THE ENCYCLOPEDIA OF BIRDS

Adelie Penguin to Yellow-billed Cuckoo

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Facts On File
An imprint of Infobase Publishing

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Facts On File, Inc.
An imprint of Infobase Publishing
132 West 31st Street
New York NY 10001

ISBN-10: 0-8160-5904-7 (set)
ISBN-13: 978-0-8160-5904-1 (set)

Library of Congress Cataloging-in-Publication Data
The encyclopedia of birds / edited by International Masters Publishers.
p. cm.
Includes index.
ISBN 0-8160-5904-7 (set)
1. Birds—Encyclopedias. I. International Masters Publishers.
QL672.2E534 2006
598.03—dc22 2006049526

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You can find Facts On File on the World Wide Web at http://www.factsonfile.com

Editorial Director: Laurie E. Likoff
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Printed in China

CP FOF 10 9 8 7 6 5 4 3 2 1

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INTRODUCTION

The Encyclopedia of Birds is a six-volume set designed to introduce the young reader to the fascinating world of birds. Birds, in all their variety, from the forests of North America, to the beaches of South America, to the mountains of Europe and the plains of Australia, share certain common features of anatomy and physiology as well as habitat and breeding. But there are also significant differences among the populations as well as unique relationships in courtship routines, nesting and life expectancy.

In this reference work, the birds are arranged alphabetically and appear in four-page spreads.

Each bird featured includes the following information:

- Order, family, genus and species
- Habitat
- Behavior
- Breeding
- Food and Feeding
- Distribution and Range
- Vital Statistics
- Creature Comparisons

In addition, fun facts or unusual information is imparted in the "Did You Know?" box and sidebar information often includes notes on conservation, related species, unusual behavior or distinguishing features.

An information panel in each section includes vital statistics on weight, length, wingspan, sexual maturity, breeding season, number of eggs, incubation period, fledging period, typical diet and lifespan.

Richly enhanced by full-color photographs as well as drawings and labeled diagrams, this wide-ranging set will be sure to fascinate and entertain bird lovers of all ages.

—Laurie E. Likoff
Editorial Director

WHAT IS A BIRD?

Generally speaking a bird is any member of the class known as Aves that share certain common characteristics and traits. Birds are warm-blooded, bipedal animals whose anatomy is characterized by forelimbs modified through natural selection and evolution to become wings, whose exterior is covered by feathers, and that have, in most cases, hollow bones to assist in flight.

Most birds are diurnal, or active during the day, but some are nocturnal, active during the evening hours, such as owls, and still others feed either day or night as needed.

Many birds migrate long distances to find the optimum or ideal habitats, while others rarely range from their original breeding spots.

Shared characteristics of birds may include a bony or hard beak with no teeth, the laying of hard-shelled eggs, a light but strong skeleton, and a high rate of metabolism.

Most birds are characterized by flight although several well-known species, particularly those that reside on islands, have now lost this ability. Some common flightless birds include the ostrich, penguin, kiwi and now extinct Dodo.

Birds feed on plants, seeds, insects, fish, carrion or other birds. Birds are also an important food source for humans. The most commonly eaten species is the domestic chicken, although geese, pheasants, turkeys and ducks are also common fare, particularly around Thanksgiving Day and the holidays. Birds grown for human consumption are known as poultry. Humans have caused the disappearance of some species due to habitat destruction, hunting or over consumption.

Other species of birds have come to depend on human activities for food and are so widespread as to be considered a nuisance such as the common pigeon or rock pigeon. In North America, sparrows, starlings, and finches are also widespread. Some birds have been used by humans to perform tasks, such as homing pigeons in the days before modern communications, and falcons to aid in hunting or for sport. Tropical birds are often sought after and kept as pets although some are now listed as endangered and their trafficking for this purpose has been restricted.

The bird population, like many other fish and wildlife groups, is facing threats worldwide. According to Worldwatch Institute, bird populations are declining, with 1,200 species facing extinction in the next century. Among the most prevalent reasons cited are habitat loss, predation by nonnative species, oil spills and pesticide use, climate change and excessive rates of hunting and fishing. All these threats make it ever more important to understand, appreciate and protect the birds we see around us everyday.

—Kenny Clements

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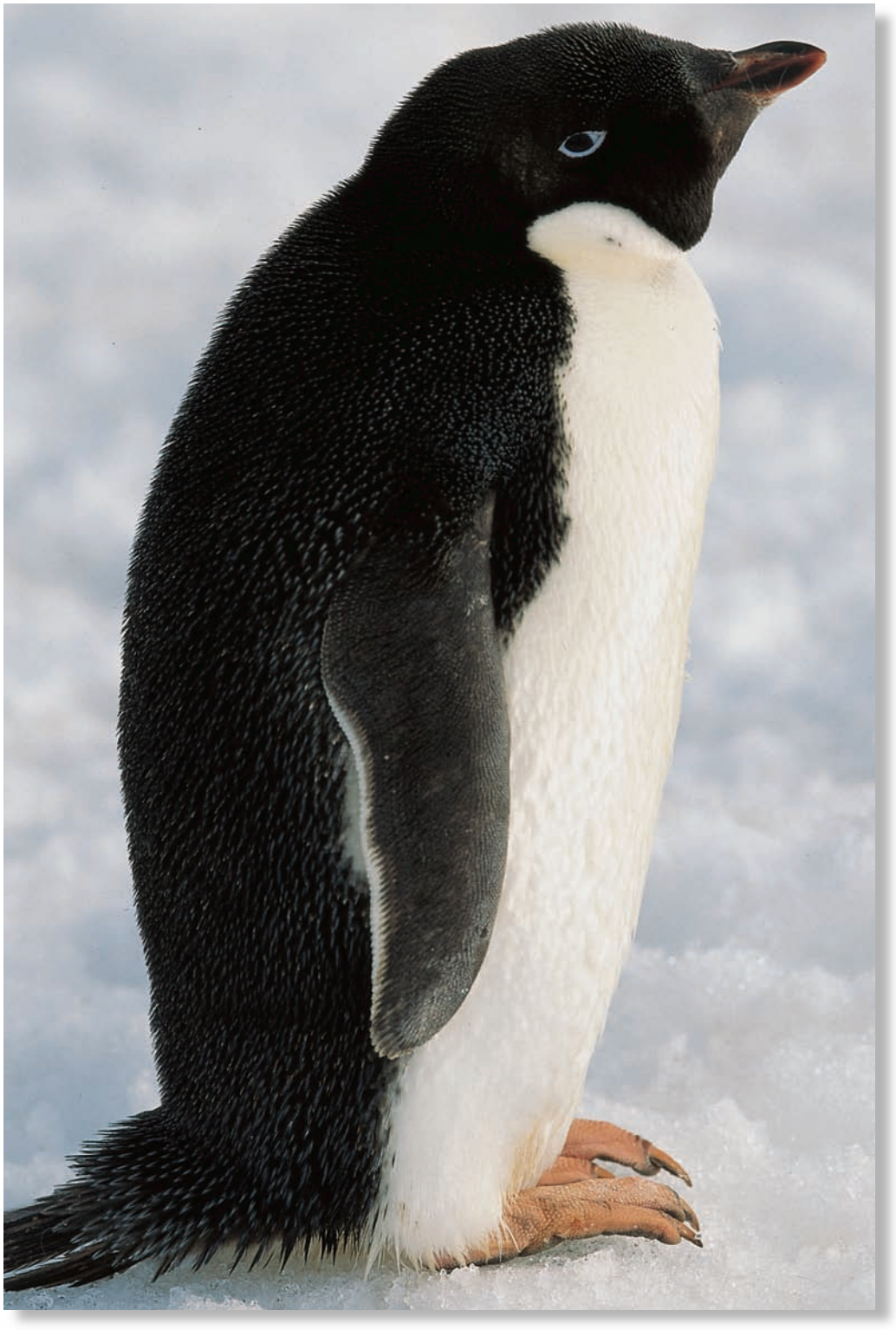
Adelie Penguin

• ORDER •
Sphenisciformes

• FAMILY •
Spheniscidae

• GENUS & SPECIES •
Pygoscelis adeliae



KEY FEATURES

- Modified, flipperlike wings drive this flightless seabird through the icy but nutrient-rich seas around Antarctica
- Crowded breeding colonies of up to a quarter of a million birds stretch over rocky coastal slopes
- Parents take turns incubating their two eggs, each fasting for days while its mate is feeding out at sea

WHERE IN THE WORLD?

A circumpolar range — limited by the northern and southern limits of Antarctica's permanent pack ice — includes inshore waters and offshore islands

LIFECYCLE

An adelie penguin is rarely alone. At sea it feeds in flocks under pack ice; in breeding seasons, it treks along bustling routes between the water and its sprawling colonies.

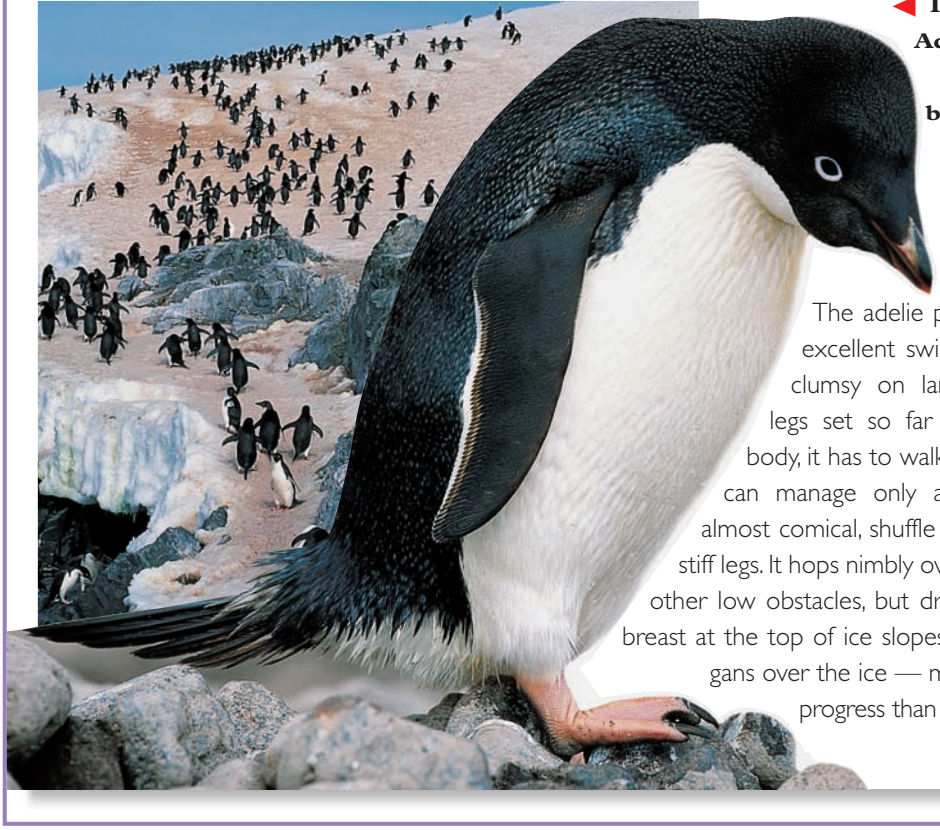
HABITAT

The adelie penguin spends nearly all its time at sea in pack ice that surrounds Antarctica. When it comes ashore to breed, it lands on barren beaches and rocky coastal slopes to gather in huge numbers. After breeding, the penguin then returns to sea, swimming in groups to new feeding grounds as winter ice begins to push farther north.

▲ **TIP OF THE ICEBERG**
Adelies inhabit ice-filled seas, rarely open water.

FOOD & FEEDING

BEHAVIOR



◀ **ICE SKATING**
Adelies jump and slide between the sea and the colony.

The adelie penguin is an excellent swimmer, but is clumsy on land. With its legs set so far back on its body, it has to walk upright and can manage only an awkward, almost comical, shuffle on its short, stiff legs. It hops nimbly over rocks and other low obstacles, but drops onto its breast at the top of ice slopes and tobogganes over the ice — making better progress than by walking.

DID YOU KNOW?

- **The word penguin derives from *pinguis*, Latin for fat. This is a reference to the thick layer of body fat which lies beneath a penguin's plumage.**
- **An adelie penguin loses almost half its bodyweight in the annual molt, which takes place on pack ice during February or March.**
- **Two colonies of adelie penguins in the Ross Sea, at Cape Adare and Cape Crozier, hold 280,000 and 180,000 pairs, respectively.**
- **To land on beaches, adelie penguins surf in on the waves.**

The adelie penguin stays close to Antarctica's pack ice to feed, since krill (tiny crustaceans that form its main food) eat the algae that grow on the underside of the ice. Diving to 65 ft for krill and other prey, the penguin can remain underwater for up to seven minutes. It catches faster-swimming prey — squid and fish — by putting on sudden spurts of speed while cruising along underwater.

Each feeding trip may last four hours or more; frequently, the adelie feeds at night, taking advantage of the nightly migration of krill and squid to the surface. Flocks also travel many miles around the fringes of the ice to exploit the best feeding grounds.

◀ **Filling meal**
Chicks over two weeks old are fed every two days.

▲ **Waiting in line**
Before leaving to feed, groups gather on the shore.

BRIEF ENCOUNTER

1 Hello again...
Up to 80% of adelie penguins are faithful to their partner of previous years when they return to land. The birds greet each other eagerly.

2 Welcome...
Standing face-to-face, with heads held high and bills to the sky, the pair makes a braying sound. This reaffirms the pair-bond.

3 Relieved...
The pair share responsibility for the young, taking turns incubating the eggs and brooding the chicks while the other feeds at sea.

4 Feed
After fasting when on nest duty, the penguin may spend up to 22 days at sea feeding, building up its reserves for its next shift.

CONSERVATION

With a total population of four to five million birds, the adelie penguin isn't threatened. However, many colonies are close to scientific installations, and ever-larger numbers of tourists arrive in Antarctica to photograph its breeding colonies. Some colonies are fast declining due to this human disturbance.

BREEDING

▲ **Seabird city**
Nests are densely packed; neighbors squabble noisily.

Penguins return to breeding colonies in September. Each pair occupies, then defends, a nest site before enacting complex mating rituals.

Two chicks hatch following six weeks of incubation by both sexes. While one parent feeds at sea, the other guards and broods the young. After two weeks, the adults feed together; all the colony's chicks in the same stage of growth join up in "crèches," which offer security against predators, such as gulls. Chicks fledge after eight weeks and head to sea.

▲ **Warm at heart**
A youngster with new feathers replacing its down.

PROFILE ADELIE PENGUIN

The adelie penguin's streamlined body, flipperlike wings and short legs reflect the amount of time it spends in the icy seas around Antarctica.

WINGS
Robust wings are used to propel the penguin in fluid and graceful "underwater flying" at a speed of 3–6 mph. However, the penguin can put on rapid spurts of speed and reach 15 mph.

FEET
Sturdy, webbed feet are set at the rear of the body and, with the stiff tail, help the penguin steer underwater.

BODY
Teardrop-shaped for reduced drag in water, the body is also insulated with a thick layer of fat.

JUVENILE
A juvenile, which takes at least five years to reach maturity, lacks the adult's eye ring and has an all-black bill.

PLUMAGE
The feathers, like all penguins, are unique among birds: they're of a uniform type over the entire body. The shaft (*rachis*) is short and curved; a second, smaller, down-covered shaft (*hyporachis*) protrudes from it for extra insulation.

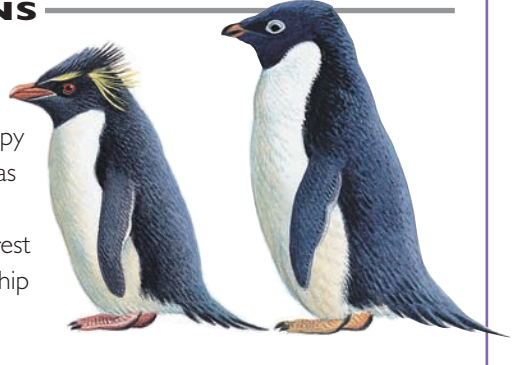
VITAL STATISTICS

WEIGHT	7–13 lbs. (varies with seasons)
LENGTH	2.5'
SEXUAL MATURITY	5–8 years
BREEDING SEASON	Arrives at nesting colonies in Sept. and Oct.; lays eggs from Nov.
NUMBER OF EGGS	2
INCUBATION PERIOD	30–43 days
FLEDGING PERIOD	50–56 days
TYPICAL DIET	Crustaceans (amphipods and krill); some fish and squid
LIFESPAN	Unknown; probably 10–15 years or more

CREATURE COMPARISONS

The rockhopper penguin (*Eudyptes chrysocome*) is slightly smaller than the adelie and more widely distributed over the Antarctic. It shares the adelie's dumpy appearance and blackish-blue and white plumage, but has more elaborate facial decorations.

Above each eye and behind the cheeks is a thin crest of golden tassels, which the rockhopper raises in courtship displays. A black crest at the back of its head is just as mobile. The rockhopper also has a thick, compact bill for catching crustaceans, such as krill.



Rockhopper penguin Adelie penguin

RELATED SPECIES

- **The *Spheniscidae* (the penguins) is the only bird family in which all species are flightless and aquatic. Its 17 members are divided into two groups. Fish-eaters, such as the king penguin** (below)**, have long, thin bills; species that feed on krill, like the adelie, have stubby bills.**

African Fish Eagle

• ORDER •
Falconiformes

• FAMILY •
Accipitridae

• GENUS & SPECIES •
Haliaeetus vocifer

KEY FEATURES

- A first-rate fisher, the fish eagle skillfully seizes prey, usually catching its quota early in the day
- Interlocked mating pairs engage in whirling aerial courtship displays that can end in death
- Known throughout Africa for its song that peals out continuously from sunrise to sunset

WHERE IN THE WORLD?

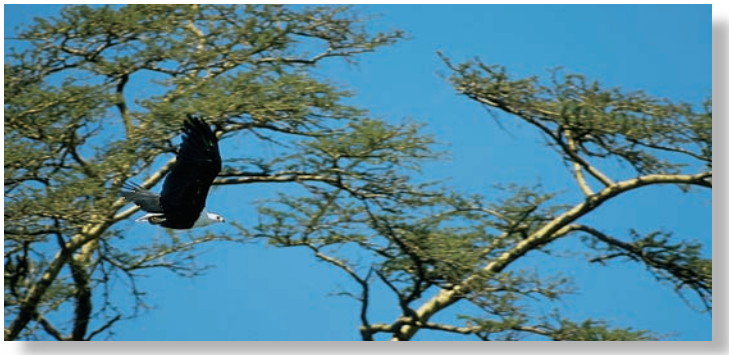
Throughout sub-Saharan Africa; from Senegal and Gambia in the west, east through Ethiopia, Sudan, Kenya and Uganda

LIFECYCLE

After awakening the continent with its song, the African fish eagle strikes quickly to land its daily meal, then retires to its perch to closely guard its territory from intruders.

HABITAT

Whether lake, river or creek, water always abounds in the African fish eagle's territory. Near Lake Victoria or the lakes of Kenyan Rift Valley, a pair of eagles may require less than 1 sq. mile of water to find enough food. If the pair inhabits an area next to a small river, however, they may need 15 miles of water. The African fish eagle spends most of the day perched in a large tree that overlooks the water, preferring fig and acacia trees.



▲ **SOARING SEARCH**
An African fish eagle soars high above a lake that provides an abundance of fish.

FOOD & FEEDING

The fish eagle hunts its prey from perches overlooking the water. If it is lucky, it will catch two live fish in about 10 minutes and be done hunting for the day. Its favorites are catfish and lungfish, and it will occasionally snatch these from herons, pelicans and storks. Young flamingos, ducks, storks and herons are targets, as are lizards and turtles. The fish eagle plucks feathers from birds and scales fish before eating the animals.

After food is ingested, it can be stored in a fleshy pouch in the neck called a crop; this pouch will hold over 2 lbs. of food. It allows the eagle to gorge itself when large amounts of food are available, then regurgitate it for later consumption.

DID YOU KNOW?

- **An African fish eagle in captivity lived 40 years, more than twice the average lifespan of one in the wild.**
- **The call of the African fish eagle is so widely heard that it is known as "the voice of Africa."**

BREEDING

During the breeding season displays become very intense. Rare among other eagles but common among sea and fish eagles, the whirling ritual occurs when a courting pair soars, locks claws and then falls wing over wing toward the ground. The birds will not release until the display is over, which occasionally can end in death if the entwined birds crash to the ground. When the female is ready to mate, she lowers her head and raises her tail so that her whole body is parallel to the ground. The male then jumps or flies onto her back. The pair usually mates for life. They build their large stick-nest in a tree and use this nest year after year, adding new material to it for each breeding season.

CONSERVATION

Current populations of the African fish eagle remain stable. Very low levels of pesticides are now found in the food chain of the African fish eagle, but humans present the greatest threat to the eagle's future. Conservation of land and clean water is needed to maintain the population.

A RAPTORIAL RAID

1 Predatory perch...
Sitting atop a tall tree, the African fish eagle has a perfect view of the lake in its square-mile territory.

2 Target in sight...
Swooping at 20 mph, the eagle glides with its feet extended and talons ready to strike at a Nile perch.

3 Heavy load...
It drags the perch, which is too heavy to be carried while flying, along the surface. The eagle gathers speed and…

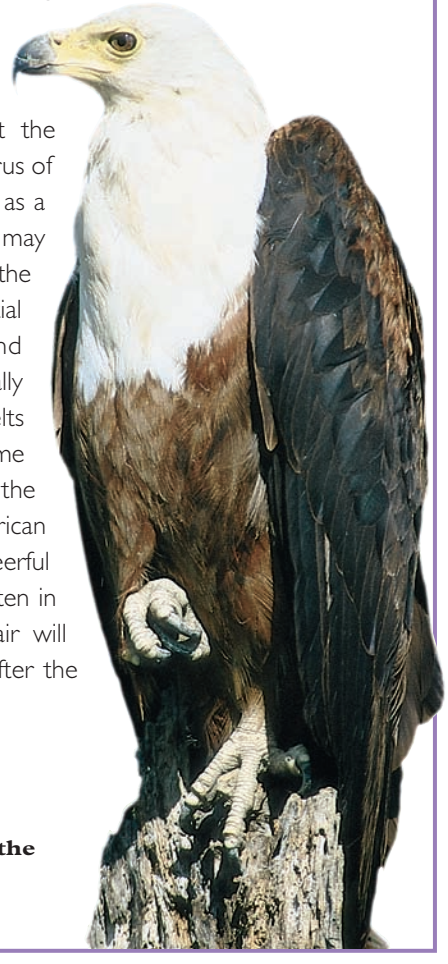
4 Well-earned meal
…lifts its meal onto the bank. The eagle uses its beak to pull the scales off the perch before enjoying its feast.

▶ **GROWING UP**
The fish eagle's plumage goes through four stages before adulthood.

BEHAVIOR

▲ **IT'S MINE**
Fiercely protective of its kills, the fish eagle will attack any potential thief, including a marabou stork.

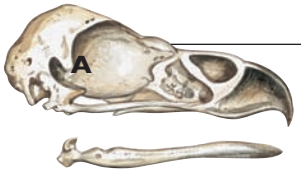
Awakening before dawn, the eagle begins its serenade, a song well known across Africa. About 40 minutes before sunrise, the air throughout the sub-Sahara fills with the chorus of singing pairs. The calls serve as a territorial signal. The "tune" may be produced in flight while the eagle searches for potential prey. When perched and singing, the eagle theatrically throws its head back and belts out its song, which bears some resemblance to the call of the American bald eagle. The African fish eagle sings this loud, cheerful song throughout the day, often in female-initiated duets. A pair will normally remain together after the breeding season.



▶ **POWERFUL POSE**
Perched high in a tree, the eagle towers above its territory.

PROFILE AFRICAN FISH EAGLE

Adept at fishing, the keen-eyed African fish eagle spots prey from high on its perch, then dives to "hook" its victim using dagger-sharp talons.

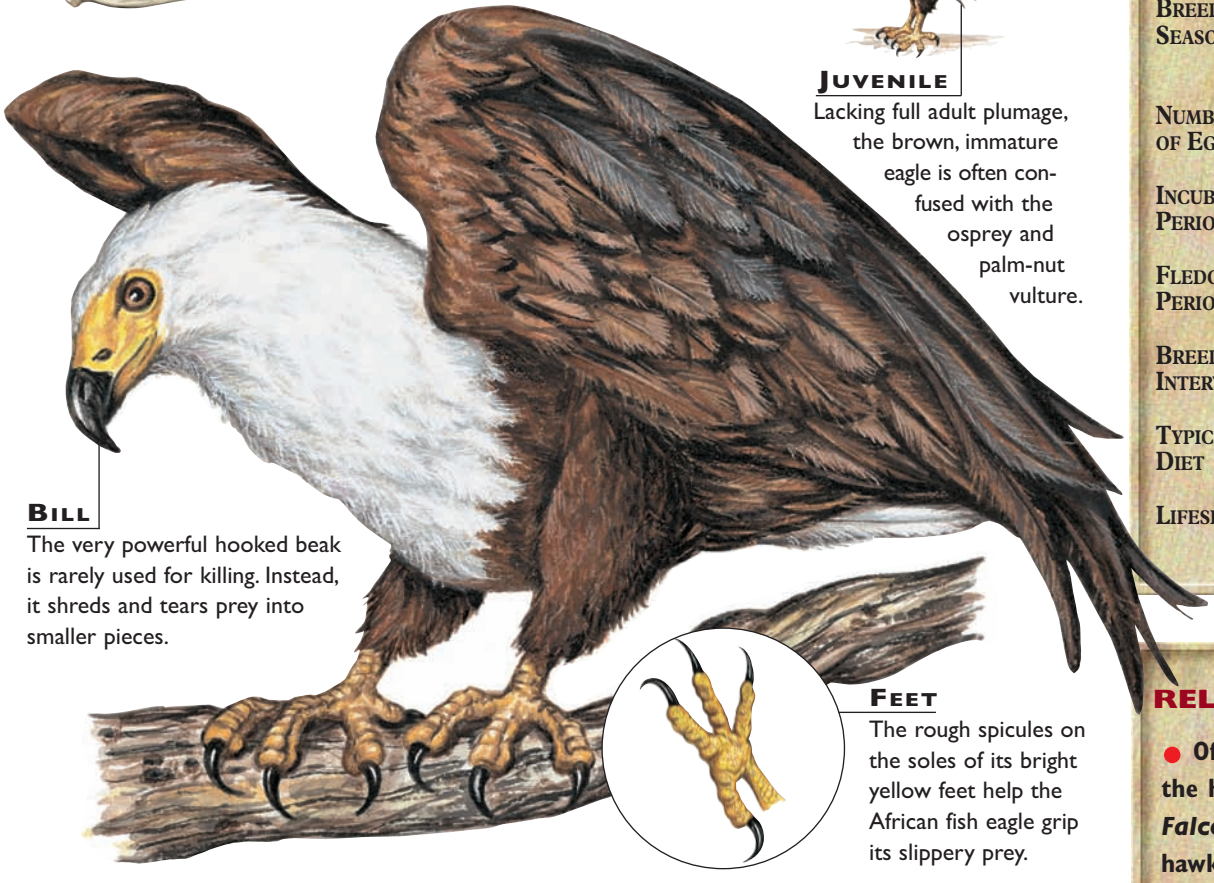


SKULL

The skull is lightweight, with reduced jaws, large eye sockets (A) and no teeth, for better flight efficiency.

JUVENILE

Lacking full adult plumage, the brown, immature eagle is often confused with the osprey and palm-nut vulture.



BILL

The very powerful hooked beak is rarely used for killing. Instead, it shreds and tears prey into smaller pieces.

FEET

The rough spicules on the soles of its bright yellow feet help the African fish eagle grip its slippery prey.

VITAL STATISTICS

WEIGHT	Male 4–6 lbs.; female 7–9 lbs.
LENGTH	26–33"
WINGSPAN	7'
SEXUAL MATURITY	4 years
BREEDING SEASON	Varies according to region
NUMBER OF EGGS	1–3
INCUBATION PERIOD	44 days
FLEDGING PERIOD	65–75 days
BREEDING INTERVAL	6 months to 1 year
TYPICAL DIET	Large fish
LIFESPAN	Up to 15 years in the wild

RELATED SPECIES

● **Often called raptors, the hawk order *Falconiformes* includes hawks, eagles, vultures, falcons, the secretary bird and the osprey. These primarily carnivorous birds all have hooked beaks, strong feet with curved talons for catching prey, large eyes and wings built for soaring. Of the world's more than 220 species of raptors, over 70 live in Africa.**

CREATURE COMPARISONS

African fish eagle

As its name implies, the white-tailed eagle *(Haliaeetus albicilla)* has a white tail, but lacks the distinctive white head of the African fish eagle. Weighing in at 7–14 lbs. the white-tailed is heavier than the African fish eagle and, in both species, females are larger than the males. The white-tailed eagle inhabits Europe and Asia, but rarely Africa. Like the African fish eagle, it includes large areas of water in its territory. The white-tailed eagle shares the scaly, fish-grabbing talons and the dietary habits of the African fish eagle, subsisting mainly on freshly caught fish.

White-tailed eagle

African Gray Parrot

• ORDER •
Psittaciformes

• FAMILY •
Psittacidae

• GENUS & SPECIES •
Psittacus erithacus

KEY FEATURES

- Expertly extracts seeds and flesh from all manner of nuts and fruits, using both delicate manipulation and brute force
- Gathers in flocks of hundreds at nightfall to roost high in the rainforest canopy
- Utters a range of screams, shrieks and whistles in the wild, but in captivity may mimic any sound that it hears

WHERE IN THE WORLD?

In a range of forest types, but especially rainforest, in equatorial Africa: from Sierra Leone and Guinea-Bissau to Tanzania and Kenya in the east and south to the Congo–Angola border

LIFECYCLE

Although the African gray parrot is one of the most familiar of all cagebirds and is kept in captivity the world over, much of its behavior in the wild remains a mystery.

HABITAT

The African gray parrot lives in dense lowland rainforest and areas of open (secondary) forest, spending nearly all its time in the treetops. At certain times of year, when trees are fruiting, it'll visit wooded areas of savannah. In the eastern Congo, the parrot frequents upland forest at 6,600'; it also occurs at sea level, in mangrove swamps along the West African coast.

The African gray is an adaptable species and takes advantage of large oil palm plantations in West Africa. The plantations provide nesting sites and a rich and reliable food source: oil palm nuts.

▶ **GRAY AREA**
Primary forest with open glades is the preferred habitat of the African gray, but it also exploits mature secondary forest and oil palm plantations.

CONSERVATION

The African gray parrot isn't in any immediate danger because it occurs over a wide range. However, in many areas of eastern and central Africa, populations are disappearing because of forest distribution, and although they are bred in captivity for sale, many are still being taken from the wild.

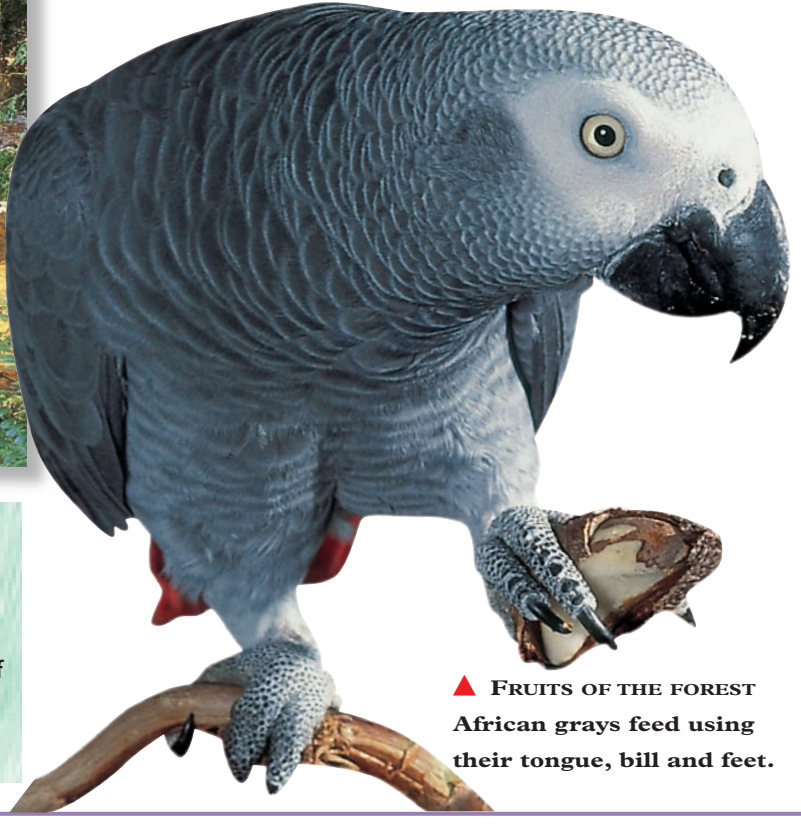
BEHAVIOR

Flying home near dusk, African grays congregate at their roosting sites, usually in tall trees at the forest edge or a clearing in the forest. Where available, they also roost on small islands near the coast or in the middle of a large river, provided there's plenty of treecover. Some roosts may have hundreds, even thousands, of birds.

African grays fly fast, with characteristic shallow and rapid wingbeats. While in flight, they whistle and shriek constantly, creating a huge amount of noise. Although they're nearly always seen high in the forest canopy, African grays may sometimes visit the ground, since small pieces of quartz have been found in their stomachs. These mineral fragments are probably important in assisting the *gizzard*, or muscular stomach, to grind down the hard nuts and berries that form the basis of the parrot's diet.

Tool-use in birds is an uncommon phenomenon, but it has been recorded in the African gray parrot. One bird was seen preening its feathers with a small splinter of wood held in its bill.

FOOD & FEEDING



▲ **FRUITS OF THE FOREST**
African grays feed using their tongue, bill and feet.

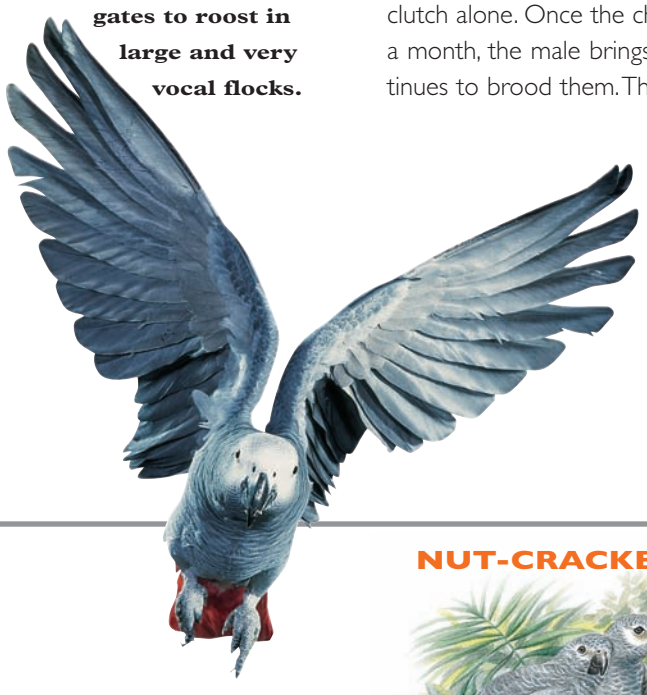
BREEDING

Little is known about the breeding of African grays in the wild, but they generally breed in the dry season.

The nest is usually in a knothole or broken tree limb 70–100' above ground. The female lays 2–4 white eggs on a bed of wood dust at the bottom of the nest hole and incubates the clutch alone. Once the chicks hatch after about a month, the male brings food while his mate continues to brood them. They fledge at 2–3 months.

▶ **BREEDING SEASON**
African grays breed from July to January in their tropical range, reflecting the dry to wet seasons.

▼ **COMING IN TO ROOST**
Although many aspects of its lifestyle are unknown, the African gray parrot is difficult to miss at nightfall, when it congregates to roost in large and very vocal flocks.



The *frugivorous* (fruit-eating) diet of the African gray is varied, comprised of seeds, nuts and berries of many forest trees. The species feeds mainly in the canopy; small parties of parrots clamber noisily on the branches in an energetic quest for ripe fruit.

Once African grays finish feeding in a particular tree, they are reluctant to fly and instead make use of their climbing skills to move to the next feeding place. However, they will fly 3 miles out to sea to offshore islands containing fruiting trees.

NUT-CRACKER

1 Feeding party...
Small flocks of African gray parrots gather in the treetops to search for fruits and nuts among the lush foliage.

2 Pluck and grip...
An African gray parrot can use either its bill or one of its feet to pluck off a ripe nut and then grasp it tightly.

3 Crack open...
Applying a tremendous amount of pressure with its powerful bill, the parrot cracks open the nut's hard casing to reveal a nutritious kernel.

4 Extract and swallow
Using its thick, fleshy tongue, the parrot removes the kernel and manipulates it, before crushing and swallowing it.

DID YOU KNOW?

- **Famous for its ability to mimic sounds, including those produced by objects, such as creaking doors or ringing telephones, the African gray can copy the human voice with remarkable realism. One bird had a "vocabulary" of over 800 words.**
- **A roost with 5,000–10,000 African gray parrots gathers each night at an oil palm plantation in Gabon.**
- **Several hundred pairs of African grays may nest in a loose colony scattered over a wide area. Pairs nest 30–100' apart, and there's usually one nest per tree.**

PROFILE AFRICAN GRAY PARROT

Dextrous feet and a large, hooked bill double up as the African gray parrot's versatile feeding and climbing tools in the forest canopy.

TONGUE

The tongue is thick, fleshy and very mobile. After cracking open nuts, the parrot uses its tongue to deftly remove the kernels.

EYES

Eyes are positioned at the center of the sides of the head, which means that the parrot can detect movement from behind by moving its head only fractionally to one side or the other.

BILL

Hooked and powerful, the bill can crack tough nuts and shred fibrous fruit. The parrot also uses its bill, as well as its feet, to grip branches and haul itself through the treetops.

FEET

Long, dextrous toes (two point forward, the other two backward) let the African gray parrot climb effortlessly along branches and grasp larger food items.

PLUMAGE

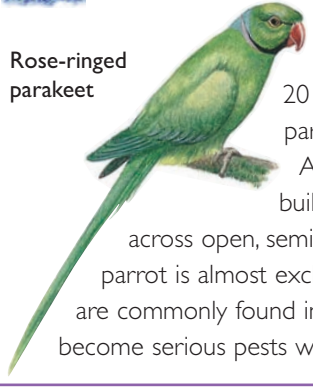
The characteristic red color of the tail presents a striking contrast with the gray body plumage. In older birds, scarlet feathers eventually begin to appear among the body feathers.

VITAL STATISTICS

WEIGHT	12–16 oz.
LENGTH	1'
WINGSPAN	2'
SEXUAL MATURITY	Unknown
BREEDING SEASON	July–January
NUMBER OF EGGS	2–4, usually 3
INCUBATION PERIOD	3–4 weeks
FLEDGING PERIOD	10 weeks
BREEDING INTERVAL	1 year
TYPICAL DIET	Seeds, nuts, fruit; may raid maize crops
LIFESPAN	Unknown in wild; 20 years in captivity

CREATURE COMPARISONS

Rose-ringed parakeet



African gray parrot

The rose-ringed parakeet, *Psittacula krameri*, with the African gray parrot, are two of only 20 or so parrot species in Africa. The parakeet looks very different from the African gray with a lighter, slimmer build and long pointed tail. The parakeet occurs across open, semidesert habitats of West and East Africa; the parrot is almost exclusively a forest dweller. Flocks of parakeets are commonly found in agricultural areas, where they sometimes become serious pests when crops are ripe.

RELATED SPECIES

● **There are 340 species in the parrot family *Psittacidae*; most are found in tropical and subtropical regions. Close relations in this family include the lories and lorikeets, cockatoos and the cockatiel, macaws, conures, parakeets and amazons. Parrots range from the small lovebirds of Africa to large macaws of South America. These adaptable birds are found in many habitats.**

African Harrier Hawk

• ORDER •
Falconiformes

• FAMILY •
Accipitridae

• GENUS & SPECIES •
Polyboroides typus

KEY FEATURES

- Specializes in flying very slowly, nearly stalling, while scanning the ground for its small prey
- Unique double-jointed knees allow it to grab victims from deep inside holes, cracks and crevices
- Its broad wings, long tail and long legs present a large, formidable figure despite its small size

WHERE IN THE WORLD?

Found only in Africa: South Africa, east to Natal, north to Botswana, northern Namibia, Zimbabwe and Mozambique, then north to the Sahara Desert

LIFECYCLE

The African harrier hawk is like many other raptors, except for its unfeathered face, which blushes to a deep red when startled or during mating displays.

HABITAT

TREE HOUSE
The harrier hawk prefers to perch in tall trees.

The African harrier hawk frequents a variety of landscapes throughout its range in central and southern Africa, including forest, woodland and savannah. It is most often found at the top of tall trees fringing the larger rivers or in hilly country where there are deep ravines and steep hillsides.

DID YOU KNOW?

- **The African harrier hawk is also known as the *gymnogene*, which means bare cheeks.**
- **Only found on the island of Madagascar, the Madagascar harrier hawk is sometimes considered to be just a subspecies of the African harrier hawk.**

BREEDING

Courtship for the African harrier hawk occurs in the air. At the onset of the breeding season, the pair can be seen soaring together in display flights involving shallow dives and upward swoops accompanied by drawn-out whistles. These displays usually end in a long glide to the nest area.

The stick nest is built in a tree by both sexes, usually from 30–150' from the ground, and is lined with green leaves. Usually 2 eggs are laid and both sexes incubate. After about 35 days, the eggs hatch at different intervals and the younger sibling usually dies of starvation as its older sibling takes all the food.

HIGH IN THE SKY
The surviving chick fledges between 49–60 days.

BEHAVIOR

The African harrier hawk's most unusual behavior is that it blushes. Whereas most raptors have feathered faces, this hawk's face is unfeathered to assist it in probing into holes for food. Unexpected disturbances, such as a branch snapping, can trigger the face (normally pale yellow) to blush a deep red. Encounters between breeding pairs also result in blushing; this is believed to represent an appeasement signal, especially during courtship, and switches in incubation duty.

TAKING A BREAK
The hawk lands to rest and scans the area.

CONSERVATION

Although population numbers are unknown, the African harrier hawk is fairly common throughout its entire range and is not currently in danger. As are all members of the hawk family, the African harrier hawk is protected by law from hunters and is not allowed to be kept without a permit. The African harrier hawk and the other member of its genus, the Madagascar harrier hawk *(Polyboroides radiatus)*, are both listed in Appendix II of CITES (Convention for International Trade in Endangered Species of Wild Fauna and Flora) and are not allowed to be exported.

FOOD & HUNTING

The African harrier hawk seeks out elusive prey. With its ability to bend its legs forward and backward, this hawk can reach deep into holes or crevices and grab prey that is safe from other raptors. The African harrier hawk shows a variety of hunting skills: it climbs around on the branches of trees, using its wings for balance; it hangs upside down for long periods of time as it explores nooks and crannies for a hidden meal; it soars slowly along the edge of hillsides and ravines and scans carefully for potential prey.

Unlike other raptors, this hawk is not a very powerful bird and normally settles for prey about as large as a lizard. In certain parts of its range, the African harrier hawk is known to eat the fruit of the oil palm, but mostly its diet consists of lizards, small birds, insects and rodents.

OPPORTUNISTIC RAIDER

1 Chase...
Spotting an agama lizard on the ground, the harrier hawk swoops down to try to snatch the lizard with its outstretched talons.

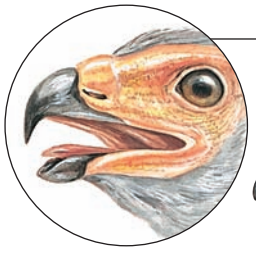
2 Wedge...
Failing to catch the lizard, the hawk pushes its head into the rock crevice and grabs the lizard with its bill.

3 Hang...
Flapping its wings for balance, the hawk hangs upside down by one foot and reaches into a weaver's nest with the other.

4 Raid
Bending its leg backward, the African harrier hawk is able to reach deep into the nest to snatch a nestling.

PROFILE AFRICAN HARRIER HAWK

The African harrier hawk is uniquely equipped for a life as a stealthy hunter; it has extremely keen vision for locating elusive prey.



BILL

The hawk's hooked bill is used to tear the flesh of its prey. Its nostrils are protected by a soft membrane called the *cere*.

JUVENILE

Immature birds are dark brown with varying amounts of light-brown edging to the feathers.

WINGS

The long, broad wings, paired with a small body, give this hawk its exceptional ability to sail slowly near the ground or the edges of hillsides while scanning for prey.

LEGS & FEET

The hawk's intertarsal joint, or "knee," can bend backward and forward, allowing the bird to reach deep into holes to snatch prey.

VITAL STATISTICS

WEIGHT	About 2 lbs.
LENGTH	22–25"
WINGSPAN	About 5'
SEXUAL MATURITY	Unknown
BREEDING SEASON	Spring and Summer
NUMBER OF YOUNG	Usually 2, but only 1 survives
INCUBATION PERIOD	About 35 days
FLEDGING PERIOD	49–60 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Lizards, birds, insects and rodents
LIFESPAN	Unknown

CREATURE COMPARISONS

At 20", the eastern chanting goshawk, *Melierax poliopterus,* is slightly smaller than the African harrier hawk. The goshawk inhabits dry open woodland and semi-desert areas of eastern Africa, compared to the forest, woodland and savannah habitats of the harrier hawk. The goshawk's feeding methods differ from the harrier: it feeds mostly on lizards and insects that it spots from a perch, or the goshawk may take small birds after a vigorous pursuit. This contrasts with the harrier hawk, which extracts its prey from holes or flies slowly when searching for prey.

African Harrier hawk

Eastern Chanting goshawk

RELATED SPECIES

- The family ***Accipitridae*** contains 208 species of eagles, hawks, kites and Old World vultures. The African harrier hawk shares its genus, ***Polyboroides,*** with the Madagascar harrier hawk, ***P. radiatus.*** Other species of hawk include the red-shouldered hawk, ***Buteo lineatus,*** the red-tailed hawk, ***B. jamaicensis,*** and the sharp-shinned hawk, ***Accipiter striatus.***

African Pygmy Falcon

• ORDER •
Falconiformes

• FAMILY •
Falconidae

• GENUS & SPECIES •
Polihierax semitorquatus

KEY FEATURES

- Uses the nests of birds called weavers to roost and breed
- Rapid and agile in flight, it darts through the air with short, quick bursts of speed
- Female easily distinguished from the male by her deep chestnut back
- Small raptor with powerful talons and a hooked beak for hunting prey

WHERE IN THE WORLD?

Found exclusively in eastern and southern Africa: parts of Ethiopia, Somalia, Uganda, Kenya, Tanzania, Angola, Transvaal, Botswana, Namibia and South Africa

LIFECYCLE

Unlike other birds of prey that build a large solitary nest, the African pygmy falcon lives alongside a friendly host, the sociable weaver, and adopts a chamber in the weaver nest.

HABITAT

The African pygmy falcon lives in two distinct and widely separated populations in Africa: one in the southwestern part of the continent and the other in the northeast. In either part of the continent, the pygmy falcon inhabits the arid and semiarid savannah and scrubland, which features sparse groundcover and scattered large trees dotting the landscape. The African pygmy falcon typically avoids open forests and forest edges. This falcon also frequents the huge nests of weavers, especially the sociable weaver, *Philetairus socius*, sharing its roosting and nesting site. The pygmy falcon occasionally shares the nests of the white-headed buffalo weaver and those of the sparrow weaver.

▲ **TREETOP**
A female falcon perches at the top of a tall tree.

DID YOU KNOW?

- **Unlike other falcons, the eggs of the pygmy falcon are pure white, consistent with many birds that lay eggs in concealed nests.**
- **The pygmy falcon's range is dictated by that of the sociable weaver; it even avoids otherwise suitable savannah habitat that is devoid of weaver nests.**
- **In the Kalahari region of Africa, pygmy falcons occupy about one out of every four sociable weaver colonies.**

BREEDING

UNWANTED HOUSEGUEST

1 Flying...
A female pygmy falcon flies toward a large nest colony of sociable weavers that the falcon exploits for its own use.

2 Hanging...
The entrance is located at the bottom of the nest colony; the falcon hangs upside down in order to enter the nest chamber.

FOOD & HUNTING

The African pygmy falcon mostly feeds on insects and lizards, though occasionally rodents and small birds are consumed. In spite of its small size, the African pygmy falcon is a voracious predator, like birds of prey. Perching from a tall tree, the pygmy falcon watches the ground below for movement from a potential meal. Once its victim is sighted, the pygmy falcon quickly dives to the ground, snatching its victim in its talons, and taking it back to the perch to be eaten. Like all falcons, the African pygmyfalcon regurgitates 1–2 pellets daily, which contain all the indigestible food fragments, such as fur and bones.

▶ **TASTY MEAL**
A male African pygmy falcon feasts upon a large lizard in the savannah.

Courtship begins in the summer and includes the male feeding his mate. The female performs exaggerated tail-wagging displays. No nest is built; instead the pair moves into a chamber in the nest colony of sociable weavers, which is comprised of a huge haystack structure built into a tree and contains chambers of up to 50 active weaver nests. Each chamber is enclosed and is reached from below through a narrow vertical tunnel. The falcon pair evicts 1–2 pairs of weavers from their nests, then the female lays from 2–4 eggs. While both parents incubate for about 30 days, the female's share of the task is larger. The male provides his mate, and later the chicks, with food. The chicks are helpless at birth, but fledge in 28–30 days. They remain with their parents for 1–2 months after fledging before becoming completely independent.

3 Striking...
The pygmy falcon strikes and kills a sociable weaver chick; this is uncommon, but necessary, when food is scarce.

4 Feeding
The pygmy falcon brings the dead weaver chick back to its nest chamber to feed it to its own young, hungry family.

BEHAVIOR

African pygmy falcons are diurnal, with activity peaks in the early morning and late afternoon. They usually roost during the hotter parts of the day. These falcons are rapid and agile in flight, darting through the air in quick bursts, similar to those of a woodpecker. Because of their small size, African pygmy falcons are able to share the nest colony of sociable weavers. These huge nests provide a safe, weatherproof environment for the falcons. The falcons do not bother the weavers beyond the eviction of 1–2 pairs and occasionally killing a chick when other food is scarce. While the falcon pairs enjoy the benefits of the weavers' work, the weavers gain a pair of bodyguards to protect them from snakes, such as cobras, that prey upon the nest chambers. The sociable weavers happily continue to add and maintain the nest in spite of having an uninvited roommate.

▲ **MORNING CHILL**
To keep warm when chilly, the falcon fluffs its feathers.

CONSERVATION

The African pygmy falcon is a fairly common resident throughout its range and is not currently endangered. It is listed in Appendix II of CITES (Convention in International Trade in Endangered Species), which regulates the import and export of animals for the pet trade. Since its range is dependent upon weavers for nesting, the pygmy falcon has a very limited distribution. Due to its small size, it falls victim to predators, including larger birds of prey found in the same habitat.

PROFILE African Pygmy Falcon

Despite its small size, the pygmy falcon is a bold predator armed with sharp talons and a strong, hooked beak for catching and killing its prey.

Male
The male is easily distinguished from the female by his full-gray back, but has a similar white front and face. Like the female, the male has a barred tail and black flight feathers with white spots.

Female
The female pygmy falcon is mainly gray above and white below, including the forehead and face. She has a white neck ring and a rich, deep chestnut back.

Eyes
Large eyes provide acute vision for capturing small prey on the open savannah. The *fovea*, a depression in the retina, serves to magnify images.

Bill
Like all birds of prey, the falcon's bill is sharp and hooked for tearing flesh. At the base of the bill is an area of bare skin called the *cere*; this skin protects the nostrils while the bird is feeding.

Feet
Strong toes with sharp, curved talons are used as weapons when hunting. Three toes face forward while the hind toe (*hallux*) is backward, allowing the falcon to firmly grip and crush its prey.

Tail
The long, broad tail aids in steering when the falcon dives for prey. It also acts as a brake when landing.

Vital Statistics

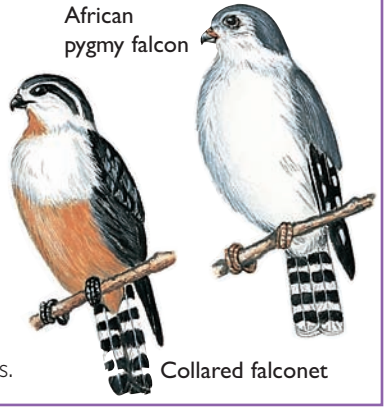
Weight	2–3.5 oz.
Length	7–8"
Wingspan	12–14.5"
Sexual Maturity	Unknown
Breeding Season	Summer
Number of Eggs	2–4; usually 3
Incubation Period	28–30 days
Fledging Period	27–40 days
Breeding Interval	1 year
Typical Diet	Mostly insects and lizards; also rodents and small birds
Lifespan	Unknown

Related Species

● The African pygmy falcon is 1 of 2 species in the genus ***Polihierax***; the other is the white-rumped falcon, ***P. insignis***. The family ***Falconidae*** contains 64 species in 10 genera of falcons, falconets, kestrels, caracaras and hobbies. Close relatives of the African pygmy falcon include the crested caracara, ***Caracara plancus***, the peregrine falcon, ***Falco peregrinus***, and the brown falcon, ***F. berigora***.

Creature Comparisons

Reaching 7" long, the collared falconet (*Microhierax caerulescens*) is slightly smaller than the African pygmy falcon and is one of the smallest of the raptors. The collared falconet has a glossy black back with white on its forehead, collar and sides of face; it has a chestnut chin and belly, compared to the pygmy falcon, which is mostly gray above and white underneath. Unlike the African pygmy falcon, which inhabits the semiarid and arid savannah, the collared falconet is mainly found at the edge of temperate forests. Despite their small size, both birds are bold predators, like their larger relatives.



American Black Vulture

• ORDER •
Falconiformes

• FAMILY •
Cathartidae

• GENUS & SPECIES •
Coragyps atratus

KEY FEATURES

- Extremely keen eyesight allows this scavenger to look for food while soaring high in the sky
- Though it searches out the most putrid food, it does not rely on smell to find a meal, as some vultures do
- Performs a useful sanitation service by cleaning up garbage dumps and removing dead animals from highways

WHERE IN THE WORLD?

Found in the tropical and warm temperate regions of central and western Canada, throughout most of the U.S. and Mexico, and south to southern South America

LIFECYCLE

The American black vulture spends most of its time soaring high above the ground, waiting for death to strike and leave behind the carrion it craves.

HABITAT

The black vulture lives in a variety of Western Hemisphere habitats, including coastal lowlands, forests, jungles and deserts. It flocks to open grasslands, the edges of cities and even to downtown urban areas, where the vulture rides the thermal air currents rising from the canyons of skyscrapers. No matter what the habitat, the birds are most likely to be found near something dead or rotting. The black vulture frequents city dumps, sewers, slaughterhouses and highways with roadkill. It also searches mangrove stands and other wooded areas where baby birds are left unprotected. After spending the day gliding and circling, it will return to roost, usually in tall trees. When not feeding, the black vulture is somewhat social, and is often found roosting with other birds, especially turkey vultures.

◀ **IN THE TREETOPS**
Resting in a tree, the vulture searches for prey.

DID YOU KNOW?

- **On hot days, the black vulture cools off by wetting its legs with its urine.**
- **The black vulture returns to roost when the air cools and the warm thermal currents dissipate.**
- **Before sanitation services were developed, black vultures were commonplace at meat markets throughout the U.S. where they cleaned up scraps, keeping the areas clean and free of disease.**

CONSERVATION

All members of the vulture family have been protected by federal law since 1972, and populations have remained stable. Black vultures previously faced threats from farmers, who believed the birds carried a virus that caused hog cholera, and the vultures were often shot. One type of vulture, the California condor, was near extinction, but preservation efforts have helped rebuild populations.

BREEDING

▲ **HELPLESS BEGINNING**
The black vulture is born helpless and completely dependent upon its parents for nourishment.

Breeding begins in January and continues until July. Male black vultures compete with other males for a female's attention, strutting past her with their wings partially spread and rapidly bobbing their heads. The female picks a suitable mate and a pair-bond forms. After mating, the pair usually does not build a nest. Instead, eggs are laid in hollow bases of trees or stumps, seldom more than 10–15' off the ground, or even in crannies of tall city buildings. Eggs number from 1 to 3, and have green, blue or olive tint and brown splotches. Both parents share incubation duty for 32–39 days. Nestlings are born helpless and naked but quickly acquire downy feathers. The parents bring back digested food and regurgitate it into the chicks' mouths. Chicks can fly after 63–70 days, but usually do not leave the nest until they are 2–3 months old.

BEHAVIOR

Black vultures begin their day soaring on air thermals in their continual search for food. They glide in circles and flap their wings periodically. Groups can range in number from a few vultures to over 100 birds. When food is spotted, the black vultures pour down from the sky. When it is not flying, the vulture often perches with its wings spread in the sun. The black vulture will mix with turkey vultures at roosting areas, usually in tall trees. In North America, the black vulture migrates to warmer climates, where it spends the winter.

▲ **COMMUNAL ROOSTING**
The black vulture can be social when not eating and is often found roosting in trees with other vultures.

FOOD & FEEDING

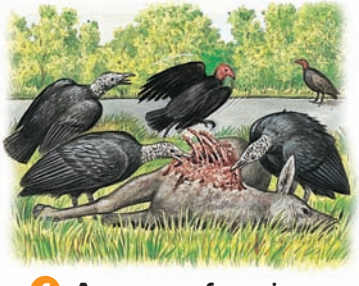
Most of the black vulture's diet consists of carrion and garbage; it supplements this menu with bird nestlings, such as baby herons, and young turtles that have just hatched. When pressed for food, the black vulture will also attack larger live prey, such as calves, lambs, skunks and opossums. The vulture uses its thick bill with a hooked end to tear into flesh. Though it has strong claws for gripping prey, its talons are not sharp enough for it to strike from the air, as a hawk or eagle can. Black vultures congregate around a kill and grab what they can.

PICK AND CHOOSE

1 A dump of delights...
A group of black vultures searches a garbage dump for a morning snack, while a single bird suns itself.

2 Turtle tidbits...
The black vulture snatches up baby turtles just after they hatch, before they can reach the safety of the sea.

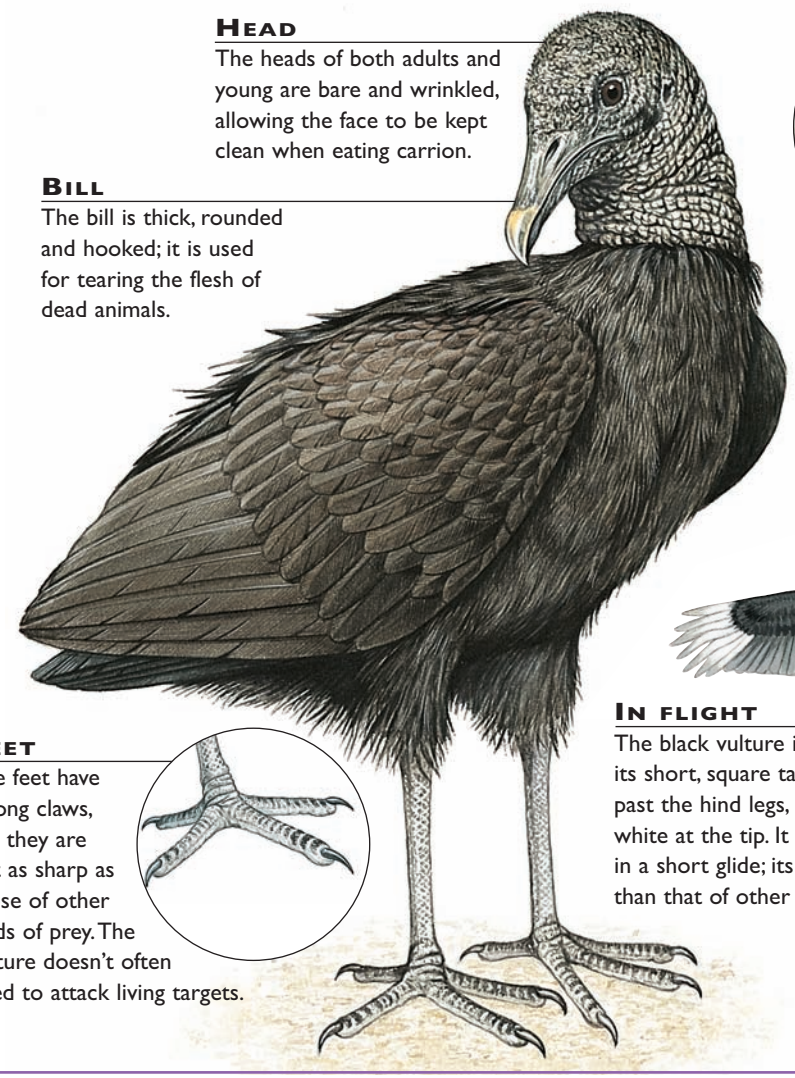
3 Nest robber...
Raiding a colony of egrets and herons, a vulture makes quick work of an unguarded nestling in its mangrove home.



4 A course of carrion
A dead donkey makes an inviting meal as black vultures drive away two turkey vultures trying to join the feast.

PROFILE AMERICAN BLACK VULTURE

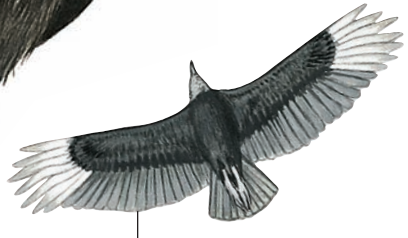
The American black vulture uses its keen eyesight to spot its carrion meals; its bullying nature keeps others away while it eats.



HEAD
The heads of both adults and young are bare and wrinkled, allowing the face to be kept clean when eating carrion.

BILL
The bill is thick, rounded and hooked; it is used for tearing the flesh of dead animals.

EYES
The vulture's vision is very acute, allowing it to find its prey as it soars high in the sky.



IN FLIGHT
The black vulture is distinguished in flight by its short, square tail, which scarcely reaches past the hind legs, and wings with a flash of white at the tip. It makes several rapid flaps in a short glide; its flight is more labored than that of other vultures.

FEET
The feet have strong claws, but they are not as sharp as those of other birds of prey. The vulture doesn't often need to attack living targets.

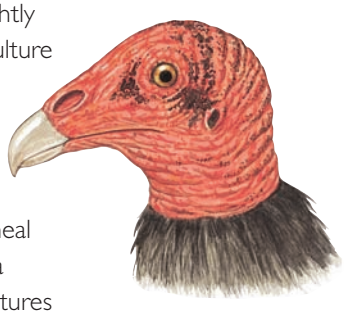
VITAL STATISTICS

WEIGHT	4.5–6 lbs.
LENGTH	23–27"
WINGSPAN	54–60"
SEXUAL MATURITY	Unknown
BREEDING SEASON	January–July
NUMBER OF EGGS	1–3, usually 2
INCUBATION PERIOD	32–39 days
FLEDGING PERIOD	63–70 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Mostly carrion; young herons, ducks, lambs; rotten and ripe fruit and vegetables
LIFESPAN	11 years

CREATURE COMPARISONS

The turkey vulture *(Cathartes aura)* has a slightly larger wing span than the American black vulture and weighs slightly less. The turkey vulture is easily identified by the red skin on its head that, at a distance, resembles a turkey. The turkey vulture uses it eyesight to spot a carrion meal but, unlike the black vulture, it also uses a highly developed sense of smell. Both vultures often roost in the same trees.

American black vulture



Turkey vulture

RELATED SPECIES

- The family ***Cathartidae*** is limited to the Western Hemisphere and includes 7 species in two genera: the Andean condor ***(Vultur gryphus)***, California condor ***(V. californianus)***, king vulture ***(Sarcoramphus papa)***, yellow-headed vulture ***(C. burrovianus)***, greater yellow-headed vulture ***(C. melambtotus)***, turkey vulture ***(C. aura)*** and black vulture. The California condor is among the rarest.

American Cliff Swallow

• ORDER •
Passeriformes

• FAMILY •
Hirundinidae

• GENUS & SPECIES •
Hirundo pyrrhonota

KEY FEATURES

- Elegantly colored small bird that forages for insect prey while in flight
- Chases after swarms of insects with its tiny mouth wide open
- Groups gather mud to build nests in colonies on cliffs, canyons, bridges or buildings

WHERE IN THE WORLD?

Found in North America, from Alaska south throughout most of the U.S. to central Mexico; winters in South America from Brazil to Argentina

LIFECYCLE

The extremely social American cliff swallow's life revolves around its flock: it forages, preens, gathers mud, sunbathes, nests, migrates and winters in large groups.

HABITAT

The cliff swallow migrates to its North American breeding grounds, arriving from March to May. True to its name, the bird has historically nested on the sides of steep cliffs. Though the cliff swallow still settles along the cliffs and canyons of western North America, it has adapted to alternative nesting sites across the U.S.: many bridges, dams or buildings offer protective overhangs and suitable vertical surfaces on which to attach a nest. Swallows also need open areas for foraging and a water source for the mud necessary to build their nests. In the fall, the birds and their young are among the earliest migrants south; large flocks fly to South America.

▼ **HISTORICAL SITE**
Cliff swallows often return to cliffs each year.

DID YOU KNOW?

- **Cliff swallows choose mud with high clay and silt content; this makes the nest less likely to crumble when dry, important when walls are shared.**
- **Cliff swallows often trespass into each other's nests. Most do nothing once inside, but occasionally one will steal fresh mud or toss an egg out of the nest.**

BEHAVIOR

American cliff swallows are very social. Large flocks forage together in flight throughout the day; birds have been timed at up to almost 30 mph. In cool and cloudy weather, the swallow gives a "squeak" call to announce the discovery of an insect swarm. This call attracts other birds to the food source.

The birds preen their feathers and sunbathe together at their daytime perches on wires, small twigs and rooftops, and they roost together at night, clinging to reeds and tall grasses.

To protect their young against enemies, such as American kestrels, black-billed magpies, bull snakes and rats, the cliff swallows build sheltered nests in large colonies. Central nests are sought after, because the nests at the edges of a colony are more vulnerable to attack. But there is not always safety in numbers: very large, conspicuous colonies attract predators. Cliff swallows usually give alarm calls and surround the predator in a loose group to drive it off.

CONSERVATION

American cliff swallows are abundant throughout their range and are currently not threatened. Their adaptability in nesting sites has led to the expansion of their range across the United States.

FOOD & FEEDING

The American cliff swallow feeds entirely on insects caught in flight. The bird chases after flying ants, wasps, grasshoppers, dragonflies, mosquitoes and beetles, including the destructive cotton-boll weevils; the swallow's menu includes 84 insect families from 10 orders. The bird holds its tiny, gaping mouth as wide as it can to scoop up hundreds of insects as it darts along.

Foraging in large groups of up to 2,000 birds, the cliff swallow searches for swarms of insects. The birds tend to focus on areas of relatively high altitudes; however, in cool and cloudy weather the cliff swallows feed just above the ground or water surface due to lack of visibility and decreased availability of swarming insects. In this damp and dreary climate, the bird tends to forage alone. Groups always tend to follow each other; if one is feeding on a big swarm, another will follow to scout out the area. This holds true for solitary feeding birds as well. American cliff swallows never have a problem sharing their food sources.

BREEDING

Cliff swallows arrive at their breeding areas by May. The birds are more comfortable in flight; on land, they shuffle along when gathering mud to build their mud nests. They often reuse nests left from the previous summer and need to add mud only to the nest's entrance, a narrow tunnel that usually points downward. The cliff swallow generally nests in dense colonies on cliffs, banks, dams and bridges; groups of several thousand nests have been observed. Swallows often fight for safer, centrally located nests in these colonies. The female swallow incubates the 4–5 eggs for up to 16 days; after hatching, the chicks are able to fly by 24 days, but still rely on their parents for food. The juveniles gather to form large crèches and depart with their parents for wintering grounds from July to September.

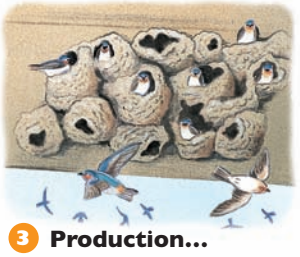
▲ **More mud**
The American cliff swallow gathers mud pellets, one by one, to build its nest.

▼ **Cute couple**
A male cliff swallow joins the female for added protection as she incubates the 4–5 eggs inside her cliffside nest.

CLOSE NEIGHBORS

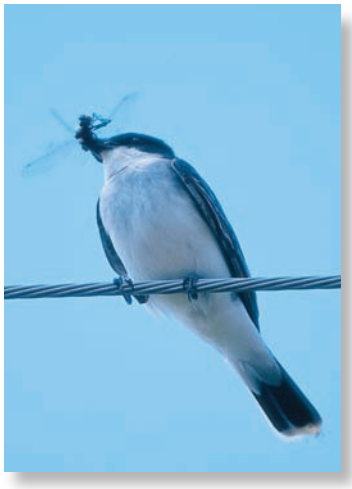
1 Collection...
American cliff swallows collect mud pellets for their nests along the shallow muddy margins of a pond.

2 Construction...
A male transports the mud in his bill back to his nest and adds it to the lip on the walls of the slowly forming cup-shaped structure.



3 Production...
Many cliff swallows have built their nests on the underside of the bridge. All birds within the colony are at the same stage of breeding.

4 Protection
Juveniles from many colonies form a protective crèche and gather along a telephone wire, anxiously awaiting their parents' return.

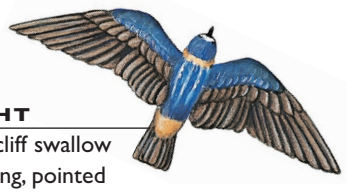


▲ **Food first**
A swallow captures a dragonfly in flight, but returns to a perch to enjoy its huge meal.

▼ **Dense colony**
Hundreds of nests are packed close together.

PROFILE American Cliff Swallow

The American cliff swallow is an accomplished aerialist; if it's not gathering mud for its nest, the bird is usually in the air.



In flight

When the cliff swallow glides, its long, pointed wings and nearly squared tail make it easily identifiable.

Bill

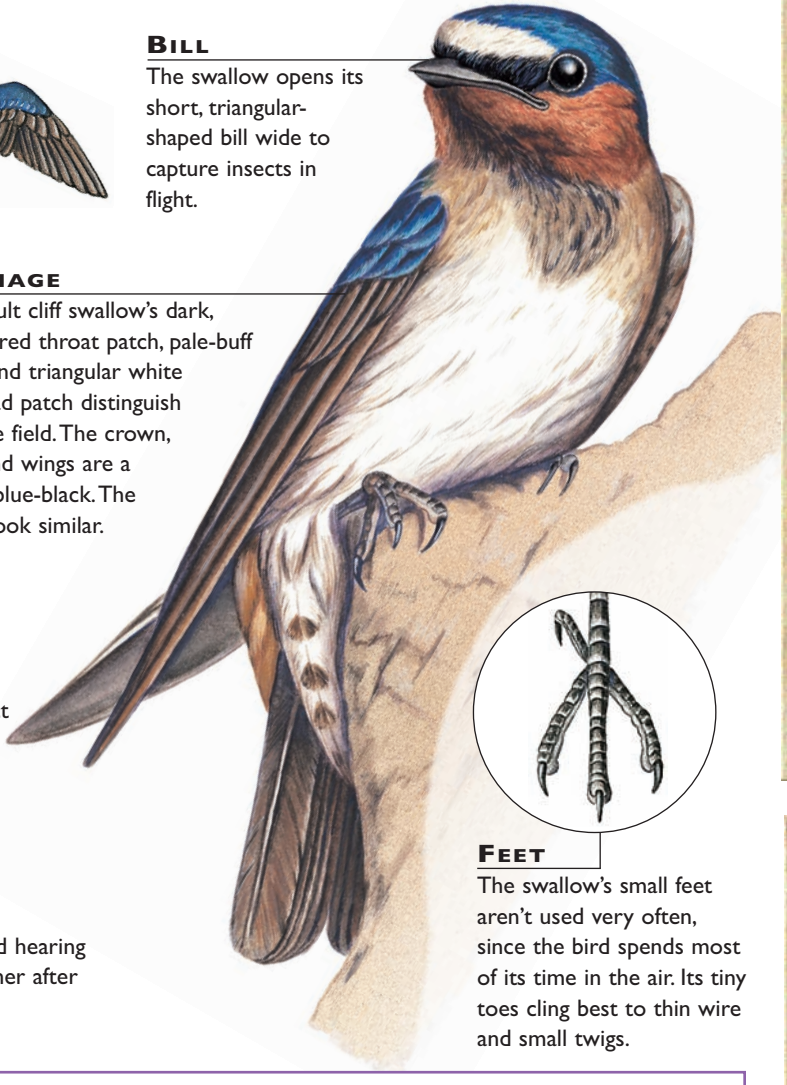
The swallow opens its short, triangular-shaped bill wide to capture insects in flight.

Plumage

The adult cliff swallow's dark, brown-red throat patch, pale-buff rump and triangular white forehead patch distinguish it in the field. The crown, back and wings are a glossy blue-black. The sexes look similar.

Juvenile

The juvenile cliff swallow is duller than the adult and has a less distinct pattern on its head. It gains adult plumage by the age of 1 year.



Feet

The swallow's small feet aren't used very often, since the bird spends most of its time in the air. Its tiny toes cling best to thin wire and small twigs.

Senses

The swallow relies on its sight and hearing to find food. Birds call to each other after discovering an insect swarm.

Vital Statistics

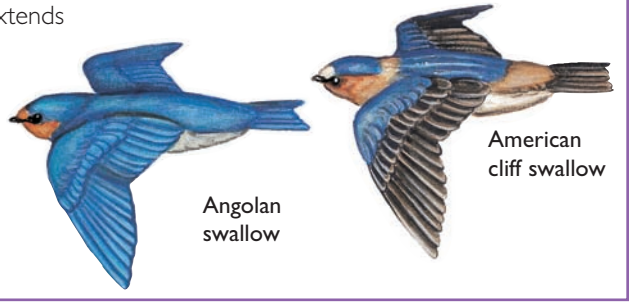
Weight	0.7–1.0 oz.
Length	5.5"
Wingspan	12–12.25"
Sexual Maturity	About 1 year
Breeding Season	April–August
Number of Eggs	4–5
Incubation Period	14–16 days
Fledging Period	21–24 days
Breeding Interval	Up to 3 broods per season
Typical Diet	Insects, especially beetles; also flying ants, wasps and grasshoppers
Lifespan	Over 5 years

Related Species

- **The American cliff swallow is one of eight species of swallow in North America. The bird was once placed in the genus *Petrochelidon*, but this was merged with *Hirundo*. The genus *Hirundo* includes birds that build an open, cup-shaped nest. One of the most common is the barn swallow, *H. rustica*. The *Hirundinidae* family includes 79 species of swallow and martin.**

Creature Comparisons

Measuring up to 6", the Angolan swallow *(Hirundo angolensis)* is similar in size to the American cliff swallow. However, the bright-blue Angolan swallow has a rufous-colored throat patch that extends to the breast and a well-forked tail, unlike the cliff swallow, which has a smaller throat patch and squared tail. The Angolan swallow forages in small groups in Africa, far from the large flocks of cliff swallows in North and South America.



Angolan swallow

American cliff swallow

American Coot

• ORDER •
Gruiformes

• FAMILY •
Rallidae

• GENUS & SPECIES •
Fulica americana

KEY FEATURES

- Propels through the water with its lobed feet in search of aquatic plants and animals
- During the breeding season, launches "splatter-attacks" on intruding birds in defense of its nesting territory
- Chicks swim almost immediately upon hatching, but remain with the parents for 7–10 weeks

WHERE IN THE WORLD?

Found in Canada, from British Columbia east to southern Ontario and Quebec and Nova Scotia, south through the U.S. and Mexico to Panama, the West Indies, Costa Rica and Hawaii

LIFECYCLE

Unlike its elusive rail relatives, the American coot is often seen gracefully swimming in open water and commonly heard defending its territory against invaders.

HABITAT

The American coot frequents both fresh- and saltwater. It lives in wetland areas such as rice fields, backwaters, reed-fringed ponds and lakes, open marshes, sluggish rivers and streams, as well as estuaries and bays. During its migrations, the coot is often seen far inland, often at ponds in parks or golf courses. In winter, the American coot is one of the most abundant birds in both North and South Carolina.

▲ **WETLAND WADERS**
A small flock of coots wades in its habitat of choice.

DID YOU KNOW?

- **An American coot's age is revealed by its vibrant tarsal (foot) color: green at 1 year, yellow-green at 2 years, yellow at 3 and orange-red at 4 or older.**
- **In 1896, the Toledo Mud Hens, a minor league baseball team, got their name from the numerous coots, also called mudhens, that frequented the marshland right next to their ballpark at the time, Bay View Park.**
- **The American coot and the ivory-billed woodpecker are the only North American birds with white bills.**

BREEDING

The American coot migrates north from February through May and begins nesting within two weeks of its arrival. However, some birds remain year-round in parts of the U.S. Courtship displays include increased calling and a bowing and nibbling ritual, in which one coot remains still while the other preens its feathers.

Coots are monogomous; they mate on land or on their platform nests, which are built by both sexes from reeds, grasses and cattails. The female usually lays about 9–10 eggs with dark-brown spots, and the pair takes turns incubating the eggs for 21–25 days. The chicks are covered with down and are able to swim and dive soon after hatching, but they return to the nest for frequent brooding and are fed by the parents for two weeks, becoming independent over the next 5–8 weeks. Nesting success is usually over 80%, mainly due to the parents' steadfast defense of the nest throughout courtship, incubation and fledging.

► **BABES IN ARMS**
Newborn chicks take time to become independent.

BEHAVIOR

The American coot is extremely noisy and its wetland haunts are often filled with a bustling medley of various calls. Pairs emit a *kuk-kuk-kuk-kuk* call or *coo-coo-coo-coo* day and night. Both the herring gull and the black-backed gull prey upon the American coot, and the bird's calls warn others in the flock of impending danger from attack by such predators.

The coot is extremely aggressive during the breeding season — it staunchly defends its territory against invasions, especially by other members of its species. It uses a combination of distinctive postural displays and attacks, including the "splatter attack," in which the coot charges at an intruder, splashing water with its wings. When taking flight, the ungraceful coot taxies for some distance, flapping its wings and noisily kicking and spraying water. When an entire flock rises from the water in this fashion, it sounds like a heavy hail or rainstorm. Although the birds have difficulty taking off, they fly for great distances; some birds migrate all the way from Canada to Panama each fall.

FOOD & FEEDING

Though the American coot obtains most of its plant food by dabbling on the water's surface, the bird also dives and up-ends in water and even grazes on land. Seeds, roots and leaves of pondweeds, water milfoil, burweed, smartweed and banana water lily are favorites, but the bird also eats wild celery as well as sprouting and waste grain. The coot snatches up aquatic animals, including insects, fish, snails and tadpoles. Waterfowl, such as canvasbacks or mallards, often stir up these animals, as well as aquatic plants, while swimming or diving, and the coot follows in their wake. This high–protein animal food is especially important in the diet of a growing coot chick.

CONSERVATION

The American coot is currently not globally threatened. In North America, it is considered abundant, and populations have even increased since breeding-ground surveys began in the 1950s. Coots appear to benefit from many waterfowl management activities across the U.S., but wetland loss has reduced numbers in some states, including both Iowa and Minnesota.

▶ **TASTY TREAT**
A dabbling coot snatches a quick afternoon snack.

▼ **COOT CHORUS**
A flock of aggressive coots guards its territory with a chorus of loud calls.

SPLATTER ATTACK

1 Tread ahead...
While patrolling its territory, an American coot spies another coot venturing into its space.

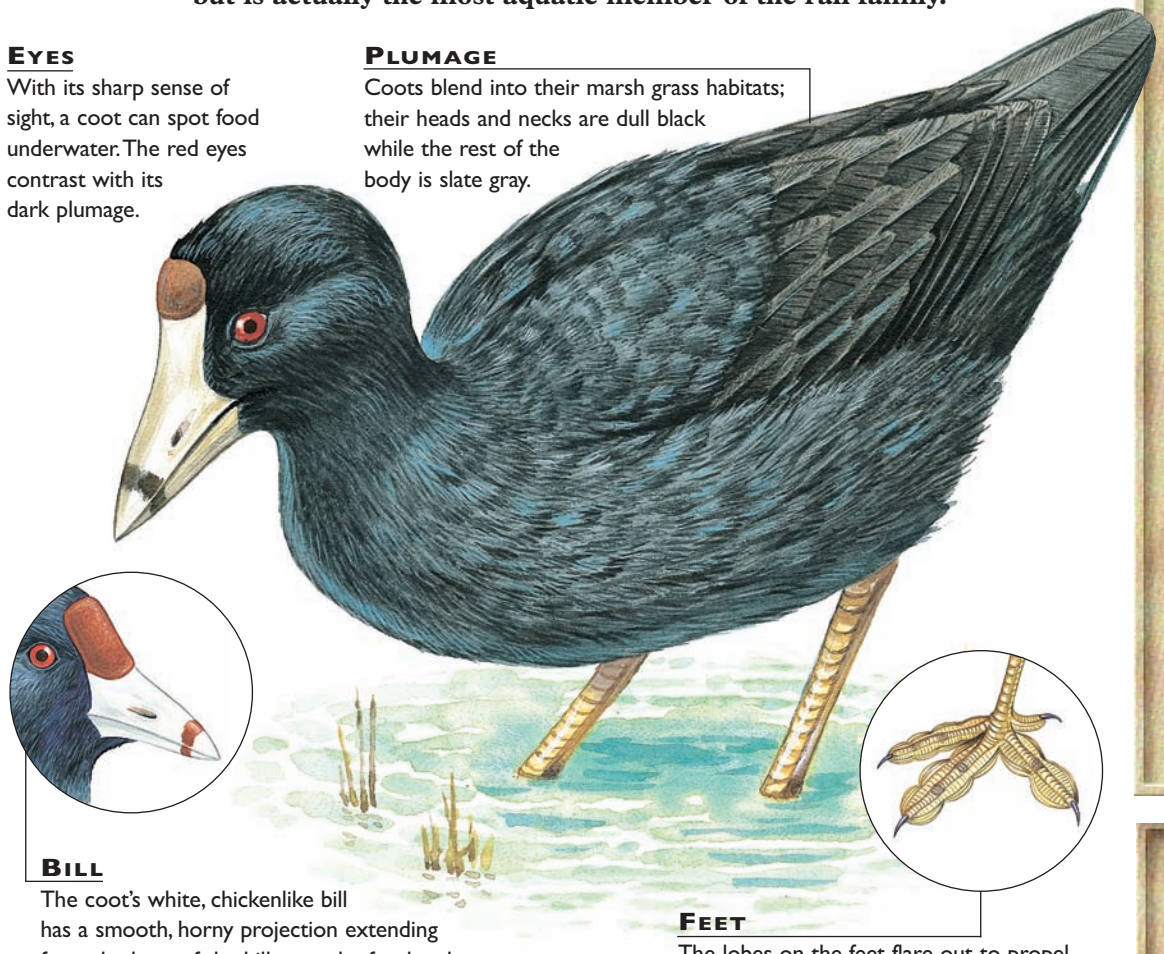
2 Sight and fight...
The coot mounts a splatter attack, running across the water to startle its adversary.

3 Stab and jab...
The two birds begin to fight. One bird lashes out with its feet; the other with its bill.

4 Beat and retreat
Splashing the water, the defeated intruder flees. The victorious bird stays in hot pursuit.

PROFILE American Coot

With its lobed feet and swimming ability, the coot resembles a duck, but is actually the most aquatic member of the rail family.



Eyes
With its sharp sense of sight, a coot can spot food underwater. The red eyes contrast with its dark plumage.

Plumage
Coots blend into their marsh grass habitats; their heads and necks are dull black while the rest of the body is slate gray.

Bill
The coot's white, chickenlike bill has a smooth, horny projection extending from the base of the bill onto the forehead. This frontal shield has a dark, red-brown callus at the top that sometimes covers the entire shield during breeding.

Feet
The lobes on the feet flare out to propel the bird on the backstroke and flatten back for less drag on the forward stroke. The toes' sharp claws are fierce weapons.

VITAL STATISTICS

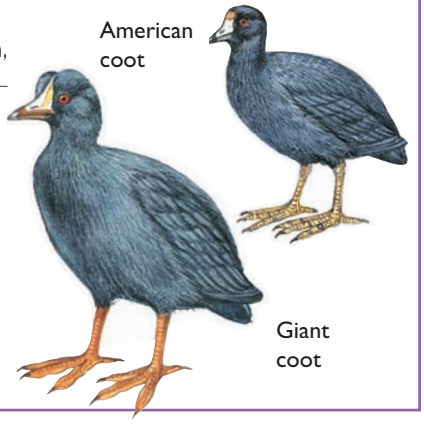
Weight	Male 20–30 oz.; female 15–22 oz.
Length	13–17"
Wingspan	24–27.5"
Sexual Maturity	1 year
Breeding Season	April–July
Number of Eggs	6–15; usually 9 or 10
Incubation Period	21–25 days
Fledging Period	50–75 days
Breeding Interval	Up to 2 broods per season
Typical Diet	Aquatic plants; also insects and snails
Lifespan	Up to 11 years

RELATED SPECIES

● The American coot is one of 11 species in the genus ***Fulica***, which contains the common coot, ***F. atra***, and the Hawaiian coot, ***F. alai***, which was once considered a subspecies of the American coot. These coots are among 133 species of rail, gallinule and coot in the family ***Rallidae***, the largest family in the order ***Gruiformes***. Relatives in the order include buttonquails, cranes and bustards.

CREATURE COMPARISONS

The giant coot (*Fulica gigantea*) measures up to 23" in length, larger than the American coot, and it weighs up to 5.5 lbs. — far heavier than its American cousin. Both species have dark, slate-gray plumage, but the giant coot has a deep-red bill with a white ridge and yellow shield, a marked contrast to the American coot's white bill with its white and red shield. While juvenile giant coots can fly readily, adults cannot because of their weight. Thus, the giant coot has a limited range — south Peru to northwest Argentina. The American coot is abundant throughout North and Central America.



American Harpy Eagle

• ORDER •
Falconiformes

• FAMILY •
Accipitridae

• GENUS & SPECIES •
Harpia harpyja

KEY FEATURES

- The heaviest bird of prey, with the largest feet and talons of any eagle
- Strong enough to snatch adult monkeys and sloths from the treetops in midflight
- Pairs mate for life and raise a single chick once every three years
- Its blend of brute force and ultra-sharp reflexes makes it one of the top rainforest predators

WHERE IN THE WORLD?

Thinly distributed from the southern tip of Costa Rica through the Amazon Basin to northern Argentina; has vanished from many former haunts and is now classed as endangered

LIFECYCLE

Casting a sinister shadow over the rainforests of tropical America, the American harpy eagle terrorizes hapless animals that forage in the shifting sunlight of the high canopy.

HABITAT

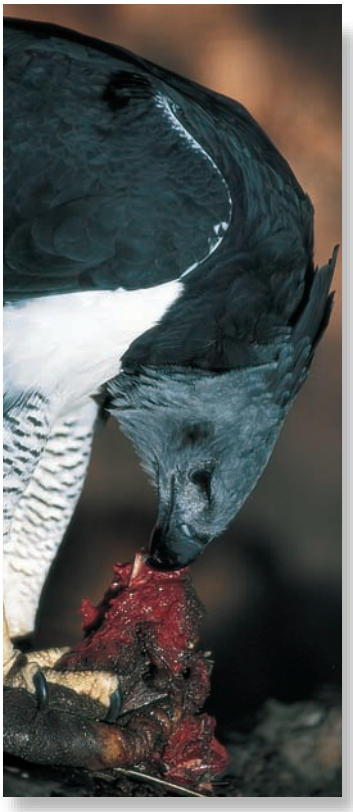
The American harpy eagle is found in the extensive tropical rainforests of South and Central America. The eagle spends most of its time high in the canopy and nests only in the tallest trees, such as the giant kapok or silk-cotton trees.

▲ **HIGH BORN**
The harpy eagle lives and breeds in lofty branches.

Like most other powerful predators, the American harpy eagle is naturally rare, as each pair hunts over a territory of up to 20 sq. miles. But new research suggests that the species occupies smaller territories in Panama and Venezuela and can survive in patches of forest bordering savannah, agricultural land and human settlements.

DID YOU KNOW?

- **This eagle can take 3 days to digest a meal, and may kill only twice a week.**
- **A young harpy eagle may return to breed in the tree where it was born, as long as the tree is unclaimed by its parents or other eagles.**
- **The heaviest bird of prey on record is a female harpy eagle that weighed 27 lbs.**
- **The harpy eagle is named after the harpies — monstrous half-woman, half-bird predators of classical Greek mythology.**



BEHAVIOR

The harpy eagle leads a solitary existence. Even when breeding, the male and female hunt and roost separately, with the female staying on the nest at night to brood the eggs or chick while her mate rests in a tree nearby. Encounters with other eagles are rare, but the female's larger size enables her to defend her nest from other males should the need arise.

For such a large bird, the harpy eagle usually goes unnoticed as it perches statue-still and silent, alert for signs of either prey or intruders. While it is perched, the eagle's dark upperparts are hard to spot in the dappled light of the forest. The harpy eagle usually only reveals itself by spreading its wings to reveal the pale breast feathers.

▲ **LONE RANGER**
Ever alert, the harpy eagle watches over its home range from a lofty vantage point and patrols it from the air.

FOOD & HUNTING

The American harpy eagle is one of the most aerobatic of all eagles. Spotting its prey from a lookout, it launches out and swoops in at speeds of up to 48 mph. Broad, slotted wings allow it to twist and turn through narrow gaps in the canopy. The eagle may even roll upside down at the last moment before reaching up with its talons, and ripping its victim away with barely a check in its flight speed.

The harpy eagle hunts monkeys, sloths and tree-living porcupines and anteaters. It also preys on lizards, snakes, macaws and other large birds, and sometimes hunts pigs and rodents on the ground.

THE MONKEY SNATCHER

1 Scan...
Perched on a dead tree rising over the forest canopy, a harpy eagle scans all around for potential prey.

2 Swoop...
The eagle spots a troop of woolly monkeys raiding a fruiting tree. It takes off to mount a surprise attack.

3 Strike...
Without warning, the eagle smashes through the tree's outer foliage and sinks its talons into a monkey's back.

4 Success!
The spine-snapping impact kills the monkey, and the eagle carries off its prize to eat at leisure.

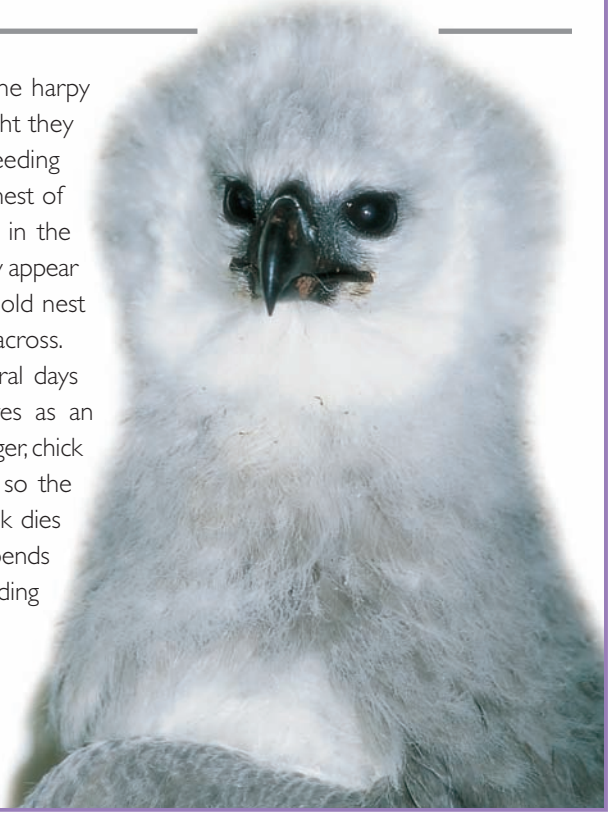
CONSERVATION

Most conservation bodies, including the IUCN (World Conservation Union), class the harpy eagle as regionally endangered. Huge swaths of rainforest have been felled in much of its range. As this bird nests only in tall trees, the growth found in some partially cleared areas cannot substitute for mature forest. However, new studies suggest that pairs can make do with compact hunting grounds fairly close to cultivated land, provided they can survive the farmers' guns.

BREEDING

Little is known about the breeding habits of the harpy eagle, as its nests are so inaccessible. It is thought they form stable pairs that stay together for the breeding season and possibly for life. Each pair builds a nest of large sticks, lined with leaves and animal hairs, in the crown of a tree 130–160' above the ground. They appear to use the same site regularly, refurbishing the old nest and gradually building it up until it is over 6.5' across.

The female harpy eagle lays two eggs, several days apart. Like most eagles, the second egg serves as an "insurance policy." The elder, and therefore stronger, chick grabs nearly all the food brought to the nest, so the weaker chick soon starves. Only if the first chick dies does the younger one survive. The juvenile depends on its parents for a further 10 months, demanding food from them even when it is able to fly.



▶ **GROUNDED FOR NOW**
After 2 months, the chick is the size of a turkey but still has a covering of down.

PROFILE AMERICAN HARPY EAGLE

The harpy eagle's split-second reflexes, needle-sharp talons and a massive, hooked bill leaves unwary animals with little chance of escape.

BILL

The harpy eagle uses its bill like a butcher's tool, to strip meat from the bone. The bill can also sever a victim's spinal cord for a quick kill.

CREST

The ruff of feathers on the harpy eagle's head helps to focus sound into its ears, a useful adaptation under the forest canopy.

WINGS

The powerful wings provide enough lift for the eagle to take off with prey equaling its own weight.

FEET

The eagle pulls victims off their perches with its powerful feet and thick talons.

JUVENILE

The young eagle's white and gray plumage is highly visible among the forest greenery. This is no handicap, however, as the harpy eagle has no natural predators.

VITAL STATISTICS

WEIGHT	Average 11 lbs.; female heavier than male
LENGTH	36–52"
WINGSPAN	7.5'
SEXUAL MATURITY	4–6 years
BREEDING SEASON	Varies by habitat
NUMBER OF EGGS	1–2
INCUBATION PERIOD	About 55 days
BREEDING INTERVAL	3 years (rarely 2 years)
TYPICAL DIET	Tree-dwelling mammals, birds, reptiles; occasionally rodents, reptiles, peccaries on the ground
LIFESPAN	Up to 30 years

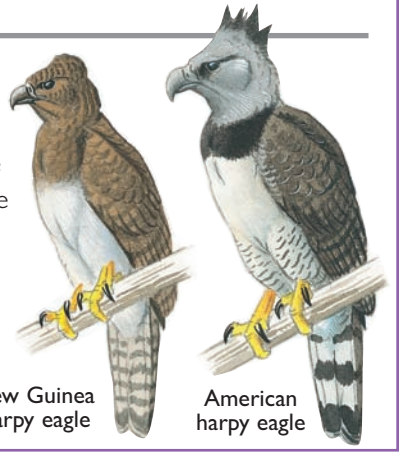
RELATED SPECIES

● There are 3 other harpy eagles: the New Guinea harpy eagle, ***Harpyopsis novaeguinae***, Philippine eagle, ***Pithecophaga jefferyi***, and Guiana crested eagle, ***Morphnus guianensis***. Like the American harpy eagle, each is the only species in its genus. Harpy eagles belong to the large family ***Accipitridae***, which also has 53 other eagle species, as well as buzzards, kites, harriers and hawks. All accipitrids hunt live prey.

CREATURE COMPARISONS

The harpy eagle shares its name with another spectacular bird of prey that lives in New Guinea. Like its American counterpart, the New Guinea harpy eagle (*Harpyopsis novaeguinae*) scans the canopy of tropical rainforests for medium-sized prey, such as tree kangaroos, but it also hunts in clearings. However, the New Guinean species has a slimmer build, smaller bill and shorter wingspan, and never exceeds 36" in length.

With its brown and gray plumage, the New Guinea harpy eagle is less conspicuous than its American cousin. It is more often heard than seen, having a distinctive, far-carrying cry.



New Guinea harpy eagle

American harpy eagle

American Redstart

• ORDER •
Passeriformes

• FAMILY •
Parulidae

• GENUS & SPECIES •
Setophaga ruticilla

KEY FEATURES

- Flicks tail conspicuously when chasing insects
- Resembles a black-and-orange butterfly as it flutters between tree branches
- Droops its wing and fans its tail in display
- One of the most common American wood warblers nesting in North America

WHERE IN THE WORLD?

Found throughout North America in parts of Canada and the U.S.; winters in Central and South America and the West Indies

LIFECYCLE

The solitary American redstart performs aerial rushes for display and defense and devours insects in midair during feeding frenzies in the forest.

HABITAT

The American redstart lives in a variety of habitats: it frequents deciduous and tropical forests, mangroves, savannahs, suburban areas and mixed forests. In winter, the redstart migrates to light woodlands and scrub habitats from the southern U.S. to South America and also in Jamaica. In Venezuela, adult male redstarts are found in forests, while females and young males prefer mangroves.

▼ **FOREST HIDEAWAY**
Only the redstart's eyes and tail are visible as it peers from its deep nest.

BREEDING

American redstarts leave their winter home in Central and South America and the West Indies in March, heading north to breeding grounds ranging from Alaska to Georgia. Males arrive first and stake out territories, usually less than 1 acre in size. A male defends his area through warning chirps and aerial displays. During courtship, he raises his wings and holds them perpendicular to the ground, and spreads his tail feathers to show his bold orange-red plumage, a symbol of his maturity. Males also court females by bringing them food. The female builds a nest high in the trees, usually 10–20' above ground, most often nestled in the crotch of the tree. The nest is a deep cup made mostly of grasses, lined with feathers and material such as deer hair. The female lays 3–5 greenish-white eggs, with small, brown specks, and incubates them alone for 12 days. Both parents feed the young chicks for 8–10 days until they are capable of finding their own food. Fledglings join the adults in August to begin the migratory journey south. They look like adult females; males will attain adult plumage in two years.

▼ **HUNGRY QUARTET**
The four hungry chicks open their mouths wide, begging for food.

DID YOU KNOW?

- **When incubating, the American redstart turns the eggs once every 8 minutes. This ensures that there is equal heating throughout the eggs and prevents embryonic membranes from sticking to the inner surface of the shell.**
- **The redstart is one of the most common victims of the cowbird, which lays its eggs in the redstart's nest. The cowbird chicks are then raised by the redstart.**
- **Latin Americans refer to the redstart as *candelita*, or little torch, because of its flashes of red and orange.**

FOOD & FEEDING

The American redstart is constantly on the lookout for its insect prey, frequently hopping between the branches of trees and shrubs in search of beetles and caterpillars. As the day warms and insects become more active, the redstart searches for prey in flight, snatching insects, such as moths and wasps, in midair. It also hovers around foliage to catch flies. Rictal bristles around the mouth protect the bird's eyes as it captures flying insects. In winter and during migrations the redstart eats seeds and berries, including barberry, juneberries and magnolia seeds. The bird's long, thin bill promotes the quick capture of either plant or animal food.

VIVACIOUS EATERS

1 Assume the position...
A male redstart prepares to land at a choice spot in a bush, perfect for perching and spotting its next insect meal.

2 A short wait...
A hungry American redstart spies a small green caterpillar and quickly grabs it with its long, thin bill.

3 Meal of choice...
With speed and skill, a redstart begins its pursuit of a flying insect, which is no match for the bird in an aerial chase.

4 Saving the best for last
With a firm grasp on its prey, the patient bird returns to its perch, where it savors the large insect in safety.

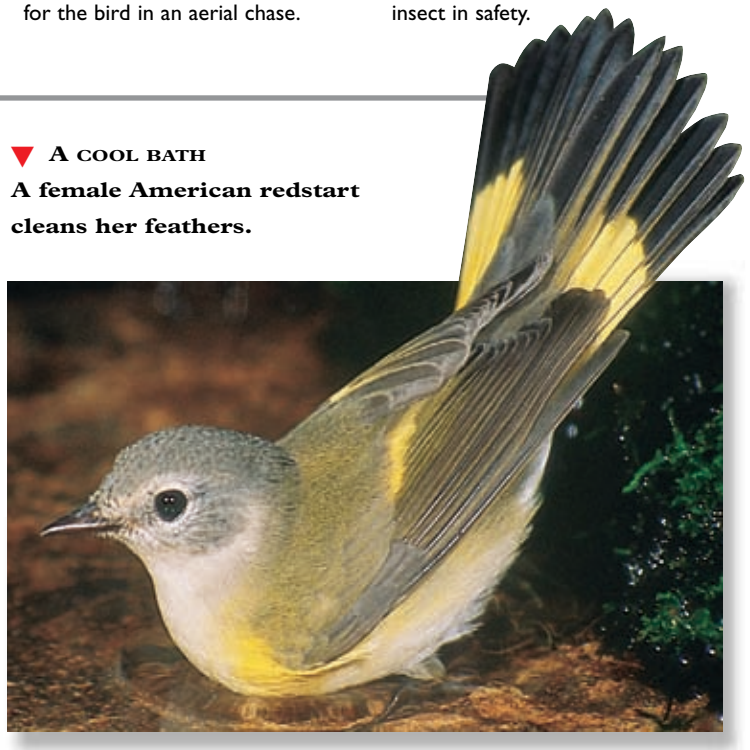
CONSERVATION

The American redstart is common throughout its range. Though abundant in open forests, the number of American redstarts has declined slightly in the last two decades, an indication of cyclical population fluctuation rather than threats posed by humans or predators. The redstart is beneficial to humans, since its diet includes many insects harmful to crops.

BEHAVIOR

The American redstart's song consists of high, thin notes that produce a pleasant buzzing sound. Although the male is most often heard as he establishes and defends his territory in the spring, females also sing. The redstart is extremely active throughout the year and flits through trees and scrubs as it forages. Usually solitary, the redstart occasionally will form flocks with other species, including white-throated sparrows, during foraging trips on wintering grounds.

▼ **A COOL BATH**
A female American redstart cleans her feathers.



PROFILE AMERICAN REDSTART

The American redstart is an agile and diminutive songbird with a long, thin beak, which it uses to capture prey in midair.

BRISTLES
Rictal bristles around the mouth protect the redstart's eyes from damage caused by flying insects.

BILL
The redstart uses its thin, pointed bill to snatch insects in flight and glean them from foliage.

PLUMAGE
The male is glossy black with a white belly and patches of orange on its wings, sides and tail.

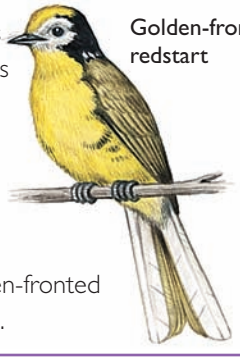
IN FLIGHT
In flight, the male redstart reveals distinctive large orange patches on the wings and tail.

FEMALE
The slightly smaller female has a gray head, olive upperparts and white underparts with yellow patches. The female's wings may appear worn.

FEET
Like most true flycatchers, the redstart has slim, weak legs and long, slim toes, adapted more for perching than walking.

CREATURE COMPARISONS

American redstart



Golden-fronted redstart

At 5.5", the golden-fronted redstart *(Myioborus ornatus)* resides year-round in South America and is slightly larger than its American redstart cousin. It has bright yellow underparts, hence its name, in contrast with the American redstart's white underparts. The golden-fronted redstart lives at altitudes up to 10,000', mainly in cloud forests in subtropical regions, while the American redstart has adapted to a variety of habitats. Both the golden-fronted redstart and the American redstart forage in trees for insects.

VITAL STATISTICS

WEIGHT	0.3 oz.
LENGTH	4.5–5.75"
WINGSPAN	8.5–9"
SEXUAL MATURITY	1–2 years
BREEDING SEASON	April–July
NUMBER OF EGGS	2–5
INCUBATION PERIOD	12 days
FLEDGING PERIOD	9–10 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Small insects, including beetles, moths, aphids, wasps; also berries and tree seeds
LIFESPAN	Over 5 years

RELATED SPECIES

- **The American redstart is the only species in the genus *Setophaga*. The painted redstart, *Myioborus pictus*, is a close relative. Redstarts join other American wood warblers, as well as the ovenbird, waterthrushes and yellowthroats, in the family *Parulidae*. The family contains about 109 species, including the yellow-breasted chat, *Icteria virens*, the largest American wood warbler.**

American Robin

• ORDER •
Passeriformes

• FAMILY •
Turdidae

• GENUS & SPECIES •
Turdus migratorius

KEY FEATURES

- Largest North American thrush and one of the most well-known songbirds in the U.S.
- Raises up to 8 young in two broods per year
- Its song is a sign that spring is coming; honored as the state bird in Connecticut, Michigan and Wisconsin

WHERE IN THE WORLD?

Widespread throughout North America; from Alaska through Canada and the U.S. to southern Mexico and Guatemala

LIFECYCLE

The American robin heralds spring with its early arrival from its wintering grounds, and announces daybreak with its persistent, well-known song.

HABITAT

The American robin prefers the deep forest, but it has spread across North America, taking up residence in a variety of habitats. The robin has flourished in areas as varied as sparsely wooded land in the east to mountains 12,000' above sea level in the western U.S. It has adapted to open regions and modern, suburban areas as well, and is often spotted in pastures, orchards, backyards and city parks. While trees offer the ideal perching site, a suburban fence, gutter or fire escape will work just as well for this adaptable bird. Most robins migrate to the south to escape the harsh, cold winters of the north, but those that stay frequent forests with an abundance of berries.

▼ **NATURAL ALARM CLOCK**

The American robin's cheery song signals the start of the day throughout its woodland range.

FOOD & FEEDING

The American robin changes its diet throughout the year to reap the rewards of seasonally available foods. During the warm spring and summer months, the robin surveys backyard lawns, meadows and even golf courses to search for its favorite food — earthworms. The robin peers carefully across the ground for the worm's tunnels, then pokes in its beak to search for food. The robin also munches on a variety of insects, from ants and beetles to termites and weevils. Even quick-hopping grasshoppers and fluttering butterflies aren't safe from the American robin. In the fall, the robin feasts on carbohydrate-rich fruits, which help it fatten up in preparation for a harsh winter or long migration. Those birds that do overwinter in northern regions exist on the berries and seeds that remain uncovered by snow. Pieces of oranges and apples, raisins and bread provide tasty treats at bird feeders. Old apple orchards provide retreats from the cold.

Though the robin arrives early at its nesting grounds, it wastes no time with elaborate courtship displays. Attempting 2–3 broods each season, the male establishes a territory and the female quickly begins a nest after pairing off. For the first brood, the nest is in an evergreen tree. The female forms the mud-lined nest of grasses and rootlets by sitting and pressing her breast against the edges. She lays 4–5 eggs, which are a medium sky-blue color, and incubates them for 14 days. After hatching, the young stay in the nest for about 13 days. The male feeds the fledglings while the female builds a second nest in a maple, elm or other deciduous tree.

DID YOU KNOW?

- **Birds have a higher and more variable temperature than mammals. The robin's average body temperature is 104°F and may fluctuate over 20°F in 24 hours.**
- **During the long summer days in Alaska, the female American robin will feed her brood for approximately 21 hours each day, so the young grow faster.**

TODAY'S DINNER

1 Wiggling worms...
In spring, a male robin exploits an open, grassy area to play a fatal tug-of-war game with an unlucky earthworm.

2 Creeping caterpillars...
In summer, a female American robin plucks a slow-moving caterpillar from a hanging leaf to feed to her hungry chicks.

3 Fleshy fruit...
A male pecks at a ripe cherry. The sugary fruit helps the robin put on weight for its long migratory journey in the fall.

4 Bittersweet berries
An overwintering robin subsists on berries, such as holly and rowan, during the cold winter.

CONSERVATION

The widespread and common American robin is in no danger. But since it frequents suburban areas, including backyards and city parks, toxic weedkillers used on lawns have often resulted in mass poisonings.

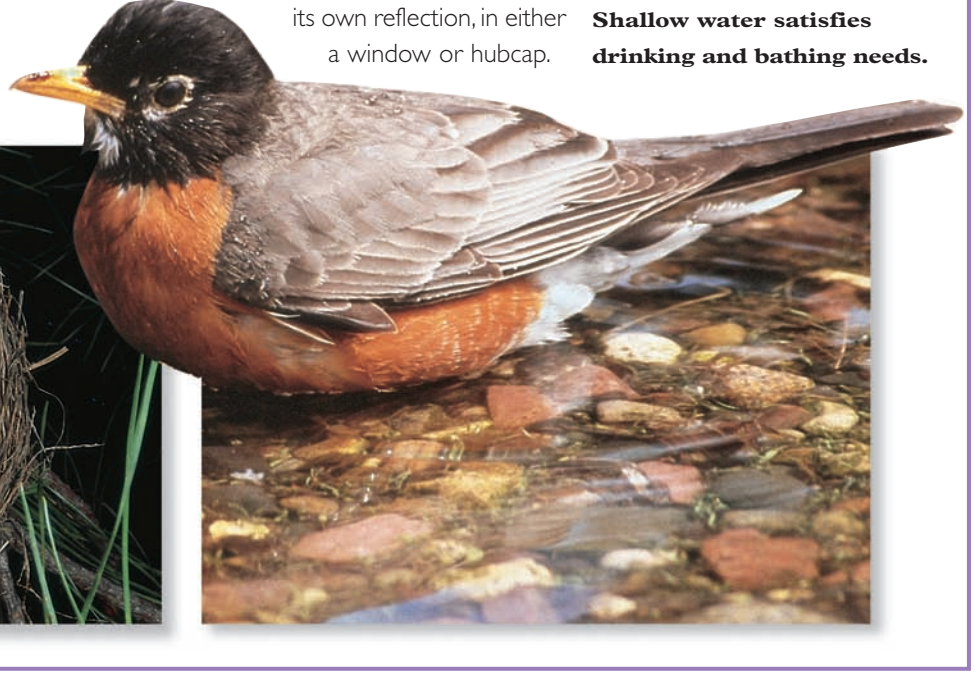
BEHAVIOR

The robin starts its trek north in February when the days reach an average temperature of 37°F. Its migratory patterns are not clear-cut; even its scientific name, from the Latin "migrator," means wanderer. Large flocks of males arrive in northern states in March. As they begin to form territories, they are much less tolerant of the other males. In an "attack run," an aggressive male often bends to a horizontal position with its tail raised and then charges toward another male. A less-aggressive robin may push another male, or take short runs toward it, forcing it to retreat.

When flocks of females show up in April, each mature male has established an individual territory about an acre in size, which becomes smaller in preparation for nesting, about a third of an acre. From high perches, the males serenade the females. The loud, familiar *cheerily-cheery-cheerily-cheery* sounds serve as a morning wake-up call and evening lullaby. But it also advertises the boundaries of their territory. Often aggressive even outside its territory when foraging, the robin occasionally confronts its own reflection, in either a window or hubcap.

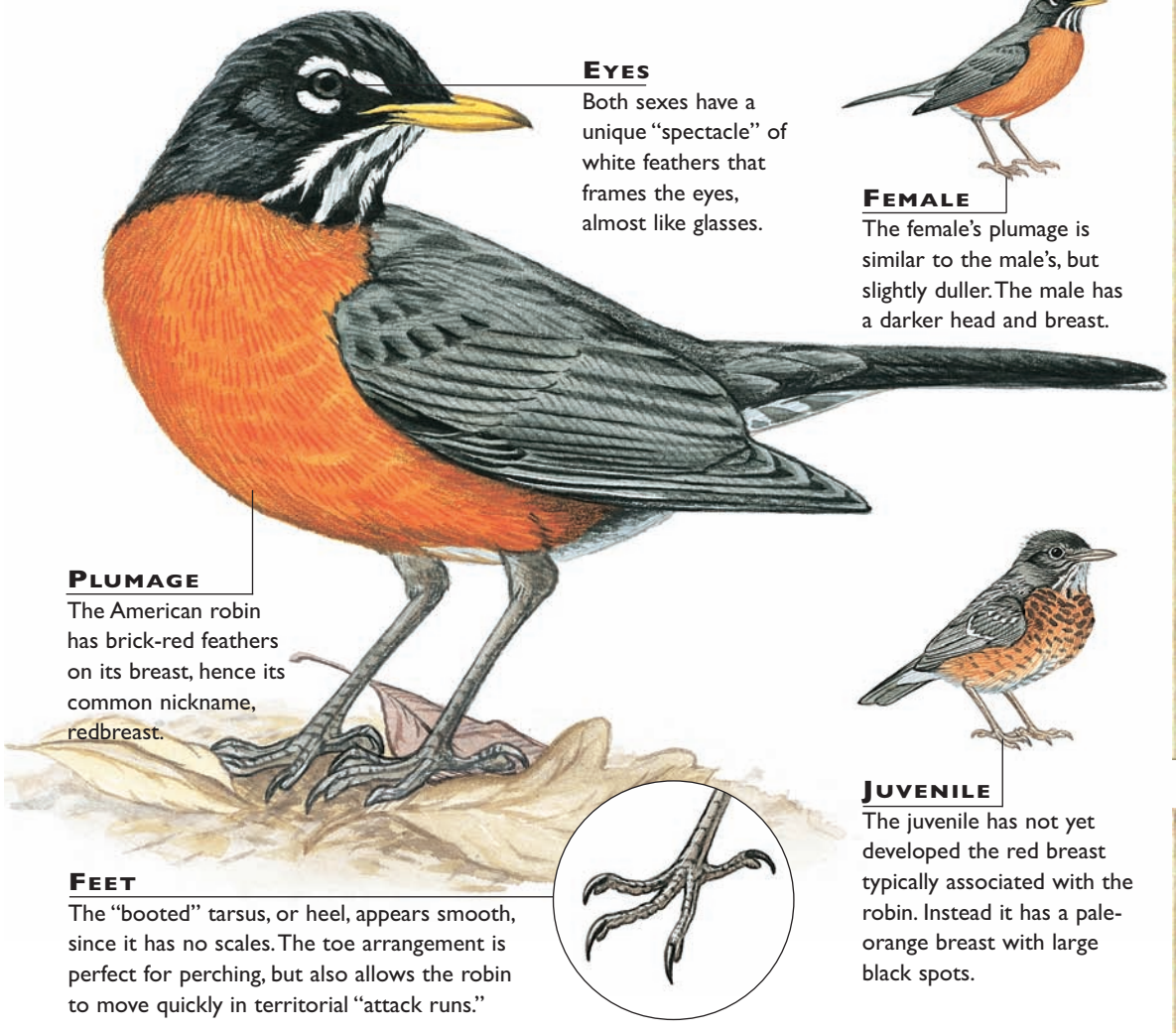
▼ **First meal**
The hatchling opens its mouth for food.

▼ **Wade and bathe**
Shallow water satisfies drinking and bathing needs.



PROFILE AMERICAN ROBIN

The American robin is a bird of vibrant colors — from its rich, red breast to its brilliant "robin's-egg blue" eggs.



EYES
Both sexes have a unique "spectacle" of white feathers that frames the eyes, almost like glasses.

FEMALE
The female's plumage is similar to the male's, but slightly duller. The male has a darker head and breast.

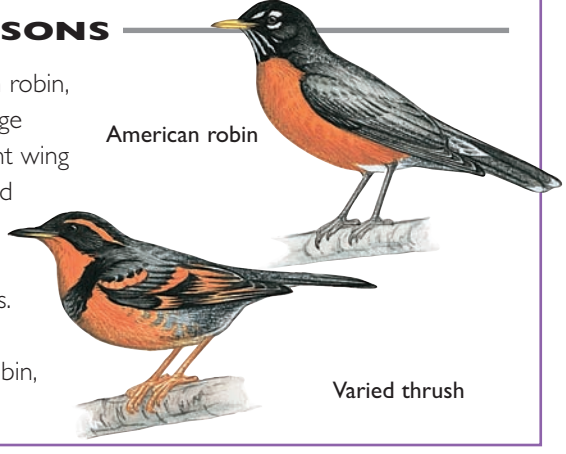
PLUMAGE
The American robin has brick-red feathers on its breast, hence its common nickname, redbreast.

JUVENILE
The juvenile has not yet developed the red breast typically associated with the robin. Instead it has a pale-orange breast with large black spots.

FEET
The "booted" tarsus, or heel, appears smooth, since it has no scales. The toe arrangement is perfect for perching, but also allows the robin to move quickly in territorial "attack runs."

CREATURE COMPARISONS

Though similar in size and color to the American robin, the varied thrush *(Ixoreus naevius)* has more orange coloring. An orange stripe over its eyes and bright wing bars help distinguish it from its relative. The varied thrush's range is restricted to the Pacific coast of North America, where it resides in high mountain forests and misty evergreen woodlands. It spends more time in the trees than the robin, feeding mainly on insects and berries. Like the robin, the varied thrush favors earthworms.



VITAL STATISTICS

WEIGHT	2.5–3.5 oz.
LENGTH	9–11"
SEXUAL MATURITY	1 year
BREEDING SEASON	April–August
NUMBER OF EGGS	4–6
INCUBATION PERIOD	12–14 days
FLEDGING PERIOD	2–4 weeks
BREEDING INTERVAL	2–3 broods per year
TYPICAL DIET	Earthworms, insects, fruits, berries and seeds
LIFESPAN	Up to 12 years in the wild, 17 years in captivity

RELATED SPECIES

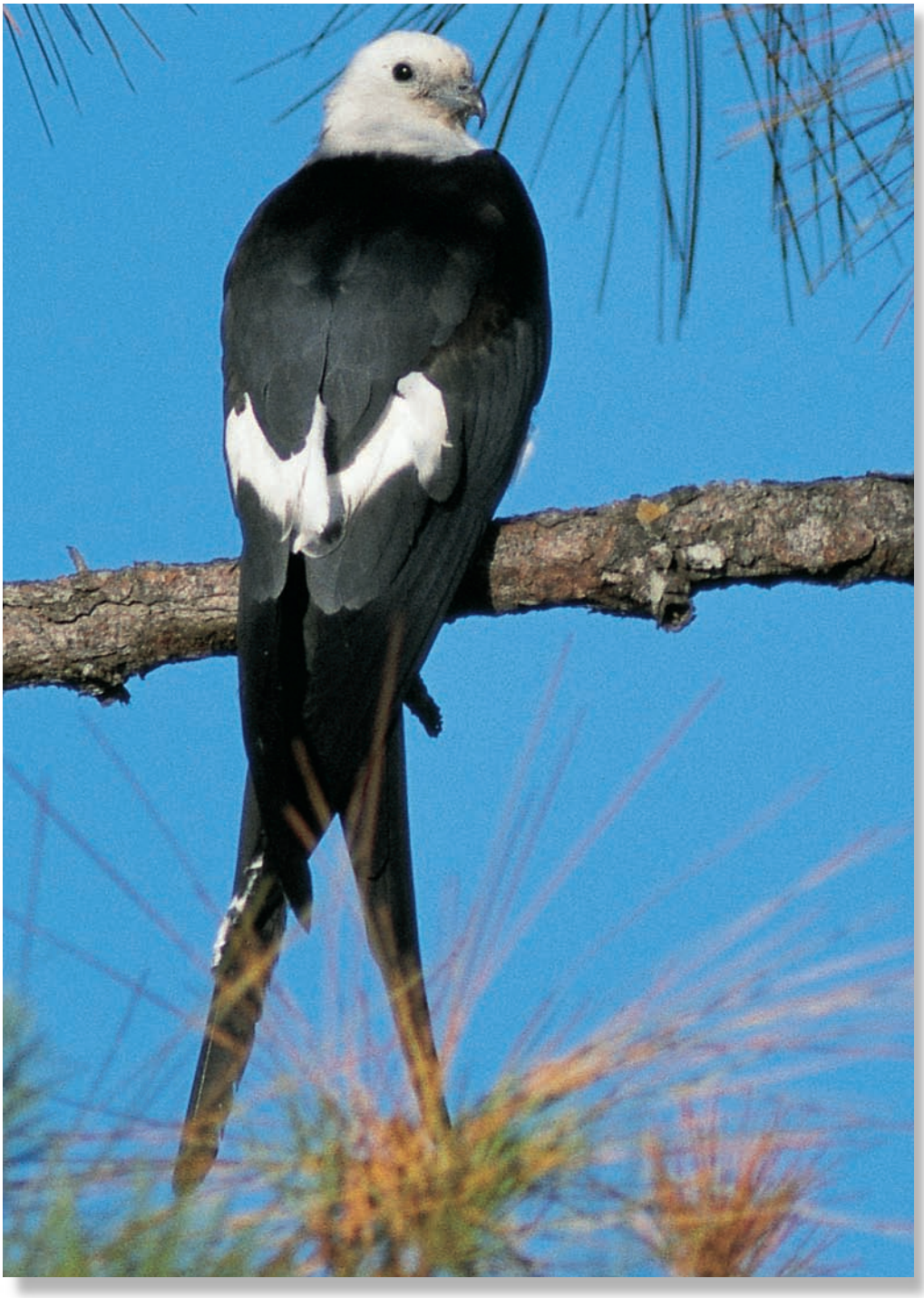
- The genus ***Turdus,*** which includes the American robin, is one of over 50 genera in the family ***Turdidae.*** This family includes over 300 species of thrushes. The eastern bluebird, ***Sialia sialis,*** is a common North American species. Despite its name, the European robin, ***Erithacus rubecula,*** is closer in color patterns and behavior to the eastern bluebird than to the American robin.

American Swallow-tailed Kite

• ORDER •
Falconiformes

• FAMILY •
Accipitridae

• GENUS & SPECIES •
Elanoides forficatus



KEY FEATURES

- Highly predatory, the swallow-tailed kite often takes and eats insect prey in midair
- Snatches entire nests of smaller birds and eats the young as it flies with the nest clutched in its extremely sharp talons
- Builds its nests at the very tops of the tallest trees in its habitat to avoid land predators

WHERE IN THE WORLD?

Found in the southeastern U.S.; also in southwestern Mexico through Central America and in northern South America to Argentina

LIFECYCLE

A migratory bird, the swallow-tailed kite spends only half the year in North America, usually arriving in March and leaving by September to winter in South America.

HABITAT

The swallow-tailed kite prefers the high trees and leafy expanses of open woods, swamps, bayous, marshes and hardwood forests. It frequents these areas in Mexico, Central America and much of South America. In North America, the kite is found in south Louisiana and south Texas, as well as in southwestern Florida, where large kite po-pulations inhabit the secluded mangrove swamps; there, they find plentiful swarms of flying insects to feast on and tall trees in which to nest.

▲ CLASSIC COMBINATION

High trees near water and plenty of insects create the perfect habitat for the kite.

CONSERVATION

The swallow-tailed kite is not globally threatened. In fact, the bird is relatively common over much of its extensive distribution. However, in the U.S., where the bird formerly occurred in such northern states as Oklahoma, Minnesota and North Carolina, it now occurs only in southern states, such as Texas, Louisiana and Florida. The probable reason for this decline is habitat destruction for farming.

BREEDING

The swallow-tailed kite's breeding season runs from January through June, depending on the region. Many kite nests are over 100' from the ground, a height that makes studying the breeding behavior of this elusive bird a challenge. As part of its courtship behavior, the male kite has been observed feeding the female before copulation, which is frequent and noisy. The nest is constructed of twigs and lined with moss and situated on very small branches in the tops of high trees. These hard-to-reach areas make it harder for terrestrial animals to reach the nest — but they also make it vulnerable to birds of prey, such as the bald eagle and great horned owl. The female usually lays 1–2 eggs and incubation lasts from about 28–31 days; in two-egg clutches, the first egg is much larger than the second, and has a greater chance of survival. Both parents share parental duties; the male provides more food, but the female remains longer at the nest. Fledging occurs at about 40 days.

▲ HIDING PLACE

Although both kite parents share in their parental duties, the female parent usually guards the nest while the male typically hunts for food.

BEHAVIOR

Gregarious swallow-tailed kites often nest quite close together in colonies, which offers an advantage in detecting and deterring potential predators. In fact, these groups of kites often launch cooperative assaults on larger birds of prey, such as bald eagles. The kite's keen vision allows it to see attackers from far away and sound a high-pitched alarm call, *eee* or *kee*, repeated several times. Kite nestlings have been known to dribble excrement directly down onto the nest rim to avoid leaving telltale signs on the ground and attracting predators, especially raccoons, which abound in the kite's Florida mangrove habitat.

DID YOU KNOW?

- **As much as half of the entire population of American swallow-tailed kites congregate each year at central Florida's Lake Okeechobee, apparently as a "staging area" before taking off for their annual winter migration to South America.**
- **Though American swallow-tailed kites nest in the highest trees for safety from predators, these elevated structures are especially vulnerable to strong winds that whip through the treetops during Florida summers, destroying the nest and nestlings.**

▼ **PROTECTIVE PAIR**
Kites often band together to drive away larger predators.

FOOD & HUNTING

The American swallow-tailed kite feeds mostly on insects grabbed in midair and snatched from the tree canopy during low, slow glides. It usually eats its catch on the wing, transferring the food from its strong, agile talons to its sharp, hooked beak while flying.

A typical kite dinner consists of numerous victims gleaned from a flying swarm of insects. The bird also preys on hummingbirds, which are caught by surprise as they hover while feeding on nectar. Tree frogs, anole lizards and snakes round out the bird's diet. In Florida, where anole lizards are plentiful in the kite's preferred mangrove forest habitat, they comprise 99% of prey delivered to the nest. The American swallow-tailed kite also takes young birds from their nests, often carrying off entire nests of smaller species and eating them with one leg free while clutching the nest with the other.

FLYING FOOD

1 Closing in...
The swallow-tailed kite will use its sharp talons to snatch flying insects in midair.

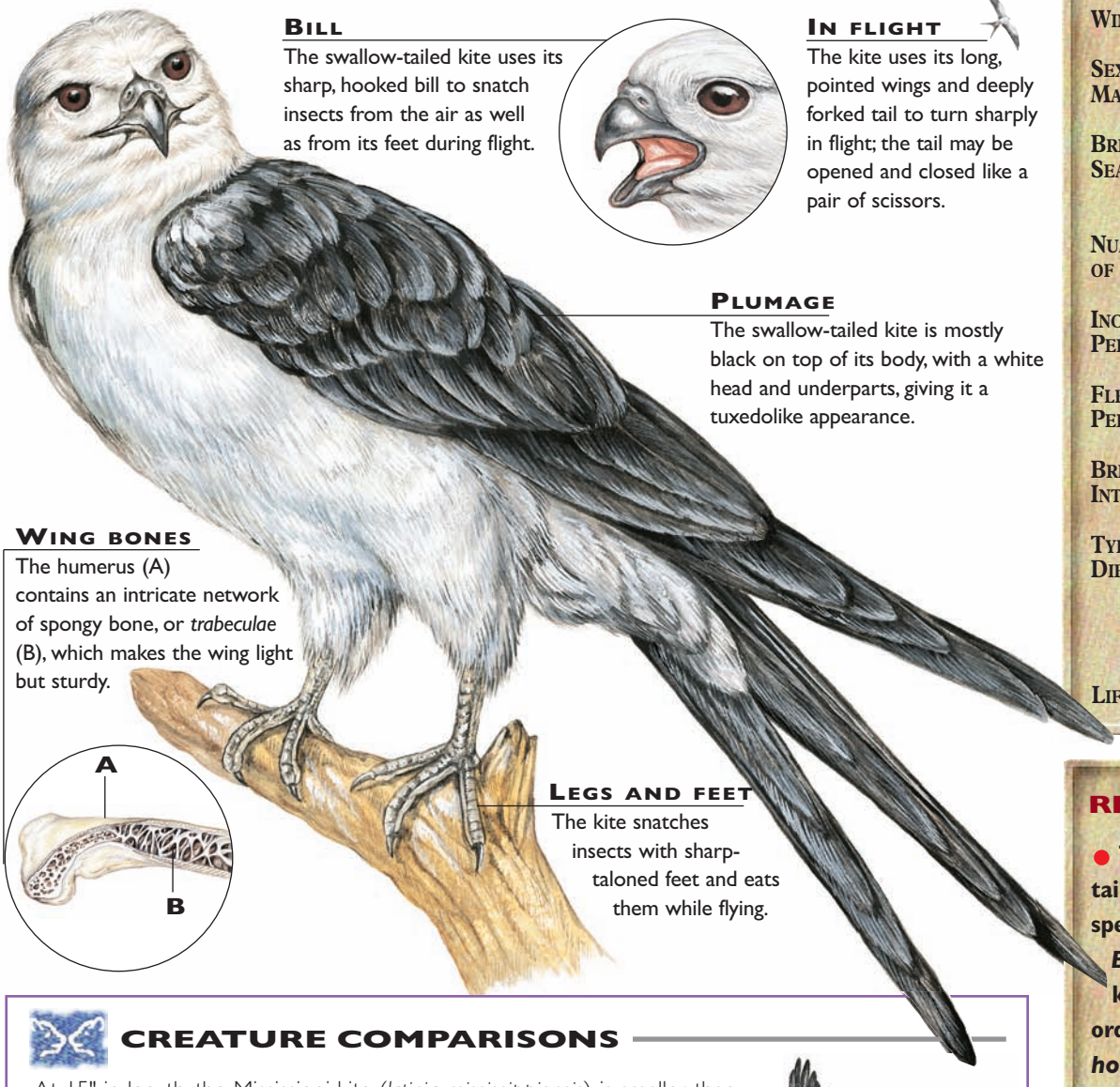
2 Dinner on the wing...
The swallow-tailed kite usually passes its food from talon to bill while still in flight.

3 In for the kill...
The swallow-tailed kite turns its agile tail to make sharp turns while chasing small prey.

4 Surprise attack
The kite extends its powerful legs to strike a nest and nestlings; it might carry both away.

PROFILE
American Swallow-tailed Kite

A skilled aerial hunter, the swallow-tailed kite can easily snatch elusive insects with its sharp talons, and eat them in midair.



Bill
The swallow-tailed kite uses its sharp, hooked bill to snatch insects from the air as well as from its feet during flight.

In flight
The kite uses its long, pointed wings and deeply forked tail to turn sharply in flight; the tail may be opened and closed like a pair of scissors.

Plumage
The swallow-tailed kite is mostly black on top of its body, with a white head and underparts, giving it a tuxedolike appearance.

Wing bones
The humerus (A) contains an intricate network of spongy bone, or *trabeculae* (B), which makes the wing light but sturdy.

Legs and feet
The kite snatches insects with sharp-taloned feet and eats them while flying.

Vital Statistics

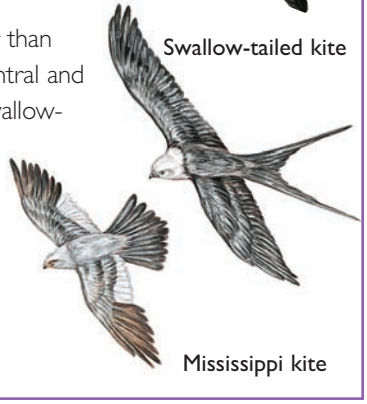
Weight	11–18 oz.
Length	20–25"
Wingspan	47–54"
Sexual Maturity	Up to 4 years
Breeding Season	Jan.–May; varies with region
Number of Eggs	2–4
Incubation Period	About 28 days
Fledging Period	5–6 weeks
Breeding Interval	1 per season
Typical Diet	Mainly large insects; also frogs, lizards, snakes and humming birds
Lifespan	Unknown

Related Species

- The American swallow-tailed kite is the only species in the small genus ***Elanoides***. Joining the kite in the much larger order ***Falconiformes, however,*** are such birds as the golden eagle, ***Aquila chrysaetos***, Cooper's hawk, ***Accipter cooperii***, the black vulture, ***Cathartes aura***, the American kestrel, ***Falco sparverius*** and the peregrine falcon, ***Falco peregrinus***.

Creature Comparisons

At 15" in length, the Mississippi kite (*Ictinia mississippiensis*) is smaller than the swallow-tailed kite. While both birds inhabit parts of North, Central and South America, the Mississippi kite ranges farther north than the swallow-tailed kite. It frequents northern Texas, where it prefers open country and streamside thickets. The swallow-tailed kite, meanwhile, enjoys swamps and bayous in the southern U.S. Both birds spend about six months of each year in South America. Slender with pointed wings, the Mississippi kite is mainly gray, though darker on the back and paler on the head. In contrast, the swallow-tailed kite is mostly black with a white head and underparts.



Andean Condor

• ORDER •
Falconiformes

• FAMILY •
Cathartidae

• GENUS & SPECIES •
Vultur gryphus

KEY FEATURES

- Soars at altitudes up to 18,000' and can spot an animal carcass from a distance of several miles
- Has the largest wing area of any bird (nearly 6.5 sq. ft., allowing it to glide on rising air currents
- Can devour up to 15 lbs. of flesh at one sitting, but may eat so much it can't take off again

WHERE IN THE WORLD?

Found high in the Andes mountains of western South America, over the grasslands of Argentina south of the Rio Negro and on the coasts of Peru and Chile

LIFECYCLE

Hanging like a huge kite on the breeze, the condor performs the role of "undertaker" in its bleak homeland, locating carcasses far below and swooping down to tear into them.

HABITAT

▲ SAILING ON HIGH
The condor soars on huge, slotted wings, supported on updrafts above monumentally high peaks.

The Andean condor is native to the Andes mountain chain that extends north to south along the entire length of western South America, but also can be found over the coasts of Peru and Chile and the Patagonian steppe of Argentina.

Wheeling and soaring over high mountains, windswept upland plains and lowland desert areas, the condor looks for signs of other scavengers gathering over carrion. It avoids forests, where locating carcasses and landing is difficult for such a broad-winged bird.

Although the Andean condor doesn't migrate seasonally, it covers huge areas while foraging. It relies on its superb soaring abilities to carry it at high altitudes back to its roosting site each evening. The condor tends to roost and nest on the faces of high cliffs, where few predators can gain access to its eggs and from where it can launch itself easily into the air.

BEHAVIOR

The condor usually roosts on cliff faces because it needs thermals (warm air currents) and cliffside updrafts to carry it aloft. It waits for the morning sun to heat the land and create the thermals and basks until its organs and flight muscles are warmed. When conditions are right for flight, it launches into the buoyant updrafts.

When feeding on hot days from a carcass, the condor absorbs reflected heat from the ground. To stay cool, it radiates excess body heat through loose skin folds on its naked head and deficates on its legs. Back up on high, thick body plumage keeps it warm and it draws its head into its snug, downy neck ruff.

DID YOU KNOW?

- **South American Indians believed that eating the condor's eyes would sharpen their own eyesight.**
- **Quills from Andean condor's wing feathers were used in mechanisms of harpsichords.**
- **The Andean condor's distant ancestors included the giant teratorn, *Teratornis incredibilis*. This enormous bird had a wingspan up to 25'.**

FOOD & FEEDING

The condor scans the ground for carcasses, but often follows other scavengers, such as smaller vulture species. This benefits lesser vultures — only the condor (with its huge, hooked beak) can rip open the tough skin of some carcasses. Condors and other vultures feed in order of age seniority; each thrusts its head into the carcass for pieces of flesh to gobble down.

The condor feeds mainly on the carrion of mammals such as sheep, cattle and llamas. In coastal areas, it pecks at beached whale carcasses, patrols seal rookeries for casualties and afterbirths and even raids seabird colonies for eggs.

▲ **LAND OF GIANTS**
The condor is the biggest vulture in South America.

SKY-HIGH SCAVENGER

1 Follow the crowd...
From high in the sky, the condor scours the horizon. Seeing a flock of vultures circling over a llama carcass, the big bird loses height…

2 Take the lead...
…and follows them to a fresh llama carcass lying on the ground. The smaller vultures stand back…

3 Rip...
…while the condor uses its stout, hooked bill to make the first cut in the llama's tough hide. Once it has opened up the belly of the carcass…

4 Feed
…the condor eats its fill. Less-senior condors await their turn at the carcass; they're followed by smaller vulture species.

BREEDING

The condor breeds every other year, and even then only when enough carrion is available to feed the chick. Once paired, however, condors remain together for life. The nest site is usually situated high on a sheer cliff face, in a small cave or recessed ledge.

The female lays a single, white egg on bare rock and both parents share the task of incubation. When the chick hatches, adults feed it partly digested flesh, passing it from bill to bill. As the chick grows, it learns to help itself from food offerings dropped by adults in the nesting area. The juvenile takes six months to fledge and depends on its parents for many more months before becoming independent.

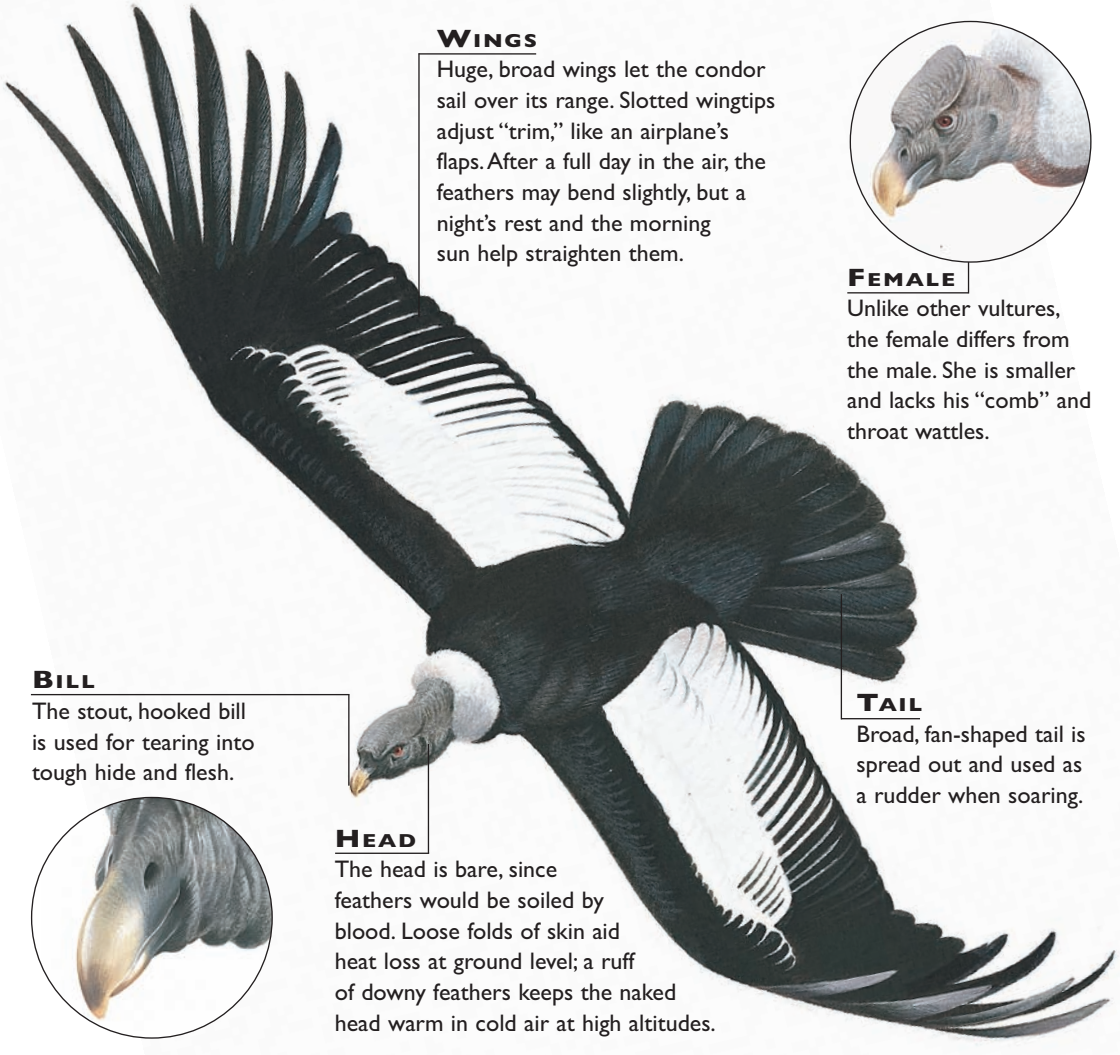
▼ **MEET ON THE LEDGE**
Condors aren't social, but pairs may use the same cliff ledge for nesting.

CONSERVATION

The Andean condor lives long and breeds slowly; any human interference rapidly upsets this pattern. The condor is hunted for sport and is persecuted by some farmers who believe it kills domestic livestock. It also suffers from pesticides that are carried up through food chains. Numbers have plummeted, but the condor isn't officially listed as endangered. Recent attempts to rescue the Andean condor and the rare California condor, through captive breeding and habitat research programs, have met with moderate success.

PROFILE ANDEAN CONDOR

The Andean condor's huge wing area allows it to soar on air currents, and its dense plumage keeps it warm at high altitudes.



WINGS
Huge, broad wings let the condor sail over its range. Slotted wingtips adjust "trim," like an airplane's flaps. After a full day in the air, the feathers may bend slightly, but a night's rest and the morning sun help straighten them.

FEMALE
Unlike other vultures, the female differs from the male. She is smaller and lacks his "comb" and throat wattles.

BILL
The stout, hooked bill is used for tearing into tough hide and flesh.

HEAD
The head is bare, since feathers would be soiled by blood. Loose folds of skin aid heat loss at ground level; a ruff of downy feathers keeps the naked head warm in cold air at high altitudes.

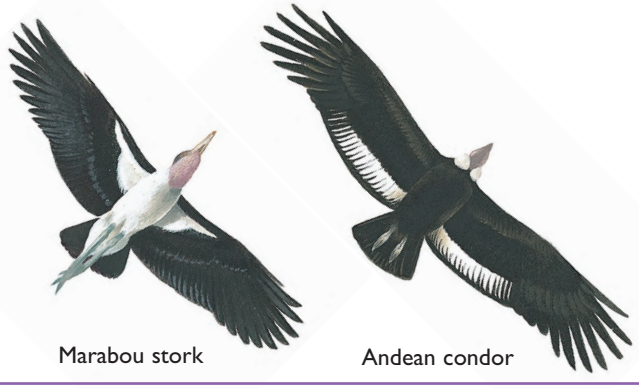
TAIL
Broad, fan-shaped tail is spread out and used as a rudder when soaring.

VITAL STATISTICS

WEIGHT	Male 24–33 lbs., female 18–24 lbs.
LENGTH	3–4'
WINGSPAN	Up to 10' or even more
SEXUAL MATURITY	6–8 years
BREEDING SEASON	Varies according to location
NUMBER OF EGGS	1
INCUBATION PERIOD	54–59 days
FLEDGING PERIOD	6 months
BREEDING INTERVAL	Nests once every two years
TYPICAL DIET	Carrion of sheep, cattle, llamas and other mammals
LIFESPAN	Over 50 years

CREATURE COMPARISONS

DNA studies show that the Andean condor isn't related to Old World (African and Eurasian) vultures, but shows closer affinities to storks. The African marabou stork, for example, has striking similarities to the condor. Like the condor, this stork is a bald-headed carrion eater and locates its prey by soaring at great altitude on huge, deeply slotted wings.



Marabou stork

Andean condor

RELATED SPECIES

● **The Andean condor is one of 7 species of New World vulture in the family *Cathartidae*, including the king vulture** (below). **The only other condor species is the rare California condor.**

Anhinga

• ORDER •
Pelecaniformes

• FAMILY •
Anhingidae

• GENUS & SPECIES •
Anhinga anhinga

KEY FEATURES

- Elegant waterbird with S-shaped neck; basis for its alternative name, snake bird
- Often swims with only its head and neck above water surface
- Hunts for fish mostly in freshwater, catching its prey with a darting movement of its head
- Breeding pairs are essentially monogamous and reuse their nest sites

WHERE IN THE WORLD?

Found in South America, from Uruguay and southern Brazil to Ecuador, Colombia and Panama; also north through Mexico to southeastern U.S.

LIFECYCLE

Nonrepellent feathers are a mixed blessing for the anhinga; they reduce its buoyancy, making it superb at fishing, but they must be dried quickly to stop it from catching a chill.

HABITAT

Unlike its marine relatives, the anhinga is usually found in freshwater habitats, perching on branches next to lakes, marshes and rivers. Brackish estuaries, mangrove swamps and shallow bays also play host to the anhinga. Wherever it lives, waterside vegetation is a standard feature and provides safe nesting and roosting sites.

▲ **PLACE IN THE SUN**
The anhinga rests on nearby branches to dry its wings.

FOOD & HUNTING

Fish feature heavily, but not exclusively, in the anhinga's diet. Across its range, it consumes various species, the majority being under 4" in length and slow moving. The anhinga also preys on aquatic amphibians, reptiles, mollusks, leeches and crustaceans.

A typical hunting foray starts with a serene, splash-free dive under the water. The anhinga hunts in the shallows among aquatic vegetation. Although it often stalks its prey for a minute or more, it seldom gives chase for long and prefers to wait in ambush. It has a habit of spreading its wings when it hunts; the precise reason is unknown, but it may act as a lure, tempting fish to approach what appears to be a shady resting place.

As soon as a fish comes within range, the bird strikes. A hinge mechanism between its neck vertebrae and powerful neck muscles enables the anhinga to straighten its neck with lightning speed. Its victim secured, the anhinga comes to the surface to eat its meal.

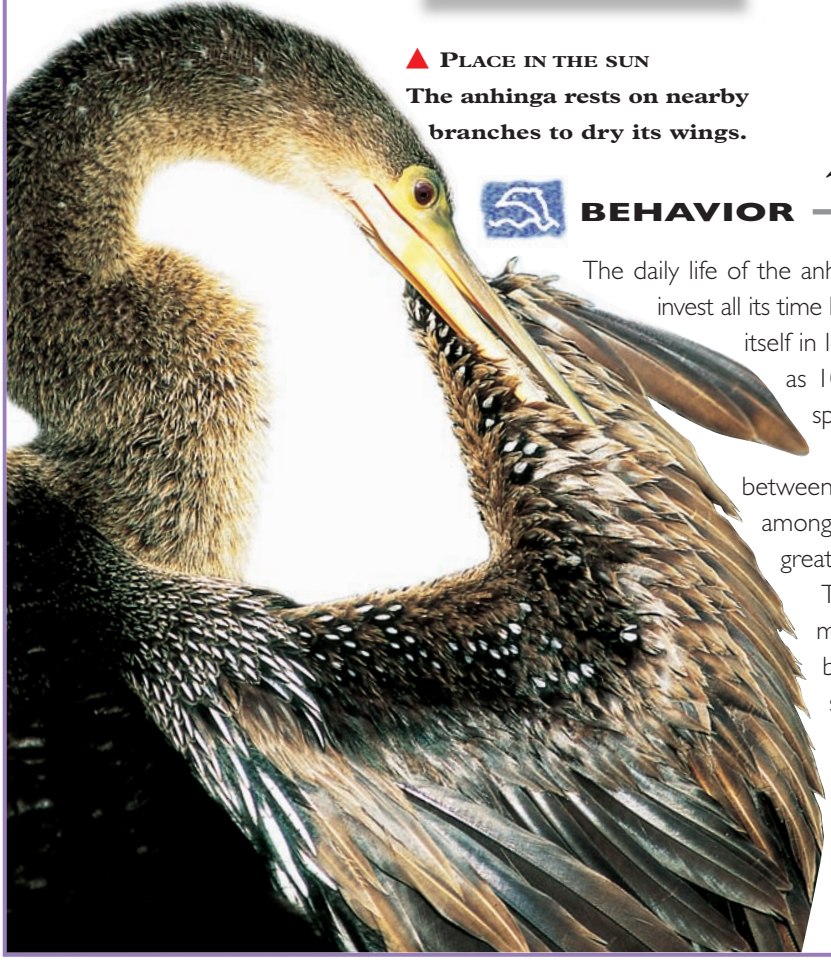
▼ **SLIPPING DOWN**
A fish swallowed head first is less likely to get stuck.

BEHAVIOR

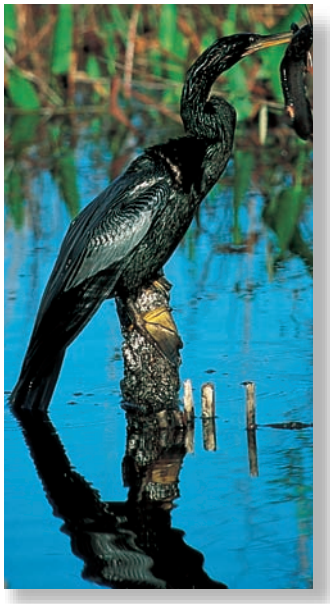
The daily life of the anhinga is not a hectic one. In food-rich areas, the bird doesn't invest all its time hunting. Instead, it spends most of the day sunning and preening itself in loose groups of fewer than 10 birds, but occasionally as many as 100. Nevertheless, the anhinga is not overtolerant of its own species and squabbles often occur at shared perches.

In the air, the anhinga has a graceful flight, alternating between flapping and gliding. Its long tail helps it maneuver deftly among the dense vegetation, and its broad wings enable it to soar to great heights on thermals (warm columns of rising air).

The anhinga has poor insulation against the cold, confining it to mostly tropical and subtropical latitudes. Those populations that breed at the northern limits of its range, most notably those in south-central U.S., desert their nesting grounds in October and fly to warmer wintering grounds in Mexico.



◀ **DRY-CLEANING BILL**
Successive dives ruffle the feathers of the anhinga, requiring the bird to spend much of its time preening.



▲ **Controlled diet**
The anhinga can take several minutes to manipulate and swallow a big fish.

SPEAR FISHING

1 Having a break...
In between dives, the anhinga cruises at a gentle speed with its body just below the water surface.

2 Back to work...
With barely a splash, the anhinga slips quietly under the water to resume hunting.

3 Taking aim...
A fish swims by; the anhinga turns sharply and, using its webbed feet for propulsion, pursues its prey.

4 Breakthrough
In a split second, the bird strikes out and impales the fish on its lower mandible.

CONSERVATION

The anhinga is common throughout its range but is sensitive to habitat disturbance. Some local populations are threatened by activities such as draining wetlands and clearing waterside vegetation. The heavy use of pesticides in parts of the anhinga's range also poses a threat. Even though its use was widely banned in the 1970s, the chemical DDT continues to contaminate and hamper the breeding success of the anhinga and other birds in the U.S.

DID YOU KNOW?

- **Whenever the anhinga feels threatened, either while flying or perching, it plummets into the water, remaining submerged for as long as possible.**
- **After breeding, the anhinga molts its flight feathers, and for a brief period is unable to fly.**
- **The anhinga tolerates other birds and is often found in mixed breeding colonies with egrets, ibises and cormorants.**

BREEDING

Breeding for many anhinga populations is a seasonal affair; even in those areas where the birds can nest all year-round, there is a distinct peak. The anhinga is faithful to its partner, forming a pair-bond that may last several years. The pair often reuses a nest from the previous season; when not possible, it builds a nest from sticks and leaves among the reeds, bushes or overhanging branches.

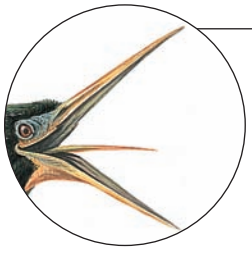
The female lays a clutch of up to five pale-green eggs that are incubated by both parents for four weeks. The chicks hatch naked, but soon grow a coat of buff-colored down. The chicks develop fast and leave their parents after two months.

▲ **Out to impress**
The male displays on a branch to attract a mate.

▶ **Fresh start**
The nestling is not fully fledged until 6 weeks old.

PROFILE ANHINGA

The anhinga seems a curious mixture of other birds, with the head, neck and wings of a heron, and the feet and plumage of a cormorant.



BILL

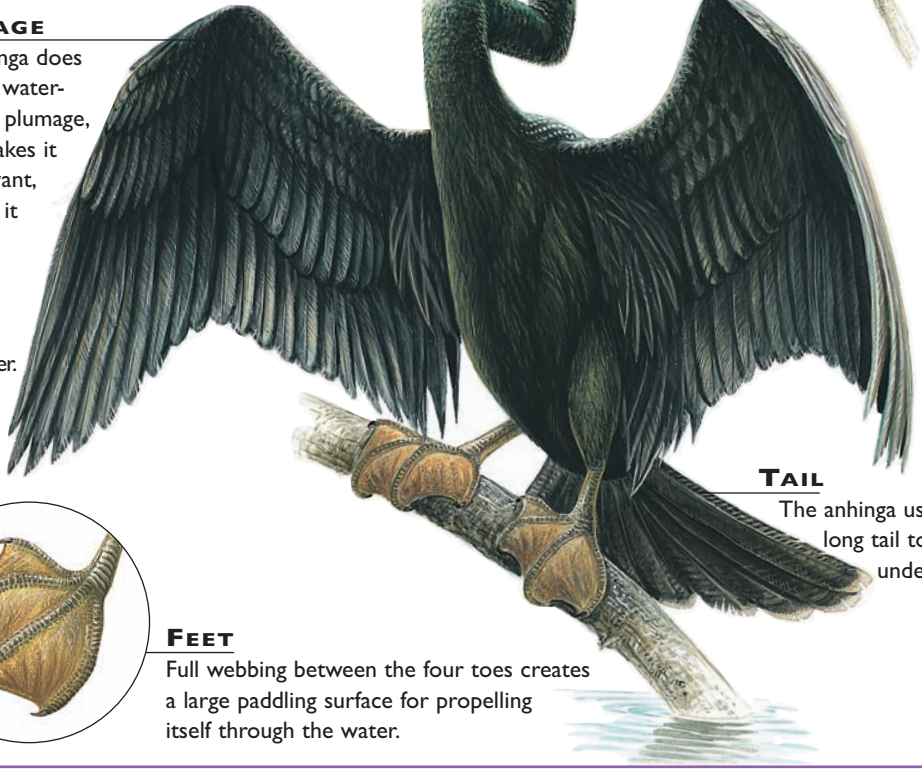
The daggerlike mandibles have backward-pointing serrations at the tip, enabling the bird to grip its slippery prey.

FEMALE

The female is about the same size as the male, but has a slightly shorter bill and paler plumage. She also lacks the male's erect crest of neck feathers.

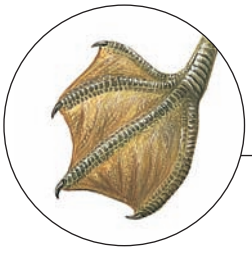
PLUMAGE

The anhinga does not have water-repellent plumage, which makes it less buoyant, but gives it added mobility when hunting underwater.



TAIL

The anhinga uses its long tail to steer underwater.



FEET

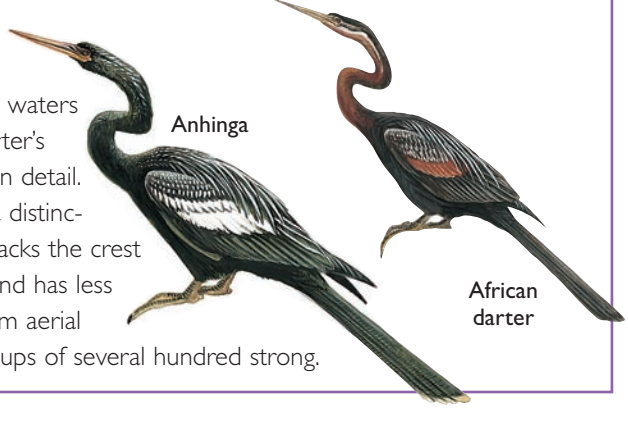
Full webbing between the four toes creates a large paddling surface for propelling itself through the water.

VITAL STATISTICS

WEIGHT	2.9–3.1 lbs.
LENGTH	32.5–36.5"
WINGSPAN	4'
SEXUAL MATURITY	2 years
BREEDING SEASON	Seasonal or all year, depending on region
NUMBER OF EGGS	3–5
INCUBATION PERIOD	25–28 days
FLEDGING PERIOD	About 42 days
TYPICAL DIET	Mainly fish, with a few amphibians, reptiles and invertebrates
LIFESPAN	At least 9 years

CREATURE COMPARISONS

Across the Atlantic Ocean, the African darter (*Anhinga rufa*) has similar haunts and habits as the anhinga. Inhabiting inland waters across most of sub-Saharan Africa, the darter's appearance differs from the anhinga only in detail. The African bird is slightly larger and has a distinctive, whitish stripe through each cheek. It lacks the crest found on the back of the anhinga's head and has less silvery gray on its wings. Both birds perform aerial displays during courtship and breed in groups of several hundred strong.



RELATED SPECIES

- The anhinga belongs to ***Pelecaniformes***, an order of fish-eating waterbirds that includes pelicans, gannets, egrets, ibises and cormorants. Its own family, ***Anhingidae***, has 4 species, collectively known as the darters because of the way they spear fish. The other 3 species include the Asian darter, the African darter and the Australian darter; some classify these as a single species.

Arctic Tern

• ORDER •
Charadriiformes

• FAMILY •
Laridae

• GENUS & SPECIES •
Sterna paradisaea

KEY FEATURES

- Elegant and agile bird with great stamina
- Migrates farther than any other animal
- Follows the sun through the seasons; in a year experiences more daylight than any other animal
- In its lifetime, may fly farther than the total distance to the moon and back

WHERE IN THE WORLD?

Breeds in the far north of Canada, Asia and Europe; spends the rest of the year in the southern Pacific and Atlantic, chiefly on Antarctic pack ice

LIFECYCLE

Life is a long summer for the Arctic tern, but its globe-trotting migrations are hard work. Each annual round trip may involve crossing vast oceans and total up to 24,000 miles.

HABITAT

The Arctic tern breeds within latitudes from Massachusetts and Brittany, France, north to within 420 miles of the North Pole, at sites such as the northern tip of Greenland.

During the summer breeding season, long hours of sunlight give the bird plenty of time to catch food. The tern nests mainly on coasts or offshore islands, flying short distances out to sea to catch fish for itself, its mate and chicks. In Scandinavia and Canada, the Arctic tern sometimes follows rivers far inland, nesting up to 180 miles from the sea and feeding on fish in the lakes and rivers.

After breeding and rearing its chicks, the Arctic tern spends the rest of the year at sea, flying a vast distance south to spend the southern summer (the northern winter) mainly around Antarctica. There, the tern rests on icebergs or floating pack ice.

◀ **BEACH BABIES**
The summer breeding grounds for the Arctic tern extend as far south as the sandy shores of Massachusett coasts.

▼ **TERN TO THE NORTH**
The world's most northerly landmasses are home to the tern during summer in the northern hemisphere.

BEHAVIOR

Terns nest in noisy colonies (often several thousand pairs) and feed in flocks of ten to several hundred birds. It's best known for epic journeys from northern breeding grounds to the southern oceans, returning the next year to breed. In its lifetime, an Arctic tern may travel at least 480,000 miles.

The tern migrates alone or in small groups. It usually flies down the west coast of North America, then follows the east coast of South America or crosses the Atlantic before continuing south. Eurasian birds follow the Atlantic coasts of Europe and Africa. With wind directions, these routes are the quickest and easiest for terns.

FOOD & FEEDING

Fish, crustaceans and insects are the main food of the tern, but prey varies with location. Shrimp, crabs, migrating insects and small squid are taken in flight from the surface waters; the tern also snaps up flies and moths at its breeding grounds.

The tern catches fish by diving into the sea, although it rarely dives deeper than 24" and may be under the waves for no longer than a second. The tern holds fish crosswise in its sharp-edged bill and can catch one or two more fish while still carrying the first. Herring, haddock, sprats, butterfish and even small salmon are typical prey, but sand eels are especially important at breeding time, providing a nutritious and convenient-sized meal for chicks.

WORLDS APART

1 Northern colonies...
The tern spends the summer at its northern breeding colonies. The young will be ready to migrate after about three months.

2 About tern...
In late summer, terns set off for the great journey south. Adult pairs often travel apart, reuniting the following breeding season.

3 Low-level refueling...
Heading south along their flyways, terns swoop to snatch fish from the sea. They stop occasionally to rest on driftwood, buoys and coasts.

4 Long, cool summer
Terns take four months to complete the journey to their southern winter quarters. By next April, they'll return.

▲ **Eel meal**
Sand eels are an important source of food during the tern's breeding season.

DID YOU KNOW?

- **The tern defends its nesting colony fiercely: it'll swoop to attack predators or humans and may draw blood with its sharp bill.**
- **The tern sometimes nests close to gull colonies. Although the gulls steal a few eggs and chicks, they protect terns from predators, such as foxes. Similarly, phalaropes and oldsquaw ducks often nest near terns, relying on the terns' sharp eyesight to warn them of danger.**

CONSERVATION

The tern's population is currently stable. But it's threatened by overfishing, resulting in a lack of food for chicks. In 1989, 10,000 breeding pairs on the Shetland Isles, off Scotland, reared just 100 young. The year after local sand eel fishery was banned, 30,000 chicks were reared in the same colonies.

BREEDING

▲ **Friends again**
Adult terns mate after renewing their pair bond.

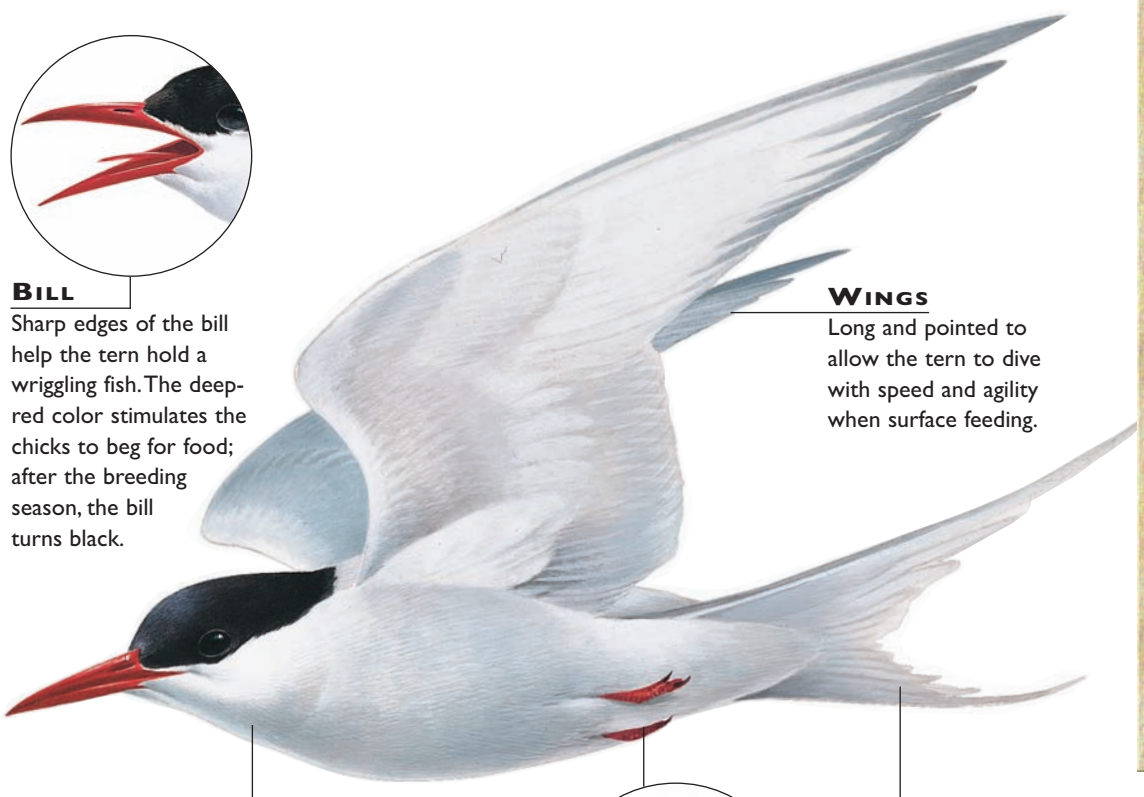
Terns pair for life. When adults return to their old nest site in spring, they renew their bond with courtship flights. The male brings food to his mate to help her into peak breeding condition.

The female lays one to three eggs in a scrape in sand or gravel. Both parents incubate the eggs and bring food to the young when they hatch in three weeks. Young stay in the nest for two or three days, then leave to hide in groundcover. They can fly in three to four more weeks, but parents may feed them for another two months.

PROFILE Arctic Tern

The Arctic tern's streamlined form allows it to dive for fish with masterful agility and minimizes drag during its long migrations.

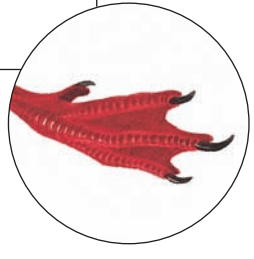
Bill
Sharp edges of the bill help the tern hold a wriggling fish. The deep-red color stimulates the chicks to beg for food; after the breeding season, the bill turns black.



Wings
Long and pointed to allow the tern to dive with speed and agility when surface feeding.

Plumage
Adult is pure grayish-white with a black cap. In winter, only the back of the head is black with a black line through the eye.

Feet
Three front toes are webbed, although the tern isn't a particularly good swimmer. The fourth toe is reduced to a peg at the back of the foot.



Tail
Long tail streamers act like a rudder to help the tern adjust its angle of descent as it dives for fish. The streamers are also used for display in courtship flights.

Creature Comparisons

A few subtle features distinguish the Arctic tern from other members of its family with which it shares parts of its range. The Arctic tern's bill is a deep blood-red during the breeding season and black for the rest of the year, whereas the common tern, *Sterna hirundo*, has a black tip on its bright red bill during the breeding season. Much larger than the other two birds, the royal tern has a ragged black crest and a bright yellow-orange bill.

Arctic tern

Common tern

Royal tern

Vital Statistics

Weight	3.5–4 oz.
Length	13–14"
Wingspan	30–34"
Sexual Maturity	2–5 years, usually 4
Breeding Season	May–August
Number of Eggs	1–3
Incubation Period	20–24 days
Breeding Interval	1 year
Typical Diet	Marine fish, crustaceans, small squid, insects
Lifespan	Up to 34 years

Related Species

- There are 43 species of tern in the ***Laridae*** family. These include the common tern, ***Sterna hirundo***, of Europe, Asia and North America. The Antarctic tern, ***S. vittata*** (slightly larger than the Arctic tern), was once thought to be descended from Arctic terns that stopped migrating and stayed to breed on islands close to the Antarctic Circle, but today the two birds are recognized as separate species.

Atlantic Puffin

• ORDER •
Charadriiformes

• FAMILY •
Alcidae

• GENUS & SPECIES •
Fratercula arctica

KEY FEATURES

- Small, but tough and hardy seabird able to swim and dive for fish on storm-tossed seas
- Nests in vast clifftop or island colonies where pairs occupy a nesting burrow dug into the turf
- Equipped with a massive and colorful bill, which is used for nibbling and wrestling in displays of affection or aggression, and also for catching fish

WHERE IN THE WORLD?

Breeds in the Arctic and along North Atlantic and North Sea coasts, from the northeastern U.S. to northwestern France, Britain, Ireland and Scandinavia; moves south into offshore waters in winter

LIFECYCLE

The Atlantic puffin may seem irresistibly comic with its waddling walk and colorful, oversized bill, but it's an efficient predator of fish even in rough seas.

HABITAT

▲ **ISLAND BREAK**
Puffins breed on rocky, wind-blown coastal islands.

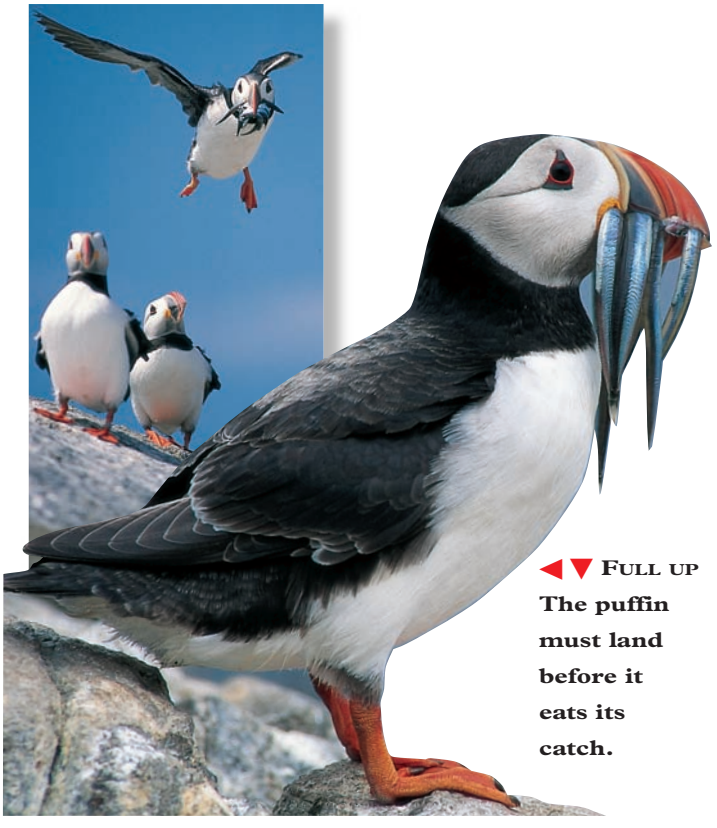
The Atlantic puffin spends most of its life at sea, coming to land only to breed in clifftop or island colonies. In the breeding season, it occurs on inshore waters from the North Atlantic and North Sea north as far as the High Arctic. But in late summer, puffins drift south away from their colonies, which are deserted by September. From fall until early spring, they stray far out to deeper, offshore waters as far south as New Jersey, the western coast of Italy and the Canary Islands.

The puffin shares nesting cliffs with other birds of its family, *Alcidae*, but doesn't compete with them for nest sites as it's the only one to use burrows high on the cliff. But in the Arctic, frozen ground prevents it from digging burrows, so it must resort to crevices in the cliff faces.

CONSERVATION

Although some of the Atlantic puffin's colonies, which normally number in the thousands, have declined in size during the 20th century, it remains an abundant species. However, it faces two serious threats — oil pollution in the form of deadly surface slicks and the overfishing of its food supply by large, commercial fishing fleets. On rare occasions, the Atlantic puffin becomes entangled in fishing nets and drowns.

FOOD & HUNTING



◀▼ **FULL UP**
The puffin must land before it eats its catch.

BREEDING

After a display of head-shaking and bill-nibbling, a male and female mate on the surface of the sea not far from their colony. Each pair mates for life, returning to the same nesting burrow every year. Puffins excavate their burrows, which can be 7' deep, with their bills, but where possible, simply use an old burrow of another animal.

The female lays her egg in the burrow and both sexes share in incubation, which lasts six weeks. Parents also cooperate in feeding the young, but after 5–7 weeks, they stop bringing food to the nest. Within days, the juvenile leaves, traveling to sea by leaping with fluttering wings as it can't yet fly with the skill of an adult.

At home on or below the surface of rough and calm seas, the puffin is a master swimmer. Diving from the surface, it can cover 150' horizontally in a single dive for fish. On other occasions, it dips its head under the water while trying to find a shoal of suitable prey.

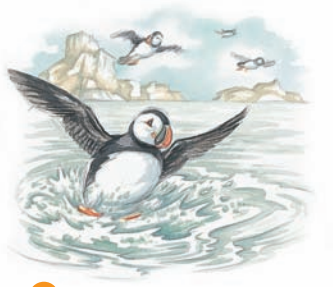
A relatively limited variety of small marine fish makes up the puffin's diet, including sand eels, sprats, whitings and rocklings. Most of the fish it catches are less than 4" long, but fish width is a more important factor: the puffin prefers to feed on prey 1" thick so that it can line up as many as possible crosswise in its bill. Adult birds, especially in the Arctic, also feed on mollusks and crustaceans, particularly shrimp or planktonlike animals.

DID YOU KNOW?

- **Large flocks of circling puffins, known as "wheels," are a common sight over every colony in the breeding season. But why they do this is unknown.**
- **The Atlantic puffin is still caught for food in Iceland and parts of Scandinavia, where it's a delicacy.**
- **Puffins nesting on the edges of a colony tend to be younger, less experienced birds and suffer the greatest losses of eggs and chicks to predators, such as gulls.**
- **The puffin sometimes dives more than 50' to fish.**

TIME FOR DINNER

1 Take-off...
A puffin launches from its high-rise nesting ledge to go fishing. At the colony, there's a constant stream of birds coming and going.



2 Crash landing...
Before splashing down onto the sea, the puffin throws its feet out sideways to provide an airbrake and cushion the impact.

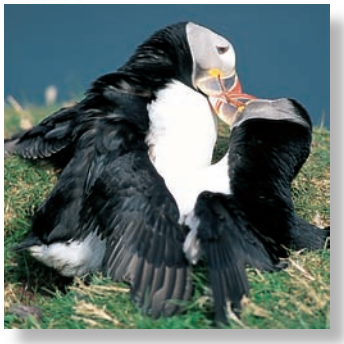
3 Dip down...
Beneath the waves, the puffin swims gracefully, powering through the water using its flipperlike wings and steering with its large feet.

4 Snatch up
Spotting a shoal of sand eels, the puffin gives chase. Its dives are usually a success; it often catches more than one fish at a time.

BEHAVIOR

◀ **MAKESHIFT HOME**
If a burrow isn't available, a puffin nests in a crevice.

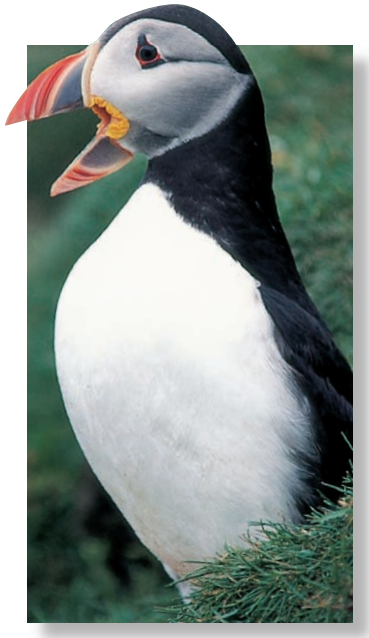
▼ **COLLECTION TIME**
Puffins gather vegetation for their nest burrows.



▲ **LIVING ON THE EDGE**
Puffins have fallen off cliffs when fighting.

In common with most sociable, colony-nesting birds, the puffin evolved a complex "language" of calls, displays and other body gestures for communication.

At sea, it indicates alarm by bobbing its head up and down; on land, it may growl menacingly. When landing at the colony after fishing, or walking through it, the puffin has a submissive pose to avoid fights with other birds. This involves bending its legs while tilting its head upward and raising its wings over its back. Nonetheless, excited squabbles between neighboring pairs are common and two puffins may grapple and twist each other with their bills, while uttering throaty calls, until they eventually pull apart.



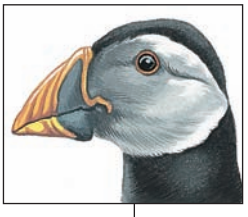
▲ **GROWLER**
The growling *aarr* call is usually only made on land.

PROFILE ATLANTIC PUFFIN

Even with up to ten fish in its bill, the Atlantic puffin can continue hunting and hold onto its large catch.

WINGS

Short and narrow wings are an ideal shape for driving the puffin underwater. But when airborne, it has to beat them rapidly to generate lift — and they appear as a blur.



WINTER PLUMAGE

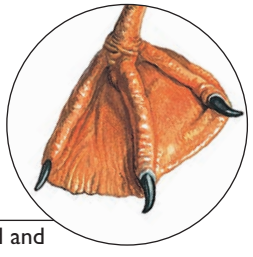
In August or September, after the breeding season, the adult puffin sheds several layers of its colorful, horny-plated bill to reveal a shrunken, gray bill with a yellowish tip. The facial feathers also become grayer.

BILL

Bill is hinged with loose skin, which lets the two mandibles move separately with greater freedom. Using its tongue to trap fish against the roof of its upper mandible, the puffin then lowers its bottom mandible to catch and hold yet more fish.

PLUMAGE

Densely packed feathers overlying insulating down protect the puffin in its repeated exposure to cold, often turbulent, water and battering waves.



FEET

Webbed and rear-set feet give maximum efficiency when paddling on the surface or steering underwater. But they cause the puffin to walk with a clumsy, shuffling gait on land.

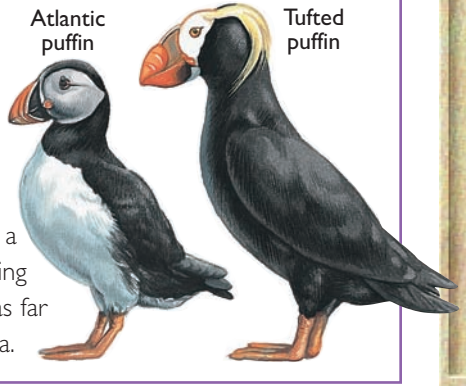
VITAL STATISTICS

WEIGHT	Male 13–19 oz; female 12–17 oz.
LENGTH Head/Body Bill	About 1' 1–1.5"
WINGSPAN	1.5–2'
SEXUAL MATURITY	5–6 years
BREEDING SEASON	April–August, depending on latitude
NUMBER OF EGGS	1 (rarely 2)
INCUBATION PERIOD	39–45 days
FLEDGING PERIOD	Variable: 35–50 days
TYPICAL DIET	Small fish, with some mollusks and crustaceans (particularly in Arctic waters)
LIFESPAN	10–15 years

CREATURE COMPARISONS

The tufted puffin (*Lunda cirrhata*) is one of three puffin species. In the breeding season, it has a pair of pale yellow tufts of feathers, which sprout from behind its eyes and fall over its neck. The rest of its breeding dress is sooty black, except for the cheeks and throat, which are white. In late summer, the puffin loses its colorful tassels and its cheeks become black.

A third larger than the Atlantic puffin, the tufted puffin has a bigger red-and-yellow bill. It's found in the North Pacific, breeding in eastern Siberia and on North America's western seaboard as far south as California. Like its Atlantic relative, it winters out at sea.



RELATED SPECIES

● **The Atlantic puffin is one of 22 seabird species known as auks; all are in the family *Alcidae*. Auks are stocky, diving birds in the Northern Hemisphere oceans and include the puffins, auklets, such as the dovekie, *Alle alle*** (below)**, guillemots, murrelets and the razorbill.**

Bald Eagle

• ORDER •
Falconiformes

• FAMILY •
Accipitridae

• GENUS & SPECIES •
Haliaeetus leucocephalus

KEY FEATURES

- Feet are equipped with spiny scales on the soles of the toes and sharp talons for gripping slippery fish
- Has been the national bird of the U.S. since 1782 — symbolizing freedom, power and majesty
- "Bald" refers not to the white head, but to the *piebald* (black-and-white) adult plumage

WHERE IN THE WORLD?

Widely but thinly distributed over the coastlines and inland waterways of Canada, the U.S. and northwest Mexico; range extends from the Arctic tundra to the subtropic mangroves

LIFECYCLE

A commanding presence in North American skies, the bald eagle patrols waterways and coasts, looking for the opportunity to swoop and snatch unwary fish and waterbirds.

HABITAT

▲ **SKY MASTER**
The bald eagle soars, usually above water, on broad, 7.9' wings.

The bald eagle is found in a range of habitats from rugged, Arctic coasts bordered by extensive coniferous forests to inland freshwater lakes and rivers. In southern parts of the U.S., such as Florida, it is quite at home in cypress swamps and mangroves; it even inhabits parts of the dry, hot deserts of the Baja peninsula in northern Mexico.

The bald eagle can often be seen sitting near the top of a tall tree at the water's edge, which provides a good lookout while waiting for fish, or any other prey in the vicinity, to come into view.

Inland-nesting eagles migrate southward in winter, and some of these migrant birds spend the non-breeding season in arid, open country far from water. It is in these surroundings that the bald eagle turns its attention to a wider range of prey.

CONSERVATION

Persecution and pesticides such as DDT have taken a toll on the bald eagle. From 1917 to 1945 and from 1949 to 1953, bounty hunters in Alaska shot an estimated 140,000 birds. Use of DDT in the 1960s and 1970s resulted in a 50–100% loss of breeding pairs in some areas. However, during the 1990s bald eagles have shown significant signs of recovery.

FOOD & HUNTING

From a prominent perch that overlooks water, the bald eagle scans the surface for fish. Once prey is located, the eagle flies out toward it, dropping down in a shallow glide. At the last moment it throws its feet down and forward to grab the fish just beneath the water. Hooking the fish into the air, the eagle carries it to a perch.

▲ **FULL-TIME JOB**
Feeding hungry young is very demanding for adult eagles.

▶ **FISH SUPPER**
Fish are carried to a favorite perch to be eaten.

In Alaska during the autumn, when salmon swim upstream to spawn and die, bald eagles gather in great numbers to feed on exhausted and dying fish. As many as 2,000 eagles have been counted; some wade through fast-flowing waters for weakened salmon.

Although specialized for catching fish, the bald eagle hunts a range of prey (seabirds, waterfowl, mammals and reptiles). In winter, when many birds move south from their breeding grounds, carrion and even scraps become important parts of the eagle's diet.

BREEDING

Depending on the locality, the eagle chooses from a variety of sites for its nest— a tree, on the ground or on a cliff. The same nest is reused for many years and may eventually become huge. One nest in Florida measured 30' across and 20' deep, and weighed about 4,400 lbs. Several pairs may nest in a relatively small area, occupying territories as small as 2,400 yds.

The eggs, normally two, are laid several days apart. Incubation begins when the first egg is laid and the chicks hatch at different times. The first chick will be fed by the parents for several days before its sibling hatches and will, therefore, have a significant size and weight advantage over it. Should the parents be unable to bring sufficient food for both chicks, the older chick bullies the younger and weaker one until it dies of starvation. This behavior ensures that in years when food supplies run short, the older chick, at least, can be raised successfully.

LOVE IS IN THE AIR

1 Round and round...
Courtship is an elaborate aerial display that begins with both birds flying leisurely in circles, the male above the female.

2 Mock attack...
Suddenly, the male swoops down toward his mate. Moments before contact, she turns upside down and thrusts her feet upward.

3 United we fall...
With talons locked together, the two birds tumble toward the ground, as if out of control. But at the very last instant...

4 New bond
...the birds break free. Their bond confirmed or renewed, they then temporarily part, flying off in different directions.

BEHAVIOR

As common with most *raptors* (birds of prey), the female bald eagle is larger than the male (known as *reversed sexual dimorphism*). The female needs to be large and strong so that she is able to defend herself against aggressive males, especially with young to look after. The size difference between sexes also reduces competition for food, as the female is able to target prey that is too large or strong for the male to cope with.

Sometimes the bald eagle turns to piracy. It frequently intimidates and harasses the osprey, an exclusively fish-eating raptor found in a similar range. The ospreys are often forced to surrender their catches.

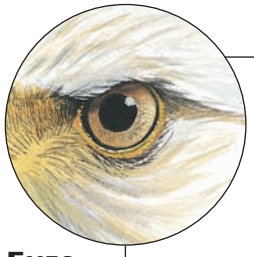
KEEPING WATCH
A female watches over her nest. She may be 30% heavier than her mate.

DID YOU KNOW?

- **Bald eagles hunt young sea otters by listening for the noises they make while feeding in kelp beds.**
- **By fitting birds with radio transmitters, researchers show that northerly nesting bald eagles may cover 1,200 miles when migrating to the south for winter.**

PROFILE BALD EAGLE

A powerful bill and specialized feet are essential tools in the armory of this imposing, fish-eating bird of prey.



SUPRAORBITAL RIDGES

These bony extensions of the skull overhang the eyes and help protect them from injury when the eagle is catching and handling prey. They also shield the eyes, like sun visors, reducing glare.

EYES

The eagle's ability to see detail at a distance is extraordinary. Its eyesight is 4–8 times sharper than a human's. The eyes are fixed in their sockets, so the eagle has to turn its whole head to look around.

BILL

As with all sea eagles, the bill is large, heavily built and strongly hooked. It's capable of tearing flesh from tough carrion into small, bite-sized pieces.

SPICULES

The soles of the toes are covered by special scales with spiny projections, called *spicules*. Together with the sharp talons, these help grip slippery fish.

VITAL STATISTICS

WEIGHT	6.6–13.9 lbs.
LENGTH	30.4–36.4"
WINGSPAN	5.5–8'
SEXUAL MATURITY	4 years
BREEDING SEASON	October–April in south, April–August in north
NUMBER OF EGGS	1–3; usually 2; rarely 4
INCUBATION PERIOD	About 35 days
FLEDGING PERIOD	70–92 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Mainly fish and seabirds
LIFESPAN	47 years in captivity; 25 years in wild

RELATED SPECIES

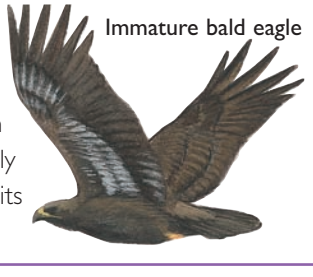
- **The bald eagle is one of ten species of sea eagle found worldwide, except South America. Steller's sea eagle, *Haliaeetus pelagicus*, has a massive bill for feeding on salmon and is found along coasts in east Asia, from Siberia to Japan. The white-tailed sea eagle, *H. albicilla*, is Europe's largest eagle species. Its range has been greatly reduced by habitat destruction.**

CREATURE COMPARISONS

Immature bald eagles are brown and look like other species of large eagle. The similarly sized golden eagle, *Aquila chrysaetos*, also has brown plumage. It can be found throughout the non-tropical zones of the northern hemisphere, occupying almost the same range as the bald eagle in North America. Both species soar on long, broad wings with characteristic splayed "fingertips" (primary flight feathers).

Adult golden eagle

Living in remote, rocky mountainous areas, the golden eagle feeds mainly on rodents, rabbits and hares.



Immature bald eagle

Bananaquit

• ORDER •
Passeriformes

• FAMILY •
Coerebidae

• GENUS & SPECIES •
Coereba flaveola

KEY FEATURES

- Drills a hole in the side of a flower with its long bill, then licks the sweet nectar with its feathered tongue
- Builds two types of dome-shaped nests, one for roosting, the other for breeding
- Despite its name, it does not eat bananas

WHERE IN THE WORLD?

Common in Central and South America, including islands in the Caribbean, excluding Cuba and the Caymans; in North America, only in Florida

LIFECYCLE

The nonmigratory bananaquit remains in its tropical habitat year-round, constantly on the lookout for new nectar sources and persistently singing its high-pitched song.

HABITAT

▲ **FLOWER POWER**
Bananaquits search high and low for sweet nectar in a forest.

As its name suggests, the bananaquit is found near bananas. Its prime habitat requirement is an abundance of flowers, its primary food. The bananaquit lives mainly in tropical regions, including Venezuela, Brazil and the Bahamas, but is also found in subtropical areas and occasionally in temperate regions, as far south as Rio Grande do Sul in South America and as far north as Florida. The bananaquit frequents forests, mangroves, plantations and gardens.

DID YOU KNOW?

- **Some bananaquit nests examined in Tobago were composed of 400–650 individual pieces of plant materials.**
- **The bananaquit is the territory bird for the U.S. Virgin Islands.**
- **The bananaquit uses a technique called gaping to eat the inside of pupae, the cocoon stage of developing insects. It pierces the case, opens its bill slightly and licks the inside with its specialized tongue.**

FOOD & FEEDING

▶ **SHORTCUT TO SWEETS**
Punching a hole in the flower's base gets to the nectar more easily.

The bananaquit is always on the move from flower to flower, and from tree to shrub, exploring plants to find nectar. Its favorites include the whorl-like clusters of flowers, called *inflorescences,* on the banana plant. More than two-thirds of its diet is nectar; the rest is insects and insect larvae. The bananaquit can reach the nectar of some flowers directly from the top, which aids pollination, since pollen sticks to the bird's facial feathers and bill and is transported to other flowers. But other flowers have nectar that is not as easy to reach. The bananaquit then uses its sharp, awl-like bill to poke a hole in the base of the flower, and sticks out its tongue to lick the carbohydrate-rich fluid. This does not help pollination, but it does assist other animals: when the flower wilts, the hole gets larger, and hummingbirds and insects can reach the leftover nectar. The bananaquit also frequents man-made feeders that contain a mixture of sugar and water and flower-boxes on verandas in towns.

▶ **DIGGING IN DEEP**
The bananaquit's beak almost disappears in the petals of some flowers.

BREEDING

When spring arrives, the bananaquit looks for a mate. Once paired, the birds abandon their own small roosting nest and join together to painstakingly construct an elaborate structure big enough for a family. This thick-walled breeding nest has a high opening almost hidden by a protruding lip, which extends up from the bottom of the nest. The female lays three white eggs with brown spots and incubates them for almost two weeks. Though the male doesn't help incubate, he helps feed the nestlings regurgitated food. Insects play a more important role than nectar in a chick's diet — they supply needed protein for growth. The nest is always kept clean; the nestlings' diaperlike fecal sacs, containing wastes, are either swallowed by the female or carried away. Within three weeks the chicks have fledged.

A CHANGE OF ADDRESS

1 Regular roost...
An adult sits in its loosely constructed nest, used throughout the year for daytime rests and overnight roosting.

2 Carefully produced...
The breeding nest takes a pair a week to construct; it's three times as large as the roosting nest, which takes only hours to build.

3 Now in use...
The female incubates the eggs during the entire 13-day incubation period. The male brings food and remains close to the nest for protection.

4 Two on the loose
Juveniles must learn to form their own dome-shaped nests, but for the time being, two settle for an abandoned flycatcher's nest.

BEHAVIOR

The bananaquit is a tireless singer. Its hurried, high-pitched call can be heard any time of the day or year. The bananaquit also bathes often. Sticky from its flower foraging, it rinses in rainwater that accumulates in the thick leaves of bromeliad plants, while grabbing an extra meal of mosquito larvae. It cleans its gooey bill by wiping it on the sides on a branch. The bananaquit keeps intruders at bay with rapid wing vibrations. If that doesn't work, it pecks at its opponent; the fighting birds often flutter down to the ground where they continue their struggle.

▲ **INTENSE STARE**
A bananaquit carefully scans its territory from its elevated perch.

CONSERVATION

The bananaquit is common throughout its range, and is currently not endangered. Its exploitation of a variety of natural vegetation, as well as hummingbird feeders and urban planters, has contributed to its success. Habitat destruction, as well as insecticide poisoning, could be potential threats in the near future.

PROFILE BANANAQUIT

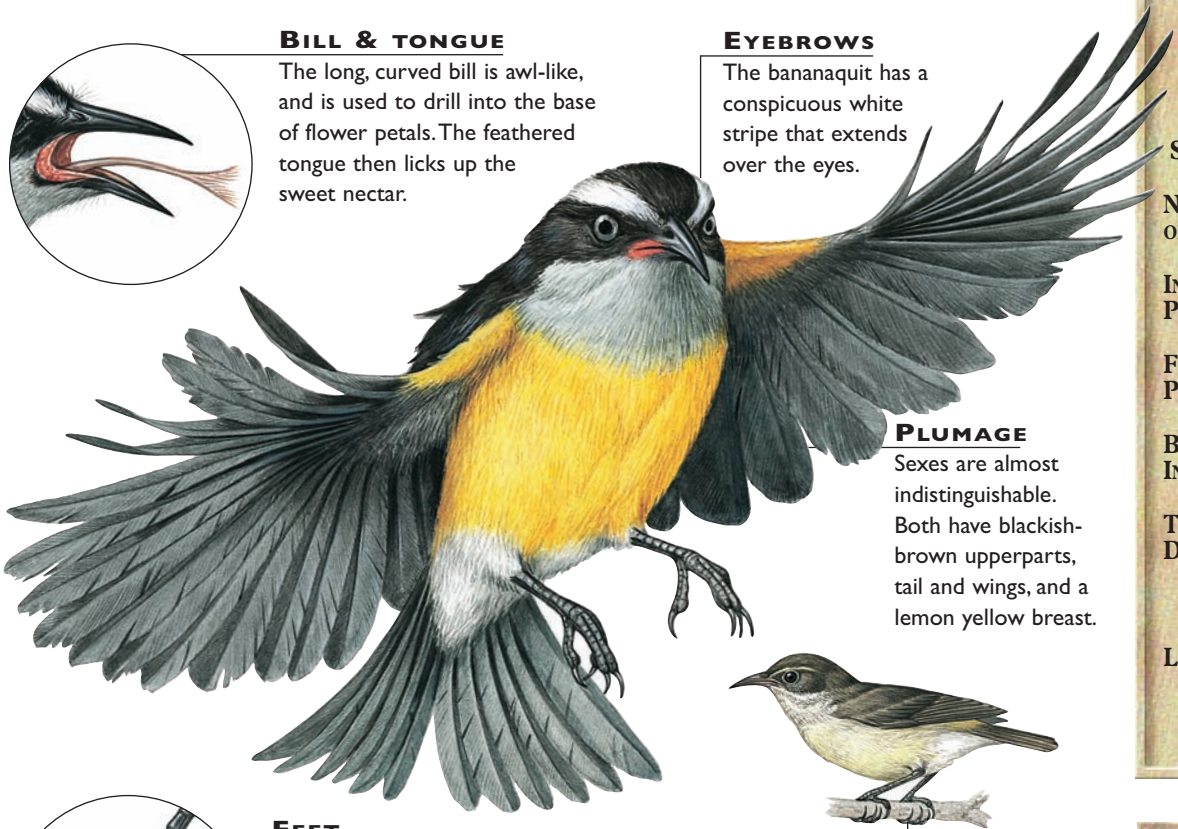
The bananaquit does not feed on the fruit of the banana tree, but instead uses its sharp bill to reach the sweet nectar of the blossoms.

BILL & TONGUE

The long, curved bill is awl-like, and is used to drill into the base of flower petals. The feathered tongue then licks up the sweet nectar.

EYEBROWS

The bananaquit has a conspicuous white stripe that extends over the eyes.

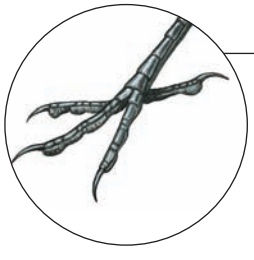


PLUMAGE

Sexes are almost indistinguishable. Both have blackish-brown upperparts, tail and wings, and a lemon yellow breast.

JUVENILE

The juvenile lacks the bold colors of the adult. The plumage is grayer, and the white streak above the eye, prominent in adults, is almost completely missing.



FEET

The bird has three toes pointed forward and one backward, a perfect arrangement for perching. The long, sharp claws help provide a firm grip when the bird hangs upside down to get to hard-to-reach flowers.

VITAL STATISTICS

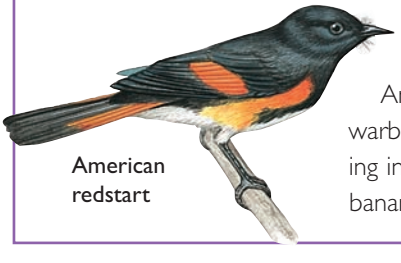
WEIGHT	0.35 oz.
LENGTH	4–5"
SEXUAL MATURITY	About 1 year
BREEDING SEASON	March–May
NUMBER OF EGGS	3
INCUBATION PERIOD	12–13 days
FLEDGING PERIOD	15–18 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Mainly nectar, but also fruits and insects, including larvae
LIFESPAN	Unknown

RELATED SPECIES

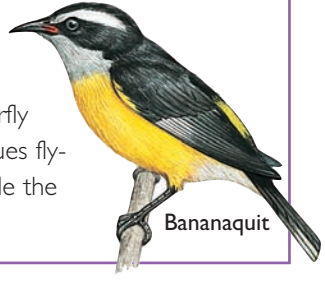
● **The bananaquit is the only member of the genus *Coereba*. It joins about 35 other species in the family *Coerebidae*, the New World honeycreeper family. The family contains nonmigratory, tropical songbirds that act much like wood warblers, flitting about the foliage in pairs, and includes the slaty flower-piercer, *Diglossa baritula*. The bananaquit is the only species found in North America.**

CREATURE COMPARISONS

The American redstart *(Setophaga ruticilla)* measures up to 5.75" and is similar in size to the bananaquit. It joins the bananaquit in the mangroves and forests of Central and South America in the winter, when it migrates south. But in the spring, it returns north to its breeding grounds in Canada and the United States, while the bananaquit remains in its home year 'round. The American redstart, often called the butterfly warbler, is an active and agile flyer as it pursues flying insects, which are a staple of its diet, while the bananaquit prefers sweet nectar.



American redstart



Bananaquit

Bank Swallow

• ORDER •
Passeriformes

• FAMILY •
Hirundinidae

• GENUS & SPECIES •
Riparia riparia

KEY FEATURES

- Spends most of its life in the air, darting in light, aerobatic flight
- Feeds mainly on flying insects, which it catches on the wing
- Nests in steep, sandy banks, excavating a breeding tunnel that may be up to 3' deep
- Migrates thousands of miles between the Southern and Northern Hemispheres each year

WHERE IN THE WORLD?

Found in the summer throughout temperate regions of North America, Europe and Asia, including parts of China; spends winter months in South America, Africa and parts of central Asia

LIFECYCLE

The bank swallow lives almost entirely in the air, wheeling and dipping as it chases its tiny insect prey. Only in the breeding season does it spend part of the time on the ground.

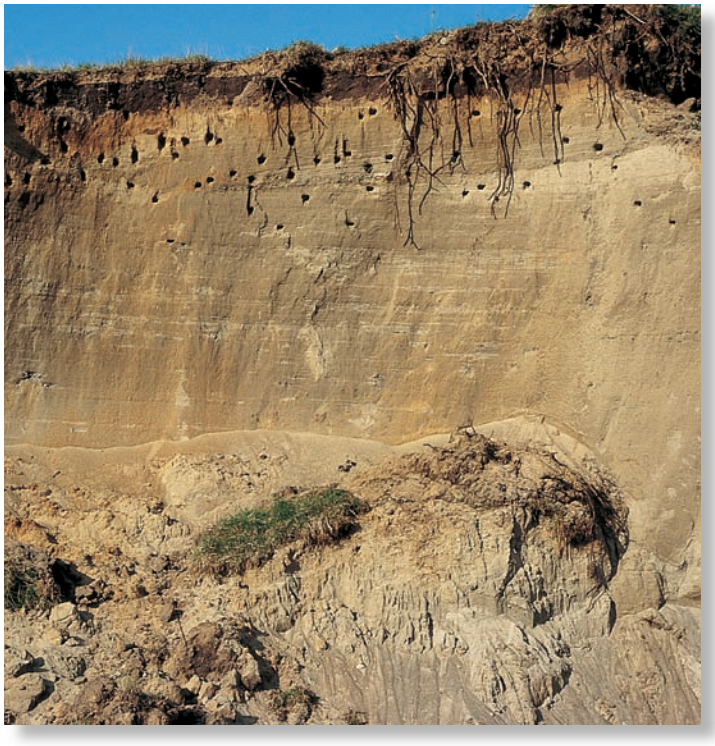
HABITAT

The bank swallow prefers open country, often near streams, rivers and lakes, where it has space to fly in pursuit of insects. It needs trees, bushes or man-made perching places to rest on, but tends to avoid thick woodland, built-up areas, highlands and dry regions.

In summer breeding seasons, the bank swallow's habitat is determined by the presence of soft, sandy banks in which it builds nesting burrows. It's now found near riverbanks, earth cliffs and old sand pits.

▲ **READY TO GO**
Swallows gather on wires before autumn migration.

▼ **COLONIAL LIVING**
Breeding bank swallows often tunnel in sandbanks.



FOOD & FEEDING

The swallow feeds on flying insects, especially flies, catching them by swooping down with an open bill. It sometimes eats grasshoppers, dragonflies and beetles. The bank swallow also drinks while in flight by flying close to the water and scooping it up in the lower half of its bill.

When there are young to be fed, the adults fly in frequent food-gathering missions — more than ten per hour — and they catch most insects in the late morning and afternoon. On average, a brood of young bank swallows may be brought as many as 7,000 insects by their parents in the course of a single day.

CONSERVATION

The western European bank swallow population has fallen by 90% owing to a series of droughts in its African wintering quarters.

▶ **SKYDIVING**
The agile bank swallow can easily out-fly its insect prey.

DID YOU KNOW?

- **Aristotle mistakenly thought bank swallows hibernated underwater — perhaps because they collect in large numbers in reedbeds before migrating.**
- **Roosting flocks with over a million bank swallows may gather in preparation of migrating.**
- **In periods of high winds or prolonged heavy rain, the bank swallow faces lean times, as few insects can take to the wing. However, it's capable of surviving up to 21 days on its fat reserves alone.**

BEHAVIOR

Like its swallow relatives, the bank swallow is highly social, spending most of its time flying in flocks and keeping in touch by constant twittering. If one bird senses danger, it alerts the rest of the flock by making a short, sharp "brrit" sound.

Most bank swallows migrate south in the fall when colder weather kills off many flying insects. Flocks follow the same route every year, flying by day and roosting together at night.

When the bank swallow returns north in spring, the older and more experienced birds arrive 3 weeks ahead of young birds making the journey for the first time, the males returning before the females.

◀ **BANK SWALLOW CITY**
Prime nesting sites may attract many swallows, so pairs space their holes far enough apart to prevent squabbles.

BREEDING

▲ **FEATHER DOWN**
The nest is lined with feathers, grass and leaves.

Since male bank swallows return to breeding grounds before females, they take up residence in old nesting burrows or begin to dig new ones. The male digs about 12" of a new tunnel, then tries to attract a female by singing and flying with fast wingbeats at the entrance. If he's successful, the pair mates and the birds finish the tunnel together.

The 4–6 eggs hatch in 14 days; the young are featherless and blind. For the first few days, one of the parents cares for them almost continuously. Young develop quickly and by 14 days can scramble to the entrance of the tunnel to defecate. At 4–5 weeks old, the young swallows are ready to leave the nest and fend for themselves. Early-nesting adults may rear a second clutch of eggs.

SHARING THE CARING

1 Home again...
In spring, the male returns from the south to a nesting site. Good sites in a steep bank of sandy earth are used every year.

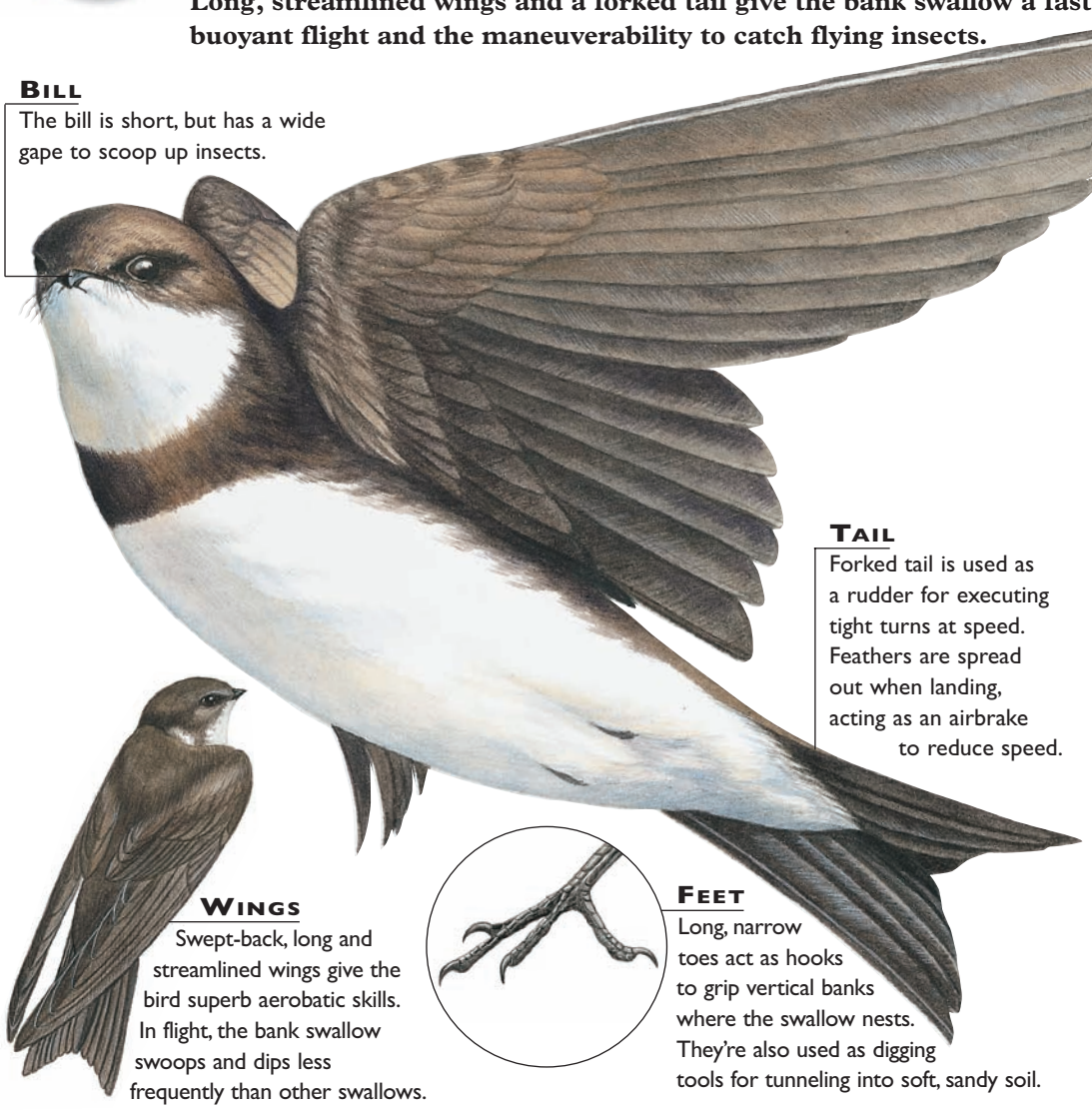
2 Tunnel...
When the female joins the male, they take turns to dig. A new tunnel may progress about 4" a day and take a week to complete.

3 Chamber...
Eggs are laid at the end of the tunnel in a small chamber about 2–2.5" in diameter. Both parents share incubation duties.

4 Hatched
After hatching, the young are fed by both adults on a diet of small insects. They grow quickly and fledge after 22 days.

PROFILE BANK SWALLOW

Long, streamlined wings and a forked tail give the bank swallow a fast, buoyant flight and the maneuverability to catch flying insects.



BILL
The bill is short, but has a wide gape to scoop up insects.

TAIL
Forked tail is used as a rudder for executing tight turns at speed. Feathers are spread out when landing, acting as an airbrake to reduce speed.

WINGS
Swept-back, long and streamlined wings give the bird superb aerobatic skills. In flight, the bank swallow swoops and dips less frequently than other swallows.

FEET
Long, narrow toes act as hooks to grip vertical banks where the swallow nests. They're also used as digging tools for tunneling into soft, sandy soil.

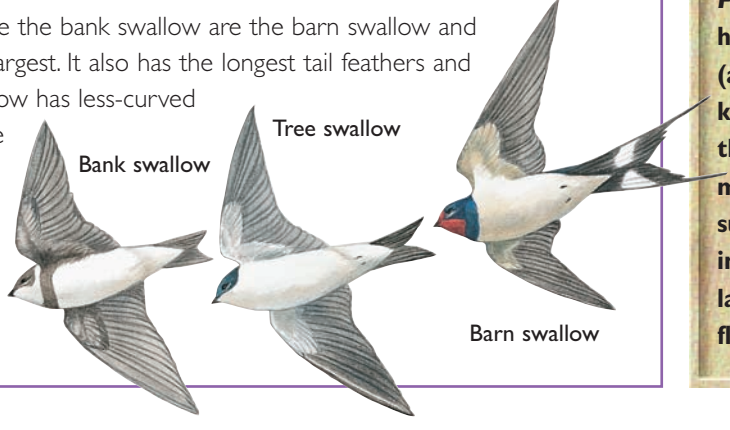
VITAL STATISTICS

WEIGHT	0.4–0.5 oz.
LENGTH	4.5–5"
WINGSPAN	8"
SEXUAL MATURITY	1 year
BREEDING SEASON	May–July
NUMBER OF EGGS	4–6
INCUBATION PERIOD	14–15 days
FLEDGING PERIOD	22 days
BREEDING INTERVAL	2 clutches a year (average)
TYPICAL DIET	Small flying insects
LIFESPAN	Up to 9 years

CREATURE COMPARISONS

Two relatives often seen flying alongside the bank swallow are the barn swallow and tree swallow. The barn swallow is the largest. It also has the longest tail feathers and the most pointed wings. The tree swallow has less-curved wings and a deep-green back, while the bank swallow is distinguished by a breast band.

All feed on flying insects. The tree swallow tends to fly the highest, while the barn swallow hunts near the ground or over water.



RELATED SPECIES

● **The sand martin (or bank swallow) belongs to the family *Hirundinidae*, which has 80 species. This family is part of the largest order of birds, *Passeriformes*, which has nearly 6,000 species (about 60% of all the known bird species). In this order, the sand martin belongs to the suborder *Oscines*, which includes relatives such as larks, thrushes, sparrows, flycatchers and tits.**

Barn Owl

• ORDER •
Strigiformes

• FAMILY •
Tytonidae

• GENUS & SPECIES •
Tyto alba

KEY FEATURES

- Acute hearing lets it locate mice and voles in total darkness by the faint noises they make while moving or eating
- Superbly sensitive binocular vision allows it to spot small mammals on the ground by day or in dim light
- Flies silently — the soft, comblike tips of its wings and its feathered legs muffle wind noise

WHERE IN THE WORLD?

In open grasslands, wetlands and semi-desert in North and South America, the Caribbean, central and southern Europe, much of Australasia and Africa; absent from the far north and much of Asia and Antarctica

LIFECYCLE

Pale and ghostly, the barn owl patrols silently over fields and grassland at night with slow, effortless wingbeats. It listens for the faintest rustle that betrays its prey.

HABITAT

Open, grassy lowlands with a few trees are typical habitat of the barn owl; this adaptable bird is also found in habitat ranging from arid scrub to farmland and roadsides.

The barn owl avoids dense woodland, which obstructs its flight, and is rarely found in deserts. It avoids mountains and northern regions where snow lies deep for more than a month or so, because prey can hide beyond reach beneath the snow. The barn owl is therefore absent from most of northern Europe and Asia — from northern Scotland to eastern Russia — and from Canada.

The barn owl relies heavily on old buildings for roosting or nest sites; hollow trees, cliffs and caves are also used. The owl's decline in recent decades can be attributed in part to the alteration of its habitat, as old buildings are pulled down or modernized and woodlands are cleared, although concerned people are helping by erecting nest boxes.

▲ **IDEAL SURROUNDINGS**
Grassy fields attract the barn owl; they're a good source of rodent prey.

CONSERVATION

The barn owl isn't endangered, although in many countries it has suffered from poisons used to kill rodents; many also die on roadsides, blinded by headlights. The owl is a valuable ally to the farmer, helping control vermin, but nest sites are disappearing with the steady "tidying" of the countryside.

BREEDING

Barn owls pair for life. Each spring, the partners perform courtship flights, weaving and chasing over fields to renew their bond. They choose a site in a hole in a building, old tree or cliff, although they don't build a nest. The female lays her eggs (usually four to seven, but sometimes many more) in a hollow, any time from March to August. She lays each egg at one- to two-day intervals, so up to two weeks may pass between the time that the first and last eggs hatch, about a month later.

Pink and naked at first, the female feeds owlets by morsels torn from food brought by the male. Although the young grow rapidly, elder owlets remain the largest; they alone will survive if food is short. They leave in two months and are independent two to three weeks later.

▲ **BUILDING A FUTURE**
An old ruin is an ideal site for rearing the young.

▼ **LINE-UP**
Chicks hatch at intervals and so vary in size.

DID YOU KNOW?

- **After eating, a barn owl coughs up pellets containing undigested parts of prey, such as bones and skull. If pellets are soaked in water for two hours, they may be pried apart to reveal the contents.**
- **The barn owl preys mainly on shrews, voles and mice; prey items recorded from around the world include blind moles, gerbils, hamsters, chameleons, crickets and hawk-moths.**

BEHAVIOR

During the day, the barn owl roosts in a barn, tree hollow or cave. Although it usually hunts in dim light or total darkness, it may occasionally hunt by day, when it relies on the sensitivity of its eyes. Its bone-chilling screams help distinguish it from other owls.

Superb hearing is key to its night hunting. Ears are offset on its skull to enhance stereo hearing, and two depressions flanking the bill on its dish-shaped face funnel the faintest sounds (such as a mouse chewing a seed) into the ear openings. By rotating its head, it can obtain an even more accurate fix on the source of a sound.

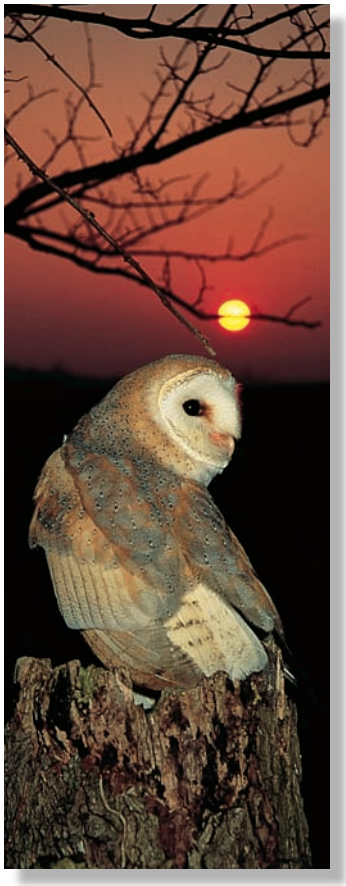
The owl needs a regular supply of food throughout the year. Winter is a particularly hard time — many small mammals are hidden from view. Many owls starve; only a quarter of young birds survive their first winter. Some owls find extra food in winter by catching small birds leaving or returning to their roosts.

▶ **LANDING GEAR**
Long legs swing forward as it alights on a perch.

FOOD & HUNTING

Through the night and for an hour or two before dusk and after dawn, the barn owl hunts by "quartering" the ground: flying slowly back and forth over a hunting patch, a few feet above the ground. It listens for noises that betray prey in the grass below. If it hears a sound, it drops slightly or hovers as it tries to trace it. Then it dives, or even somersaults backward, to attack.

As it hits the ground, it may spread its wings to steady itself. The owl eats its catch on the ground or carries it to a perch, such as a nearby fence post. Mice, small voles and shrews are staple prey, but the owl also takes rats, small birds, frogs, toads and even bats.



SILENT KILLER

1 Listen...
By twilight or night, a hunting barn owl quarters the ground, its ears alert for the rustling of small mammals in the grass below.

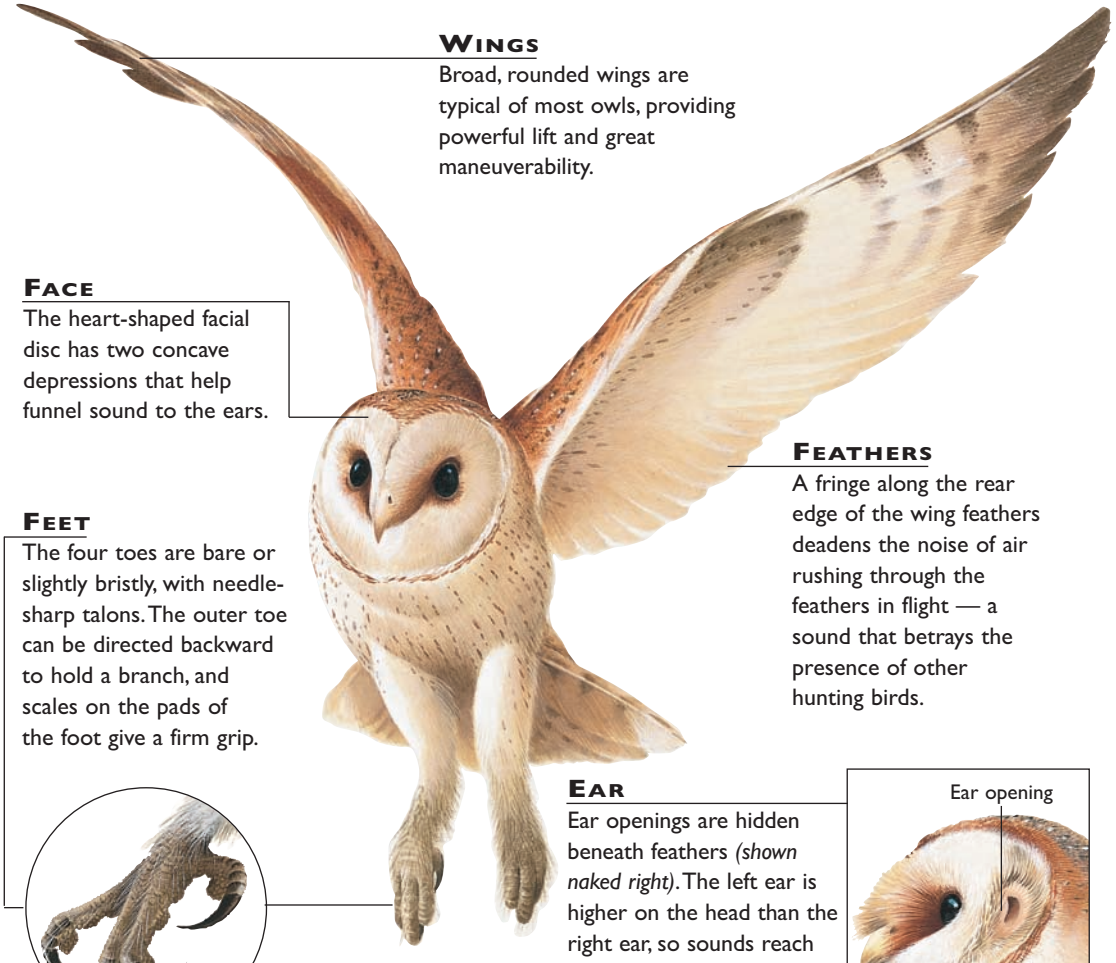
2 Dive...
Locating a sound, the owl slopes its wings and swoops rapidly upon its prey, remaining deathly silent in approach.

3 Catch...
The owl jerks its curved bill forward, swings its long legs down and spreads its feet. Sharp talons seize the prey in an inescapable, vicelike grip.

4 Devour
The owl kills with a swift bite to the neck. It eats the meal on the ground or carries it to a perch. Small mammals are eaten whole.

PROFILE BARN OWL

Totally silent in flight and possessing incredibly sharp hearing, the barn owl is an efficient nocturnal hunter, particularly over grassland.



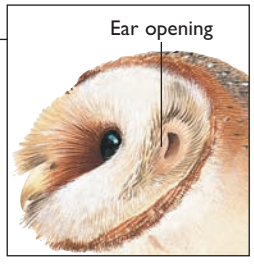
WINGS
Broad, rounded wings are typical of most owls, providing powerful lift and great maneuverability.

FACE
The heart-shaped facial disc has two concave depressions that help funnel sound to the ears.

FEATHERS
A fringe along the rear edge of the wing feathers deadens the noise of air rushing through the feathers in flight — a sound that betrays the presence of other hunting birds.

FEET
The four toes are bare or slightly bristly, with needle-sharp talons. The outer toe can be directed backward to hold a branch, and scales on the pads of the foot give a firm grip.

EAR
Ear openings are hidden beneath feathers *(shown naked right)*. The left ear is higher on the head than the right ear, so sounds reach them at different times, helping to pinpoint prey.



VITAL STATISTICS

WEIGHT	8–16 oz.
LENGTH	13–17"
WINGSPAN	34–37"
SEXUAL MATURITY	1 year, sometimes 2
BREEDING SEASON	Late February or March to November in the Northern Hemisphere
NUMBER OF EGGS	Up to 20, but usually 4–7
INCUBATION PERIOD	30–31 days
FLEDGING PERIOD	50–55 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Rodents, small birds, shrews, frogs, toads
LIFESPAN	Nearly 18 years

RELATED SPECIES

● There are 35 known subspecies of common barn owl (in localized areas or island groups). Ten other species of the barn owl family live on grasslands, islands or in rainforest. A species from Indonesia may be extinct; others are rare. Family ***Tytonidae*** also includes two species of bay owl, genus ***Phodilus***. The other 150 owl species belong to the family ***Strigidae:*** the hawk, or true, owls.

CREATURE COMPARISONS

The barn owl differs from other owls. It has smaller eyes and relies more on acute hearing, which is enhanced by its dish-shaped face. The barn owl also lacks the ear tufts of species such as the great horned owl. Owls have hooked bills and sharp talons like eagles and kestrels, but aren't related: the two groups have both simply evolved to hunt using the same basic method.

American kestrel

Barn owl

Great horned owl

Golden eagle

Barn Swallow

• ORDER •
Passeriformes

• FAMILY •
Hirundinidae

• GENUS & SPECIES •
Hirundo rustica

KEY FEATURES

- Nests close to humans— in barns and derelict buildings, beside dams and beneath bridges
- One of the most widespread birds in the world, its range has increased alongside human settlement
- A swift and agile hunter of flying insects, it follows domestic livestock herds to snap up insects in their wake

WHERE IN THE WORLD?

In summer throughout North America, Asia and Europe — in open country, farmland, grassland and parks, wherever there are suitable nesting sites; winters in South America, southern Africa and Asia

LIFECYCLE

The twittering calls and aerial acrobatics of returning swallows, as they swoop and twist to catch insects with graceful ease, are a herald of spring in northern regions.

HABITAT

The supply of flying insects and availability of nesting sites are important factors determining the northern location of the swallow in summer. Insects are abundant over low, lush vegetation and shallow water, so pastures, fields, meadows and river valleys are preferred domain, especially where barns and sheds provide nesting sites nearby. Bare branches, overhead wires and roof-ridges are also useful places to rest and preen in the sun.

▲ **PERCH PRIORITIES**
Branches and wires make useful resting sites.

Human activities, such as building and settlement, have helped release the species from its dependency on traditional nesting sites, such as cliffs and caves. In its southern winter habitat, the swallow finds rich insect-hunting grounds on stock-ranching land.

A HOME OF YOUR OWN

1 Advertising...
A male chooses a nest site (here an old nest on a shed wall) and displays to attract a mate, showing off the nest by pecking at it.

2 Refurbishing...
The adults collect pellets of mud in their beak to repair the nest, which may contain 1,400 mud pellets in all and weigh about 7 oz.

3 Furnishing...
Dry grasses and roots are woven into the mud to strengthen the structure. The nest is then lined with wool and soft, white feathers.

4 Hatching
The downy lining insulates the eggs, which are incubated almost entirely by the female. Hatchlings soon outgrow the cozy nest.

FOOD & FEEDING

The swallow feeds on flying insects, especially flies, which it captures in aerial pursuit. It favors large insects, such as bluebottles, hoverflies and beetles; in subtropical wintering grounds it also eats termites, grasshoppers and flying ants. In any habitat, the bird often follows grazing animals — whether farm cattle or zebras — to take insects stirred up by their hoofs. In poor weather, the bird may also dip into flowers to pick off insects or land on beaches to eat sandhoppers.

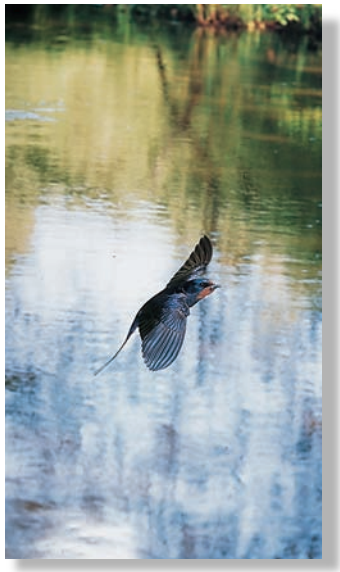
When there are young to be fed, feeding is even busier. Large, stout-bodied flies are the main food for early summer broods, but smaller prey, such as swarming greenfly, become more important for later broods. The swallow catches several insects at a time and compresses them into a ball in the throat to feed to the nestlings.

▶ **DIP AND SIP**
The swallow dives and scoops water in its bill.

BREEDING

Older birds are the first to return to the breeding grounds and take the best sites. Unpaired males make a nest, then display to attract a mate, circling near the nest and twittering loudly. If a female is attracted, the male shows her the nest as proof of his prowess and they then mate. The female lays four or five eggs at daily intervals. She incubates after laying the last egg, so all the eggs hatch together two weeks later. Young are fed by both parents and grow rapidly. They first fly in three weeks and are fed for another week, but may stay nearby for another month.

Early nesters can then rear a second clutch, even a third in good summers. Pairs often stay together for life, but because the swallow has an average lifespan of only 19 months, many adults have to seek a new mate the following breeding season.



CONSERVATION

The number of swallows soared in North America and Europe as settlers cleared woodland and erected buildings, offering new nest sites, such as bridges. However, the bird is now declining in some areas of the wild in the wake of intensive agriculture and the removal of old barns.

BEHAVIOR

Through the year, the swallow spends much time preening its feathers with its bill to keep them in peak flight condition. The bird also bathes by dipping into water while in flight.

The swallow is highly social. In the summer, it can often be seen feeding in large flocks, uttering busy "witt-witt" calls to keep in contact with others.

Colder weather in autumn brings a sharp decline in flying insects. Accordingly, the swallow flies south, setting off in small groups to spend the winter in South America, southern Africa or southern Asia. The barn swallows return north in the spring in preparation for breeding.

▲ **READY, GET SET...**
Swallows line up on wires before migrating in fall.

▼ **TILL DEATH DO US PART**
The swallow pairs for life and will stay close by when its mate dies.

DID YOU KNOW?

- **When swallows disappeared from northern regions in fall, it was once thought that they buried themselves in the mud or hid in caves to hibernate through the winter.**
- **A migrating flock in Nigeria had 50,000 swallows.**
- **One swallow nest was used every year for 48 years by different breeding pairs.**

PROFILE Barn Swallow

Scythelike wings and elongated tail streamers give the barn swallow the maneuverability it needs to pursue and catch insects on the wing.

Plumage
Races of the swallow vary in chest color, but all are the same species *(right)*.

Beak
The small, flattened beak has a wide gape to help scoop up insects on the wing.

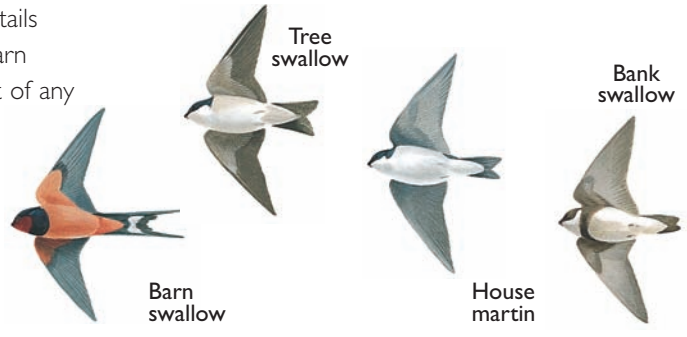
Wings
The swallow's long, tapering wings make it agile, but this bird isn't particularly fast, reaching flying speeds of only about 18 mph.

Tail
Elongated feathers help the swallow slow down or turn rapidly. Extra-long tail streamers on a male show a prospective mate that he is healthy and fit to breed.

Feet
Long, narrow toes are adapted for perching on branches, cliffs and wires. On the ground, the bird shuffles on its short legs.

Creature Comparisons

All swallows have long wings and tails for maneuverable flight, but the barn swallow's tail is among the longest of any species. The North American tree swallow has a squarer tail and is less aerobatic in confined spaces, such as woodland edges. Both the bank swallow and the related, similar-looking European house martin have a shorter tail.



Vital Statistics

Weight	0.6–0.7 oz.
Length	6.6–7.3"
Wingspan	13–13.6"
Sexual Maturity	1 year
Breeding Season	March–September
Number of Eggs	Usually 4 or 5
Incubation Period	11–19 days
Fledging Period	18–23 days
Breeding Interval	1–3 clutches in a year, depending on the weather
Typical Diet	Flying insects, especially flies
Lifespan	Up to 15 years, average is only 19 months

Related Species

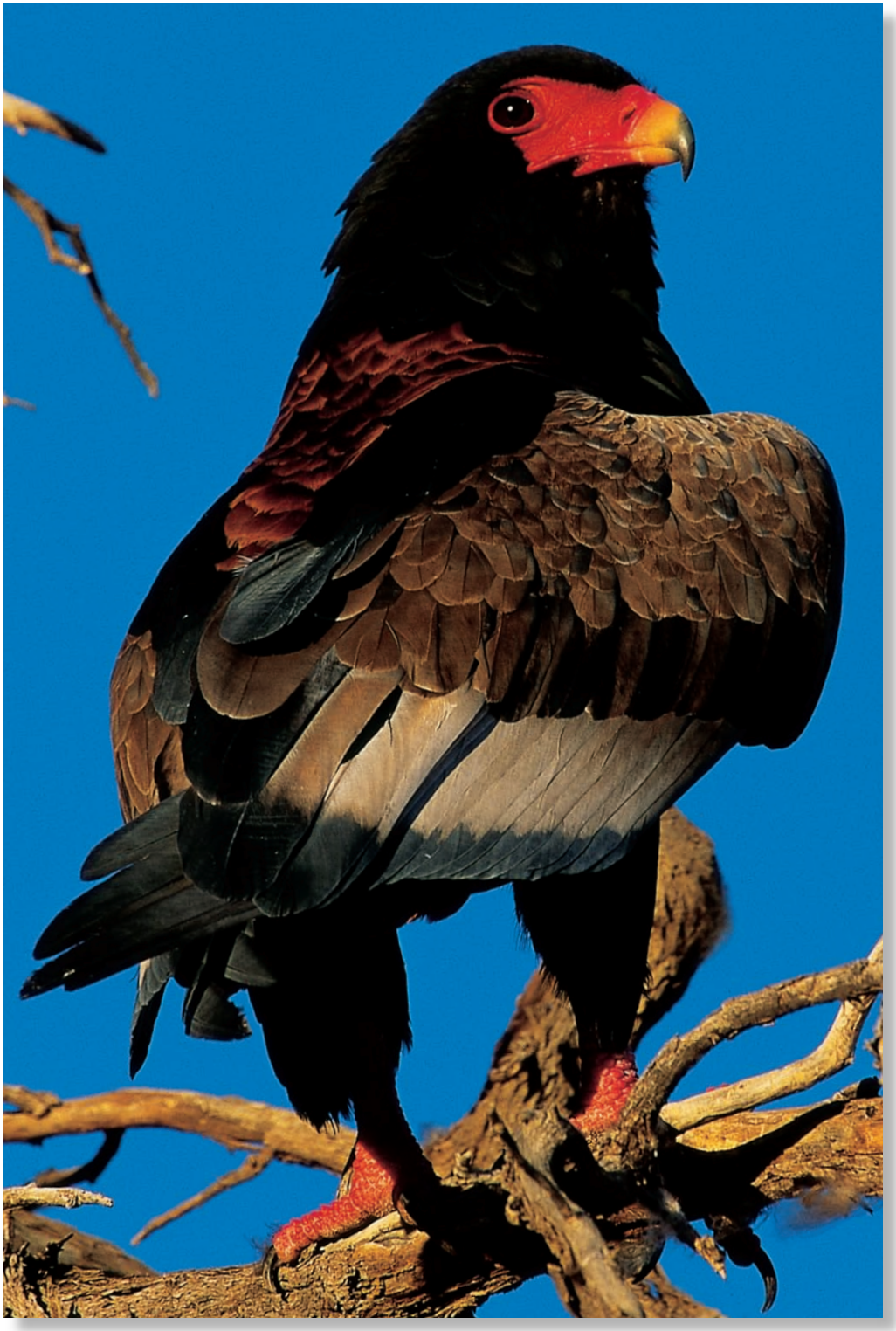
● **All 74 swallow and martin species, including the purple martin** (below), **feed on flying insects. They are in most regions, except the poles and remote islands. They're unrelated to the similar-looking swifts, from a separate order, *Apodiformes*.**

Bateleur

• ORDER •
Falconiformes

• FAMILY •
Accipitridae

• GENUS & SPECIES •
Terathopius ecaudatus



KEY FEATURES

- Extremely large wingspan and a short tail give this eagle a unique flying style: it turns by banking like an aircraft, rather than using its tail as a steering rudder
- Hunts on the wing, soaring above the ground before spiraling down to strike its prey
- Indulges in dramatic courtship flights — the male makes spectacular 360° rolls in midair

WHERE IN THE WORLD?

Found across much of Africa south of the Sahara Desert, but absent from Republic of South Africa, parts of Somalia and the forested regions around the equator

LIFECYCLE

Whether hurtling down upon a live victim, descending to feed on carrion, or ambushing other scavengers and stealing their kill, the bateleur is a master opportunist.

HABITAT

The bateleur occurs in woodland and savannah dotted with trees that provide perches and nesting sites. It occasionally ranges into semi-desert thornbush and open grassland. In West Africa it migrates to the fringes of the Sahara during the rainy season. It usually avoids dense forest regions and mountains, but the bateleur has nested at more than 13,200' in Ethiopia.

▼ **LIFE ON THE ROAD**
The adaptable bateleur occupies a huge range.

DID YOU KNOW?

- **Bateleur is a French word meaning "circus performer." It refers to the eagle's acrobatic displays and habit of rocking, like a tightrope walker, inflight.**
- **During its courtship flight, the beating wings of the bateleur produce a loud *whup-whup* sound.**
- **The bateleur has scavenged corpses of war victims; some tribes believe that the eagle carries away their spirits.**

CONSERVATION

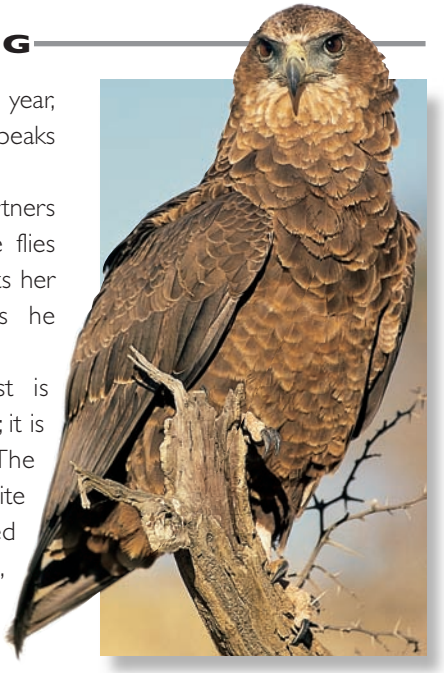
In East Africa and in the larger nature reserves of West and southern Africa, the bateleur is common, but elsewhere its numbers are declining, especially in Sudan. Intolerant of humans when rearing its young, the bateleur often deserts its nest if it feels threatened. It is also seen as a threat to livestock, and has been poisoned by farmers. Collection from the wild for zoos and aviaries is now restricted by international law.

BREEDING

The bateleur breeds all year, but in East Africa, mating peaks in February and March.

During courtship, partners dive and roll; the female flies upside down and presents her talons to the male as he swoops past.

The cup-shaped nest is built in a large, shady tree; it is repaired each year. The female lays a single white egg, occasionally dotted with a few red speckles, and takes on most of the eight-week incubation — the longest of any African eagle species. Both parents rear the chick, and a juvenile reared the previous season often brings food for its sibling.



▲ **FINISHING SCHOOL**
After fledging, the juvenile depends on its parents for four months.

BEHAVIOR

The long wings and short tail of the bateleur are an adaptation for soaring and gliding. Lacking an effective rudder, the bateleur turns by banking from side to side. It stays aloft for most of the day, soaring in circles on thermals (warm, rising air currents) with its wingtips splayed to reduce air turbulence. Between thermals the eagle glides fast and straight with its wingtips swept back. Adults usually remain in large territories, but nomadic juveniles wander more widely, often covering 180 miles or more a day.

CHILDHOOD LESSONS

1 Pounce...
Watched by its offspring, a parent pounces on a snake, talons extended to strike.

2 Snatch...
The juvenile takes the struggling reptile from its parent; it learns by practice how to kill prey adeptly.

3 Preen...
The adult demonstrates how to keep its feathers in good condition with regular washing and preening.

4 Splash
While the adult dries its wings, the juvenile tries to wash; it will improve with practice.

FOOD & HUNTING

The opportunistic bateleur attacks anything from grasshoppers to small species of antelope. Groups of up to 50 juveniles gather to feast on winged termites emerging from their nests, and adults hunt birds as big as guineafowl. This eagle also takes carrion and even snatches carcasses from vultures and other scavengers in bold, piratical attacks.

Small mammals are probably the bateleur's favorite prey, which it hunts on the wing from a height of 160' or so. Gliding back and forth, it watches for any movement that could betray a grass rat, a dik-dik or a gazelle fawn. On spotting a victim, it corkscrews down in a spiral, slamming into its target with its talons. It then tears the carcass with its sharp and powerful bill.

▶ **EXPANDING TASTE**
The bateleur has a more broad-ranging diet than its snake eagle relatives.

PROFILE BATELEUR

With a powerful and murderously hooked bill shaped for hacking into its victims, the bateleur makes quick work of prey — whether dead or alive.

BILL

With its heavily hooked upper mandible, the bill is ideal for plucking feathers and stripping flesh.

FLIGHT

In flight, with feet protruding beyond a "sawed-off" tail, the long-winged bateleur won't be confused with any other African eagle.

EYES

With its exceptional vision, the bateleur can pinpoint a mouse in grass from more than 160' above ground.

PLUMAGE

A chestnut back contrasts with a black body; the wings are gray-tan. The female has white flashes on her wing uppersides. Juveniles are brown, with blue-green facial skin and legs.

TALONS

Short, sharp and extremely powerful talons exert enough grip to squeeze the life out of a newborn antelope.

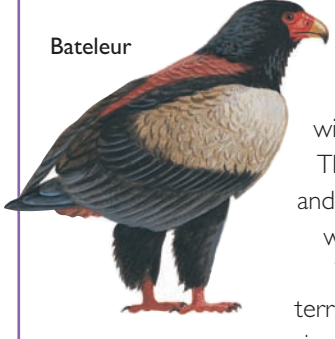
WINGS

Long, deep wings enable the bird to glide huge distances at speeds of up to 50 mph.

VITAL STATISTICS

WEIGHT	4.5–6.5 lbs.
LENGTH	32–34"
WINGSPAN	5.5–6'
SEXUAL MATURITY	5–6 years
BREEDING SEASON	Year-round
NUMBER OF EGGS	1
INCUBATION PERIOD	52–59 days
FLEDGING PERIOD	93–194 days
BREEDING INTERVAL	1–2 years
TYPICAL DIET	Mammals, birds, fish, reptiles, insects and crabs; carrion
LIFESPAN	30 years

CREATURE COMPARISONS



Verreaux's eagle (*Aquila verreauxi*) shares parts of the bateleur's range in East Africa. It is the largest eagle in Europe, Africa and Asia, with a wingspan of up to 8' and a weight of up to 13 lbs. The bateleur and Verreaux's eagle are superb fliers, and both hunt mammals. But where the bateleur favors wooded savannah and feeds on a wide range of prey, Verreaux's eagle generally prefers more arid, rocky terrain, and specializes in preying on hyraxes — rabbit-sized animals that live on cliffs and rocky outcrops in sub-Saharan Africa.

RELATED SPECIES

- **The bateleur is placed in the subfamily *Circaetinae*; it contains powerful raptors with short, strong talons. The 14 species include the short-toed eagle of southern Europe, India and North Africa, and the crested serpent-eagle of India, China and Southeast Asia. They are part of the family *Accipitridae*, which also includes kites, harriers and Old World vultures.**

Bee Hummingbird

• ORDER •
Apodiformes

• FAMILY •
Trochilidae

• GENUS & SPECIES •
Mellisuga helenae

KEY FEATURES

- The smallest known bird in the world, smaller even than some day-flying moth species
- Beats its wings 50–80 times a second to maneuver in midair
- Hovers in front of flowers to sip nectar from their petals
- Male is territorial and defends a good source of nectar from other hummingbirds

WHERE IN THE WORLD?

Confined to Cuba's main island and the Island of Pines in the Caribbean; found mainly in parks, gardens and open woodland, wherever its favored food source (nectar-rich flowers) is most abundant

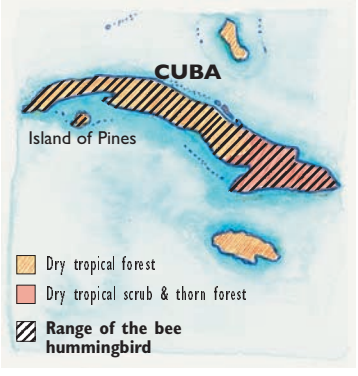
LIFECYCLE

The bee hummingbird is the world's smallest bird. To feed, it spends its time buzzing from flower to flower and sipping the sugary nectar that provides its energy.

HABITAT

In its Caribbean island habitat, the bee hummingbird is usually seen around small flowers, since its tiny beak can't reach the nectar of larger flowers.

The hummingbird is solitary; the male in particular stakes out a territory with a good source of nectar and busily patrols it, chasing intruding hummingbirds away. Favorite perches include the highest treetops and telephone wires.



▲ **ISLAND LIFE**
The bee hummingbird is native to two Cuban islands.

FOOD & FEEDING

The bee hummingbird feeds on nectar, a vital food for a bird that uses energy so rapidly.

The hummingbird reaches nectar by hovering in front of a flower. Completely still except for its whirring wings, it reaches inside petals to take nectar on its long, brush-tipped tongue.

Favorite plants include coral plant and scarlet bush. A bloom-laden shrub may attract a group of hummingbirds, although typically each bird visits plants in rotation, giving each plant time to replenish its nectar. The hummingbird may also eat small insects and spiders.

As the hummingbird drinks from a flower, its head is dusted with pollen, which it carries to other flowers as it feeds. In doing so, it fertilizes the flowers and helps the plants colonize its habitat.

BREEDING

The male hummingbird sings a song of high-pitched squeaks and twitters to attract a mate, a song he learns as he matures by listening to other males. Several males may compete for one female, with much chasing and excited twittering. After mating, however, the male fulfills no further parental duties.

Using plant fiber and lichens, the female weaves a cup-shaped nest the size of half a walnut shell and binds it to a branch with spiders' webs. She lays two white eggs 0.3" long and 0.009 oz.

The female feeds her tiny nestlings by regurgitating nectar into their throats. Young hummingbirds grow slowly and take more than 18 days to fledge; poor weather or food scarcity can delay their progress even further.

▼ **HOVERCRAFT**
Figure-eight wingbeats allow the hummingbird to maneuver with precision.

▶ **NUT-SIZED NURSERY**
The nest measures less than 1" across its rim.

▲ **SUGARY DRINK**
A hummingbird takes nectar from "flame of the woods," a favored plant.

DID YOU KNOW?

- **The genus name, *Mellisuga*, means "honey-sucker." Its species name, *Helenae*, honors Helena Booth, the benefactress of Juan Gundlach, who first identified the bird.**
- **The hummingbird makes up for its tiny size in sheer bravado. Researchers in Cuba were dive-bombed by a furious male when they "trespassed" on his territory.**

CONSERVATION

There are about 100,000 bee hummingbirds, all in a small area on Cuba and the Island of Pines. This limited range makes it vulnerable to freak weather (hurricanes), which can wreak havoc on island plants. However, as long as it has access to suitable flowers and nesting trees, the hummingbird is assured a future. It adapts readily to living in parks and gardens, so human influence may even be beneficial.

BEHAVIOR

The hummingbird flies with masterly control, but such maneuverability has its cost, as the energy required rapidly exhausts the bird. To fuel its high body temperature and energy consumption, it feeds almost ceaselessly by day.

In the cool of the night, the hummingbird stops feeding. Because the bird is too small to stay warm while it remains inactive, it falls into a torpor — its body temperature and heart rate fall, reducing its energy needs.

SMALL BUT FEARLESS

1 Sip...
Hovering in front of a flower in its personal feeding territory, a male extends its beak into the bloom to sip nectar.

2 Move on...
The bird flits to other flowers, drinking sparingly from each so as not to drain them. Then another bird draws close to feed…

3 Repel...
…but the resident male isn't in the mood for sharing his nectar resources. Angrily, he stabs at the intruder with his sharp beak.

4 Success
The visitor gives up and beats a hasty retreat to try his luck elsewhere, leaving the victorious resident to continue feeding.

PROFILE BEE HUMMINGBIRD

While hovering to feed, this tiny living jewel beats its wings so rapidly that they disappear in a blur and produce an insectlike hum.

BILL
The hummingbird uses its thin, 0.4"-long bill and brush-tipped tongue to reach deep into flowers and sip nectar.

HEAD
The male's head is adorned with long throat plumes and iridescent neck feathers that sparkle bright red in sunlight.

FEMALE
The female doesn't have the male's iridescent colors; she needs to be inconspicuous on the nest.

LEGS AND FEET
Legs are short and the feet are small. Large feet and claws are unnecessary for a bird that spends so much time on the wing.

WINGS
The tiny size and rapid action of the wings lets the bird control its position with remarkable precision while hovering.

VITAL STATISTICS

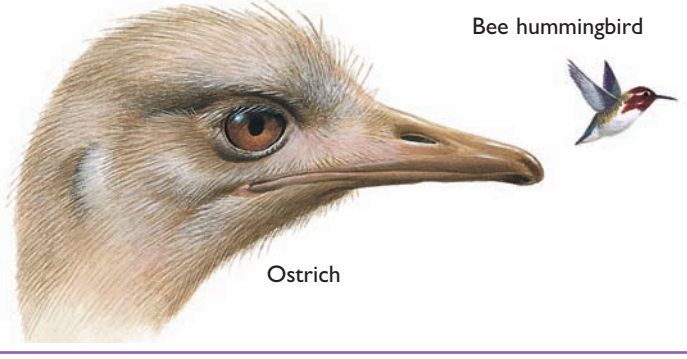
WEIGHT	0.07 oz.
LENGTH	2.4"
WINGSPAN	About 4"
SEXUAL MATURITY	1 year
MATING SEASON	May nest year-round; linked to availability of nectar
NUMBER OF EGGS	2
INCUBATION PERIOD	14–19 days
FLEDGING PERIOD	18 days or more, depending on weather
BREEDING INTERVAL	Unknown
TYPICAL DIET	Nectar and a few small insects
LIFESPAN	Unknown

RELATED SPECIES

- There are more than 330 hummingbird species in the family ***Trochilidae***, all in the Americas. Most species live in warm tropical areas, but the family as a whole ranges from Alaska to Tierra del Fuego. The bee hummingbird's closest relative is the vervain hummingbird of Jamaica and Hispaniola. This bird is 0.2" longer than the bee hummingbird and its plumage is less colorful.

CREATURE COMPARISONS

The world's smallest bird, the bee hummingbird is no larger than the eye of the flightless ostrich (the largest bird, about 8' tall). An ostrich weighs about 50,000 times more than the hummingbird; its egg is 3,000 times heavier. The heaviest flying birds (bustards and swans) weigh about 8,000 times more than the bee hummingbird.



Belted Kingfisher

• ORDER •
Coraciiformes

• FAMILY •
Alcedinidae

• GENUS & SPECIES •
Megaceryle alcyon

KEY FEATURES

- Most prevalent kingfisher in North America
- Hovers and plunges headfirst into the water to snatch a fish
- Makes a loud, rattling call as it flies
- The female lays her eggs at the end of a long tunnel near the water

WHERE IN THE WORLD?

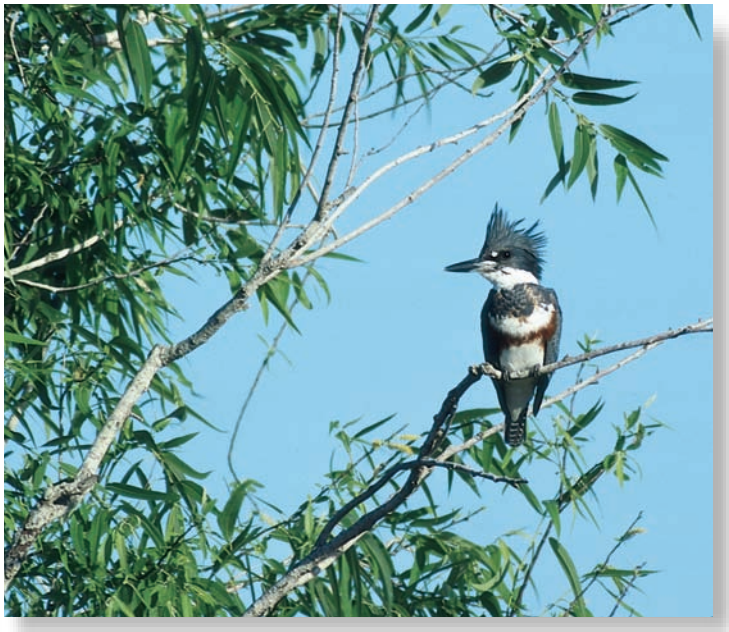
Found in Alaska, Canada and throughout the entire U.S.; also Mexico, the West Indies, Panama and Central America

LIFECYCLE

Sometimes called the lazy bird, the belted kingfisher can be spotted perched on pier posts or hovering above the water before making its lightning-fast attack on prey.

HABITAT

The kingfisher lives near water, whether along the sea coast, creeks, ponds, lakes or mountain streams; it prefers clear waters with overhanging trees or other perches. It also can be found in mangroves, tidal creeks, swamps and garden ponds in elevations from sea level to 10,000' in the Rocky Mountains. Though it winters over most of its breeding range in the U.S. and southern Canada, the kingfisher is an occasional migrant to Central America and the West Indies.



▼ **FLORIDA RESIDENT**
A female perches high above her Everglades home.

FOOD & HUNTING

The belted kingfisher hunts from a perch when the water surface is calm. The bird eats mainly small fish, either by diving from its perch and seizing the fish with its powerful bill or by hovering about 20' above the water and making a straight or spiral dive. From the air, the bird swoops close to the water's surface and dips down to catch a meal, closing its eyes at the last instant. Most aquatic prey is caught about 2' below the water's surface; the bird spreads its wings underwater to break the dive. No matter which method the kingfisher chooses, it takes the captured fish back to its perch, beats it against a hard object, such as post or branch, and then tosses it into the air, swallowing the morsel head first. The belted kingfisher also eats insects, crayfish, clams, oysters, frogs, small snakes, mussels, turtles, grasshoppers, moths, beetles, young birds, mice, berries and bullfrog tadpoles. While fish are swallowed whole, invertebrates are often torn into pieces after being beaten against a hard surface.

DID YOU KNOW?

- **When pursuing prey, flight speeds of the belted kingfisher range from 36–45 mph, depending on wind factors.**
- **The belted kingfisher disgorges pellets of fish bones, scales and other indigestible parts of food.**

BEAT AND EAT

1 Hover...
The belted kingfisher hovers above a stream, scanning the water's surface for prey.

2 Plunge...
Spotting a crayfish, the kingfisher plunges headfirst into the water with its bill and eyes closed.

3 Beat...
The bird brings the captured crayfish to its perch and thrashes it against the tree branch.

4 Eat
The kingfisher dismembers the crayfish with its sharp bill before eating it, ignoring the fallen claw.

BEHAVIOR

The territorial kingfisher will perch regularly on dead branches over water or on piers — perfect vantage points for watching prey. At night, the belted kingfisher often can be spotted roosting on dead tree limbs. Its loud, rattling call can be heard as the bird flies from its perch in search of food. Not afraid of humans, the bird is always on the lookout for its predators, mainly birds of prey. Sometimes the kingfisher dives below the water's surface to escape the attacks of a peregrine falcon or Cooper's hawk. The bird is solitary except during the nesting season.

DELICATE BALANCE
A male approaches his tunnel nest with food.

BREEDING

The male belted kingfisher marks the start of the breeding season in the spring with noisy chasing flights within its territory. The male will feed the female as part of the courtship ritual. Pairs, which mate for life, emit high-pitched squeaks during courtship flights.

Nest-building is elaborate and time-consuming. Both sexes dig a nesting tunnel 4–8' long in the steep section of a river bank, at the end of which they make a nesting chamber. Depending on the soil type, the nest can take from three days to three weeks to dig. The nesting chamber at the end of the burrow is often lined with clean white fish bones. Some belted kingfishers have also been known to nest in the tops of hollow stumps or in tree cavities. The female lays 5–8 white eggs, which are then incubated by both parents for about 23 days. The eggs hatch at daily intervals; thus, the chicks vary greatly in size. Both parents feed the young small fish, which they carefully deposit into the hungry mouths. Each chick eats up to 15 small fish a day, which keeps the parents extremely busy. The chicks are ready to leave the nest in about 30–35 days.

CONSERVATION

The belted kingfisher populations remain strong, and the bird is not currently threatened. The kingfisher's widespread range heavily contributes to its success, unlike some other species of kingfisher with more limited confines on isolated islands.

DINNER TIME
Hungry juveniles line up inside their tunnel nest, waiting for their parents.

PROFILE BELTED KINGFISHER

The large blue-gray head and conspicuous crest of the belted kingfisher contrast with its small body, short tail and tiny feet.

BILL

The bill is stout and sharp for spearing fish and also for carrying the prey back to its perch. In this fish-eating species, the bill is flattened from side to side.

FEMALE

Both sexes are blue-gray above, with a white collar, and sport a gray breast band and ragged crest, but the more colorful female also has a chestnut band across the belly and down-covered flanks.

FEET

The feet are weak and fleshy, with the second and third toes partly joined, a feature which facilitates movement underwater when the bird dives for prey.

IN FLIGHT

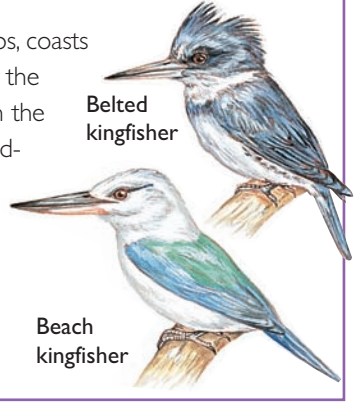
When diving for fish, the kingfisher plunges with powerful wingbeats at a 45° angle, making last-minute adjustments to its aim by fanning its tail feathers.

VITAL STATISTICS

WEIGHT	4–6 oz.
LENGTH	11–14"
SEXUAL MATURITY	1 year
BREEDING SEASON	April–July
NUMBER OF EGGS	5–8
INCUBATION PERIOD	23 days
FLEDGING PERIOD	30–35 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Fish, frogs, crabs, crayfish, lizards, snakes, insects, birds and mice
LIFESPAN	Unknown

CREATURE COMPARISONS

The beach kingfisher (*Halcyon saurophaga*) is found in mangrove swamps, coasts and offshore islands from Indonesia and northern New Guinea around the Bismarck Sea and the Solomons, far from its cousin. Slightly smaller than the belted kingfisher, the more colorful beach kingfisher has a large black-and-white bill, a white head and underparts and a bright blue and green coloring. Its crown varies from white to blue. The diets of both birds are similar; both favor fish, crabs, insects and lizards. Both species dive and plunge for fish, and both are noisy, solitary birds that sometimes travel and feed in pairs. The beach kingfisher nests in a tree hole, while the belted kingfisher prefers a tunnel.



RELATED SPECIES

- **The belted kingfisher is 1 of over 85 species of kingfisher in the family *Alcedinidae* and 1 of 4 species in the genus *Megaceryle*, which includes the giant kingfisher, *M. maxima*. The belted kingfisher is one of the most widespread and well known of the kingfishers that hunt fish. Other kingfishers, including the sacred kingfisher, *Halcyon sancta*, prefer hunting insects.**

Black-billed Magpie

• ORDER •
Passeriformes

• FAMILY •
Corvidae

• GENUS & SPECIES •
Pica pica

KEY FEATURES

- Notorious as a thief of shiny objects and a raider of other birds' nests; the subject of more superstitions than any other bird
- Unmistakable black and white plumage makes it one of the easiest birds to identify
- An intelligent opportunist that has extended its range into the modern urban and suburban environment

WHERE IN THE WORLD?

Occupies an enormous range from Europe and northwest Africa, across central Asia, into northeastern Asia; also along the west coast of North America, from Alaska to California, into the Midwest

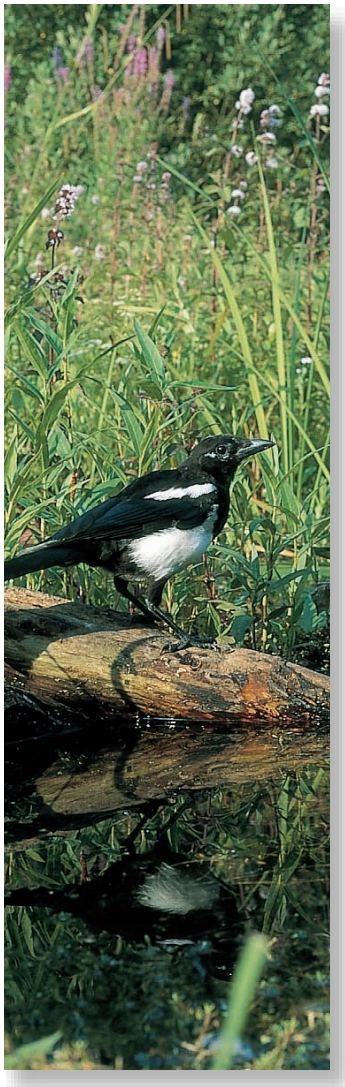
LIFECYCLE

Widely reviled as a killer — although it takes far fewer birds than hawks — and feared by others as unlucky, the clever and resourceful magpie still holds a fascination for us.

HABITAT

Once a bird of light woodland and field edges, the magpie avoids both dense woodlands and wholly treeless areas.

Urban parks and gardens, with trees, shrubs and open patches of grass, are ideal habitats for the magpie, which has been swift to exploit these new opportunities. Its bold, inquisitive nature and ability to take advantage of a wide range of foods have enabled it to thrive in the suburbs, despite its widespread unpopularity.



▲ **PARK LIFE**
Magpie colonies occur in parks, even in large cities.

CONSERVATION

The magpie has long been persecuted by gamekeepers, who see it as a threat to the nests of gamebirds such as the pheasant. On ranchlands in the west, the birds will feed on dead cattle and sheep. This has proved lethal when the carcass has been poisoned to kill marauding coyotes. The magpies ate the poisoned meat and whole families of birds were lost. However, it is an adaptable species and continues to be numerous.

FOOD & FEEDING

▲ **DEAD, EASY MEAL**
Like members of the crow family, the magpie takes advantage of carrion.

The magpie is notorious as a raider of other birds' nests and can occasionally be seen taking juveniles or even the adults of small species from the air. It is known to track down nest sites by watching target birds, such as the thrush. But this potentially rich food source is available only part of the year, and makes up less than 1% of the magpie's diet.

For most of the year, the magpie eats invertebrates, which it uncovers by scratching among leaf litter or in loose soil. It also regularly feeds on seeds, fruits and carrion. As this clever and resourceful species has made its way into the suburban landscape, it has learned to find many new sources of food, from overturned refuse bins to doorstep milk bottles.

BEHAVIOR

Although usually seen singly or in pairs, the magpie has a complex set of social relationships. A pair occupies a territory during the breeding season, which it defends from other pairs. If the territory is particularly rich, the pair remains all year 'round, but otherwise joins temporary winter flocks that roost communally during the coldest months. Young males without a mate may form flocks at any time of the year.

In early spring, the magpie may exhibit a form of communal behavior that has puzzled ornithologists for years. Flocks of up to 200 birds gather and, amid much excited chattering, make extravagant displays of flying skills, preening and posturing to one another. This behavior has been described as the "magpie parliament" or "crow marriage" and was thought to be an arena in which individuals chose mates. But studies have shown that many birds attending are already paired. Another theory is that the event is part of a process that establishes a hierarchy among the local population. This hierarchy may decide which pairs get the best territories.

BREEDING

DID YOU KNOW?

- **The magpie's name comes from the name Maggie, a traditional nickname for a chattering woman, and "pied," referring to the bold plumage pattern.**
- **The magpie's thieving habits are notorious worldwide; the Kashmir subspecies is known as dudz, meaning thief.**
- **In many cultures, there is a superstition that anybody encountering a magpie must make a sign to ward off the bad luck the bird brings. In Norway, however, the bird is seen as a good omen.**

Mating pairs of magpies form when roosting flocks gather during winter. Pairs generally remain together for life. Establishing a territory early in the spring, each pair builds a nest before mid-April — the peak laying period.

The magpie's nest is a large, untidy, robust structure often built high up in a tree. Thorn trees are the preferred site since they offer some defense from predators, but, failing this, the magpie often incorporates thorny branches into a protective domed roof. Inside the nest, a basin of hardened mud lined with feathers, grass or other soft material holds the eggs.

▲ **SUMMER HOUSE**
A mating pair often returns yearly to a favored nest.

▶ **SUN WORSHIPPER**
The magpie, like other birds, sun-bathes, using the natural warmth to help "iron out" kinks in its feathers.

FAMILY WAY

1 Preparing...
The male and female magpie cooperate in constructing a nest. The male collects material and brings it to the female.

2 Expecting...
The female constructs the large, domed structure and, when it is finished and lined with mud and grass, she lays her clutch of eggs.

3 Feeding...
Once the nestlings hatch, both parents feed the brood for 3–4 weeks in the nest and for another 6–8 weeks afterward.

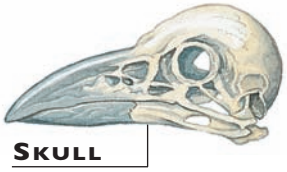
4 Fly the nest
Some families stay together in their territory until the start of winter, but the juveniles have to gather food for themselves.

PROFILE BLACK-BILLED MAGPIE

The magpie's short wings and long, fanning tail are adaptations to a habitat very different to the one it has colonized in recent years.

PLUMAGE

The black-and-white plumage pattern is eye-catching out in the open but effectively breaks up the bird's outline among bare branches. Like other members of its family, the magpie's black feathers are lustrous and glimmer with a blue, purple or green sheen.

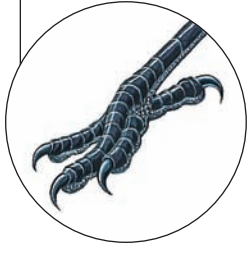


SKULL

The brain-case is relatively large for a bird, suggesting a high level of intelligence. A large, strong, general-purpose bill enables the magpie to eat a range of foods.

FEET

Like its cousin the crow, the magpie grips its food in its foot when eating. Its strong legs enable it to make hops of more than 20".



TAIL

Although not a strong flier, the magpie is remarkably agile in the air thanks to its long, diamond-shaped tail, which acts as a rudder. Like the short wings, the tail is an adaptation to flying in a wooded habitat full of obstacles and tight spaces. The length of the tail may also dictate social rank.

VITAL STATISTICS

WEIGHT	6.5–9.5 oz.
LENGTH	16–18.5" including tail
WINGSPAN	21–24"
BREEDING SEASON	Mid-March
NUMBER OF EGGS	5–8
INCUBATION PERIOD	17–18 days
FLEDGING PERIOD	22–27 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Invertebrates, seeds, fruit, carrion
LIFESPAN	10 years

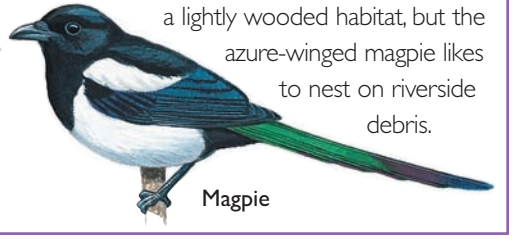
RELATED SPECIES

● There are 12 other species in the genus ***Pica***, including the North American yellow-billed magpie, ***P. nuttalli*** (below), found only in California. They are among 115 species in the family ***Corvidae***, which includes the crow, jay and raven.

CREATURE COMPARISONS

The azure-winged magpie (*Cyanopica cyana*), about a third smaller than the black-billed magpie, is a very handsome bird with a black cap, white throat and sky-blue wings. Found in small, isolated populations across southern Eurasia from Spain to Mongolia and Japan, the azure-winged magpie may have once occupied a continuous range across this entire region. The azure-winged magpie relies more on the flock than does its relative, banding together for the whole year and defending a communal territory. Both species favor a lightly wooded habitat, but the azure-winged magpie likes to nest on riverside debris.

Azure-winged magpie



Magpie

Black-browed Albatross

• ORDER •
Procellariiformes

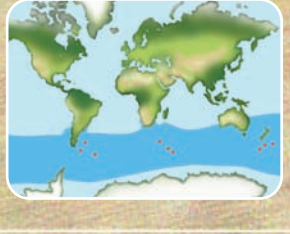
• FAMILY •
Diomedeidae

• GENUS & SPECIES •
Diomedea melanophris

KEY FEATURES

- One of the largest flying seabirds, the black-browed albatross conserves energy by gliding with locked wings
- Lays one egg, much like its penguin relatives; chick has an exceptionally long period of flightless dependence

WHERE IN THE WORLD?



Widespread in the sub-Antarctic; breeds on Cape Horn, Staten Islands, Kerguelen, Heard, South Georgia and Campbell Islands and the Falklands

LIFECYCLE

Although it is a seabird, the black-browed albatross spends more time above the sea than in the frosty waters, descending only to feed and rest during its long migrations.

HABITAT

▲ **SUNNY ISLANDS**
Albatross nest in colonies on sub-Antarctic islands.

Spending little time on land or in the icy water, the black-browed albatross soars majestically above the Southern Hemisphere oceans and off the coasts of Australia, South America and Antarctica. Wave crests force wind upward, and the albatross remains in flight for hours on end, riding these air currents.

As Antarctic ice begins to break up during longer summer days, the black-browed albatross flies farther south. The warmer water contains millions of tiny shrimp, called krill, a staple of an albatross's diet.

Highly migratory, the albatross flies up to 8,000 miles between mating seasons, seeking relatively moderate climates for breeding. It returns to the same nesting site each year, often sharing islands with penguins and gray-headed albatrosses.

CONSERVATION

Longline fishing is currently a major threat to the future of the albatross. Longlines, stretching for several miles, are designed to catch bluefin tuna, but instead they attract at least a dozen species of albatross that go after the squidlike bait while feeding during their long migratory travels. It is estimated that every 12 minutes an albatross is snagged in the hooks and drowned. Approximately one million hooks are set yearly in the Southern Hemisphere.

FOOD & HUNTING

The black-browed albatross is an opportunistic hunter, roaming the seas for days at a time and seizing its prey from the water's surface. By night it feeds on surface-skimming squid and cuttlefish. During the day, the albatross hunts for fish and its favorite snack: krill, a shrimplike crustacean that swims in schools. It also feeds on the carcasses of dead seals and whales, and glides alongside ships and fishing boats in search of refuse. On occasion it dives underwater for its food. The black-browed albatross tops its meal off with a drink of seawater. Paired salt glands behind the nostrils rid the black-browed albatross of excess salt; ducts from the glands then carry the concentrated saline solution to the nostrils. When the albatross "blows its nose" to expel the liquid, the tube-shaped nostrils project the solution away from the bird's face, preventing it from hitting the albatross's eyes.

AQUATIC OPPORTUNIST

1 Floating...
With wings partially open for balance, the black-browed albatross picks at the carcass of a king penguin.

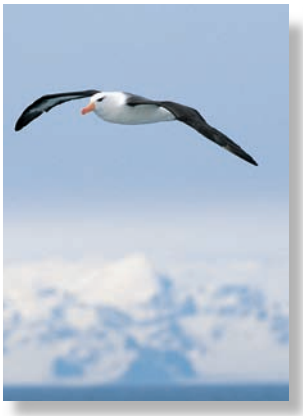
2 Diving...
Although the albatross prefers to feed near the surface, it may also plunge into the water after squid, a staple of its diet.

BREEDING

The black-browed albatross returns to land only to breed and constructs a nest on barren islands near the shore. Made of mud, the nest is a shallow cup on top of a small pedestal of soil and vegetation. Pairs bow their heads and rattle their beaks during mating rituals; they stay together for years and return to the same nest site year after year. Adults share incubation of the single white egg. Covered with brownish down, the hatched nestling matures slowly for four months. To feed their chick, they regurgitate small, partially digested amounts that are easier for the nestling to accept. After fledging, the juvenile leaves the colony. It reappears at the nesting site three years later, but will not breed until 5–10 years of age.

BEHAVIOR

The black-browed albatross is an avian nomad. A massive bird, this expert glider spends months wandering tremendous distances, sometimes thousands of miles, over the oceans. The albatross sleeps while floating in the water. After resting it takes flight with the wind, racing across the ocean's surface until it's clear of the waves. It climbs upward 60° before curving downward, then zigzagging skyward, repeating this pattern for miles without a single wingbeat.



▲ **ANTARCTIC NOMAD**
An albatross wanders great distances for months.

3 Gulping...
After swallowing the squid, the digestive process begins, so that back at the nest, the albatross can regurgitate for its hungry chick.

4 Stealing
A known pirate, the black-browed albatross routinely snatches fish from the beaks of other birds, including shags.

▲ **SAME TIME, NEXT YEAR**
Stable pairs return to the same nest site each year.

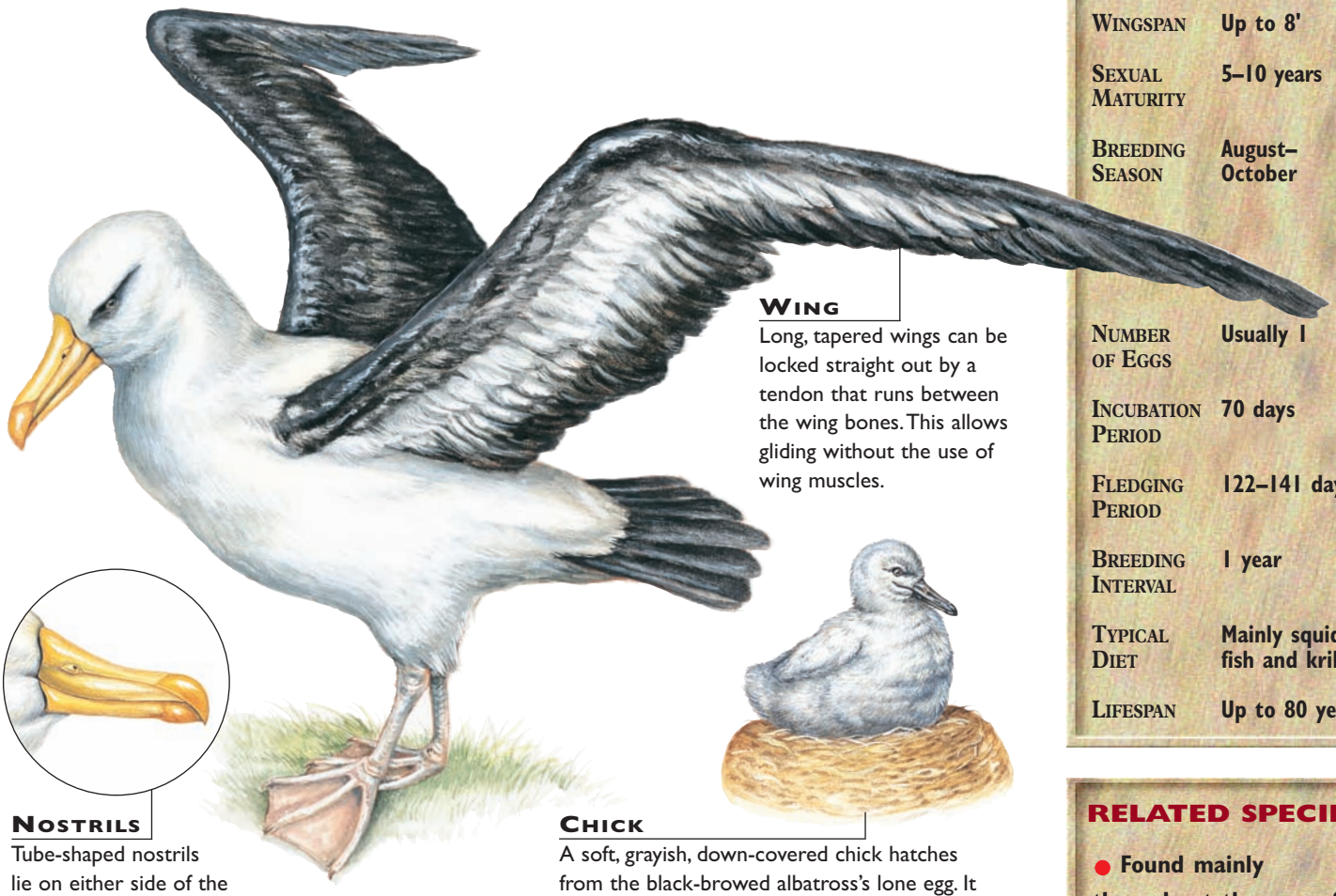
DID YOU KNOW?

- **The albatross often has great difficulty taking off and looks quite awkward, hence the nicknames "gooney" and "mollymawk," Dutch for "foolish gull."**
- **Superstitious sailors believe killing an albatross brings bad luck; captured birds are usually released.**

▼ **BEAK TO BEAK**
A chick, almost ready to fledge and begin its long aerial journeys, receives food from one of its parents.

PROFILE BLACK-BROWED ALBATROSS

The black-browed albatross glides around the Antarctic world with wings designed to take full advantage of air and eddy currents.



WING

Long, tapered wings can be locked straight out by a tendon that runs between the wing bones. This allows gliding without the use of wing muscles.

NOSTRILS

Tube-shaped nostrils lie on either side of the bill's base. Salt glands, located internally behind the nostrils, remove excess salt from the seawater that the albatross drinks.

CHICK

A soft, grayish, down-covered chick hatches from the black-browed albatross's lone egg. It wanders along the beach with its parents within days after birth, but doesn't fly until it is 4 months old.

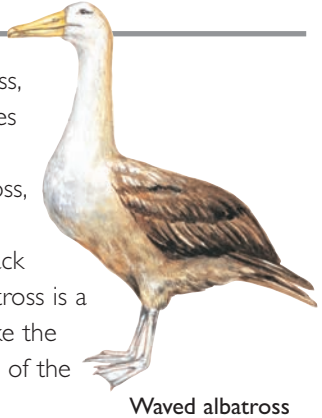
VITAL STATISTICS

WEIGHT	Up to 11 lbs.
LENGTH	Up to 3'
WINGSPAN	Up to 8'
SEXUAL MATURITY	5–10 years
BREEDING SEASON	August–October
NUMBER OF EGGS	Usually 1
INCUBATION PERIOD	70 days
FLEDGING PERIOD	122–141 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Mainly squid, fish and krill
LIFESPAN	Up to 80 years

CREATURE COMPARISONS

Black-browed albatross

A close relative of the black-browed albatross, the waved albatross *(D. irrorata)* measures almost 3' long and is comparable in size but differs in color. The black-browed albatross, mainly white, has extensive black coloration on the underwings, combined with a long, black teardrop stripe through the eye. The waved albatross is a brownish bird with a white head and neck. Unlike the black-browed, the waved albatross lives north of the equator on the Galapagos Islands.



Waved albatross

RELATED SPECIES

- **Found mainly throughout the seas of the Southern Hemisphere, there are 14 species of albatross, the largest flying seabirds, in the genus *Diomedea*. The biggest is the wandering albatross, *D. exulans*, with a wingspan of more than 11.5'. The waved albatross, *D. irrorata*, is found only on Hood Island in the Galapagos. All species of albatross lay only one egg.**

Black-capped Chickadee

• ORDER •
Passeriformes

• FAMILY •
Paridae

• GENUS & SPECIES •
Parus atricapillus

KEY FEATURES

- Has an extensive vocal range, which includes at least 15 calls and songs
- Diverts and evades predators by "throwing its voice" as it calls
- Families continue to forage together even after chicks have fledged

WHERE IN THE WORLD?

Found across most of the United States and part of Canada from central Alaska to Newfoundland, south to North Carolina

LIFECYCLE

With its complex range of calls, the black-capped chickadee is able to communicate a wide range of messages, from warnings to mating songs.

HABITAT

The black-capped chickadee favors edges of deciduous, mixed and coniferous forests, gardens and parks. Depending on the species, the bird can be found at high and low elevations. It occurs in the spruce fir forests in the Adirondacks in New York and pinyon-juniper forests in Colorado. Other favorite habitats include riverine willows, cottonwoods, alders, well-wooded farmland and cemeteries. In the winter and during migrations, the bird may be found in a wider variety of bushy habitats, including urban areas and among conifers. Due to fear, it usually avoids crossing open bodies of water when it migrates. Some mountain populations of the bird will change elevations depending on food availability and the weather. The chickadee is also found at higher elevations in the Appalachians, the Great Smoky Mountains and the Rocky Mountains.

▲ **BRAVING THE COLD**
The chickadee remains in some areas year 'round.

DID YOU KNOW?

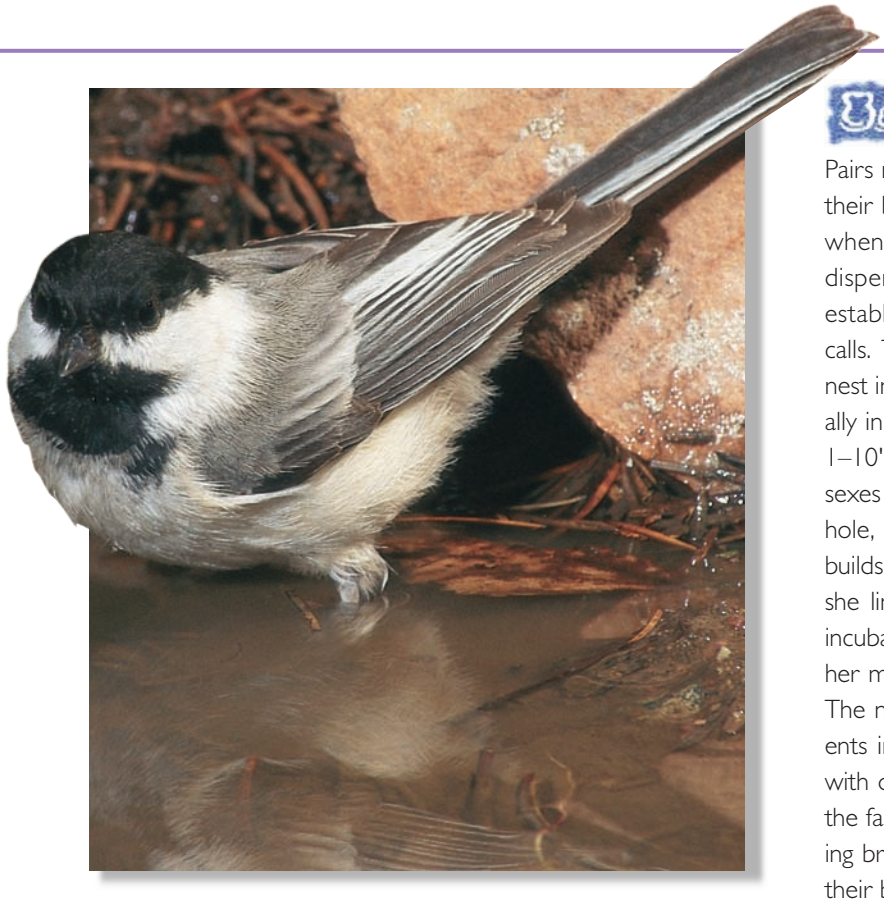
- **The black-capped chickadee is able to retrieve stored food items up to one month after hiding the food.**
- **Chickadees are able to fly even after lowering their body temperature.**
- **Along with the great tit, the black-capped chickadee is one of the most-studied birds in the world.**
- **Only birds have a syrinx, a specialized voice box; it sits lower in the body and aids in balance during flight.**

BEHAVIOR

Flocks of black-capped chickadees consist of about 2–18 birds. They brave the cold of winter by shivering, which helps turn body fat to energy, keeping the birds warm. This hardy bird also conserves energy in temperatures far below freezing by lowering its body temperature and burning fewer calories. Throughout the year, flocks will often join together and fly with other similar bird species, such as warblers and creepers, in search of food. Vocalizations serve to ensure the safety of the group. Some members of a feeding flock will keep an eye out for danger, and the first chickadee to spot a potential predator gives a warning note. In response, the whole flock freezes and utters thin, ventriloquial calls, which sound as if they are coming from another area. This confuses the predator, and most will then leave. When the coast is clear, and all is well, a *chickadee* call brings the flock back to life. Other birds also benefit from this defense system. Though often tame to the extent of being hand-fed, the black-capped chickadee remains secretive in its family life, from egg-laying to fledging, but its *seet-seet-seet* and *zee-zee-zee* calls are heard throughout the breeding season.

CONSERVATION

The black-capped chickadee is fairly common throughout its expansive range, with upward population trends recorded in its eastern range, as well as periodic fluctuations peaking every 2–3 years across the southern U.S. The presence of suitable nesting sites is always a limiting factor within any habitat.



▲ **KIDDIE POOL**
The tiny black-capped chickadee doesn't have to search far for a shallow pool of water to bathe in.

FOOD & FEEDING

Almost all the nourishment the black-capped chickadee needs can be found in trees and shrubs. Feeding primarily on insects, seeds and berries, the chickadee uses its pointy beak to pluck at the bark of trees or tug at branches. The bird favors caterpillars and spiders, as well as hemlock and bayberries, and may also feed on maple sap, the fat of animal carcasses or dead fish. The birds often carry larger food items to their roost before eating, often stashing them for the winter among pine needles and in tree holes. Finding food in the winter is difficult for this tiny bird; foraging in groups increases the chance of success. The birds keep an eye on each other; when one finds a morsel, the others renew their search in that area. New food sources are continually communicated throughout the flock either through calls or direct observation of captured items.

◀ **BOUNTIFUL BERRIES**
The chickadee enjoys the seasonal treats.

BREEDING

Pairs mate for life and begin their breeding cycle in April when the winter flocks disperse; territories are established using *fee-bee* calls. The birds build their nest in a rotting branch, usually in a birch or aspen tree, 1–10' above ground. Both sexes excavate the nesting hole, but only the female builds the nest inside, which she lines with grasses, pine needles, fur and spider webs. She incubates the 5–10 brown-spotted white eggs for 11–13 days; her mate feeds her while she remains in the nesting chamber. The new chicks fledge after 14–18 days but still join their parents in search of feeding grounds. Single families often join up with one or more families, forming flocks of 8–12 birds, during the fall and winter months. Families break up during the following breeding season, and young chickadees finally disperse from their birth areas, often moving several miles away.

AND BABIES MAKE FIVE

1 Teamwork...
A pair excavates a nesting hole in an aspen tree. One digs as the other removes wood chips.

2 Finishing touches...
The female makes herself at home in the chamber, as she lines the area with fresh green grass.

3 Hungry mate...
The male feeds the female a large caterpillar while she remains inside incubating the eggs.

4 Family affair
The family forages together after the chicks have fledged, finding food under leaves and bark.

PROFILE Black-capped Chickadee

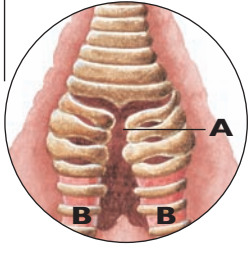
Named for its cheery song and bold black cap, the sociable black-capped chickadee sings a concert of calls year-round.

Bill

The stout, pointed bill is perfect for gathering the wide variety of items on the chickadee's menu, from bayberries to caterpillars.

Voice box

The syrinx (A), a voice box in the lower windpipe, functions as a resonating chamber, producing the chickadee's repertoire of calls. It is located above the two bronchi (B) that lead to the lungs. There are no vocal chords.



Plumage

Males and females look similar, with a neat, black cap and bib, and gray or olive upperparts. The cheeks are white and the flanks are pale buff, with narrow white edges on feathers at the bend of the wing.

Legs & feet

Small but strong legs and feet help support the diminutive chickadee as it flits from branch to branch.

Vital Statistics

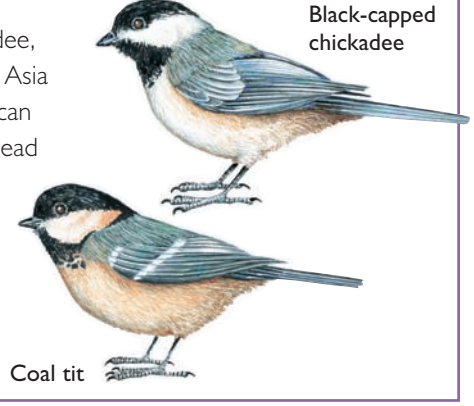
Weight	About 0.3 oz.
Length	4.75–5.5"
Wingspan	7.5–8.5"
Sexual Maturity	About 1 year
Breeding Season	April–June
Number of Eggs	5–10, usually 6–8
Incubation Period	11–13 days
Fledging Period	14–18 days
Typical Diet	Insects, seeds and berries
Lifespan	12 years or more

Related Species

- The black-capped chickadee's genus, ***Parus,*** includes the boreal chickadee, ***P. hudsonicus***, and the Carolina chickadee, ***P. carolinensis***. They join over 60 species of titmouse, bushtit and chickadee in the family ***Paridae***. The subfamily ***Parinae***, which contains mostly cavity nesters, includes the largest member of the family: the 8"-long sultan tit, ***Melanochlora sultanea***.

Creature Comparisons

Similar in appearance and size to the black-capped chickadee, the coal tit (*Parus ater*) is found in continental Europe and Asia to northeast China, far from the chickadee's North American range. An accomplished singer, the coal tit sports a black head and bib, just like the chickadee, and its upperparts range from gray to olive, while underparts are buff to cinnamon colored with cream-colored patches. Both the black-capped chickadee and coal tit collect seeds and insects in the autumn and cache them, hiding the food in storage areas to be retrieved later in the winter.



Black-crowned Night Heron

• ORDER •
Ciconiiformes

• FAMILY •
Ardeidae

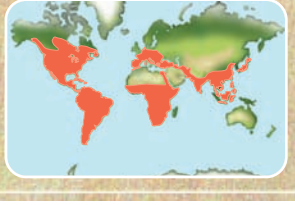
• GENUS & SPECIES •
Nycticorax nycticorax

KEY FEATURES

- It can feed by night, usually to avoid competition with day-active species of heron that are better adapted to hunting in aquatic habitats
- Large eyes help it spot prey — including aquatic creatures underwater — at dusk
- Spends the daylight hours roosting with other herons in a large colony

WHERE IN THE WORLD?

One of most widely distributed and numerous of all herons found in many parts of the world, including Europe, Asia, Africa, North and South America; also found on oceanic islands, such as Hawaii



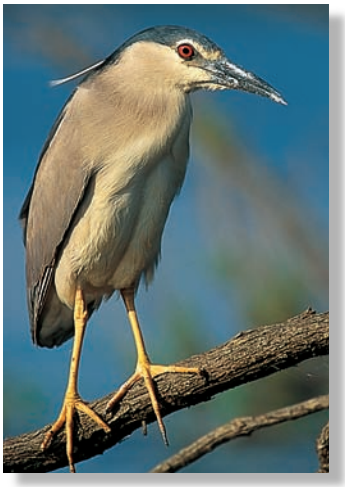
LIFECYCLE

Although the black-crowned night heron may have to wait its turn while other, larger, species of heron feed, it is a successful and wide-ranging bird due to its flexible habits.

HABITAT

The night heron needs dense cover in which to spend the day and build its nest, as well as access to fresh- or saltwater feeding grounds. The heron nests and roosts in oak, pine, willow and mangrove trees. Where there are no trees, it makes do with reeds, bamboo or any bushy vegetation. It feeds near lakes and ponds, rivers and streams, swamps and marshes and sometimes also drier grasslands.

The heron favors warm temperate or subtropical areas, but is also found in cooler climates, such as those found in Canada, southern South America and the Falkland Islands in the South Atlantic.



▲ **BEST OF BOTH WORLDS**
The night heron is at home in cool or warm areas.

▼ **RIVER RAIDER**
This Kenyan waterway is a night heron habitat.

BEHAVIOR

The night heron is most active at dawn and dusk. During the day, it often faces competition at its feeding grounds from other species of heron, which are larger, with longer legs and necks, giving them an advantage in finding food. This is probably why the black-crowned species feeds mainly when it's dark and the other species have returned to their roosts.

When there aren't competing heron species nearby, however, the black-crowned night heron commonly feeds by day. At the height of breeding season, when young are hungriest, the heron may hunt at regular intervals throughout both day and night.

The black-crowned night heron has a fascinating range of ritualized displays, usually a part of courtship and breeding, in which an adult bird may offer a twig to its partner, wave its head, neck or wings and erect its feathers and head plumes. It also performs an elegant, hopping "ballet."

Outside the breeding season, the heron migrates to warmer regions in winter, where it tends to be more solitary. It's quieter when not breeding and often goes unnoticed when it is roosting.

CONSERVATION

The night heron isn't currently threatened; it may even be expanding its range, thanks to its ability to live in different habitats and the variety of prey it eats. It's also unusually tolerant of human activities. In certain places it is affected by the draining of wetlands. In areas such as the farmed rice paddies of China, it may be regarded by humans as a competitor. In the Sahel region, south of the Sahara, local populations of the black-crowned night heron are threatened by repeated droughts.

BREEDING

The night heron breeds in colonies of from 20 to several thousand birds, in trees or among reeds, on cliff ledges, even open ground. Colonies resound with croaks and barks of young and adult herons.

The male starts building the nest, but the female completes it with twigs and other material brought by the male. Nests are spaced so birds are out of beak range of each other. In a season, the female lays one clutch (three to five eggs), but may lay a second.

The young hatch in two-day intervals. At first, adults pass food directly into each chick's mouth, but after a few days just drop it into the nest. After six or seven weeks, the offspring are ready to leave the nest.

▼ **CLEANING UP**

A heron preens its feathers to maintain their efficiency.

DID YOU KNOW?

- **Herons have special feathers whose tips crumble into a powder. They spread this over their plumage to keep it water repellent and to absorb greasy deposits.**
- **A night heron parent "bows" to its young before feeding them, showing its black crown and raising long, white neck feathers. If parents fail to greet them, the chicks see them as a threat and attack them.**

FOOD & HUNTING

The night heron preys mainly on frogs, fish and insects, but also eats small mammals, young birds, flies, dragonflies, spiders, mollusks and worms. The heron generally stands statue-still on a waterside perch, waiting for prey to come past, but may also walk through water, hoping to disturb an animal. It also hovers, then dives into the water to catch a choice item.

▶ **WHAT A RACKET!**

The breeding colony emits a variety of raucous calls.

▼ **NURTURED IN THE NEST**

Both parents feed and care for their young.

FURTIVE FISHER

1 Set off...

As twilight falls on the colony, the herons take off and circle around, before leaving in a flock for the feeding grounds.

2 Watch and wait...

On arrival, the birds separate so each has its own territory. Much time is spent watching and waiting for prey to pass by.

3 Take the plunge...

When the heron spots a victim, it lunges down to stab with its bill, but keeps a grip on the perch in case it misses its target.

4 Gulp

Success! The heron grips the prey in its bill, then gulps it down, often swallowing the victim before it has stopped struggling.

PROFILE

BLACK-CROWNED NIGHT HERON

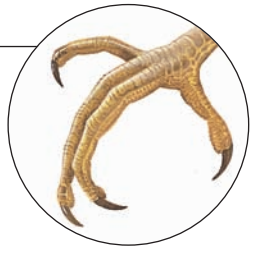
The black-crowned night heron feeds mainly at dawn and dusk, but also fishes during the day when it has nestlings to feed.

EYES
Large eyes let the heron spot its prey even underwater at dusk.

PLUMES
Adult has two or three white, ribbonlike head plumes during the breeding season. The bird erects them in courtship displays.

HEAD
Black cap on its head distinguishes the adult black from its yellow-crowned relative.

LEGS AND FEET
Legs and feet are green for most of the year but turn red or yellow in the breeding season. Toes give the heron a good grip on reeds and similar perches at the riverside.

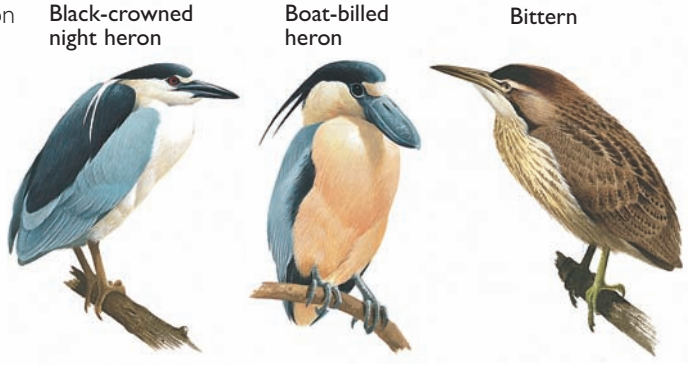


VITAL STATISTICS

WEIGHT	About 1.5 lbs.
LENGTH	22–26"
WINGSPAN	41–44"
SEXUAL MATURITY	2–3 years
MATING SEASON	April through August in North America
NUMBER OF EGGS	Usually 3–5; occasionally two clutches
INCUBATION PERIOD	21–26 days
BREEDING INTERVAL	Every year
FLEDGING PERIOD	42–49 days
TYPICAL DIET	Frogs, insects, fish, mollusks, squirrels, worms crustaceans
LIFESPAN	Up to 25 years

CREATURE COMPARISONS

An adult black-crowned night heron isn't likely to be mistaken for any other bird, but its young resemble those of yellow-crowned night herons or American bitterns. The boat-billed heron has an unusual-looking, distinctive bill, with which it scoops fish and shrimp from the water; it's sometimes classified in a family of its own.



RELATED SPECIES

● The 60 species in the family ***Ardeidae*** include bitterns, egrets and herons. These medium- to large-size birds have a long neck and legs, broad wings and a slim body. A long bill for hunting is also typical of birds in this family. There are seven night heron species in the family ***Ardeidae;*** only two species are found in the Americas: the black-crowned and the yellow-crowned night herons.

Black-headed Gull

• ORDER •
Charadriiformes

• FAMILY •
Laridae

• GENUS & SPECIES •
Larus ridibundus

KEY FEATURES

- Unlike most gulls, spends much of its life inland
- Adapts to man-made environments, nesting on reservoirs and gravel pits, feeding on farmland and scavenging at dumps and parks
- Sexes look identical and raise young together, amid the din of bustling, close-packed colonies

WHERE IN THE WORLD?

Breeds across Europe and Asia, from Iceland to Russia; some move south in winter to the Middle East, western Africa and eastern North America

LIFECYCLE

The black-headed gull thrives close to humans, as it has learned to exploit the rich feeding provided by agricultural land, dumps and hand-outs in city-center parks.

HABITAT

▲ **EASILY PLEASED**
Colonies prefer flat land near water.

Adaptability is key to the success of the black-headed gull, and the only major habitats that it can't exploit at some stage in the year are forests and mountainous areas. Breeding colonies are located on flat lowland areas or upland plateaus near calm and shallow freshwater, such as lakes, reservoirs, gravel pits or slow-moving rivers. It also breeds on both fresh- and saltwater marshes and in reedbeds, as well as on drier sites, from sand dunes to moorland.

Outside the breeding season, the gull flies long distances in search of food. In the north, it moves south in winter. Other populations don't disperse so far, traveling to sheltered coastal estuaries and man-made habitats, including refuse dumps, sewage plants, gravel pits, farmland, golf courses, parks and even gardens.

CONSERVATION

With a world population of more than three million, the black-headed gull is abundant. It faces no severe threats — the only dangers to nesting birds are flooding, predation of eggs and young by mammals, and egg-harvesting by humans.

BEHAVIOR

The black-headed gull is usually seen in a flock. It appears that families and groups of gulls stay together in flocks of varying size for several years; in fall and spring dispersals, flocks may be several thousand strong.

When it roosts at night, the gull is vulnerable to foxes, weasles and other mammals, so it often chooses a safe place on open water (reservoirs and lakes), using islands and sandbanks. It may fly 12 miles to its roost each evening, collecting at an "assembly point" before the flight.

The black-headed gull uses a series of ritualized displays to communicate with others and to reduce aggression. For example, the male advertises his possession of a nest site by throwing his head back and calling loudly.

BREEDING

DID YOU KNOW?

- **The scientific name of the black-headed gull means "laughing gull," referring to its rasping, *kreeay*, call.**
- **Several species of duck and wading bird build their nests near, or among, black-headed gull colonies. The alert and aggressive gulls act like security guards, noisily driving away predators.**
- **A massive roost of about 100,000 black-headed gulls was counted at one English reservoir on a January night.**

FOOD & FEEDING

The gull varies its diet and feeding habits according to the season and food availability. It walks in search of food in short vegetation, such as winter wheat or grazed grassland or wades in shallow water. When it spots an invertebrate or a crustacean, the gull scoops it up, sometimes dashing forward to seize its prey.

Skilled in the air, the gull often flies just a few feet above fields or water, dipping to snatch prey from the surface. When there is a hatch of flying insects — typically flying ants — in warm weather, flocks of gulls spiral after them on the rising air currents. They also steal food from smaller birds.

▲ **RICH PICKINGS**
Plowing exposes a host of invertebrates in the soil.

▲ **ANYTHING GOES**
Small fish, frogs and crabs *(above)* are eaten.

◀ **FEEDING FRENZY**
If one bird discovers food, others quickly join it.

The male and female gulls build their nest together — a simple scrape in the earth to a mound up to 1.5' high in shallow water that keeps the eggs above water level. Two or three eggs are laid at an interval of two days. Both parents care for their downy chicks, which, like the eggs, are well camouflaged until they fledge after five weeks.

◀ **MOTTLED DOWN**
Camouflage markings hide the chick on the ground.

▶ **EQUAL PARTNERS**
Both parents incubate the eggs for 23–26 days.

CITY LIVING

1 Off to town...
Some gulls live near cities all year, commuting to the center to find food dropped in the street...

2 Grab a bite...
...and visiting parks to feed on bread and other scraps people throw to the tame ducks and geese.

3 Home and dry...
At some gravel pits and recreational lakes, small colonies of gulls nest on man-made floating platforms...

4 Street-wise
...where they have few natural predators. They raise their young without ever leaving the city.

PROFILE BLACK-HEADED GULL

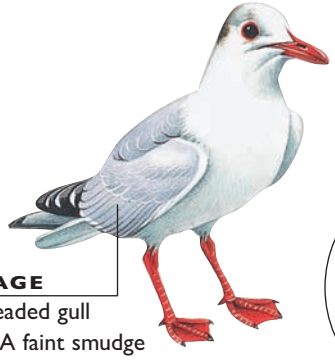
The black-headed gull has a multipurpose body plan. Agile in the air, it's also nimble on the ground and yet quite at home paddling on the water.

BILL

The pointed bill lets the black-headed gull catch insects in flight and pick them off the ground or plants. It's also sturdy enough to deal with carrion and scraps.

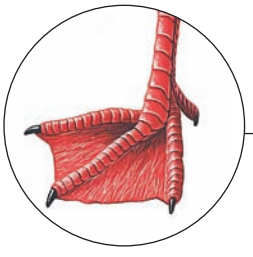
JUVENILE

The juvenile has orange-brown areas on its back, wings, neck and head, pinkish legs and feet, and a black tip to its pale bill.



WINTER PLUMAGE

In August, the black-headed gull loses its dark "hood." A faint smudge behind the eye is all that remains until the hood is regained in the following February or March.



FEET

Scarlet feet are webbed, letting the gull paddle on the water surface and stand on soft mud or sand.

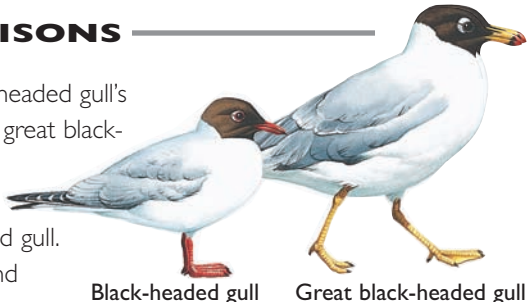
VITAL STATISTICS

WEIGHT	7–13 oz.
LENGTH	1–1.5'
WINGSPAN	3–3.3'
SEXUAL MATURITY	2 years
BREEDING SEASON	April–July
NUMBER OF EGGS	2–3
INCUBATION PERIOD	23–26 days
FLEDGING PERIOD	35 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Invertebrates, carrion, small animals; scraps
LIFESPAN	Up to 30 years

RELATED SPECIES

● **There are 47 gull species in the family *Laridae*. Most gulls have pale plumages (gray above and white below), but the ivory gull (*Pagophila eburnea*) is all-white and Ross's gull (*Rhodostethia rosea*) has pink underparts. Gulls live at sea or in wetland habitats and nest in colonies. Relatives include terns in the family *Sternidae* and skuas in the family *Stercorariidae*.**

CREATURE COMPARISONS



Black-headed gull Great black-headed gull

Seen from a distance or in poor light, the black-headed gull's chocolate-brown head appears blackish, but the great black-headed gull (*Larus ichthyaetus*) has a truly pure-black head. Both have white 'eyelids,' but these are more striking in the larger great black-headed gull. Its bill is yellow and red, with a narrow black band separating the two colors. Its legs and feet are also bright yellow. The great black-headed gull is less common than the black-headed gull, breeding in scattered colonies on coastal marshes and lakes on steppes across central and southern Asia. Unlike the black-headed gull, most migrate to winter on the Caspian Sea and Indian Ocean.

Black-winged Stilt

• ORDER •
Charadriiformes

• FAMILY •
Recurvirostridae

• GENUS & SPECIES •
Himantopus himantopus

KEY FEATURES

- Performs aerial and ground displays, such as the "parachute display" and the "butterfly flight," the purpose of which remains a mystery
- Measuring up to 14" long, the stilt's legs trail far behind it in flight and make it easy to identify
- The stilt's versatile, sharp bill is perfect for snatching insects or cutting up large crabs before swallowing

WHERE IN THE WORLD?

Widespread throughout Australia as well as coastal and inland regions of New Zealand; also in India, Sri Lanka, Southeast Asia, Africa, Europe, Mexico, Central and South America

LIFECYCLE

The black-winged stilt goes through a series of mysterious displays that observers have yet to explain; it "parachutes," "butterflies" and performs a "grouping" ceremony.

HABITAT

The black-winged stilt is most at home in extensive shallow wetlands, such as coastal wetlands and lagoons, which are full of insects, as well as small invertebrate prey. Stilts occur in both fast-flowing and still waters and prefer wetlands where there is adjacent open space that's suitable for nesting and resting. The black-winged stilts also occupy other freshwater, estuarine and artificial environments, such as irrigated fields, and will move seasonally to find adequate wetlands. In areas heavily modified by human activity, stilts must depend upon artificial wetlands, such as scrapes, salt lakes, dams and drainage ponds, some of which are created expressly for wildlife conservation.

▼ **WALKING TALL**
A stilt uses its long legs to search for food.

CONSERVATION

The black-winged stilt is not globally threatened. In fact, the stilt's far-reaching range and local abundance indicate that the species is quite strong and its future appears to be secure. However, on the Hawaiian Islands, the local form of the black-winged stilt, the Hawaiian stilt, has come under pressure principally from the loss of natural wetlands due to urban development and the farming of sugar cane.

DID YOU KNOW?

- **The black-winged stilt is also known as the long-legged plover, longshanks, pied stilt, stilt-bird and dog-bird.**
- **The genus name *Himantopus* comes from the Greek words for a "strap"and a "foot," referring to the black-winged stilt's long legs.**

BREEDING

Black-winged stilt courtship begins with preening and bill-dipping, followed by the female assuming a receptive posture. The male then moves from side to side in a semicircle behind the female several times before mating begins. Breeding pairs are most often found in colonies, typically ranging from between 2–50 pairs. Nests are built from flood debris, driftwood, grass, fine twigs and other vegetation, and shaped into a bowl, cone or mound up to 6" high. Nests are spaced widely on the ground, often among grasses and sedges, although some nests are made from well-lined masses of floating water weeds. The female usually lays four eggs in a 24-hour interval. Both parents take turns incubating the eggs from 22–26 days, when the downy young hatch. Fledging takes between 28–32 days, and the young are independent of their parents nearly 2–4 weeks after fledging.

▲ **SITTING ON THE JOB**
A black-winged stilt incubates a nest of eggs.

▼ **BABY STEPS**
Three fledglings try out their wobbly legs.

BEHAVIOR

The black-winged stilt exhibits extremely unusual (and largely unexplained) behavior. For example, it often forms small groups of 3–4 and performs a "parachute display," in which the birds leap high into the air and then parachute downward slowly on outspread wings. Some experts speculate that this may be a unique form of predator distraction. It also performs a "butterfly flight," hovering 16–32' above a spot and then flying off quickly to another site to repeat the procedure. In the also unexplained "grouping ceremony," 3–4 stilts gather together and spontaneously display mild aggression in the form of lunging and pecking at each other before dispersing.

STRANGE STILT BEHAVIOR

1 Parachute display...
Four stilts engage in their odd habit of leaping into the air and "parachuting" down to their shallow wetland home.

2 Butterfly flight...
A stilt hovers directly above a spot; it will hold this position for a few seconds and then repeat the display somewhere else.

3 Dive and seek...
Four stilts gather, lunging and pecking at each other during another puzzling display known as a "grouping ceremony."

4 Mission over
As the afternoon approaches, the hungry black-winged stilt will join others in the endless search for elusive prey.

FOOD & HUNTING

Black-winged stilts tend to feed primarily on aquatic prey, especially beetles, mayflies and spiders, although mollusks, crustaceans, earthworms and small fish, as well as water plants and their seeds, are also part of the bird's varied diet. The stilt usually hunts in shallow water or on damp land, but the bird also employs its unusually long legs, neck and bill to feed in deeper water as well. The stilt usually hunts by pecking at clearly visible prey in the water or on the ground. Grasping it with a slightly open bill and swallowing with a backward and forward jerk of the head, the food is quickly eaten. The bird then returns to its original position to search for more food. Larger prey, such as crabs, must be cut up by the bill into smaller pieces before they can be swallowed. Other visual methods commonly used by stilts are "plunging," an underwater form of pecking or probing in which the bill and head are totally immersed, and "snatching," which involves pecking at flying insects.

ADEPT ANGLER
A stilt expertly snatches a small tadpole.

PROFILE BLACK-WINGED STILT

The black-winged stilt flies gracefully and walks slowly, raising its legs high and taking long steps in the flooded areas it inhabits.

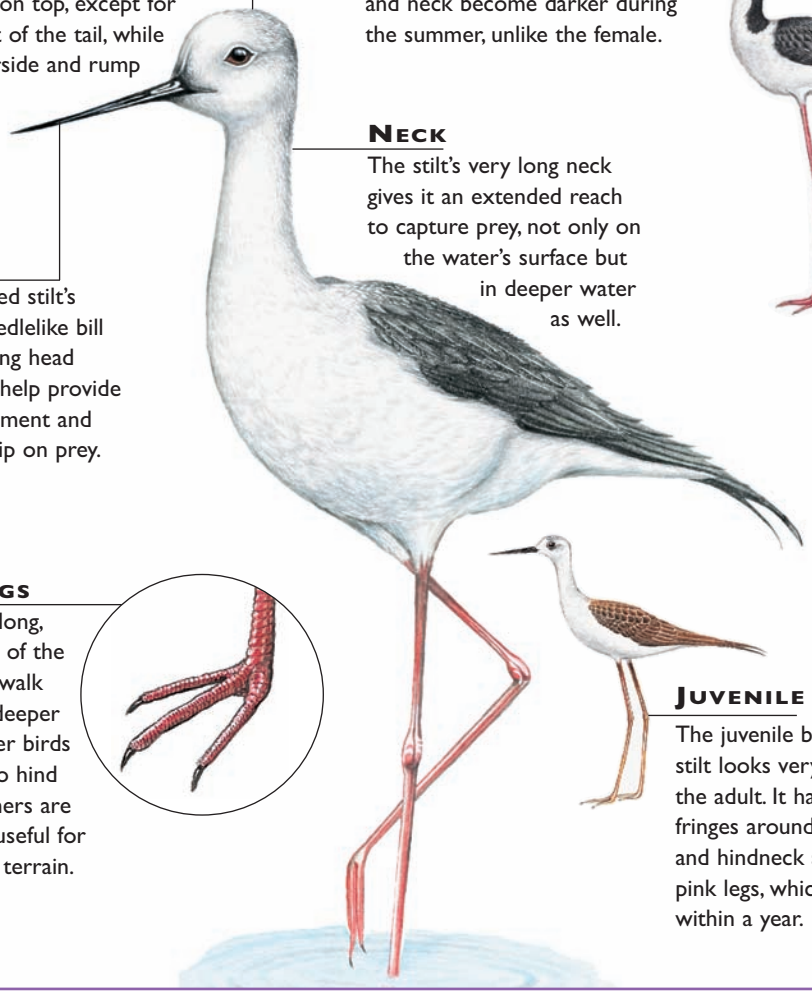
PLUMAGE
The female black-winged stilt (*right*) is mostly black on top, except for the grayish part of the tail, while the head, underside and rump are white.

BILL
The black-winged stilt's long, almost needlelike bill is aided by strong head muscles, which help provide quick jaw movement and give it a firm grip on prey.

FEET & LEGS
The extremely long, pinkish-red legs of the stilt allow it to walk through much deeper water than other birds its size; it has no hind toe, but the others are unusually long, useful for walking on soft terrain.

MALE
The back of the male's head and neck become darker during the summer, unlike the female.

NECK
The stilt's very long neck gives it an extended reach to capture prey, not only on the water's surface but in deeper water as well.

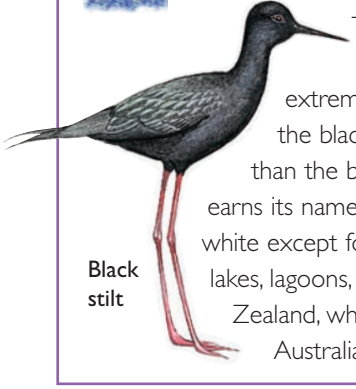


JUVENILE
The juvenile black-winged stilt looks very much like the adult. It has buff fringes around its crown and hindneck and grayish-pink legs, which turn red within a year.

VITAL STATISTICS

WEIGHT	6–7 oz.
LENGTH	13–14"
WINGSPAN	24–28"
SEXUAL MATURITY	1–2 years
BREEDING SEASON	Seasonal; varies with region
NUMBER OF EGGS	3–6, usually 4
INCUBATION PERIOD	22–26 days
FLEDGING PERIOD	28–32 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Mainly aquatic prey such as beetles and spiders
LIFESPAN	Up to 12 years

CREATURE COMPARISONS



Black stilt

The black stilt *(Himantopus novaezelandiae)* and its close relative, the black-winged stilt, both boast the extremely long legs that inspired their "stilt" names. However, the black stilt's tarsus (connective bone of the ankle) is smaller than the black-wing stilt's, and it has a slightly shorter neck. The black stilt earns its name by being entirely black, while the black-winged stilt is mostly white except for its wings. Both species frequent wetlands such as swamps, lakes, lagoons, lake shores and mudflats. The black stilt resides only in New Zealand, while the black-winged stilt enjoys a wider range through Australia, India, Sri Lanka, southeastern Asia, Africa and Europe.

Black-winged stilt

RELATED SPECIES

- **The black-winged stilt is 1 of 2 species in the genus *Himantopus,* which also includes the black stilt, *H. novaezelandiae.* Two other genera are recognized within the *Recurvirostridae* family: the *Recurvirostra,* which includes the pied avocet, *R. avosetta,* and the red-necked avocet, *R. novaehollandiae,* and the *Cladorhynchua* which is limited to the banded stilt, *C. leucocephalus.***

Black Heron

• ORDER •
Ciconiiformes

• FAMILY •
Ardeidae

• GENUS & SPECIES •
Egretta ardesiaca

KEY FEATURES

- Unlike other herons, hunts by forming a canopy with its wings over the water to reduce glare and attract prey to the shade
- Entirely black except for its yellow-orange feet, which turn bright red during courtship
- Both parents incubate the eggs and care for the chicks until they are ready to leave the nest

WHERE IN THE WORLD?

Found in Africa, south of the Sahara, including Guinea, Ivory Coast, Nigeria, Kenya, Tanzania, Zambia, Zimbabwe and South Africa; also on the island of Madagascar

LIFECYCLE

The black heron employs an unusual hunting method: it spreads its wings like a cape, creating a shade canopy over the water's surface that lures prey within striking distance.

CONSERVATION

The black heron is locally abundant in parts of its range, but is declining due to habitat destruction and overhunting. Though not globally threatened, it is often disturbed by human encroachment during breeding, and many colonies have a low breeding success.

HABITAT

The black heron is usually found near freshwater throughout its African habitat. This wading bird prefers shallow lakes, rivers, ponds, marshes, flood plains and rice paddies, as well as alkaline lakes, mangroves and tidal flats. The black heron has also been recorded as high as 4,900' above sea level on the high plateaus of Madagascar. This sedentary bird remains within its home territory, where it roosts in tall trees at night and wades in shallow water or mudflats. Breeding grounds, also within the territory, are reused year after year.

▲ **GROUP OUTING**
The black heron often forms flocks near shallow lakes and ponds.

BEHAVIOR

The black heron spends a great deal of time on the ground, walking on strong, unwebbed feet. At communal roosts, flocks mix with other species during feeding and rest periods. The black heron is generally quiet except during the breeding season; then, it emits a guttural call, usually during rainy months. When alarmed, the heron emits a low-pitched croak.

The black heron preens and grooms itself with its soft powder-down feathers. Using its bill to spread the powder onto its feathers, the black heron then uses the comblike claw on its longer middle toe to remove grease, dirt and fish slime from its plumage. Males and females often engage in mutual cleaning as part of the mating ritual; this serves to strengthen the bond between breeding pairs.

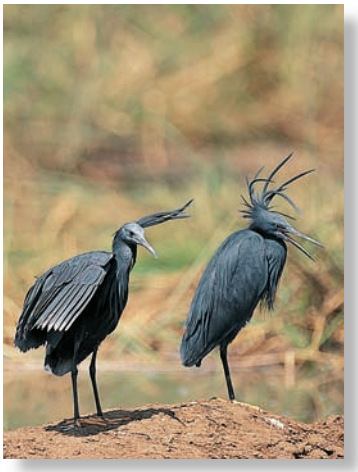
▲ **LONG-DAY'S JOURNEY**
The heron spends most of its day walking while searching for prey.

FOOD & FEEDING

The black heron feeds mainly on fish and employs a unique feeding technique — it lures prey to the surface of the water by forming a canopy with its wings. The black heron walks about slowly, intermittently spreading its wings over its head like an umbrella, maintaining this pose for 2–3 seconds. The canopy reduces glare and forms shade — this attracts fish, its favorite prey. The black heron spears a fish with its long, pointy bill, and swallows it whole, usually head first, to avoid the fish's spiny fins. This bird also feeds on crustaceans and aquatic insects that it stirs up by raking its feet along the muddy bottom. The black heron feeds during the day or at dusk, and then moves off to nighttime communal roosts with other herons, egrets and darters.

BREEDING

Breeding occurs during the rains and flooding periods, and the male begins to collect nest materials while simultaneously trying to attract a female. Nests are usually scattered in colonies mixed with other herons, egrets or darters. Both sexes' yellow-orange feet turn bright red during courtship. The male stretches on his perch, pointing his head and neck to the sky, inviting the female to take a closer look. After mating, the pair builds a nest of sticks and rocks in trees up to 15' above ground, or in bushes or reed beds near or over water. Both sexes incubate for the 2–4 eggs for 18–30 days. The helpless and blind chicks are covered with a dark-gray down and hatch at different intervals over a one-week period; the adults feed them regurgitated food. Because of the hatching intervals, there is a big difference in the chicks' size, and the largest chick often gets more food; some late-hatching chicks do not survive. Juveniles resemble adults but have duller plumage and reach maturity in 1–2 years.



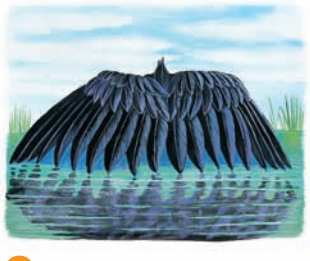
▲ **MATES FOR LIFE**
Like most herons, the black egret forms monogamous pair bonds.

DID YOU KNOW?

- **In 1950, more than 10,000 black herons lived in a single colony at Antananarivo on the island of Madagascar; today there are fewer than 50 pairs of birds there.**
- **The black heron also forages by vibrating its colorful feet in the water; this helps to attract aquatic prey, such as fish and crustaceans.**

CLOAK AND DAGGER

1 Slow approach...
A black heron walks slowly through shallow wetland waters while scanning for prey, such as fish and crustaceans.



2 Cloaking...
The heron stops and holds its broad wings in a canopy. The wings come together at the tips, just above the water's surface.

3 Setting the trap...
Lured by the false shade, a fish ventures close. The heron starts moving its feet, arousing the fish's curiosity and bringing it closer.

4 Caught
After impaling the fish, the heron pulls its head up and repositions the fish in its bill; like all herons, it swallows its prey whole.

PROFILE BLACK HERON

The black heron's yellow-orange feet turn a rich red during the breeding season; its broad wings are an integral part of its hunting technique.

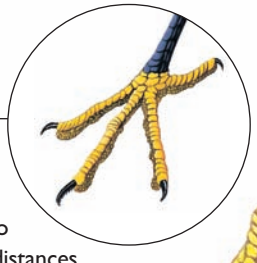
BILL
The straight, daggerlike bill is used to spear fish and snatch crustaceans and insects.

EYES
The eyes are located toward the top of the head; this allows the heron to see approaching predators even while feeding with its head down.

POWDER DOWN FEATHERS
Continuously growing downy feathers disintegrate to form powder. Located on the breast and rump, powder downs are used to remove dirt and slime from the rest of the plumage.

BREEDING COLORS
Both sexes have yellow-orange feet; they change to bright red during the breeding season. The plumes on the head and neck become shaggier during courtship.

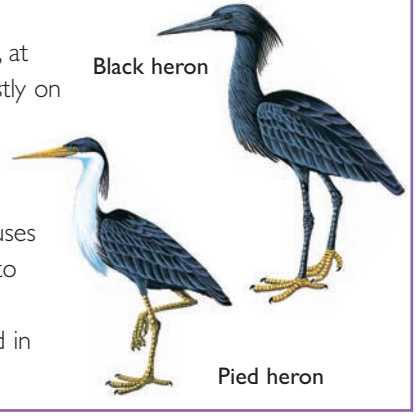
WINGS
The bird spreads its broad wings to form an umbrella over the water when wading for food.



FEET
Strong, unwebbed feet enable the heron to walk great distances while foraging. The middle toe is slightly longer, with comblike serrations used to remove fish slime and mud during grooming.

CREATURE COMPARISONS

The pied heron (*Egretta picata*) is smaller than the black heron, at 18–21". Also black, the pied heron also has white plumage, mostly on its neck. Like its cousin, the pied heron feeds on aquatic insects, crustaceans and fish, but its range is in New Guinea, Australia, Moluccas and Tanimbar Island, far removed from the black heron's African home. Unlike its relative, the pied heron often uses aerial techniques to capture prey, whether pausing in midflight to capture prey or striking the surface of the water to flush out a victim. Nesting habits of the two species are similar; both breed in colonies and build untidy platform nests of sticks and twigs.



VITAL STATISTICS

WEIGHT	9.5–14 oz.
LENGTH	16.5–26"
WINGSPAN	35–41"
SEXUAL MATURITY	1–2 years
BREEDING SEASON	Varies with location
NUMBER OF EGGS	2–4
INCUBATION PERIOD	18–30 days
FLEDGING PERIOD	Unknown
BREEDING INTERVAL	1 year
TYPICAL DIET	Fish, crustaceans and aquatic insects
LIFESPAN	Unknown

RELATED SPECIES

- The black heron is 1 of 13 species in the genus ***Egretta***, which includes the great egret, ***E. alba***, the little egret, ***E. garzetta*** and the white-faced heron, ***E. novaehollandiae***. There are 60 species in 17 genera of heron, egret and bittern within the family ***Ardeidae***. The goliath heron, ***Ardea goliath***, is the largest heron, reaching nearly 5' long with a massive wingspan of up to 7.5'.

Black Skimmer

• ORDER •
Charadriiformes

• FAMILY •
Rynchopidae

• GENUS & SPECIES •
Rynchops niger

KEY FEATURES

- Slender, boldly patterned waterbird renowned for, and named after, its unique feeding style
- Uses the very long lower mandible of its bright bill to scoop fish from the water's surface
- Nests in large colonies, often with terns, on small river islands and coastal beaches

WHERE IN THE WORLD?

Distributed along both seaboards of the U.S., Mexico and Central America, across much of tropical South America, and along the coasts of Chile and Argentina

LIFECYCLE

Though full of poise and elegance when hunting over the water, the black skimmer becomes embroiled in unsightly territorial squabbles when breeding in large colonies.

HABITAT

▲ **ON THE FLAT**
The Everglades of Florida provide still waters, perfect for skimming.

The black skimmer inhabits both coastal and inland sites, although there are differences in the habitat preferences of its three subspecies. The North American race is mostly confined to coasts, but the two South American races occur on inland waterways and only gather in coastal habitats outside the breeding season.

Across its various habitats, the skimmer feeds mostly on calm, open waters such as large rivers, lakes, estuaries and tidal creeks. It relies on high densities of shrimp or fish in shallow water or near the surface of deeper water. It also requires habitats that have secluded areas for breeding and roosting.

CONSERVATION

The black skimmer is not an endangered species, but many of its populations have been reduced by human activities such as the damming of rivers in South America, water pollution by oil and chemicals, and predation on nesting colonies by dogs, cats and rats from human settlements.

BEHAVIOR

The skimmer usually feeds alone or in pairs, but it is essentially a social bird in all seasons. At nesting time, it gathers in colonies of up to several hundred pairs, with nests spaced at least 3' apart. The largest colonies form in areas of proven breeding success, and such stable sites often harbor colonies of terns. Skimmers are thought to benefit from this, as the terns are more aggressive birds and provide a measure of protection from predatory gulls. As nesting gets underway, there is much squabbling over territorial space.

Outside of breeding season, large flocks of black skimmers are a common sight. Occasionally, 1,000 or more birds can be seen sheltering on saltmarsh flats. Like many birds, the skimmer faces the wind while resting so that its feathers do not get ruffled.

▶ **CROWD CONTROL**
Skimmers gather in large flocks on sheltered waters.

BREEDING

▲ **DIGGING IN**
The chick hatches in a simple scrape, usually just a few inches deep.

Pairs of skimmers gather at breeding colonies at much the same time every year. The months vary by region — in the upper Amazon Basin, most nesting takes place from May to October, while birds of the same subspecies in northern Colombia breed from October to March.

The black skimmer mates for life, and the parents take turns incubating a clutch of eggs. About 3–4 weeks after being laid, the eggs are broken open by the downy chicks, and parental duties turn to brooding and bringing food. The chicks leave the nest after a week. After a further three weeks, they have grown their flight feathers and possess the characteristic bill shape of their parents.

DID YOU KNOW?

- **The black skimmer is also called the seadog because of its barklike calls, which are longer and harsher under stress.**
- **Though usually thought of as a bird of lowland waters, the black skimmer has been seen near Lake Titicaca, 12,500' up in the Bolivian Andes.**

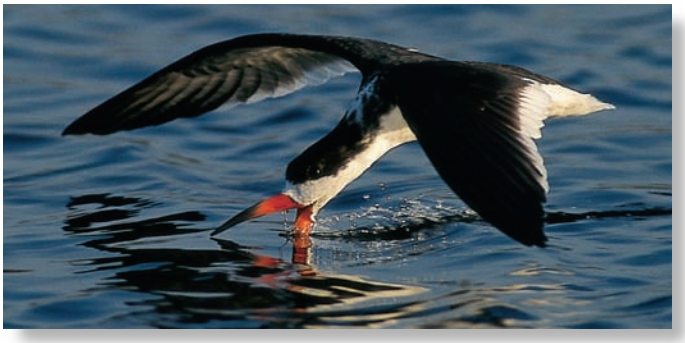
FOOD & FEEDING

The skimmers have a unique fishing technique, based on precise movements and tactile foraging. When searching for food, a skimmer glides in a straight line just above the water's surface, dipping its extended lower mandible into the water so that it ploughs a liquid furrow for as much as 100 yards. If it does not catch a fish, it typically rises at the end of the skim, turns and repeats the action, retracing its own wake of gently disturbed water. Because the skimmer's feeding method relies on touch, it can forage during the day or night.

The skimmer eats mostly small-sized fish including anchovy, mullet, herring, silversides and minnows. Its prey are typically 1–5" in length, or occasionally up to 8". The bird also snatches small crustaceans such as shrimp.

▼ **FLY FISHING**

The skimmer's feeding method is possible because the upper mandible can be lifted clear of the water.



TOP OF THE BILL

1 A cut above...
When feeding, the skimmer flies low over the still surface, ploughing its long lower mandible through the water.

2 Caught in the middle...
The skimmer chooses its line of attack at random, relying on the chance that its path will happen to intercept that of a fish.

3 Uplifting experience...
When the bill hits a fish, the head reflexively doubles under and the bill snaps shut. The tail dips to stop the bird from crashing into the water.

4 Carried away
If the prey is small enough, the skimmer can jostle it lengthwise in its bill and toss it down its throat while still in flight.

PROFILE BLACK SKIMMER

Propelled just above the water by its broad wings, the black skimmer dips its elongated lower mandible into the water's surface to detect fish prey.

BILL

Both the upper and lower mandible are compressed like blades. Only the upper mandible, which is two-thirds the length of the lower one, is hinged, enabling the bird to lift it above the surface of the water.

WINGS

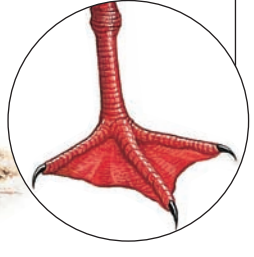
Along with its streamlined build, the skimmer also has narrow but very long wings with a span of up to 2.5 times its bodylength.

EYE

By day, the pupils contract to vertical slits to protect the retinas from the glare of sandy beaches and glittering water. This feature is unique to the genus *Rynchops*: all other birds have round pupils.

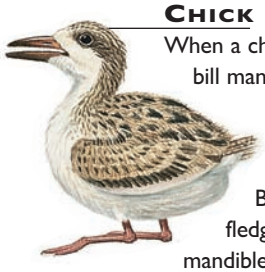
LEGS

The bright red on the bill, and on the short legs and webbed feet, stands in bold contrast to the pied plumage.



CHICK

When a chick hatches, the two bill mandibles are equal in length, but grow at different rates over the next few weeks. By the time the bird fledges, the lower mandible is 0.5" longer.

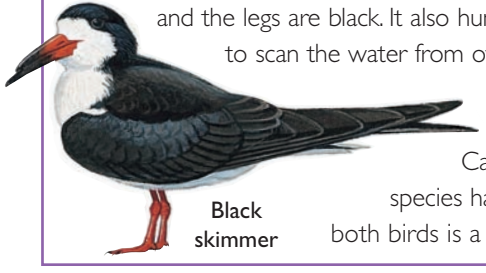


VITAL STATISTICS

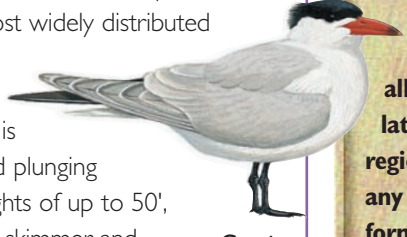
WEIGHT	Male 10–13 oz.; female 8–10.5 oz.
LENGTH	16–20"
WINGSPAN	42–50"
SEXUAL MATURITY	1–3 years
BREEDING SEASON	Varies with region; April –September in the U.S.
NUMBER OF EGGS	2–4
INCUBATION PERIOD	21–26 days
FLEDGING PERIOD	28–30 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Small fish and shrimp
LIFESPAN	20 years

CREATURE COMPARISONS

The slender build of the black skimmer is similar to that of the terns. The skimmer shares parts of its range with the Caspian tern (*Hydroprogne caspia*), the largest and most widely distributed of the sea terns. The Caspian tern is as much as 4" longer, with a more robust build. The black plumage is mostly confined to the head, and the legs are black. It also hunts for surface fish, but its method is to scan the water from overhead before targeting a fish and plunging directly into the water from heights of up to 50', stabbing at its prey. The black skimmer and Caspian tern both breed in colonies, although both species have been seen breeding in single pairs. The nest for both birds is a simple depression in sand, gravel or shells.



Black skimmer



Caspian tern

RELATED SPECIES

- The black skimmer is 1 of 3 similar-sized species in the genus ***Rynchops***. The African skimmer, ***R. flavirostris***, lacks a black-tipped bill, while the Indian skimmer, ***R. albicollis***, has a white collar. They all range over tropical latitudes, but in separate regions. They are so unlike any other birds that they form their own family, the ***Rynchopidae***. Their closest relatives are gulls, terns and skuas.

Black Tern

• ORDER •
Charadriiformes

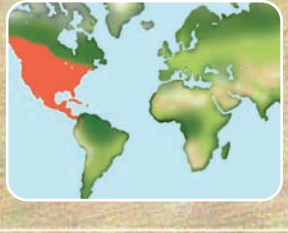
• FAMILY •
Sternidae

• GENUS & SPECIES •
Chlidonias niger

KEY FEATURES

- This far-ranging tern has been known to feed up to 3 miles from its home colony
- Though it pursues aquatic prey, it also plucks insects out of midair with its sleek, black bill
- Often mistaken for a bat due to its erratic, dipping flight and dark coloring

WHERE IN THE WORLD?



Found in Scandinavia, Europe, western Asia and Africa; also in North America, as well as Central and South America

LIFECYCLE

While its buoyant flight makes it look almost weightless, the feisty black tern makes a strong impression when it utters its prolonged, shrill scream to fend off intruders.

HABITAT

The black tern will live on virtually any wetland, including well-vegetated inland pools, lakes, peat bogs, rice fields, brackish marshes and even small ponds and ditches. The bird prefers sparse, open vegetation such as bulrush, cattail and, if available, floating water lilies.

Foraging over wetlands, but also in drier areas, black terns can often be found roosting on branches of downed trees or on pilings. In the colder winter months, large groups of black terns inhabit estuaries, coasts and coastal lagoons.

HUNTING ON THE WING
A large flock of terns flies over its watery habitat in search of aquatic prey.

DID YOU KNOW?

- **Since the tern has lost much of its breeding habitat to wetland drainage, the U.S. Fish and Wildlife Service has considered listing it as threatened or endangered.**
- **The tern will sometimes build its water-based nest on an already assembled muskrat home.**

FOOD & FEEDING

A low-flying predator that prefers to feed mainly in the daytime, the black tern feasts on aquatic insects, small fish, snails, tadpoles and frogs, which make up the bulk of its extremely varied diet. When foraging, black terns constantly dip over water to snatch aquatic prey from the surface, but very rarely plunge into the water completely. The opportunistic birds are often seen close to the shore, feeding on small fish that have been forced to the surface by a pod of feeding dolphins. Instead of flying, the tern sometimes hunts from a perch high over water.

During the breeding season, the black tern prefers to feed insects to its nestlings. Tern favorites include dragonflies, moths, crickets and flies, which it captures by snatching them from the air. In fact, insects comprise over 90% of the food brought back to hungry nestlings. The tireless black tern zigzags back and forth after dragonflies in long pursuits that can last up to 10 seconds each. As it circles low over its various foraging areas with slow, shallow wingbeats and a downward-pointing bill, the gregarious black tern often congregates with other birds in large flocks where food is heavily concentrated.

MOTHER HOVER
A tern hovers above the nest while feeding her hungry nestlings.

FAST FOOD

Cruise missile...
A cockchafer beetle is no match for the swiftly swooping black tern; the bird quickly snatches it with its sleek, black bill.

BEHAVIOR

Gregarious in nature, flocks of black terns may bathe together in extremely dense groups, also gathering in large flocks where there is a heavy concentration of food. During these interactions, the black tern's call is a sharp *klitt*, or a short, nasal *kja*, which sounds quite clipped. The black tern is often mistaken for a bat or storm petrel, due to its erratic flight, frequent hovering and dark summer plumage. Although its feet are webbed, the black tern rarely settles on water when hovering in search of prey. Despite its fragile, almost meek appearance, the black tern is suprisingly agressive: intruders are met with a shrill scream, *kreek* or *craik*, and then quickly chased away.

TERN TWOSOME
Two terns take a break from their constant hovering.

2 Dinnertime...
With the advantage of a "bird's-eye view," the tern spots a frog from far above the water and takes aim before descending.

3 Unfair advantage...
The acrobatic tern swoops suddenly down to the water's surface, easily capturing the unlucky frog in its bill.

4 Tern teamwork
The tern takes advantage of a school of feeding dolphins: the mammals force small fish to the surface for an easy meal.

CONSERVATION

The black tern is not globally threatened. In fact, some estimates of its world population run as high as 500,000 breeding pairs. However, many local populations are considered vulnerable and, sadly, appear to be on the decline. The main cause of the black tern's apparent decline is the gradual loss of its freshwater marsh habitat for agricultural use or through the overgrowth of cattails. Pesticides are also believed to have played some role in the species' decline, either through direct poisoning or by killing the aquatic prey that makes up the tern's diet.

▼ **NUZZLING NESTLING**
A protective mother and her chick rest in the reeds.

BREEDING

From May to August, black terns practice what is known as *assortative mating*, by which bird pairs are formed by size. Most colonies contain fewer than 20 breeding pairs, and rarely more than 100. The female makes her nest in a shallow depression by assembling masses of floating vegetation or selecting clumps of dead reeds or cattail root stalks. These water-based nests are usually found floating in shallow freshwater or brackish marshes. In her floating nest, the female tern lays from 2–4 eggs, which are pale brown with darker brown blotches. Incubation lasts for about 21–22 days and, within two short hours after hatching, the hungry chicks are fed their first meal. After about 25 days of feeding and care, the hardy chicks are ready to leave the nest.

PROFILE BLACK TERN

With its short tail and wings, the black tern appears erratic and batlike in flight, often dipping to the water's surface to pick up food with its bill.

IN FLIGHT
The black tern hovers in the air on broad wings.

PLUMAGE
It is the only tern with a black body, but the bird's back and wings are gray.

TAIL
The short, notched tail is only slightly forked and when spread out in flight it acts as a rudder.

VISION
The tern's keen vision allows it to snatch flying insects in midair.

BILL
The black tern plucks food from land, water or air with its sleek, black bill.

FEET
Only the front digits are webbed, allowing the bird to swim and walk equally well. Strong claws enable the bird to perch easily.

VITAL STATISTICS

WEIGHT	2–2.5 oz.
LENGTH	8.5–9.5"
WINGSPAN	22.5–25.5"
SEXUAL MATURITY	2–4 years
BREEDING SEASON	May–August
NUMBER OF EGGS	2–4; usually 3
INCUBATION PERIOD	21–22 days
FLEDGING PERIOD	21–28 days
TYPICAL DIET	Dragonflies, moths, crickets, flies, mollusks, small fish and other marine animals
LIFESPAN	Up to 17 years

CREATURE COMPARISONS

The white tern (*Gygis alba*) is larger than the black tern, measuring 11–13". The only tern with all-white plumage, the white tern is a sharp contrast with its cousin's dark to pale-gray plumage. While the black tern frequents inland pools, lakes and marshes, the white tern prefers coral islands, usually with vegetation. The white tern nests in trees, bushes and cliffs, where it lays its single egg directly on a tree branch; its cousin nests in a low mound of water weeds. The white tern ranges widely throughout the tropical and subtropical oceans; the black tern is found from southern Scandinavia to eastern Europe and western Asia to North, Central and South America.

Black tern

White tern

RELATED SPECIES

- **The black tern is 1 of 3 species in the genus *Chlidonias*; the others are the white-winged tern, *C. leucopterus*, and the whiskered tern, *C. hybridus*. These terns join 41 other species in the family *Sternidae*, including the Sandwich tern, *Thalasseus sandvicensis*. Terns belong to the order *Charadriiformes*, which also includes gulls, skuas, jaegers and skimmers.**

Black Woodpecker

• ORDER •
Piciformes

• FAMILY •
Picidae

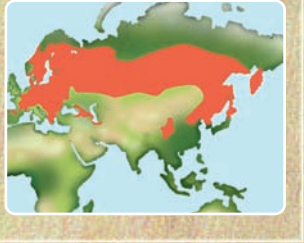
• GENUS & SPECIES •
Dryocopus martius

KEY FEATURES

- Attracts a mate or sends a signal by drumming a rapid sound called a "tattoo" with its beak
- To guard against predators, it makes a "doorway" in a tree just large enough for an adult woodpecker to pass through
- Feeds its chick by prodding a "facial knob" that makes the chick open its mouth

WHERE IN THE WORLD?

Throughout Europe and Asia; south into Spain and France, north to Norway, Sweden and Finland, across central Asia, east to Japan and southwest China



LIFECYCLE

The black woodpecker was an accomplished percussionist long before drumsticks and drums were invented; its steady tap and drilling noises reverberate through the forest.

HABITAT

▲ WOODLAND HOME
A black woodpecker can be heard drilling in the forest.

The nonmigratory black woodpecker commonly inhabits mixed forests, though it frequents both coniferous and deciduous. It excavates its nests mainly in large aspen or pine trees, chipping away with powerful blows of its beak. As the woodpecker works, flying debris begins to pile up in and around the hole. The busy bird stops periodically to remove billfulls of wood particles from the deepening hole, sending them tumbling to the ground directly below. As the nest is nearing completion, only the woodpecker's tail is visible from the hole, with wood chips flying out behind it. Unfortunately, the pile of chips accumulated at the base of the trunk sends a signal to predators that a nest has been built directly above.

The constant drilling by the black woodpecker for nesting and feeding purposes often leaves a dying tree with a pock-marked appearance. Most of the damage, however, is caused by the wood-boring insects that the woodpecker feeds on. The woodpecker's work is almost invisible until the tree dies from insect infestation. Then the bark peels off, revealing thousands of insect-extraction sites.

DID YOU KNOW?

- **The family name *Picidae* comes from the Roman god Picus, who was changed into a woodpecker by the sorceress Circe.**
- **The head and neck muscles of a woodpecker absorb the shock of 8,000–12,000 pecks a day.**
- **Internally, the woodpecker's tongue wraps around the skull before protruding into the mouth.**

FOOD & HUNTING

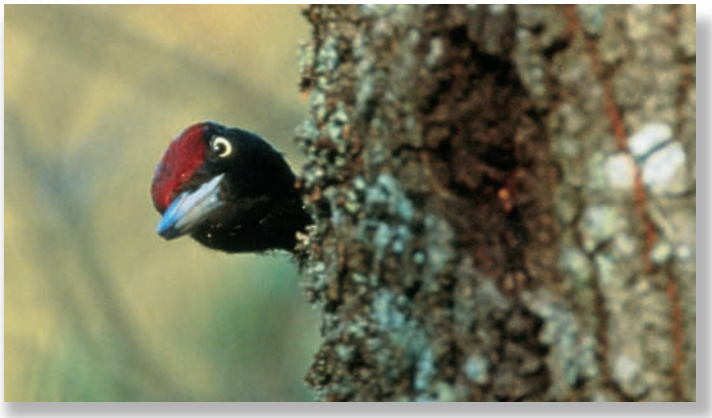
Tapping a tree with its long bill, the woodpecker detects the small, hidden tunnels made by destructive wood-boring insects. The black woodpecker's acute hearing picks up the slightest sounds made by the insect larvae as they gnaw and move within the tree. With pickaxlike blows, the woodpecker excavates and then extends its tongue to locate the edible morsels. Sensitive nerve endings guide the woodpecker's spear-tipped tongue to the tasty insects, which stick to it and are removed from their hiding place. The woodpecker also picks up insects from the surface of the tree. In the spring, it seeks a different snack — tasty sap. In addition to its importance in locating food, the rapping "tattoo" of the black woodpecker also helps define its territory. The drumming noises are used to communicate with the woodpecker's mate, as well; quieter sounds are exchanged during nest preparation and incubation of the eggs.

A PIERCING PURSUIT

1 An undulating flight...
Flying in small, wavelike movements, the woodpecker slows its approach, in preparation for landing, by swooping upward.

2 A pressing situation...
Eager to find food, it begins chiseling a deep hole in the trunk. Its tail presses against the tree, acting as a brace.

BEHAVIOR



3 A spry pry...
With its bill, the black woodpecker lifts a large piece of bark from the tree to get to the large white grub hidden inside.

4 Tasty "grub"
With the aid of its long tongue, the black woodpecker catches the insect larva and swallows it whole.

Outside of the breeding season, the black woodpecker lives alone. It carves holes used for sleeping, called dormitories, with the male excavating new holes more frequently than the female. Both sexes steadfastly defend their separate territories. At dawn the woodpecker ventures from the dormitory and occasionally fights with rivals along territorial borders. During incubation and fledging, the woodpecker maintains a close watch and defends the nest hole.

◀ **SHORT BREAK**
A black woodpecker glances around after drumming its unique "tattoo" of over 30 taps in under three seconds.

BREEDING

▲ **VERY HUNGRY**
A nestling almost swallows its parents bill.

As the nesting season nears, each pair decides which of their two prepared nests to use. Both the male and the female live throughout the year in holes carved specifically for solitary sleeping. The male's hole is usually better constructed, and the female bird frequently prefers it to her own for nesting. The female lays 3–5 white eggs on a bed of loose wood chips at the bottom of the nest. Both parents take turns incubating, but the male spends the night in the nest hole, while the female sleeps in her separate sleeping hole. After 12–17 days, the hatchlings emerge with pink, naked skin and closed eyes. The parents take turns feeding the nestlings. Using their bills they prod facial knobs (projecting folds of skin) at the corners of the youngs' mouths. The hatchlings then open their mouths to receive regurgitated food. As the chicks grow, they climb the nest's walls and fight for the top spot; the first one at the "doorway" is the first to eat. The nestlings excrete feces into diaperlike sacs that the parents remove to keep the nest clean.

CONSERVATION

Current populations of the black woodpecker are stable, despite loss of habitat. Occasionally damaged trees are chopped down because woodpeckers are believed to have destroyed the trees with their nests and pecking.

PROFILE BLACK WOODPECKER

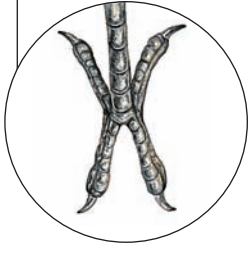
The black woodpecker, clinging tenaciously, appears to defy gravity while it drills into trees — quite a feat for the largest European woodpecker.

BILL
Sharp, straight and strong, the bill grows continuously to combat its constant wear.

TAIL
Shafts of the tail feathers end in hard spines. The stiff tail helps to prop the bird when climbing or clinging.

FEMALE
The female is less ornate, with only a small red area on the nape.

FEET
Two toes forward and two behind are designed for perching on branches, but are also used to cling to tree trunks.



VITAL STATISTICS

WEIGHT	9–12 oz.
LENGTH	17.5–19"
WINGSPAN	25–27"
SEXUAL MATURITY	About 1 year
BREEDING SEASON	March–May
NUMBER OF EGGS	3–5
INCUBATION PERIOD	12–17 days
FLEDGING PERIOD	About 4 weeks
BREEDING INTERVAL	1 year
TYPICAL DIET	Wood-boring insects, tree sap
LIFESPAN	Up to 4 years

CREATURE COMPARISONS

Unlike many colorful woodpeckers, the black woodpecker and Guadeloupe woodpecker (*Melanerpes herminieri*) blend into the dark reaches of the forest. The black woodpecker is entirely black except for the bright red on the head and/or nape. The Guadeloupe woodpecker is entirely blue-black, except for a splash of red on its breast and belly. At 3.5 oz. and 9.5", the Guadeloupe woodpecker weighs one-third as much and stands half as tall as the black woodpecker. The Guadeloupe woodpecker lives only in the humid forests of Guadeloupe Island in the West Indies.

Black woodpecker

Guadeloupe woodpecker

RELATED SPECIES

- The six families of the order ***Piciformes*** include honeyguides, puffbirds, barbets and toucans. The woodpecker family, ***Picidae***, contains more than 200 species. The seven species in the genus ***Dryocopus*** include the black woodpecker, as well as the pileated woodpecker, ***Dryocopus pileatus***. Found in North America, the pileated woodpecker is black with a red crest.

BLACKBIRD

• ORDER •
Passeriformes

• FAMILY •
Turdidae

• GENUS & SPECIES •
Turdus merula

KEY FEATURES

- Uses songs to advertise territory, court mates or sound warnings
- Occupies a wide range of habitats, but densest populations are now in suburban areas
- Raises several broods each year to offset heavy predation, especially by the domestic cat

WHERE IN THE WORLD?

From Azores and Iceland eastward through Europe, northwestern Africa and southern Asia to China; introduced to Australia and New Zealand

LIFECYCLE

A garden bird loved for its rich song and lively manner, the blackbird is accustomed to people but always wary of predators, fleeing at the slightest hint of danger.

HABITAT

The most adaptable of British thrushes, the blackbird is found in city streets as well as windy shores of remote Scottish islands. It does, however, prefer moist, shady areas and usually stays within 200 yards of cover.

Originally a bird of forests, the blackbird still inhabits all types of woodland. Since the early 19th century, however, it has spread into urban areas to become one of the most familiar species in town gardens, where lawns full of earthworms provide easy pickings.

▲ **WINTER WARMER**
A blackbird fluffs its plumage to keep cold out.

The blackbird also thrives on farmland and in other open areas, including marshes and parks, where hedgerows, thickets and bushes provide shelter. Although it is scarce in the bleaker uplands of Scotland, it occupies hilly moors, and sightings have been recorded at altitudes of up to 6,000' in mountainous regions of mainland Europe.

BEHAVIOR

Often heard during the dawn chorus and at dusk, the male blackbird's mellow song is at its best when he is proclaiming territory between early spring and midsummer. A young blackbird learns its basic song from its parents. But by copying neighboring blackbirds, and sometimes mimicking other species, it continues to incorporate new phrases into its repertoire throughout its life. The blackbird's shrill, almost hysterical, rattling alarm cries are as familiar as its song. It directs the series of anxious calls at prowling cats and other predators, such as owls.

Although mainly resident in Britain, the blackbird is migratory in the colder north of its range. Large numbers cross the North Sea from Scandinavia to winter in Britain and Ireland. The blackbird is not gregarious, but migrants travel in flocks and often roost in dense bushes or trees, sometimes with other species.

▼ **LOW PROFILE**
The female's plumage provides camouflage.

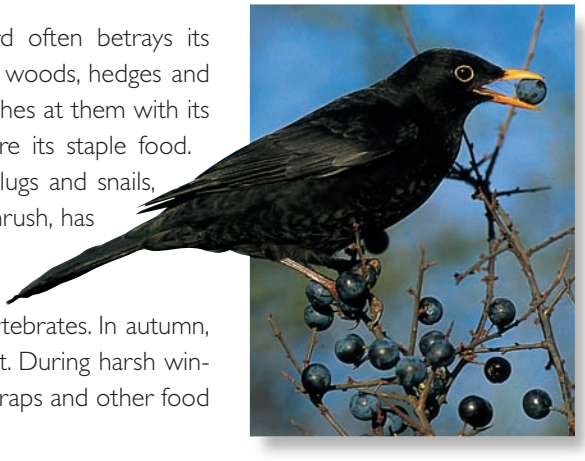
CONSERVATION

The blackbird's success is due largely to its ability to find food in many habitats, even in harsh weather where other birds starve. Six million blackbird pairs breed in Britain, and migrants from northern Europe swell the number to about 20 million in early winter.

FOOD & FEEDING

Feeding mainly on the ground, the blackbird often betrays its whereabouts as it noisily forages in leaf litter, woods, hedges and gardens. It scatters leaves with its bill or scratches at them with its feet to uncover worms and insects, which are its staple food. Loved by gardeners, the blackbird also eats slugs and snails, which it snaps up after its cousin, the song thrush, has smashed their shells against a rock.

The blackbird also forages in trees and shrubs for caterpillars, spiders and other invertebrates. In autumn, it eats berries as well as apples and other fruit. During harsh winters, the blackbird often survives on kitchen scraps and other food put out on bird feeders.



DID YOU KNOW?

- **Albino (pure white) blackbirds sometimes occur. Partial albinos, which are quite common, have white patches on black plumage.**
- **If a predator approaches its nest, the blackbird uses different calls to tell chicks whether the danger is from an animal on the ground or a bird overhead.**
- **One blackbird reportedly used a small twig, held in its bill, as a tool to sweep snow from a patch of feeding ground.**
- **The blackbird bullies smaller birds at bird feeders, but retreats when challenged by the even more aggressive European starling.**

BREEDING

Fierce, and sometimes fatal, fights occur at the beginning of the blackbird's mating season as rivals peck and slash each other with their bills and claws in disputes over territories.

The male attracts a female to his territory with his song and courts her by ruffling his feathers and fanning his tail. Pairs usually stay together for many years.

The female constructs her nest in a shrub or tree, 3–6' off the ground. But she may choose another site such as a building ledge. Using moss, grass and plant stems she forms a cup-shaped nest lined with mud. She then lays 3–5 eggs; once the chicks hatch, both parents feed them on worms and insects, especially caterpillars when available.

Road traffic and predators, such as cats, kill many chicks, and few survive the three weeks it takes them to become independent. By raising more than one brood a year, the blackbird helps compensate for such losses.

▲ **JOINT EFFORT**
The male helps his mate feed grubs to the chicks.

THE EARLY BIRD CATCHES THE WORM

1 Landing strip...
At first light, when the grass is still dew-covered and worms are near the surface, a hungry blackbird alights on a neat suburban lawn.

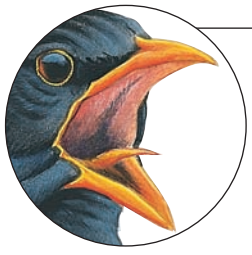
2 Stop, look and listen...
The bird runs over a small patch of ground, pausing with its head tilted to scan for any movement or sound made by prey.

3 Lightning dash...
Spotting an earthworm disappearing below the soil, the blackbird dashes over to it, ready to grab its meal.

4 Tug of war
The blackbird needs all its strength to pull the prey out of its burrow, but once it does, it swallows the worm whole.

PROFILE BLACKBIRD

Often seen flying fast and low between shrubs, with frequent changes in direction, the blackbird is also capable of high, powerful, direct flight.



BILL
Bright orange-yellow in the male, the bill is strong and pointed for probing in the soil and pulling worms from their burrows.

PLUMAGE
The male's all-black plumage is at its peak in early autumn, after his summer molt. The glossiness of fresh feathers is gradually lost through wear.

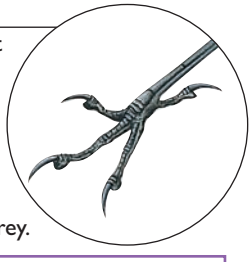
EYE-RING
The eye-rings are yellow in both sexes, but are more obvious in the male than the female.

TAIL
The tail is often lowered and fanned during courtship. The bird cocks its tail as it lands on a perch or in warning when alarmed.

WINGS
British blackbirds have more rounded wings than those that migrate from northern Europe.

FEMALE
The female is dark brown with a pale throat and mottled breast. Her bill is yellowish-brown. The juvenile is more reddish-brown, with heavier mottling.

FEET
The strong feet have sharp claws that the blackbird uses to rake the ground when searching for prey.

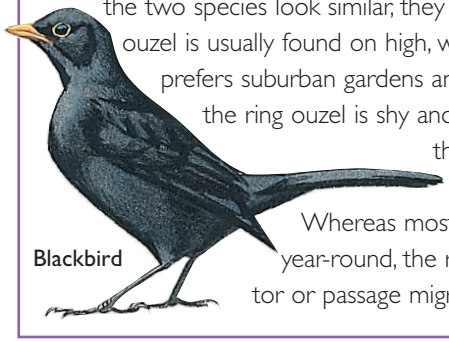


VITAL STATISTICS

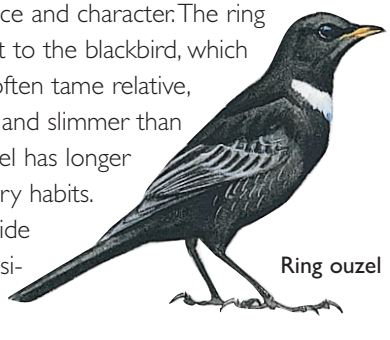
WEIGHT	3–4 oz.
LENGTH	About 10"
WINGSPAN	13–15"
SEXUAL MATURITY	1 year
BREEDING SEASON	March–July
NUMBER OF EGGS	3–5
INCUBATION PERIOD	13–15 days
FLEDGING PERIOD	12–15 days
BREEDING INTERVAL	Usually 2–3 broods a year; occasionally up to 5
TYPICAL DIET	Earthworms, insects, fruit and bird-feeder scraps
LIFESPAN	Up to 16 yrs.

CREATURE COMPARISONS

A white breast crescent distinguishes the ring ouzel (*Turdus torquatus*) from the blackbird. Although the two species look similar, they differ in habitat preference and character. The ring ouzel is usually found on high, wild moorland, in contrast to the blackbird, which prefers suburban gardens and woodland. Unlike its often tame relative, the ring ouzel is shy and restless. Slightly smaller and slimmer than the blackbird, the ring ouzel has longer wings to suit its migratory habits. Whereas most blackbirds in Britain reside year-round, the ring ouzel is a summer visitor or passage migrant.



Blackbird



Ring ouzel

RELATED SPECIES

- **The blackbird is 1 of 60 thrushes in the genus *Turdus*, which includes the American robin, *Turdus migratorius*. Another relative is the olive thrush, *T. olivaceus*** (below)**, which is a common sight in suburban areas of southern Africa.**

Blue-and-Yellow Macaw

• ORDER •
Psittaciformes

• FAMILY •
Psittacidae

• GENUS & SPECIES •
Ara ararauna

KEY FEATURES

- One of the largest and gaudiest of all parrots, familiar worldwide as a showpiece cagebird
- Lives in tropical forests, where it flies just above the canopy in noisy, squawking flocks
- Uses its massive bill to crack open tough nuts and hard seedcases
- Eats clay, possibly for important minerals and to aid digestion

WHERE IN THE WORLD?

Native to forested lowland areas of Central and South America, from eastern Panama south through the Amazon basin to northern Bolivia and southeastern Brazil; also on Trinidad

LIFECYCLE

Although the blue-and-yellow macaw is a familiar sight in exotic collections, zoologists are only now piecing together knowledge of the lifestyle and habits of the bird in the wild.

HABITAT

The blue-and-yellow macaw is a bird of the treetops, spending most of its time in the upper canopy. Throughout its range, it shows a preference for trees close to water, finding ideal conditions near rainforest lakes and rivers, in seasonally flooded forests, palm-filled swamps and in the forests that line the rivers flowing through drier savannah habitats. The species is less common in hilly terrain and is found in only a few places above 1,650'.

▲ **PARROT FASHION**
In remote areas, this is the most common macaw.

BEHAVIOR

The blue-and-yellow macaw spends much time under the cover of canopy foliage or fronds of tall palms to avoid being detected by large eagles — its main predators. When it takes to the air, its rich colors and screeching calls make it highly conspicuous; to compensate, it flies quickly and directly through the trees.

Most blue-and-yellow macaws live in pairs or family groups. Pairs may join other blue-and-yellow macaws to form flocks, especially at feeding or roosting sites and during trips to and from these areas. Large congregations also gather at clay-licks: cliffs of bare clay exposed by river erosion. Here, the macaws cling to the surface and nibble pieces of clay. This may help detoxify the potentially harmful chemicals in some food, especially unripe fruits, which produce toxins for their defense. Clay may also provide essential minerals, such as calcium, that are otherwise lacking from the bird's diet.

▲ **LIFELONG PALS**
Blue-and-yellow macaws probably pair for life.

DID YOU KNOW?

- **The demand among bird collectors for blue-and-yellow macaws is so high that some will pay over $2,400 for one bird.**
- **In places where good nest sites are scarce, macaw pairs have been known to kill any resident fledglings of their own kind and take over the nest.**
- **The blue-and-yellow macaw's bill is so strong and powerfully muscled that it can crack open the hardest Brazil nut.**

FOOD & FEEDING

Flocks of macaws leave their roosting site early in the morning in search of food. Studies in Guyana have shown that flocks fly for long distances to feed, especially when a favorite food, such as the fruit of the jabillo tree, is in season. When feeding, a flock is silent and each bird hides among high branches, giving its presence away only by a shower of dislodged twigs, leaves and discarded food.

Unlike most birds, the blue-and-yellow macaw favors unripe seeds and fruit, despite these items often being protected by tough skins and unpalatable chemicals.

◀ **FOOTHOLD**
Grasping fruit with its claw, the macaw strips the skin and scoops out the flesh with its bill.

▲ **TWO IN THE BUSH**
Palm trees provide cover from predatory eagles.

BIRDS OF A FEATHER

1 Settling down...
Macaws typically spend the night in a nest hole, often in a deep cavity in the decaying trunk of a tree. Early each day, before setting off to feed…

2 Close bonds...
…the two birds spend several minutes grooming one another, strengthening the pair bond between them.

3 Taking flight...
With a squawk, the birds set off for food. Flying fast over the forest, they may travel up to 15 miles to find a good source of nuts or fruit.

4 Dinner party
Some nut-bearing palms have already attracted other blue-and-yellow macaws. The pair joins the flock, but remains close together.

BREEDING

The breeding season of the blue-and-yellow macaw varies across its tropical range. The normal clutch is two white eggs, which the female incubates alone for four weeks. Chicks hatch blind and featherless, and spend three months in the nest hole until they're fledged. Even after they fledge, they remain with their parents for up to a year and breed only after another two or three years.

▲▼ **TREE HOUSE**
A nest site in a palm *(top)* or abandoned woodpecker hole *(below)* is valued.

CONSERVATION

Deforestation and illegal capture of the bird for the pet trade are the biggest threats to the blue-and-yellow macaw. Its low birthrate also hampers its recovery, a problem made worse by trappers who cut down nesting trees to capture fledglings.

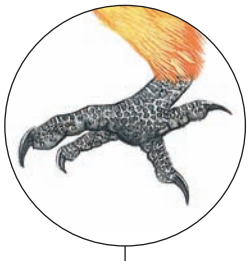
PROFILE BLUE-AND-YELLOW MACAW

Despite its dandyish plumage, the blue-and-yellow macaw is remarkably well camouflaged in its rainforest habitat.

BILL
The heavy, hooked bill is extremely powerful and easily capable of cracking tough nutshells.

TAIL
The very long tail helps the macaw balance while it perches high in the upper forest canopy.

PLUMAGE
Vivid blue upperparts contrast with bright yellow underparts and help camouflage the macaw among the sun-dappled foliage of the forest canopy.



FEET
In common with all parrots, the feet have two backward-pointing and two forward-pointing toes. This provides the macaw with a secure grip on branches and bark as well as the ability to manipulate food.

FACE
Unlike most other parrots, macaws have bare, or lightly feathered, faces. The pattern of dark lines on the face is unique to individual birds.

VITAL STATISTICS

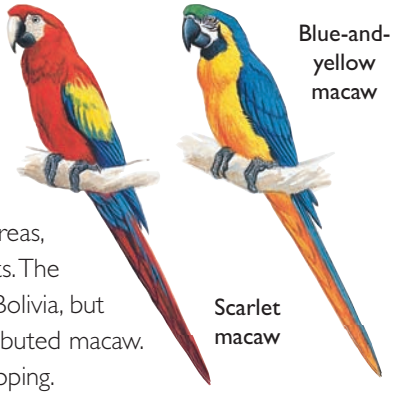
WEIGHT	1.5–2 lbs.
LENGTH	Up to 3' (nearly half of which is tail)
WINGSPAN	2.5–3'
SEXUAL MATURITY	Probably 3–4 years
BREEDING SEASON	Varies with region
NUMBER OF EGGS	2
INCUBATION PERIOD	24–26 days
FLEDGING PERIOD	3 months
BREEDING INTERVAL	Usually more than 1 year
TYPICAL DIET	Seeds, fruits and nuts
LIFESPAN	Up to 50 years in captivity

RELATED SPECIES

- The parrot family, ***Psittacidae***, to which the blue-and-yellow macaw belongs, has 340 species. Among its members are lovebirds, parrotlets and the budgerigar, as well as other members of the genus ***Ara***, such as the green-winged macaw, ***A. chloroptera*** (below).

CREATURE COMPARISONS

The scarlet macaw has much in common with the blue-and-yellow macaw. Similar in size and build, it's brightly colored, widely distributed and sought after as a cagebird. The scarlet macaw has plain whitish cheek patches, lacking the individualized patterns of the blue-and-yellow macaw. The ranges of the two overlap; where they share the same areas, the blue-and-yellow macaw is more common in open habitats. The scarlet macaw is also found throughout Brazil and northern Bolivia, but ranges into southern Mexico, making it the most widely distributed macaw. The scarlet macaw is also threatened by deforestation and trapping.

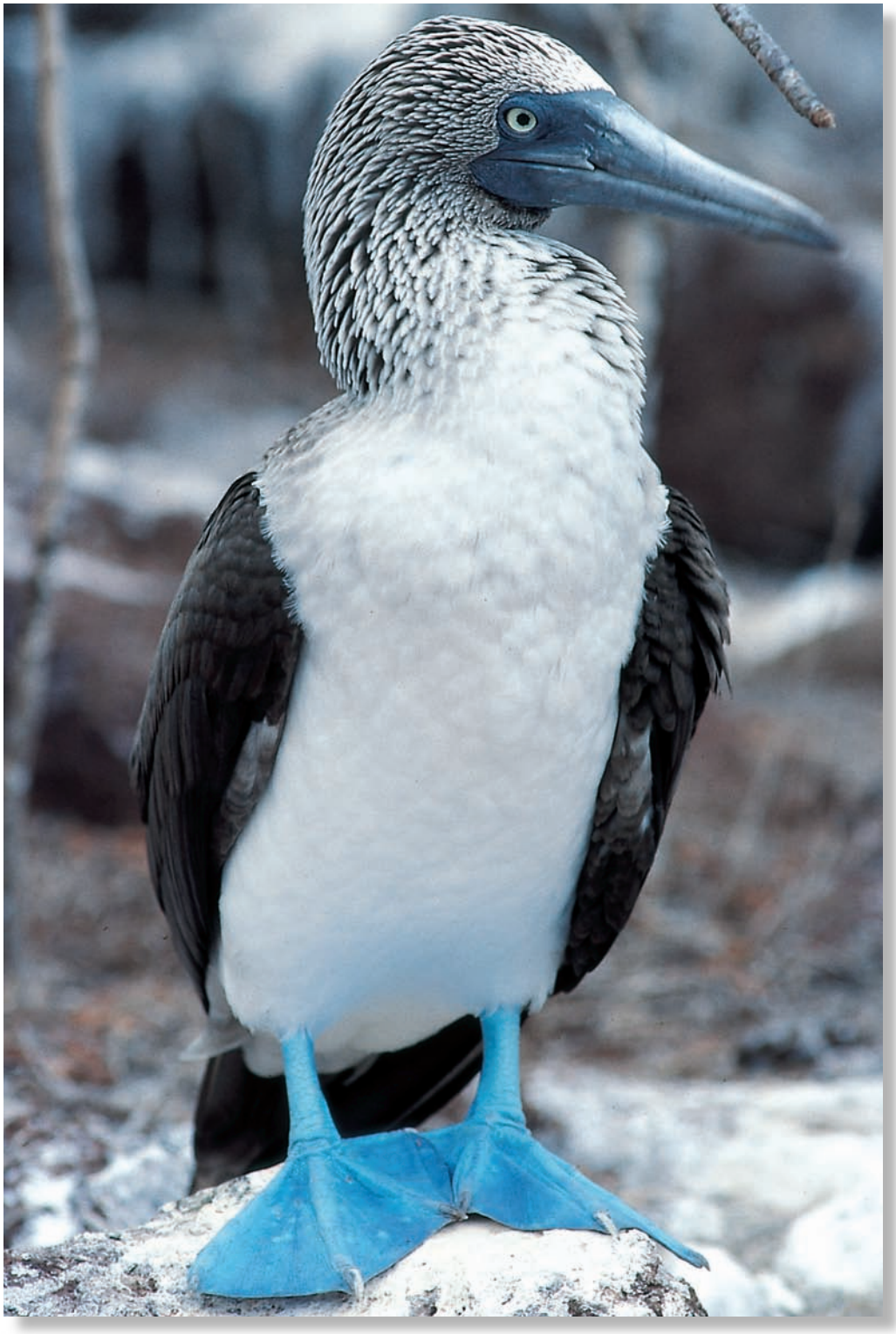


Blue-footed Booby

• ORDER •
Pelecaniformes

• FAMILY •
Sulidae

• GENUS & SPECIES •
Sula nebouxii



KEY FEATURES

- Plunge-dives into the sea from 100' above to plunder the abundant shoals of fish found in tropical offshore waters
- Breeding pairs use brightly colored webbed feet and facial skin in ritualized displays and greeting ceremonies
- Highly sociable year 'round, nesting in large colonies and fishing cooperatively in groups of up to 200 birds

WHERE IN THE WORLD?

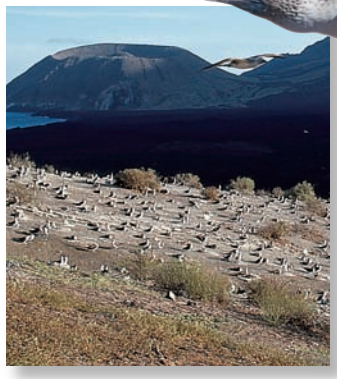
Coastal and offshore waters of western North and South America, nesting on rocky coasts and islands from Baja California to Peru; an isolated population of about 10,000 pairs nests on Galapagos Islands

LIFECYCLE

Diving from the sky with purposeful grace, the blue-footed booby plunges through the surface of the sea and powers along underwater in pursuit of shoals of fish.

HABITAT

Skies above tropical and sub-tropical waters off the western shores of North and South America, from Mexico to Peru, are the domain of the blue-footed booby for nearly all its life. Deep, cold currents flowing north from the Antarctic rise to the surface in this region. These cold upwellings are nutrient-rich and bring plentiful stocks of plankton, fish and squid to the surface — productive feeding grounds for the booby.



▲ **MASS PRODUCTION**
Breeding colonies have thousands of booby pairs.

Following currents as they change with the seasons, the booby keeps track of waters with the best fish supplies. It comes ashore only to breed on rocky, mainland coastlines or small, barren islets.

▲ **DOUBLE ON THE ROCKS**
Rocky coasts, especially those with steep, bare cliffs, become the booby's home when it flies ashore to nest.

FOOD & FEEDING

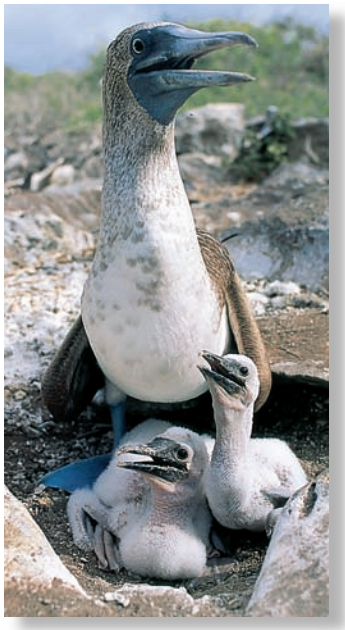
Upwellings of cold currents, such as the Humboldt Current off Peru, yield a rich supply of pilchards, anchovies and sardines: principal food of the booby. Large shoals of these fish fall under repeated "dive-bomb" attack when boobies gather to feed. The blue-footed booby feeds in groups of up to 200 birds, often in the company of flocks of the Peruvian booby (*Sula variegata*).

Sometimes, the booby feeds cooperatively, with several birds diving together at a given signal — usually a whistle by a male. As the first wave of boobies hits the water, the fish scatter, improving the success rate of the next wave of boobies.

DID YOU KNOW?

- **"Booby" comes from the Spanish word *bobo*, meaning "stupid." This refers to the birds' lack of fear, making them easy to catch.**
- **The blue-footed booby sometimes feeds alongside dolphins, snatching flying fish attempting to flee from the marine mammals.**
- **To cool down in the heat of the day, the booby pants by opening its bill and rapidly vibrating its bare throat skin.**

BREEDING



LIGHTNING STRIKE

1 Cruise missile...

At 100' above the sea (twice the height of an average two-story house), a booby identifies a shoal of sardines in the sea below.

2 Lock on...

Plummeting headlong in a steep dive, the booby pulls its wings back parallel to its body before hitting the water.

3 Dive and seek...

Fish scatter as the booby hits the sea. Momentum of its high dive, aided by rapid paddling of its feet, lets it reach a depth of 30'.

4 Mission over

The booby quickly selects its target and, after a brief pursuit, snatches a fish in its pointed bill and heads for the surface.

BEHAVIOR

The booby is highly sociable, and birds frequently encounter new individuals, especially in dense breeding colonies. The birds use complex displays to show aggression, recognition and friendship.

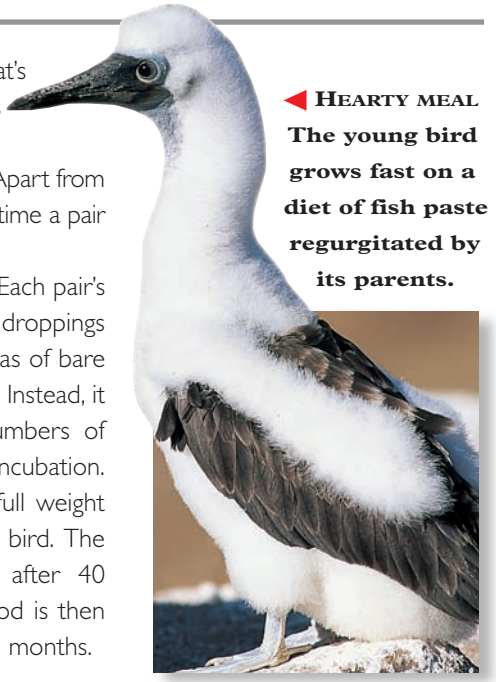
A range of displays promotes and maintains bonds between mates. When flying toward his incubating mate in a colony, a male pushes his brightly colored, blue feet forward for her to see just before he lands. While facing her on the nest, he rocks back and forth, lifting one leg, then the other, to show off the blue webbing of his feet. Other displays include stretching vertically and turning the head sideways, as if avoiding eye contact.

▼ **BALLET DANCER**
A display involves pointing the bill up to the sky.

Like other seabirds that depend on a food source that's unpredictable in supply and distribution, the booby adapts its breeding cycle to suit its circumstances. It pairs with a regular mate, but doesn't nest at the same time each year. Apart from food availability, the onset of breeding is influenced by the time a pair has spent together and its success rate of rearing young.

When it breeds, the booby gathers in large colonies. Each pair's crude nest becomes surrounded by sun-hardened white droppings (*guano*). The booby doesn't develop brood patches (areas of bare skin on the breast) to warm the eggs during incubation. Instead, it uses the webs of its large feet, which have large numbers of prominent blood vessels, to transmit heat essential for incubation. The eggs are thick-shelled so they can withstand the full weight of an incubating bird. The two eggs hatch after 40 days and the brood is then fed for over three months.

◀ **BARE ESSENTIALS**
The nest is a simple hollow scraped out of bare ground.



◀ **HEARTY MEAL**
The young bird grows fast on a diet of fish paste regurgitated by its parents.

CONSERVATION

The blue-footed booby isn't under any serious threat, with a stable population of about 100,000 pairs. The Galapagos Islands are home to a tenth of these; this population, while healthy, is vulnerable to predation by feral dogs and cats. Intensive fishing may threaten the booby as fish stocks decline. Already, growing numbers of the birds are becoming fatally entangled in lines and nets while out at sea.

PROFILE BLUE-FOOTED BOOBY

A sleekly shaped body and self-sealing nostrils let the blue-footed booby plunge smoothly into the sea to snatch fish in its daggerlike bill.

NOSTRILS
Nostril openings on the top of the bill have become permanently closed and don't function. Secondary nostrils on the sides of the bill, just in front of the eyes, close automatically by movable flaps when the bird dives into the sea.

JUVENILE
Young have browner body plumage than their parents, as well as dull-colored feet and facial skin. When breeding, adults display their brightly colored parts, so the drab tones of a juvenile reduces the risk of it being mistaken for a breeding rival and injured in squabbles.

EYES
The blue-footed booby has binocular vision, enabling it to pinpoint its prey with great accuracy. Both eyes face forward, focusing on the same objects — but from a fractionally different angle. By comparing the two images it receives, the brain determines the exact distance to all objects.

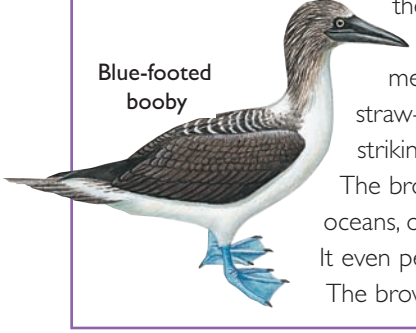
BILL
The mandibles of the long tapering bill have sharp cutting edges. These help the booby keep a hold on slippery fish.

FEET
Broad webs between the toes of the bright blue feet provide strong paddle power while the booby swims. The feet also help keep the eggs warm during incubation.

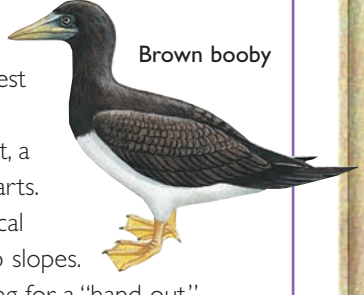
VITAL STATISTICS

WEIGHT	2 lbs.
LENGTH	2.5–3'
WINGSPAN	5'
SEXUAL MATURITY	2–3 years
BREEDING SEASON	Seasonal and opportunistic, depending on food supply
NUMBER OF EGGS	1–3, usually 2
INCUBATION PERIOD	41 days
FLEDGING PERIOD	102 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Sardines, flying fish, pilchards, mackerel, anchovies
LIFESPAN	10–20 years

CREATURE COMPARISONS



In northern tropical waters off Baja California, the blue-footed booby is found near the brown booby (*Sula leucogaster*). The smallest member of its family, the brown booby has a straw-colored bill and bright-yellow legs and feet, a striking contrast to its chocolate-brown upperparts. The brown booby occurs widely across the tropical oceans, often nesting and roosting on cliffs or steep slopes. It even perches on outriggers of fishing boats, waiting for a "hand out." The brown booby performs extensive aerial displays when courting.



RELATED SPECIES

- **The 9 species in the family *Sulidae* divide into two groups: 3 gannets in temperate oceans and 6 booby species (all have tropical ranges). Gannets are larger than boobies, with a similar shape and fishing technique. Apart from black wingtips, they're mainly white. Gannets and boobies are in the *Pelecaniformes* order, which includes pelicans, frigatebirds and cormorants.**

Blue Tit

• ORDER •
Passeriformes

• FAMILY •
Paridae

• GENUS & SPECIES •
Parus caeruleus

KEY FEATURES

- A small, common bird with striking blue and yellow plumage
- Forages in woodlands and hedges for small invertebrates
- A visitor to garden bird feeders, where it shows acrobatic skill and a flair for obtaining food from awkward places
- Forms flocks in winter, mixing with other species to find scarce food

WHERE IN THE WORLD?

Breeds throughout most of Europe as far east as Russia and Ukraine; also common in northwestern Africa; occurs in Middle East from Turkey and Syria to Iraq

LIFECYCLE

With unflagging energy, the blue tit explores its surroundings, searching crevices for tasty morsels and holes for potential nesting sites.

HABITAT

The blue tit thrives in wooded habitats, including palm-fringed Saharan oases and Mediterranean olive groves. It avoids conifer plantations, preferring deciduous trees.

On agricultural land, the blue tit inhabits orchards, thickets and hedgerows, and is often found around farmyards in winter; when the weather turns cold, it forages on open fields and among reedbeds.

The blue tit's familiarity as a garden bird has grown with the increase in nestboxes and bird feeders. Parks and tree-lined avenues also provide suitable breeding territories.

◀ **TINY BUT TOUGH**
The blue tit is a hardy bird and can survive the coldest winters.

CONSERVATION

The blue tit suffers from predation and periodic failures of natural food, particularly caterpillars lost to wet summers. However, its large broods and regular use of bird feeders ensure that it remains abundant. It is common in the British Isles, where an estimated population of over 4 million pairs is double that of the great tit.

FOOD & FEEDING

The blue tit's agility and curiosity make it an innovative foraging bird. By prodding at any object, it discovers new food sources, such as the cream at the top of a bottle of milk — a habit that began in the 1920s.

The blue tit finds most of its prey among foliage, often hanging by one leg in order to inspect twigs, leaves and buds for insects. It uses similar acrobatics when sipping nectar from flowers. The bird holds nuts against a perch before cracking them open.

Experiments at bird feeders have shown the blue tit to be a good puzzle solver. This clever bird is able to do simple tasks in sequence to obtain a reward of food.

PRY AND PECK

1 Strip search...
A blue tit alights on a branch and rips away scraps of loose bark, looking for hidden insects.

2 Caterpillar catering...
The tit flits over to a larva beneath a leaf. Perching acrobatically, the bird snaps up its prey.

BEHAVIOR

3 Lair of the spider...
In gardens, the blue tit examines crevices, including the old, cracked putty around a window frame.

4 A juicy tidbit
The tit disturbs a spider lurking under the damaged putty and quickly snaps it up.

Pugnacious by nature, the blue tit regularly fights other small birds for food and territory in spring and summer. In winter, however, it forages in mixed flocks of small birds, including goldcrests, warblers and treecreepers. The blue tit usually dominates other species in such groups, except when the more powerful great tit is present.

In winter the blue tit may move from exposed upland areas into sheltered valleys, but it rarely travels more than 6 miles from where it hatched. In Britain, the bird is sometimes joined by its more brightly colored subspecies, which make sporadic migrations when food shortages coincide with high populations.

In summer, the blue tit roosts in trees and bushes but, uses sheltered holes in winter. Natural sites include hollows in trees, but nestboxes left in position after the breeding season also provide the bird with vital nighttime accommodations.

◀ **SPLASH OF COLOR**
The blue tit regularly uses garden birdbaths.

BREEDING

In spring, the male blue tit performs displays to attract a mate, including slow, gliding flights and vigorous prancing with his crest erected. The female frequently begs food from her mate, who responds by bringing her insects. This activity reinforces the pairbond and gives the female the extra nutrition she needs to produce a clutch of eggs.

The female builds a nest in a tree hole, wall crevice or nestbox from moss and grass, and lines it with feathers. She incubates the eggs alone, but both parents feed the chicks freshly hatched caterpillars, which are abundant at this time.

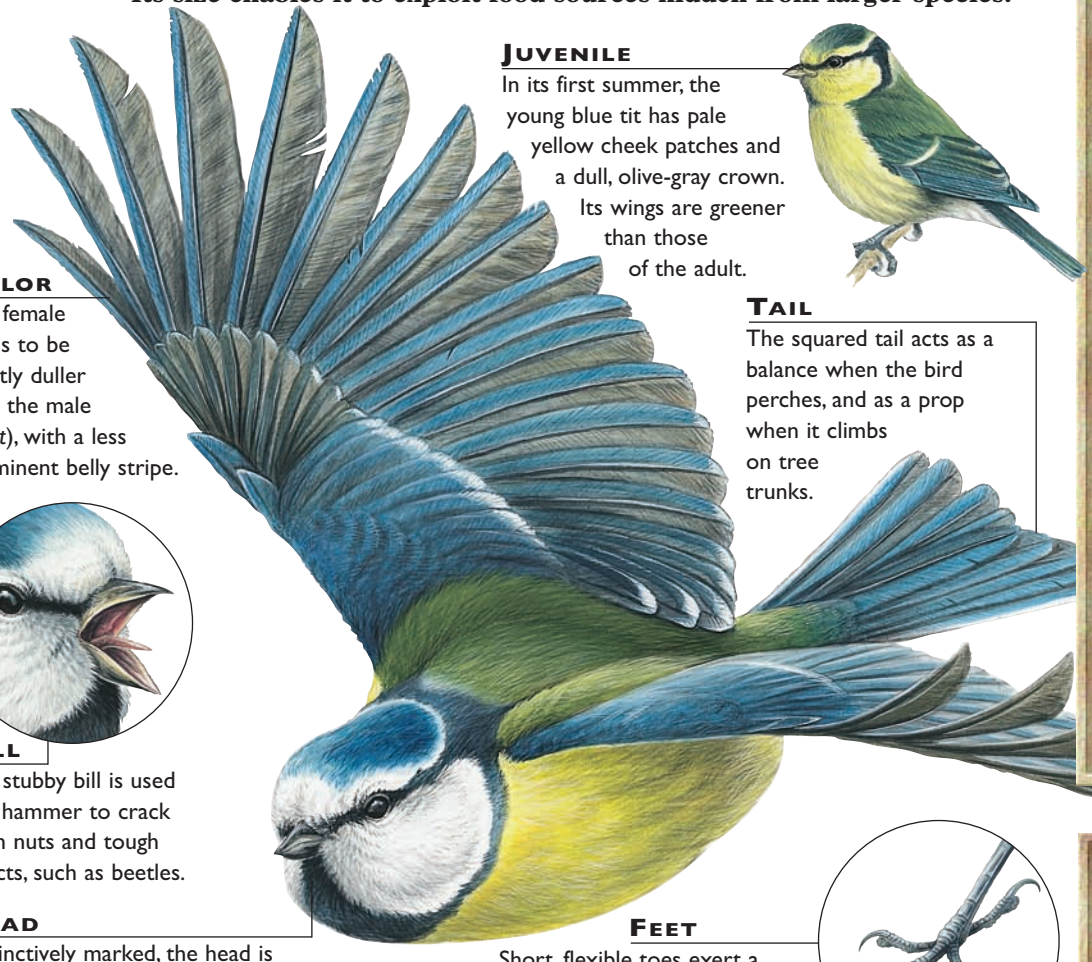
▼ **LEAVING THE NEST**
Young blue tits fledge at about 3 weeks of age.

DID YOU KNOW?

- **A bird feeder may be visited by over 1,000 blue tits in a single year.**
- **A blue tit with young spends up to 17 hours a day gathering food.**

PROFILE BLUE TIT

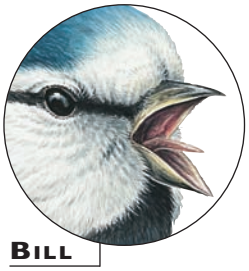
A tiny ball of energy, the blue tit forages restlessly for insects and nuts. Its size enables it to exploit food sources hidden from larger species.



JUVENILE
In its first summer, the young blue tit has pale yellow cheek patches and a dull, olive-gray crown. Its wings are greener than those of the adult.

COLOR
The female tends to be slightly duller than the male (*right*), with a less prominent belly stripe.

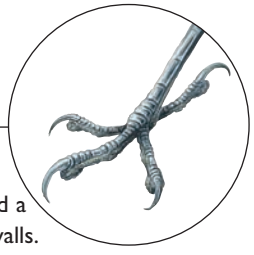
TAIL
The squared tail acts as a balance when the bird perches, and as a prop when it climbs on tree trunks.



BILL
The stubby bill is used as a hammer to crack open nuts and tough insects, such as beetles.

HEAD
Distinctively marked, the head is square with a flat top. The bird raises the blue feathers of its crown when alarmed.

FEET
Short, flexible toes exert a strong grip. A front toe may be angled backward to give the bird a better hold on tree trunks or walls.



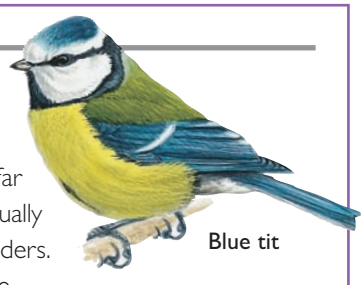
VITAL STATISTICS

WEIGHT	0.35–0.45 oz.
LENGTH	4.5"
WINGSPAN	7–8"
SEXUAL MATURITY	1 year
BREEDING SEASON	April–June
NUMBER OF EGGS	6–16
INCUBATION PERIOD	12–16 days
FLEDGING PERIOD	16–22 days
BREEDING INTERVAL	1 or 2 broods a year
TYPICAL DIET	Insects, spiders, seeds, nuts and fruit
LIFESPAN	Up to 12 years; usually 4–6

CREATURE COMPARISONS

The great tit (*Parus major*) ranks second to the blue tit as the most numerous member of the tit family in Europe. It is found in most of temperate and tropical Asia, as far east as Japan and Indonesia. An aggressive bird, it usually drives the much smaller blue tit from bird feeders. It has a loud voice and a varied repertoire, including a familiar and repetitive *teacher-teacher* song. The blue tit, by contrast, has a clearer, ringing call. The great tit eats a greater proportion of seeds and fruits than does its cousin, which feeds more commonly on insects and their larvae.

Great tit



Blue tit

RELATED SPECIES

● **The blue tit and the azure tit, *Parus cyanus*, are so closely related that they can interbreed. The genus *Parus*, to which both species belong, contains 40 species, 6 of which occur in Britain including the crested tit, *P. cristatus* (below).**

Boat-billed Heron

• ORDER •
Ciconiiformes

• FAMILY •
Ardeidae

• GENUS & SPECIES •
Cochlearius cochlearius

KEY FEATURES

- Has unusual bill that looks like a small boat hull
- A reclusive bird, it avoids humans and most other birds
- Catches prey by wading, then scooping it into its specialized bill, rather than spearing small fish as most herons do

WHERE IN THE WORLD?

Found only in limited equatorial regions of Central and South America, from southern Mexico into Bolivia and northern Argentina

LIFECYCLE

Living a reclusive life in the depths of swamps, the boat-billed heron feeds at night, then spends its days roosting among the thick trees and brush.

HABITAT

▲ **PEACEFUL PERCH**
During the day, the heron rests in thick forests.

The boat-billed heron makes its home in the warm equatorial swamps of Central and South America, ranging from Mexico to northern Argentina. When hunting, the heron prefers slow-moving or still water surrounded by heavy vegetation. The boat-billed heron chooses higher branches in trees with dense foilage for nesting, but it will spend its days roosting closer to the ground. It prefers the deep cover of mangroves or similar brush. Its choice of living conditions contributes to the heron's reclusive reputation, since its habitat is largely inaccessible to man. This, along with its being active only at night, means some biological aspects of the heron remain unknown.

DID YOU KNOW?

- **Some experts believe that the boat-billed heron should receive its own family classification since it differs so much from even its most immediate relations.**
- **The boat-billed heron is the only species of bird whose chicks are born with two teeth used to peck through the shell when hatching.**

BREEDING

At breeding time, both the male and female boat-billed heron perform preening and bill-clattering displays to attract a mate. Mated pairs will stay together for several weeks, often returning to the same flat stick nest for many seasons. The boat-billed heron typically builds its nests in thick branches 12–30' above the ground, though it may make use of nests abandoned by other birds if the opportunity presents itself.

Mating season for the boat-billed heron depends on the amount of rainfall in its particular region. Pairs wait for the rainy season when food is plentiful before the female lays 2–4 eggs. Incubation and rearing of the helpless chicks is shared.

▲ **CLUTCH PERFORMANCE**
The heron lays its eggs during the rainy season.

▼ **FEED ME**
Herons exchange food as a part of their courting.

FOOD & FEEDING

The boat-billed heron feeds mainly at dusk and at night. Scooping up food in its large, curved bill, the heron's enormous, circular eyes give it superior night vision, allowing it to spot potential prey in almost total darkness. Even without its keen night vision, the boat-billed heron would be a formidable predator to small marsh animals. The bill is the most specialized feeding adaptation of the boat-billed heron. It has an incredible level of sensitivity that allows the heron to feel even the most minute movements in the water.

Primarily a solitary feeder, the boat-billed heron waits patiently and silently for prey to approach. Its most common victims are small crustaceans, crabs, shrimp, insects and small fish that it scoops up by the mouthful in its large bill. The large bill is also used to rake muddy bottoms, where it can turn up mollusks, annelids and insect larvae.

GOOD THINGS COME...

1 Standing patiently...
Motionless but attentive, the boat-billed heron watches intently for signs of movement in the water.

2 Unsuspecting victim...
Oblivious to the heron, a frog swims through the water. The heron spots the frog and prepares to scoop up its prey.

3 A scoop full...
The frog tries to flee but stands little chance of escape as the broad bill sweeps through the water in a wide swath.

4 Down the hatch
The heron tosses its head back and swallows the frog alive and whole. The frog is destroyed by the heron's strong digestive juices.

BEHAVIOR

Essentially a shy and mysterious bird, the boat-billed heron is unlikely to be seen in the open during daylight hours, leaving cover only at dusk to feed throughout the night. As one of the most nocturnal species of herons, it spends its day sleeping completely hidden in the bushes.

▶ **NIGHT LIFE**
The heron emerges at dusk to begin feeding.

The boat-billed heron is nonmigratory, as its native habitat is essentially within warm equatorial regions. Normally a mated pair of boat-billed herons will return to the same nest for many years during the breeding season and while rearing young. Pairs of boat-billed herons mate for life.

CONSERVATION

The lack of information about the boat-billed heron makes accurate estimates of its numbers difficult. It is believed, however, that because of the lack of predators and the near impossibility of human intrusion into its habitat, the heron populations are stable.

PROFILE Boat-billed Heron

The exaggerated eyes and bill of the boat-billed heron give it an unusual appearance, but these features serve it well during nighttime hunts.

Juvenile

The young heron's downy feathers are gray-brown with occasional buff, pink and cinnamon highlights. The juvenile achieves its blue-gray adult coloration after its third molt.

Bill

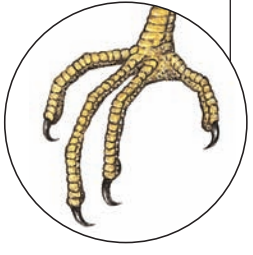
The bill, which may be up to 2" wide, is used for scooping up small invertebrates and dredging the bottom of lakes and pools for other edibles.

Plumage

Adult herons have specialized feathers that never molt; instead, they fray from the tip and grow continuously. As they fray, they turn to a powder that helps protect other feathers. The heron uses the powder to remove slime and oil.

Feet

The boat-billed heron has unwebbed feet with strong toes. The heron roosts in trees, and its claws are designed for grasping branches.



Vital Statistics

Weight	4–7 oz.
Length	17.5–24"
Wingspan	Up to 30"
Sexual Maturity	Unknown
Breeding Season	Varies according to amount of rainfall
Number of Eggs	2–4
Incubation Period	23–28 days
Fledging Period	Unknown
Breeding Interval	1 year
Typical Diet	Crustaceans, insects, worms
Lifespan	Unknown

Related Species

- **The family *Ardeidae* contains only 4 genera, which in turn contain about 60 species, which include all herons, egrets and bitterns. By far the largest genus is *Ardeinae*, which contains the 34 species of day herons. The genus *Nycticoracinae* contains only 8 species, and all 7 species of night herons. The boat-billed heron is the only species in the genus *Cochlearius*.**

Creature Comparisons

Boat-billed heron Yellow-crowned night heron

Much like the boat-billed heron, its cousin the yellow-crowned night heron *(Nycticorax violaceus)* is fond of mangrove, cypress and river swamps. Though more widespread than the boat-billed heron, it shares its feeding habits, subsisting on a diet of small crustaceans, insects, an occasional fish and other aquatic creatures. It resides from as far north as Nova Scotia, throughout Canada, the U.S. and Central and South America. Like the boat-billed heron, the yellow-crowned night heron has a broad, short bill built for scooping. But unlike the boat-billed heron, its bill is still sharp enough to be employed in the traditional heron hunting method of spearing fish.

Bohemian Waxwing

• ORDER •
Passeriformes

• FAMILY •
Bombycillidae

• GENUS & SPECIES •
Bombycilla garrulus

KEY FEATURES

- Has waxlike ornaments on its wings, and thick feathers to insulate it from sub-Arctic temperatures
- Sporadically leaves home to roam when its food supply cannot support the population
- Indulges in a courtship display, where a gift is passed back and forth between a mating pair

WHERE IN THE WORLD?

Breeds in sub-Arctic regions of northern Europe, Siberia, Alaska and western Canada; usually migrates south of its breeding range in autumn

LIFECYCLE

The Bohemian waxwing usually spends winter in northern forests, but when facing starvation it wanders long distances, never knowing where it will find its next meal.

HABITAT

▲ **SEEING RED**
The waxwing is attracted by trees with ripe berries.

The Bohemian waxwing breeds in largely coniferous taiga forests that span the sub-Arctic, south of the treeless tundra. These dense woods are dominated by pine and spruce, which tower over deciduous birch and aspen. The largest populations live in the lowlands, with others on the slopes of upland valleys.

In autumn, the bird leaves the conifer forests and moves south of its breeding area where rowan, or mountain ash, is numerous. However, when circumstances force the waxwing to make long migrations, its habitat changes far more dramatically. A bird accustomed to wild surroundings adapts readily to life among city parks, town gardens or wherever there are berry-bearing trees.

BEHAVIOR

▲ **WAXWORKS**
These sociable birds feed and breed in large flocks.

The Bohemian waxwing, like other birds that breed in the Arctic, has a boom-or-bust lifecycle. Every 10 years or so, when its population exceeds the limited winter food supply, the risk of starvation forces the waxwing to flee its home in a large-scale migration, known as an irruption.

An irruption occurred in January 1996, when 10,000 waxwings invaded Britain. In the U.S., New England felt this same influx with hundreds showing up in areas where they had not been seen before.

Many waxwings die of starvation or exhaustion in irruption years. When survivors return to their breeding grounds, the natural habitat is rejuvenated and can support the reduced numbers. The population increases until the next winter food crisis. The waxwing has a peaceable nature and spends most of its life in flocks. Its voice is feeble, consisting of a quiet trill, given in flight.

FOOD & FEEDING

▲ **OPPORTUNITY KNOCKS**
The waxwing waits to snap up any passing insects.

From autumn to spring, the Bohemian waxwing eats the berries of conifer trees and shrubs, especially mountain ash.

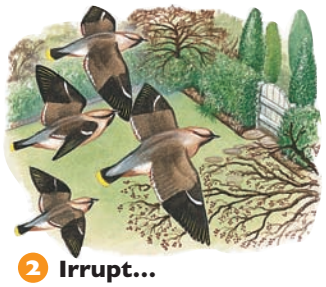
It eats buds, flowers, young shoots, leaves and even tree sap in early spring, after the berry season has finished and before the emergence of insects.

In the brief summer, which is also its breeding season, the waxwing exists mostly on mosquitoes and midges. It dashes out from treetops to snap them up in midair before returning to the same perch. Sometimes it feeds by zigzagging through an insect swarm.

DRIVEN TO MIGRATION

1 Plunder...

The Bohemian waxwing favors mountain ash berries, so the supply is soon exhausted. If food is scarce, waxwings scatter in search of food.



2 Irrupt...

Flocks abandon their regular wintering areas and search for any trees that still bear berries; gardens are often their only hope.

3 Settle...

Many waxwings descend on a single tree and strip it before moving on. They feed acrobatically, often hanging upside down on branches.

4 Feast

The waxwing eats up to three times its weight of fruit in a day. Individuals have been known to swallow 300 berries in two hours.

DID YOU KNOW?

- **The Bohemian waxwing drinks copiously to help digest large quantities of berries. It eats snow and catches snowflakes.**
- **Before the waxwing's mysterious appearances in places where it was unknown nor understood, it earned a reputation as a bird of ill omen. In the Netherlands, where it is still known as "pest bird," people believed the waxwing brought with it war, pestilence and famine.**

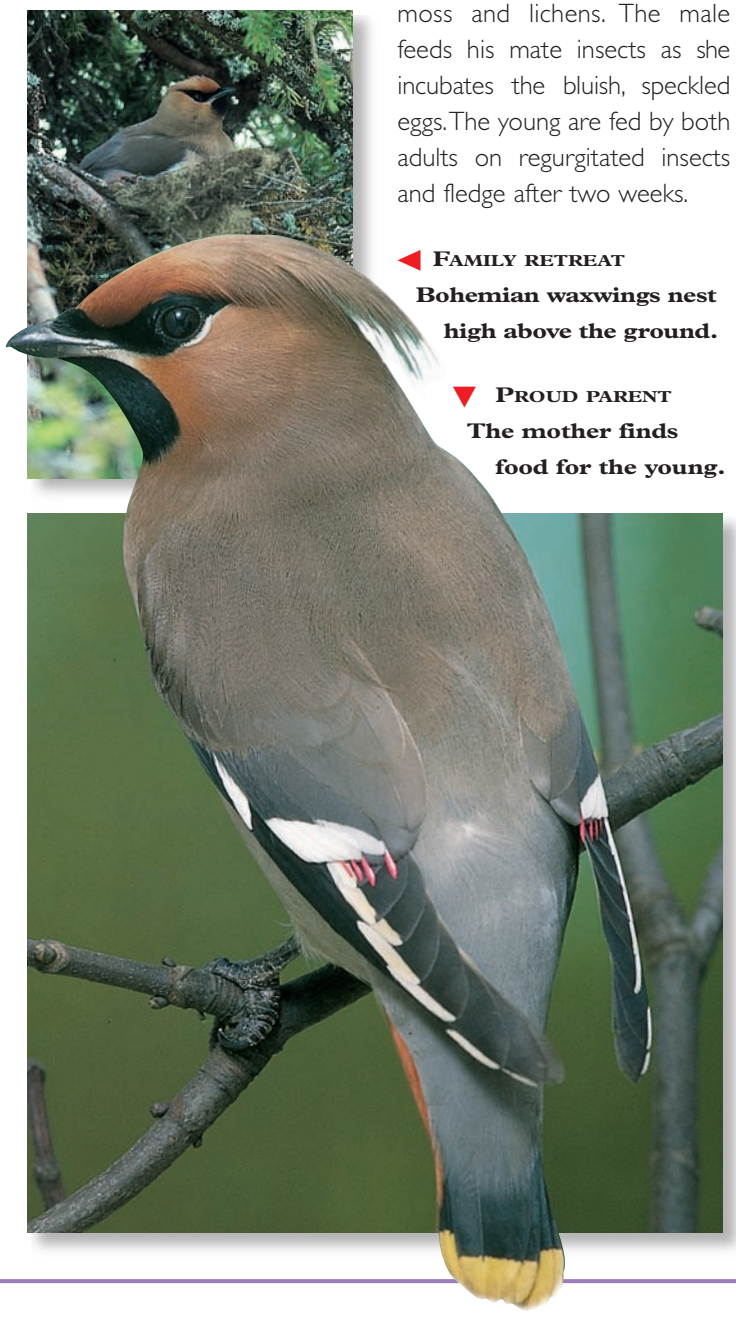
CONSERVATION

Bohemian waxwing numbers fluctuate naturally with the winter berry crop. Logging in the bird's breeding areas may cause short-term local declines, but there are no threats to its future on a wider scale. The trend toward labor-saving gardening — which has brought an increase in the planting of berry-bearing shrubs and ornamental trees — is helping more waxwings survive severe winters.

BREEDING

When the breeding season starts in May, the male looks for a mate. He courts a female by passing her a "gift" in his bill. It may be a berry, insect, ant pupa or even an inedible piece of bark. A receptive female receives the gift and holds it in her bill for a few seconds before returning it to her suitor. The male also raises his crest and puffs up his rump and belly feathers to make himself look larger and almost spherical. In addition, he chases the female in flight.

Stunted pines with hanging lichen are favorite nest sites. The nest is an open cup made from a base of twigs, lined with grass, reindeer moss and lichens. The male feeds his mate insects as she incubates the bluish, speckled eggs. The young are fed by both adults on regurgitated insects and fledge after two weeks.



◀ **FAMILY RETREAT**
Bohemian waxwings nest high above the ground.

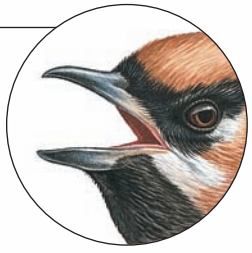
▼ **PROUD PARENT**
The mother finds food for the young.

PROFILE BOHEMIAN WAXWING

The elegantly crested Bohemian waxwing is easily identified by the loud, rattling noise made by its wing appendages during takeoff and landing.

CREST
The adult male's head plumes normally sweep upwards and reach a length of 2–3". The female's head plumes are a little shorter and sweep backward.

BILL
The waxwing has a short, stubby bill and a wide mouth, enabling it to swallow most berries whole.



WINGS
The species gets its name from the red, waxlike appendages that extend from the tips of the inner wing feathers.

JUVENILE
The young waxwing has a shorter crest and is drabber than its parents. It lacks the black bib, and the few red tips on its wings are very small.

TAIL
The short, black tail has a bold yellow tip. Some birds have waxy red tips on their tail as well as on their wings.

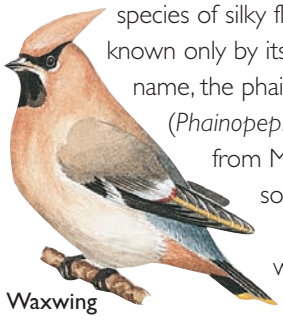
VITAL STATISTICS

WEIGHT	1.75–2.8 oz.
LENGTH	8"
WINGSPAN	13–14"
SEXUAL MATURITY	1–2 years
BREEDING SEASON	Late May –June
NUMBER OF EGGS	4–7
INCUBATION PERIOD	12–15 days
FLEDGING PERIOD	14–16 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Birch, spruce, alder seeds; fruits, buds; mosquitoes and midges
LIFESPAN	Up to 12 years

RELATED SPECIES

- **Two species, both of which are very similar to the Bohemian waxwing, share its name. The cedar waxwing, *Bombycilla cedrorum*, breeds in the U.S. and eastern Canada; the Japanese waxwing, *B. japonica*, occurs in Japan and northern Manchuria. The cedar waxwing is smaller, with no yellow on its wings; the Japanese species has a red-tipped tail but lacks waxy tips.**

CREATURE COMPARISONS



Waxwing

The waxwing family includes four species of silky flycatcher; one is known only by its scientific generic name, the phainopepla (*Phainopepla nitens*). It occurs from Mexico into southwestern U.S. The male is black with white flashes on his primary wing feathers; the female is olive-gray. The species is much slighter than the Bohemian waxwing but the same length; its tail accounts for half of its overall 8". It shares the waxwing's swept-back crest and soft plumage. It's fond of mistletoe berries, and catches flying insects in spectacular swoops.

Phainopepla

Broad-billed Hummingbird

• ORDER •
Apodiformes

• FAMILY •
Trochilidae

• GENUS & SPECIES •
Cynanthus latirostris

KEY FEATURES

- Eats more insects than most other hummingbirds
- Brightly colored bill distinguishes it from other hummingbirds
- Only the female builds the nest, incubates the eggs and cares for the young
- Moves up, down, forward and backward while hovering in the air among flowers

WHERE IN THE WORLD?

Found in North America in northern and central Mexico; also in the U.S. in parts of southeastern Arizona, southwestern New Mexico and western Texas

LIFECYCLE

The broad-billed hummingbird's brilliant colors flash in the sunlight, as the bird darts from flower to flower to collect nectar or when the male displays to females.

HABITAT

The broad-billed hummingbird is primarily a Mexican species; its range barely enters the U.S. in southeastern Arizona, southwestern New Mexico and western Texas. Whether in Mexico or the U.S., it inhabits stands of sycamore and mesquite trees at the base of mountain canyons. It also dwells in foothills in *arroyos* (dry gullies) and along the banks of streams. The bird also frequents gardens and residential areas, always searching for new foraging sites that are full of flowers. In the fall, when the weather turns cooler, the hummingbirds that venture as far north as the U.S. return to Mexico for the winter.

▲ **PERCH AND SEARCH**
A male broad-billed hummingbird scans for new flowers.

BREEDING

Broad-billed hummingbirds that migrate north to the U.S. for breeding arrive in March and April, but do not form bonded pairs. The males display for the females, showing off the iridescent markings on their throats in the sunlight in order to attract a mate. After mating, the male flies off to find another female, leaving the first female to build the nest alone. The broad-billed female uses grasses, bits of leaves and bark. She forms a small cup, usually on the branch of a small tree about 4–7' above ground, and lays her two white eggs.

After a 17–20-day incubation, the young hatch — naked, blind and totally helpless. But they have well-developed crops, and shortly after they hatch, the female begins pumping extraordinary amounts of food, both tiny insects and nectar, into her young. Even after fledging, the female continues to feed the young birds for an additional 20–40 days. In the U.S., the breeding season lasts from April to August, and a second nesting attempt is common; due to the warm weather, a third is not uncommon in the long tropical breeding season in Mexico.

FOOD & FEEDING

Like all hummingbirds, the staple of the broad-billed hummingbird's diet is nectar. Favorites include paintbrush plants (*Castilleja*) and the red blossoms of the ocotillo plant. For most of the year, the ocotillo is bare and thorny, but as soon as the spring rains arrive, scarlet flower clusters appear at the branch tips — just in time for the broad-billed hummingbird's spring arrival in the U.S. The hummingbird is able to hover and also move forward or backward to reach the sweet fluids nestled inside flowers. After inserting its bill into the flower, it opens its bill slightly and darts its tongue into the fluid. The long tongue can be extended the same length as the bill; when it is pulled back into the bill, the nectar is scraped off of the tongue. The tongue flicks in and out with great speed, from 10–15 times per second. The broad-billed hummingbird's specialized bill enables it to catch insects as well as sip nectar. Aphids, leafhoppers, root gnats, flower flies, ants, parasitic wasps and daddy longlegs are all captured either by hovering in flight, gleaning from the vegetation or stealing from spider webs. All hummingbirds expend great amounts of energy and must eat over 50% of their bodyweight in food each day. Hummingbirds, like all birds, only have about 50 taste buds — 1% of the number found in human tongues. But this amount is enough for them to differentiate between liquids. They choose the one highest in sugar — the sweetest.

NEVER-ENDING NEED

1 Still hungry...
A male takes a brief break. It remains in one place since its feet are designed only for perching.

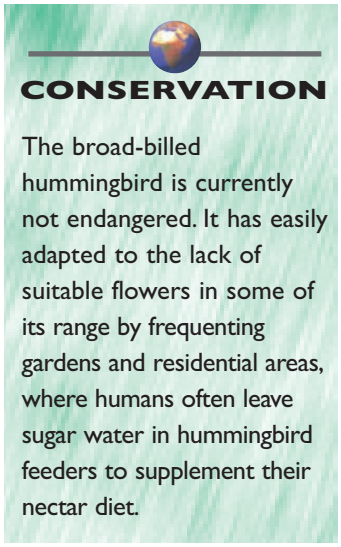
2 Forward...
Most of the hummingbird's diet is nectar; it eats over half its bodyweight in food each day.

3 Backward...
A hummingbird expertly backs away from flowers by tilting the leading edges of its wings to the rear.

4 Insects too
Its broad bill enables it to catch larger insects as well, such as a fly that comes too close.

CONSERVATION

The broad-billed hummingbird is currently not endangered. It has easily adapted to the lack of suitable flowers in some of its range by frequenting gardens and residential areas, where humans often leave sugar water in hummingbird feeders to supplement their nectar diet.



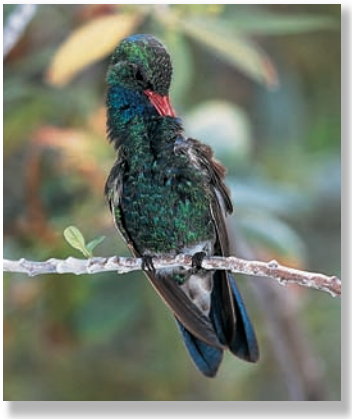
◀ READY FOR MORE
Two young chicks beg for more insects and nectar.

DID YOU KNOW?

- **Many women in the 19th century wore stuffed hummingbirds on their hats; London, Paris and New York imported 400,000 birds each per year.**
- **In all but three or four species of hummingbird, males do not even know the location of their mate's nests.**
- **Hummingbirds have the largest breast muscles of all birds relative to body size.**

BEHAVIOR

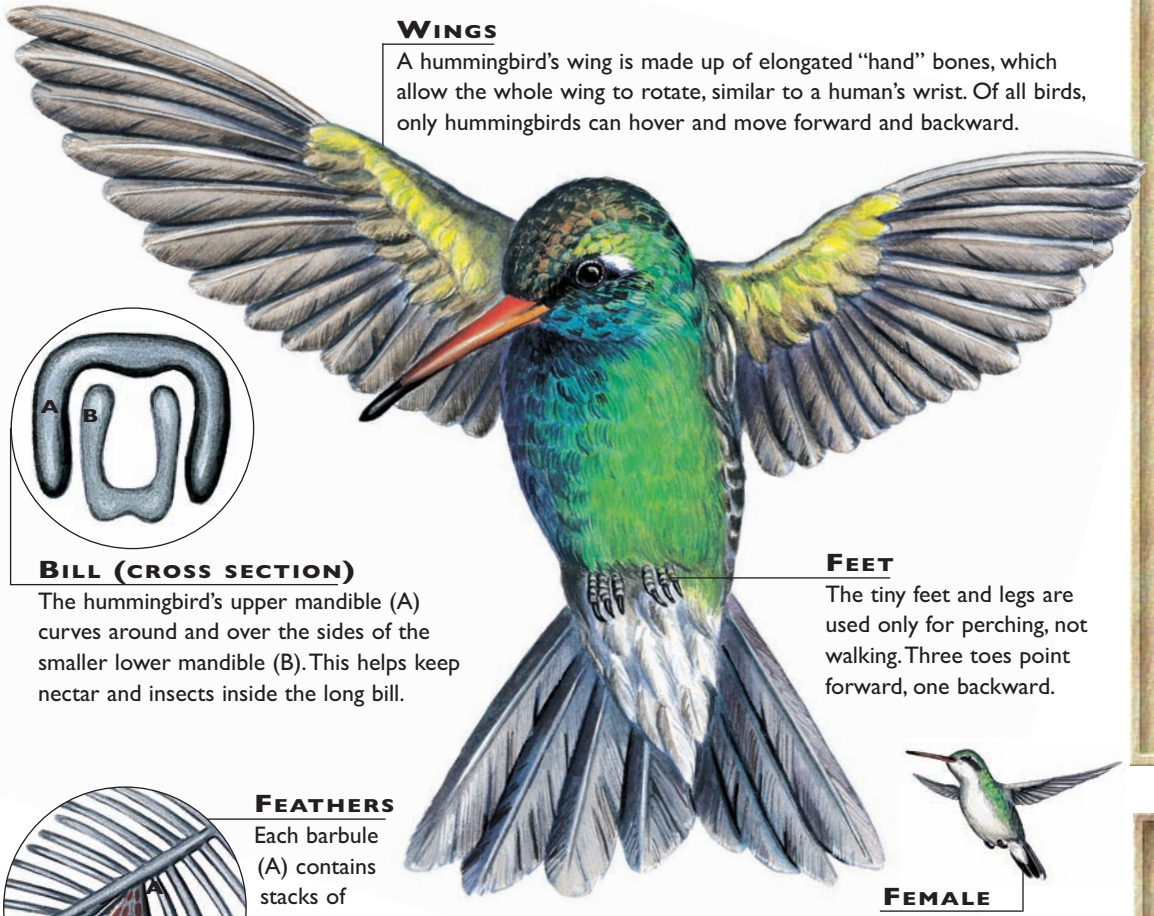
Broad-billed hummingbirds reach the U.S. only in the spring. In September and October, they migrate south to Mexico. Some birds are residents year-round in Mexico, preferring to bypass the migration, which requires extra energy. A hummingbird appears quite blurry in flight, since its wings are moving from 22–78 beats per second. The bird's shoulder joint can be rotated just like a human's wrist. The hummingbird has large breast muscles for power; it is the only bird whose upstroke of the wing provides as much power as its downstroke. The broad-billed hummingbird takes advantage of its fast speed and small size to evade predators, including hawks.



▲ STRETCH AND PECK
A male cleans his brilliantly colored feathers.

PROFILE
BROAD-BILLED HUMMINGBIRD

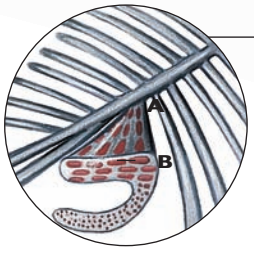
Though its brightly colored bill is adapted for catching insects, the broad-billed hummingbird also hovers near flowers to sip nectar.



WINGS
A hummingbird's wing is made up of elongated "hand" bones, which allow the whole wing to rotate, similar to a human's wrist. Of all birds, only hummingbirds can hover and move forward and backward.

BILL (CROSS SECTION)
The hummingbird's upper mandible (A) curves around and over the sides of the smaller lower mandible (B). This helps keep nectar and insects inside the long bill.

FEET
The tiny feet and legs are used only for perching, not walking. Three toes point forward, one backward.



FEATHERS
Each barbule (A) contains stacks of microscopic plates (B). Light is refracted through the tiny plates much like light through a prism, producing brilliant metallic blues and greens.

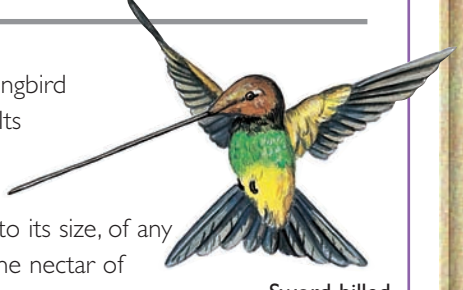
FEMALE
The female is similar to the male in coloration but she has pearl-gray underparts.

VITAL STATISTICS

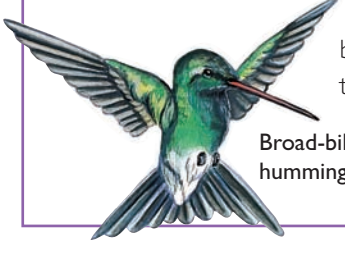
WEIGHT	Less than 1 oz.
LENGTH	3.5–4.5"
WINGSPAN	About 5"
SEXUAL MATURITY	About 1 year
BREEDING SEASON	Varies according to region
NUMBER OF EGGS	2
INCUBATION PERIOD	15–20 days
FLEDGING PERIOD	About 22 days
BREEDING INTERVAL	Up to 3 clutches per season
TYPICAL DIET	Nectar and insects
LIFESPAN	Unknown

CREATURE COMPARISONS

Measuring 7" in length from bill to tail, the sword-billed hummingbird (*Ensifera ensifera*) is larger than the broad-billed hummingbird. Its 4"-long bill is its distinguishing feature. The green, yellow and brown sword-billed hummingbird has the longest bill, relative to its size, of any bird. It uses this "sword" to reach the nectar of trumpet-shaped flowers, including fuschias. Found farther south than its relative, the sword-billed hummingbird inhabits the Andes, from Venezuela and Colombia southwest through Ecuador, Peru and Bolivia.



Sword-billed hummingbird



Broad-billed hummingbird

RELATED SPECIES

- **The broad-billed hummingbird is 1 of 315 species within 112 genera in the family *Trochilidae* — the second largest bird family in the New World. Hummingbirds range in length from 2.25–8.5" and can be found wherever nectar-producing flowers blossom. The smallest hummingbird found in North America is the calliope hummingbird, *Stellula calliope*, measuring only 3.5" from bill to tail.**

Brown Creeper

• ORDER •
Passeriformes

• FAMILY •
Certhiidae

• GENUS & SPECIES •
Certhia familiaris

KEY FEATURES

- A sparrow-sized bird of woodland and forests
- Creeps up tree trunks and along branches to probe the bark for hidden insects and spiders
- Climbs each tree in same way, by starting near its base and moving up the trunk in spirals
- Small groups survive winter nights by huddling together in spaces behind loose bark

WHERE IN THE WORLD?

Found across most of Europe and Asia to eastern China and Japan; separate populations occur in the Caucasus Mountains and Himalayas; also across most of North America

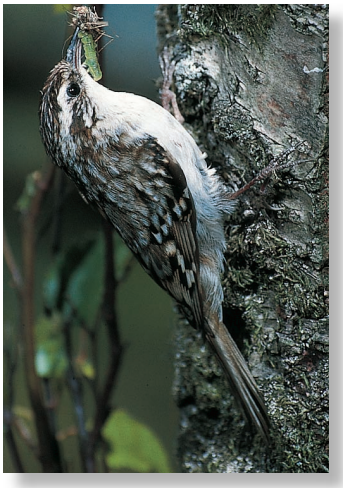
LIFECYCLE

At first glance, the brown creeper looks more like a mouse than a bird as it scurries up tree trunks, stopping every now and again to extract prey from crevices in the bark.

HABITAT

Although the brown creeper feeds in a highly specialized way, it lives in a wide range of wooded habitats, from dense forests to small woods in farmland, hedgerows, parks and wooded gardens, even in cities. It stays close to tree trunks and large branches, but is sometimes seen on small treetop twigs and on crumbling walls.

In central Europe, where the short-toed treecreeper occurs, the brown creeper is largely confined to coniferous woods and mountainous areas, so as to avoid competition for food and nest sites with its relative, which prefers deciduous woodland in the lowlands.



▲ **BURIED TREASURE**
Old trees with loose, flaking bark are best for hunting.

CONSERVATION

In harsh winters, brown creeper numbers can suffer large declines, but they usually recover within a few successful breeding seasons. Modern forestry practices have led to local declines, as the bird favors mature trees mixed in with dead or rotting timber, and avoids the fast-growing, frequently felled trees of commercial forests.

BREEDING

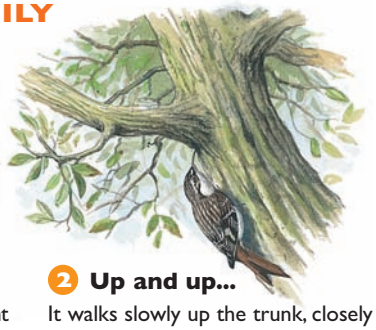
In spring, the male brown creeper regularly performs a high-pitched song from high in a tree to defend his nesting territory from rivals and to attract females. When a potential mate finally arrives, he chases her around tree trunks and through the air, shivering his wings to show off their bold coloring. As part of his courtship, he feeds her tasty morsels, delicately placing the food straight into her bill.

The pair builds a cosy nest behind loose bark or ivy, at the bottom of a hole in a tree, or in a cavity (*left*), such as that made by a lightning strike. The female usually lays 5 or 6 eggs. She incubates them alone for two weeks or so, but the male then helps her to feed the chicks for up to 16 days.

▶ **HANGING AROUND**
A recent fledgling may cling to bark for several days before making its first flight.

FEEDING THE FAMILY

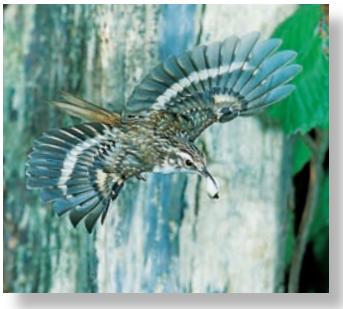
1 Flying start...
With a hungry brood to feed, a parent flies to the base of an old tree and begins to glean systematically.



2 Up and up...
It walks slowly up the trunk, closely examining every little nook and cranny in the bark as it goes.

BEHAVIOR

The camouflage on the brown creeper's upperparts makes it easy to escape the attention of humans, and is very hard for predators to spot. If pursued, it deploys evasive tactics to outwit its enemies: it runs to the other side of the tree trunk, where it can suddenly change direction, or makes quick "side-steps" across the trunk. However, its flight is weak and butterflylike.



▲ **SPRING CLEANING**
Adults remove youngs' droppings from the nest.

Except during the breeding season, the brown creeper leads a rather solitary life, staying close to its nesting territory. In winter, it may join a mixed flock of other small woodland birds in the search for food.

3 Round and round...
The brown creeper climbs in long spirals, disappearing behind the trunk to reappear again much higher up.

4 Grubs up
The only time this bird stops moving is to pause to extract an insect or grub from the bark.

FOOD & FEEDING

The brown creeper shares its woodland habitats with other insectivorous (insect-eating) birds, including warblers, kinglets, nuthatches and flycatchers, but its specialized bill can probe into places they can't reach. Most of its prey is easily pulled out and swallowed whole, but the bird sometimes struggles to pry grubs from their tight-fitting holes. The brown creeper may look like a tiny woodpecker, but it cannot peck or drill with its delicate, needlelike bill.

The brown creeper's diet consists mainly of spiders, woodlice, weevils and other small beetles, earwigs and moths. It devours adult insects and spiders, as well as their eggs and larvae, especially fat grubs and caterpillars. In winter, the brown creeper may supplement this diet with seeds, especially from pine and spruce trees.

▼ **JUICY HARVEST**
Caterpillars are a rich source of food for the brown creeper in early summer.

DID YOU KNOW?

- **Woodpeckers are among the brown creeper's more unlikely predators.**
- **The male often makes several nests, and his mate chooses her preferred location.**
- **In England, soft-barked redwood trees from North America have become a favorite roost site.**
- **An old name for the brown creeper is the tree mouse.**

PROFILE Brown Creeper

Using its strong claws as climbing hooks, the brown creeper walks up tree trunks to extract prey from the bark with its fine, tweezerlike bill.

Bill
The slender, downcurved bill can slip into tiny crevices in bark to pull out prey.

Winter roost
In winter the brown creeper roosts in a sheltered spot, such as a tree hollow or bark crevice. It puffs out the soft plumage of its lower back to trap warm air around itself and hide its outline from predators.

Plumage
The brown creeper's upperparts are intricately mottled and streaked with brown, cream and black, to camouflage it against bark. Its underparts and "eyebrow," or *supercilium*, are silvery white.

Feet
The toes are long and tipped with sharp, curved claws to give a good grip on bark. The large rear claw helps anchor the bird when climbing.

Tail
The stiff tail feathers splay outward at the tips and act with the legs to form a tripod, bracing the bird against the tree trunk.

Vital Statistics

Weight	0.28–0.42 oz.
Length	5"
Wingspan	7–8.5"
Sexual Maturity	1 year
Breeding Season	April–August
Number of Eggs	3–9; usually 5–6
Incubation Period	14–15 days
Fledging Period	14–16 days
Breeding Interval	1 year
Typical Diet	Invertebrates, such as insects and their eggs, spiders and woodlice; some seeds in winter
Lifespan	Up to 9 years

Related Species

● There are 7 species of small, tree-climbing bird in the brown creeper family, ***Certhiidae***; includes 5 treecreeper species and the brown and spotted-gray creepers. They are similar in appearance and habits to the ***Sittidae***: a family of tree- and rock-climbing birds that includes the wallcreeper and 21 species of nuthatch. Both families belong to the order ***Passeriformes***, which has over 5,700 species.

Creature Comparisons

Many birds can climb vertical surfaces, but few are as skilled as the wallcreeper (*Tichodroma muraria*), which is found in rocky gorges and on high crags in many mountain ranges in Europe and Asia. It climbs rock faces in search of insects, and can even cling underneath overhangs of rock.

Wallcreeper (male)

The wallcreeper's body is similar to the brown creeper's, but is larger and lacks the long, stiffened tail that its relative uses as a brace. Instead, it flicks open its colorful, scarlet-and-black wings for balance and support. The female wallcreeper's plumage is grayer than the male's, with less red on the wings.

Brown creeper

Brown Pelican

• ORDER •
Pelecaniformes

• FAMILY •
Pelecanidae

• GENUS & SPECIES •
Pelecanus occidentalis

KEY FEATURES

- Heavyweight hunter that patrols coastlines of the Americas in large aerial formations
- Only pelican species that skydives into the sea to scoop up fish
- Opens its bill and unfurls a huge throat pouch, like a fisherman's net, to trap prey
- Widespread and common, it's a visitor to tourist beaches

WHERE IN THE WORLD?

On the east and west coasts of the Americas, from California and the Carolinas, south to northern Chile and northeastern Brazil; also found on the Galapagos Islands and most Caribbean islands

LIFECYCLE

With its madcap crashing dives and billowing throat pouch, the brown pelican is less than elegant when feeding, yet it plunders fish from coastal waters with ruthless efficiency.

HABITAT

The brown pelican is a bird of coastlines, seldom wandering more than a few miles to inland lagoons or venturing out to sea beyond sight of the shore. Though its ties to the ocean fringe are strictly defined, its choice of coastline homes is broad. In its range in the Americas, it's found on rocky shores in Baja California, among the mangrove swamps of Belize, along beach resorts in the Caribbean and on islets off western South America. Parties of brown pelicans in flight are also a familiar sight along many tourist beaches and even over coastal cities.

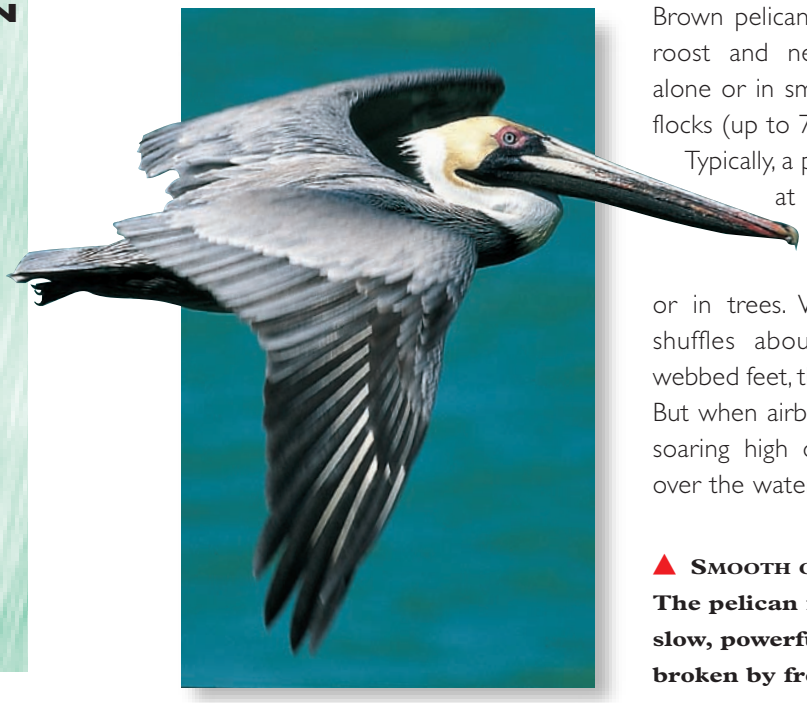
▼ **WARM WATERS**
Brown pelicans inhabit only warm coastal waters.

CONSERVATION

While the brown pelican remains a common sight in many parts of its range, persecution and water pollution by humans have taken their toll on some populations. In the U.S., accumulation of pesticides in the marine food chain caused the species to decline in the 1950s and 60s. In the past, commercial fishermen attempted to exterminate some colonies in the false belief that the birds wiped out fish stocks.

FOOD & HUNTING

BEHAVIOR



Brown pelicans are sociable birds that feed, roost and nest together. Though sighted alone or in small groups, they also gather in flocks (up to 70 birds).

Typically, a pelican spends much of its time at rest, floating on the water surface, standing on the shoreline or perched on rocks or in trees. When it settles on land and shuffles about on perches on its large webbed feet, the pelican seems a clumsy bird. But when airborne, it has unexpected grace, soaring high on updrafts or skimming low over the water with consummate ease.

▲ **SMOOTH GLIDER**
The pelican flies with slow, powerful wingbeats broken by frequent glides.

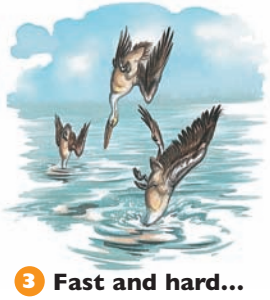
The brown pelican sometimes catches food by lunging down from the surface, but is renowned for its diving prowess. A pelican looking for prey flies 10–30' above the sea — a sufficient drop to carry the bird just below the surface to snatch its meal. To dive, the pelican stalls in flight and plunges headlong into the water. Moments later, it returns to the surface, drains the water from its bulging pouch, then swallows the fish it has caught.

Fish are the mainstay of the pelican's diet, but at docks and fishing boats, it feeds on fish offal. It also consumes other animal scraps, as well as injured chicks at its breeding colony.

SKYDIVERS

1 Flying high...
A flock of hungry brown pelicans flies a few feet above the sea's surface, looking for signs of shoaling fish swimming below.

2 Free fall...
Sighting a shoal near the surface, each bird twists in the air, folds its broad wings, targets a fish and plummets into the water.



3 Fast and hard...
Traveling fast, the birds hit the water with a resounding splash. An air sac under the skin of the chest cushions the force of the impact.

4 Fish treat
As a pelican enters the water, it opens its bill and extends its pouch like a large trap to engulf fish and water.

DID YOU KNOW?

- **Despite their sociability, adult pelicans make few contact calls; these are limited to clucking sounds.**
- **On Peru's coast, centuries' old deposits of pelican droppings are mined and used as fertilizer.**

BREEDING

Nesting colonies may be located on the ground on secluded islands, on a series of rock ledges or in trees. A male makes the first move at breeding time, seeking out a nest site and trying to attract mates with ritualized movements of its head and bill. If successful, the male then presents the female with sticks and other plant matter from which she builds a nest.

The clutch contains two or three eggs, which hatch after an incubation period of 30 days. The chicks are provided with regurgitated fish food by each parent and after a few weeks, are strong enough to walk. Parents continue to feed their young for several weeks more until, at about 12 weeks old, they gain their flight feathers and are ready to start fishing for themselves.

◀ STANDING GUARD
Brown pelican chicks are featherless on hatching, but soon gain down.

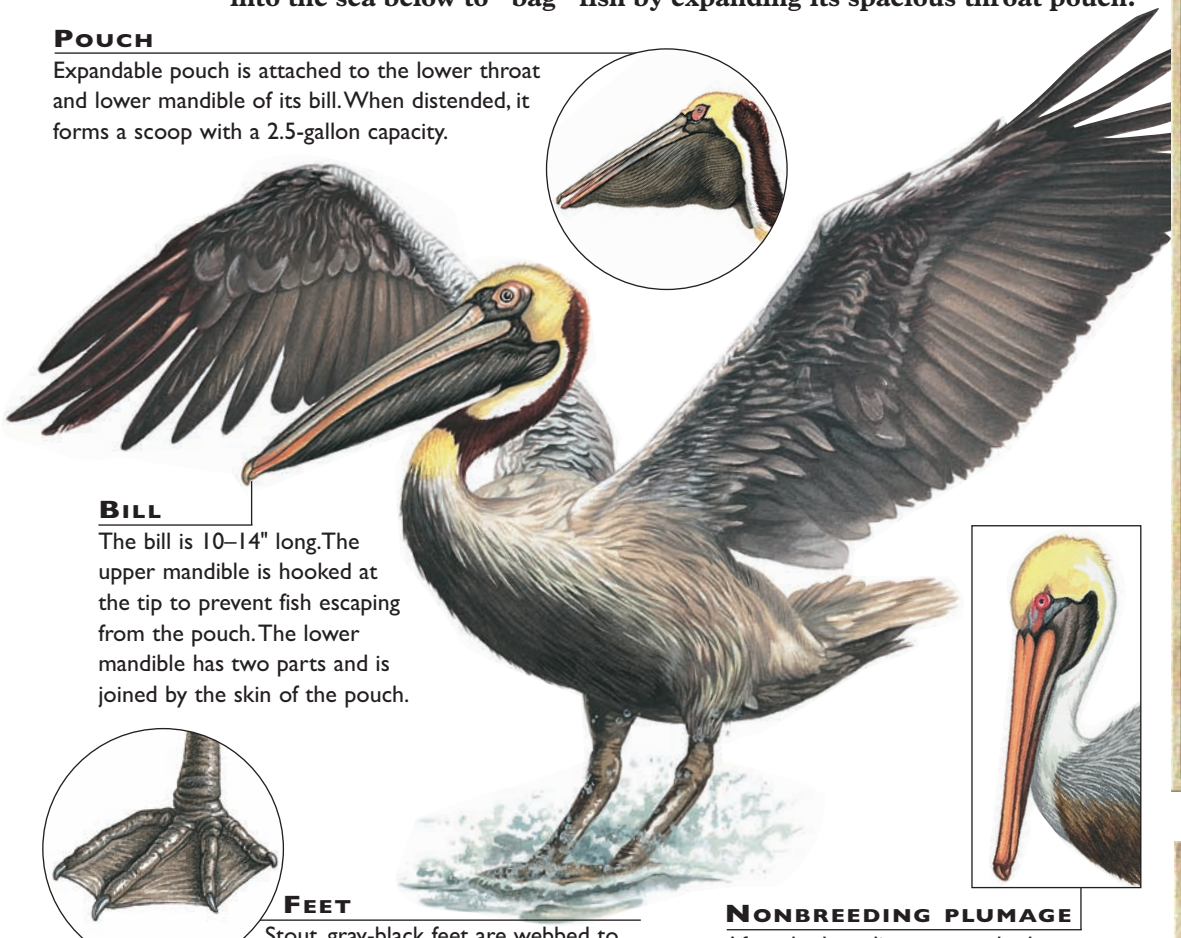
◀ SHOWING OFF
A male in full breeding plumage. Male pelicans swing their heads and clap the mandibles of their bills together to attract females.

PROFILE Brown Pelican

The brown pelican surveys coastal waters in large squadrons, crashing into the sea below to "bag" fish by expanding its spacious throat pouch.

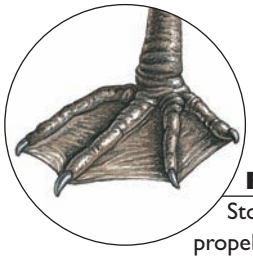
Pouch

Expandable pouch is attached to the lower throat and lower mandible of its bill. When distended, it forms a scoop with a 2.5-gallon capacity.



Bill

The bill is 10–14" long. The upper mandible is hooked at the tip to prevent fish escaping from the pouch. The lower mandible has two parts and is joined by the skin of the pouch.



Feet

Stout, gray-black feet are webbed to propel the pelican when it swims. They're also used like paddles to help this heavy bird become airborne during its long take-off "run" from the water and as "water skis" when it lands.

Nonbreeding plumage

After the breeding season, the brown pelican molts the chestnut-brown feathers that adorn its neck, replacing them with creamy white plumes.

Vital Statistics

Weight	8 lbs.
Length	4–5'
Wingspan	9'
Sexual Maturity	2–3 years
Breeding Season	Varies with location
Number of Eggs	2 or 3
Incubation Period	30 days
Fledging Period	11–12 weeks
Breeding Interval	1 year
Typical Diet	Mainly fish; occasionally carrion and nestlings
Lifespan	15–25 years

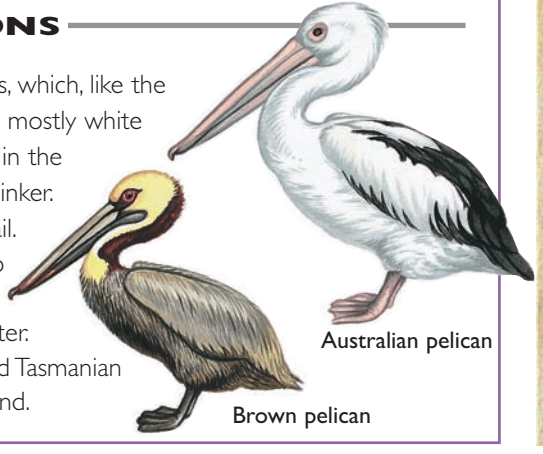
Related Species

● **The brown pelican is 1 of 7 pelican species in the genus *Pelecanus*. The others are the white, American white, pink-backed, spot-billed, Australian and Dalmatian pelicans. The brown pelican is the smallest. *Pelecanidae*, the pelican family, is in a large order of fish-eating waterbirds, *Pelecaniformes*, including cormorants, darters, tropicbirds, gannets, boobies and frigatebirds.**

Creature Comparisons

The brown pelican is an unusual color among pelicans, which, like the Australian pelican, *Pelecanus conspicillatus*, usually have mostly white plumage. Both birds grow small crests on their heads in the breeding season; the Australian pelican's pouch gets pinker. This pelican is larger, reaching 6' in length, bill tip to tail.

The Australian pelican fishes not by plunging into the water from the air like the brown pelican, but by swimming on the surface and dipping its bill underwater. Gregarious, it occurs along much of the Australian and Tasmanian coastline, but also lives in freshwater habitats well inland.



Australian pelican

Brown pelican

Brown Skua

• ORDER •
Charadriiformes

• FAMILY •
Stercorariidae

• GENUS & SPECIES •
Catharacta skua lonnbergi

KEY FEATURES

- Fearsome predatory bird that terrorizes the colonies of penguins and other seabirds
- Skillful, long-distance flier that journeys around Antarctica during the southern winter
- Pirate of icy southern seas, harassing other birds into dropping or disgorging hard-won food

WHERE IN THE WORLD?

Found in a ring all around Antarctica, breeding on sub-antarctic islands, along the northern part of the Antarctic Peninsula and south of New Zealand

LIFECYCLE

A fierce bird of prey of southern oceans, the brown skua is successful because it will feed on anything that's available — from penguin eggs to fish and even human's garbage.

HABITAT

With the exception of the south polar skua, the brown skua occurs farther south than any other flying bird. It breeds on subantarctic islands, in the South Shetland Islands and the northern part of Antarctica.

The skua is found close to penguin colonies, where it gets most of its food. It prefers to nest in snow-free areas near the sea or on bare earth, short grass or high ridges.

In winter it flies around the Antarctic, on winds called the "roaring forties." In spring it heads north to coasts of South America, South Africa, Australia or New Zealand. The south polar skua is a real wanderer, with some ranging as far north as Alaska, Greenland and the North Russia coast.

▲ **MOVING NORTH**
The skua steals catches from gulls, with which it shares parts of its range.

▲ **ROUND THE POLE**
The brown skua has a more northerly breeding range than the south polar skua. It breeds mainly on islands around Antarctica, but both species overlap on the Antarctic Peninsula.

BEHAVIOR

FOOD & HUNTING

The skua will consume a variety of prey or even carrion, but its favored food is penguin eggs and chicks raided from breeding colonies. In some areas, the skua may show a similar dependence on other seabirds (shags, terns, petrels or gulls).

Sometimes the skua hunts alone, flying low over a penguin colony, looking for an exposed egg or poorly defended chick. A pair of skuas will also cooperate to distract a group of adults.

When it can, the skua will steal food from other birds. When penguins are feeding their chicks, skuas often fly down to catch the shrimplike krill as it is regurgitated. The skua also attacks seabirds in flight, twisting and turning for several minutes as it follows every evasive maneuver of its quarry, then grabbing a wing or a tail to force the victim to discard its hard-won food.

True to its aggressive nature, the skua defends its nest with ferocity. In a dense colony, the frenzied conflict of neighbors rarely ceases. An intruder is threatened with a "long call" — lifting its wings in a V, it points its bill at the sky and utters a long shriek. If this fails to repel the intruder, it mounts an attack — a swift aerial chase or a lively fight on the ground. If humans stray too close to a nest, the occupant will "dive-bomb" them, often striking home with its beak or claws.

The skua protects its hunting grounds with equal vigor. On the Antarctic Peninsula, its range overlaps with that of its relative, the south polar skua. Although the skua is outnumbered eight to one, it relentlessly drives other species away from the penguin colonies.

DID YOU KNOW?

- **In one study of skuas feeding on a penguin colony, each pair consumed around 1,000 eggs in one season. One pair has been responsible for wiping out an entire colony of terns.**
- **After feeding on a large penguin chick, the skua leaves only feet, leg bones, pelvic girdle and skin.**
- **The skua eats the afterbirth of seals and has even been seen taking milk from nursing elephant seals.**

DEADLY DUO

1 Skua alert...
A pair of brown skuas circles above an agitated penguin colony. The adult penguins look skyward, alert to potential danger.

2 Attack...
One skua dives, distracting the penguins. The other swoops and grabs a chick while the adults' backs are turned.

3 Gulp...
The skua drags the chick away from the penguin colony until it is out of range. If the chick is small, the skua usually swallows it whole.

4 Sharing the spoils
Larger chicks are carried away, then killed. The two skuas help each other tear the carcass to pieces with their sharp bills.

BREEDING

The skua returns to its nesting sites from late October to mid-November, having been away about seven months.

The skua is faithful to its mate of the previous year. If a female finds herself without a mate (if, for example, he has died) she'll try to find another male or even a male south polar skua. Hybrid pairs always involve a female brown skua and a male south polar skua, never the other way around.

Egg-laying is synchronized with the breeding cycle of nearby penguins; they provide a good supply of food when chicks are born. Breeding success doesn't vary much; most pairs raise two young.

▲ **SIMPLE HOUSING**
Although skuas favor one nesting site, the nest itself is often just a shallow scrape in the ground.

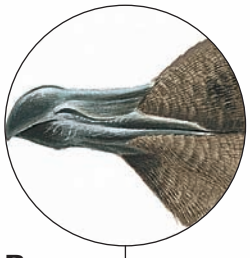
▲ **WARM COAT**
Protected from cold by its fluffy down, a chick beds down in snow and moss.

CONSERVATION

The brown skua faces no immediate threat and seems to be increasing its numbers in some areas. A growing human presence in the South Shetland Islands resulted in more food waste for skuas to feed on; in South Georgia a population explosion of seals has increased the carrion available.

PROFILE Brown Skua

With a bold air, a cruel bill and powerful wings, the brown skua looks like what it is — a cunning predator and master of the Antarctic skies.

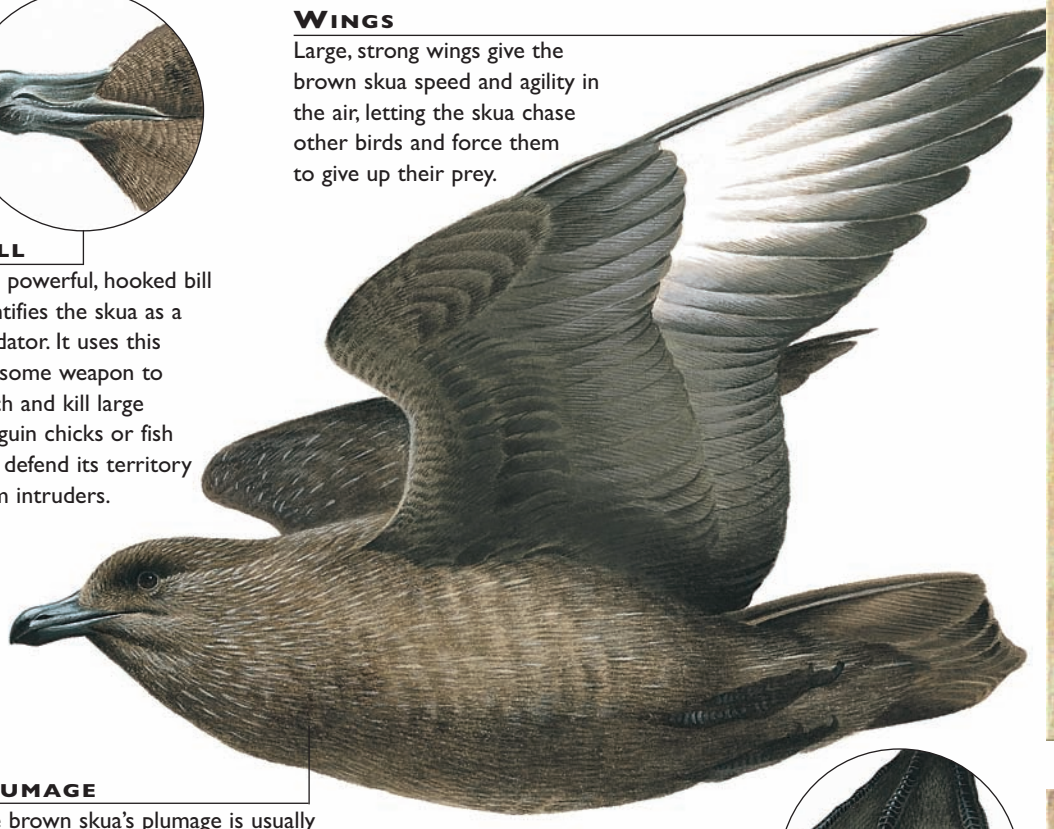


Bill

The powerful, hooked bill identifies the skua as a predator. It uses this fearsome weapon to catch and kill large penguin chicks or fish and defend its territory from intruders.

Wings

Large, strong wings give the brown skua speed and agility in the air, letting the skua chase other birds and force them to give up their prey.



Plumage

The brown skua's plumage is usually browner than its relative, the south polar skua. Its head has a dark cap. In old age, the feathers turn gray and in the breeding season, the neck is flecked with gold.

Feet

The webbed feet typical of seabirds help the skua when swimming and diving to catch fish.

VITAL STATISTICS

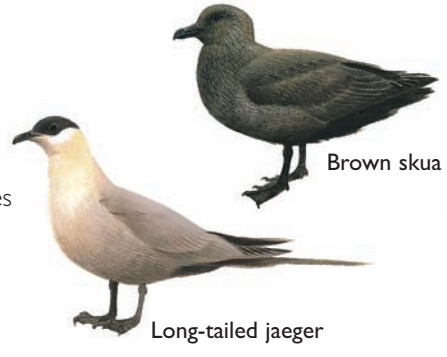
Weight	3–4 lbs.
Length	24–26"
Wingspan	About 60"
Sexual Maturity	6 years
Breeding Season	Late October through April
Number of Eggs	Usually 2
Incubation Period	About 30 days
Breeding Interval	Annual
Typical Diet	Penguin eggs and chicks; also fish and carrion; forces other birds to disgorge their catch in flight
Lifespan	Up to 20 years

RELATED SPECIES

● **The brown skua belongs to the skua (or jaeger) *Stercorariidae* family — strong-flying, predatory birds with hooked bills and piratical habits. Four species, including the great skua, breed in the polar north; others — including the south polar skua — breed only around Antarctica. The south polar skua lives farther south than any other flying bird and has even been seen at the South Pole.**

CREATURE COMPARISONS

The South Polar skua, the Northern or Great skua and the Chilean skua are the closest relatives of the brown skua. Three other relatives bear the name skua in Europe but jaeger in North America. One, the long-tailed jaeger, is found in the northern polar region; its range never overlaps the brown skua's. The jaeger shares the brown skua's habit of stealing catches from other birds, but is the least piratical of the family. It's smaller than the brown skua, but in breeding seasons, the long-tailed jaeger's tail streamers can be as long as its body.



BUDGERIGAR

• ORDER •
Psittaciformes

• FAMILY •
Psittacidae

• GENUS & SPECIES •
Melopsittacus undulatus

KEY FEATURES

- One of the most abundant species of parrot in Australia
- Huge flocks of budgerigars often gather for protection against predators when they fly in to drink at scattered waterholes
- Bred in a range of colors in captivity, this bird is always green in the wild so that it remains camouflaged in its scrub and woodland home

WHERE IN THE WORLD?

Distributed across Australia's dry interior; absent only from the extreme southwest, the far north, the coastal strip east of the Great Dividing Range and Tasmania; introduced in Florida

LIFECYCLE

Although it's best known as a solitary cage bird, the budgerigar is a gregarious parrot that joins others to form great wheeling flocks containing thousands of birds.

HABITAT

▲ **CHEEP AND CHEERFUL**
Noisy flocks of budgerigars sweep over dry, open areas of the Outback.

The budgerigar is found mainly in the sparsely populated semi-wilderness of Australia's interior, the Outback, which covers 2 million sq. miles of land to the west of the Great Dividing Range. A sociable bird, it flies in flocks over dry, open grassland and farmland, roosting among scattered acacia trees and eucalyptus scrub. The budgerigar avoids the mountains and forests of the east, but flocks have been seen flying southeast toward Melbourne and into lush southwestern parts of western Australia.

Rarely venturing far from water, the bird is seldom found in areas prone to drought. Unlike many of Australia's native birds, it has benefited from the expansion of farming land. The permanent supplies of water in tanks built by sheep farmers have enabled the budgerigar to inhabit areas where it was formerly absent.

CONSERVATION

Although budgerigar numbers fluctuate widely, the population is believed to be several hundred thousand strong despite the deaths regularly caused by severe drought. Apart from such natural disasters, the budgerigar faces few other threats.

BREEDING

▲ **QUICK GETAWAY**
A swift exit avoids revealing the nest site.

The budgerigar breeds all year if sufficient rainfall stimulates a good crop of food. In the south, breeding peaks between August and January; in the north, from June to September. The budgerigar breeds in large colonies, pairing for long periods, possibly for life.

Nests are made in tree holes, stumps, posts or even logs. The white, rounded eggs (usually four to six, occasionally eight) are laid on wood dust at the bottom of the hole. After the female incubates the eggs for 18 days, young hatch and are cared for by both parents for five weeks. Young are first fed on "budgie milk," a regurgitated food high in protein similar to a mammal's milk.

The young budgerigar is a duller color than its parents and has dark-brown eyes. Within three or four months, it acquires adult plumage and both sexes are sexually mature and ready to breed.

BEHAVIOR

▲ **Role model**
The male budgerigar helps feed and rear his offspring.

FOOD & FEEDING

Grass seeds and herbs form the bulk of the budgerigar's diet. Seeds are taken directly from the plant or collected from the ground. Ripened seeds of porcupine grass, Mitchell grass, spinifex and saltbush are favored. The budgerigar removes the outer seed casing, then swallows the inner part whole. Feeding usually takes place in the morning and evening, while the hottest part of the day is spent resting and preening in the trees.

▲ **Bird bath**
The colorful budgerigars arrive at waterholes by the thousands for a daily drink and a nice, cool bath.

In the wild, the budgerigar drinks every day. But drinking in the open can be dangerous; a bird with its head down is vulnerable to attack by predators. Consequently, the budgerigar often gathers in great numbers for safety at waterholes. Indeed, flocks have been known to be so large that successive waves of birds trying to get to the water land on top of those already drinking and drown them.

The budgerigar is a nomad, moving around in flocks, the size of which vary with food availability and water supplies. Smaller flocks, sometimes with as few as half a dozen birds, occur near the fringes of the continent; the largest flocks are seen in central Australia, especially after heavy rains.

Flying with rapid wingbeats, large budgerigar flocks wheel and twist with precision. Flocking helps the budgerigar find food by increasing the number of eyes looking for feeding areas. The swirling flock on the move also confuses predators by making it difficult for them to target one bird.

BEATING ABOUT THE BUSH

1 Waking up...
As a breeding season approaches, a male and female strengthen their bond by preening each other early in the morning.

2 Sticking together...
They then leave the safety of the trees with the flock, flying quickly to avoid predators. The pair remains close together…

3 Thirsty work...
…when the flock stops at a waterhole. In dry conditions, the pair could survive for months without water, but wouldn't breed.

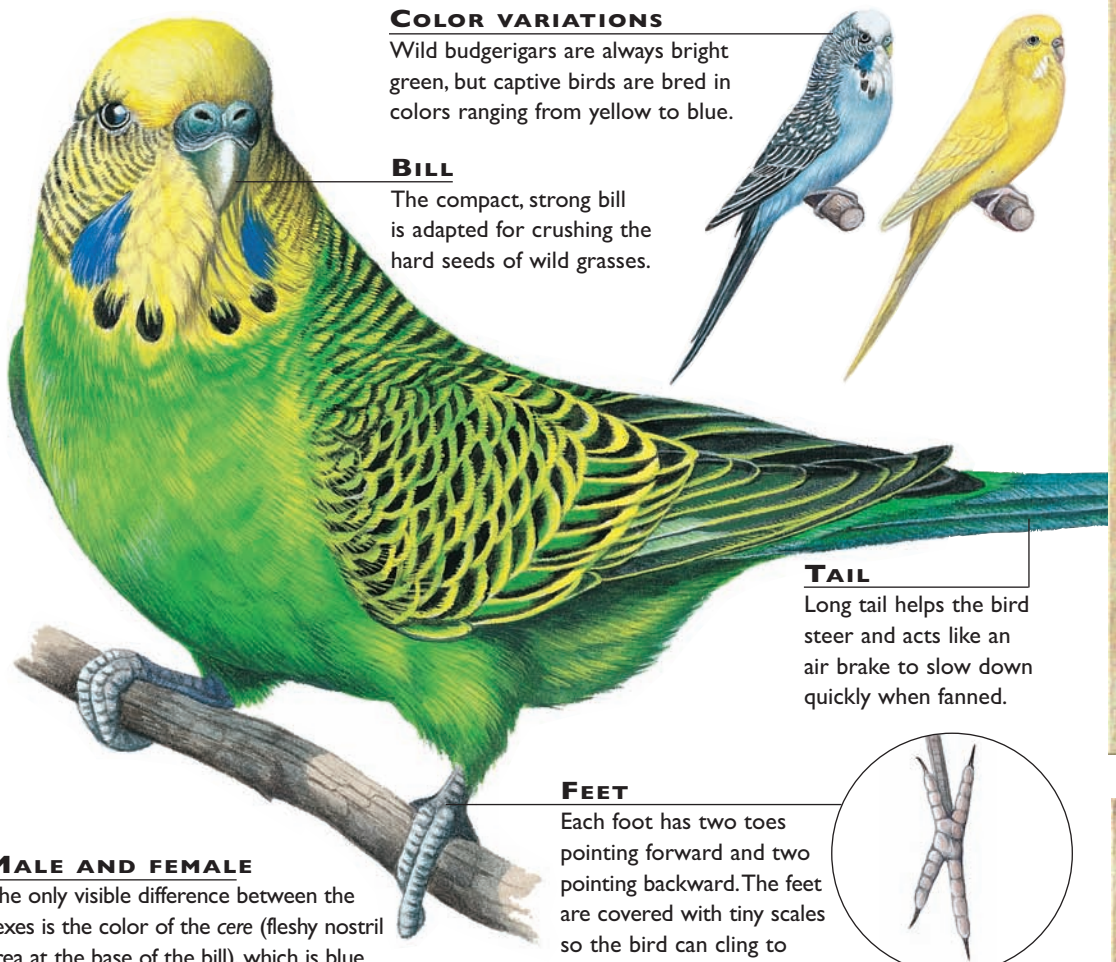
4 Going to seed
The budgerigar spends most of its time feeding. It uses its feet to climb grass stalks and extracts the seeds with its bill.

DID YOU KNOW?

- **In a heat wave in 1932, millions of budgerigars migrated north of Australia in a flock so large that it took four hours to fly over any one spot.**
- **English exhibition budgerigars have been bred to weigh three times the weight of wild birds; some of the males are even too heavy to copulate.**
- **A female budgerigar often feeds the youngest and smallest of her offspring first, giving the whole brood a chance to survive, rather than just the larger chicks.**

PROFILE BUDGERIGAR

The budgerigar, with its compact, streamlined body and long, tapering wings, is a fast flier that travels long distances in search of food.



COLOR VARIATIONS
Wild budgerigars are always bright green, but captive birds are bred in colors ranging from yellow to blue.

BILL
The compact, strong bill is adapted for crushing the hard seeds of wild grasses.

TAIL
Long tail helps the bird steer and acts like an air brake to slow down quickly when fanned.

FEET
Each foot has two toes pointing forward and two pointing backward. The feet are covered with tiny scales so the bird can cling to grass stems while feeding.

MALE AND FEMALE
The only visible difference between the sexes is the color of the *cere* (fleshy nostril area at the base of the bill), which is blue in males *(shown)* and brown in females.

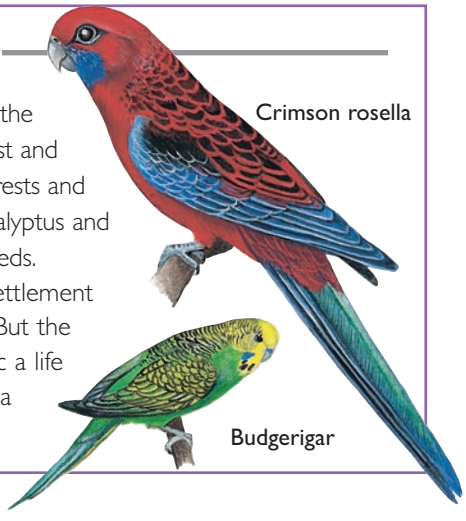
VITAL STATISTICS

WEIGHT	1 oz.
LENGTH	7"
WINGSPAN	8"
SEXUAL MATURITY	3 months
BREEDING SEASON	Throughout the year; varies with location
NUMBER OF EGGS	4–6
INCUBATION PERIOD	18 days
FLEDGING PERIOD	About 35 days
BREEDING INTERVAL	Several broods a year
TYPICAL DIET	Grass seeds
LIFESPAN	7–8 years in the wild; up to 20 in captivity

CREATURE COMPARISONS

Twice the length of the budgerigar and four times its weight, the striking crimson rosella (*Platycerus elegans*) is found in the east and southeast of Australia. The crimson rosella inhabits coastal forests and enjoys a more varied diet than its relative. It lives among eucalyptus and acacia trees and feeds on fruit, blossoms, insects and grass seeds.

Like the budgerigar, it doesn't shy away from human settlement and may be seen in the outer suburbs of towns and cities. But the crimson rosella doesn't fly in large flocks or lead as nomadic a life as the budgerigar. Adult birds prefer to stay in the same area throughout the year, in small groups or in pairs.



RELATED SPECIES

● The budgerigar is the only member of its genus and belongs to the parrot family, *Psittacidae*. Of the 330 parrot species, 50 are found in Australia, including the Australian king parrot (below). An inhabitant of forest canopy, this colorful bird feeds on tree seeds.

Burrowing Owl

• ORDER •
Strigiformes

• FAMILY •
Strigidae

• GENUS & SPECIES •
Athene cunicularia

KEY FEATURES

- Nests in abandoned underground rodent burrows, and leads a largely terrestrial life
- Has long legs, unique among North American owls, enabling it to stalk prey on the ground
- An accomplished vocalist, it mimics a rattlesnake's rasp to warn off predators

WHERE IN THE WORLD?

Found in grassland from British Columbia in Canada, through western U.S. and central Mexico, to Tierra del Fuego in South America

LIFECYCLE

The burrowing owl is primarily a ground-level operator, nesting underground and running after prey, but it is also a clever hunter, hovering in flight above its target.

HABITAT

The burrowing owl's range includes prairies and plains. Level, open, dry vegetation — found in Canada, the western U.S., Mexico and the treeless pampas of Central and South America — provides hiding sites for the young, while allowing full vision for adults.

The male usually "borrows" an abandoned burrow of a badger, prairie dog or, in South America, viscacha, but he can excavate his own, too. The burrow slopes gradually and then turns abruptly right or left. This ensures that the nest chamber at the end of the tunnel is as dark as it can be, an essential feature for added protection of eggs and young. A network of branching tunnels provides food-storage areas and escape routes. Raised mounds, fences or rocks make perfect perches for observing prey. Migratory only in its northern range, the owl often overwinters in the south, setting up permanent residency to keep the burrow clean.

▲ **STAKING CLAIM**
Taking over a prairie dog's burrow, the male enlargesthe tunnel, making a home.

▼ **HIDE AND SEEK**
Grasses provide an effective cover against predators and an excellent lookout for prey.

BEHAVIOR

Considered comical because of its bowing display, the male burrowing owl dips its body forward as it sings, *cu-coo, cu-coo,* a mellow love song that is one of approximately 17 vocalizations. This song, repeated every hour at night during courtship, is also emitted for territorial defense. Bobbing up and down for a better view, the burrowing owl guards the immediate area of its burrow, but allows feeding in commonly shared areas by adjacent owl pairs. Females rasp when begging for or receiving food from the male during incubation, or when passing food to the young. The burrowing owl utters a buzzing "rattle" resembling the sound of a rattlesnake when disturbed, or when cornered by predators such as badgers or snakes. Burrowing owls line their nest chambers with 1–2" of dung, which provides insulation and also masks the odor of the nest to protect the young from hungry predators.

▶ **ON GUARD**
No trespassing owls or predators allowed here.

FOOD & HUNTING

Most of the year, the owl hunts from sunrise to sunset. In the spring, it pursues small mammals at low-light periods, especially during the cool early evening. In the summer heat, these small mammals retreat underground to stay cool, and the burrowing owl then stalks larger insects, such as locusts, grasshoppers, dragonflies and dung beetles.

The burrowing owl runs on its long legs and snatches smaller prey with one foot. With broad wings unfolded, the owl can also swoop in for the kill from a perch near the nesting hole. The owl quietly hovers, taking deadly aim at a mouse, cottontail or even a ground squirrel that is equal to its own size. Feathers, hair and bones, which are all indigestible, accumulate in the owl's gizzard and are regurgitated in the form of pellets.

DID YOU KNOW?

- **In Greek mythology, Athena, the daughter of Zeus and goddess of wisdom, arts and warfare, was often depicted with an owl on her shoulder, hence the burrowing owl's genus name, *Athene*.**
- **The burrowing owl's species name, *cunicularia,* comes from the Latin word cunicularius, meaning "a miner or burrower."**

BREEDING

Before initiating courtship, the male owl selects a burrow and prepares a nest. Up to 10' long and 6" wide, the tunnel ends with a dark 12–18" wide nesting cavity, lined with dung and feathers. Once it is complete, the courtship ritual begins. The pair mates after an extended period of songs, billing, mutual nibbling of the head feathers and food presentation. Since burrowing owls do not form permanent bonds, the mating cycle is repeated annually. After mating, the female lays one egg every other day. Incubation starts with the first egg; the parents take turns incubating the 6–11 eggs. The female's absence is brief, however, because the male brings her food. The grayish-white owlets weigh 0.3 oz. each and hatch at intervals; the oldest can be two weeks older than the youngest.

▼ A FIRST LOOK

A 2-week-old is sheltered by its parent during its first venture out of the burrow.

A PLAN OF ATTACK

1 A perfect view...
The owls emerge at sunrise, ready to start another day. Turning their heads up to 270°, they search carefully for prey.

2 Silent suspension...
With talons drawn, an owl flies toward an unwary beetle, then quietly hovers, its softened feathers deadening the sound.

3 Swift descent...
The owl then swoops to capture the dung beetle with its needle-sharp talons. Legs and talons are stretched for the kill.

4 Strike to survive
The owl now chases one of its favorites, an uta lizard. The burrowing owl must eat more than its weight each day.

CONSERVATION

Rodent burrows usually offer an ideal protective environment for the nesting burrowing owl. But ranchers, trying to control squirrel and prairie dog populations, have destroyed burrows and inadvertently poisoned burrowing owls. Insecticides and rangeland conversion have reduced the owl's food supply and habitat. The burrowing owl has been on the National Audubon Society's Blue List, and The Committee on the Status of Endangered Wildlife in Canada has listed it as an endangered species.

PROFILE BURROWING OWL

One of the few owls adapted for land dwelling, the burrowing owl is an ultra-efficient daytime hunter, attacking prey on land or in the air.

BILL

The burrowing owl breaks its prey's neck with sharp blows from its large hooked beak.

EYES

The large pupils and corneas gather as much light as possible during the low-light conditions of sunrise and sunset. The lemon-yellow irises distinguish the burrowing owl from nocturnal owls, which have brown irises that are invisible during night hunting.

CLAWS

With two toes in front and two toes directed backward, the owl grasps prey with sharp talons fully spread. The powerful claws also dig dirt and kick it backward during burrow excavation.

LEGS

Legs, longer than those of nocturnal owls, enable the burrowing owl to walk easily across grassland in search of insects.

CREATURE COMPARISONS

Burrowing owl

The closest relative of the burrowing owl is the little owl (*Athene noctua*). Weighing in at 4–7.5 oz., it is not the world's smallest owl, despite its name. Both owls have brown plumage streaked with white and scantily feathered legs and toes. Noisier and more nocturnal than the burrowing owl, the nonmigratory little owl spends less time on the ground and lives all over Europe in old houses, ruins, caves, wells or low cliffs. On both sides of the world, the owls perch on low posts on the lookout for small vertebrates and insects.

Little owl

VITAL STATISTICS

WEIGHT	5–5.5 oz.
HEIGHT	7–9.5"
WINGSPAN	20–24"
SEXUAL MATURITY	1 year
BREEDING SEASON	Late March –August
NUMBER OF EGGS	6–11, but usually 7–9
INCUBATION PERIOD	27–30 days
FLEDGING PERIOD	40–45 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Large insects and small vertebrates
LIFESPAN	Up to 10 years

RELATED SPECIES

- There are four subspecies of the burrowing owl: *Athene cunicularia floridana, A.c. troglodytes, A.c. rostrata* and *A.c. hypugaea*, which has the widest range. The family *Strigidae* has 138 species in 24 genera. In 1983 the genus *Speotyto* merged with the genus *Athene*. Other similar species of the genus *Athene* are forest-dwelling owls in India and southeast Asia.

Canada Goose

• ORDER •
Anseriformes

• FAMILY •
Anatidae

• GENUS & SPECIES •
Branta canadensis

KEY FEATURES

- One of nature's great spectacles: thousands fill the flyways on their journey south in autumn
- Travels in V-formations, creating slipstreams to minimize the effort of migratory flight
- Has a built-in compass to aid navigation when clouds obscure landmarks and hide the stars

WHERE IN THE WORLD?

Breeds across northern North America; winters farther south in the U.S. and Mexico; introduced into Britain, Scandinavia and New Zealand

LIFECYCLE

Each fall, Canada geese take to the air and fly in undulating V-shaped formations as they follow their migratory flyways south across the North American continent.

HABITAT

▲ **WATERSIDE HOME**
The Canada goose always breeds near water.

The Canada goose is an open-country bird, breeding in a variety of freshwater wetlands, from the tundra belt to plains, swamps and lakeside pastures. In winter, the goose favors cultivated fields, estuaries and coastal marshes.

Where it has been introduced in Europe and the U.S., it has colonized parks, farmland, reservoirs and golf courses. These birds are generally nonmigratory, although some move locally each year. They are creating problems as populations are out of control.

CONSERVATION

The Canada goose isn't under threat as a species, but its future depends upon the conservation of its winter-range wetlands — many have been drained for urban development and farming. Efforts by wildlife and conservation organizations have brought hope that vital habitats will be safeguarded.

BEHAVIOR

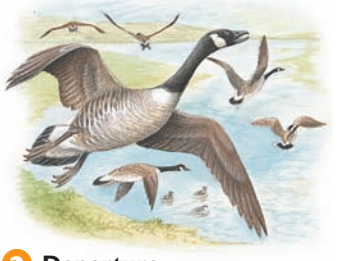
Bird migration is both a marvel and a mystery, and it's still not fully understood how the flocks of Canada geese find their way to the same areas every year. They probably use a range of navigational aids, including landmarks, the sun and stars and their own built-in sensitivity to the Earth's magnetic field.

Birds that nest in the far north travel the longest distances. Some Arctic breeders fly more than 3,000 miles to winter around the Gulf of Mexico, more southerly populations migrate only a few hundred miles and some not at all.

Northbound geese fly in smaller flocks over a longer period; their journey is less dramatic than the mass migration in autumn.

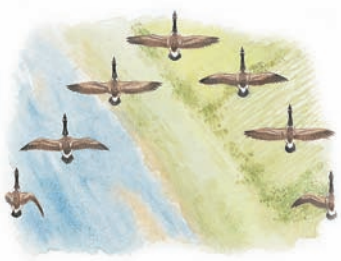
THE GREATEST AIR SHOW ON EARTH

1 Assembly…
Geese become restless as the time approaches for the southern migration. On a signal from a dominant male, they face the wind.



2 Departure…
With a honking chorus and a flurry of wings, the great autumn journey gets under way. Flocks at first mill around, but soon all head south.

FOOD & FEEDING



3 Flight...
By traveling in V-formation and changing position regularly, each bird can conserve energy by flying in the slipstream of its leader.

4 Arrival
Geese lose height by "whiffling," like a falling leaf, slip sideways or even roll, dropping a few feet at a time before leveling out.

The Canada goose is a grazer. It eats a wide variety of plant parts (leaves, stems, roots, rhizomes, fruits and seeds). It feeds mostly on land, although it will also feed in water, upending like a duck to reach juicier growth. A common target for hunters in parts of its range, the goose has learned to be wary, especially while feeding. A grazing flock always has sentry birds alert and scanning for danger.

Flights to the feeding grounds are made at sunrise, the geese arriving in family parties one after another — sometimes an entire field may be covered by birds. Largest concentrations are found in wildlife refuges and on arable farmland; birds raid cereal crops and cause further damage by compacting the soil with their feet.

Changes in agricultural methods have led to increased availability of food in northern areas; this is thought to be one reason why many geese don't migrate as far south as they did in previous decades.

◀ **COLD COMFORT**
Seasonal food shortage in northern climates forces the goose to migrate.

BREEDING

The Canada goose mates for life, selecting its partner at the wintering grounds. Courtship involves neck movements and honking duets. This routine is repeated annually, even by established pairs.

The nest (a waterside pile of vegetation lined with down) is built by the female, who also incubates the eggs. Her mate fiercely defends the nest against rivals until the eggs hatch. Then both parents are devoted to protecting their brood wherever they roam.

A gosling nibbles plants and eats insects until it is strong enough to graze properly.

▲ **QUICK OFF THE MARK**
Goslings swim and find food on the first day of life.

DID YOU KNOW?

- **The Canada goose quickly learns to fly higher than usual during the hunting season and feed whenever possible in areas where shooting is banned.**
- **During its marathon migration, the goose cruises at about 4 mph, usually at altitudes up to 3,300'. On occasion, the bird has been known to fly over mountains 12,045' high.**
- **The bond between a pair of Canada geese is so strong that if one is injured during migration, its partner will stay behind with it.**

◀ **GUARDIAN**
The male goose is a fierce guardian of its nest and young and will aggressively drive away any intruder.

PROFILE CANADA GOOSE

Warmed by dense plumage in the cold skies, the high-flying Canada goose travels thousands of miles each year on migration.

BILL

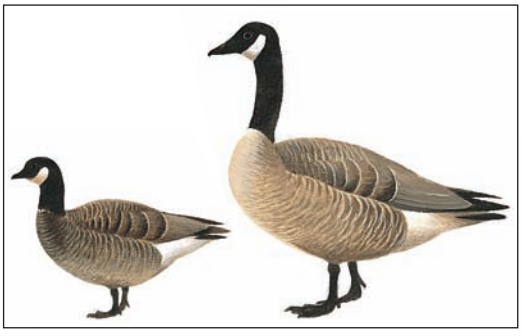
Toothlike serrations along the edges of the upper and lower mandibles of the bill help the goose grip plants.

NECK

The long neck enables the Canada goose to reach down for food underwater, when it upends like a duck or a swan.

PLUMAGE

Insulating plumage keeps the bird warm in northern latitudes and while flying at high altitudes. The goose sheds all its primary (wingtip) feathers simultaneously and so becomes flightless during its annual molt.



SIZE

The largest subspecies and largest goose in the world, the giant Canada goose of the northern U.S. (*Branta canadensis maxima*) towers over the smallest, the cackling Canada goose of Alaska (*B. c. minima*).

FEET

Typical of most waterfowl, the three front toes are connected by webbing to provide power while swimming.

VITAL STATISTICS

WEIGHT	3–11 lbs.
LENGTH	22–44"
WINGSPAN	4–6'
SEXUAL MATURITY	2–3 years
BREEDING SEASON	March–July
NUMBER OF EGGS	Usually 4–7
INCUBATION PERIOD	24–30 days
FLEDGING PERIOD	6–12 weeks
BREEDING INTERVAL	1 year
TYPICAL DIET	Grasses, grain and aquatic vegetation
LIFESPAN	Up to 23 years

RELATED SPECIES

● **The Canada goose is one of 15 "true" geese in a family of 147 species, including ducks and swans. The Canada goose is the largest of five species in the genus *Branta* (known as black-necked geese). Along with swans, whistling ducks, the Cape Barren goose and freckled duck, the true geese are classified in the subfamily *Anserinae*. Geese and swans are classified together in the tribe *Anserini*.**

CREATURE COMPARISONS

The Canada goose's close relatives bear distinctive plumage, particularly on the face. The black brant is a black-faced subspecies of the brant goose. The red-breasted goose has a black face boldly marked with white and rusty-brown. The barnacle goose has a bold white face against a dark crown, neck and breast, while the Canada goose bears only a white bib against its dark facial plumage.

Black brant goose

Red-breasted goose

Barnacle goose

Canada goose

Carrion Crow

• ORDER •
Passeriformes

• FAMILY •
Corvidae

• GENUS & SPECIES •
Corvus corone

KEY FEATURES

- Does not miss an opportunity for a meal, often hoarding food for future feasts
- Constructs an extra-sturdy nest using a multitude of materials from twigs to hair to paper
- Employs ants to remove fleas and parasites from its feathers

WHERE IN THE WORLD?

Found throughout Europe except for a small area in northern Russia; from Wales and England, south through Austria and Switzerland

Common Quail

• ORDER •
Galliformes

• FAMILY •
Phasianidae

• GENUS & SPECIES •
Coturnix coturnix

KEY FEATURES

- Seldom seen, it is Europe's smallest gamebird and one of the smallest in the world
- Male utters a loud, distinctive mating call in late spring and early summer to attract a mate
- A long-distance migrant, making journeys of 600–3,000 miles each spring and autumn

WHERE IN THE WORLD?

Breeds across Europe into Asia, northern, southern and eastern Africa and Madagascar; winters in much of Africa, India and the eastern Himalayas

LIFECYCLE

The common quail is one of the most secretive of all gamebirds, and is rarely seen, even by birdwatchers. It lives most of its life hidden deep within dense vegetation.

CONSERVATION

The common quail is heavily hunted, particularly along its migration routes, and is in decline across its range. It is also affected by drought, pesticides and changes in farming practices.

HABITAT

The common quail is found from sea level to altitudes of 3,300' or more, on level or gently sloping terrain. A bird of open country, it favors dense, moist vegetation less than 3' tall in which it can hide from predators. The common quail usually shuns shrub and woodland habitats, and this secretive bird also avoids bare ground. Sunny areas with light, well-drained soils of chalk, sand or peat are popular haunts.

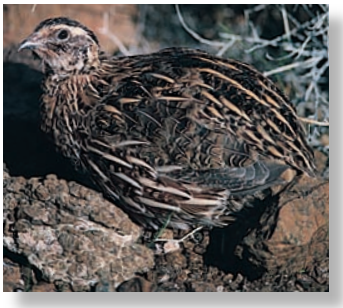
The quail has adapted well to the spread of agriculture. It can be found in large fields of crops, especially winter wheat and clover, but also oats, barley, rye, rape, lucerne, flax and meadow grasses.

▲ **GREEN AND PLEASANT**
Areas with dense vegetation are popular quail breeding sites.

BEHAVIOR

Shy and wary, the quail spends most of its life among dense cover. Reluctant to fly even when disturbed, it usually goes unnoticed unless flushed from hiding. Startled in this way, a quail springs suddenly into the air, often giving a low trilling call. It flies fast and low before dropping down into cover. After the brief flight, the bird tends to run a safe distance, and effectively melts from view.

Despite its reluctance to fly, the common quail makes long annual migrations between its European breeding quarters and wintering grounds to the south of the Sahara in Africa.



▶ **QUAKE AND QUAIL**
One of the wariest of birds, the quail normally stays hidden in undergrowth.

FOOD & FEEDING

▲ **BARK IF YOU'RE HUNGRY**
Old timber is a source of invertebrate prey.

More than 100 species of food plant have been recorded in the quail's diet. Staple foods include seeds of grasses, cereals and weeds, but the quail also eats beetles, bugs, ants, earwigs and grasshoppers, as well as spiders, snails and worms.

Animal food is important in spring and early summer, when seeds are scarce and females need as much protein as possible to prepare for breeding. The chicks probably bulk up on high-protein insects, too.

Whether pecking at wind-scattered seeds or invertebrates, the quail feeds mainly on the ground. Sometimes it catches flies, ants and other flying insects by fluttering up to 3' above the ground.

DID YOU KNOW?

- **The name quail can be traced back to the Latin *quaquila*, which probably imitated the male's distinctive call.**
- **Across England, the quail has many quaint old local names, such as wet-my-lips, wet-my-feet and but-for-but. Other traditional common names for this bird include quailzie, throsher, deadchick and rine.**
- **The quail is Europe's only migratory gamebird.**

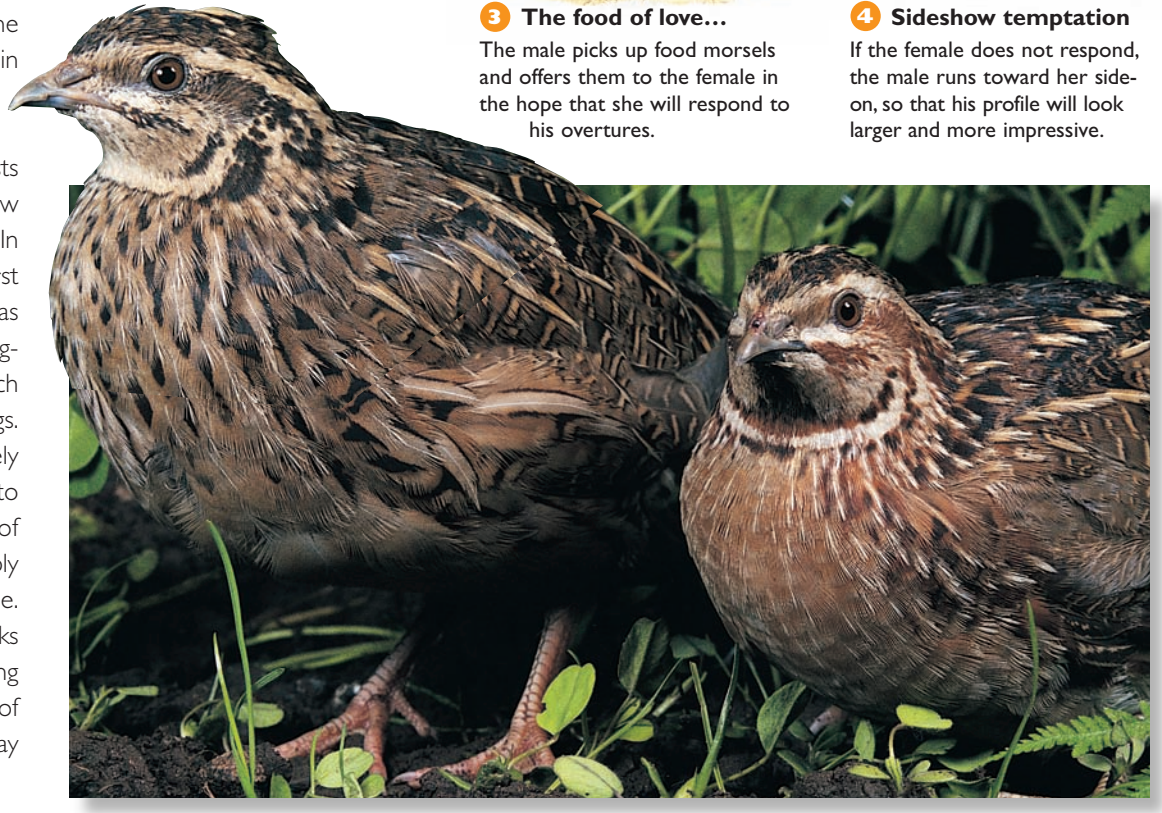
BREEDING

The male utters his loud, staccato call in spring and early summer to attract a mate. He is most vocal at dawn and dusk and generally silent once he has found a mate. Depending on the ratio between the sexes in an area, a female may mate with several males.

The female quail nests on the ground, in a shallow scrape lined with grass. In southern Europe, the first eggs are laid as early as April, but in the north, egg-laying begins later. Clutch size ranges from 7–18 eggs. These are incubated solely by the female for up to three weeks. Clutches of more than 18 are probably laid by more than one female.

The striped downy chicks are well developed, leaving the nest within hours of hatching. Their mother may then lay a second clutch.

▲ **IN HER CLUTCHES**
The common quail's nest is located in deep cover as its eggs are prized by many predators.



GAME, SET AND MATCH

1 Cry out for attention…
Soon after arriving at the breeding grounds, each male utters his far-carrying call from deep within cover, to attract a female.

2 Playing on the wing…
When a female approaches, he circles her in a courting display, drooping a wing toward her or even trailing it along the ground.

3 The food of love…
The male picks up food morsels and offers them to the female in the hope that she will respond to his overtures.

4 Sideshow temptation
If the female does not respond, the male runs toward her side-on, so that his profile will look larger and more impressive.

PROFILE COMMON QUAIL

A tiny gamebird the size of a plump starling, the quail prefers to run and hide rather than fly, but manages to migrate great distances each year.

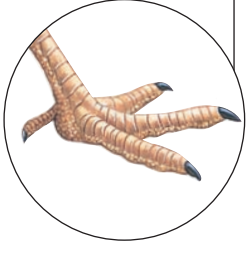
FEMALE
The female has a plainer pattern on her head than does the male, with duller markings and no neck or throat bands.

MALE
The male's plumage varies between individuals: races breeding in Europe and Asia are paler and grayer, while African breeders are darker and reddish-brown.

WINGS
The relatively long, pointed wings contrast with the shorter, rounded wings of other gamebirds. They enable the quail to fly far and fast on migration.

CHICK
Clad in down and able to feed itself soon after hatching, the chick can flutter short distances when it's 11 days old, and flies when it's 19 days old.

LEGS & FEET
The legs and feet are slender, with sharp, narrow claws that are well-suited for scratching at the soil for seeds and insects.

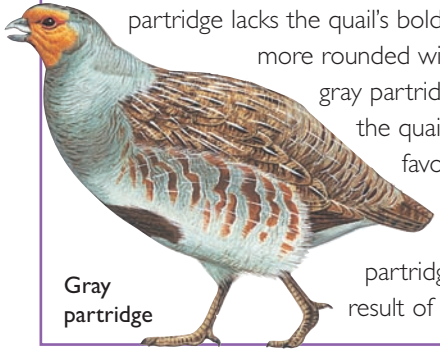


VITAL STATISTICS

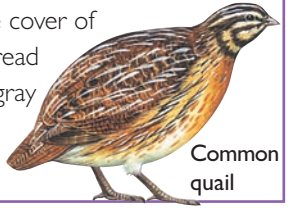
WEIGHT	2.5–5.4 oz.
LENGTH	6.4–7.2"
WINGSPAN	13–14"
SEXUAL MATURITY	1 year
BREEDING SEASON	Varies by location
NUMBER OF EGGS	4–15, usually 8–13
INCUBATION PERIOD	17–20 days
FLEDGING PERIOD	About 19 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Wide range of plant seeds; also small invertebrates
LIFESPAN	Unknown

CREATURE COMPARISONS

The common quail can be confused with a young gray partridge (*Perdix perdix*). However, the partridge lacks the quail's bold head pattern, and in flight it reveals proportionately shorter, more rounded wings and a longer, broader tail. There is no confusing an adult gray partridge, distinct in plumage, and twice the size of an adult quail. Like the quail, the gray partridge feeds on seeds and invertebrates. It favors pasture or grassland and enjoys the cover of mature hedgerows. Although widespread across much of Europe and Asia, the gray partridge has suffered massive declines as a result of modern farming methods.



Gray partridge



Common quail

RELATED SPECIES

● The common quail's closest relatives are the 7 other species in the genus *Coturnix*. These include the Japanese quail, *C. japonica,* the African blue quail, *C. adansonii,* harlequin quail, *C. delegorguei,* also of Africa, and the stubble quail, *C. pectoralis,* of Australia. Of the 7 families in the order *Galliformes,* the largest is *Phasianidae,* with 155 species of pheasant, partridge and quail.

Common Snipe

• ORDER •
Charadriiformes

• FAMILY •
Scolopacidae

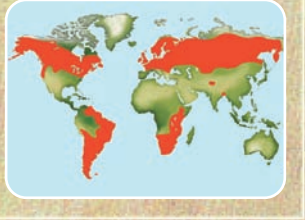
• GENUS & SPECIES •
Gallinago gallinago

KEY FEATURES

- A wading bird of shallow marshes and wetlands that uses its long, slender bill to probe for invertebrates
- The male produces a distinctive "winnowing" with his tail feathers during display flights
- Female nests in a depression on the ground and relies on the superb camouflage of her mottled plumage to escape the attention of predators

WHERE IN THE WORLD?

Resident in western Europe, South America, the U.S. and southern Africa; migratory elsewhere, breeding in North America, northern Europe and Asia, and wintering farther south



LIFECYCLE

The common snipe has two highly effective strategies to avoid predators: on the ground, it lies low and relies on superb camouflage; in the air, it flies in a dashing, zigzag flight.

HABITAT

▲ **SOGGY GROUND**
Marshland is a typical habitat of the snipe.

The common snipe is primarily a bird of waterlogged ground as it needs soil soft enough to let it probe deep beneath the surface to find food. The rich, spongy ground of peat bogs, water meadows, reedbeds, marshes and flooded fields of scrubby grass are all sought-after habitats during the breeding season. The snipe also requires dense cover nearby, patches of drier ground for nesting and ridges to use as lookout posts.

In winter, the snipe often exploits man-made feeding sites, such as the margins of reservoirs, sewage farms and even muddy pastures churned up by cattle. It visits seashores when frosts freeze the ground hard inland, and in the U.S., many snipe are attracted to feed around some of the warm springs found at higher altitudes.

DID YOU KNOW?

- **Snipe have been observed washing mud off food.**
- **Nests are often rotated between breeding pairs.**
- **In a dive, the snipe's tail feathers vibrate back and forth 11 times per second, producing a winnowing that can be heard a mile away.**

BEHAVIOR

▶ **COVER UP**
A nesting snipe relies on camouflage for safety from predators and is difficult to spot unless it moves.

Outside the breeding season, the snipe associates in groups (or "wisps") of 50 or so birds, but groups of up to 500 may gather at rich feeding grounds.

Most snipe are migratory and begin the journey north to breeding grounds in March. The birds reach their destination in late April or early May.

At the end of the breeding season, the snipe concentrates on feeding intensively to build up its energy reserves for its journey south to warmer wintering grounds. It also molts its old flight feathers, growing a new set for the long, arduous flight ahead. The autumn passage south is a slower, more leisurely affair than the spring migration. Some birds set off as early as July, but the peak is September. It can take some birds many weeks to reach their winter quarters.

FOOD & FEEDING

The common snipe is most active at dawn and dusk when it uses its bill to probe for food in the soil. On soft ground, the entire bill is pushed in. Worms form the largest part of the snipe's diet, but it eats almost any small invertebrate.

Sometimes the snipe walks slowly forward as it probes, but more often it stands rooted to a spot and makes several quick stabs in a semicircle. Small items are eaten before the bill is withdrawn, but large earthworms are pulled free before being swallowed whole.

◀ **BILLSTICKER**
Aquatic seeds supplement the snipe's invertebrate diet.

CONSERVATION

The zigzag flight of the common snipe when flushed from cover makes it a challenging target; many are shot for sport and the table. Loss of habitat due to land drainage is causing declines, notably in the south of England, the Netherlands and parts of Scandinavia. Harvesting of peat, especially in Ireland, has also reduced its habitat. But despite these pressures, the snipe remains numerous and, overall, isn't in danger.

BREEDING

The male is the first to arrive at the breeding grounds and begins his aerial displays to advertise his presence and claim a territory. After the arrival of the females, both sexes associate with several partners before firm pair bonds are established.

▲ **EARLY DEVELOPER**
Like its parents, a just-hatched young snipe is well camouflaged.

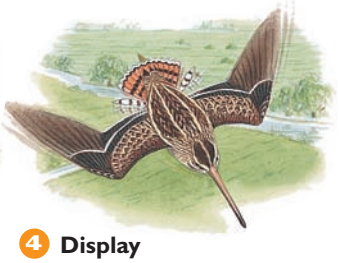
The nest is a shallow scrape in the ground chosen by the female, who lines it with soft grass and disguises it with bits of vegetation. Eggs are laid at daily intervals and incubated by the female alone. But the male stays close by, and when the chicks hatch, both parents feed them, the male taking charge of the first-hatched chicks while his mate tends the remainder. The chicks develop rapidly on their diet of protein-rich worms and other invertebrates and become totally independent within about three weeks.

DRUMMING DISPLAY

1 Close call…
While his mate is on the nest, the male sits on a perch nearby. He makes a familiar chipping call to reassure her that he's close.

2 Confirmation…
Like a rocket from a launching pad, he shoots up into the sky to confirm his message of fidelity to the sitting hen.

3 Preparation…
Head down, he flies in a widening circle above the nest site. He banks to one side in preparation for a spectacular dive.



4 Display
With beating wings, the male drops. Air rushing over the stiff outer tail feathers creates a characteristic winnowing sound.

PROFILE COMMON SNIPE

The common snipe spends most of its time wading in boggy or marshy sites inland, probing for invertebrates in the soil, using its long bill.

PLUMAGE
Brown and black, streaked and mottled upperparts provide camouflage while the snipe is on the ground. Adults and juveniles are almost indistinguishable.

TAIL
During the male's display flight, the two outer tail feathers *(below)* vibrate, creating a loud "drumming."

ESCAPE FLIGHT
When forced to break cover, the snipe rises suddenly and flies on a zigzag course, turning sharply one way and then the other close to the ground.

EYES
Set high in the skull, the eyes give good all-round vision, letting the snipe keep watch for predators while probing headdown on the ground.

FEET
Each foot has three, long, forward-facing toes bearing sharp claws and a shorter, spurlike hindtoe.

BILL
The tip of the bill is flexible and can be opened while the rest of the bill remains closed. It also contains touch-sensitive organs that allow the snipe to locate buried food.

VITAL STATISTICS

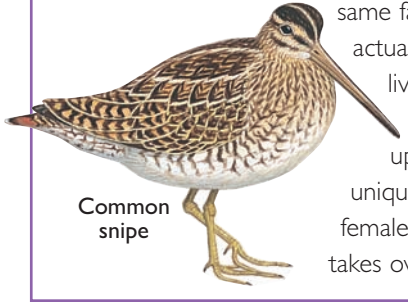
WEIGHT	3–4.5 oz.
LENGTH	10–11"
WINGSPAN	1.5'
SEXUAL MATURITY	1–2 years
BREEDING SEASON	April–July
NUMBER OF EGGS	2–5, usually 4
INCUBATION PERIOD	18–20 days
FLEDGING PERIOD	19–20 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Mainly worms; also insects, larvae, frogs, mollusks, leeches, aquatic seeds
LIFESPAN	Up to 12 years

RELATED SPECIES

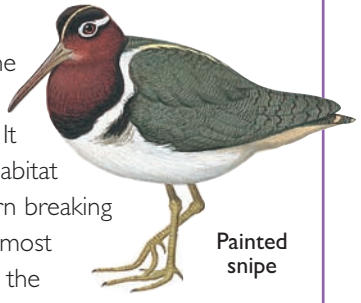
● **The genus *Gallinago* contains 15 snipe species, including the common snipe, which has several subspecies in both hemispheres. Relations in the family *Scolopacidae* (86 species in all) include sandpipers, such as the purple sandpiper, *Calidris maritima*** (below).

CREATURE COMPARISONS

Common names can often lead to confusion. A good example is the painted snipe (*Rostratula benghalensis*). The name implies that it's in the same family as the common snipe, but it's actually in its own family, the *Rostratulidae*. It lives in the same marsh and swampy habitat as the common snipe, its bold pattern breaking up its outline and camouflaging it. The most unique feature of the painted snipe is that the female is brightly plumaged and the male is dull. The male also takes over all the nesting duties after the eggs are laid.



Common snipe



Painted snipe

Common Tailorbird

• ORDER •
Passeriformes

• FAMILY •
Sylviidae

• GENUS & SPECIES •
Orthotomus sutorius

KEY FEATURES

- An abundant insecteater that is as at home in an urban vegetable patch as in the undergrowth of a forest clearing
- Stitches leaves together to form a pouch, in which it builds its nest hidden from predators
- The constant call between male and female is a characteristic sound of southeastern Asia

WHERE IN THE WORLD?

Found across southern China, southeastern Asia, the Malay Peninsula and Java; also throughout the Indian subcontinent, including Sri Lanka

LIFECYCLE

The tailorbird owes its name to the female's extraordinary sewing skills. Using her bill as a needle, she stitches one or more leaves into a pouch to form the basis of the nest.

HABITAT

▲ **BIRD IN THE BUSH**
The tailorbird lives in undergrowth that springs up in forest clearings.

The common or long-tailed tailorbird is a familiar sight throughout its extensive range. It even thrives in urban gardens and parks, where it hunts and skulks in hedges, flowerbeds and tangled shrubbery.

The common tailorbird is adaptable, taking advantage of any dense vegetation, including forest clearings. It is also found in semi-desert scrublands and in clumps of bamboo woodland at altitudes of up to 6,000', provided that there is cover for nesting.

DID YOU KNOW?

- **Despite its efforts to hide its nest, the tailorbird is often the victim of cuckoos, which lay their eggs in the tiny nests.**
- **The common tailorbird often steals fibers from house doormats, which it then uses to stitch up its nest pouch.**

BEHAVIOR

Seemingly tireless, the common tailorbird hops actively among bushes, hedges and trees in its ceaseless search for tiny insects, its tail cocked high above its back and wagging from side to side.

The bird's weak, erratic flight makes it an easy target for flying predators. Therefore, it flits swiftly from one patch of undergrowth to another, avoiding open areas. However, where the tailorbird inhabits areas near human settlements, it is surprisingly tame.

A tailorbird pair forms a long-term bond and lives within a static territory all year. The birds remain in constant contact with each other, uttering a surprisingly loud, monotonous call: *chee-up, chee-up*. When danger threatens, such as the appearance of a shikra — the common small sparrowhawk of southern Asia — the pair makes noisy alarm calls of *pit-pit-pit* until the danger has passed.

BREEDING

The tropical undergrowth where the tailorbird lives teems with nest robbers, such as snakes, lizards, mongooses and various predatory birds. To avoid these predators, the tailorbird constructs its nest deep in a thicket or tree up to 20' high.

Pairs usually breed between February and May. After mating, the female begins the arduous work of nest-building. It takes her up to two days to stitch the pouch together, while the male defends the pair's territory from other tailorbirds. Once the pouch is complete, the male helps her construct the nest from grasses, and then line it with cotton, feathers and animal hairs.

Both parents incubate the clutch, and later bring food to the nestlings — an exhausting task that occupies them constantly until the chicks are fledged two weeks later.

▶ **SAFETY POUCH**
The nest leaves provide excellent camouflage.

GETTING STITCHED UP

1 Tailor maid...
Selecting a large leaf in the middle of a bush, the female carefully brings the two edges together to form a pouch.

2 Needlework...
Using her long, thin bill like a hole puncher, the female deftly jabs a line of small, precise holes along the edges of each side of the leaf.

Chiffchaff

• ORDER •
Passeriformes

• FAMILY •
Sylviidae

• GENUS & SPECIES •
Phylloscopus collybita

KEY FEATURES

- One of Europe's most common migratory birds, easily recognized by its distinctive two-note song
- A resourceful insect hunter, its agility and size enable it to find food that larger birds miss
- Male sings from the treetops, but female builds her ball-shaped nest close to the ground

WHERE IN THE WORLD?

Breeds in woodlands in Europe, Central Asia and Siberia, as far as the Arctic Circle; winters in southern Europe, North Africa, the Middle East and India

LIFECYCLE

One of the first migrants to appear in northern Europe, the chiffchaff arrives in early spring. The male broadcasts his presence by singing heartily from treetops.

HABITAT

▲ **BUSHY TALE**
Thick vegetation is an ideal chiffchaff habitat.

The chiffchaff is a bird of woodlands, but is often found in large, wooded gardens and even in hedgerows studded with tall trees. Like other leaf warblers, it is most at home in tree canopies or among tangles of vegetation and rarely alights in the open. If there is enough cover, the chiffchaff sometimes feeds in low shrubs, but it only breeds where there are trees the male may use as singing posts.

The chiffchaff arrives in northern European woodlands so early that it often sets up its breeding territories before the trees are fully in leaf.

BREEDING

The chiffchaff's arrival in early spring allows breeding to get off to a prompt start. The male courts the female with a fluttering display flight and, after mating, the female alone weaves the nest from a variety of plant matter and animal hair. The nest is a domed structure built about 1' from the ground in a tangle of plants. The female lays her clutch of eggs in early May, unless the weather is especially cold; then, there might be a delay.

The male chiffchaff takes no part in incubating eggs, although he helps feed the nestlings once they have hatched. But the female does most of the work, carrying a supply of insects to the nest.

After the first brood has fledged, the female often produces a second, which normally hatches out in July. Although these later nestlings do not have to face the uncertain spring weather, they may have less time to feed before the migration south. If they fail to build up enough body fat, they may die on the journey.

BUILDING A NEST

1 Extra bedding...
The female collects leaves, grass, animal hair and feathers to build and line the nest. Sheep's wool makes a useful insulating material.

FOOD & HUNTING

The chiffchaff feeds mainly on insects and times its arrival at its breeding grounds to take full advantage of the spring boom in invertebrates. The hunt involves hours of nonstop activity as the bird flits from tree to tree, inspecting leaves, buds and twigs for caterpillars and adult insects.

Like most of its relatives, the chiffchaff specializes in picking insects off plants and rarely catches them in midair. The chiffchaff has been seen feeding on nectar from flowers and, in its winter quarters, sometimes eats fruit and berries.

▲ **HEAVY LUNCH**
The chiffchaff must forage constantly to feed young.

2 Secret hideaway…
Despite being close to the ground, the nest is well hidden. The female arrives and leaves rapidly to avoid revealing the location to predators.

3 Soft furnishings…
The female tugs moss from stones with her beak and adds it to the nest; this extra layer provides insulation from wind.

4 Builder at work
Although the female may have never built a nest before, instinct tells her how to arrange the materials collected.

DID YOU KNOW?

- **The chiffchaff is so similar to the willow warbler that it usually takes an expert to tell them apart. However, the willow warbler has a more melodic song.**
- **A chiffchaff's color shows regional variations. Birds from Siberia are mainly gray and white, while European birds are more olive-brown.**
- **The wood mouse is a chiffchaff enemy. In places where it's common, the mouse can destroy over three-quarters of chiffchaff nests, eating eggs and nestlings.**

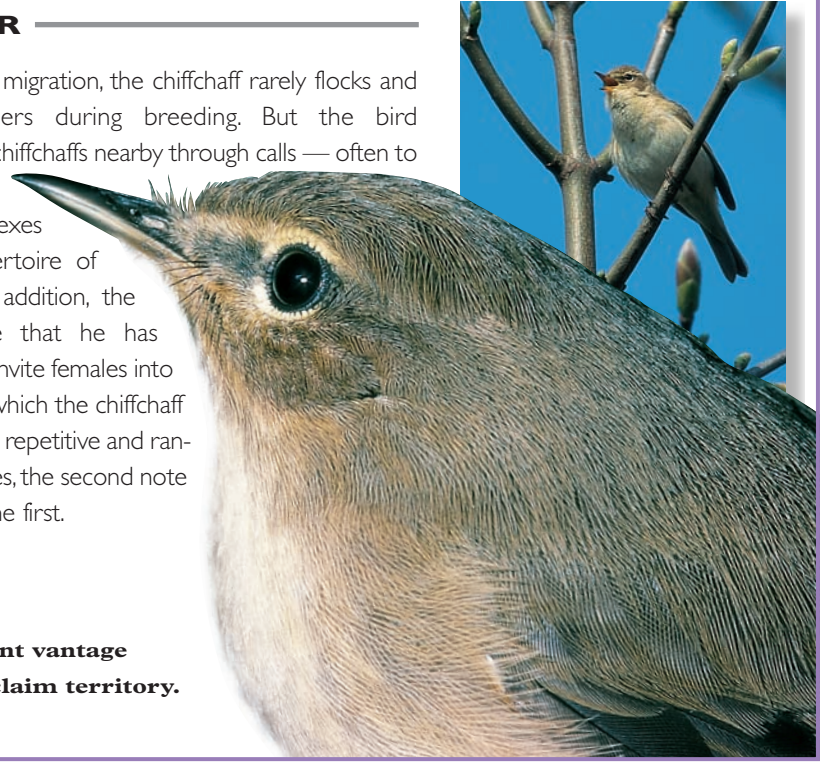
CONSERVATION

The chiffchaff is one of Europe's most common and widespread birds. Compared to some other songbirds, such as the hedge sparrow or skylark, chiffchaff numbers have remained relatively stable despite dramatic changes to the rural landscape. This is because the chiffchaff eats a wide range of insect food and breeds in many types of wooded habitats including bushes close to towns, parks and gardens.

BEHAVIOR

Solitary during winter and migration, the chiffchaff rarely flocks and only appears with others during breeding. But the bird communicates with other chiffchaffs nearby through calls — often to warn of danger.

Like many birds, both sexes of chiffchaff share a repertoire of simple one-note calls. In addition, the male sings to announce that he has claimed a territory and to invite females into it to mate. His song, from which the chiffchaff takes its name, consists of a repetitive and random sequence of two notes, the second note being a lower pitch than the first.



STAKING A CLAIM
A treetop is an excellent vantage point for the male to claim territory.

PROFILE CHIFFCHAFF

With its tiny lightweight body, slender toes and narrow beak, the chiffchaff is adept at foraging for insects beyond the reach of many birds.

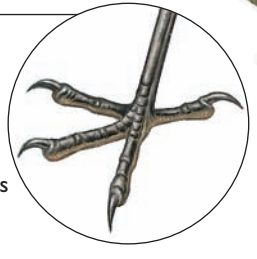
BILL
The bill ends in a sharp point and is small enough to permit the chiffchaff to pick up minute insects one by one.

PLUMAGE
Olive-brown coloring enables the chiffchaff to hide among twigs and leaves. The bird is easiest to see in early spring, when it is often silhouetted in the bare treetops.

WINGS
Small wings enable the chiffchaff to fly and hover in thick foliage while hunting for insects.

TAIL
The chiffchaff flicks and fans its tail for balance as it maneuvers through dense vegetation.

LEGS & FEET
The chiffchaff's legs splay out at an angle to steady it as it feeds. Like other songbirds, it has toes that curl around twigs for greater stability when it perches.

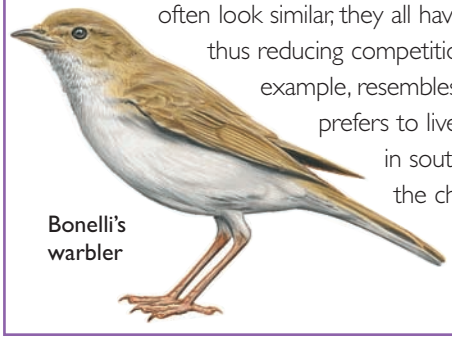


VITAL STATISTICS

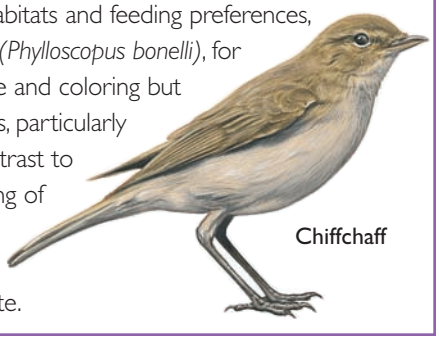
WEIGHT	0.21–0.35 oz.
LENGTH	4–4.4"
WINGSPAN	6–8.5"
SEXUAL MATURITY	1 year
BREEDING SEASON	April to July
NUMBER OF EGGS	4–7
INCUBATION PERIOD	13–15 days
FLEDGING PERIOD	14–16 days
BREEDING INTERVAL	1 or 2 clutches a year
TYPICAL DIET	Insects and their larvae
LIFESPAN	Up to 6 years

CREATURE COMPARISONS

The chiffchaff is one of a group of small insect-eating birds called leaf warblers. Although leaf warblers often look similar, they all have slightly different habitats and feeding preferences, thus reducing competition. Bonelli's warbler *(Phylloscopus bonelli)*, for example, resembles the chiffchaff in size and coloring but prefers to live in mountain forests, particularly in southern Europe. In contrast to the chiffchaff's call, the song of Bonelli's warbler consists of a short trill with a single note.



Bonelli's warbler



Chiffchaff

RELATED SPECIES

● **The chiffchaff belongs to the family *Sylviidae*, which includes European, African and Asian leaf warblers. This family is a small part of the diverse order *Passeriformes*, which includes the blue-tailed pitta, *Pitta guajana* (below).**

Cockatiel

• ORDER •
Psittaciformes

• FAMILY •
Cacatuidae

• GENUS & SPECIES •
Nymphicus hollandicus

KEY FEATURES

- The cockatiel is the smallest cockatoo, weighing only 3.5 oz.
- Searches for seeds, fruits and berries on or near the ground
- Devoted mate and parent; remains paired year-round and both sexes care for young
- Keeps its distance while perching, but is usually gregarious, traveling in flocks of several hundred

WHERE IN THE WORLD?

Found exclusively in and throughout Australia; especially numerous in the northern regions and rarely found along the continent's many coastal areas

LIFECYCLE

Extremely faithful, the cockatiel is noted for its touching concern for an injured comrade; if one member of a flock is hurt, the others will hover about the bird to protect it.

HABITAT

Cockatiels prefer open, lightly timbered country close to a source of freshwater, such as open woodlands and savannahs, threaded with waterways or bordered by water holes. Flocks also live in more arid parts of Australia, foraging for food in one place and flying some distance for water. Cockatiels prefer large, dead eucalyptus trees, on which they perch on the stout outermost branches. Cockatiels are able to endure extreme temperatures as low as 42°F and as high as 110°F. This ability to endure extreme temperatures enables the cockatiel to inhabit areas where other cockatoos or parrots usually cannot survive.

▲ **PRIVATE PERCH**
Cockatiels prefer trees near steady water supplies.

BEHAVIOR

Cockatiels can be found in pairs and small groups, but more often congregate in flocks numbering well into the hundreds. The birds living in the more arid regions of northern Australia are highly nomadic and constantly on the move in search of favorable feeding grounds. Their flight call, *weel, weel,* is often heard before the birds are seen, and the cockatiels zoom through the sky at speeds up to 44 mph. In spite of their gregariousness, each cockatiel prefers to maintain its own space: when large flocks perch together, they will not come into contact with one another. However, caring cockatiels will surround an injured bird in order to protect it from further harm. The bond between mates is extremely strong. A cockatiel separated from its mate may "grieve" for as long as six months, during which time attraction to the opposite sex may appear absent.

BREEDING

Cockatiels are picky when choosing a mate and form strong bonds that last for life. Breeding usually occurs following a heavy rain, when food will be plentiful for the chicks. During the rain, many of the birds will sit with their tails and wings outstretched to bathe. Males then make displays with their wings, and the females posture in return. Once the rains have passed, the breeding pair searches for a nest hollow, usually about 15" deep in a dead eucalyptus tree about 5' above ground. About four days after nesting, the female begins to lay a clutch of 4–7 eggs, laying one egg every other day. Incubation lasts 17–23 days, with the male and female sharing the duties. Upon hatching, the chicks are fed immediately, and the parents attentively guard them for the first five days. Then, they leave the chicks unattended as they forage. The young leave the nest at about 4–5 weeks and males develop their yellow facial mask at about 6 months of age.

RAPID GROWTH

1 Honey, I'm home…
After a night of guard duty, the male reenters the nest to relieve the female of her incubation duties until late afternoon.

2 Backing in…
Since their long tails prevent them from turning around in the small tree hollow, the adults must enter the hole tail first.

▲ **SEPARATE BUT EQUAL**
Although they may congregate in large flocks, perched cockatiels will not come in contact with each other.

CONSERVATION

The cockatiel is not threatened. Because of their occasional raiding of crops, however, there is an open hunting season for cockatiels in Queensland. Elsewhere in Australia they are protected by law year-round. Although they are second only to the parakeet in popularity as a pet, they are not regularly captured from the wild since they are easily bred in captivity.

FOOD & FEEDING

Cockatiels prefer to forage on the ground, searching for small sun-dried seeds from grasses and plants, but they will also perch in trees and shrubs to look for food. The bird husks seeds by rotating them with its tongue while the beak and strong jaws effortlessly crack the seed. The cockatiel also enjoys fruits, berries and the nectar of some flowers. Large flocks may raid, and often completely destroy, crops of ripening sorghum, wheat and sunflowers. Powerful fliers, cockatiels will often take several long flights throughout the day from foraging grounds to water holes. Cockatiels are cautious when coming in to drink and will usually circle an area several times before descending. The bird drinks by immersing its bill into the water, raising its head and allowing the water to flow down the esophagus.

3 Feed me...!
Upon hatching, the chicks almost immediately beg for food and often receive their first meal within two hours of hatching.

4 I'm a big bird now!
Young leave the nest to join the flock after 4–5 weeks but are easily recognizable, with their duller plumage and much smaller crests.

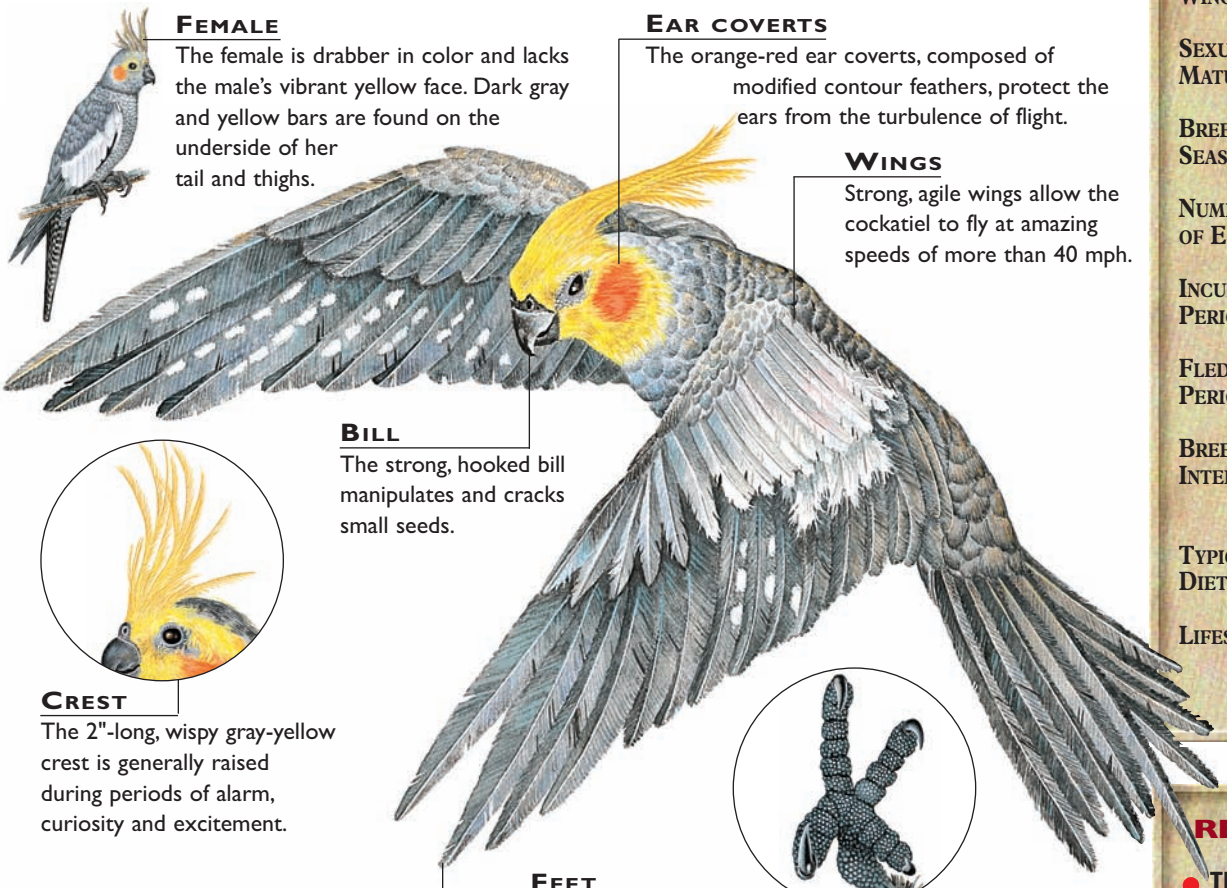
▼ **DOUBLE DUTY**
The cockatiel uses its bill and its tongue to forage.

DID YOU KNOW?

- **Travelers in arid regions of Australia have been able to follow the flights of the cockatiel to find water.**
- **Confined cockatiels have developed almost no homing ability, and they can become hopelessly lost in a house or even in a single room.**

PROFILE COCKATIEL

The swift and powerful cockatiel reaches incredible flight speeds of up to 44 mph, and is easy to spot with its rosy-orange ear coverts.



FEMALE
The female is drabber in color and lacks the male's vibrant yellow face. Dark gray and yellow bars are found on the underside of her tail and thighs.

EAR COVERTS
The orange-red ear coverts, composed of modified contour feathers, protect the ears from the turbulence of flight.

WINGS
Strong, agile wings allow the cockatiel to fly at amazing speeds of more than 40 mph.

BILL
The strong, hooked bill manipulates and cracks small seeds.

CREST
The 2"-long, wispy gray-yellow crest is generally raised during periods of alarm, curiosity and excitement.

PLUMAGE
The cockatiel is gray; males have a bright-yellow face mask and orange ear coverts.

FEET
The feet are adapted for perching; the bird has a slow, waddling gait.

VITAL STATISTICS

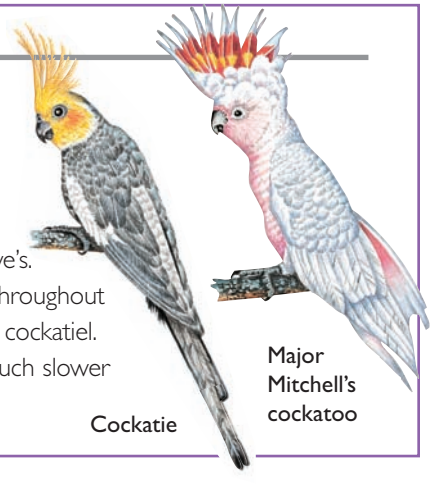
WEIGHT	2.8–3.5 oz.
LENGTH	10–13"
WINGSPAN	20"
SEXUAL MATURITY	2–3 years
BREEDING SEASON	After heavy rains
NUMBER OF EGGS	4–7
INCUBATION PERIOD	17–23 days
FLEDGING PERIOD	4–5 weeks
BREEDING INTERVAL	Up to 2 clutches per year
TYPICAL DIET	Seeds, fruits and berries
LIFESPAN	15–20 years; up to 38 in captivity

RELATED SPECIES

The cockatiel is the only species in the genus *Nymphicus*, but joins 20 other species of cockatoo in the family *Cacatuidae*. The palm cockatoo, *Probosciger aterrimus*, is the largest cockatoo, weighing over 2 lbs. and measuring almost 2' in length. The most distinct cockatoo is probably the galah, *Eolophus roseicapillus*, with its deep-pink face, neck and underparts.

CREATURE COMPARISONS

Major Mitchell's cockatoo *(Cacatua leadbeateri)*, also known as the pink cockatoo, is mainly white but has a light-pink head, breast and underwing. Measuring up to 15" long and weighing up to 1 lb., it is larger than the cockatiel. Its 5"-long, fanlike crest feathers are also longer and more colorful than its relative's. Major Mitchell's cockatoo is found among the dry grasslands throughout central and western Australia—a more limited range than the cockatiel. The bird's rounded wings enable it to fly at a leisurely pace, much slower than the cockatiel, whose narrow wings allow fast flight.



Cockatiel

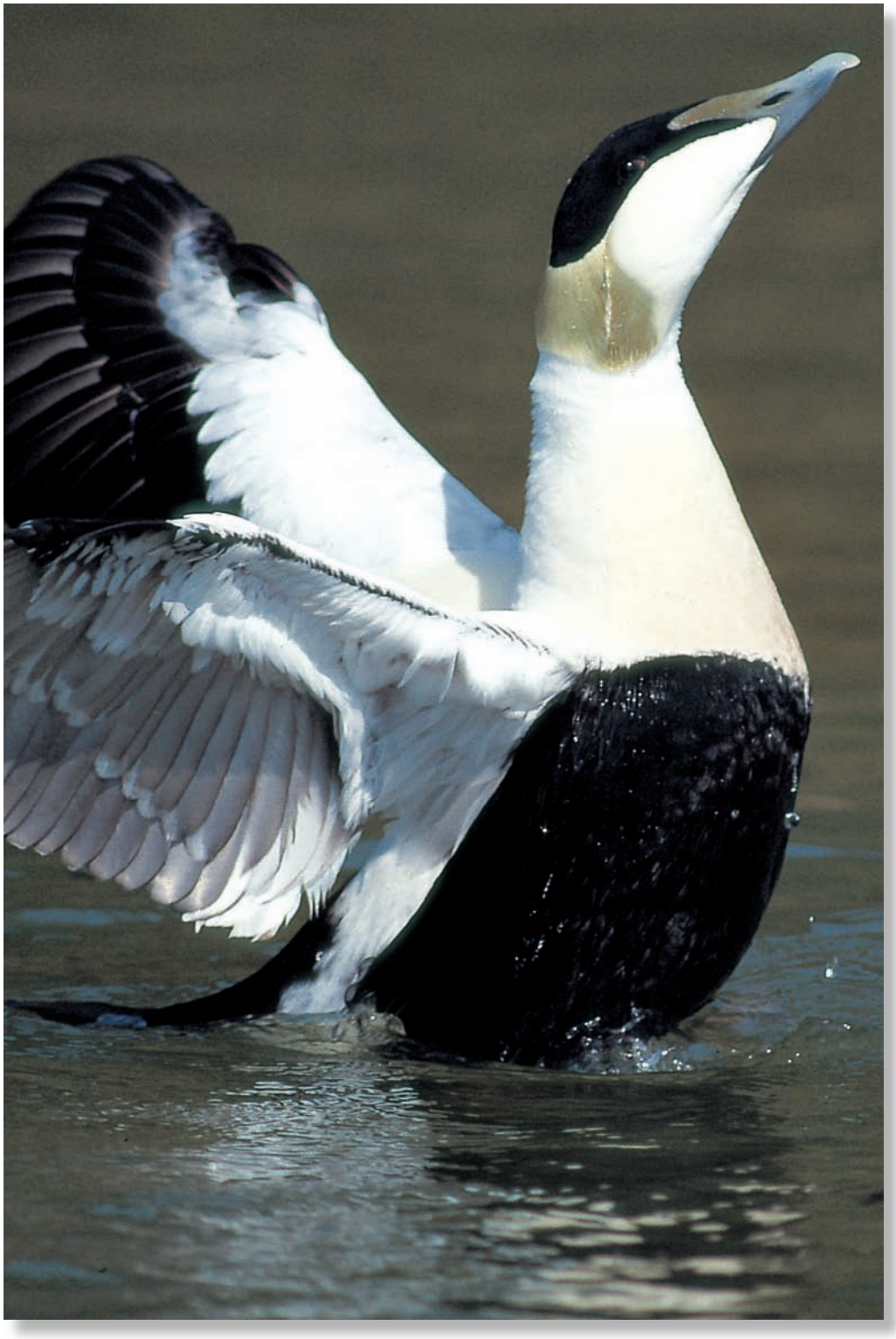
Major Mitchell's cockatoo

Common Eider

• ORDER •
Anseriformes

• FAMILY •
Anatidae

• GENUS & SPECIES •
Somateria mollissima



KEY FEATURES

- A hardy bird that spends most of its life at sea, living on cold, storm-tossed waters
- Expert diving skills and a hefty bill enable the eider to feed on shellfish on the seabed
- Uses its own soft, down feathers plucked from its breast to make a snug lining for its nest; the down is "harvested" by humans for use in quilts and sleeping bags

WHERE IN THE WORLD?

On coasts from Alaska, across northern Canada and northeastern U.S. to Greenland, Great Britain, Scandinavia and eastern Siberia; birds in the High Arctic and Baltic areas migrate south in winter

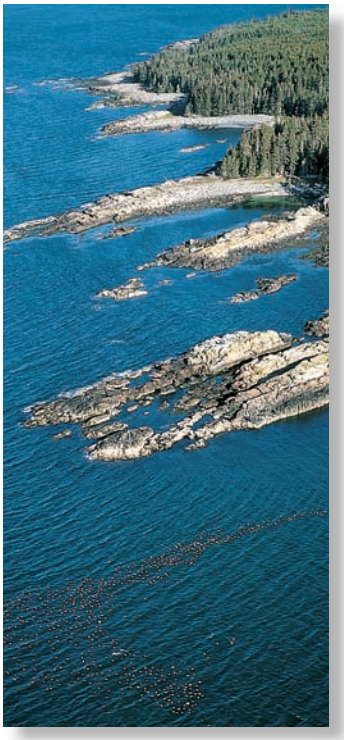
LIFECYCLE

The common eider spends most of its time in the cold, storm-tossed waters of northern seas, buoyantly bobbing among rough wave crests or diving below the surface to feed.

HABITAT

The common eider is essentially a seaduck, spending most of its life offshore along cold, bleak and inhospitable sea coasts, from the North Atlantic and Pacific, north to the High Arctic. It sometimes flies to inland lakes and rivers, but visits only those waters that are a short distance away from the coast.

Rarely venturing far out to sea, the common eider prefers to remain close inshore, seeking the shelter of protected bays, inlets and estuaries. These sheltered areas also offer ideal breeding sites, as the common eider tends to nest very close to the water, just out of range of the pounding surf.



▶ **OUT TO SEA**
A "raft" of eider duck off the rocky coast of Maine.

BEHAVIOR

Common eiders gather in large flocks on coastlines; they spend most of their time resting between feeding sessions. The sociable birds also come onto land to loaf about and preen. When moving from place to place, they usually fly in single file or in loose strings.

Eiders winter mainly within their breeding range out at sea, although eiders from the Baltic and Arctic areas may be driven to coasts farther south when the polar seas freeze over.

▶ **COMMUNAL LIVING**
Eiders gather in flocks, sometimes thousands strong.

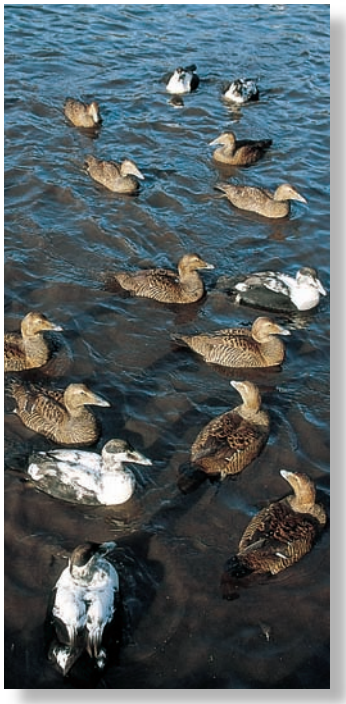
FOOD & FEEDING

The eider feeds on a variety of shellfish (mussels, whelks, cockles and crabs), which it finds on the seabed. At high tide, the eider dives beneath the waves to grab shellfish in its powerful bill or, as the tide ebbs, it dabbles for them in the shallows.

The eider cracks open large shellfish with its bill, but swallows small ones whole. The gizzard (part of the stomach) grinds down the shells of the food that it swallows whole, releasing the soft flesh inside.

Shellfish form the basis of the eider's diet, but it also occasionally eats small fish. While incubating her eggs, a female may nibble away at plant matter that's within reach of the nest, such as berries, seeds and leaves.

▲ **SEAFOOD SPECIALISTS**
After diving to the seabed for food, the ducks rest to digest their meal. Eiders also up-end to catch small fish.



BREEDING

Courtship occurs in flocks. *Drakes* (males) circle females in the water, cooing softly. A female accepts by imitating his display, then allows him to mate with her. The pair goes ashore to find a nest site. Once a site is selected, the pair separates.

Eiders nest in colonies, and egg-laying within a colony is *synchronous* (most clutches hatch within a short time of each other). Ducklings are active as soon as they hatch; within hours, females lead their young to the sea, where they plunge in, quickly learning to dive and find food. The young are fledged at about 10 weeks.

▶ **NURSERY GROUP**
In dense colonies, ducklings gather in groups.

▼ **NEST BUILDER**
Females line their ground nests with grass and down.

CONSERVATION

In parts of the eider duck's range, its down feathers are harvested at nesting time, when the bird plucks out its down to line its nest. "Eider farmers" collect the down, which has excellent insulating properties, and sell it for use in clothing and quilts. As a result, the bird is carefully protected. Artificial nesting sites are provided and the eider's predators are controlled. Colonies of up to 10,000 birds have become established. The world population now stands at over 5,000,000 and the bird is in no danger.

DUCKING AND DIVING

1 Surf...
On rough coastal waters, flocks of common eiders gather to feed on shellfish living on the ocean floor.

2 Plunge...
Plunging underwater, the birds use their large, webbed feet to propel down to the seabed.

3 Pluck...
Spotting a mussel bed, the eider pulls off a large individual to take up to the surface to eat.

4 Chow down
After a dive lasting just over a minute, the eider surfaces and cracks open its catch.

DID YOU KNOW?

- **It's believed that the common eider inspired the first bird sanctuary. St. Cuthbert, a 7th-century hermit on the Farne Islands off the east coast of northern England, protected them. In fact, the Farne Islands are still a bird sanctuary today.**
- **In the few hours between hatching and reaching the sea, half of a brood may be snatched by predators, such as gulls.**
- **It takes the down from up to 100 common eider nests to fill just one quilt or sleeping bag.**

PROFILE COMMON EIDER

Cold-cheating down feathers insulate the common eider against icy seas and a powerful, shell-cracking bill helps it exploit abundant shellfish.

FEMALE

In contrast to the drake's bold, black-and-white breeding plumage, the female is a uniform brown with blackish stripes and bars all year round. This provides camouflage when the female is nesting.

BILL

Large, triangular bill is employed for cracking open mussels, crabs, whelks and other shellfish.

FEET

Feet are large and broadly webbed, providing the eider with the thrust needed to dive down to the seabed to feed.

DOWN FEATHERS

Under the outer body feathers is a thick layer of down. These small, soft and loosely structured feathers trap a layer of air close to the skin, giving the eider excellent protection against the cold.

VITAL STATISTICS

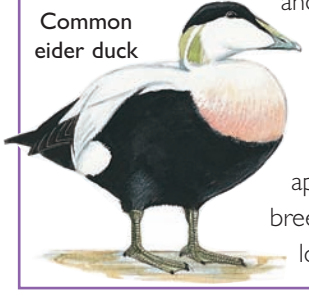
WEIGHT	4–5 lbs.
LENGTH	1.5–2'
WINGSPAN	2.5–3.5'
SEXUAL MATURITY	2–3 years
BREEDING SEASON	April–July
NUMBER OF EGGS	1–8, but usually 4–6
INCUBATION PERIOD	25–28 days
FLEDGING PERIOD	60–75 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Mainly shellfish; occasionally fish and plant matter
LIFESPAN	5–6 years

CREATURE COMPARISONS

In the breeding season, drakes of all four eider duck species are strikingly patterned, but the most spectacular is the king eider (*Somateria spectabilis*), resplendent in its velvety-black body and rose-tinged white breast. The pale-green and pearl-gray head has a remarkable bright-orange "shield" outlined in black at the base of the red bill.

The common eider lacks the king eider's colorful head and has a white back, making it appear cleaner cut than the king eider. After breeding, both molt into a dark, drab "eclipse" plumage, looking quite different from their courtship dress.

Common eider duck



King eider duck

RELATED SPECIES

● **The common eider is a member of the family *Anatidae*, a large group with over 140 species. The majority are ducks, including the Magellanic flightless steamer duck, *Tachyeres pteneres*** (below)**. However, geese and swans also belong to the same family.**

Common Grackle

• ORDER •
Passeriformes

• FAMILY •
Icteridae

• GENUS & SPECIES •
Quiscalus quiscula

KEY FEATURES

- Eats almost anything, from grasshoppers to weeds, salamanders to seeds; considered a pest by farmers
- Its song resembles rusty hinges on a gate
- Very sociable; flies, roosts and eats in the company of many other birds

WHERE IN THE WORLD?

Found in southern Canada and in the U.S., east of the Rocky Mountains; from British Columbia, east to Nova Scotia and Florida

LIFECYCLE

The common grackle is a clever crafter, using cloth, plastic or yarn when building its nest, and an ingenious hunter that scratches, chases and leaps to find food.

HABITAT

The common grackle is highly adaptable and has enjoyed great population success in its North American habitat. Grackles are conspicuous, sociable birds on farmland and in town gardens, open woodland, fields, swamps, parks and orchards. The grackle also lives near cities, towns and suburbs. This widespread bird winters just south of its breeding range. However, some subspecies, such as those found in Florida, remain sedentary.

▲ **GROUNDED GRACKLE**
A grackle enjoys the shelter of its woodland habitat.

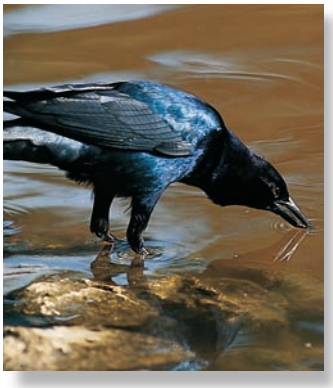
BREEDING

The common grackle is polygamous; each male often takes on multiple partners throughout the breeding season. Just before this season begins in the early spring, the grackle forms very large, noisy roosts, often with thousands of other birds. In a characteristic display performed during the mating ritual, the male lifts his head and drops his wings before breaking into song. He then puffs up his feathers to impress the female.

Once paired, the birds fly off to find a nest site, which is usually located in tall coniferous trees, but can also be found in elms or maples. Other desirable nesting sites include cattail marshes and low shrubs around lakes and ponds. With no assistance from the male, the female builds a large, bulky nest of woody stems, leaves and grasses; she will even incorporate man-made materials such as fabric, cloth or plastic. As added reinforcement, she then lines the nest with mud, fine grasses and horsehair, if available. The clutch usually varies from 4–6 bluish or pinkish eggs that are blotched with brown. The female incubates the eggs for 13–14 days, and both parents tend the young until the chicks fledge 18–20 days later.

FOOD & FEEDING

The common grackle will feed on almost anything, and it does so on the ground, in the water and in the trees. It forages in the company of many birds in trees and bushes, looking for a variety of foods, including nuts, fruit, the eggs of small birds and even young birds. The common grackle has also been known to eat salamanders, acorns, chestnuts, weeds, seeds and grain. The grackle carefully probes on the ground using its strong claws and sharp beak to scratch for worms and buried insects. Though it usually walks with slow, deliberate steps during the search for food, the grackle will often chase insects, mice or lizards, or even leap up to catch flying insects or snatch worms from out of the beaks of feeding robins. The versatile common grackle will wade into shallow water if necessary to catch aquatic creatures such as frogs, aquatic insects and crayfish.



▲ **WET WADER**
A grackle wades into the water for a meal.

IN THE COMPANY OF MANY

1 Awakening…
Numerous common grackles roost in a line of trees among thousands of birds.

2 Location, location…
A pair of breeding birds inspects a coniferous tree as a possible nesting site.

3 Master crafter…
The female completes the finishing touches to the nest by adding mud to the inside layer.

4 One for all
The five growing chicks feed off a large spider provided by their protective mother.

CONSERVATION

The common grackle is plentiful in its New World residence and faces no real threats in its environment. The bird eats almost anything available and enjoys a high survival rate of its young.

DID YOU KNOW?

- **Flight speeds of the grackle can reach up to 30 mph depending on the wind.**
- **Birds have no vocal chords; sounds come from a resonating voice box at the bottom of the windpipe.**

BEHAVIOR

The sociable common grackle is rarely seen alone. In fact, it often flocks with blackbirds, cowbirds and starlings in congregations that number in the thousands. The noisy grackles roost in large groups in the midst of evergreen forests and fly together over potential feeding grounds. In level flight, the grackle splits its long, wedged-shaped tail to form a V. Pointed wings offer these strong fliers optimum control and agility.

Considered a songbird, the male common grackle marks the onset of spring with a call that resembles the grating sound of rusty hinges. Though it is unpleasant to human ears, this courtship song attracts female grackles. This extremely vocal bird has a loud voice; the grackle also emits a loud, hoarse *chuk* or *chak* wheezing song when it is threatened or in flight.

▼ **SPLISH SPLASH**
A fastidious common grackle enjoys a refreshing midday bath.

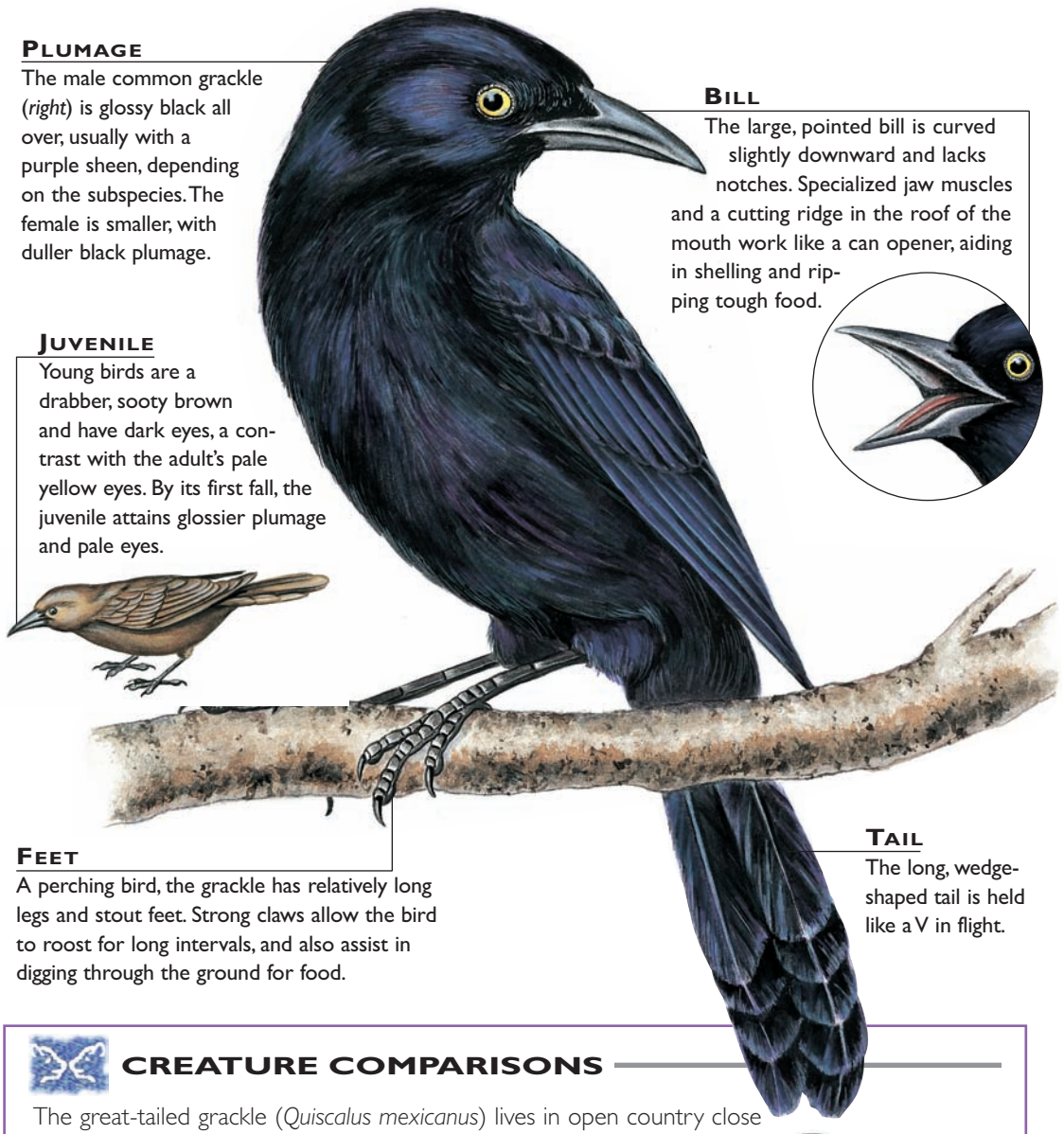
PROFILE COMMON GRACKLE

Sunlight enhances the glossy–black common grackle's metallic sheen; males accentuate this feature by puffing out their feathers.

PLUMAGE
The male common grackle (*right*) is glossy black all over, usually with a purple sheen, depending on the subspecies. The female is smaller, with duller black plumage.

JUVENILE
Young birds are a drabber, sooty brown and have dark eyes, a contrast with the adult's pale yellow eyes. By its first fall, the juvenile attains glossier plumage and pale eyes.

BILL
The large, pointed bill is curved slightly downward and lacks notches. Specialized jaw muscles and a cutting ridge in the roof of the mouth work like a can opener, aiding in shelling and ripping tough food.



FEET
A perching bird, the grackle has relatively long legs and stout feet. Strong claws allow the bird to roost for long intervals, and also assist in digging through the ground for food.

TAIL
The long, wedge-shaped tail is held like a V in flight.

VITAL STATISTICS

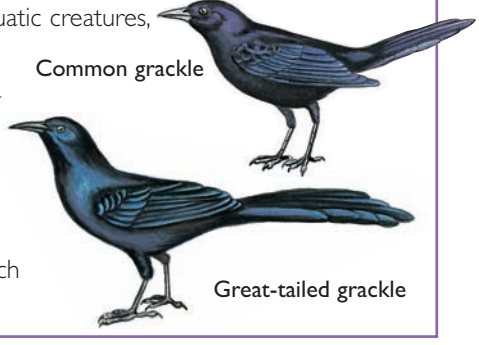
WEIGHT	3–5 oz.
LENGTH	11–13.25"
WINGSPAN	17–18.5"
SEXUAL MATURITY	1–2 years
BREEDING SEASON	March–June
NUMBER OF EGGS	4–7
INCUBATION PERIOD	13–14 days
FLEDGING PERIOD	18–20 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Nuts, seeds, fruit, insects, frogs, lizards, worms, birds and bird eggs
LIFESPAN	More than 17 years

RELATED SPECIES

● The common grackle is 1 of over 90 species in the family *Icteridae*. The birds in this family range from 6.5–21" in length, and include 22 North American species, including the bobolink, *Dolichonyx oryzivorus*, as well as the boat-tailed grackle, *Q. major*a, a close relative in the genus *Quiscalus*. Tropical species include the melodious blackbird, *Dives dives*, and the Martinique oriole, *Icterus bonana*.

CREATURE COMPARISONS

The great-tailed grackle (*Quiscalus mexicanus*) lives in open country close to water, where it feeds mainly on small fish and other aquatic creatures, unlike the common grackle. Measuring 12–17", the great-tailed grackle is larger than the common grackle and has a longer tail. Not nearly as widespread as the common grackle, the great-tailed grackle inhabits woodland groves and towns in Mexico, Panama and the southern U.S., including Texas, Arizona and New Mexico. It is a noisy bird with a similarly grating, shrieking courtship call, *cha-we*, much like the common grackle's hoarse *chuk* call.



Common Guillemot

• ORDER •
Charadriiformes

• FAMILY •
Alcidae

• GENUS & SPECIES •
Uria aalge

KEY FEATURES

- A diving seabird resembling a penguin in size and color, but with a much longer, narrower beak
- Colony performs a complicated ballet display in the water under the leadership of a single bird
- Young guillemot take their first dive off a cliff and into the sea before they are able to fly

WHERE IN THE WORLD?

Found on the northern coasts of the Atlantic and Pacific oceans in North America, Europe, Asia, Africa, Greenland and Iceland; also in the U.S. in Maine and southern California

LIFECYCLE

The guillemot is an accomplished swimmer and diver; it ventures onto dry land only to nest in colonies that dot the sea cliffs, where the bird lays a single egg on bare rock.

HABITAT

The common guillemot prefers ice-free waters where it can dive and hunt without obstacles. This seabird remains on the high seas until the breeding season, when it moves to steep sea cliffs and low, flat islands. It occurs along seacoasts, rocky cliffs and offshore islands during winter, as well as along the edge of the continental shelf and shallow banks, marine coasts and bays. The guillemot can generally be found in boreal (northern) waters with some birds in the cool, subtropical zone. Depending on the direction of fish schools, the guillemot winters offshore at sea within the breeding range. In Newfoundland and Norway, the bird is relatively sedentary; in Great Britain and Iceland, birds move toward the North Sea.

◀ **TIGHT FIT**
Rows of guillemots pack the edges of the steep coastal cliffs.

BEHAVIOR

The social guillemot nests in large colonies on cliffs, presenting a spectacular splash of black and white during the nesting season. These remote sites are mostly predator-free except for gulls that fly in and grab the eggs or very young birds. This cousin of the penguin, better suited for swimming, waddles on land only during the nesting season and rests sitting upright.

Common guillemots use a variety of signals and displays to protect territories. They chatter continuously, with a combination of grunts, cries and whistles that they emit on land and also as they swim.

▶ **DEEP DIVE**
The streamlined guillemot can dive up to 230' and hold its breath for up to one minute.

▼ **SHORT FLIGHT**
The guillemot rapidly flaps its narrow wings to support its heavy body.

DID YOU KNOW?

- **The common guillemot and other relatives in the auk family are related to penguins, but these birds have retained the ability to fly — due mainly to their larger wing size.**
- **Adult common guillemots use a loud, distinctive call to locate a chick lost in the dark, icy waters. Guillemot chicks use loud begging calls when hungrily awaiting their parents' arrival.**

FOOD & FEEDING

The guillemot searches for its fish prey by dipping its head just below the sea's surface. After spotting prey, the bird then dives and propels its body underwater with its wings, in hot pursuit of a meal. This acrobatic chase usually results in several catches during the day, with the bird diving from 30–230'. The guillemot prefers fish that are high in fat, such as herring, capelin, sprat and sand eels, carrying each one head first in its bill before swallowing it. It will also eat crustaceans, fish eggs, mollusks and worms. The guillemot swims up to 13 miles in search of large schools of fish.

▶ **ONE AT A TIME**
The guillemot carries one fish head first before swallowing it.

BREEDING

Courting for the guillemot consists of a series of calls and complicated water ballets. Once formed, pairs are monogamous and both male and female defend the breeding site, flicking their heads and lunging at intruders in threat displays.

In April, the female lays a single pear-shaped, blue-green, speckled egg on bare rock on a cliff ledge (the egg's pear shape helps keep it from rolling off the cliff's edge). Both parents take turns incubating the egg for about 33 days by holding it between their feet; they turn to face the cliff side for added protection from the wind. The hatchling resembles a gray ball of wool; the feathers become waterproof within about three weeks, about the time that the chick is ready to make its first attempt to dive into the sea below, where its parents are waiting. This "parachute" leap can be from heights up to almost 1,000'.

The juvenile will become an expert swimmer before it learns to fly; once it is able to fly well, it will leave with the male. The female, possibly to break the bond with its chick, will often remain at the breeding site for two weeks after the chick leaves.

CONSERVATION

With a population estimated at 9 million pairs, the guillemot is not globally threatened. But the populations of guillemot were reduced in the early 20th century through human exploitation, mainly egg robbing and hunting. The bird has made a recovery over much of its Atlantic breeding range due to bird protection laws enacted in the 1970s. However, the numbers continue to drop near Greenland and Newfoundland, where overhunting occurs.

SPECTACULAR SIGHT

1 Room for one more...
A common guillemot colony nests on the narrow ledges of a steep cliff face, where the birds will remain close to their eggs.

2 Tight quarters...
Guillemot eggs are pear-shaped to prevent rolling. A parent prepares to incubate its egg; it will huddle against the cliff wall.

3 Feeding time...
The parents feed their hungry young chick up to eight meals per day, including fish, such as sand eels, that are high in fat.

4 Bird's eye view
About 15 days after hatching, the chick leaps off the edge of the cliff, gliding unsteadily into the ocean to join its waiting parents.

PROFILE COMMON GUILLEMOT

Though awkward on land, the guillemot, with its streamlined head and slender neck, is a graceful swimmer and diver when it hunts for food.

BILL

The long, slender bill is designed to catch fish underwater. The guillemot also uses its bill to smear oil over its feathers for insulation. The yellow lining contrasts with the black bill.

FEET

The black webbed feet are better suited for swimming than walking. On land, the bird moves clumsily in an upright position. Claws grasp rough, surfaces. Underwater, the guillemot uses its feet as a rudder.

PLUMAGE

When viewed from above, the floating guillemot blends in with the dark ocean waters. From below, the white underbelly blends in with the light from the sky. Both sexes have similar plumage. In winter, the cheeks and underside of the head and foreneck are white, in the summer, black.

BRIDLED FORM

The bridled, or ringed, form has a white eye ring and stripe that extends, much like a pair of glasses, on its head. This form is found only in northern populations in the Atlantic Ocean.

VITAL STATISTICS

WEIGHT	About 2 lbs.
LENGTH	14–16"
WINGSPAN	25–28"
SEXUAL MATURITY	4–5 years
BREEDING SEASON	Spring and early summer
NUMBER OF EGGS	1
INCUBATION PERIOD	32–35 days
FLEDGING PERIOD	19–21 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Fish, crustaceans, mollusks and worms
LIFESPAN	Over 7 years

CREATURE COMPARISONS

The rhinoceros auklet *(Cerorhinca monocerata)* is 11.5" long, smaller than the common guillemot. Unlike its cousin, the rhinoceros auklet develops a hornlike growth on its upper beak area during the breeding season, and two long white facial plumes that extend from the eye and beak area to the throat. The rhinoceros auklet is found only in Pacific waters, whereas the guillemot is found in northern regions of both the Pacific and Atlantic. Both species winter in colonies offshore and along sea coasts and islands.

Rhinoceros auklet

Common guillemot

RELATED SPECIES

● **The common guillemot, also known as the common murre, is one of 2 species in the genus *Uria;* the other species is the thick-billed murre, *U. lomvia*. There are 11 genera and 22 species in the family *Alcidae*, which includes murres, auklets, murrelets and puffins. The smallest members of the family are the 5.5"-long least auklet, *Aethia pusilla*, and the 7"-long whiskered auklet, *A. pygmaea*.**

Common Kestrel

• ORDER •
Falconiformes

• FAMILY •
Falconidae

• GENUS & SPECIES •
Falco tinnunculus

KEY FEATURES

- One of the most abundant and adaptable falcons
- A superb flier that can swoop, soar, dash and glide with equal and effortless grace
- Hovers in the air while scanning the ground for prey, then drops like a stone for the kill
- Takes advantage of human alterations made to its habitat

WHERE IN THE WORLD?

A huge range includes most of Europe and Asia (apart from the far north and east), parts of the Middle East and Southeast Asia, and much of Africa

LIFECYCLE

An adaptable bird of prey, the kestrel has bounced back from a population crash in the 1960s to become a common sight in both natural and man-made environments.

HABITAT

▲ **FRINGE BENEFITS**
The kestrel stays near woodland edges.

A bird of open country, the kestrel hovers over meadows, fields, coastal heaths and other grassy areas. Highways and airports, with their wide grass verges, make ideal hunting grounds. The kestrel avoids forests, wetlands and mountains, but sometimes occurs at up to 15,000' in the mountain ranges of central Asia. In sub-Saharan Africa, it also lives in savannah.

The kestrel usually nests in a large hole on a cliff or inside a tree trunk. But it readily nests and roosts in quarries and on electricity pylons, radio masts and buildings, including barns, churches and power stations.

CONSERVATION

Today, the common kestrel is the most abundant bird of prey in Europe and across much of the rest of its range. Its total numbers have recovered to 1–2 million pairs since the 1950s and 1960s, when pesticides led to a population crash.

FOOD & HUNTING

Adapting its plan of attack to suit every occasion, the kestrel preys mainly on voles, shrews and field mice. It usually hunts over areas of long grass, stopping every now and then to hover about 30' above the ground until it spots a prey animal. With perfect timing, the kestrel dives and seizes the mammal in its talons. At other times, it ambushes prey from a suitable perch, such as a dead tree or fence post.

The kestrel hunts at dawn and dusk or even on moonlit nights. Certain prey, such as moths, slugs and earthworms, are easier to find at dusk. In urban areas, small birds such as sparrows top the kestrel's menu.

VIEW TO A KILL

1 Ground surveillance…
A kestrel hovers over a grassy roadside, wings wide open and tail fanned for control.

2 Target located…
Spotting a vole, the kestrel loses a little height, hovers once more, then drops again.

3 Clean sweep…
When the vole is just a few yards below, the kestrel drops silently and grasps its victim.

4 Gripping stuff
Moments later, the bird takes off with the vole in its bill, and flies to a perch to feed.

BREEDING

The common kestrel is one of the first birds of prey to begin breeding each spring. This ensures that chicks hatch before the grass has grown too long and small mammals become difficult to find.

Some pairs stay together all year-round, while others meet again in late winter. They engage in mock chases and aerobatics. The male also offers his mate gifts of food to cement their relationship.

The pair may line its nest hole with twigs and straw, but does not spend long on construction. The female incubates her 3–6 eggs for a month or so, then guards the chicks, while the male brings food. At first, he passes food to the female to tear up and give to the young, but later he simply deposits it, and the young feed themselves. Being larger enables the female to defend her nest, and to fend off young males in search of a mate.

▲ **CHANGING ROOM**
Kestrel chicks turn from white to gray. They depend on their parents for 2–4 weeks after fledging.

BEHAVIOR

Although it is far from social, the kestrel lives in dense concentrations. It does not defend a large territory and, when food is plentiful, pairs may nest near one another. Occasionally, two kestrels join forces at dusk to hunt bats that are leaving daytime roosts. By working together, the birds can cut off the bats' escape.

Many kestrels do not travel far, although large numbers migrate from Central Europe across Africa, as far south as Angola and Zimbabwe. Even in areas where the bird is sedentary (does not migrate annually), young kestrels disperse in late summer to find home ranges of their own.

▲ **SUSPENDER**
The kestrel has superb control when hovering, searching for prey below.

DID YOU KNOW?

- **The kestrel is an extremely rare visitor to Alaska and the east coast of North America. Most are young, inexperienced birds that are blown across vast stretches of ocean by severe storms.**
- **It is possible to find out what a kestrel has eaten by examining the pellets that it coughs up. The pellets contain things that the bird can't digest, such as bones, fur, feathers and insect wings.**

PROFILE COMMON KESTREL

With its strong wings, lightweight body and fanned tail, the common kestrel hovers in the air, pinpointing prey with its superkeen eyesight.

FEMALE & MALE

The slightly heavier female lacks the male's gray head and tail plumage. She has paler, more uniform coloring and a barred tail. The juvenile resembles the adult female.

TAIL

When hovering, the kestrel spreads its 12 tail feathers like a fan for additional lift and steering.

BILL

The short, notched and hooked bill can deal with a wide range of prey. It is strong enough to rip voles apart and pluck birds, yet delicate enough to hold insects and earthworms.

EYES

Forward-facing eyes provide the kestrel with binocular vision — essential for judging the position of prey accurately. A bony extension above each eye, known as the supra-orbital ridge, shades its eyes from glare.

LEGS & FEET

To help it reach out and grab prey at full stretch, the kestrel has very long, powerful legs that are feathered above the knees. On each foot, four strong toes bear curved talons that sink into prey to hold it tight.

VITAL STATISTICS

WEIGHT	Male 5–7.5 oz.; female 6–9 oz.
LENGTH	13–14"
WINGSPAN	28–32"
SEXUAL MATURITY	1–2 years
BREEDING SEASON	Depends on region
NUMBER OF EGGS	3–6
INCUBATION PERIOD	27–34 days
FLEDGING PERIOD	27–32 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Small mammals and birds, worms, lizards
LIFESPAN	Up to 16 yrs.

RELATED SPECIES

● **The common kestrel is 1 of 13 species of kestrel in genus *Falco*, which has 38 members. The genus includes the American kestrel, *F. sparverius*** (below)**, North America's smallest bird of prey.**

CREATURE COMPARISONS

Weighing up to 1 lb. and measuring about 15" from bill to tail, Eleonora's falcon (*Falco eleonorae*) is distinctly larger than the kestrel and has more pointed wings. It preys almost exclusively on small birds and dragonflies, which it catches in midair after a dramatic chase. Some 75% of these birds are dark gray above and creamy orange with dark streaks below. The remaining 25% are gray overall.

Eleonora's falcon is rarer than the kestrel: there are no more than 4,000 breeding pairs scattered among rocky islands in the Mediterranean and sea cliffs on the North African coast.

Common Loon

• ORDER •
Gaviiformes

• FAMILY •
Gaviidae

• GENUS & SPECIES •
Gavia immer

KEY FEATURES

- Has an evocative, haunting call (among the loudest of any bird) that can carry for long distances across water
- Can fish underwater for several minutes, propelled by strong legs and webbed feet
- Model parent that tends to its young closely; chicks are carried on a parent's back or kept under a wing for warmth and protection

WHERE IN THE WORLD?

Breeds across northern North America, Iceland and Greenland; winters as far south as Florida and California; also occurs in western and northern Europe, occasionally nested in Scotland

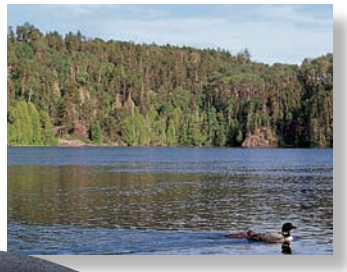
LIFECYCLE

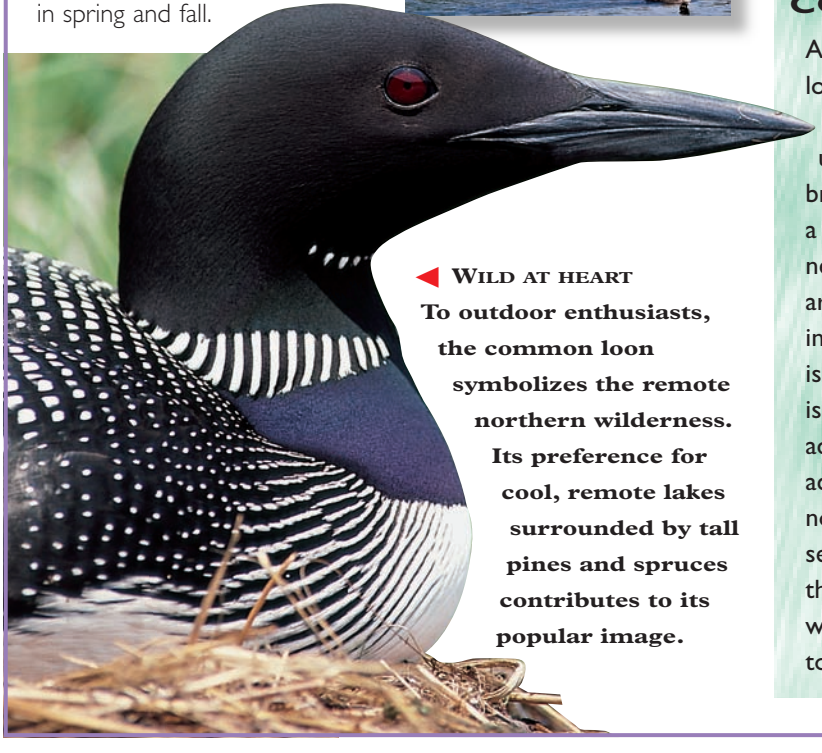
Sleek and exquisitely marked, the common loon haunts secluded lakes, announcing its presence with an eerie cry that travels far across its remote home.

HABITAT

A shy and highly aquatic bird, the common loon spends almost all its life on water. This is mainly because it can barely walk on land (a characteristic of all loon species) due to the extreme rear placing of its legs on its body. In the breeding season (the short northern summer), it's found on large, remote ponds and lakes in high latitudes of the Arctic tundra and northern North America. After breeding and before winter sets in, the loon may migrate long distances, flying south to warmer, ice-free waters, especially along coasts. It frequents the seas off rocky headlands and in sheltered bays. Migration across North America also brings it to inland waters; large numbers are in the Great Lakes area in spring and fall.

▼ **GREAT DEPTHS**
The common loon favors deep freshwater lakes.





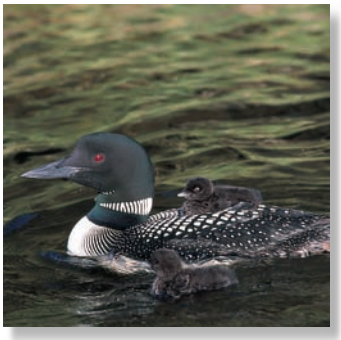
◀ **WILD AT HEART**
To outdoor enthusiasts, the common loon symbolizes the remote northern wilderness. Its preference for cool, remote lakes surrounded by tall pines and spruces contributes to its popular image.

BREEDING

As ice retreats from vast expanses of northern forest and tundra in spring, the loon returns to its breeding waters, occupying the same site year after year. Loons mate for life and are highly territorial, defending the nest against all intruders. Tiny offshore islets (a few feet across) are the usual site for nests; these offer protection from predators (raccoons and foxes) that steal eggs.

Both parents incubate the spotted eggs for about a month. The chicks, usually two, hatch covered with dark down. They leave the nest soon after hatching and are precocious swimmers and divers. But most of a chick's early life is spent riding around on the back of one of its parents, nestled among the feathers for protection and warmth.

Although chicks can dive within a day of hatching, it takes up to six weeks for them to become efficient hunters, so the parents need to fish for them in the meantime. The adults train their chicks to catch prey by dropping captured fish in front of them.



CONSERVATION

Although the common loon isn't threatened, increased recreational use of lakes in the loon's breeding range has had a serious impact on nesting success in some areas. Chemical pollution in the form of acid rain is also a danger. Acid rain is killing fish, destroying aquatic vegetation and acidifying lakes. And it's not only in the breeding season that the loon is threatened: at sea in winter, it's susceptible to oil spills.

BEHAVIOR

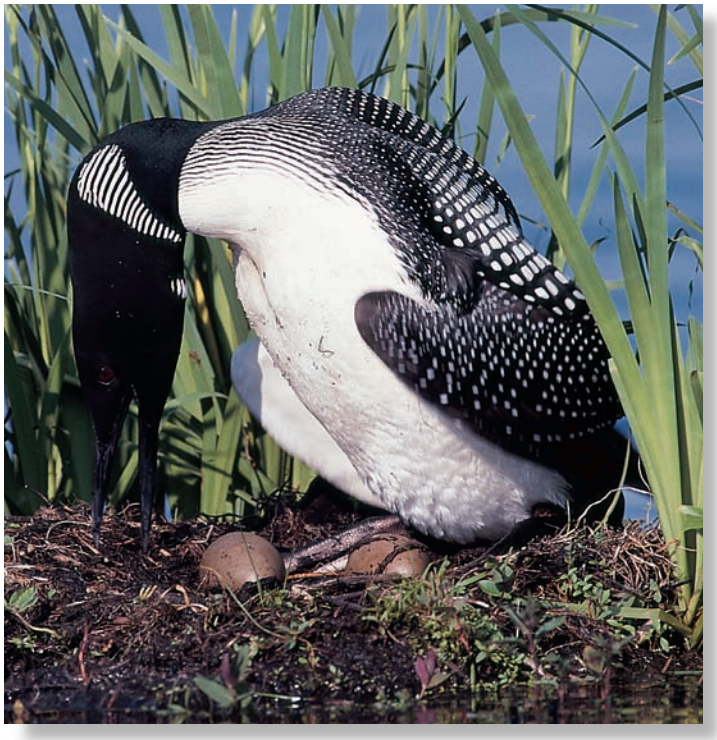
In the spring and early summer breeding season, loons make their presence known and defend their nesting territory with calls. The yodeling calls have a haunting quality that has been described like "maniacal laughter." For the rest of the year, the birds are silent.

Visual displays are also used to communicate. From mid- to late summer, loons hold ritualized ceremonies with their neighbors. One or both members of a mating pair will attend these gatherings.

▶ **BRIEF STAY**
Loons leave the water only to clamber onto the nest.

◀ Diving board
Chicks use their parents' backs as a diving platform and ride on board for safety and warmth.

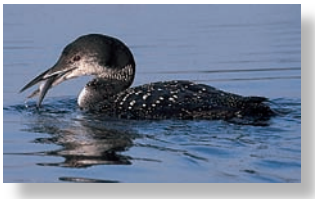
▲ Togetherness
Loon pairs form a strong, lifelong bond.



FOOD & HUNTING

The loon hunts fish, amphibians and aquatic invertebrates, such as mollusks and crustaceans, normally about 30' below the surface. A typical foray underwater lasts for about one minute, although dives of up to eight minutes have been recorded and depths of over 230' are occasionally reached.

The bird's throat is expandable, letting it accommodate large fish. However, some loons have tried to swallow large flounders and the fish become wedged in their throat, causing the birds to suffocate.



DEADLY DIVE

1 On patrol...
The loon cruises along, on the lookout for food. Sometimes it dips just its head under water to scan for prey.

2 Dive...
Spotting fish, it flattens its plumage to expel air and make itself less buoyant, then plunges below the surface in pursuit.

3 Paddle...
Taking up the the chase, the loon paddles rapidly with its feet. The wings are sometimes opened to help with steering.

4 Snap
Once in range of its quarry, the loon lunges forward, snapping at a fish to catch it sideways between the mandibles of its bill.

DID YOU KNOW?

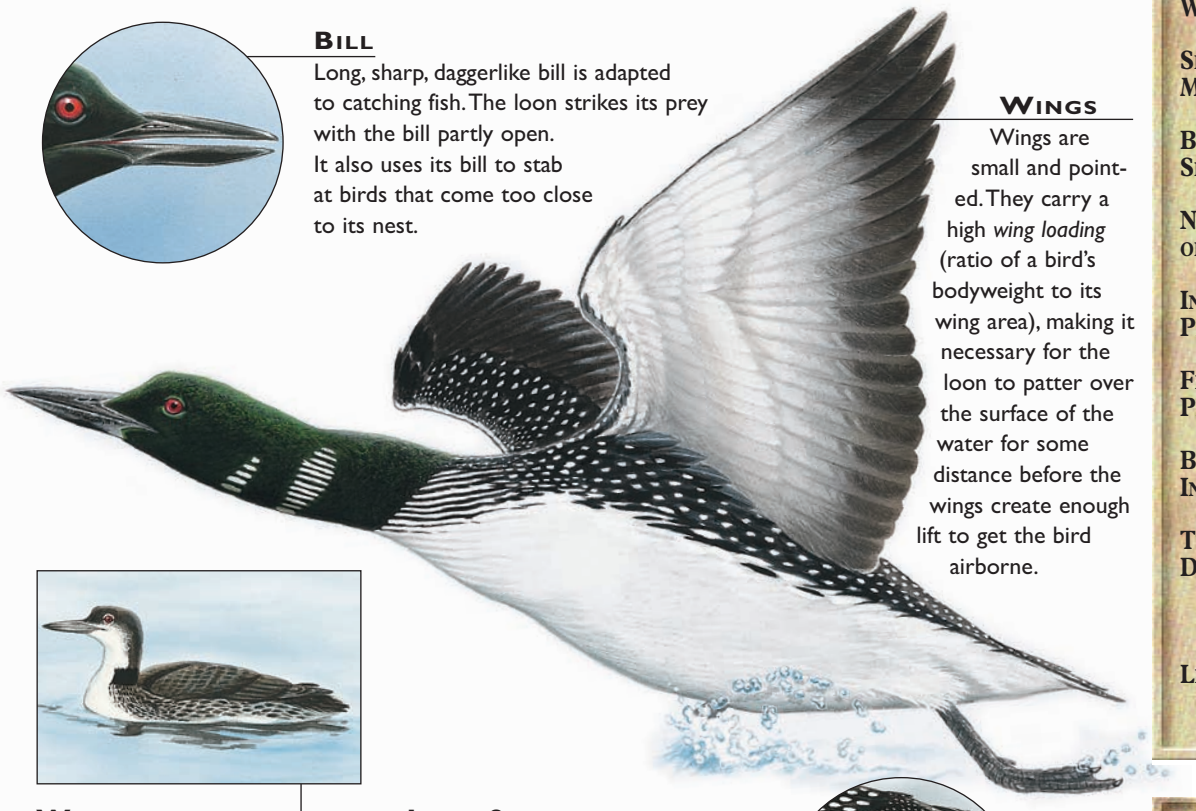
- **The common loon is called the "loon," because of the "lunatic" sounds of its wailing cries.**
- **In the breeding season, one family of common loons may consume nearly one ton of fish.**

PROFILE COMMON LOON

The common loon's streamlined body is enhanced by legs set far back, providing great maneuverability and power on and under water.

BILL

Long, sharp, daggerlike bill is adapted to catching fish. The loon strikes its prey with the bill partly open. It also uses its bill to stab at birds that come too close to its nest.



WINGS

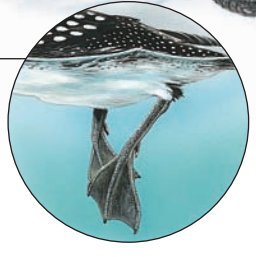
Wings are small and pointed. They carry a high *wing loading* (ratio of a bird's bodyweight to its wing area), making it necessary for the loon to patter over the surface of the water for some distance before the wings create enough lift to get the bird airborne.

WINTER PLUMAGE

In both sexes, the boldly patterned black-and-white breeding plumage is replaced in winter by a drabber version. The white-spotted back becomes uniformly dark and the black throat becomes white.

LEGS & FEET

Short, powerful legs are set far back. In this position, the legs are able to move through a long backstroke to gain maximum thrust from the webbed feet. They also extend to act as rudders for steering.



VITAL STATISTICS

WEIGHT	6–10 lbs.
LENGTH	27–36"
WINGSPAN	4–5'
SEXUAL MATURITY	2 years
BREEDING SEASON	May–July
NUMBER OF EGGS	1–3, usually 2
INCUBATION PERIOD	25–30 days
FLEDGING PERIOD	12 weeks
BREEDING INTERVAL	1 year
TYPICAL DIET	Fish, mollusks, crustaceans, aquatic insects and vegetation
LIFESPAN	8 years in wild; maybe 20 years in captivity

RELATED SPECIES

- The common loon is one of five loons in the genus *Gavia*. The others are Pacific, red-throated, yellow-billed and Arctic loons. The common loon has two subspecies: *G. immer immer* and *G. i. elasson*. The Arctic loon has three subspecies: *G. arctica arctica* of Europe and Russia, *G. a. suschkini* of Siberia and Asia and *G. a. viridigularis* of Siberia and Alaska.

CREATURE COMPARISONS

Almost identical to the common loon, the yellow-billed loon is the largest of all loons at up to 14 lbs. It differs in its slightly upturned, ivory-colored bill, which gives rise to its nickname of "banana-bill." The smallest loon is the red-throated loon (only about 2 lbs). Being lighter than other loons, the red-throated loon is able to take off directly from dry land. In breeding plumage, it is brownish with a scarlet throat-patch.

Yellow-billed loon | Red-throated loon | Common loon

Common Nighthawk

• ORDER •
Caprimulgiformes

• FAMILY •
Caprimulgidae

• GENUS & SPECIES •
Chordeiles minor

KEY FEATURES

- Leaves its roost at sundown to fly with its mouth wide open to scoop insects from the air
- Large eyes allow it to see well in poor light, as it seeks prey in dashing, hawklike flight
- Mottled plumage provides camouflage as it sleeps by day, disguised as a stump of a branch

WHERE IN THE WORLD?

Breeds in North and Central America (sub-Arctic Canada to Panama, the Bahamas and Greater Antilles); winters in South America (Colombia to northern Argentina)

LIFECYCLE

The *"peent"* call of the nighthawk joins the dusk chorus in many American cities, as this bird sets out on its zigzagging flight, twisting to and fro through swarms of flying insects.

HABITAT

▲ **OUT ON A LIMB**
The nighthawk's patterned plumage conceals it by day.

The nighthawk is a country bird that has prospered in town. It favors open spaces; common rural habitats include barren, rocky land, pebble beaches and farm fields. The nighthawk is also found in large clearings of forested areas. Its love for conifer country laid open by forest fires has given it the name "burnt-land bird."

The nighthawk likes stony nesting sites and started to spread to towns after the first buildings with flat, graveled roofs were erected in the 19th century. Roof nests are less vulnerable to predators, so now more nighthawks breed in towns than in the country.

DID YOU KNOW?

- **Rooftop nests may fail in hot weather when eggs get stuck in sun-warmed tar.**
- **The nighthawk's booming call has been compared to the sound made by blowing in the mouth of a soda bottle.**
- **In the 1880s, many nighthawks paid for their name with their lives when game commissioners in Pennsylvania felt obliged to allow bounty to be paid on them simply because they were called hawks.**

FOOD & HUNTING

The nighthawk is a voracious eater of flying insects, all of which are captured on the wing as the bird twists through the air with its wide mouth open. Although the nighthawk hunts mostly for short periods, it catches large amounts of insects rapidly. It needs to — it uses a lot of energy during its zigzagging flight. One bird was found to have more than 2,000 flying ants in its stomach.

Moths and mosquitoes also figure high on a menu that may include grasshoppers and beetles. Some insects, such as Colorado beetles and weevils, are agricultural pests. As a result, the nighthawk, once wrongly accused of killing poultry chicks, is now regarded as a friend by farmers.

HAWKING BY NIGHT

1 Take off...
As the sun falls below the horizon, the nighthawk flies up from its daytime resting place.

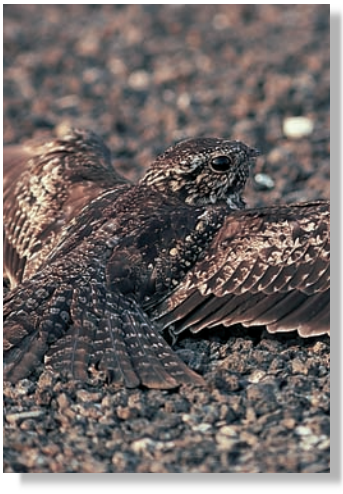
2 Zigzag...
The nighthawk zigzags through the air, seeking insects that still linger in the fading evening sky.

BEHAVIOR

The nighthawk is active at dawn and dusk, but may hunt in daylight, particularly in overcast weather. It normally sleeps by day, perched lengthwise on a branch so it resembles a broken stump. Its mottled plumage renders it almost invisible against tree bark.

The nighthawk also relies on camouflage at its nest. Only at the last moment will it react to an intruder, either by scaring it by opening its gaping mouth and hissing with wings raised or by feigning injury to distract the predator from its brood.

On its breeding grounds, the bird is normally seen singly or in pairs but large flocks gather at migration times.



3 Catch…
Closing in on a swarm of flies, it opens its mouth wide and scoops in the insects.

4 Feed
An adult with young carries a balled mass of captured insects back to the nest in its throat.

BREEDING

The nighthawk reaches its North and Central American breeding grounds in spring, after a winter spent in warmer southern climates. By the time it arrives, most other bird species have begun to breed.

A spectacular feature of the male's courtship display is his "dive-and-boom" routine. He swoops toward his mate as she rests at their breeding site. As he veers abruptly upward, only a few feet above her, air rushing through his wing feathers produces a roar that gave the bird its old names of "bullbat" and "booming nighthawk." When he lands near his mate after his aerial display, he wags his fanned tail and rocks his body while making a deep croak as he expands his white throat patch.

The female lays a clutch on bare ground, a rooftop, even an old fence rail. The female incubates the eggs, but the male helps her feed the young. Parents regurgitate insects directly into the throat of each chick. In about one month, chicks can feed themselves

▲ **MOTTLED MINOR**
Like adults, the chick has camouflaging plumage.

▼ **OPEN-PLAN NURSERY**
Nighthawks rear their chicks on bare ground.

CONSERVATION

The nighthawk's fast, erratic flight made it a popular target for 19th-century hunters. Many were shot during their annual migration through the southern U.S., where roast "bullbat" was prized as a delicacy until the species gained protection a century ago. Recent studies have shown declines in populations — the cause of which is under investigation.

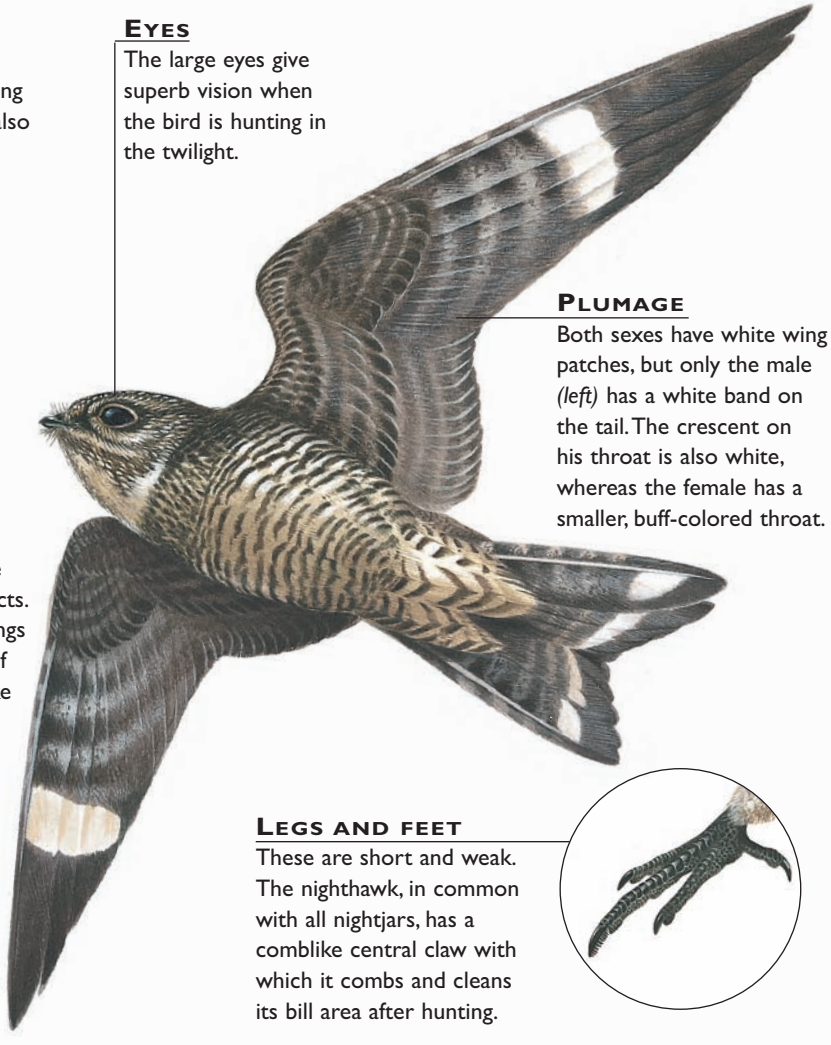
◀ **BOLD DEFENDER**
A nesting adult spreads its wings defensively.

PROFILE Common Nighthawk

The nighthawk has long, pointed wings for fast, agile, falconlike flight and a highly specialized bill for scooping insects out of the skies.

Bill
The bill is tiny, but has a wide gape for catching flying insects. The wide gape is also used in a threat display.

Eyes
The large eyes give superb vision when the bird is hunting in the twilight.



Plumage
Both sexes have white wing patches, but only the male *(left)* has a white band on the tail. The crescent on his throat is also white, whereas the female has a smaller, buff-colored throat.

Throat
As it patrols the skies, the nighthawk scoops up insects. When an adult has fledglings to feed, it stores a mass of insects in its throat to take back to the nest.

Legs and feet
These are short and weak. The nighthawk, in common with all nightjars, has a comblike central claw with which it combs and cleans its bill area after hunting.

Vital Statistics

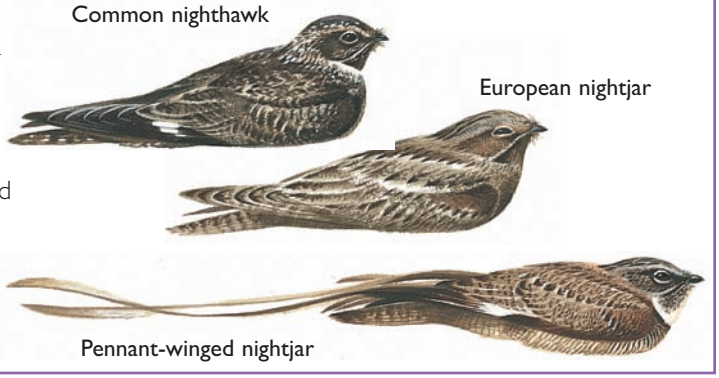
Weight	2.5–2.75 oz.
Length	9–9.5"
Wingspan	21.5–26"
Sexual Maturity	1 year
Breeding Season	March through August
Number of Eggs	2
Incubation Period	14–19 days
Fledging Period	18–22 days
Breeding Interval	1 year
Typical Diet	Flying insects
Lifespan	Up to 6 years

Related Species

- The common nighthawk is one of eight nighthawk species in the Americas. All belong to the nightjar family *Caprimulgidae*, including the American whippoorwill and Old World (African and Eurasian) nightjars. There are 76 nightjar species distributed throughout the world. Most have long, stiff bristles surrounding the mouth that aid in the capture of insects.

Creature Comparisons

The nightjar family has similar species (the common nighthawk and European nightjar) around the world. All have long, pointed wings, a short bill and wide mouth. The male pennant-winged nightjar is one of several species with bold plumage: 2'-long wing feathers trail from its wings as it flies over the African savannah.

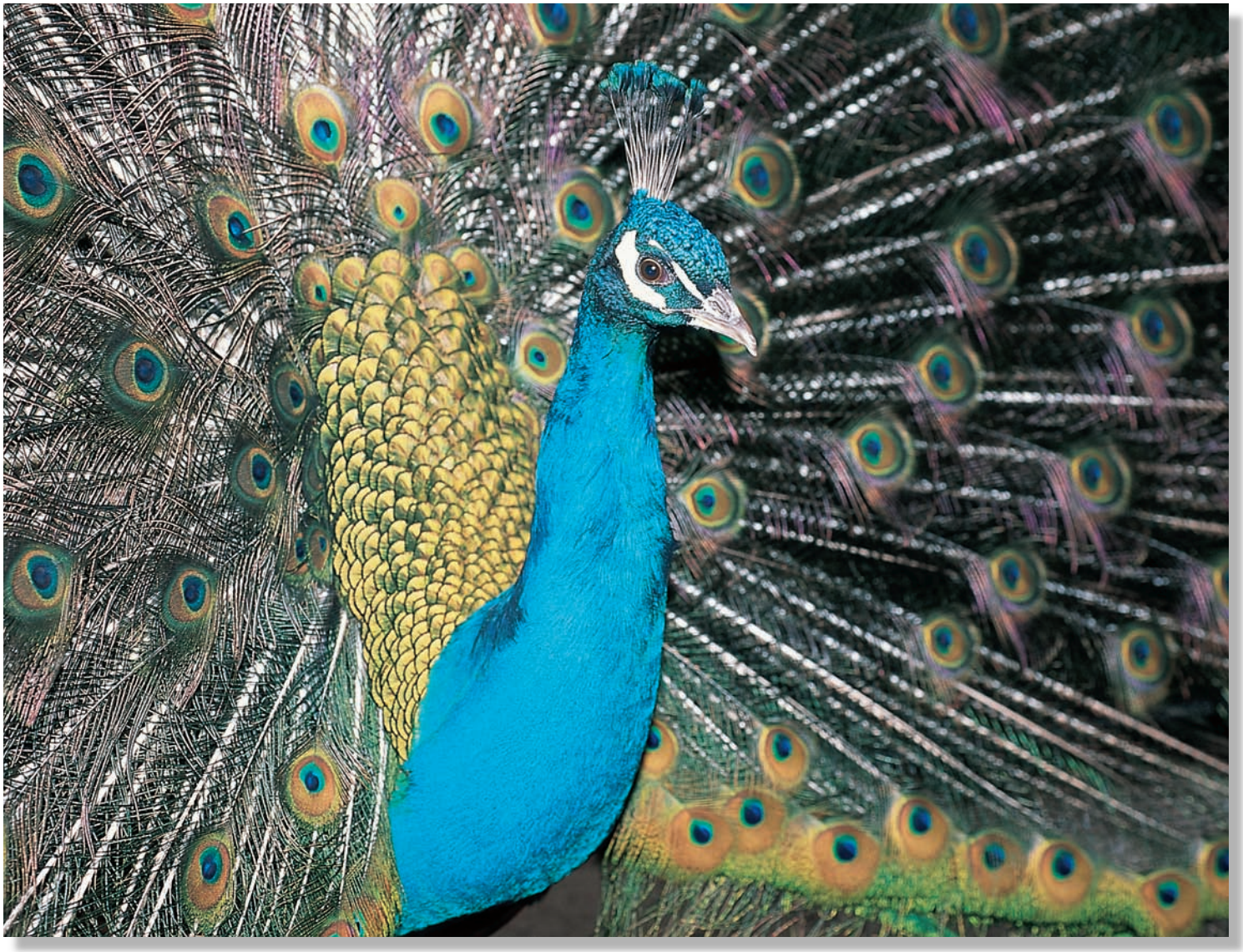


Common Peafowl

• ORDER •
Galliformes

• FAMILY •
Phasianidae

• GENUS & SPECIES •
Pavo cristatus



KEY FEATURES

- One of the most spectacular birds, its long, colorful feathers are used purely for display
- The peacock (male) rules a harem of peahens (females), dazzling them with his shimmering fan
- Considered sacred in some cultures and kept as an ornamental bird around the world

WHERE IN THE WORLD?

On the Indian subcontinent: Sri Lanka north to Kashmir and east through Nepal and Bangladesh; extends west into Pakistan to the Indus River; introduced to many other parts of the world

LIFECYCLE

As he flaunts his incredible finery to woo a mate, the male peafowl is the ultimate animal show-off. It is easy to see why "proud as a peacock" so aptly describes human vanity.

HABITAT

In its wild state, the peafowl lives in hillside jungle and is rarely found far from streams bordered by dense, bushy vegetation. It is usually a bird of low to medium altitude, found up to about 1,980', although it has been recorded living at 5,940' in the Himalayas.

In areas where it's protected, the common peafowl is found around villages. The peafowl can adapt readily to life in small, isolated patches of woodland or fields of sugarcane.

▼ **DRINKS ALL AROUND** **Peafowl and sambar deer share a refreshing drink.**

CONSERVATION

The common peafowl enjoys protection as the national bird of India and is sacred in the Hindu religion. The bird is destined to remain a common species in much of its native range. It's extremely common elsewhere in the world, where it has been introduced mainly for its ornamental value.

BEHAVIOR

BREEDING

The mating season begins with the monsoon (heavy rains), so its chicks benefit from the abundance of food resulting from the rains. Breeding starts in January in Sri Lanka, but in northern areas doesn't begin until the summer monsoon in June. The male displays to, and mates with, the three to five peahens in his harem. After mating, the female incubates the eggs and tends her chicks, her dull plumage concealing her from predators.

Newly hatched downy chicks instinctively peck at their mother's bill, from which she offers them tiny bits of food until they feed themselves. At two weeks, the chicks can flutter and jump to accompany their mother on a roosting perch. Young don't join the main adult roosts until they're two months old.

STRUTTING PROUD

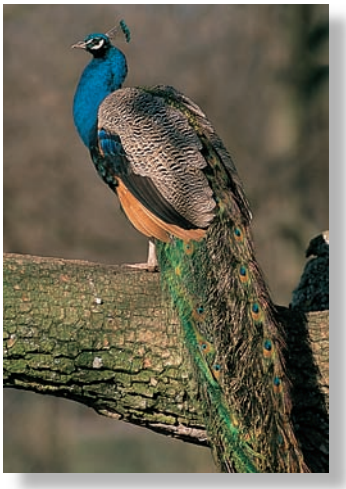
1 Love song...
The peacock is a noisy bird, especially in the mating season. His repeated call asserts his dominance over his harem.

2 First approach...
The male singles out a particular female and begins to spread his magnificent train, cocking his tail to help support his long plumes.

The peafowl is a creature of habit. It stays in the same area year 'round and has a sedate daily routine, disrupted only when forced to flee a predator (a tiger or Indian mongoose). The peafowl has regular sites for feeding, roosting, loafing and courting. It spends the middle of the day in the shade, where it rests and preens. Like other pheasants, the peafowl doesn't bathe in water, but cleans itself by vigorously rubbing its plumage in dry soil and dust.

Tall trees, with open views of the surrounding countryside, are used for roosting. As many as 100 birds may gather at favored sites. They fly almost vertically into the treetops, their raucous cries carrying far into the forest. In the morning, amid another chorus of loud wailing, they split into small groups. Grazing animals often stampede at the sound of the peafowl's alarm call, which they recognize as a signal that a big cat may be on the prowl.

◀ **LOOK OUT!**
The peacock calls to warn of a predator nearby.



▲ **RULING THE ROOST**
The peafowl roosts in trees with open views.

DID YOU KNOW?

- **Peahens and even chicks sometimes spread their short tail coverts to imitate the male's display.**
- **At one time, roast peafowl was a fashionable dish at European banquets.**
- **It's been suggested that the peacock struts around during his display to keep his balance as the wind catches his fanned train.**

3 Indifference…
With his train fully erected, the peacock struts with his back to the female, fluttering his drooped wings. She appears unimpressed.

4 Full frontal
Suddenly the peacock spins to show his full, shimmering train. This finally catches her attention and they then mate.

FOOD & FEEDING

The peafowl will eat virtually any plant or animal matter. Wild figs, berries and nuts are favorite foods in season, but seeds, grain and leaves are staple items all year. Peafowl can be a pest on farmland, where crops are eaten and also flattened by the males' trains. This aggressive bird will stalk and catch small snakes, mice, other small mammals and insects such as grasshoppers, termites and ants.

Groups forage for food as soon as they leave their roosts at daybreak. They'll drink from a stream during their midday rest and feed again in late afternoon. They drink again at sunset, just before going to roost.

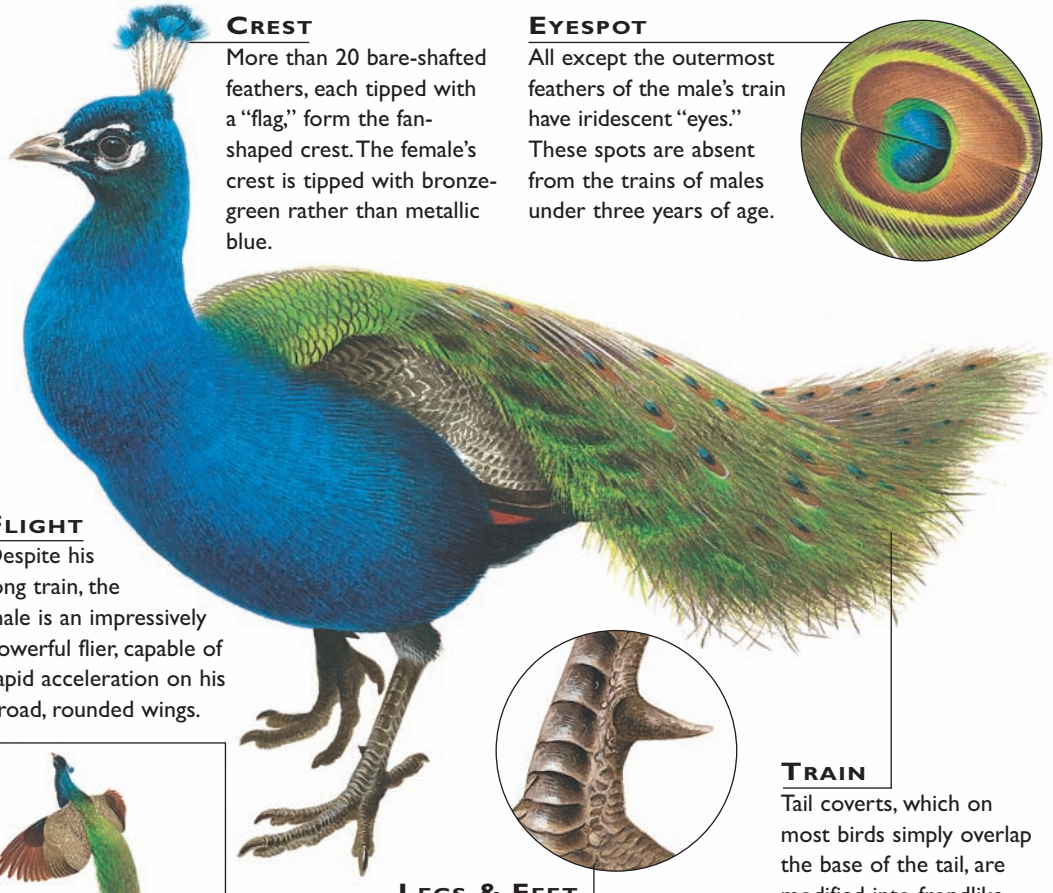
▼ **ANYTHING GOES**
The peafowl will eat almost anything, from seeds to snakes.

PROFILE COMMON PEAFOWL

The male's brilliant plumage is designed to attract his mates, but it also provides surprisingly good camouflage in the dappled light of the forest.

CREST
More than 20 bare-shafted feathers, each tipped with a "flag," form the fan-shaped crest. The female's crest is tipped with bronze-green rather than metallic blue.

EYESPOT
All except the outermost feathers of the male's train have iridescent "eyes." These spots are absent from the trains of males under three years of age.



FLIGHT
Despite his long train, the male is an impressively powerful flier, capable of rapid acceleration on his broad, rounded wings.

LEGS & FEET
Like most pheasants, the common peafowl has pointed spurs on the backs of its long, strong legs.

TRAIN
Tail coverts, which on most birds simply overlap the base of the tail, are modified into frondlike display plumes. There are about 150 of them, some more than 5' long.

VITAL STATISTICS

WEIGHT	Male 9–13 lbs.; female 6–8 lbs.
LENGTH	Male with train 6–7'; female 36–40"
WINGSPAN	Male 4–5'; female 30–52"
SEXUAL MATURITY	3 years
BREEDING SEASON	Varies to coincide with monsoon rains
NUMBER OF EGGS	Usually 3–6
INCUBATION PERIOD	28–30 days
FLEDGING PERIOD	3 weeks
TYPICAL DIET	Seeds, fruits, insects, small mammals and reptiles
LIFESPAN	Up to 20 years

RELATED SPECIES

● **There are 49 species of pheasant, including the common peafowl. The rare green peafowl** (below) **is the other member of the genus *Pavo*.**

CREATURE COMPARISONS

Although none of its relatives outshines the common peafowl, all male birds of the pheasant family are gaudily clad in vivid plumage. The train of the great argus pheasant is formed by much enlarged wing and tail feathers, which are raised above its head in its dramatic display. This bird lives in Malaysia and Indonesia. The gray peacock pheasant of Southeast Asia spreads its wings and tail to show off the glossy eyespots that adorn its subtly colored plumage.

Great argus pheasant

Common peafowl

Gray peacock pheasant

Common Pheasant

• ORDER •
Galliformes

• FAMILY •
Phasianidae

• GENUS & SPECIES •
Phasianus colchicus

KEY FEATURES

- This ground-dwelling bird rarely ranges more than 6 miles from its breeding ground
- Flies low and fast, skimming over thickets and brush, but only for short distances
- Males have a bright red inflatable pouch, called a wattle, that is extended during breeding

WHERE IN THE WORLD?

Southeast Europe and central Asia to China, Korea and Japan; introduced to western Europe, North America and New Zealand

LIFECYCLE

Though a fast flier over short distances, the common pheasant spends most of its life on the ground, foraging in undergrowth, taking dust baths and building its nest amid shrubs.

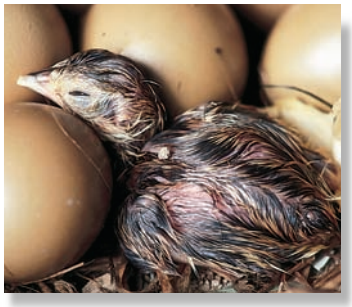
HABITAT

The common pheasant is most often found in open, lightly wooded areas, parks and farmlands of Asia, Europe and North America. But it also populates desert oases of the western U.S. as well as the cool mountain forests of China, where it lives at altitudes of up to 13,000'. It prefers to nest under protective cover and thrives along river and lake banks, hiding in reed beds or riverside thickets of tamarisks, poplars, wild olives and other trees and shrubs. Rice fields provide cover and ready food in China, Korea and Japan.

▼ **OPEN HOUSE**
The pheasant mostly lives out in the open.

BREEDING

Common-pheasant breeding is based on dominance. The dominant male will attract a harem of several females, then woo them with a complex courtship ritual of movement and sound. Standing tall and straight, the male struts around the female in semicircles, feathers fluffed and wattle inflated. To attract the attention of a female, he will hiss, flutter his tail feathers and crouch low to the ground with his tail held high, while making a soft, guttural cooing sound. After mating, the female lays 1–2 eggs a day until she has a full clutch of around 10. After a 3–4 week incubation, the chicks are born virtually ready to start feeding themselves. The male takes no responsibility for the young birds, leaving their care entirely to the female. At 12 days the young make their first flights, and at 10 weeks the brood leaves its mother.



▲ **FIRST BORN**
Pheasant eggs hatch at different intervals.

▼ **EARLY FLIGHT**
The chick is able to fly at as young as 12 days old.

DID YOU KNOW?

- **The state bird of South Dakota is the common pheasant.**
- **The common pheasant can fly up to 60 mph.**
- **The ring-necked pheasant is another name for the common pheasant because of the typical white ring around its neck.**

FOOD & FEEDING

The common pheasant is an omnivore, feeding on what is most readily available in each season and habitat. Farmlands provide an abundance of energy-rich grains and fruits, while wooded areas offer berries, roots, insects, worms and slugs. Young pheasants (up to 4 months old) eat more animal matter than adults to obtain the protein necessary for growth. The common pheasant spends most of its time on the ground scratching for food. It makes use of both its bill and its feet for digging, but in spring, it alights in high tree branches to feast on tasty buds and flowers. During winter, pheasants may feed together in large flocks.

VERSATILE FORAGER

1 Dig...
A male pheasant uses his bill like a shovel, throwing soil aside as he forages for food such as seeds, berries, worms and insects.

2 Peck...
The common pheasant's sharp bill also allows it to unearth items buried in the ground, including roots and tubers.

3 Jump...
A powerful jumper, the pheasant flutters its wings and easily reaches berries in the highest branches of a blackberry bush.

4 Perch
When food is scarce on the ground during the spring, the pheasant flies up to a lofty limb for a hearty meal of leaf buds.

BEHAVIOR

Active both night and day, the common pheasant begins calling well before sunrise. The birds often leave their roosting sites at that time to forage for 2–3 hours, then move to a nearby source of water for a short time. Pheasants like to spend the warmest part of the day relaxing in the shade, preening, dustbathing and sleeping. The birds then continue their search for food until dusk, when they settle for the night. They roost most often in dense ground cover, but they may also adopt nests abandoned by squirrels or other birds. Roosting groups in the cold winter months may vary from 2–24 birds.

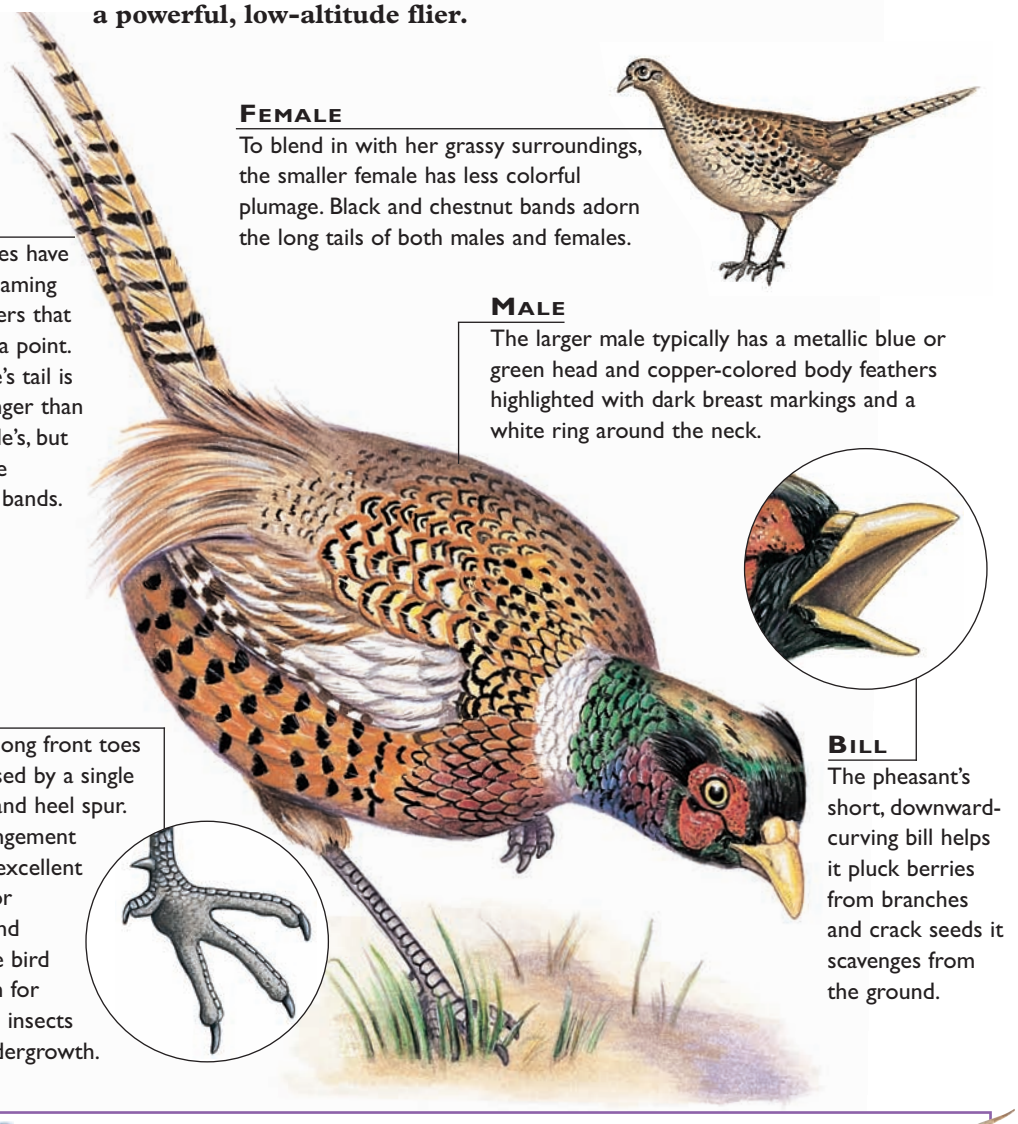
▲ **BATH TIME**
The pheasant regularly takes dust baths to remove oil from its feathers.

CONSERVATION

The common pheasant is a hardy and adaptable species. Clearing forests for farmland in the U.S. earlier this century reduced pheasant populations, but through the efforts of organizations such as the Conservation Reserve Program, it now thrives in many midwestern states. It continues to flourish in its native Asian environment, as well as in the other diverse geographical areas where it has been introduced.

PROFILE COMMON PHEASANT

The common pheasant is a speedy runner and, over short distances, a powerful, low-altitude flier.



FEMALE

To blend in with her grassy surroundings, the smaller female has less colorful plumage. Black and chestnut bands adorn the long tails of both males and females.

TAIL

Both sexes have long, streaming tail feathers that taper to a point. The male's tail is much longer than the female's, but both have chestnut bands.

MALE

The larger male typically has a metallic blue or green head and copper-colored body feathers highlighted with dark breast markings and a white ring around the neck.

BILL

The pheasant's short, downward-curving bill helps it pluck berries from branches and crack seeds it scavenges from the ground.

FEET

The two long front toes are opposed by a single rear toe and heel spur. This arrangement provides excellent balance for running and allows the bird to scratch for seeds and insects in the undergrowth.

VITAL STATISTICS

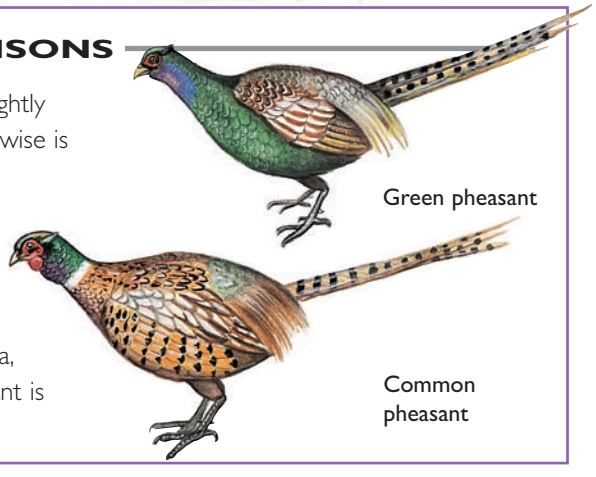
WEIGHT	1.5–3 lbs.
LENGTH	Male 20–36"; female 20–26"
WINGSPAN	About 32"
SEXUAL MATURITY	1 year
BREEDING SEASON	Varies, but majority from March–June
NUMBER OF EGGS	8–15
INCUBATION PERIOD	23–28 days
FLEDGING PERIOD	70–80 days
BIRTH INTERVAL	1 year
TYPICAL DIET	Seeds, berries, shoots and invertebrates
LIFESPAN	Average 10–20 months

RELATED SPECIES

- **The common pheasant is one of two species in the genus *Phasianus;* the other member, the green pheasant *(P. versicolor),* is often considered a subspecies. Other relatives include the reeves pheasant *(Syrmaticus reevesi)* and the copper pheasant *(S. soemmeringi).* The family *Phasianidae* includes about 174 species of pheasant, francolin, peafowl, partridge and quail.**

CREATURE COMPARISONS

The green pheasant *(Phasianus versicolor)* is slightly smaller than the common pheasant, but otherwise is remarkably similar to its close relative. However, female green pheasants have darker mantle feathers than the the female common pheasant, and green wingtips. While the common pheasant, as its name implies, ranges over broad ranges in Asia, Europe and North America, the green pheasant is confined to Japan and the Hawaiian islands.



Common Quail

• ORDER •
Galliformes

• FAMILY •
Phasianidae

• GENUS & SPECIES •
Coturnix coturnix

KEY FEATURES

- Seldom seen, it is Europe's smallest gamebird and one of the smallest in the world
- Male utters a loud, distinctive mating call in late spring and early summer to attract a mate
- A long-distance migrant, making journeys of 600–3,000 miles each spring and autumn

WHERE IN THE WORLD?

Breeds across Europe into Asia, northern, southern and eastern Africa and Madagascar; winters in much of Africa, India and the eastern Himalayas

LIFECYCLE

The common quail is one of the most secretive of all gamebirds, and is rarely seen, even by birdwatchers. It lives most of its life hidden deep within dense vegetation.

CONSERVATION

The common quail is heavily hunted, particularly along its migration routes, and is in decline across its range. It is also affected by drought, pesticides and changes in farming practices.

HABITAT

The common quail is found from sea level to altitudes of 3,300' or more, on level or gently sloping terrain. A bird of open country, it favors dense, moist vegetation less than 3' tall in which it can hide from predators. The common quail usually shuns shrub and woodland habitats, and this secretive bird also avoids bare ground. Sunny areas with light, well-drained soils of chalk, sand or peat are popular haunts.

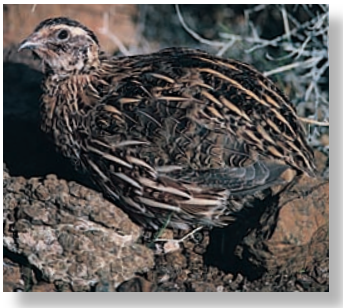
The quail has adapted well to the spread of agriculture. It can be found in large fields of crops, especially winter wheat and clover, but also oats, barley, rye, rape, lucerne, flax and meadow grasses.

▲ **GREEN AND PLEASANT**
Areas with dense vegetation are popular quail breeding sites.

BEHAVIOR

Shy and wary, the quail spends most of its life among dense cover. Reluctant to fly even when disturbed, it usually goes unnoticed unless flushed from hiding. Startled in this way, a quail springs suddenly into the air, often giving a low trilling call. It flies fast and low before dropping down into cover. After the brief flight, the bird tends to run a safe distance, and effectively melts from view.

Despite its reluctance to fly, the common quail makes long annual migrations between its European breeding quarters and wintering grounds to the south of the Sahara in Africa.



▶ **QUAKE AND QUAIL**
One of the wariest of birds, the quail normally stays hidden in undergrowth.

FOOD & FEEDING

▲ **BARK IF YOU'RE HUNGRY**
Old timber is a source of invertebrate prey.

More than 100 species of food plant have been recorded in the quail's diet. Staple foods include seeds of grasses, cereals and weeds, but the quail also eats beetles, bugs, ants, earwigs and grasshoppers, as well as spiders, snails and worms.

Animal food is important in spring and early summer, when seeds are scarce and females need as much protein as possible to prepare for breeding. The chicks probably bulk up on high-protein insects, too.

Whether pecking at wind-scattered seeds or invertebrates, the quail feeds mainly on the ground. Sometimes it catches flies, ants and other flying insects by fluttering up to 3' above the ground.

DID YOU KNOW?

- **The name quail can be traced back to the Latin *quaquila*, which probably imitated the male's distinctive call.**
- **Across England, the quail has many quaint old local names, such as wet-my-lips, wet-my-feet and but-for-but. Other traditional common names for this bird include quailzie, throsher, deadchick and rine.**
- **The quail is Europe's only migratory gamebird.**

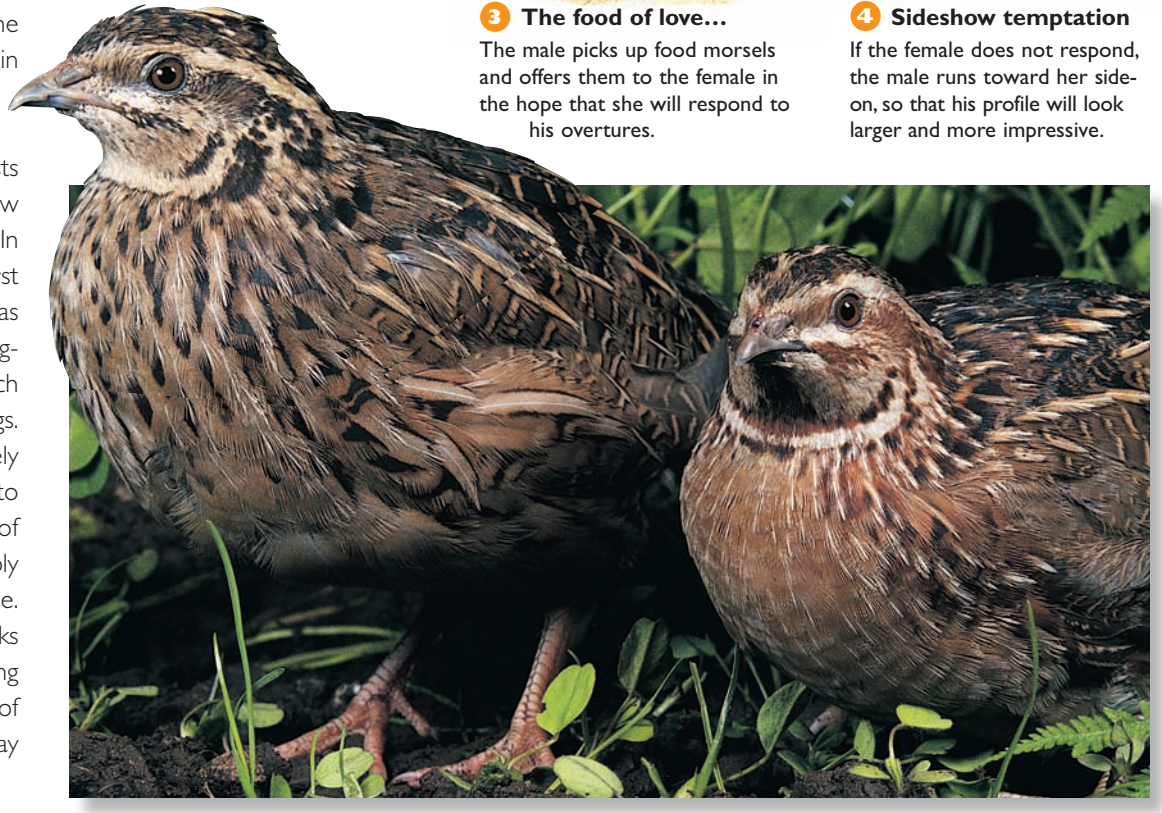
BREEDING

The male utters his loud, staccato call in spring and early summer to attract a mate. He is most vocal at dawn and dusk and generally silent once he has found a mate. Depending on the ratio between the sexes in an area, a female may mate with several males.

The female quail nests on the ground, in a shallow scrape lined with grass. In southern Europe, the first eggs are laid as early as April, but in the north, egg-laying begins later. Clutch size ranges from 7–18 eggs. These are incubated solely by the female for up to three weeks. Clutches of more than 18 are probably laid by more than one female.

The striped downy chicks are well developed, leaving the nest within hours of hatching. Their mother may then lay a second clutch.

▲ **IN HER CLUTCHES**
The common quail's nest is located in deep cover as its eggs are prized by many predators.



GAME, SET AND MATCH

1 Cry out for attention…
Soon after arriving at the breeding grounds, each male utters his far-carrying call from deep within cover, to attract a female.

2 Playing on the wing…
When a female approaches, he circles her in a courting display, drooping a wing toward her or even trailing it along the ground.

3 The food of love…
The male picks up food morsels and offers them to the female in the hope that she will respond to his overtures.

4 Sideshow temptation
If the female does not respond, the male runs toward her side-on, so that his profile will look larger and more impressive.

PROFILE COMMON QUAIL

A tiny gamebird the size of a plump starling, the quail prefers to run and hide rather than fly, but manages to migrate great distances each year.

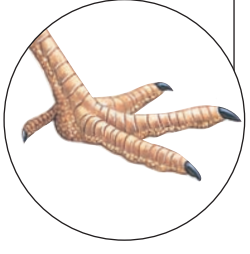
FEMALE
The female has a plainer pattern on her head than does the male, with duller markings and no neck or throat bands.

MALE
The male's plumage varies between individuals: races breeding in Europe and Asia are paler and grayer, while African breeders are darker and reddish-brown.

WINGS
The relatively long, pointed wings contrast with the shorter, rounded wings of other gamebirds. They enable the quail to fly far and fast on migration.

CHICK
Clad in down and able to feed itself soon after hatching, the chick can flutter short distances when it's 11 days old, and flies when it's 19 days old.

LEGS & FEET
The legs and feet are slender, with sharp, narrow claws that are well-suited for scratching at the soil for seeds and insects.

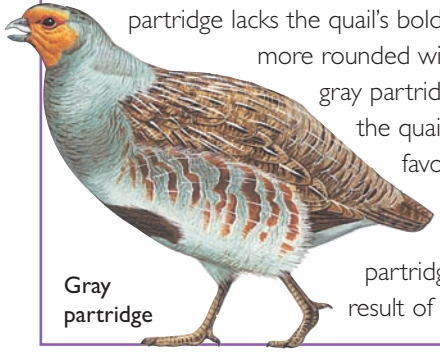


VITAL STATISTICS

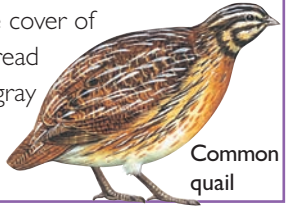
WEIGHT	2.5–5.4 oz.
LENGTH	6.4–7.2"
WINGSPAN	13–14"
SEXUAL MATURITY	1 year
BREEDING SEASON	Varies by location
NUMBER OF EGGS	4–15, usually 8–13
INCUBATION PERIOD	17–20 days
FLEDGING PERIOD	About 19 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Wide range of plant seeds; also small invertebrates
LIFESPAN	Unknown

CREATURE COMPARISONS

The common quail can be confused with a young gray partridge (*Perdix perdix*). However, the partridge lacks the quail's bold head pattern, and in flight it reveals proportionately shorter, more rounded wings and a longer, broader tail. There is no confusing an adult gray partridge, distinct in plumage, and twice the size of an adult quail. Like the quail, the gray partridge feeds on seeds and invertebrates. It favors pasture or grassland and enjoys the cover of mature hedgerows. Although widespread across much of Europe and Asia, the gray partridge has suffered massive declines as a result of modern farming methods.



Gray partridge



Common quail

RELATED SPECIES

● The common quail's closest relatives are the 7 other species in the genus *Coturnix*. These include the Japanese quail, *C. japonica,* the African blue quail, *C. adansonii,* harlequin quail, *C. delegorguei,* also of Africa, and the stubble quail, *C. pectoralis,* of Australia. Of the 7 families in the order *Galliformes,* the largest is *Phasianidae,* with 155 species of pheasant, partridge and quail.

Common Snipe

• ORDER •
Charadriiformes

• FAMILY •
Scolopacidae

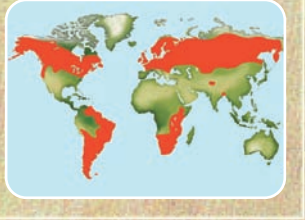
• GENUS & SPECIES •
Gallinago gallinago

KEY FEATURES

- A wading bird of shallow marshes and wetlands that uses its long, slender bill to probe for invertebrates
- The male produces a distinctive "winnowing" with his tail feathers during display flights
- Female nests in a depression on the ground and relies on the superb camouflage of her mottled plumage to escape the attention of predators

WHERE IN THE WORLD?

Resident in western Europe, South America, the U.S. and southern Africa; migratory elsewhere, breeding in North America, northern Europe and Asia, and wintering farther south



LIFECYCLE

The common snipe has two highly effective strategies to avoid predators: on the ground, it lies low and relies on superb camouflage; in the air, it flies in a dashing, zigzag flight.

HABITAT

▲ **SOGGY GROUND**
Marshland is a typical habitat of the snipe.

The common snipe is primarily a bird of waterlogged ground as it needs soil soft enough to let it probe deep beneath the surface to find food. The rich, spongy ground of peat bogs, water meadows, reedbeds, marshes and flooded fields of scrubby grass are all sought-after habitats during the breeding season. The snipe also requires dense cover nearby, patches of drier ground for nesting and ridges to use as lookout posts.

In winter, the snipe often exploits man-made feeding sites, such as the margins of reservoirs, sewage farms and even muddy pastures churned up by cattle. It visits seashores when frosts freeze the ground hard inland, and in the U.S., many snipe are attracted to feed around some of the warm springs found at higher altitudes.

DID YOU KNOW?

- **Snipe have been observed washing mud off food.**
- **Nests are often rotated between breeding pairs.**
- **In a dive, the snipe's tail feathers vibrate back and forth 11 times per second, producing a winnowing that can be heard a mile away.**

BEHAVIOR

▶ **COVER UP**
A nesting snipe relies on camouflage for safety from predators and is difficult to spot unless it moves.

Outside the breeding season, the snipe associates in groups (or "wisps") of 50 or so birds, but groups of up to 500 may gather at rich feeding grounds.

Most snipe are migratory and begin the journey north to breeding grounds in March. The birds reach their destination in late April or early May.

At the end of the breeding season, the snipe concentrates on feeding intensively to build up its energy reserves for its journey south to warmer wintering grounds. It also molts its old flight feathers, growing a new set for the long, arduous flight ahead. The autumn passage south is a slower, more leisurely affair than the spring migration. Some birds set off as early as July, but the peak is September. It can take some birds many weeks to reach their winter quarters.

FOOD & FEEDING

The common snipe is most active at dawn and dusk when it uses its bill to probe for food in the soil. On soft ground, the entire bill is pushed in. Worms form the largest part of the snipe's diet, but it eats almost any small invertebrate.

Sometimes the snipe walks slowly forward as it probes, but more often it stands rooted to a spot and makes several quick stabs in a semicircle. Small items are eaten before the bill is withdrawn, but large earthworms are pulled free before being swallowed whole.

◀ **BILLSTICKER**
Aquatic seeds supplement the snipe's invertebrate diet.

CONSERVATION

The zigzag flight of the common snipe when flushed from cover makes it a challenging target; many are shot for sport and the table. Loss of habitat due to land drainage is causing declines, notably in the south of England, the Netherlands and parts of Scandinavia. Harvesting of peat, especially in Ireland, has also reduced its habitat. But despite these pressures, the snipe remains numerous and, overall, isn't in danger.

BREEDING

The male is the first to arrive at the breeding grounds and begins his aerial displays to advertise his presence and claim a territory. After the arrival of the females, both sexes associate with several partners before firm pair bonds are established.

▲ **EARLY DEVELOPER**
Like its parents, a just-hatched young snipe is well camouflaged.

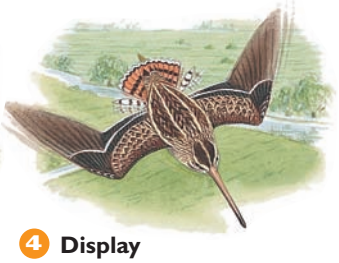
The nest is a shallow scrape in the ground chosen by the female, who lines it with soft grass and disguises it with bits of vegetation. Eggs are laid at daily intervals and incubated by the female alone. But the male stays close by, and when the chicks hatch, both parents feed them, the male taking charge of the first-hatched chicks while his mate tends the remainder. The chicks develop rapidly on their diet of protein-rich worms and other invertebrates and become totally independent within about three weeks.

DRUMMING DISPLAY

1 Close call…
While his mate is on the nest, the male sits on a perch nearby. He makes a familiar chipping call to reassure her that he's close.

2 Confirmation…
Like a rocket from a launching pad, he shoots up into the sky to confirm his message of fidelity to the sitting hen.

3 Preparation…
Head down, he flies in a widening circle above the nest site. He banks to one side in preparation for a spectacular dive.



4 Display
With beating wings, the male drops. Air rushing over the stiff outer tail feathers creates a characteristic winnowing sound.

PROFILE COMMON SNIPE

The common snipe spends most of its time wading in boggy or marshy sites inland, probing for invertebrates in the soil, using its long bill.

PLUMAGE
Brown and black, streaked and mottled upperparts provide camouflage while the snipe is on the ground. Adults and juveniles are almost indistinguishable.

TAIL
During the male's display flight, the two outer tail feathers *(below)* vibrate, creating a loud "drumming."

ESCAPE FLIGHT
When forced to break cover, the snipe rises suddenly and flies on a zigzag course, turning sharply one way and then the other close to the ground.

EYES
Set high in the skull, the eyes give good all-round vision, letting the snipe keep watch for predators while probing headdown on the ground.

FEET
Each foot has three, long, forward-facing toes bearing sharp claws and a shorter, spurlike hindtoe.

BILL
The tip of the bill is flexible and can be opened while the rest of the bill remains closed. It also contains touch-sensitive organs that allow the snipe to locate buried food.

VITAL STATISTICS

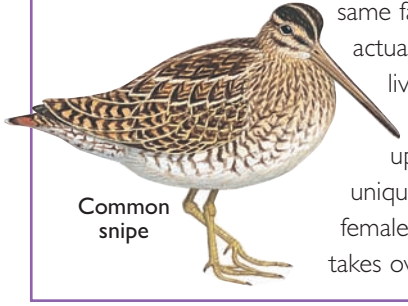
WEIGHT	3–4.5 oz.
LENGTH	10–11"
WINGSPAN	1.5'
SEXUAL MATURITY	1–2 years
BREEDING SEASON	April–July
NUMBER OF EGGS	2–5, usually 4
INCUBATION PERIOD	18–20 days
FLEDGING PERIOD	19–20 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Mainly worms; also insects, larvae, frogs, mollusks, leeches, aquatic seeds
LIFESPAN	Up to 12 years

RELATED SPECIES

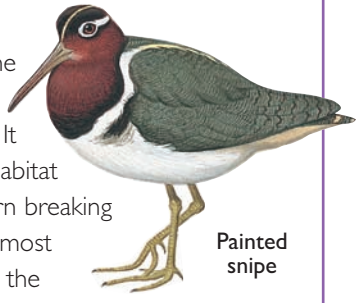
● **The genus *Gallinago* contains 15 snipe species, including the common snipe, which has several subspecies in both hemispheres. Relations in the family *Scolopacidae* (86 species in all) include sandpipers, such as the purple sandpiper, *Calidris maritima*** (below).

CREATURE COMPARISONS

Common names can often lead to confusion. A good example is the painted snipe (*Rostratula benghalensis*). The name implies that it's in the same family as the common snipe, but it's actually in its own family, the *Rostratulidae*. It lives in the same marsh and swampy habitat as the common snipe, its bold pattern breaking up its outline and camouflaging it. The most unique feature of the painted snipe is that the female is brightly plumaged and the male is dull. The male also takes over all the nesting duties after the eggs are laid.



Common snipe



Painted snipe

Common Tailorbird

• ORDER •
Passeriformes

• FAMILY •
Sylviidae

• GENUS & SPECIES •
Orthotomus sutorius

KEY FEATURES

- An abundant insecteater that is as at home in an urban vegetable patch as in the undergrowth of a forest clearing
- Stitches leaves together to form a pouch, in which it builds its nest hidden from predators
- The constant call between male and female is a characteristic sound of southeastern Asia

WHERE IN THE WORLD?

Found across southern China, southeastern Asia, the Malay Peninsula and Java; also throughout the Indian subcontinent, including Sri Lanka

LIFECYCLE

The tailorbird owes its name to the female's extraordinary sewing skills. Using her bill as a needle, she stitches one or more leaves into a pouch to form the basis of the nest.

HABITAT

▲ **BIRD IN THE BUSH**
The tailorbird lives in undergrowth that springs up in forest clearings.

The common or long-tailed tailorbird is a familiar sight throughout its extensive range. It even thrives in urban gardens and parks, where it hunts and skulks in hedges, flowerbeds and tangled shrubbery.

The common tailorbird is adaptable, taking advantage of any dense vegetation, including forest clearings. It is also found in semi-desert scrublands and in clumps of bamboo woodland at altitudes of up to 6,000', provided that there is cover for nesting.

DID YOU KNOW?

- **Despite its efforts to hide its nest, the tailorbird is often the victim of cuckoos, which lay their eggs in the tiny nests.**
- **The common tailorbird often steals fibers from house doormats, which it then uses to stitch up its nest pouch.**

BEHAVIOR

Seemingly tireless, the common tailorbird hops actively among bushes, hedges and trees in its ceaseless search for tiny insects, its tail cocked high above its back and wagging from side to side.

The bird's weak, erratic flight makes it an easy target for flying predators. Therefore, it flits swiftly from one patch of undergrowth to another, avoiding open areas. However, where the tailorbird inhabits areas near human settlements, it is surprisingly tame.

A tailorbird pair forms a long-term bond and lives within a static territory all year. The birds remain in constant contact with each other, uttering a surprisingly loud, monotonous call: *chee-up, chee-up*. When danger threatens, such as the appearance of a shikra — the common small sparrowhawk of southern Asia — the pair makes noisy alarm calls of *pit-pit-pit* until the danger has passed.

BREEDING

The tropical undergrowth where the tailorbird lives teems with nest robbers, such as snakes, lizards, mongooses and various predatory birds. To avoid these predators, the tailorbird constructs its nest deep in a thicket or tree up to 20' high.

Pairs usually breed between February and May. After mating, the female begins the arduous work of nest-building. It takes her up to two days to stitch the pouch together, while the male defends the pair's territory from other tailorbirds. Once the pouch is complete, the male helps her construct the nest from grasses, and then line it with cotton, feathers and animal hairs.

Both parents incubate the clutch, and later bring food to the nestlings — an exhausting task that occupies them constantly until the chicks are fledged two weeks later.

▶ **SAFETY POUCH**
The nest leaves provide excellent camouflage.

GETTING STITCHED UP

1 Tailor maid...
Selecting a large leaf in the middle of a bush, the female carefully brings the two edges together to form a pouch.

2 Needlework...
Using her long, thin bill like a hole puncher, the female deftly jabs a line of small, precise holes along the edges of each side of the leaf.

▲ **CONSTANT FIDGET**
This restless, inquisitive bird is always on the move.

CONSERVATION

Widespread in its range, the common tailorbird readily adapts to human habitation and benefits from jungle clearance, a process detrimental to many other animals. But clearance of scrubby undergrowth may cause declines in some areas.

3 Sew far, sew good…
The bird pushes binding material, such as plant fibers and spider silk, through the holes, drawing the edges of the leaf together.

4 Hanging basket
The ends of the stitching fray naturally into bunches, making a solid cradle in which both parents build the tiny nest.

FOOD & FEEDING

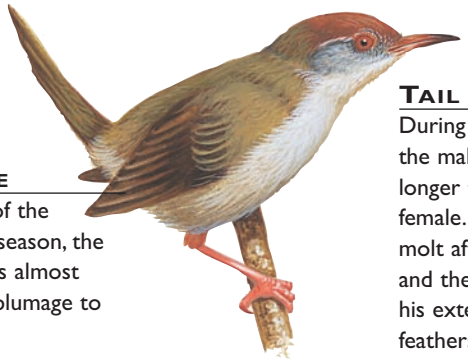
Like most warblers, the tailorbird feeds on insects and other small invertebrates that abound in its tropical habitat. Creeping in the undergrowth, it uses its bill like a pair of forceps to pick off beetles, bugs, caterpillars and spiders from leaves, stems and branches. The bird is also able to reach deep into flowerheads and drink the sugary nectar.

Swarms of flying termites provide food for many birds, and are particularly abundant in the rainy season. The tailorbird, being a less adept flier, must wait until the creatures land and shed their wings before gorging itself. Such gluts are essential to feed chicks, and may enable more young to survive to adulthood.

▶ **GULP**
Young battle for every scrap.

PROFILE COMMON TAILORBIRD

Brown and olive-green plumage conceals the common tailorbird as it hunts tirelessly in undergrowth for food.



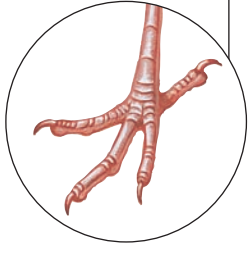
FEMALE
Outside of the breeding season, the female has almost identical plumage to the male.

TAIL
During the breeding season the male's tail is nearly 2" longer than that of the female. Both sexes molt after nesting, and the male loses his extended feathers.

BILL
Long, slim and slightly curved, the bill is a useful tool for grasping insects. It is also strong and sharp enough for the female to pierce the toughest leaves and then sew them together.

WINGS
Short, rounded wings enable the bird to fly through tiny gaps in thick undergrowth.

FEET
Three forward-pointing toes and a single hindtoe give the bird a firm grip as it perches.

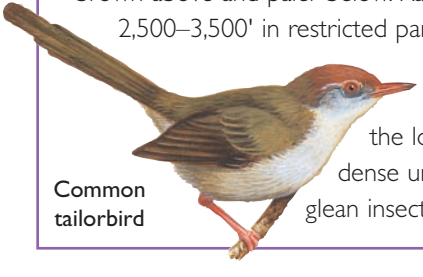


VITAL STATISTICS

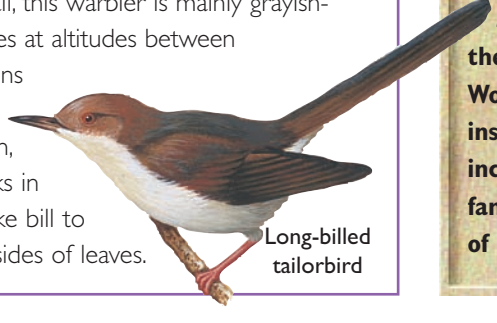
WEIGHT	0.4 oz.
LENGTH	5–7"
WINGSPAN	5–5.5"
SEXUAL MATURITY	1 year
BREEDING SEASON	All year; peaks from February–May
NUMBER OF EGGS	3–5
INCUBATION PERIOD	12 days
FLEDGING PERIOD	12–13 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Insects and spiders; rarely nectar from flowers
LIFESPAN	Unknown

CREATURE COMPARISONS

The long-billed forest tailorbird, *Orthotomus moreaui*, is one of two tailorbird species in eastern Africa. This rare bird exhibits the same nest-building skills as the rest of the genus. Similar in shape and size to the common tailorbird, and with an equally long tail, this warbler is mainly grayish-brown above and paler below. Rarely found near humans, it lives at altitudes between 2,500–3,500' in restricted parts of the Usumbara Mountains and Njesi Plateau of Tanzania. Like its Asian cousin, the long-billed forest warbler skulks in dense undergrowth using its needlelike bill to glean insects from stems and the undersides of leaves.



Common tailorbird



Long-billed tailorbird

RELATED SPECIES

● The common tailorbird is 1 of 11 species in the genus *Orthotomus*. Of these, 9 occur in southeastern Asia and 2, the forest warblers, are found in East Africa. *Orthotomus* is 1 of 67 genera in the family *Sylviidae*. Most of these species are Old World warblers — small, insect-eating birds. They include a number of familiar woodland species of Europe.

Common Yellowthroat

• ORDER •
Passeriformes

• FAMILY •
Parulidae

• GENUS & SPECIES •
Geothlypis trichas

KEY FEATURES

- Feeds and nests on or near the ground, rarely ascending to a tree or bush higher than 5'
- Despite its preference for the ground, flies high in the sky during spring and fall migrations
- Male birds are easily distinguished from female birds by their broad, black mask

WHERE IN THE WORLD?

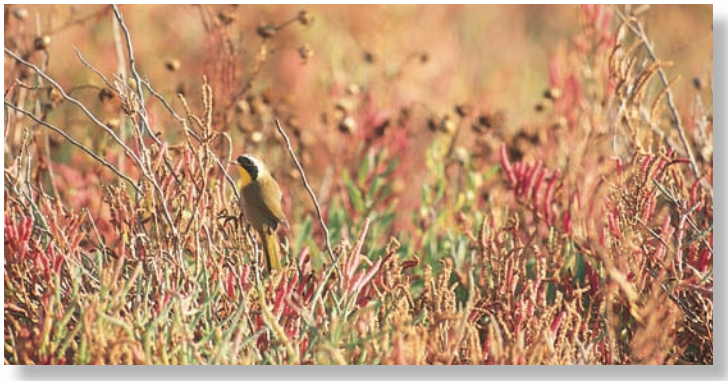
Breeds from Alaska to the Gulf of Mexico; winters from California and North Carolina to the Bahamas, Cuba, Mexico and Central America

LIFECYCLE

The common yellowthroat leads a secret life; the male masquerades with its black mask while the female remains well hidden, carefully protecting her clutch.

HABITAT

The common yellowthroat is perhaps the most widespread American wood warbler. It breeds in all 49 of the mainland states in the U.S. and in all of Canada's provinces and territories. Summer and winter haunts are similar, with the yellowthroat preferring damp, brushy habitats, including marshes, cattail meadows, brambles and bogs. In the drier regions of the western U.S., the bird occurs mainly in marshy stream and pond margins and flooded thickets. Rarely seen in gardens or backyards, the main requirement of the common yellowthroat's home is thick cover nearby.



▼ **PEACEFUL PERCH**
A yellowthroat enjoys the view from atop a bramble.

BREEDING

Beginning in March, males start to arrive at their northern breeding grounds. Territories are established before females arrive, and the males' songs resound across the U.S. and Canada, advertising their presence to the arriving females. The males' courtship displays include postures and aerial maneuvers designed to show off their sleek, black masks. The bulky nest is constructed from grasses, leaves and bark; it is then lined with fine grasses and hairs. The pair builds the nest on or near the ground, at the base of a bush or in a clump of weeds (usually no higher than 5' above ground). The female lays 3–5 glossy white eggs with dark specks, lines or blotches, and she incubates them alone for about 12 days. Both parents feed insects to nestlings, and the young birds grow rather quickly; they are ready to fly in 10 days. But since the nest is on or near the ground, they often fall prey to snakes and small mammals.

PARENTS AT WORK

1 Multitude...
A female yellowthroat has finished laying her clutch of five speckled eggs inside the bulky, cup-shaped nest.

2 Solitude...
A male yellowthroat perches high on a reed stem overlooking the marsh, keeping a close watch for intruders that might pose a threat.

FOOD & FEEDING

The common yellowthroat forages for an extremely wide range of insects while crouched low in vegetation or on the ground. This equal–opportunity hunter targets everything from dragonflies, grasshoppers, moths and leafhoppers, to damselflies, mayflies and butterflies. The bird also gleans spiders, beetles, grubs, cankerworms and caterpillars from leaves and grasses. The yellowthroat carefully works its way through the dense tangles of its preferred habitat, often perching and climbing on the tall vertical stalks of nearby reeds or rushes while searching for a wide variety of food.

◀ **LUNCH TIME**
A common yellowthroat takes time out to enjoy a quick snack.

CONSERVATION

Widespread across much of North America, the common yellowthroat is not currently globally threatened. The gradual loss of its wetland habitat, however, including drainage of swamps for various purposes, could ultimately affect its long-term success.

3 Baby food...
One parent snatches a spider from the head of a bulrush, expertly capturing a high-protein snack for its hungry young.

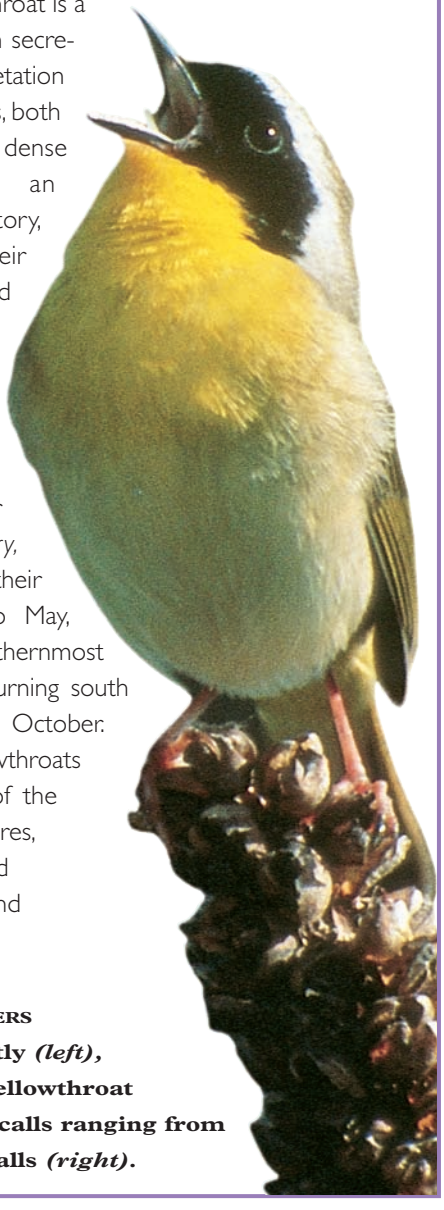
4 Gratitude
The fast-growing nestlings, with mouths agape, are anxiously awaiting their next meal from their dutiful parent.

DID YOU KNOW?

- **Subspecies of the common yellowthroat include the Maryland, the Florida and the tule yellowthroats, with the Maryland name used as a universal label for these birds by birdwatchers.**
- **The yellowthroat's genus name comes from the Greek words, *ge,* meaning earth, and *thlypis,* a kind of finch — hence the genus name means, quite literally, a ground bird.**

BEHAVIOR

The male common yellowthroat is a masked bandit, moving with secrecy through the dense vegetation of its home. To avoid threats, both sexes skulk low in the dense underbrush. But when an intruder enters their territory, the wary birds utter their startling alarm note, a loud *tsip,* emerge from cover, curiously peer around and then quickly retreat back out of sight. In spring, the males can be quite conspicuous, singing their bright *witchery, witchery, witchery* call to advertise their presence. From March to May, the birds arrive in the northernmost reaches of their range, returning south from mid-August to late October. Because the common yellowthroats are night migrants, many of the birds collide with tall structures, including power stations and lighthouses, as they fly to and from their summer homes.



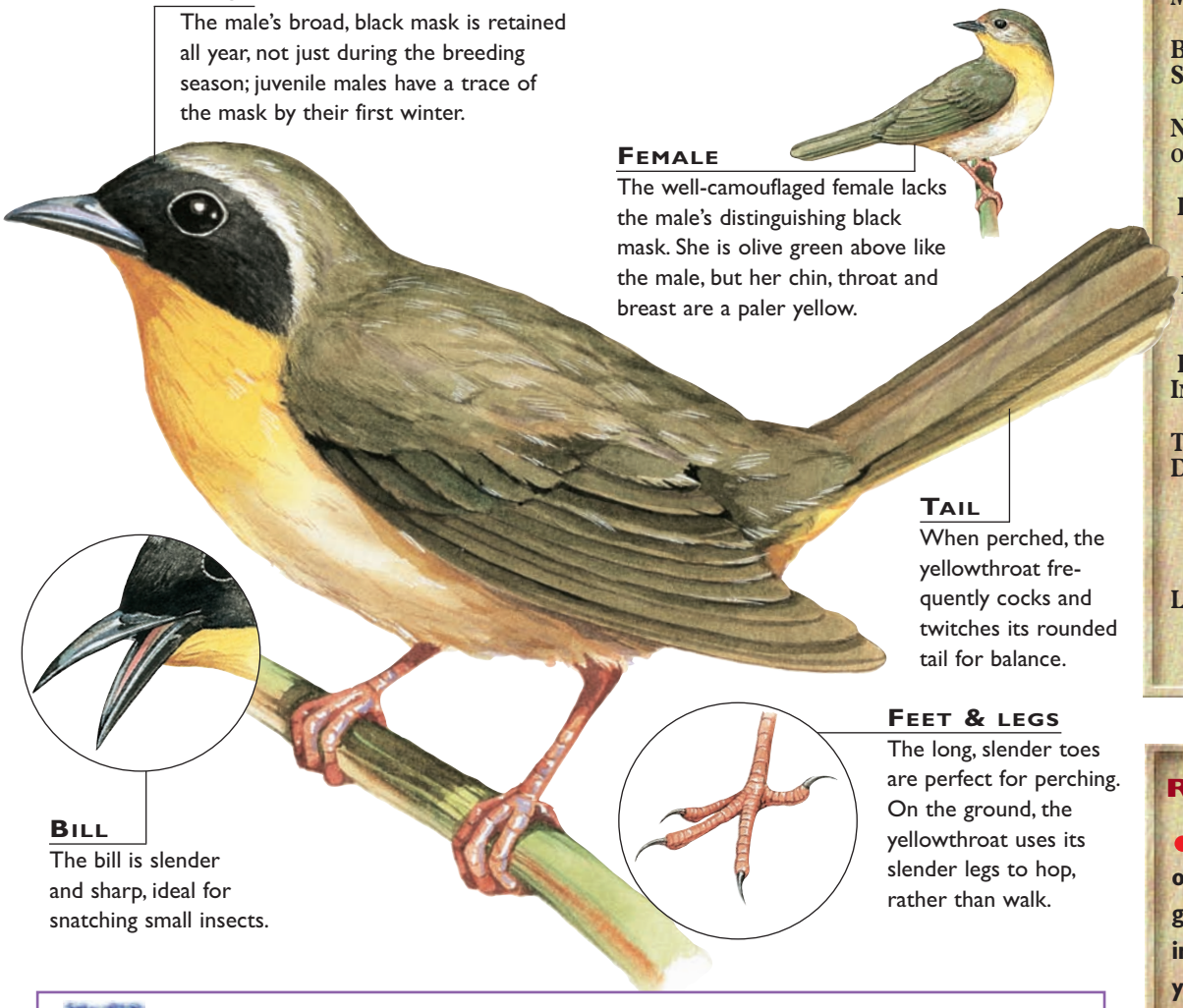
SENSATIONAL SINGERS
When not hunting quietly *(left)*, the talented common yellowthroat emits a wide variety of calls ranging from mating calls to alarm calls *(right)*.

PROFILE COMMON YELLOWTHROAT

The energetic and lively common yellowthroat, with its distinct golden neck feathers, makes a lasting impression throughout its range.

MASK
The male's broad, black mask is retained all year, not just during the breeding season; juvenile males have a trace of the mask by their first winter.

FEMALE
The well-camouflaged female lacks the male's distinguishing black mask. She is olive green above like the male, but her chin, throat and breast are a paler yellow.



TAIL
When perched, the yellowthroat frequently cocks and twitches its rounded tail for balance.

FEET & LEGS
The long, slender toes are perfect for perching. On the ground, the yellowthroat uses its slender legs to hop, rather than walk.

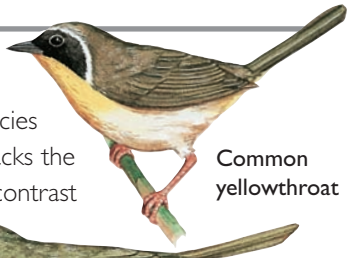
BILL
The bill is slender and sharp, ideal for snatching small insects.

VITAL STATISTICS

WEIGHT	0.25–0.5 oz.
LENGTH	4.5–5.5"
SEXUAL MATURITY	About 1 year
BREEDING SEASON	April–July
NUMBER OF EGGS	3–5
INCUBATION PERIOD	12 days
FLEDGING PERIOD	10 days
BREEDING INTERVAL	Up to 2 broods per season
TYPICAL DIET	Mainly insects, including grasshoppers, beetles, flies and ants
LIFESPAN	Over 6 years

CREATURE COMPARISONS

The Bahama yellowthroat *(Geothlypis rostrata)*, measuring up to 6", is slightly larger than the common yellowthroat. Males of both species boast the conspicuous black mask, but the Bahama yellowthroat lacks the extensive gray border around the mask and has a yellow belly, in contrast to the common yellowthroat's whitish one. Both species feed on insects, but the Bahama yellowthroat uses its larger and heavier bill to catch anole lizards as well. While the widespread common yellowthroat frequents marshes and wet scrub, the Bahama yellowthroat, limited to the Bahamas, prefers pine woodlands and hardwood thickets.



Common yellowthroat

Bahama yellowthroat

RELATED SPECIES

- **The yellowthroat is 1 of about 12 species in the genus *Geothlypis*, which includes the Belding's yellowthroat, *G. beldingi*, and the gray-crowned yellowthroat, *G. policephala*. These birds are among over 100 species of American wood warblers in the family *Parulidae*, including the largest North American wood warbler, the 7.5" long yellow-breasted chat, *Icteria virens*.**

Cooper's Hawk

• ORDER •
Falconiformes

• FAMILY •
Accipitridae

• GENUS & SPECIES •
Accipiter cooperii

KEY FEATURES

- Hunts by ambushing its prey; sometimes drowns its victim in nearby watering holes
- The male chooses a new nest site each year and builds most of the nest
- Females begin laying their eggs on the same day each year
- The eyes undergo several color changes, which also indicate the bird's age

WHERE IN THE WORLD?

Found in much of North America, including British Columbia, Ontario, Nova Scotia and the U.S.; south through Mexico and Costa Rica to Colombia in South America

LIFECYCLE

The Cooper's hawk preys on small birds and mammals, often hunting from a perch or flying around the edges of a forest clearing before pouncing on its victim.

▶ **LIVING AMONG THE TREES**
The Cooper's hawk inhabits the forests of North America.

HABITAT

The Cooper's hawk prefers deciduous and coniferous forests dotted with meadows and clearings; there, the bird can glide freely to the ground. Found in most of North America, the hawk inhabits areas close to water. Large expanses of farmland are another favored residence, giving the bird plenty of open areas and a chance to capture domesticated fowl. On nesting grounds, the hawk lives in wilderness forests and in farm woodlots. In October, some populations of the Cooper's hawk migrate to New England and farther south to Costa Rica and Colombia. The main migration northward to the breeding woods occurs in March.

FOOD & HUNTING

The Cooper's hawk hunts mainly by waiting on its perch until it spots its prey, usually small birds or small mammals like chipmunks or red squirrels. It surprises its victim by swooping down silently, then striking with its talons; it has sometimes been known to bring its captured but still-living prey to a watering hole and drown it. When pursuing birds, this hawk flies swiftly while darting through the trees. Typical prey includes bobwhite quails, starlings, robins and blackbirds. The hawk boldly attacks farm poultry, which is why farmers refer to it as the chicken hawk. The Cooper's hawk regurgitates pellets containing indigestible material, such as bones and fur.

▲ **CLEARING THE TABLE**
The hawk takes its prey to a clearing to be eaten.

PERCH AND POUNCE

1 From the perch...
The Cooper's hawk perches on a conifer branch at the edge of a clearing where it will wait patiently until its prey appears.

3 Total surprise...
With its prey in sight and within range, the Cooper's hawk pounces on the crested flycatcher, catching it by surprise.

BEHAVIOR

The Cooper's hawk makes its presence known through a series of loud *cack-cack-cack* calls; when danger is near, it emits a piercing call. The bird is able to dart and dash through the woods with great ease, twisting and turning through the branches. Its short, round wings and long, narrow tail are suited for complex maneuvers in the pursuit of prey or during aerial courtship displays, which include rapid circling while flapping and gliding. Some populations remain sedentary, but most northernpopulations of the Cooper's hawk migrate south for the cold winter months.

▲ **FLYING HIGH**
A powerful flier, the hawk soars through the air.

CONSERVATION

Numbers of the once-plentiful Cooper's hawk have dwindled as a result of habitat loss and pesticides, particularly in the eastern deciduous forests. Hawks are protected by federal law in the U.S.

2 Around the bend...
The hawk dashes around the trees at high speeds, twisting and turning along the forest's edge until it spots a crested flycatcher.

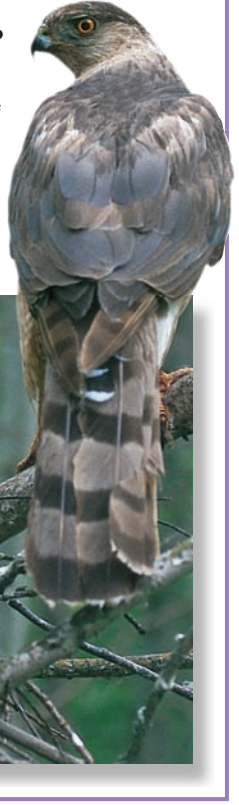
4 Nowhere to hide
On the ground with its victim, the Cooper's hawk holds its prey with its feet before tearing meat off the bird with its strong bill.

DID YOU KNOW?

- **Sometimes chicks mistake the adult's red eye for a piece of meat and peck at it using their sharp bills.**
- **The Cooper's hawk can attain flight speeds of up to 55 mph, especially when in hot pursuit of prey such as small birds.**

BREEDING

Males defend territories during the breeding season, where they wait for a mate. When a female arrives, the male feeds her. Both sexes perform courtship displays, often flying with wings lifted high. The pair sings melodious duets, sometimes lasting up to an hour at a time. The male selects and builds the nesting site each year where the female lays 3–6 (usually 4–5) eggs. Incredibly, the eggs are laid on the same day each year; they are dull white or spotted brown or green. The eggs lie in a nest of sticks and twigs, usually 20–50' above the ground in both pine and hardwood groves or in cottonwoods and sycamores along streams. The female incubates alone for 30–34 days and remains very close to the chicks for the first few weeks. Chicks are born with soft, white down. Males do not approach the nest; instead, they meet the female nearby and provide food for the hatchlings. Within 27–30 days, the birds are ready to fly from the nest. Young females usually breed while still in their immature plumage at 1 year; males typically breed after attaining adult plumage at 2 years of age.



▼ **ON GUARD**
The female keeps a close eye on her chicks for their first few weeks.

PROFILE COOPER'S HAWK

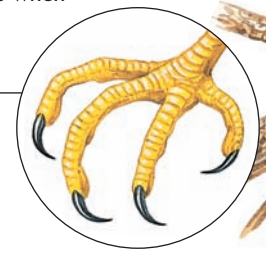
With its long tail and short, rounded wings, the Cooper's hawk flies swiftly as it darts through the trees in pursuit of prey.

BEAK
The beak is sharply hooked for tearing meat into bite-sized pieces.

EYES
The color of the hawk's eyes change as the bird matures — from gray, to yellow, to red. During breeding season, both sexes develop a yellow ring around the eyes.

JUVENILE
The young Cooper's hawk develops immature plumage at 30 days, which camouflages it in the forest.

WINGS
The short, rounded wings enable the hawk to twist and dart through the branches of trees when pursuing prey.



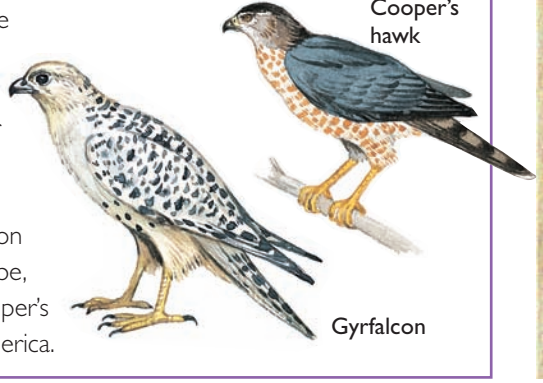
FEET
The feet have long, curved talons designed for grasping and killing prey.

VITAL STATISTICS

WEIGHT	Female 14–22 oz.; male 8–11 oz.
LENGTH	14–20"
WINGSPAN	35–39"
SEXUAL MATURITY	1–2 years
BREEDING SEASON	February –July
NUMBER OF EGGS	3–6
INCUBATION PERIOD	30–34 days
FLEDGING PERIOD	27–30 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Small birds and small mammals
LIFESPAN	8 years or more

CREATURE COMPARISONS

The gyrfalcon *(Falco rusticolus)* is a close relative of the Cooper's hawk. Reaching up to 24" long, with a wingspan up to 4.5' and weighing over 4 lbs., the gyrfalcon is the world's largest falcon and is larger than the Cooper's hawk. Unlike the hawk, which has only one color phase, the gyrfalcon occurs in three phases — white, gray and blackish-brown. The gyrfalcon inhabits the cliffs of the Arctic tundra regions of Europe, Asia, North America, Greenland and Iceland; the Cooper's hawk prefers the forest and woodlands of North America.



RELATED SPECIES

- **The Cooper's hawk is 1 of 50 species in the genus *Accipiter*, including the northern goshawk, *A. gentilis*, the crested goshawk, *A. trivirgatus*, and the bicolored hawk, *A. bicolor*. The family *Accipitridae* contains 237 species in 64 genera. There are 271 species in 5 families of falcons, eagles, hawks, vultures, condors, kites and osprey in the order *Falconiformes*.**

Corncrake

• ORDER •
Gruiformes

• FAMILY •
Rallidae

• GENUS & SPECIES •
Crex crex

KEY FEATURES

- Shy, skulking ground bird of rough grassland with a characteristic rasping, two-syllable call
- Undertakes long, twice-yearly migrations
- Threatened by loss of habitat and changing agricultural methods and classified as rare by the IUCN (World Conservation Union)

WHERE IN THE WORLD?

Breeding range stretches from western Europe east through central Asia to central Siberia; main winter range is in eastern and southern Africa

LIFECYCLE

A rare, reclusive bird active at dawn and dusk,-the corncrake might go unnoticed in the-countryside if it were not for the male's quirky but penetrating call.

HABITAT

The corncrake inhabits open, grassy regions. Its breeding haunts are the treeless steppes of eastern Europe and Asia, alpine meadows and grassy bogs in mountains, and the drier parts of marshes and fens in western Europe. It shuns forests and thickets, rocky or sandy terrain and boggy reedbeds or swamps. In early autumn, it migrates to Africa to spend the winter on grassy savannahs and plains.

Expanding human settlement across the corncrake's range has brought change; in some cases, the replacement of forests with cereal, clover and fodder plants has expanded its habitat. Nevertheless, its strongholds are largely confined to southern Ireland and a few islands off Scotland's west coast.

▼ **LANDSLIDE**
Natural habitat in Britain is increasingly rare.

CONSERVATION

The corncrake is widely distributed, but Eurasian populations are fragmented and in serious decline. With intact natural habitats now rare, changes in agricultural practices represent the biggest threat. They include mechanized harvesting, which kills many adults and chicks and destroys nests.

BEHAVIOR

▲ **GRASS ROOTS**
More often heard than seen, the corncrake spends most of the day hiding motionless in thick ground vegetation.

FOOD & FEEDING

The corncrake uses its feet to scratch at the soil to reveal food, and gathers items from the ground or from vegetation with its sharp-tipped bill. Though vegetation such as green shoots, seeds and cereal grains is part of its diet, the bulk of the bird's intake is animal-based.

Insect prey that has been recorded include beetles, ants, earwigs, flies, crickets, grasshoppers and butterflies. Other invertebrate victims include spiders, harvestmen, earthworms, slugs, centipedes, millipedes and snails.

While most food is taken directly from the ground, the corncrake sometimes runs after active prey, such as dragonflies. Occasionally, it even takes small birds or mammals, and it is known to eat young frogs and birds' eggs.

For most of the year, the corncrake prefers to forage in the subdued light of dusk and dawn. When active, it skulks about in grassy vegetation, holding its body low and horizontal as it weaves between the crowded stems. At the first sign of disturbance, it runs off through the cover or crouches in hiding. A sudden shock will make it take flight, where it covers the minimum distance for safety before dropping back into the grass.

At the breeding grounds, males establish territories where they try to exclude other males but attract females. Encounters between rivals and potential mates result in a similar display: the male holds his head low while spreading his wings.

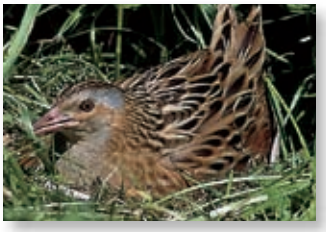
▲ **SPRING ROLE**
In April, the male begins to advertise his territory.

◀ **EARTH CRAKE**
The bird pecks food from the soil with its bill.

DID YOU KNOW?

- **Corncrakes blown off course during migration have turned up in Greenland, Newfoundland, Bermuda, Australia and the United States.**
- **The corncrake derives its name from its monotonous call, which is like a raspy *crake, crake*.**
- **The corncrake's nesting chances are improved if meadows are not cut until midsummer. But devices that frighten them out of harm's way can be added to harvesting machinery.**

BREEDING



▲ **SINGLE SITTING**
The female incubates the eggs on her own.

Following a brief courtship and mating at the breeding grounds, the female corncrake builds a bowl-shaped nest of grass and herb stems on the ground amid dense cover. She lays 8–12 spotted eggs in the nest, producing the clutch over a period of a few days. Incubation begins once the last egg is laid, ensuring that all the young hatch out at roughly the same time—usually about two-and-a-half weeks later.

The chicks are well developed upon hatching, with dark brown plumage. They quickly gather enough leg strength to leave the nest. Although the male plays no part in incubation, he sometimes helps feed the young as they follow the parents around for the first three or four days. Within a week, the chicks feed independently, but they stay close by the adults until molting into their flight feathers at about 5 weeks old.

NEW TO THE FIELD

1 Dual-purpose call...
A male corncrake calls from his territory to warn other males and appeal to potential mates.

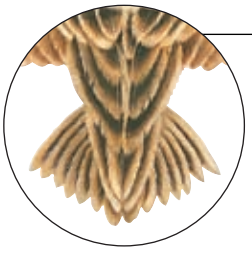
2 Grass court...
A nearby female responds to his cry, and the two birds display for a while before they finally mate.

3 Clutch control...
The female lays her eggs in a nest hidden by surrounding stems; she rarely strays far from them.

4 Parental guidance
Once hatched, the chicks follow their parents around and learn to forage for themselves.

PROFILE CORNCRAKE

Bedecked in cryptic camouflage, the corncrake only forsakes ground cover if a close encounter with a predator forces it into flight.



WINGS & TAIL

Folded for most of the year, in autumn the corncrake puts rounded, reddish wings to good use by flying to Africa for the winter. The short tail helps the bird change direction in flight.

BILL

The corncrake uses its sharp bill for jabbing and snatching invertebrate prey from the ground and for pecking at seeds.

PLUMAGE

There is little difference in the appearance of the plumage between the sexes, though the female has noticeably less bluish-gray color on the head and neck than has the male.

CHICK

The chick emerges with a ready-grown coat of long, sooty down feathers ending in silky tips. Soon able to walk, it leaves the nest within days of hatching.

FEET

The muscular legs and feet are adapted for a life of standing and foraging on the ground. The single hindtoe acts as a brace while the bird is walking on its three foretoes.

VITAL STATISTICS

WEIGHT	Male 4.5–7.5 oz.; female 5–5.5 oz.
LENGTH	11–12"
WINGSPAN	18.5–21"
SEXUAL MATURITY	1 year
BREEDING SEASON	April–August
NUMBER OF EGGS	8–12
INCUBATION PERIOD	16–19 days
FLEDGING PERIOD	34–38 days
BREEDING INTERVAL	1 or 2 broods a-year
TYPICAL DIET	Insects, other invertebrates; green shoots, seeds
LIFESPAN	Not known

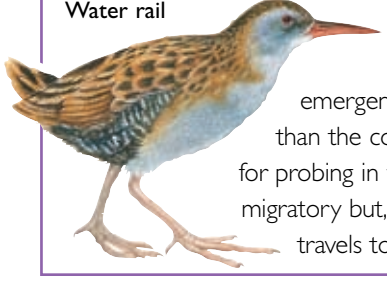
RELATED SPECIES

● **The sole member of its genus, the corncrake is 1-of 124 species in 41 genera in family *Rallidae*; it includes rails, coots, gallinules and crakes, such as the black crake, *Amaurornis flavirostris*** (below)**. The closest U.S. relative is the black rail.**

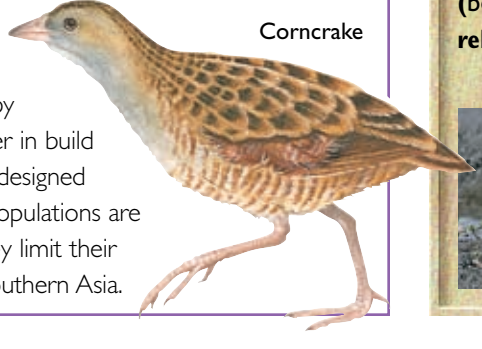
CREATURE COMPARISONS

The corncrake shares much of its breeding range with the water rail (*Rallus aquaticus*), though the two species select different living quarters. As its name suggests, the water rail is closely associated with marshes, swamps and ponds surrounded by emergent vegetation. Though slightly smaller in build than the corncrake, it has a much longer bill designed for probing in water and soft mud. Many of its populations are migratory but, unlike those of the corncrake, they limit their travels to the Mediterranean region and southern Asia.

Water rail



Corncrake



Crab Plover

• ORDER •
Charadriiformes

• FAMILY •
Dromadidae

• GENUS & SPECIES •
Dromas ardeola

KEY FEATURES

- The only wading bird in the world to breed underground in self-excavated burrows
- The only member of its family; differs from other plovers in appearance and breeding
- Dependence on crabs as its main food choice restricts the plover's range

WHERE IN THE WORLD?

Found along the west Indian Ocean coastline, from Madagascar and Africa east to Pakistan and India; also in Thailand and Malaysia

LIFECYCLE

A born beachcomber, the crab plover thrives at the seashore, probing for crabs and other crustaceans and scooping out a nesting tunnel in the sand dunes.

HABITAT

▲ **CHANGE OF ADDRESS**
A flock of crab plovers prepares to migrate to wintering grounds

True to its name, the crab plover favors coastal areas and islands where there are an abundance of crabs. Found mainly along the east African coast, Madagascar and other Indian Ocean islands, the crab plover also migrates to various beaches along the coasts of India and Sri Lanka. The crab plover's breeding range is very restricted. The sites are found exclusively on the Indian coastline of the Persian Gulf and Arabian peninsula and islets off North Somalia. Traveling inland less than 1 mile, the crab plover searches for sand that is soft enough to shovel, but moist enough to hold together when the crab plover burrows its nesting tunnel. In addition, there must be plenty of crabs nearby. Only a dozen or so crab plover breeding locations are known, and several have been abandoned in recent years.

DID YOU KNOW?

- **The crab plover's breeding cycle is synchronized so that the chicks hatch when crab numbers are at their peak.**
- **The crab plover nests underground, so its egg needs no camouflage.**
- **Researchers believe that the crab plover, the only member of the family *Dromadidae*, has been on an evolutionary monorail for 35 million years — it has changed very little over the ages.**

BREEDING

The crab plover digs deep nests to safeguard its young. A mating pair tunnels into sand dunes, burrowing up to 6.5'. The tunnel slopes downward before it rises upward to an unlined nesting chamber, which protects the egg and chick from predators and the hot sun. A group of up to 10 non-breeding plovers help attend the nest, assisting the male in bringing food to the incubating female and the newborn chick. This communal breeding is rare among wading birds. The chick remains with its parents for several additional months, during which time it can often be heard begging with a whistling call.

FOOD & FEEDING

The crab plover feeds during the day, always poking and prodding beach sand in search of crabs. In groups of up to 1,000 birds, the crab plover easily wades with its long legs along tidal areas. Standing about 15' apart, the birds scan the sand carefully with their large eyes wide open, looking for telltale marks of burrowing by crabs, marine worms, mollusks and other invertebrates. The plover spots the mark or movement where its prey is buried and then races toward its target.

Crab plovers also venture into mangroves to scoop up the crabs that have emerged from their burrows to scuttle over the surface. Before the crab even has a chance to strike, the crab plover effortlessly breaks the animal's shell in its powerful bill and devours the meat inside. During the breeding season, the crab plover uses its bill to make a crab pulp for its chick, until the juvenile is old enought to join its parents in the search for crabs.

▶ **WADING ALONG**
The crab plover searches for crabs year-round

UNDERGROUND NURSERY

1 Labor of love…

Unlike other wading birds, the crab plover tunnels through the moist sand and makes a nest inside a dune.

2 Fits like a glove…

The 6.5'-long tunnel leads to the darkness of the nesting chamber where the plover lays only a single egg.

3 Dinner bell…

The young chick begs for food at the tunnel entrance with a whistling call. The parent makes a pulp from its crab meal to feed the chick.

4 Show and tell

The juvenile, still semi-dependent on its parents, receives a lesson on breaking crabs. It stays with its parents for several months.

BEHAVIOR

▲ **CRAB GRAB**
A group of hungry plovers pokes around mangroves, constantly searching for scurrying crabs.

Sociable crab plovers flock together while feeding and nesting. The long-legged birds wade in shallow water on the lookout for a meal, then fly to nearby sand dunes to build deep nesting chambers. The sandbanks often look like large honeycombs with their hundreds of tunnel openings. In low flight between feeding areas, the birds are easy to identify: they fly in tight formation, with their legs trailing behind them and their necks extended. But the crab plover can also be heard. A loud shrill call carries up to 1 mile away, and a constant barking call, *crow-ow-ow,* carries almost as far.

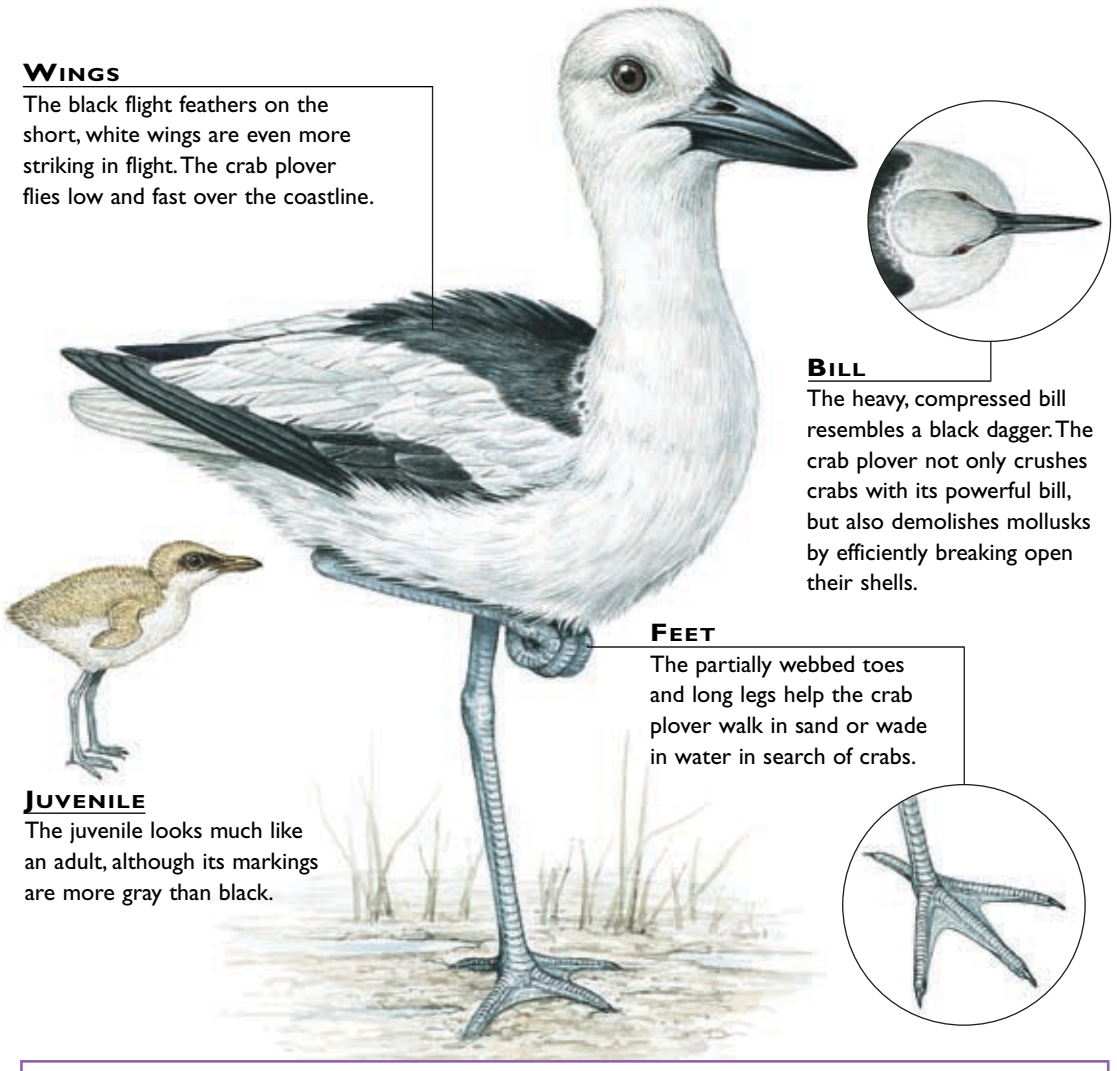
The majority of crab plovers migrate from their breeding grounds to overwinter in southern locations with a fresh supply of crabs. Flying high, the adults and juveniles keep in straight-line or V formations, with their necks retracted for streamlining. The young can often be heard throughout the winter uttering a high whistle, begging for food. Though capable of flight, the young remain semi-dependent on their parents for food for several months.

CONSERVATION

Despite its restricted breeding and wintering grounds, crab plover populations seem healthy. The largest population in the non-breeding range is in Tanzania, where about 26,000 birds migrate for the winter. The bird's limited range and limited diet could prove a problem for the crab plover in the future.

PROFILE CRAB PLOVER

The unique crab plover is a standout on the shore; its large, powerful bill and long legs make it an accomplished shellfish hunter.



WINGS
The black flight feathers on the short, white wings are even more striking in flight. The crab plover flies low and fast over the coastline.

BILL
The heavy, compressed bill resembles a black dagger. The crab plover not only crushes crabs with its powerful bill, but also demolishes mollusks by efficiently breaking open their shells.

FEET
The partially webbed toes and long legs help the crab plover walk in sand or wade in water in search of crabs.

JUVENILE
The juvenile looks much like an adult, although its markings are more gray than black.

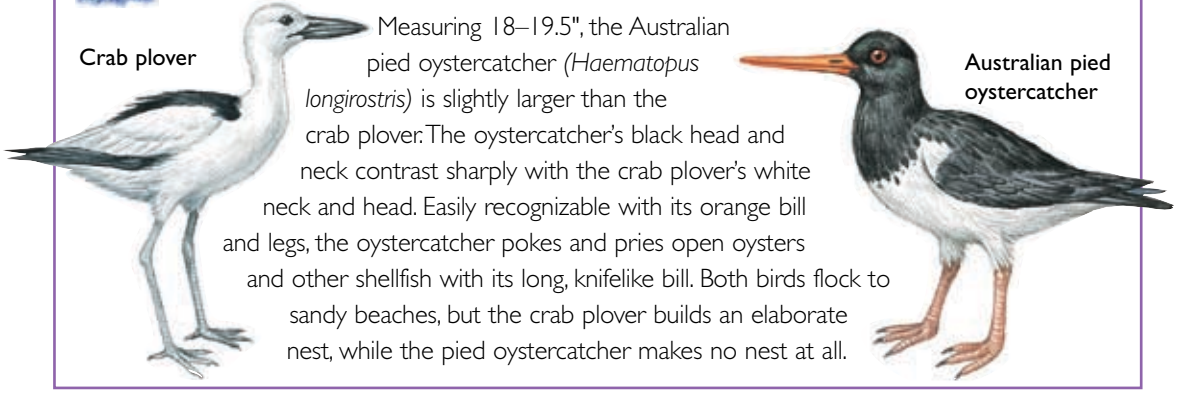
VITAL STATISTICS

WEIGHT	11.5 oz.
LENGTH	15–16"
SEXUAL MATURITY	Unknown
BREEDING SEASON	May and June
NUMBER OF EGGS	1
INCUBATION PERIOD	Unknown
FLEDGING PERIOD	Unknown
BREEDING INTERVAL	1 year
TYPICAL DIET	Mainly crabs, but also other crustaceans, mollusks, marine worms and other invertebrates
LIFESPAN	Unknown

RELATED SPECIES

- **The crab plover is the only member of the family *Dromadidae*. Its unique physical appearance and breeding behavior exclude it from the plover family, *Charadriidae*. The approximately 60 species of plover in this family have short legs and bills. The thick knees, in the family *Burhinidae*, include the water dikkop, *Burhinus vermiculatus*, which more closely resembles the crab plover.**

CREATURE COMPARISONS



Measuring 18–19.5", the Australian pied oystercatcher *(Haematopus longirostris)* is slightly larger than the crab plover. The oystercatcher's black head and neck contrast sharply with the crab plover's white neck and head. Easily recognizable with its orange bill and legs, the oystercatcher pokes and pries open oysters and other shellfish with its long, knifelike bill. Both birds flock to sandy beaches, but the crab plover builds an elaborate nest, while the pied oystercatcher makes no nest at all.

Dipper

• ORDER •
Passeriformes

• FAMILY •
Cinclidae

• GENUS & SPECIES •
Cinclus cinclus

KEY FEATURES

- Perches on rocks in mountain torrents while constantly bobbing (or dipping) up and down, waiting to launch into the water to catch prey
- Skilled at wading in shallows, plunging into whitewater or walking along stony streambeds
- Builds its nest a few feet from running water

WHERE IN THE WORLD?

On and beside rapidly flowing streams in upland Europe and mountainous regions of northwest Africa, the Middle East, Russia and central Asia

LIFECYCLE

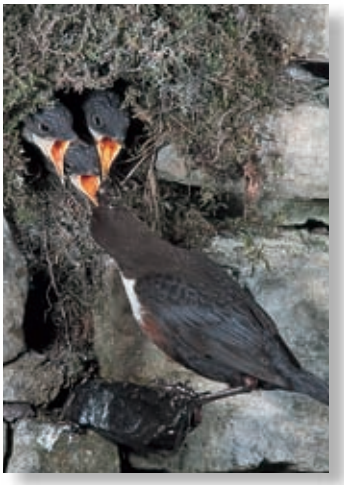
Amid the splash and swirl of rushing rivers and bubbling streams, the dipper swims, flies, feeds and nests, displaying a complete mastery of this challenging environment.

HABITAT

The dipper — with the other four members of its family — is adapted to a specific habitat: it's restricted to clear, fast-flowing streams in mountainous and hilly areas and never moves far from its watery home. It inhabits shallow streams with gravelly bottoms and rocky banks that lack vegetation, often choosing a prime spot where the torrent rushes down a ravine or plunges into a deep chasm.

In hard winters, even mountain streams can partially freeze. Then, the dipper may move to lower altitudes, to lakesides and rocky coastlines.

BREEDING



▲ **DOME OF THE ROCK**
The nest, shaped like a basketball, clings to rock-faces above water

In early spring, the dipper selects a nest site along its home stretch of stream. The nest is normally wedged into a crevice in a vertical slab of rock under a bridge or behind a waterfall. Both male and female build the moss nest, spending three weeks on the task.

Parents feed chicks in a "carousel." Each chick moves to the back of the nest once it's been fed, to allow its siblings a chance. When they leave the nest, at 22 days old, the young seek refuge in streamside vegetation. Mastering the water takes several weeks.

▼ **STEPPING STONES**
The dipper rests on rocks midstream and often sings a territorial warning.

CONSERVATION

Scientific studies show that the dipper's populations are stable through most of its European range — with the exception of eastern Germany and Poland, where chemical pollution of rivers and streams may be the cause of its decline. But recent political changes in Eastern Europe have given a higher priority to conservation, and it's likely that pollution levels will be slowly reduced there.

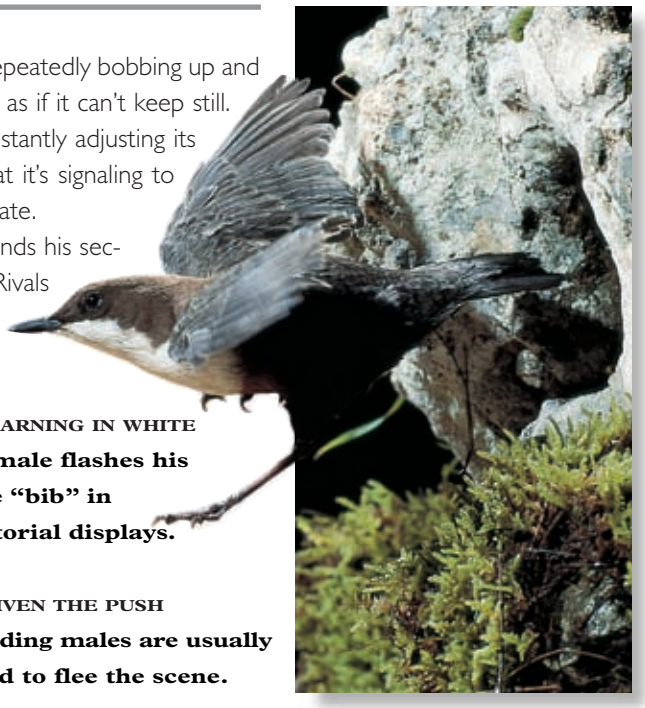
BEHAVIOR

It's not known why the dipper "dips." By repeatedly bobbing up and down it appears restless and hyperactive, as if it can't keep still. One explanation is that the dipper is constantly adjusting its field of vision to spot prey, another is that it's signaling to other birds or keeping contact with its mate.

Territorial all year, the male dipper defends his section of stream against all other males. Rivals face each other on adjacent rocks, while singing loudly and bobbing frantically.

◀ **WARNING IN WHITE**
The male flashes his white "bib" in territorial displays.

▶ **GIVEN THE PUSH**
Intruding males are usually forced to flee the scene.



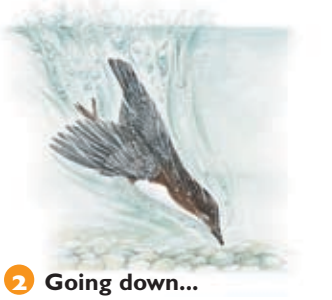
FOOD & FEEDING

The dipper uses a range of feeding methods. It carefully picks insects off rocks on the surface, chases tiny fish and crustaceans underwater by swimming with powerful wingbeats or locates snails, worms and insect larvae by walking on the streambed.

A variety of insects and their larvae make up the dipper's diet, but the larvae of caddis flies are its main prey. These larvae live in tubes they construct from grains of sand and fragments of plant material and hide under streambed stones. The dipper snatches a "tube" in its bill before squeezing out the larva or breaking the tube against a rock.

MAKING A SPLASH

1 Dip, dip, dip...
On a rock in the middle of a stream, a dipper rapidly bobs up and down while flicking its tail. Checking that all is clear...



2 Going down...
...the dipper plunges into the water. It dives, propelling itself by beating its wings. Despite the strong current, it's an agile swimmer.

3 Rock-bottom...
The dipper can walk along the streambed as if on land. As it moves, it turns over stones to reveal insect larvae and other prey.

4 Home and dry
Popping to the surface like a cork, the dipper swims to a rock. If it has young, it returns to the nest, which is often hidden behind a waterfall.

DID YOU KNOW?

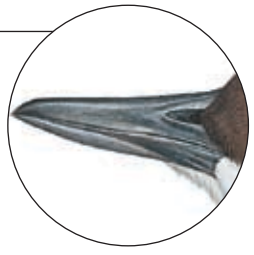
- **One dipper nest site was used for 123 years by successive generations.**
- **The male dipper isn't always faithful to his mate. Males have been seen visiting neighboring nests to feed the young, which they probably fathered.**
- **The dipper's preen gland is ten times larger than any other bird's in the order *Passeriformes*, which includes 60% of the world's bird species. This reflects the length and frequency of its preening sessions, when it repairs and waterproofs the damage caused to its feathers by rough water.**

PROFILE DIPPER

To cope with the ravages of rough water and spray, the dipper has waterproof feathers, while its eyes and nostrils are protected by special membranes.

NICTITATING MEMBRANE
Each eyeball's surface is cleaned by a transparent membrane that is flicked across the eye. The dipper blinks the membranes in time with each "bob" of its body.

NOSTRILS
A broad membrane just above the nostrils closes off the nasal passages when the dipper dives



PLUMAGE
To prevent its plumage from getting waterlogged, the dipper spends much time preening and applying waterproof oil from a large preen gland above its tail.

JUVENILE
The juvenile is an overall dull gray. Its underparts have white feathers with black tips, which creates a "scaly" appearance.

FEET
Long claws let the dipper clamber over rocks. Feet aren't webbed because the bird uses its wings to "fly" when under water.

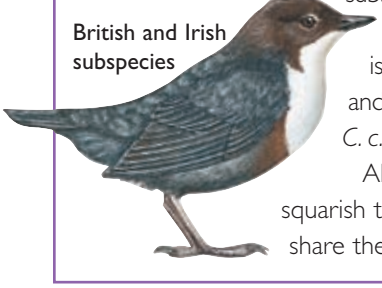
VITAL STATISTICS

WEIGHT	2–2.5 oz.
LENGTH	7–7.5"
WINGSPAN	10"
SEXUAL MATURITY	1 year
BREEDING SEASON	February –June
NUMBER OF EGGS	1–8, usually 4–5
INCUBATION PERIOD	12–18 days, usually 16 days
FLEDGING PERIOD	22 days
TYPICAL DIET	Large aquatic invertebrates (mainly caddis fly larvae); some fish, snails, worms, leeches and crustaceans
LIFESPAN	5 years

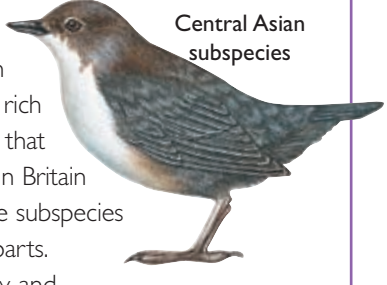
CREATURE COMPARISONS

Across Europe and Asia, the dipper has evolved into several distinct subspecies, each with different plumage. Northern European subspecies (*Cinclus cinclus cinclus*) lacks the rich chestnut band below the white breast, that is a distinctive feature of the subspecies in Britain and Ireland (*C. c. gularis*). In central Asia, the subspecies *C. c. leucogaster* has almost all-white underparts.

All dipper subspecies have a plump body and squarish tail, which is cocked upward. Their lifestyles, too, are similar, and all share the characteristic habit of bobbing, or dipping, up and down.



British and Irish subspecies



Central Asian subspecies

RELATED SPECIES

- **The dipper is in the family *Cinclidae*, which has four other species. Three species occur in the Americas: the white-capped dipper (South America), American dipper (North and Central America) and rufous-throated dipper (Argentina). The brown dipper is found in Asia. Dippers are closely related to thrushes in the family *Turdidae*, which has 310 members.**

Double-wattled Cassowary

• ORDER •
Casuariiformes

• FAMILY •
Casuariidae

• GENUS & SPECIES •
Casuarius casuarius

KEY FEATURES

- Though flightless and heavy, it can sprint at 30 mph and jump into the air to its own head-height
- Female mates several times a year, leaving each partner to tend her eggs and young
- Lashes with daggerlike claws of its huge feet when in danger
- Has bizarre tassels of bare skin and a hard "helmet" on its head

WHERE IN THE WORLD?

Once more widespread, it now ranges over two areas in northeastern Queensland, Australia and lowland New Guinea; also on the island of Seram and Aru Islands, off New Guinea's western coast

LIFECYCLE

One of the most ancient bird species alive, the double-wattled cassowary is notoriously bad tempered and dangerous if provoked, but prefers to lead a quiet life in thick forests.

HABITAT

▲ **OUT OF THE LIMELIGHT**
The double-wattled cassowary keeps to thick cover in dark rainforests.

The double-wattled cassowary inhabits rainforests in areas that still remain relatively free from human disturbance. In New Guinea, it occurs at altitudes of up to 1,650', occupying a central niche between the habitats of the two other species of cassowary, which inhabit lowland swamp forest and montane forest. It's the only cassowary species in Australia, where it lives in rainforest at any altitude as there is no competition.

Left undisturbed, the cassowary stays in the same patch of rainforest for years, but forest destruction increasingly forces it to wander in search of new homes. Such movements may account for occasional sightings as it passes through commercial plantations.

DID YOU KNOW?

- **Local tribes make daggers from cassowary leg-bones and arrowheads from its claws.**
- **To some New Guinean people, every cassowary is a female ancestor reincarnated.**

BEHAVIOR

▲ **SHORT TEMPER**
When escorting young, a male can be aggressive.

FOOD & FEEDING

Access to a year-round supply of fruit is vital to the cassowary, which consumes about 7 lbs. a day in captivity. Most of the fruits it feeds on grow in the middle or upper canopy of the rainforest, so it waits until they ripen and drop to the ground. Then, it tosses them up with a flick of its bill, catches and swallows them whole. It also plucks fruits off low bushes. Favorite fruits are those of myrtle, laurel and palm trees, but at least 75 different fruit species have been identified in its diet in Queensland.

▲ **MAKING TRACKS**
The cassowary creates "paths" between prime feeding sites by wearing down vegetation.

The cassowary's large size means that it burns large amounts of energy and often supplements its sugar-rich diet of fruit with fungi, invertebrates (mainly insects and snails), small mammals and birds, even carrion. It catches and kills prey with its huge feet. When food is scarce, it sometimes strays into plantations for bananas and mulberries.

Outside the breeding season, the cassowary lives a largely silent and solitary life. Rarely seen since it's shy and prefers the densest areas of forest, it's most active on moonlit nights, in the early morning and during late afternoon. It rests in the middle of the day, often seeking out sunny spots in clearings.

If it's threatened or cornered, the cassowary may attack its aggressor, but prefers to run into thick cover. When attacking, it ruffles up its plumage to appear larger, points its bill to the ground and rushes forward at a sprint, lashing out with its sharp claws.

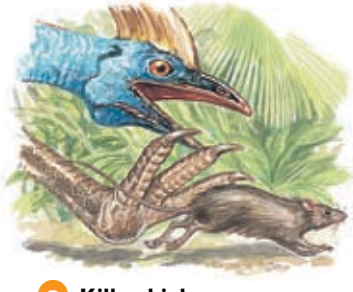
CONSERVATION

The forest-dwelling tribes of New Guinea have hunted the cassowary for its meat, feathers, bones and claws for many years, but the felling of its rainforest home is a far more serious threat to its long-term future. In Australia, cassowaries are killed on the roads as they wander in search of new habitats, while dogs and pigs eat their eggs and young.

A TYPICAL DAY

1 Crash helmet…
A cassowary pushes through thick undergrowth. Its head is protected from injury by its hornlike casque.

2 Fallen fruit…
Finding a durian fruit too large to swallow whole, the cassowary breaks it up with its hefty bill.



3 Killer kick…
Further in the forest, the bird disturbs a rat and gives chase until it can deliver a lethal kick.

4 Down in one.
The cassowary tosses its dead prey into the air, catches it in its bill and gulps it down whole.

BREEDING

The cassowary breeds when forest fruits are most plentiful — during the June to October dry season. Like its close relatives, the kiwis of New Zealand and the emu of Australia, the job of rearing the young is left to the male, which occupies a large, clearly defined territory of 0.4–2 sq. miles. The female seeks out a male and approaches his territory. On the defensive, he's hesitant at first, but then raises the feathers on his back and moves up to her circling, puffing out his throat and making a rumbling, *boo-boo-boo* call.

After mating, the male makes a nest. A shallow hollow lined with vegetation, it's so well camouflaged that few have ever been found. The female lays 3–5 eggs, which hatch after an incubation of 50 days. She then leaves to mate, and lay more eggs, with other males. Chicks can walk and feed themselves in hours, but stay close to their parent for safety.

▼ MAN'S WORK
The male guards the young, which are striped at first, for 36 weeks.

PROFILE DOUBLE-WATTLED CASSOWARY

Massive legs let the double-wattled cassowary rush across the forest floor and kill prey as well as act as formidable defensive weapons.

CASQUE
The function of the hornlike casque isn't known for certain. It grows as the bird becomes older, so may serve as a visible symbol of its dominance and age. It has also been suggested that the casque helps the cassowary force a path through dense vegetation.

PLUMAGE
Coarse, tough feathers protect the skin from damage by thorns, twigs and tangled undergrowth. They also form a cloak, keeping the cassowary dry in the high humidity of the rainforest.

WATTLES
This cassowary is named after the two loose folds of naked skin, or *wattles*, that hang from its neck. Their function is unclear, but the bold colors (red, yellow, blue, purple or white) may help communicate in dark forests. The female is brighter than the male.

JUVENILE
The juvenile is drabber than the adult and has a smaller casque.

TOES
When threatened, the cassowary uses its 4"-long inner toes as slashing weapons, sometimes inflicting fatal wounds on attackers.

VITAL STATISTICS

WEIGHT	Male 64–100 lbs.; female 127 lbs.
LENGTH	4–5.5'
SEXUAL MATURITY	3 or 4 years
BREEDING SEASON	June–October
NUMBER OF EGGS	3–5
INCUBATION PERIOD	About 50 days
FLEDGING PERIOD	About 36 weeks
BREEDING INTERVAL	Probably 1 year
TYPICAL DIET	Fallen fruit; fungi, insects, snails, small mammals and birds; carrion
LIFESPAN	At least 12–19 years

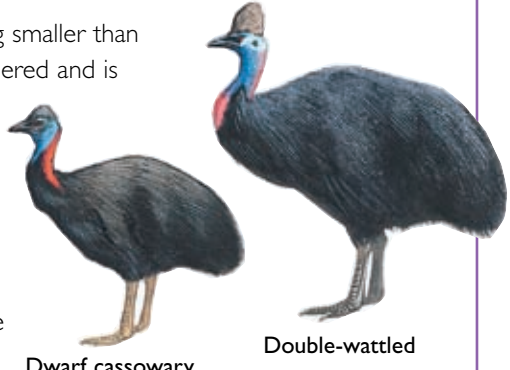
RELATED SPECIES

● **The *Casuariiformes* order has two families: the *Dromaiidae* (the Australian emu is the sole member) and *Casuariidae*, to which the double-wattled, northern (or single-wattled) and dwarf (or Bennett's) cassowaries belong. *Casuariiformes* can't fly, and walk or run on outsized legs — like their relatives the rheas of South America, kiwis of New Zealand and the ostrich of Africa.**

CREATURE COMPARISONS

The dwarf cassowary (*Casuarius bennetti*), despite being smaller than the double-wattled, is even more aggressive when cornered and is considered to be the world's most dangerous bird. It raises its body and kicks with its legs or charges its aggressor while flailing its legs and slashing with its claws. One blow can kill a dog-sized animal.

The dwarf cassowary has a more thickly feathered neck and its casque is smaller and darker. It occurs at up to 9,900' in the mountains of Papua New Guinea, where it's known as the *moruk*. It, too, feeds mainly on fruit.



Dwarf cassowary

Double-wattled cassowary

Dovekie

• ORDER •
Charadriiformes

• FAMILY •
Alcidae

• GENUS & SPECIES •
Alle alle

KEY FEATURES

- A small seabird that swims around the Arctic pack ice, its numbers counted in millions
- Eats animal plankton, which it pursues underwater, using its wings and paddle-like feet
- Raises its single chick in teeming, noisy colonies located on remote northern coasts

WHERE IN THE WORLD?

Breeds on land within the Arctic Circle, including parts of Greenland, Iceland and northern Siberia; winters at sea, mainly in the North Atlantic

LIFECYCLE

Restless and gregarious, the dovekie brings life to the High Arctic summer, as nutrient-rich seas and all-day sun promote an abundance of the plankton on which it feasts.

HABITAT

▲ **FROZEN NORTH**
The dovekie breeds in areas far from humans.

The dovekie spends most of its life at sea, in freezing conditions that would kill a human swimmer in minutes. Its main haunts are the cold, food-rich currents of the Arctic and North Atlantic Oceans. Even in the harshest winters, it keeps well to the north of the warmer, mid-Atlantic waters.

The dovekie comes to land only in the breeding season, living in such bleak areas as northwestern Greenland and the Franz-Josef-Land islands, which lie closer to the North Pole than to the northern coasts of Europe or North America. Nesting colonies are established on slopes close to the seas that fringe the polar ice cap.

CONSERVATION

The dovekie is one of the most abundant seabirds, with a breeding population of about 12 million pairs. Although hunted both for food and for feathers in northern Greenland, it suffers little from human disturbance. Climati c warming has caused it to abandon some smaller, more southerly colonies.

DID YOU KNOW?

- **The dovekie, or "little dove," was given its name by Scandinavian whalers. In the U.K., it is known as the little auk.**
- **The droppings that amass beneath dovekie colonies enable mosses and even lush grass meadows to flourish.**
- **Severe gales result in sporadic "wrecks" of dovekies on far shores. In 1983, more than 1,200 of the birds were found dead on the eastern coasts of Britain, and many others were blown far inland.**

BREEDING

Huge numbers of dovekies throng the breeding grounds in the High Arctic during the brief polar summer. Colonies are divided into "neighborhoods" of a few hundred pairs, which behave independently of one another, establishing communal areas on nearby rocks where birds not on duty at their nests assemble to preen.

The dovekie breeds mainly on scree-covered slopes. Courting birds indulge in head-shaking and bowing, and present stones to each other when selecting a nesting hollow. The single, large egg is laid on a small bed of pebbles and is incubated by both sexes. The chick is reared on plankton and brooded continuously for the first few days. The young bird fledges after about four weeks, at which point it closely resembles its parents in size but has a browner plumage.

BEHAVIOR

▲ **Off to lunch**
The sky above the breeding colony is alive with thousands of dovekies.

The dovekie leaves its nesting site in August to follow the broken edge of the pack ice, which creeps southward during autumn, in order to winter far out to sea. The most important areas are off Newfoundland in eastern Canada and in the Norwegian Sea, between Scandinavia and Iceland. Even in winter the auk remains sociable, roosting on the sea in large flocks, known as rafts.

For all its hardiness, the dovekie can still fall victim to the weather. Although it withstands intense cold, it suffers when storms drive plankton to unreachable depths. In its weakened state, it is at the mercy of the winds, which may blow it beyond the southerly limits of its range.

◀ **Safety in numbers**
By joining a large flock or colony, a dovekie increases its chances of locating food and avoiding predators.

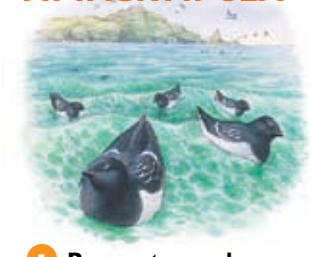
FOOD & HUNTING

▲ **Prepare to dive**
The dovekie surfaces before diving, in non-breeding plumage.

The sea provides all of the dovekie's food. Like the baleen whales, the bird thrives on tiny planktonic animals, which in turn feed on microscopic plant organisms that bloom in the polar seas. Clouds of plankton drift just beneath the water's surface, and the dovekie simply has to open its wide mouth to feed. It occasionally varies its diet with small fish, mollusks and aquatic worms.

Most feeding takes place at night, at least during the breeding season, as the sun dips toward the horizon and the plankton rises closer to the surface. The dovekie's favorite foraging sites are the narrow channels between slabs of pack ice. Powered by its narrow, oarlike wings, it stays submerged for about 30 seconds on each feeding dive, reaching depths of up to 60'. It eats the catch at once unless gathering food for its young, in which case it packs its throat pouch.

ATTACK AT SEA



1 Buoyant mood...
Like toy boats, dovekies bob about on the ocean waves, searching for plankton.

2 Water wings...
A dovekie submerges and begins to "fly" underwater with strong beats of its stubby wings.

3 Swoop and swallow...
Paddling feet help steer the bird into a swarm of food. It steadily gulps down mouthfuls of tiny prey.

4 Ride the wind
The hunter flies back to its nest with its throat pouch brimming full of food for its chick.

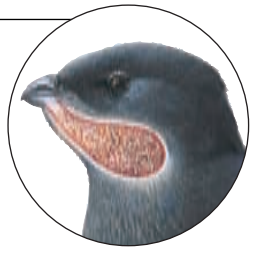
PROFILE DOVEKIE

Dense, waterproof plumage and thick layers of body fat help to insulate the dovekie from its harsh, icy environment.

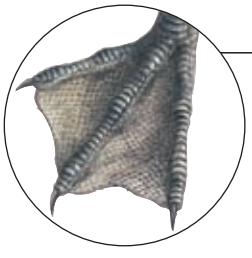
WINTER PLUMAGE
Outside the breeding season, the entire underparts and lower face become white.

BILL
The stubby bill is broad at the base for scooping up large quantities of plankton.

THROAT POUCH
The elastic skin of the throat expands to form a pouch in which the adult carries food for its chicks when returning to its nest from the sea.



WINGS
The narrow wings whirr rapidly in flight, and act like flippers for propulsion underwater.



FEET
The broad, webbed feet make efficient paddles for swimming. The dovekie lacks hindtoes.

STANCE
The bird squats on its heels at rest. As in many swimming birds, its legs are positioned close to its tail for effective paddling, but make it awkward on land.

VITAL STATISTICS

WEIGHT	5–6.7 oz.
LENGTH	6.8–7.5"
WINGSPAN	16–19"
SEXUAL MATURITY	Unknown
BREEDING SEASON	June–Aug.
NUMBER OF EGGS	1
INCUBATION PERIOD	29 days
FLEDGING PERIOD	28–31 days
TYPICAL DIET	Animal plankton
LIFESPAN	Unknown

CREATURE COMPARISONS

While the dovekie feeds on plankton just below the surface of the ocean, its larger cousin, the black guillemot (*Cepphus grylle*), hunts on the seaweed-covered beds of shallower waters closer to shore. A powerful swimmer, it catches crabs, prawns and fish in its delicate, slender bill. Like the dovekie, the black guillemot lives in the High Arctic, although its breeding range stretches farther south, encompassing northern Britain. In winter, the black guillemot loses its pied plumage; its head and belly become mostly white, with upperparts speckled gray, brown and white.

Dovekie

Black guillemot

RELATED SPECIES

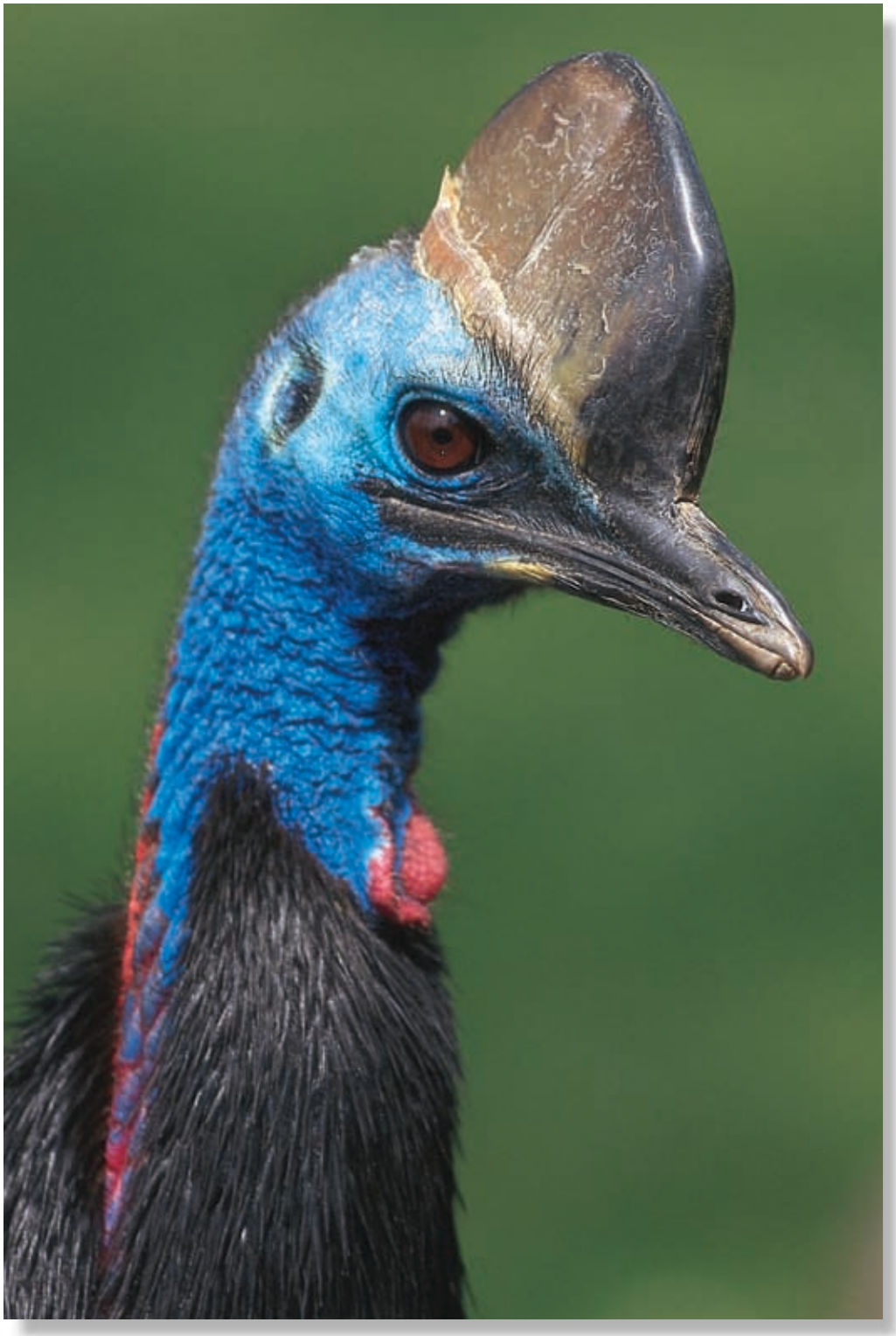
The dovekie is a member of the *Alcidae* family, which also includes the Atlantic puffin, *Fratercula arctica*, common guillemot, *Uria aalge*, and razorbill, *Alca torda* (below). Dovekies belong to the order *Charadriiformes*, as do gulls, plovers and waders.

Dwarf Cassowary

• ORDER •
Struthioniformes

• FAMILY •
Casuariida

• GENUS & SPECIES •
Casuarius bennetti



KEY FEATURES

- The dwarf cassowary's inner toe has evolved into a long, daggerlike claw, making its foot a formidable weapon
- Extremely heavy, this flightless bird weighs up to 55 lbs., yet can run up to 30 mph
- The male dwarf cassowary incubates the eggs and also cares for the chicks for up to 9 months

WHERE IN THE WORLD?

Found only in the forests of New Guinea, New Britain Island and on Yapen Island, mainly at higher altitudes; found occasionally at lower elevations

LIFECYCLE

Usually a shy bird, the cassowary can be quite aggressive, especially when caring for its young; the long, sharp claw on its inner toe can seriously injure even large mammals.

HABITAT

The dwarf cassowary dwells at high altitudes, preferring montane forest up to 9,800'; it occasionally will come down to sea level in areas where no other species is present, such as the lowland forest in north-east New Guinea. The dwarf cassowary frequents rainforests, where it searches for food on steep slopes and in thick vegetation. The bird's populations actually flourish in virgin forest, where they are relatively free from human disturbance.

▲ **HIDDEN HABITAT**
Cassowaries thrive in undisturbed forests.

BEHAVIOR

The cassowary is a solitary bird outside the breeding season. It is most active in the early morning and late afternoon, tending to rest in the middle of the day. When relaxing, the bird visits the same sunny sites over and over. The cassowary can be quite aggressive when cornered or while breeding, especially when accompanied by chicks. An attack is generally preceded by a threatening "stretch display," in which the bird arches its body upward, bristling up the feathers toward its rump in an attempt to appear bigger, while making a deep booming sound. An attacking cassowary either jumps up and kicks out at its adversary with both feet at once, or races past, kicking out as it goes with the long, sharp claw on the inner toe, which can inflict a mortal wound.

CONSERVATION

The main threat facing the dwarf cassowary is the loss of its natural habitat. It is especially vulnerable to the massive reduction of the rainforests, whether for housing developments, road construction or agricultural projects. In addition to the destruction of its natural habitat, adult cassowaries are run over on roads or even attacked by dogs, making the chicks left behind particularly vulnerable. Hunting pressure has intensified in New Guinea, where prices fetched by cassowary feathers have increased.

FOOD & FEEDING

The cassowary feeds mainly on the fruit of forest trees, which it usually eats whole. The cassowary cannot fly to reach the high fruit, so it eats only those pieces that have fallen on the ground. Because the bird needs a supply of fruit throughout the year, only forests with a diversity of trees that ripen at different times will sustain a population of cassowaries. While foraging, the bird wanders slowly along regularly used trails, picking up fallen fruit with its powerful bill and then tossing it up so that it falls directly into the throat to be swallowed whole. Small stones in the bird's gizzard help to break down the food by grinding away the tough skins. The dwarf cassowary leaves numerous multicolored droppings on the forest floor, which are full of seeds and partially digested fruits. The cassowary can drink water while either standing or sitting.

▲ **FALLEN FRUIT**
The cassowary eats fruit that has fallen from trees.

DID YOU KNOW?

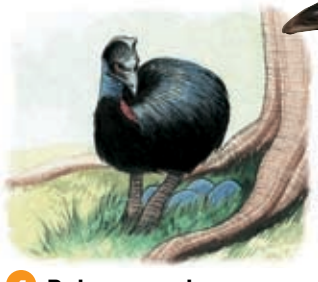
- **Nests are so well camouflaged that very few have ever been found in the wild, although egg collectors have offered large sums of money for a complete clutch of dwarf cassowary eggs.**
- **Upon detecting an approaching human, the shy dwarf cassowary usually disappears into dense vegetation before it is ever seen; consequently, observation of wild cassowaries is difficult.**

MATING MATTERS

1 Beginning the dance…
A male cassowary approaches a female, the plumage on his back raised in a courting posture.

2 Mating dance…
Continuing the courtship, a male circles the female with his throat puffed out.

3 Appeasement behavior…
The female crouches down as the male strokes her with one foot while balancing on the other.



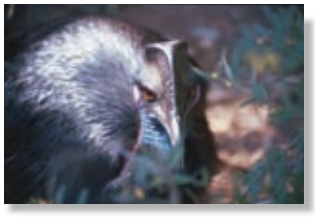
4 Role reversal
While the female searches for another mate, the male remains behind to care for the eggs.

BREEDING

The dwarf cassowary tends to breed during the dry season, between June and October, when fruit is most plentiful in the forest. Males defend clearly defined territories of about 6 sq. miles. When a female enters an occupied territory, the male repeatedly attempts to approach her, raising the plumage along his back until she gradually accepts him and lets him remain by her side. He then begins a courtship display, circling around the female while puffing out his throat and making a rumbling *boo-boo-boo* call. The nest is a shallow scrape in the ground lined with grass and leaves, which the male prepares after mating.

Once the female has laid 3–5 pale- or dark-green eggs in the nest, she leaves in search of another male to mate with; on average, most females lay 2–3 clutches during one breeding cycle. Meanwhile, the male remains in charge of the eggs. After incubating for 49–56 days, the downy chicks hatch; they are able to walk and feed themselves only a few hours after hatching. A short time later, the male leaves the nest with his chicks. He accompanies them for about nine months, helping them to feed by picking food up off the ground for them while protecting them from predators including mammals, birds of prey and large reptiles. After one or two years they reach adult size and start to acquire the characteristic black plumage and casque. Sexual maturity is usually reached at 3.5 years of age. Wild cassowaries have a lifespan of at least 12–19 years; in captivity birds have lived as long as 40 years.

▲ **SOLITARY STANCE**
The cassowary usually prefers to be alone.



▲ **HELPFUL HELMET**
The helmetlike casque parts forest growth.

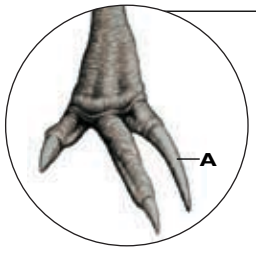
PROFILE DWARF CASSOWARY

A flightless bird with quills that resemble hairs more than feathers, the dwarf cassowary has adapted successfully to life on the ground.

CASQUE
The casque, or helmet, is a flattened, horny crown, which parts undergrowth as the bird searches for food.

BILL
Large, strong mandibles on either side of the cassowary's bill enable it to easily chew pieces of fallen fruit or swallow them whole.

PLUMAGE
Cassowary plumage is extremely hard and coarse to protect the bird from thorns and sharp leaves in the dense forest.



LEGS AND FEET
The legs and feet are powerful, enabling the bird to run at speeds of up to 30 mph and jump up to 1.5' from a standing position. The bird's long inner claw (A) is adangerous weapon.

WINGS
The flightless bird's ineffectual wings are very small and hang at its side.

VITAL STATISTICS

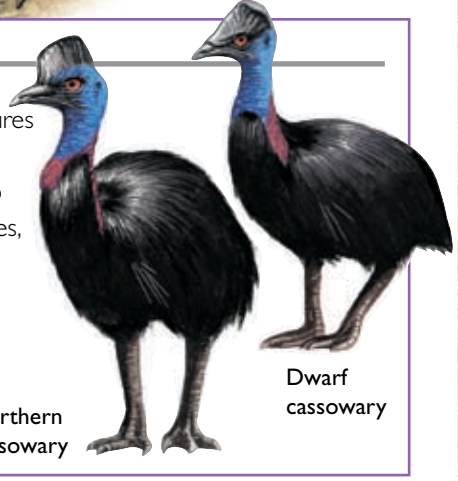
WEIGHT	Up to 55 lbs.
LENGTH	3.5'
WINGSPAN	Unknown
SEXUAL MATURITY	Up to 4 years
BREEDING SEASON	June–October, depending on availability of fruit
NUMBER OF EGGS	Up to 8
INCUBATION PERIOD	47–54 days
FLEDGING PERIOD	9 months
BREEDING INTERVAL	2 or 3 clutches per season
TYPICAL DIET	Feeds mainly on the fallen fruit of trees
LIFESPAN	Up to 40 years

RELATED SPECIES

● **The dwarf cassowary is 1 of 3 species in the genus *Casuarius*, which includes the southern cassowary, *C. casuarius*, as well as the northern cassowary, *C. unappendiculatus*. The cassowaries are closely related to the emu, which is the only other family of large, flightless birds found exclusively in Australasia. In the past, these two families were thought to form a separate order, *Casuariiformes*.**

CREATURE COMPARISONS

The northern cassowary (*Casuarius unappendiculatus*) measures up to 5' in length and weighs up to 100 lbs., almost twice as heavy as the dwarf cassowary. While both birds are native to New Guinea, the northern cassowary is a low-altitude species, occupying lowland rainforest and coastal swamp forest. In contrast, the dwarf cassowary favors higher altitudes, living in montane forest up to 9,800'. The northern cassowary's neck and head are ornamented with colored *wattles* (small, fleshy flaps) that are red, blue, purple, green or yellow, while the darker dwarf cassowary has no wattles.



Eagle Owl

• ORDER •
Strigiformes

• FAMILY •
Strigidae

• GENUS & SPECIES •
Bubo bubo

KEY FEATURES

- The world's largest owl, but very shy and elusive despite its great size and fearsome appearance
- Highly sensitive ears can detect the faintest sounds of prey at a distance of 30' and then pinpoint its position even in total darkness
- It can tackle prey as large as hares and ducks, killing its quarry with its deadly curved talons

WHERE IN THE WORLD?

From the Iberian peninsula and North Africa east through Europe, the Middle East, central Asia, including India, as far as Siberia and China; rare or uncommon across most of its range

LIFECYCLE

When darkness falls, the huge eagle owl launches from its roost to take on the role of top avian predator of the night, replacing the day-hunting eagles that give it its name.

HABITAT

▲ **SNOWY WASTES**
Winters are harsh in the eagle owl's wide range.

The eagle owl lives in remote wilderness areas far from human activity. Only large tracts of undisturbed land can provide a sufficient and reliable food supply for this predator.

A variety of habitats support the eagle owl, from northern coniferous forests, temperate woodlands, steppes and deserts. It prefers rocky terrain, roosting and nesting on cliff faces.

BREEDING

Eagle owls begin breeding in mid- or late winter. This owl doesn't build a nest; eggs are laid on cliff ledges or rocky slopes. Incubation often begins when there's still fresh snow on the ground. This early start means that the young will fledge in time to feed on unwary animals that are preoccupied with spring courtship and nesting or are just emerging from hibernation.

After hatching, young are brooded by the female for two weeks. During this time, the male brings food until the young fledge about six weeks later.

DID YOU KNOW?

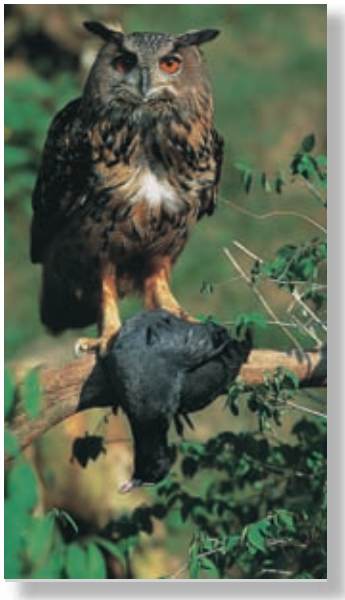
- **Eagle owls can be cannibalistic. The youngest and weakest chick may be killed and then devoured by its parents and siblings.**
- **If daytime birds notice a roosting eagle owl, they attack it. After repeated dive-bomb attacks, the owl takes cover elsewhere.**
- **The eagle owl's deep, mournful *wooo* call carries for 3 miles so it can keep contact in large territories.**

FOOD & HUNTING

The eagle owl is most active after dusk and before dawn. Shortly after sunset, it leaves its daytime roost and flies off to hunt. Perched in a tree, it waits patiently for the chance to make a kill.

Small rodents, especially voles, make up the eagle owl's diet, but it also seizes larger victims, such as ducks, grouse, rabbits and hares. Among more unusual prey are other predatory birds, notably smaller owls.

The owl regurgitates mucous-covered pellets containing the hair, bones and feathers that it's unable to digest. Piles of pellets often gather under a favorite perch.



▲ **DEATHLY SILENCE**
Special wing feathers silence the owl's attack.

BEHAVIOR

Sedentary and territorial, the eagle owl moves only to escape severe winter weather, when its food supply is reduced. In Norway, owls may fly 120 miles to the coast to avoid the cold, exchanging their normal diet of mammals for one of seaducks and seabirds.

Despite its barrel-chested, fierce appearance, the eagle owl is very shy and is rarely seen, even when it flies by daylight. Due to years of persecution, it won't tolerate human presence and quickly takes cover in trees or rock crevices. A cornered bird, however, faces an intruder with its feathers ruffled and wings held over its back to make itself appear bigger.

▲ **SLOW DEVELOPER**
Young eagle owls are independent 12 weeks after fledging.

▶ **LARGER THAN LIFE**
Threat postures intimidate intruders.

DEATH IN THE DARK

1 All ears…
Constantly alert, the eagle owl listens for sounds that may betray prey — either a faint rustling in a tree or in the leaf litter below.

2 About turn…
Its keen ears detect movement in a tree behind it. Turning its head 180°, the eagle owl pinpoints the sound's source...

3 Ghostly glide…
...a barn owl. It glides swiftly yet silently to its unsuspecting prey. Even the barn owl's own acute hearing fails to detect the eagle owl in time.

4 Fatal strike
Thrusting its long legs forward, the eagle owl strikes its victim, piercing it with its sharp talons and killing it almost instantly.

CONSERVATION

Like many poorly understood night birds, the eagle owl has been the victim of ignorance. During the 19th century, the species declined dramatically over most of its range, due mainly to the destruction of its eggs and young by farmers and gamekeepers. Today, legal protection and projects to release birds into areas from which they had vanished, such as Germany, have helped some populations recover. But as it needs large feeding territories and is so wary of humans, the species is likely to remain scarce over much of its range.

PROFILE EAGLE OWL

With exceptional hearing and special feathers for silent flight, the eagle owl swoops in surprise attacks, killing prey with its lethal talons.

FLIGHT FEATHERS

The flight feathers have soft, bristly fringes along their edges, and those forming the top layer are also downy. This softens the sound of rushing air when in flight, so prey can be taken by surprise.

EARS

The ears are buried deep under the head feathers behind the eyes; 'ear' tufts are feathers and are unrelated to hearing. The owl can pick up sounds from behind it by raising a flap of skin over each ear-opening to direct sound waves into its ears.

CHICKS

Chicks are born covered with soft, dense down of a uniform white or creamy-white color. The down insulates young chicks against the cold of early spring.

FEET

Powerful feet are equipped with long, curved talons, which pierce prey. To grip struggling prey tightly, the owl swivels the outer front toe of each foot around to assist the rear toe.

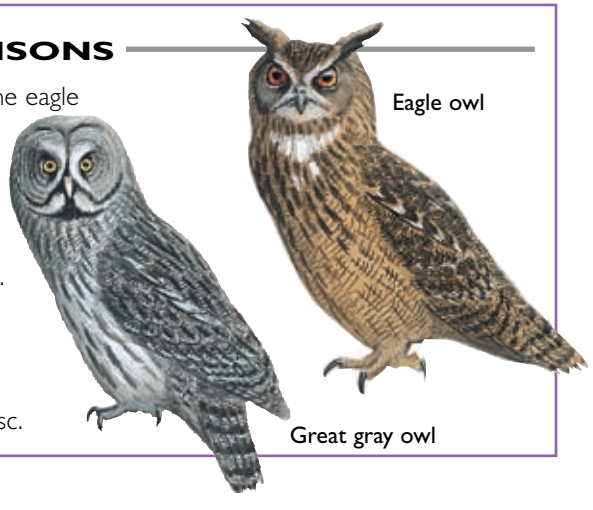
VITAL STATISTICS

WEIGHT	4–9 lbs.
LENGTH	2–2.5'
WINGSPAN	5–7'
SEXUAL MATURITY	2–3 years
BREEDING SEASON	February –August
NUMBER OF EGGS	1–6, but usually 2 or 3
INCUBATION PERIOD	34–36 days
FLEDGING PERIOD	50–60 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Mammals from small rodents to adult hares; birds up to the size of ducks
LIFESPAN	20 years

CREATURE COMPARISONS

The great gray owl (*Strix nebulosa*) vies with the eagle owl for the title of the world's largest owl. But their similarity in size is deceptive — the great gray is lighter and not as powerful. Its dense plumage, needed for harsh winters of northern forests, accounts for much of its bulk.

The great gray's huge head is even larger viewed head-on; its yellow eyes are set close together in a round facial disc. The eagle owl's orange eyes are set in a flatter-shaped facial disc.



RELATED SPECIES

● **The family *Strigidae* contains nearly all the owls. The 14 species of eagle owl are the largest; pygmy owls are the smallest. The spectacled owl** (below) **lives in South American forests.**

Eastern Screech Owl

• ORDER •
Strigiformes

• FAMILY •
Strigidae

• GENUS & SPECIES •
Otus asio

KEY FEATURES

- Cries out a shrill, chilling "screech" during the night, hence its common name
- Species has three colors —-gray, red and brown — none of which has to do with age, sex or season
- Incredible ability to camouflage itself; can blend with tree bark or look like a tree branch
- Most nocturnal owl in North America

WHERE IN THE WORLD?

Widely distributed throughout North America; from southern Canada, to the south, east and central U. S. (east of the Rocky Mountains) and northeast Mexico

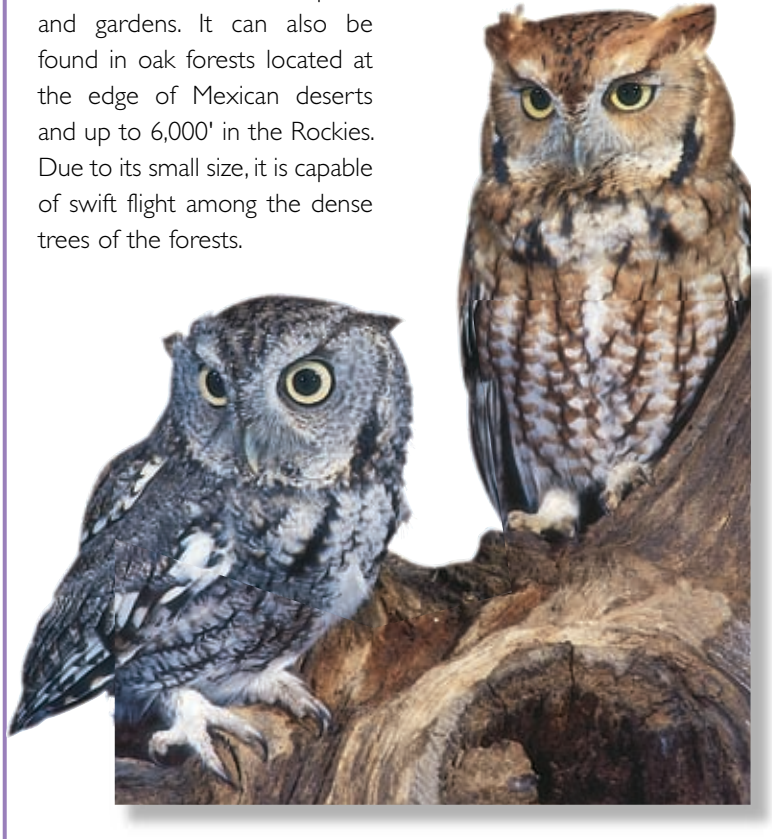
LIFECYCLE

Despite its small size, the eastern screech owl is a fearless predator capable of snatching insects in flight and killing mammals and birds larger than itself.

HABITAT

The eastern screech owl is found in a wide variety of habitats, including deciduous forests, open woodlands, orchards, cultivated land, parks and gardens. It can also be found in oak forests located at the edge of Mexican deserts and up to 6,000' in the Rockies. Due to its small size, it is capable of swift flight among the dense trees of the forests.

▼ **MIXED COLORS**
Mixed pairs and offspring share the same area.



BREEDING

Like most owls, the eastern screech owl mates for life. After spending the winter alone, the male calls each night from February onward to attract his mate. Once paired, the owls usually nest in the male's roosting site, often an abandoned woodpecker hole or a man-made nest box. Together the pair fiercely defends their nest, even attacking humans who venture too close. No nesting materials are gathered; the eggs are simply laid on the bottom of the cavity, where the female alone incubates them for 21–30 days. The male provides her with food during this period and feeds the helpless chicks once they hatch. After 26–28 days, the chicks take their first flight. Young screech owls usually remain with their parents until they mate themselves.

FOOD & HUNTING

The eastern screech owl is active only at night. It is most easily recognized by its cry, which consists of a mournful whistle ending in a shrill shriek. Used by the male as his territorial warning, the cry is heard soon after dusk, when the owl emerges from its roosting site to hunt. Hunting in the air and on the ground until dawn, the screech owl feeds mainly on insects, shrews and mice, but it can take a wide variety of prey, such as birds, fish, amphibians, spiders and earthworms. Small mammals make up most of the owl's diet in the winter months; in the summer, it eats mainly insects.

In order to survive the severe winter months, the owl puts on weight during the fall and stores food in caches. It remains inactive in the harshest weather, feeding on the stored prey. On winter nights when the weather is suitable, the owl ventures out and hunts for small birds and rodents.

NOCTURNAL HUNT

1 Perch...
Perched high on the branch of a tree, the owl scans the ground and listens for any type of movement from potential prey.

2 Chase...
Flying swiftly, the owl darts after nocturnal insects, catching them in midair. With a loud click of its bill, the owl snaps up a moth.

DID YOU KNOW?

- **In the backwoods of North America, the screech owl is regarded as a bad omen, its mournful wail foretelling disaster.**
- **Red screech owls have higher metabolic rates than gray ones, which makes them more likely to die during heavy snowfalls.**

▼ HUDDLE UP
Owl chicks hatch separately and vary in size and age.

CONSERVATION

In 1981, the eastern screech owl was listed on the National Audubon Society's Blue List of declining species and listed as a Species of Special Concern in 1982 and 1986. It is common throughout its range, and is now protected by law. Threats come mainly from habitat destruction. The owl frequently collides at night with car traffic and even trains. It also has suffered from thinning eggshells caused by pesticide pollution.

BEHAVIOR

The eastern screech owl sleeps by day in a variety of places, including hollow and leafy trees, rock crevices, nest boxes and under the eaves of barns. It can camouflage itself very effectively during the daytime. With eyes closed and ear tufts raised, the gray owl closely resembles a broken branch, and the red and brown phases tend to blend with the bark of certain pine trees. Confident in its ability to camouflage, the eastern screech owl remains completely still even when closely approached. Humans have lifted it off its perch; the owl still acts as if it is camouflaged.

▼ A FROG'S FATE
An eastern screech owl snatches an unsuspecting frog with its sharp talons and prepares to take the first bite.

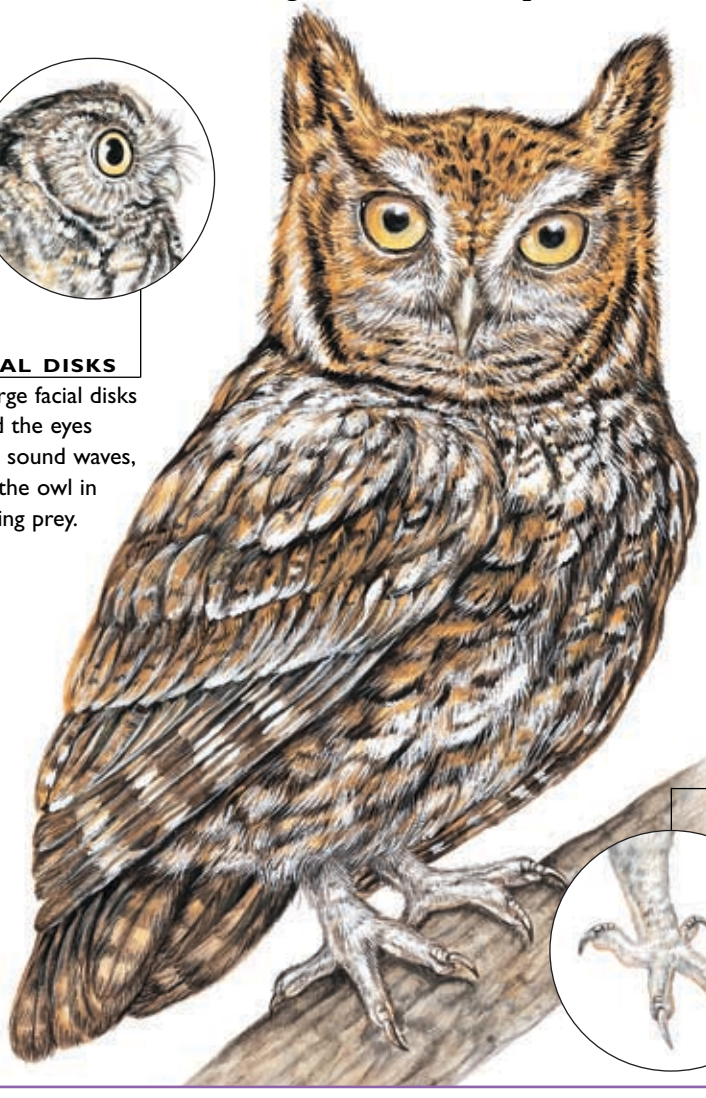
3 Snatch...
Spotting a chipmunk from the air, the owl silently descends. With wings and tail splayed, it snatches the chipmunk in its sharp talons.

4 Swoop
In a surprise attack, the owl swoops down on a blue jay. No match for the talons, the jay falls victim to the voracious hunter.

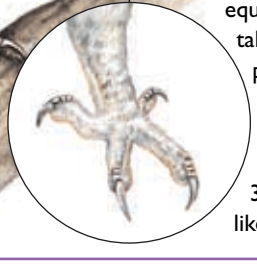
PROFILE EASTERN SCREECH OWL

All three colors of the owl can be found in its North American range; all have keen night vision and sharp talons that make them fierce predators.

FACIAL DISKS
The large facial disks around the eyes collect sound waves, aiding the owl in detecting prey.



GRAY PHASE
More commonly found in the north, but also in southern Texas and in Florida, the gray eastern screech owl resembles the bark of old trees, allowing it to blend with its surroundings.



FEET
The four toes are equipped with sharp talons used for seizing prey. The outer toe is reversible so the bird may perch with 2 toes forward and 2 back or 3 forward and 1 back, like songbirds.

VITAL STATISTICS

WEIGHT	3–8 oz.
LENGTH	7–10"
WINGSPAN	18–24"
SEXUAL MATURITY	1 year
BREEDING SEASON	February–July
NUMBER OF EGGS	Up to 8, but usually 4–5
INCUBATION PERIOD	21–30 days
FLEDGING PERIOD	26–28 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Mainly insects but also small mammals, frogs, lizards and birds
LIFESPAN	Up to 13 years

CREATURE COMPARISONS

The whiskered screech owl (*Otus trichopsis*) closely resembles the eastern screech owl but only has two color variants — gray and red. It prefers higher elevations than the screech owl and seeks out extremely dense forests of oak, oak-pine and sycamore. At a length of 6.5–8" and a weight of 3–3.5 oz., the whiskered screech owl is smaller and feeds on insects in flight, rather than capturing small mammals and birds like its eastern cousin.

Eastern screech owl

Whiskered screech owl

RELATED SPECIES

- **The genus *Otus* contains about 56 species, including the eastern screech owl's relative, the western screech, *O. kennicotti*. Other well-known species are the common scops owls, *O. scops* and *O. sunia*, of Europe and Asia. The order *Strigiformes* contains 10 species of barn owls (family *Tytonidae*) and about 175 species of true owls (family *Strigidae*).**

Eclectus Parrot

• ORDER •
Psittaciformes

• FAMILY •
Psittacidae

• GENUS & SPECIES •
Eclectus roratus

KEY FEATURES

- Eye-catching in scarlet and violet-blue, the female is very different from the green male
- Feasts on rainforest fruits and nuts, aided by its powerful yet sensitive bill
- More often heard than seen, despite its color and abundance, as it lives high in the canopy

WHERE IN THE WORLD?

In parts of Southeast Asia, from the Sunda Strait in the west to the Solomon Islands, including New Guinea; also found in northeastern Australia

LIFECYCLE

Rainbow-colored parties of eclectus parrots move through the rainforest in search of food, yet they're elusive residents of the treetops and quickly fly off when disturbed.

HABITAT

▲ CANOPY COUPLE
The eclectus is often seen 100' or more up in the trees.

Preferring rainforest-covered lowlands of islands in Southeast Asia, the eclectus parrot rarely lives higher than altitudes of 3,300'. It also inhabits clearings and open (secondary) forest that has regrown following the felling of the original treecover. It's abundant in coastal areas, including mangroves, plantations and even gardens.

As the eclectus parrot feeds, roosts and nests high among the branches of the forest canopy, it usually remains unseen.

FOOD & FEEDING

▲ JUICY FRUIT
A female devouring figs: a favorite food in the Solomon Islands.

BREEDING

In parts of its range, the eclectus parrot may breed throughout the year, but on Cape York Peninsula, Australia, its breeding season is between August and January. A pair develops a strong bond and the male may delicately nibble his mate's neck before mating, which takes place while both birds perform a duet of loud, bell-like calls.

The female lays two glossy white eggs on the woodchip floor of her deep nesting hole. She incubates them for 26 days, twice a day climbing up to the entrance — which may be up to 20' above the base of the hole — to be fed by her mate. The young eventually leave the nest after 11 or 12 weeks.

▲ HIGH-RISE
The nest hole is high in a deciduous tree trunk.

BEHAVIOR

With its range of strident, raucous calls, the eclectus is more often heard than seen. Before dusk, groups of three or four parrots return to their communal roost in noisy procession, males flying ahead of the females. At the roost they're even noisier and their screeching and squawking may continue after nightfall.

The parrot climbs and hops with agility in the branches and foliage of the treetops. But it flies high over the canopy when it's alarmed, moving to new feeding grounds or traveling to its roosting site. It flies strongly, but with slow, deliberate wingbeats and often appears dark-colored in flight, an illusion exaggerated by the blackish undersides of its largest wing feathers.

▲▶ HIDING ITS LIGHT
The green male is seen more often than the female; she must keep to cover to avoid attracting predators.

Main foods of the eclectus are rainforest fruits, seeds, nuts, leaf buds and nectar. As all of the parrot's range is tropical, with high daytime temperatures all year, there's always food. In a tree where ripe fruit is abundant, the parrot gathers in flocks of up to 80, but usually feeds in smaller groups. While feeding, the parrots make a soft, flutelike *chu-we, chu-we* call.

The parrot readily takes advantage of cultivated fruits, which sometimes draws it into populated areas. For example, on Bougainville Island, off the coast of Papua New Guinea, it moves into gardens to feed on sweetcorn, bananas and papaya. Nevertheless, it remains a wary bird and will take flight if disturbed during its meal.

DID YOU KNOW?

- **For 100 years or so, the strikingly different plumages of the male and female eclectus parrot led naturalists to believe that they were two different species.**
- **Adult eclectus parrots with a pair of newly hatched chicks to feed are often helped by offspring of the previous year.**
- **The eclectus parrot is also known as the red-sided parrot, and a local Southeast Asian name for the bird is the "kalunga."**

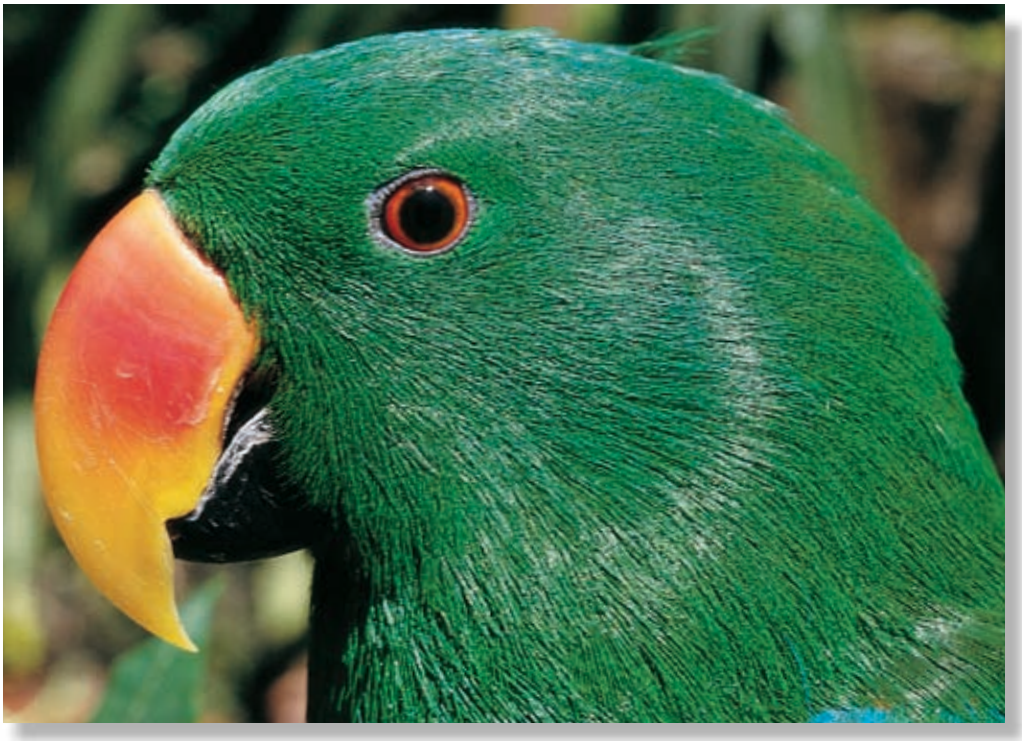
FOOD FOR THOUGHT

1 Going nuts...
A small group of eclectus parrots busily cracks open ripening seeds in the crown of a rainforest tree.

2 Flying colors...
Having exhausted this food supply, the party flies off in search of fresh feeding grounds.

3 Joining in...
From high above the canopy, they spot another feeding party of parrots, which have found nuts.

4 Sweet reward
Maneuvering a nut with a dexterous foot, a parrot splits it to reveal its nutritious kernel.



CONSERVATION

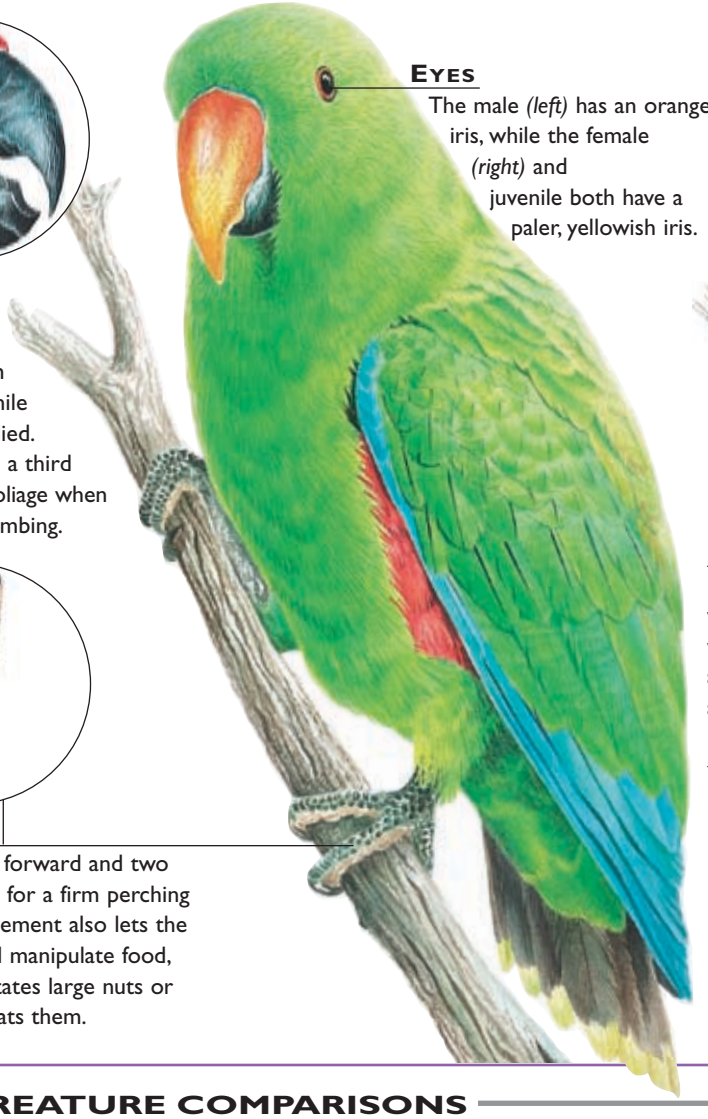
Common and even abundant in places, the eclectus parrot faces no serious threats at present. But its long-term security, like that of all parrots, is ultimately dependent on the preservation of its habitat in the face of loss to logging and clearance for human settlement. In Australia, the eclectus has actually extended its range since first being discovered on the mainland in 1913. It's now commonly attracted to commercial fruit plantations and even visits gardens.

PROFILE ECLECTUS PARROT

By pairing its strong grasping feet with its sturdy, hooked bill, the eclectus parrot can handle food and clamber among treetop foliage with great skill.

BILL
Powerful bill is notched at the top and bottom to hold nuts while pressure is applied. It's also used as a third "foot" to grip foliage when the parrot is climbing.

EYES
The male *(left)* has an orange iris, while the female *(right)* and juvenile both have a paler, yellowish iris.



FEMALE
Female is scarlet, with a contrasting violet-blue band across her chest and around the neck. Her bill is black, rather than peach-colored as in the male.

FEET
Two toes point forward and two point backward for a firm perching grip. This arrangement also lets the parrot hold and manipulate food, and it deftly rotates large nuts or fruits while it eats them.

CREATURE COMPARISONS

The eclectus parrot is stouter than its relation the Australian king parrot (*Alisterus scapularis*) and weighs twice as much. But like the eclectus, the sexes look quite different. The female is green, except for a crimson belly; the male is also crimson on his breast, head and neck, with a blue rump and tail.

The Australian king parrot inhabits the Great Dividing Range, which runs from north to south parallel to Australia's eastern coast, as well as the coastal strip. It's absent from the only part of the continent where the eclectus occurs: Cape York Peninsula at the northern tip of Queensland.

Australian king parrot (male)

VITAL STATISTICS

WEIGHT	14–21 oz.
LENGTH	1'
WINGSPAN	1.5'
SEXUAL MATURITY	Probably 3 or 4 years
BREEDING SEASON	All year, peaks Aug.–Jan. in Australia
NUMBER OF EGGS	2
INCUBATION PERIOD	26 days
FLEDGING PERIOD	72 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Fruits, nuts, seeds, leaf buds and nectar
LIFESPAN	20–30 years

RELATED SPECIES

● **There are 340 species of parrot in 3 families in the order *Psittaciformes*. The largest family, *Psittacidae*, includes the buff-faced pygmy parrot, *Micropsitta pusio*** (below)**, the world's smallest parrot (3" long).**

Egyptian Plover

• ORDER •
Charadriiformes

• FAMILY •
Glareolidae

• GENUS & SPECIES •
Pluvianus aegyptius

KEY FEATURES

- Terrestrial bird; uses sand to incubate its eggs, which are laid on an exposed patch of riverbed
- Exceptionally fearless, and reputedly plucks food from the gaping mouths of crocodiles
- A fast and nimble runner, it captures insects or stalks them with heronlike deliberation

WHERE IN THE WORLD?

Distributed across sub-Saharan Africa, from Senegal to Ethiopia; found mostly north of the equator, but extends to Angola in the southern tropics; populations in Egypt have become extinct

LIFECYCLE

A spirited bird that adds a splash of color to villages and farmland, the Egyptian plover also fascinates with its clever use of sun, sand and water when rearing its young.

HABITAT

The plover inhabits the edges of several of the great rivers of Africa, including the Nile, Congo and Niger. But its habitat needs mean that it is found only on certain stretches.

The plover favors sandbars, which break the surface where rivers run wide and shallow. It also favors slow-flowing waters moving through lowland scrub or lightly wooded savannah.

After the breeding season, when many sandbars disappear under floodwater, the plover may be found in a broader range of wetland sites, including the gravel shores of freshwater lakes. It dislikes densely forested riverbanks, and is rarely seen on saltwater estuaries. The plover often frequents riverside villages, from which it may venture into nearby cultivated fields.

◀ **SIDELINED**
The Egyptian plover prefers sandy riverbanks.

BREEDING

No other bird has breeding habits quite like those of the Egyptian plover. It nests during the dry season, when river levels are low enough to expose banks of sand in midstream. On its chosen sandbar, it scrapes out a hollow in which to lay its eggs.

At night, the clutch is incubated with body heat by one of the parents, but shortly after dawn the sitting bird rises, covers the eggs with sand, and leaves them unattended. By midmorning, with the sun threatening to overheat the nest, the parents cool the sand with water ferried in their belly plumage, and continue to dampen the nest until late afternoon.

The chicks can run an hour after hatching. When a predator approaches, they nestle down and stay still while their parents cover them with sand. Parents protect the chicks for 3–4

KEEPING COOL

1 Blanketing…
An Egyptian plover lets the sun incubate its speckled eggs by flicking warm sand over them.

2 Wading…
In the midday heat, the plover keeps the clutch from dehydrating by first soaking its belly feathers.

BEHAVIOR

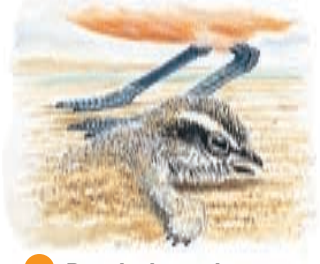
The Egyptian plover is one of the tamest of birds, living happily alongside villagers and behaving with indifference toward fishermen.

Whether its fearlessness lives up to its alternative name of crocodile-bird is open to debate. As long ago as the fifth century BC, the Greek historian Herodotus spoke of a small bird entering the open jaws of basking crocodiles to remove leeches from their mouths. Reports of this behavior have persisted ever since. As yet, there remains no proof of it, although the plover is remarkably bold in the presence of crocodiles and may run across their backs.

This brave bird is equally undaunted by birds of prey. It chases and even attacks black kites, which are more than three times its size. Its pugnacious nature extends to its own species during the breeding season, but at other times of the year the plover is more social, forming flocks of up to 60.

▶ **FEATHER DUSTER**
Preening is essential in the plover's sandy home.

3 Shower time...
The plover lets water from its plumage seep into the sand so the eggs can be cooled off.



4 Break through
A newborn chick struggles out of the sand, taking its first drink from its parents' wet feathers.

DID YOU KNOW?

- **Outside the breeding season, the Egyptian plover may join flocks of the spur-winged lapwing, *Vanellus spinosus*, a member of the plover family.**
- **The juvenile Egyptian plover resembles its parents in plumage pattern, but has a less distinct breast band, and reddish flecks on its head, neck, rump and wings.**

CONSERVATION

Although in the 20th century it became extinct in Egypt, the Egyptian plover remains common in most of its current range. Its preference for rivers makes it less vulnerable to wetland drainage than marsh-dwelling wading birds, but high water levels as a result of dam-building projects are a threat.

FOOD & FEEDING

With its quick-stepping gait, the Egyptian plover resembles a wind-up toy as it races across the ground in pursuit of insects. Short sprints are punctuated by halts and sudden changes of direction.

Spiders, beetles and other scurrying invertebrates are captured in this way, and some flying insects are also caught after a chase. The bird also creeps up on flies resting on the ground until they are within striking distance of its bill.

Most hunting takes place on exposed sand or gravel, either in rivers or along their banks. The plover also forages by wading into shallow water and pulling out any prey that it can reach without submerging its head.

The Egyptian plover unearths worms, mollusks, subterranean insects and their larvae by probing with its bill in damp sand or by digging into the surface with both feet. It can even lift pieces of driftwood and overturn stones of almost its own weight.

The plover drinks from streams and lakes. Occasionally, it seeks food away from water, moving to open ground.

▼ SNAP SHOT
The plover feeds on the ground, stopping and pecking at insects with a sudden jab of its bill.

PROFILE EGYPTIAN PLOVER

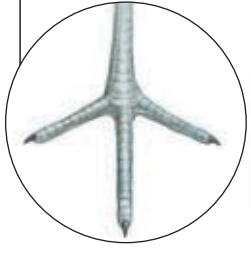
Slightly hunched in appearance on the ground, the Egyptian plover reveals its stunning plumage and pointed wings in flight.

FLIGHT
The wings are noticeably broad at the base, giving them an almost elliptical appearance, accentuated by the black-and-white pattern.

PLUMAGE
At close range, a green gloss can be seen on the black feathers of the head, back and breast band. The sexes are alike.

BILL
The short bill is strong enough to probe among gravel and larger stones in search of food.

FEET
The absence of a hind-toe is an adaptation for life on the ground, enabling unimpeded movement when the bird runs across soft sand on its three forward-pointing toes.



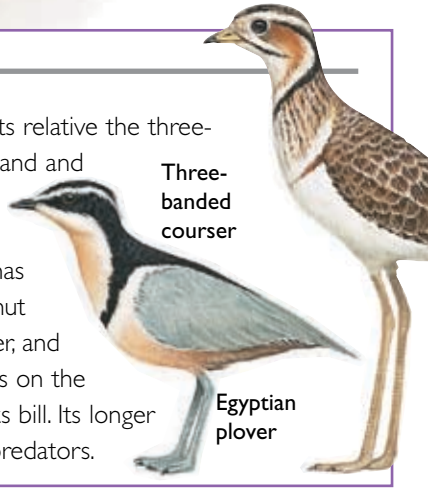
CHICK
The white patch on the back of the downy chick's crown is a recognition mark for its parents. The patch is hidden when the young bird crouches in alarm.

VITAL STATISTICS

WEIGHT	2.5–3 oz.
LENGTH	7.5–8.4"
WINGSPAN	19–20"
SEXUAL MATURITY	Probably 1 year
BREEDING SEASON	Mainly January–April, but varies across its range
NUMBER OF EGGS	2–3
INCUBATION PERIOD	28–31 days
FLEDGING PERIOD	30–35 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Insects, worms and other invertebrates
LIFESPAN	Unknown

CREATURE COMPARISONS

Whereas the Egyptian plover is associated with inland waters, its relative the three-banded courser (*Rhinoptilus cinctus*) is found in the scrub, bushland and woodland of East Africa. Largely active from dusk till dawn, the courser uses its mottled brown upperparts to disguise itself when roosting under a bush during the day. The courser has three bands on its neck and breast: At the top, there is a chestnut band, then a thicker band of mottled brown with a black border, and below another chestnut band. Like the plover, the courser feeds on the ground, either pecking at insects or probing into the soil with its bill. Its longer legs enable it to run quickly, its preferred method of escaping predators.



RELATED SPECIES

● The Egyptian plover is the sole species in the genus *Pluvianus*, 1 of 6 genera in the family *Glareolidae*. This family contains the coursers and the pratincoles. The Egyptian plover is classified with coursers — terrestrial birds that hunt for insects. The pratincoles have a red base on their bill. The bill also has a wider gape, which helps them catch insects on the wing.

Egyptian Vulture

• ORDER •
Falconiformes

• FAMILY •
Accipitridae

• GENUS & SPECIES •
Neophron percnopterus

KEY FEATURES

- Uses a stone as a tool to crack open ostrich eggs, which are a favorite food item
- Scavenges at garbage dumps and town markets, where it thrives on a diet of rotting rubbish
- Performs a spectacular sky-dance as part of its courtship display, and nests in caves on cliff faces

WHERE IN THE WORLD?

Found in much of Africa, southern Europe, Arabia and India; birds in the north-of the range spend the-winter farther south

LIFECYCLE

More aggressive scavengers deprive it of meat at carcasses, but the Egyptian vulture is the only bird species native to Africa that can crack the world's largest egg.

HABITAT

▲ **HIGH RISE**
Warm updrafts enable the vulture to soar effortlessly.

Dry, open country is the Egyptian vulture's traditional habitat, but it is also found in urban areas. Although modern cities are too clean, it does visit garbage dumps within its range.

Outside urban areas, the Egyptian vulture lives in deserts, semi-arid scrub country and short-grass plains, especially where rocky outcrops or hills provide nest sites. The bird visits pasture and newly ploughed fields on farmland. It also forages along the shore and within marshes.

The Egyptian vulture has been recorded above 13,000' in mountain ranges, but is more often seen at lower altitudes.

DID YOU KNOW?

- **Egyptian vultures lift stones as heavy as 2 lbs. and crack eggs with them.**
- **Usually silent, the vulture grunts, hisses and mews if angry or excited.**

FOOD & FEEDING

A scavenger, the vulture eats anything it can digest. Most of its diet is carrion, but it eats all kinds of rubbish. It takes decaying fish from docks, rotting fruit from markets and waste from slaughterhouses.

MThe vulture spots most of its carrion food while soaring up high above the ground. When it arrives at a carcass, the Egyptian vulture must wait until larger vultures have had their fill. Eventually its turn comes to feed, and it uses its slender, hooked bill to pick scraps of meat from the bones of the carcass.

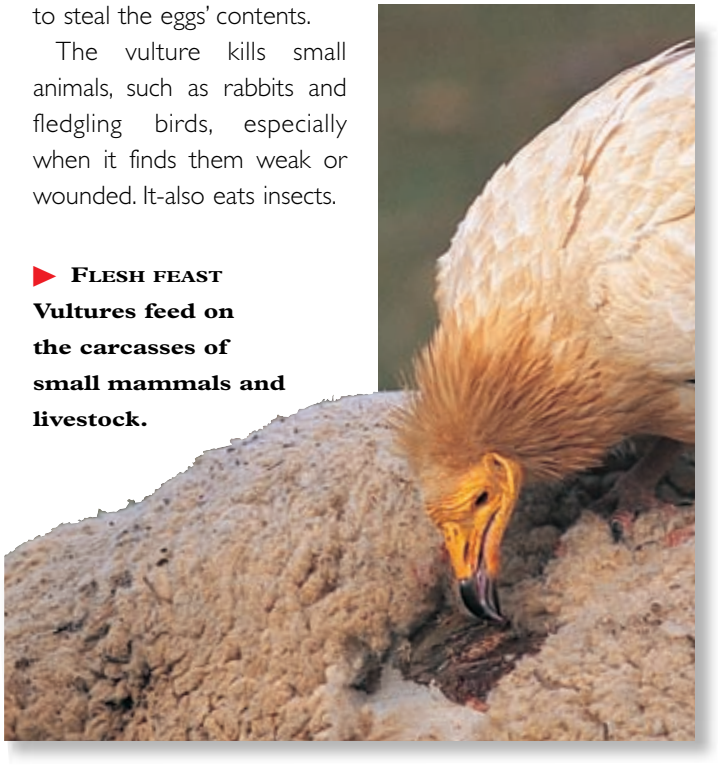
The Egyptian vulture eats ostrich eggs as well as those of flamingos and pelicans. After it breaks open the egg, other vultures often swoop in to steal the eggs' contents.

The vulture kills small animals, such as rabbits and fledgling birds, especially when it finds them weak or wounded. It-also eats insects.

CRACKING THE PROBLEM

1 Search flight...
Always on the lookout for feeding opportunities, an Egyptian vulture scans-the terrain as it flies over the-tops of scattered acacia trees.

3 Stone's throw...
Selecting a large stone, the vulture picks it up and hurls it onto one of the eggs. It usually takes several attempts to break the shell.

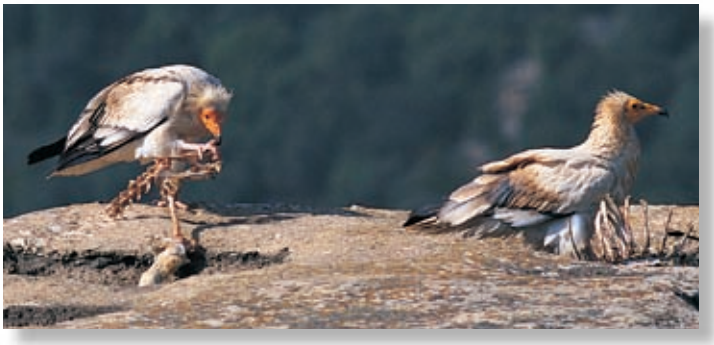


▶ **FLESH FEAST**
Vultures feed on the carcasses of small mammals and livestock.

BEHAVIOR

2 Eyes on the prize…
The vulture spots an unguarded ostrich nest. It lands alongside two enormous eggs, each of which may weigh 4.5 lbs.

4 Runny reward
Eventually, the bird's work pays off, and the thick shell cracks. The vulture inserts its long bill and eats the nutritious yolk.



▲ **LOOK-ALIKE**
The male and female are identical in appearance.

The Egyptian vulture usually lives alone or with its mate in wild areas, but often flocks near villages. Up to 100 may gather at feeding sites and roosts. The species also forms flocks, usually of no more than 30 birds, on migration. It is does not migrate within most of its range, but leaves southern Europe for winters in Africa.

Its relatively small size enables the Egyptian vulture to take flight earlier in the morning than larger vulture species, which must wait for the sun to create rising warm air currents before they can soar.

CONSERVATION

Although not seriously threatened, the Egyptian vulture has declined in much of its range. One reason is the recent modernization of formerly primitive cultures; the result is a reduction in the availability of foodstuffs such as offal and rubbish. The largest Egyptian vulture populations are found in poverty-stricken parts of Ethiopia and India. In Europe, Spain is the Egyptian vulture's chief stronghold.

BREEDING

Dramatic aerial dives and upward swoops mark the beginning of the Egyptian vulture's spring breeding season. Pairs often roll over, touching talons in midair.

Both sexes build the nest on a ledge, in a cave or on a building. Ideally, the nest site provides a wide view of the surrounding area. The birds pile up sticks to form a platform, which is often more than 3' wide, and line it with rubbish such as rags, paper, skin and fur. A single breeding site, such as a cliff face, may contain several nests, which are repaired and reused year after year. Unlike many other vultures, the Egyptian vulture does not form breeding colonies.

The female lays two chalky-white eggs several days apart. Both adults incubate them and rear the hatchlings. The young are fledged within three months but may stay around for another month.

▲ **PLACE IN THE SHADE**
Choosing a nest site under an overhanging rock, the vulture ensures that its chicks are sheltered from direct sunlight.

PROFILE EGYPTIAN VULTURE

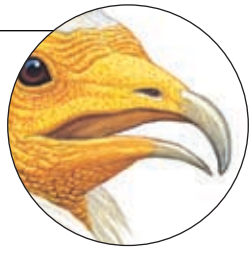
Agile and supremely efficient in flight, the Egyptian vulture is no beauty on the ground, where it walks with a typically hunched profile.

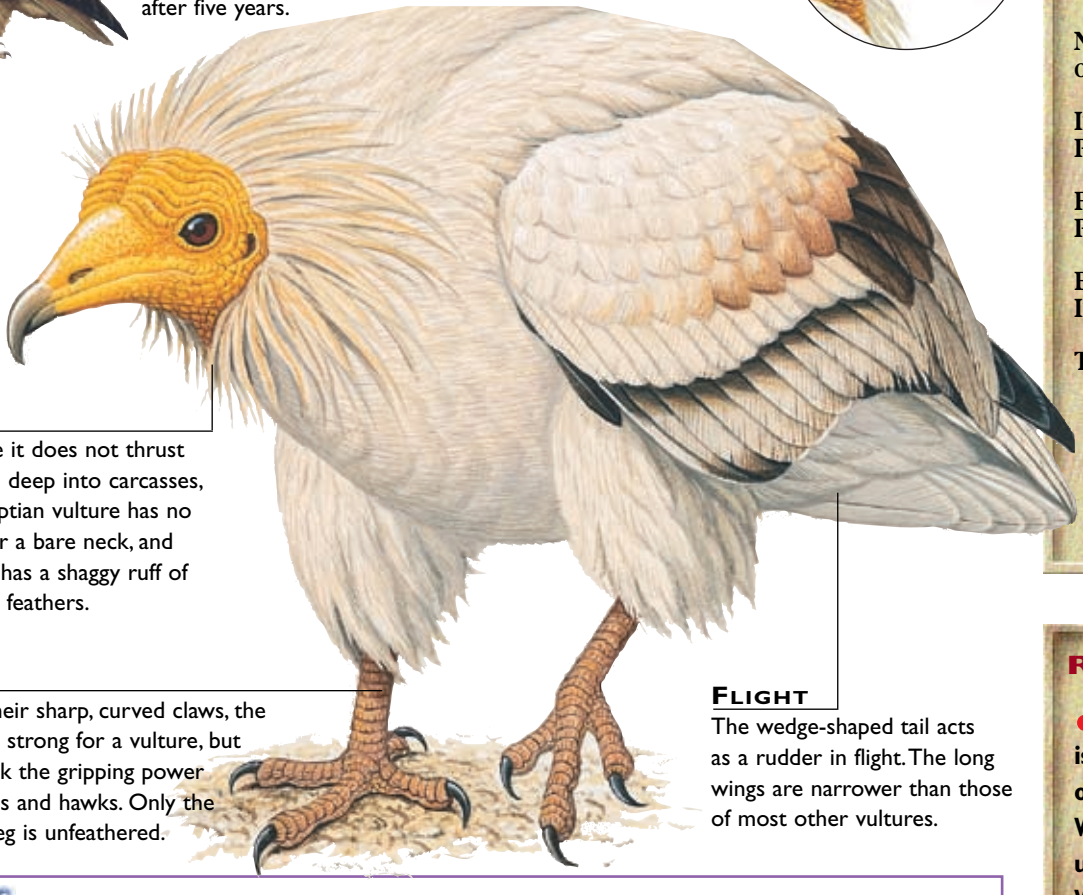
JUVENILE

First-year plumage is all dark brown. The bare, gray face soon turns yellow. More white feathers appear with each molt until adult plumage is acquired after five years.

BILL

The thin, hooked tip of the long bill is adapted for scavenging small food items and picking scraps off carcasses. It is not strong enough to tear through tough skin.





RUFF

Because it does not thrust its head deep into carcasses, the Egyptian vulture has no need for a bare neck, and instead has a shaggy ruff of pointed feathers.

FEET

With their sharp, curved claws, the feet are strong for a vulture, but they lack the gripping power of eagles and hawks. Only the lower leg is unfeathered.

FLIGHT

The wedge-shaped tail acts as a rudder in flight. The long wings are narrower than those of most other vultures.

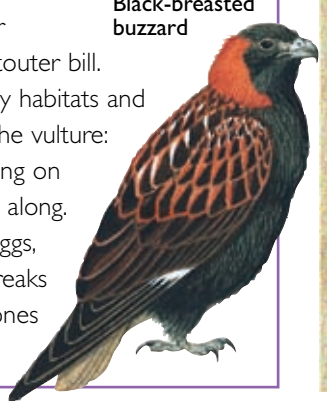
VITAL STATISTICS

WEIGHT	3.5–4.8 lbs.
LENGTH	23–28"
WINGSPAN	5–5.6'
SEXUAL MATURITY	4–5 years
BREEDING SEASON	Mainly March–May
NUMBER OF EGGS	Usually 2
INCUBATION PERIOD	42 days
FLEDGING PERIOD	70–85 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Carrion, organic waste, eggs, mammals and insects
LIFESPAN	20 years in the wild

CREATURE COMPARISONS

The black-breasted buzzard (*Hamirostra melanosternon*) is slightly smaller than its relative the Egyptian vulture, with a stockier build and a stouter bill. Found in Australia, the buzzard, like the vulture, prefers open, dry habitats and avoids forests. Its method of feeding is similar to that of the vulture: it searches for carrion and small mammals while soaring on high, sweeping low over the ground or walking along. The black-breasted buzzard also eats large eggs, which are usually those of the emu. It breaks the eggs with its bill or hurls large stones at them from a standing position.

Egyptian vulture



Black-breasted buzzard

RELATED SPECIES

- **The Egyptian vulture is among the smallest of the 15 species of Old World vulture, which are unrelated to their New World counterparts. Its closest relations are the slightly larger hooded vulture, *Necrosyrtes monachus*, found in Africa, and the huge lammergeier, *Gypaetus barbatus*, which has a wingspan of almost 10' — double that of the Egyptian vulture — but otherwise resembles it in shape.**

Elf Owl

• ORDER •
Strigiformes

• FAMILY •
Strigidae

• GENUS & SPECIES •
Micrathene whitneyi

KEY FEATURES

- The smallest owl in the world; at 5–6" long, it is roughly the size of a sparrow
- Relies entirely on abandoned woodpecker holes in cacti and trees for nesting sites
- Acute hearing allows it to locate prey in the darkness of night
- The most nocturnal owl found in all of North America

WHERE IN THE WORLD?

Found in North America from southeastern California west to northeastern New Mexico, and from southern Texas to central and southern Mexico, including the tip of Baja California

LIFECYCLE

Despite its small size, the elf owl has an extraordinarily loud voice; its rapid series of high-pitched notes are an advertisement for protecting its territory and attracting a mate.

HABITAT

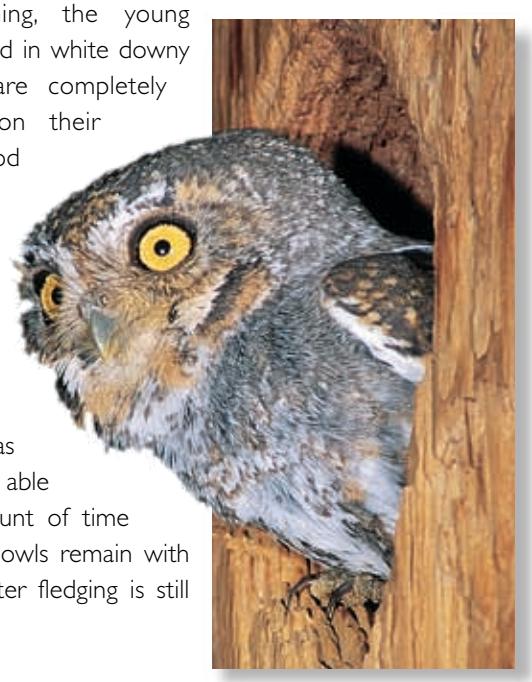
The elf owl inhabits the wooded canyons and deserts throughout Mexico and the southwestern United States. This owl is very common in the dry, upland Sonoran deserts up to about 7,000', which are dominated by the giant saguaro cactus (*Carnegiea gigantea*). The elf owl can also be found on low plains and streamside thickets with cottonwood, sycamore and almost any other types of trees, but typically avoids areas with solid stands of pines. The elf owl's habitat is greatly dependent upon abandoned woodpecker holes for nesting sites, and on an abundance of insects for its food supply.

FOREST HOME
Mostly found in the desert, elf owls also inhabit forests.

BREEDING

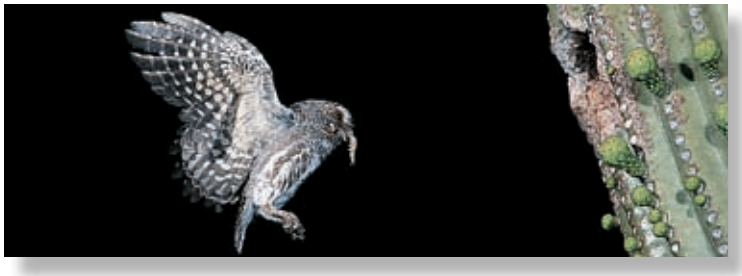
Elf owls breed from April to June, and the birds depend on deserted woodpecker holes located in both cacti and trees for nesting sites. The male arrives first at a prospective site and begins singing from the cavity to entice a female. The female responds with her own song and enters the nest site, where the pair forms a bond and mates. No nesting material is used; the female lays 1–5 eggs (usually 2 to 3) inside the cavity and incubates alone for 21–24 days. The male feeds the female during the incubation period and also feeds the young once they hatch.

Upon hatching, the young owls are covered in white downy feathers and are completely dependent upon their parents for food and protection. The chicks will fledge within 27–33 days, and they begin to capture insects on their own as soon as they are able to fly. The amount of time that the young owls remain with their parents after fledging is still unknown.



FOOD & FEEDING

The nocturnal elf owl comes out at dusk and hunts for prey throughout the night. Unlike its larger relatives, it feeds almost exclusively on insects, such as beetles, moths, crickets and grasshoppers, as well as arachnids, such as spiders and even scorpions — after crushing and removing their sting. Occasionally, the elf owl takes larger prey, such as lizards and small snakes. Most prey is caught in the owl's feet while in flight; however, it also hunts from a perch and even pursues prey while running on the ground. It uses its sharp, hooked bill to tear its prey into pieces that can be swallowed.



BRING HOME THE BACON
A male elf owl returns to his nest with dinner for both his mate and his young chicks.

IN THE STILL OF THE NIGHT

1 Emerging...
With just its head visible through a hole in a large saguaro cactus, the elf owl emerges at dusk to forage for food.

DID YOU KNOW?

- **The elf owl is the tiniest owl in the world; it is so small and delicate that it can be knocked out of the air in mid-flight by a robin or other songbird.**
- **The elf owl has about 15 different vocalizations; its yips are very similar to the sounds made by a puppy.**
- **When captured, this tiny owl fakes death.**

CONSERVATION

The elf owl is not currently endangered and is very common in most of its range. However, this bird is directly dependent upon nesting holes made by birds, such as woodpeckers, as well as an abundant supply of insects for food. In California and Arizona, the elf owl population is declining due to habitat destruction; however, in New Mexico and Texas the owl's range and number are growing. The elf owl is listed on Appendix II of CITES (Convention for International Trade of Endangered Species). Like all owls, it is protected by law in the U.S., and a permit is required to keep one in captivity.

BEHAVIOR

The elf owl is the most nocturnal of all North American owls and remains inactive during the day unless disturbed. It spends the daylight hours roosting on a tree branch or in a bush to escape the intense desert heat and to avoid predators, such as large birds of prey. Since its diet consists mainly of insects, spiders and scorpions, the elf owl is extremely migratory throughout its range and must travel south during the winter months — the cold weather causes its prey to either hibernate or die. In October, the elf owl gathers in large flocks to make the migration south; the birds will return to their breeding grounds by mid-March.

▲▼ **INSIDE OR OUT**
The elf owl roosts by day (*above*) and hunts from a perch at night (*below*).

◀ **WOODPECKER HOLE**
Small enough to enter a woodpecker hole, the elf owl lays its eggs and raises its chicks in a deserted cavity. This hole provides a warm nesting site that is well protected from predators.

2 Swooping…
With outstretched talons and wings held high to slow it down, the owl swoops and strikes at a grasshopper on the ground.

3 Watching…
After eating its first course, the elf owl scans the ground below, watching for any type of tiny, flying insect prey.

4 Snatching
Spotting a potential meal, the elf owl flies down from its perch and snatches a large flying beetle in midair with its sharp talons.

PROFILE ELF OWL

With its small size, lack of ear tufts, yellow eyes and short tail, the elf owl is easily distinguished from all other small owls in its range.

BILL

The owl's bill is strong and hooked, with a sharp tip for tearing rather than killing its prey. At the base of the bill is the *cere*, an area of bare skin surrounding the nostrils that protects them when feeding.

FEET

Like all owls, the elf owl has large feet with sharp, curved talons that are used to capture and kill prey. The outer toe is reversible, allowing the bird to perch with two toes forward and two back, like most owls, or with three forward and one back, like songbirds.

IN FLIGHT

Unlike other nocturnal owls, the elf owl's flight is not completely silent; its wing beats can be heard when flying. Since its diet consists mainly of invertebrates that cannot swiftly flee, soundless flight is not necessary when hunting.

EYES & EARS

The large, yellow eyes are set forward, enabling the owl to see prey with both eyes at once. Openings on the sides of the head are surrounded by deep, soft feathers that funnel sounds to the ears; this enhances hearing when the bird is hunting at night.

BODY

With its round head and short tail, the elf owl is easily distinguished from other small owls in its range. The sexes look alike.

VITAL STATISTICS

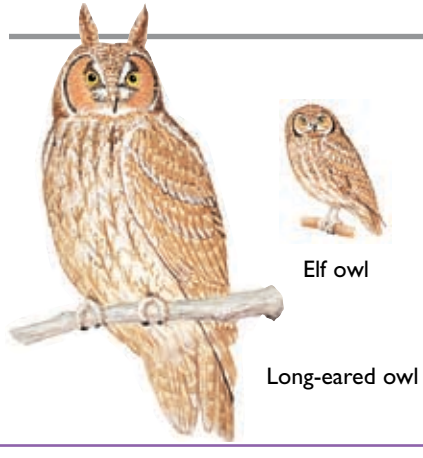
WEIGHT	1.25–1.75 oz.
LENGTH	5–6"
WINGSPAN	About 15"
SEXUAL MATURITY	Unknown
BREEDING SEASON	April–June
NUMBER OF EGGS	1–5; usually 2–3
INCUBATION PERIOD	21–24 days
FLEDGING PERIOD	27–33 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Mainly insects, spiders and scorpions; sometimes lizards and small snakes
LIFESPAN	7–10 years

RELATED SPECIES

● **The elf owl is the only species in the genus *Micrathene*. The order *Strigiformes* contains 10 species of barn owls in the family *Tytonidae* and about 175 species of true owls in the elf owl's family, *Strigidae*. The elf owl's closest relatives include the northern pygmy owl, *Glaucidium gnoma*, the ferruginous pygmy owl, *G. brasilianum* and the western screech owl, *Otus kennicotti*.**

CREATURE COMPARISONS

At 13–16" long and with a wingspan of 36–42", the long-eared owl (*Asio otus*) is much larger than the elf owl. As its name suggests, the long-eared owl has long ear tufts, along with chestnut facial disks and a mottled brown and tawny plumage; the elf owl lacks ear tufts and has similar plumage streaked with white. The long-eared owl is found in the deciduous and evergreen forests from Alaska to Mexico, but the elf owl is mostly found in the wooded canyons and deserts of the southwestern U.S. and Mexico.



Elf owl

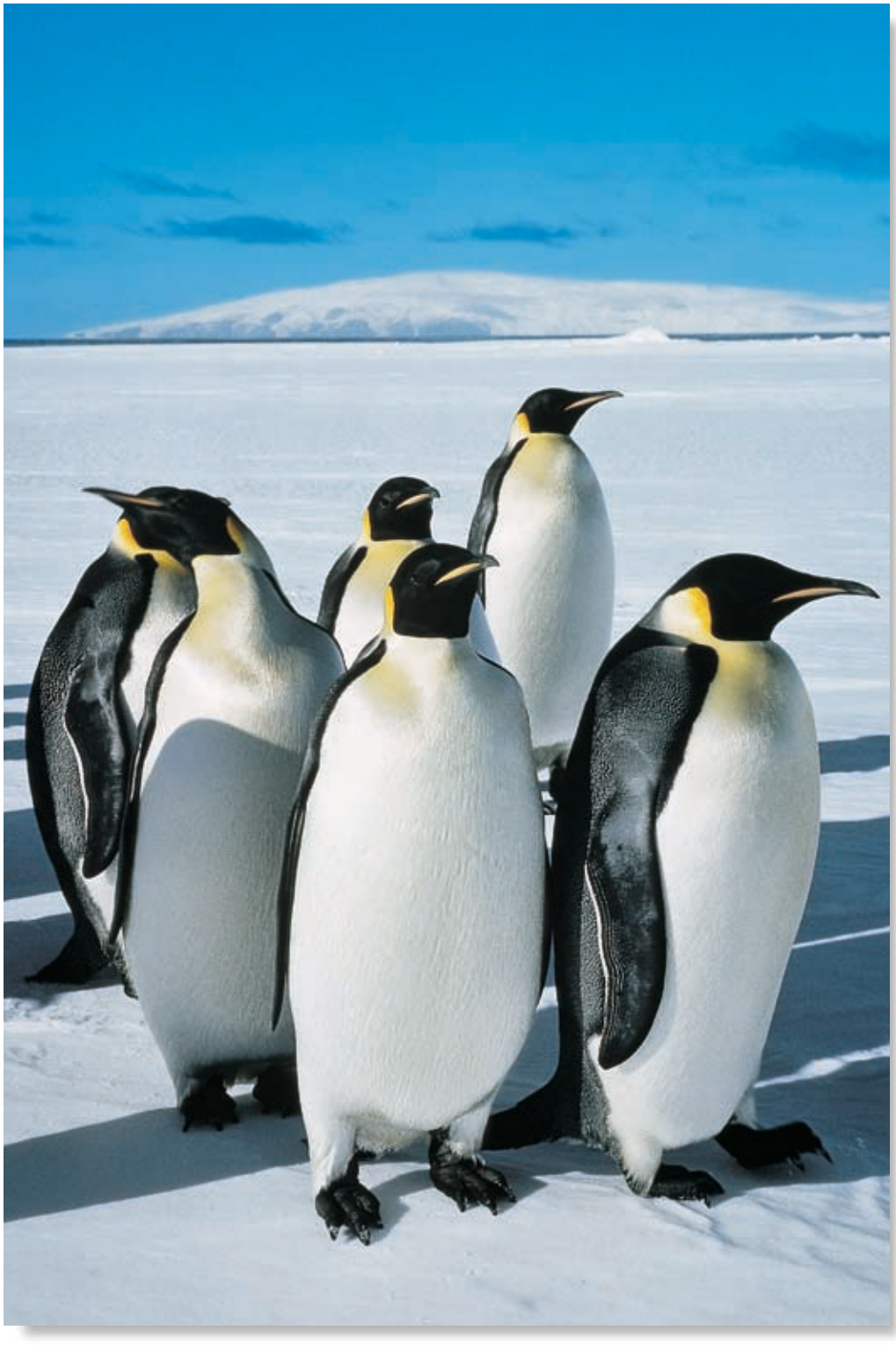
Long-eared owl

Emperor Penguin

• ORDER •
Sphenisciformes

• FAMILY •
Spheniscidae

• GENUS & SPECIES •
Aptenodytes forsteri



KEY FEATURES

- Dense, waterproof plumage and nearly an inch-thick layer of fat provide insulation
- Hunting beneath surface ice, it can swim after prey for nearly 20 minutes, diving to depths of about 1,600'
- Males huddle together for warmth in vast colonies (up to 40,000 birds) as they incubate their eggs throughout the Antarctic winter

WHERE IN THE WORLD?

Inhabits the icy coastline of Antarctica and neighboring island coasts; it sometimes travels hundreds of miles out to sea when feeding; largest colonies are located around the Ross Sea

LIFECYCLE

The emperor penguin spends its entire life in the coldest region on Earth. Other birds share its habitat on a part-time basis; only the emperor penguin lays its eggs on ice.

HABITAT

▲ **SUBZERO SURVIVOR**
The penguin has been observed in temperatures as low as -76°F.

The pack ice and inhospitable waters surrounding Antarctica are home to the penguin. The bird establishes its enormous breeding colonies (rookeries) mainly at sea level, on stable sea ice. The rookery site can be close to shore or up to 10 miles out to sea, among closely packed, grounded icebergs. Sites are chosen where the ice won't break up in the long winter-breeding season; some birds have traveled over 60 miles to reach a suitable location. Very occasionally, rookeries are established on dry-land sites (rocky headlands or shingle spits).

CONSERVATION

The emperor penguin is numerous (population estimated at up to 175,000 pairs) and currently unthreatened. However, many experts are concerned that increasing human activity in Antarctica may change this. Commercial fishing could endanger the food supply; aircraft flying low over the coast intrude upon the activity of penguin colonies.

BEHAVIOR

The emperor penguin's first priority is to keep warm. It's helped by its 0.8"-thick layer of body fat and dense, insulating plumage, but even these physical adaptations aren't enough of a defense against extreme temperatures and almost ceaseless, biting wind. In its desolate, icy habitat, the penguin seeks whatever shelter it can find, taking refuge from wind in an ice cliff or low, snow-clad hill.

During the breeding season, males keep warm by huddling together, while females hunt.

▶ **CREATURE COMFORTS**
A protective huddle is one of the penguin's main defenses against the cold.

BREEDING

DID YOU KNOW?

- **A male penguin will lose up to half his bodyweight while incubating the egg through the winter.**
- **Most of the penguin's body is covered with 33 feathers to a square inch.**

Emperor penguins gather in large, crowded breeding colonies from early March. As soon as the birds arrive they begin courtship displays, forming pairs that will last the whole season.

After laying a single egg, the female passes it to the male, who rolls it onto his feet and covers it with a fold of skin to keep it warm. For the next two months, males press together in the winter gales, until the females return to hatch the eggs. The males, who haven't eaten all this time, then set off to feed. Once they've regained strength they return to resume parental duties.

COLD COMFORT

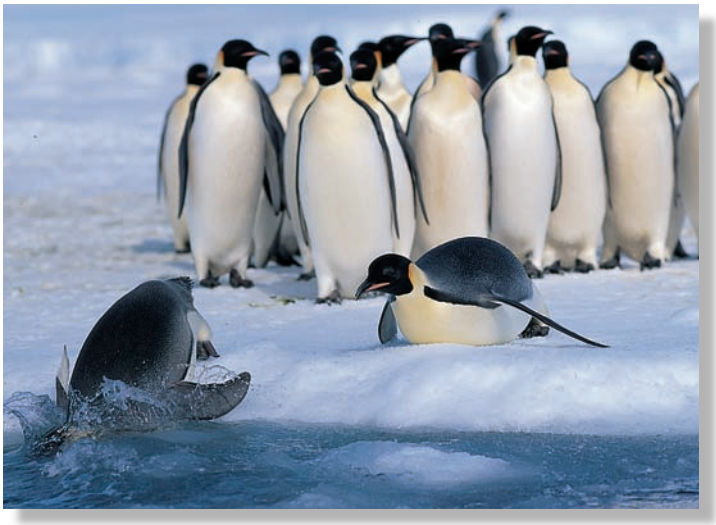
1 Getting friendly…
The male and female trumpet and bow to each other. The female carries the egg on her feet, waiting to transfer it to the male.

2 Small talk…
They continue their display, trumpeting loudly. They need to learn each other's calls so they can recognize each other later.

3 Egg change…
The male rolls the egg away from the female and onto his feet. This is done as quickly as possible to keep the egg warm.

4 Winter warming
Males shuffle together, forming constantly moving huddles to keep warm during the two-month incubation period.

FOOD & HUNTING



▲ **TIME FOR A BITE**
In an extended dive the emperor penguin may eat several fish or squid.

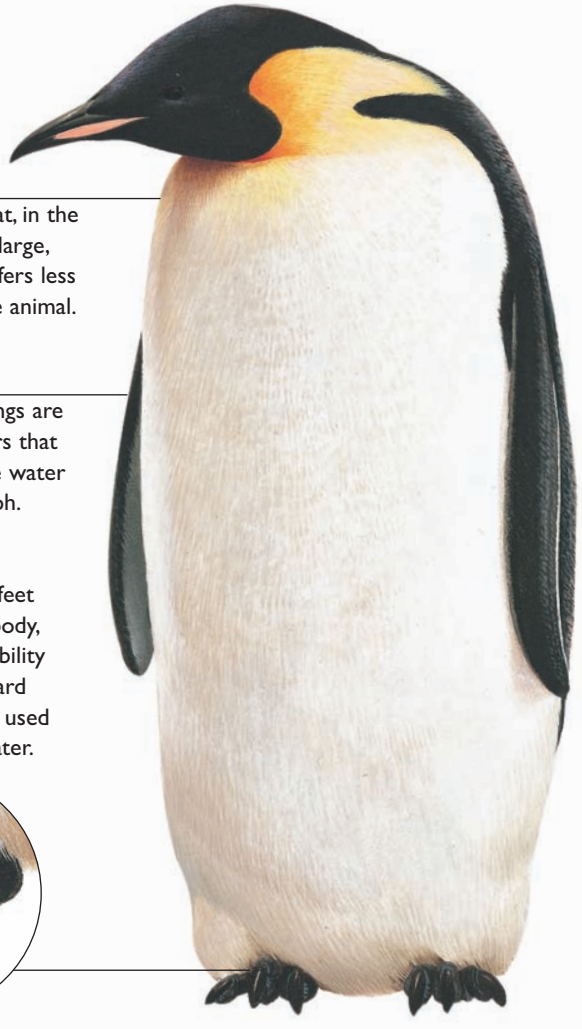
Waters surrounding Antarctica are as rich in prey as the land is barren and it's here that the penguin finds its food. Diving beneath the surface, it uses its flippers to "fly" with ease through the water. Able to twist and turn with the grace of a seal, the emperor penguin can pursue its prey underwater for nearly 20 minutes before it has to return to the surface to breathe.

Fish, squid and krill are principal prey of the penguin, although favored prey species vary greatly with location. During offshore foraging trips, the emperor penguin may travel up to 300 miles.

Relying on sight to locate its prey, the penguin hunts only by day and usually only at depths to which sunlight can penetrate. Occasionally, however, it will dive to astounding depths — more than 1,600' has been recorded — to feed on the seabed.

PROFILE EMPEROR PENGUIN

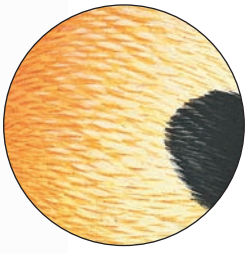
Largest of all penguins, the emperor penguin has exchanged mastery of air for the ability to "fly" through water as it dives deep for prey.



BODY SHAPE
Tests have shown that, in the water, this penguin's large, cigar-shaped body offers less drag than any marine animal.

FLIPPERS
Useless for flying, wings are paddle-shaped flippers that power it through the water at speeds up to 9 mph.

FEET
The penguin's small feet are set back on its body, reducing the bird's ability to walk to an awkward waddle. The feet are used as rudders in the water.



FEATHERS
The outer plumage is waterproof. Beneath it lies a thick layer of stiff, short, lance-shaped feathers.

CHICK
The emperor penguin chick *(shown below)* is covered in a thick insulating coat of gray down, and its facial markings differ from the adult's markings.

VITAL STATISTICS

WEIGHT	Male up to 88 lbs.; female up to 70 lbs.
LENGTH	3–4.3'
SEXUAL MATURITY	4–8 years
MATING SEASON	April–May
INCUBATION PERIOD	65 days
NUMBER OF EGGS	1
FLEDGING PERIOD	150 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Squid, fish and krill
LIFESPAN	Up to 20 years

RELATED SPECIES

● **Of 17 penguin species in the family *Spheniscidae*, the closest relative of the emperor penguin and the only other member of the genus *Aptenodytes* is the king penguin, *A. patagonicus*. The king penguin is almost as tall as the emperor, but weighs about half as much. The king penguin breeds on sub-Antarctic islands, including South Georgia, where it gathers in colonies numbering up to 300,000 pairs.**

CREATURE COMPARISONS

Standing up to 4' tall, the emperor penguin is the largest of all penguins. Its great size is an adaptation to the extreme cold of its habitat. The Macaroni penguin, which shares the emperor's sub-Antarctic environment but at a more northerly latitude, is much smaller. The smallest penguin is the little blue penguin, (about 16" tall). This species inhabits the warmer waters of New Zealand and southern Australia.

Little blue penguin

Macaroni penguin

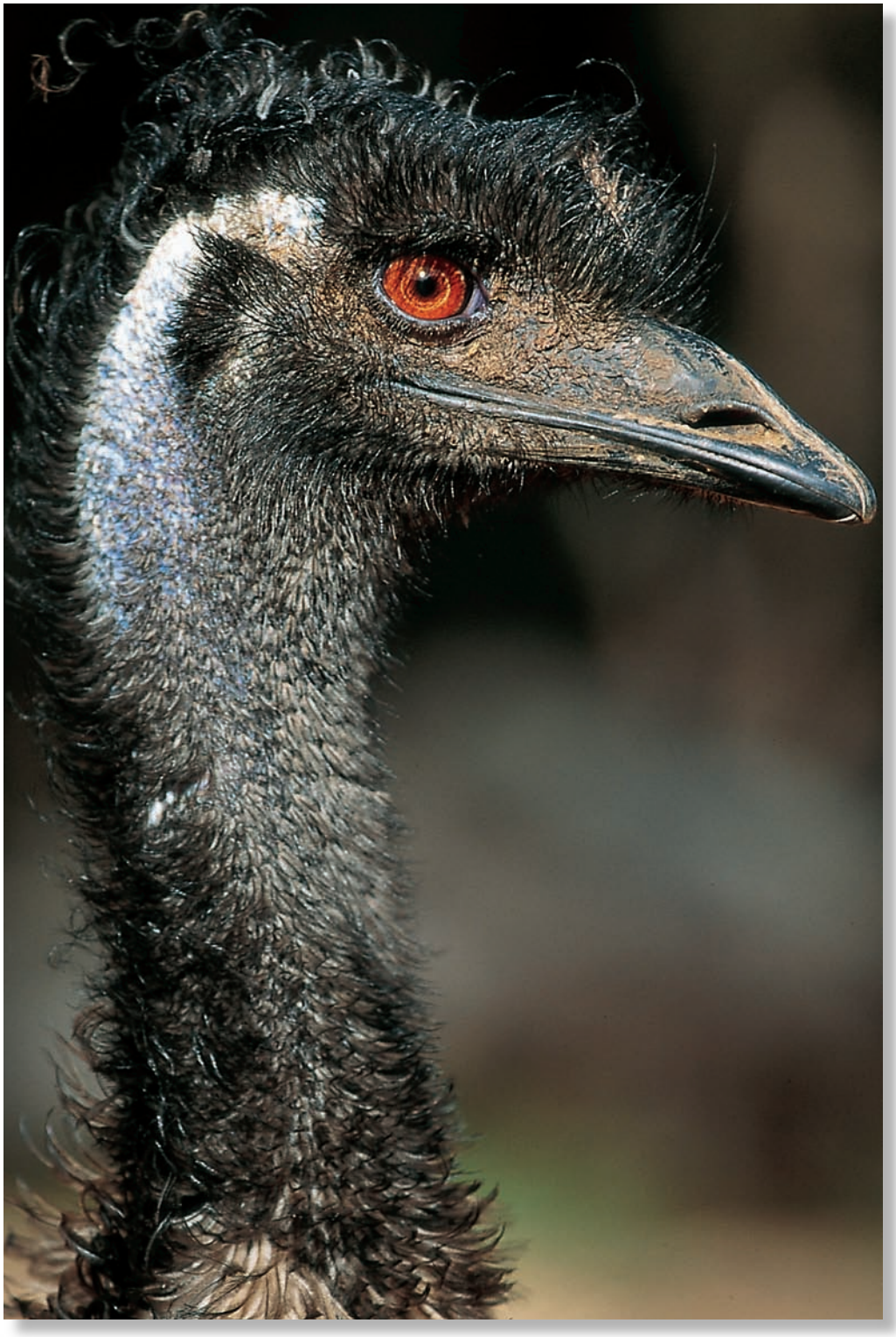
Emperor penguin

Emu

• ORDER •
Casuariiformes

• FAMILY •
Dromaiidae

• GENUS & SPECIES •
Dromaius novaehollandiae



KEY FEATURES

- Distributed widely across Australia in a wide range of habitats
- Second in size only to the ostrich, which lives in Africa, this huge bird is similarly flightless and relies on its ability to run fast when threatened
- Unusual among birds, the male emu incubates the eggs and rears the brood without assistance from the female

WHERE IN THE WORLD?

Throughout much of Australia, the emu is found in a wide variety of habitats — from coastal flats, woodlands and grassy plains to the uplands of the Great Dividing Range

LIFECYCLE

A wanderer by nature, the emu adopts a more settled existence in the breeding season; the male dutifully tends to his brood and defends it fiercely against intruders.

HABITAT

◀ **ON THE PLAIN**
Nomadic, the emu follows the rains for food.

▼ **IN THE BUSH**
Open woodland on plains provides cover.

The emu is found in a variety of habitats, avoiding only desert and tropical forest. Around 700,000 birds are dispersed across woodlands, shrublands and grassy plains — from the tropical north to temperate south and from coastal flats up to the Great Dividing Range.

The emu avoids Australia's arid heartland, but may occur in desert after rains or where water is available. Emus may turn up in unlikely settings while migrating, such as plowed fields or suburbs. It abandons its nomadic life only in the breeding season, when it moves to reliable food supplies, away from human disturbance.

CONSERVATION

The emu isn't currently under threat, but its numbers decline in times of drought. It has benefited from the provision of water for livestock in arid areas. In Western Australia, the emu is raised on farms for its meat, feathers, oil and leather; the state government also funds research of emu rearing.

FOOD & FEEDING

BREEDING

The emu looks for a mate in December, in the middle of the Australian summer. Once a bond is formed, the pair stays together while the male builds a nesting platform of grass, twigs, bark and leaves. After mating, the female lays a clutch of green, oval eggs and then, as incubation begins, she leaves her mate and may mate again with other males. Sometimes several females mate with a male and lay their eggs in his nest, leaving him with several clutches of eggs to incubate. The male stays within his nesting territory, defending it until the chicks hatch.

The young hatch well developed and bear camouflage stripes that they keep for about ten weeks. In a few hours they can walk and soon the brood leads, rather than follows, the male. In most cases, the young stay with the father for five months before leaving, but in dry conditions, when food is short and chicks develop slowly, parental duties may continue for a year or more.

TENDER LOVING CARE

1 Sitting...
With utmost devotion, the male emu incubates the eggs alone. For eight weeks, neither eating nor drinking, he rarely leaves the nest.

2 Feeding...
After hatching, the chicks forage with their father, keeping close by his side and sheltering under his feathers when the family settles for the night.

The emu's diet depends largely on what's available. If there's a varied food supply, it prefers to pick out the most nutritious items, such as seeds and flowers. Tender shoots and leaves are also favored, along with insects and the occasional small vertebrate, such as a lizard or rodent. The emu resorts to coarse leaves and grass if it's the only food available in a particular area.

The emu forages at a walking pace, with its head held straight out or low to the ground. Plant matter is either plucked in passing or gleaned from the ground, then swallowed with a backward toss of the head. Feeding takes place only in daylight hours. If an emu is disturbed, it races away to cover at up to 30 mph.

◀ **Pecking order**
A father and his brood feed close to the woods.

3 Strolling…
Though young chicks of different broods will mix freely, their fathers are more wary and act aggressively to drive off the other brood.

4 Kicking
If two males stand their ground, a violent fight can ensue, starting with pecking, then forward kicks and finally ending with a chase.

BEHAVIOR

▲ **Wanderer**
An adult may wander about 950 miles in a year.

Although it frequently occurs alone or in pairs, the emu is a sociable bird that may roam in small groups or loose flocks.

Outside the breeding season, the bird rarely maintains any territorial claims it may have made. It wanders freely from place to place, eating and drinking to build up fat reserves. An emu can travel for days without food and, in lean times, lives off this fat reserve, surviving losses of up to half its total bodyweight.

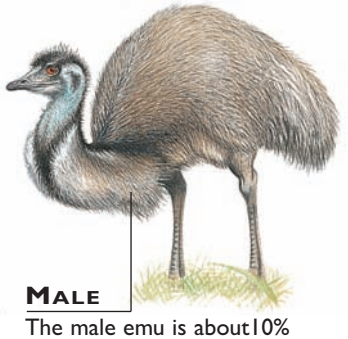
The emu's mobility enables it to make seasonal migrations across the drier western parts of Australia, following the rainfall pattern. At times, nomadic bands join together to form flocks of several hundred. These can cause severe damage to crops — so severe, in fact, that a vast fence 600 miles long has been erected to keep the emu away from the arable lands of the southwest.

DID YOU KNOW?

- **The emu is a shy but curious bird, drawn to unusual objects. Aboriginal hunters, hidden in trees, would dangle balls of feathers to lure an inquisitive emu into range.**
- **Due to damage done by emus to grain crops, the Australian army was enlisted to control the situation by shooting large numbers of birds in the so-called 'Emu Wars' of 1932.**

PROFILE EMU

The long, powerful legs of the emu compensate for its heavy body, small wings and shaggy plumage, which prevent it from flying.

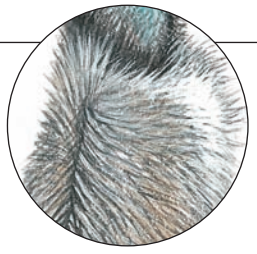


MALE

The male emu is about10% smaller than the female *(main picture)*. The light-blue skin that shows through the sparse neck feathers is paler in males.

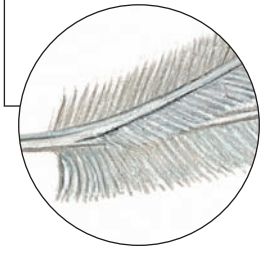
PARTING

As if styled by a heavy-duty comb, the emu's coarse plumage has a prominent middle part running down the back of its neck and back.



FEATHERS

The emu's double-shafted feather structure is unique among birds. A secondary plume sprouts from the base of the shaft, equal in length to the main feather.



LEGS & FEET

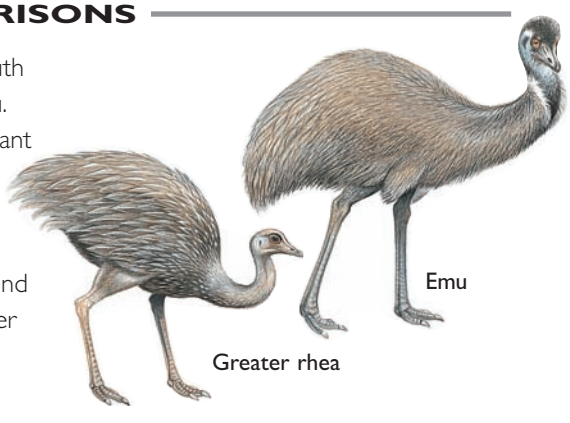
Long and sturdy, the legs give the emu speed, while the long-clawed toes provide grip and allow it to deliver flying kicks in defense.

WINGS

The small, claw-tipped wings are useless for flight and hang limply at the emu's sides.

CREATURE COMPARISONS

The greater rhea (*Rhea americana*) from South America has much in common with the emu. Shorter and of slimmer build, the rhea is a giant among birds even though its bodyweight is about half that of the emu. Like the emu, it's a flightless bird, built for walking. It has long legs and a neck designed for foraging at ground level in open terrain. Like the emu, the greater rhea male takes sole responsibility for the incubation and upbringing of its offspring.



VITAL STATISTICS

WEIGHT	77–110 lbs.
HEIGHT	5–6' to top of head; 3–4' to top of back
SEXUAL MATURITY	2 years
BREEDING SEASON	April–June
NUMBER OF EGGS	7–11
INCUBATION PERIOD	8 weeks
BREEDING INTERVAL	Usually 1 year
TYPICAL DIET	Seeds, fruits, flowers, shoots and insects
LIFESPAN	6 years

RELATED SPECIES

● The emu is the only member of its family, but is related to the double-wattled cassowary (*Casuarius casuarius*) in the *Casuariiformes* order. Standing 3' high to the top of its back, it's Australia's only other large flightless bird. Their ranges overlap in places, but the two species are unlikely to meet; the cassowary is confined to a habitat the emu avoids — the tropical forests of northeastern Australia.

Eurasian Avocet

• ORDER •
Charadriiformes

• FAMILY •
Recurvirostridae

• GENUS & SPECIES •
Recurvirostra avosetta

KEY FEATURES

- Scythes through mud and water with specialized upturned bill to filter out tiny aquatic organisms
- Strikingly patterned in black and white, it's a conspicuous inhabitant of saltwater wetlands
- Defends its nest vigorously during the breeding season, noisily driving away intruders

WHERE IN THE WORLD?

On wetlands from Europe to China; winters in North and West Africa, the Middle East and southeast China; also occurs in East Africa

LIFECYCLE

Resplendent in its eye-catching piebald plumage, the Eurasian avocet has another striking feature: an upwardly curved, or recurved, bill — a rare design among birds.

HABITAT

The avocet inhabits coastal estuaries, lagoons, inland lakes and marshes. To feed, it needs shallow expanses of water with loose, muddy sediments rich in microscopic aquatic organisms. Avocets often live in saltwater habitats with limited surface vegetation and is found where there is bare, muddy ground.

In Afghanistan, the avocet also occurs on salty mountain lakes up to altitudes of over 9,900'. The bird will also fly long distances to take advantage of localized rains, when temporary abundances of food appear, and can also adapt to man-made habitats, such as commercial saltpans.

▲ **READY SALTED**
Avocets favor shallow, salty water with muddy bottoms.

▲ **STANDING OUT FROM THE CROWD**
The avocet *(foreground)* and the lesser flamingo are two of a kind: both are highly specialized filter-feeders.

CONSERVATION

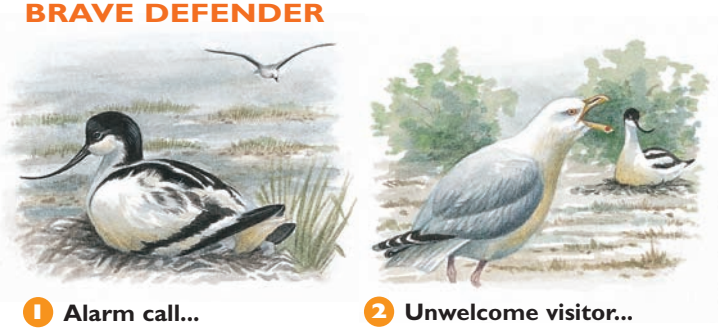
Although the Eurasian avocet is generally thriving throughout its wide range, it's increasingly affected by habitat damage caused by drainage, dam development, and water pollution.

BEHAVIOR

At breeding colonies, black-and-white birds incubating eggs on the ground would seem to attract predators. However, the bold black and white pattern breaks up the bird's outline and aids in camouflage. Despite its delicate appearance, the avocet is remarkably determined in the defense of its nest and young; parent birds will aggressively chase away nest robbers, even aggressive birds, such as crows, birds of prey and large gulls.

With a more determined threat, the avocet resorts to a variety of distractions to lure the intruder away. These include imitating "weakness" or an injury, such as a broken wing.

BRAVE DEFENDER



1 Alarm call...
Circling nearby, a gull hopes to steal the avocet eggs. Incubating birds send out loud warning calls to other members of the colony.

2 Unwelcome visitor...
When the gull lands near a nest and approaches it, the avocet prepares for action. One step further and the gull will be dealt with.

FOOD & FEEDING

With its neck stretched forward and its bill held just under the surface of water or soft mud, the avocet repeatedly sweeps its head from side to side in a scything action. It holds the curved part of its bill slightly open and filters out tiny aquatic organisms as the water or mud passes across its mandibles. Several avocets may feed in a group, moving with rhythmically sweeping bills. In deeper water, the avocet is also able to swim on the surface and up-end like a duck to reach food on the muddy bottom.

▶ **BEST OF BOTH WORLDS**
Avocets can feed by touch or sight to fully exploit their food sources.

At other times, the avocet feeds by sight. It wades slowly while looking for food in the water and mud. Dashing forward with an open bill, it snatches any prey it spots.

3 Counter-attack...
Standing up from its nest, the avocet stretches to its full height. It then rushes at the gull with wings wide open and drives the intruder away.

4 Peace at last
Satisfied that the intruder has been warned off, the avocet returns to its nest and settles back on the clutch of eggs.

BREEDING

Avocets almost always nest in loose colonies on bare ground near water, occasionally among sparse vegetation. The nest is a simple hollow scraped in the ground, lined with grass, stems and roots. Depending on the colony's size, nests are placed 16–100' apart. The three or four, smooth, oval eggs are mottled and blotched with black, brown and gray, which helps camouflage them.

As soon as they hatch, the cryptically colored (colored to match the background), downy young are mobile and active; the adults soon lead the chicks away from the exposed nest.

Although able to feed for themselves, chicks huddle in the warmth of their parents' feathers. Families stay together until the young fledge at about six weeks.

▲ **NEST EGG**
Once all the avocet's eggs have hatched, the chicks are led away from the nest site.

▼ **MATING TIME**
Mating among avocets is a balancing act; the male's long legs hinder him from securely perching on the female's back.

DID YOU KNOW?

- **In Spain, the avocet is known as *cusisacs*, meaning "sack-sower"; the shape of its bill is similar to the traditional darning needles used to repair sacks.**
- **A campaign earlier this century to protect the avocet in Europe was so successful that the bird was adopted as the symbol of the Royal Society for the Protection of Birds — one of the world's largest conservation organizations.**

PROFILE EURASIAN AVOCET

A delicate, upturned bill and long legs give the Eurasian avocet one the most elegant profiles of all wading birds.

EYE RING

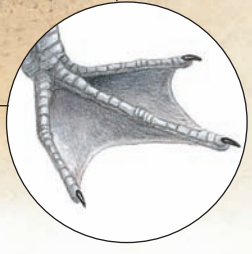
The female *(above right)* differs from the male *(above left)* in having a ring of white feathers around the eyes. The female *(main picture)* also has a shorter and more upcurved bill than the male.

BACKREST

When at rest, the avocet turns its head and places its bill along its back, between its shoulders.

JUVENILE BILL

A chick's bill is short and almost straight. The tip gets more upcurved as it grows.



LEGS & FEET

Long legs enable the avocet to wade through water to feed. Partly webbed feet offer support on soft mud and assist it in swimming, which it does frequently in deeper water, up-ending like a duck to reach the mud below.

VITAL STATISTICS

WEIGHT	8–14 oz.
LENGTH	17–18"
WINGSPAN	31–32"
SEXUAL MATURITY	2–3 years
BREEDING SEASON	April–August in Eurasia
NUMBER OF EGGS	2–5, but usually 3 or 4
INCUBATION PERIOD	23–25 days
FLEDGING PERIOD	35–42 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Aquatic insects, invertebrates, mollusks, worms, small fish
LIFESPAN	10–12 years

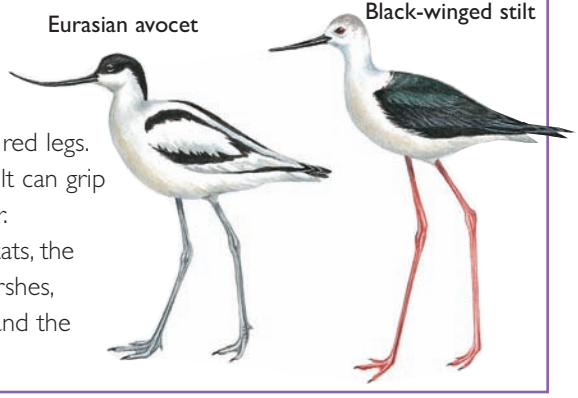
RELATED SPECIES

- There are four avocet species; all have upturned bills and a pied plumage. Two species also share a chestnut-red head and neck: the American avocet, ***Recurvirostra americana*** (Mexico to southern Canada), and the red-necked avocet ***(R. novaehollandiae)*** of Australia. The Andean avocet ***(R. andina)*** inhabits high lakes and marshes up to 10,230' in South America's Andes mountain range.

CREATURE COMPARISONS

Avocets and stilts are closely related; both are characterized by contrasting black-and-white plumage. The black-winged stilt, *Himantopus himantopus*, has a fine, straight bill and very long, red legs. Muscles that operate its bill are strong, so the stilt can grip prey tightly; long legs let it wade into deep water.

Whereas the avocet prefers saltwater habitats, the black-winged stilt favors freshwaters, such as marshes, flooded fields and lakesides, in both the tropics and the subtropics of the Old World.



Eurasian Buzzard

• ORDER •
Falconiformes

• FAMILY •
Accipitridae

• GENUS & SPECIES •
Buteo buteo

KEY FEATURES

- A versatile hunter found in many habitats, the buzzard is the most numerous large bird of prey over most of its wide range
- Often hovers while scanning the ground below
- Courtship involves an aerial display called "skydancing," in which birds soar, dive and swoop

WHERE IN THE WORLD?

Breeding across Europe and parts of Asia to Japan and eastern Russia; eastern populations winter in Africa, India and Southeast Asia

LIFECYCLE

Looking like a miniature eagle, the Eurasian buzzard is a master of the skies — utilizing its broad wings to soar, glide, hover and perform breathtaking "roller-coaster" dives.

HABITAT

The buzzard occupies a wide range of habitats, from farmland and moorland to mountainsides and coastlines, but lives in places that have stands of tall trees for roosting and nesting. It prefers areas of open country (required for hunting) alternating with woodland. However, buzzards living along rocky coasts manage without trees, nesting and roosting on sea cliffs. In winter, some buzzards migrate into areas with few trees, such as steppe grasslands.

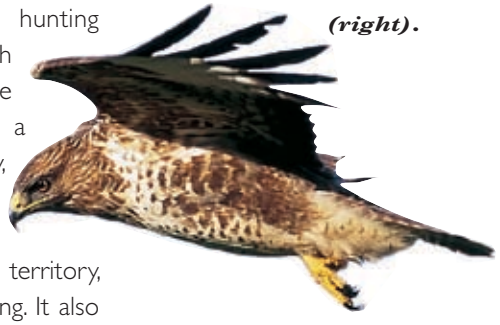
▲► **PERCHING**
Open country with hunting perches is the ideal home.

FOOD & HUNTING

The buzzard is a versatile predator, with a wide diet and a variety of hunting methods. It eats small mammals and also large insects, earthworms, reptiles, amphibians, birds and carrion.

The preferred hunting method is to watch for prey from the vantage point of a perch. Alternatively, it scans the ground for prey as it soars and glides over its territory, occasionally hovering. It also hunts on the ground for insects.

▼► **HUNTING METHODS**
A buzzard 'slope soars' *(below)*, hanging like a kite on the updraft of air rising up from the edge of a slope. In winter, carrion is a staple food *(right)*.



BREEDING

Buzzards generally pair for life. Courtship involves an aerial display; the pair soars around each other in tight circles, emitting a wild, ringing *pee-ow* call. In the next few weeks, a nest, up to 3' across, is built by the pair, usually high up in the fork of a large tree.

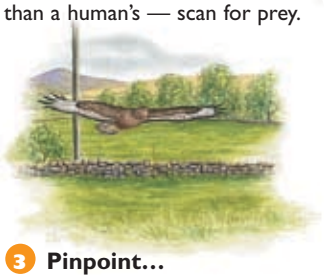
The female does most of the incubation and caring for the 2–3 chicks when they hatch. The male provides food for the family, as the female broods the chicks for the first 3 weeks. Then the female joins her mate in hunting forays to satisfy the chicks' growing appetites. After their first flights eight weeks later, the youngsters stay close to home for a further 6–8 weeks while they learn to hunt. The young then fly off to lead a nomadic lifestyle until they can establish their own territories.

▲ **FUZZ BALL**
Chicks are down-covered for 18 days after hatching.

PATIENT HUNTER

1 Lookout…
A buzzard perches patiently on a high post to survey its surroundings. Its sharp eyes — eight times keener than a human's — scan for prey.

2 Unaware…
A rabbit sits in a nearby field, unaware of the hungry buzzard in the distance, which is still looking around for a meal.



3 Pinpoint…
The buzzard spots the rabbit and launches itself from the post, swooping in a shallow glide, ready to attack with sharp talons.

4 Strike
The rabbit bolts, but the buzzard speeds in, striking the rabbit with its deadly talons and bowling it over with the impact.

CONSERVATION

Although it's the most common large bird of prey across much of its range, the Eurasian buzzard has suffered serious declines in many parts of Europe. In Britain, it was so persecuted by landowners and gamekeepers from the 18th to the early 20th century that its numbers were severely reduced. Eventually, more enlightened attitudes resulted in a gradual increase, but even today the buzzard's numbers are declining in heavily populated areas throughout its range.

DID YOU KNOW?

- **A buzzard's territory extends over a flat area and also as much as 800' vertically above the ground. Other buzzards flying higher than this mark aren't harassed.**
- **After chasing off an intruder, a male performs a victory roll, diving up to 100' with closed wings, then shooting up again.**
- **To avoid a fight with a rival over prey, a weaker buzzard may assume a submissive posture — lying motionless on its side with one wing raised.**

BEHAVIOR

Buzzards live on their own, in pairs or family groups. In areas where they don't migrate, pairs defend a territory all year. Migratory buzzard pairs separate in winter; individuals keep feeding territories on their wintering grounds. Breeding territories are reestablished when birds return to their nesting range the following spring.

Males dive in a roller-coaster fashion to advertise territories. Wandering juveniles are chased away by a resident male.

◀ **HEATING UP**
Sunbathing rids the buzzard's feathers of mites, especially those of the hard-worked wings and tail.

PROFILE EURASIAN BUZZARD

The buzzard is a remarkably unspecialized bird of prey, which means it's an extremely versatile hunter that can exploit a wide range of food.

PLUMAGE
The Eurasian buzzard shows more variation in its plumage than almost any other bird of prey. Its color ranges from an overall reddish hue to nearly black, but typical birds are brown above with cream mottling on the underparts.

DARK PHASE
The Eurasian buzzard appears in a "dark phase" — mostly chocolate brown with just a few pale feathers on the breast. This phase is most common in the European part of its range.

WINGS
The wings are broad and generate large amounts of lift, allowing the buzzard to soar effortlessly for long periods. They're not especially long for a bird of its size, but this gives the buzzard the advantage of maneuverability.

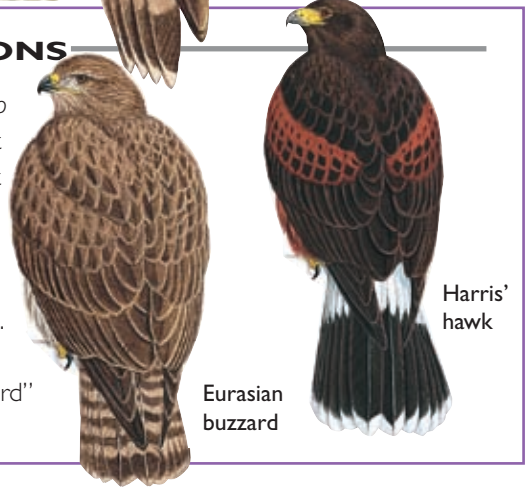
FEET
The feet are equipped with sharp talons for killing prey; the yellow lower legs don't have feathers.

TAIL
Short tail is fanned in soaring and outer feathers almost touch the trailing edges of the wings. Tail-fanning increases the surface area of the tail and gives fine steering control at slow soaring speeds.

CREATURE COMPARISONS

The Eurasian buzzard and Harris's hawk (*Parabuteo unicinctus*) share the compact build typical of most buzzards. A thickset neck, broad wings and a short tail produce a stocky, "all-around" physique.

Harris's hawk, like the Eurasian buzzard, uses a variety of hunting techniques to catch a range of prey in dry, open habitats in the southwestern U.S. and Central and South America. "Buzzard" is used outside the U.S. for large hawks. In the U.S., "buzzard" implies another group of birds — the vultures.



VITAL STATISTICS

WEIGHT	Male 1–2.5 lbs.; female 1.5–3 lbs.
LENGTH	1.5–2'
WINGSPAN	3–4'
SEXUAL MATURITY	2–3 years
BREEDING SEASON	Late March –August
NUMBER OF EGGS	1–5, usually 2 or 3
INCUBATION PERIOD	33–38 days
FLEDGING PERIOD	50–60 days
TYPICAL DIET	Small to medium-sized mammals, birds and reptiles; large insects, earthworms and carrion
LIFESPAN	25–30 years

RELATED SPECIES

- **Members of the buzzard subfamily *Buteoninae* are among the most widespread of all birds of prey. The 28 species in the genus *Buteo* live throughout the world, except Antarctica and Australia. The red-tailed hawk (*Buteo jamaicensis*) and jackal buzzard (*Buteo rufofuscus*) are abundant. The Galapagos hawk (*Buteo solitarius*) is now endangered.**

Eurasian Cuckoo

• ORDER •
Cuculiformes

• FAMILY •
Cuculidae

• GENUS & SPECIES •
Cuculus canorus

KEY FEATURES

- Lays its eggs only in the nests of other birds
- Plays no part in rearing its young, relying entirely on the caring response of foster parents
- More than 100 bird species have reared cuckoo nestlings
- Each cuckoo lays eggs of a color suited to one host species and usually lays only in the nests of this species

WHERE IN THE WORLD?

Found throughout Africa south of the Sahara in winter; in spring, flies north to breed in a range of habitats in Europe and Asia; occasionally strays across the Atlantic to the Aleutian Islands

LIFECYCLE

The Eurasian cuckoo's method of parenting seems cruel, but is very effective. Each of its chicks destroys the eggs of its foster parents and receives their full care and attention.

HABITAT

The cuckoo is found in most climatic zones and habitats in its range. Its summer range is controlled by the distribution of birds in whose nests it lays its eggs. It's most common over grassland and dunes where meadow pipits nest, bush and scrub that are typical habitats of the dunnock and reedbeds that support reed warblers. The cuckoo is also found in farmland and woodland.

In late summer, the cuckoo sets off to spend the winter in southern Africa, completing most of the journey nonstop.

▲ **POACHER ON A PERCH**
Meadows and marshes are ideal habitat for cuckoos.

▼ **FOSTER HOME**
The cuckoo can be found where foster parents, such as dunnocks, make nests.

BEHAVIOR

A shy bird, the cuckoo is more often heard than seen. The familiar *cu-coo* call is the display song of the male, used to attract a mate and deter other males; the female makes a bubbling call. The male will chase other males off his home patch, but the cuckoo isn't strongly territorial. Several males and females have been found to share overlapping ranges.

The cuckoo is most often seen in flight, using a rapid wingbeat interspersed with frequent glides. Its falconlike form probably results from the adaptation of both the cuckoo and the falcon to gliding as they look for prey or nest sites. Because it resembles a bird of prey, the cuckoo is often mobbed in flight by smaller birds — but this works to its advantage, since nest sites are betrayed as they take to the air.

▶ **WINGED INTRUDER**
The cuckoo flies over its habitat in search of homes for its brood.

BREEDING

The cuckoo is a *brood parasite*, meaning it never builds a nest or rears its young. The female lays her eggs in the nests of a hundred or more other bird species, which serve as hosts to rear the young cuckoo. Meadow pipits, dunnocks and reed warblers are common hosts, but garden warblers, pied wagtails, European robins, restarts and bramblings are also used.

In the summer, each female cuckoo mates with a number of males. Mating is timed to suit the host; the female lays nine eggs in different nests, one in each nest at two-day intervals.

Although the cuckoo's eggs are larger than its host's, they usually have similar markings. Different groups of cuckoos may have eggs with coloring adapted for particular hosts; the female always lays her eggs in the nest of the species that reared her.

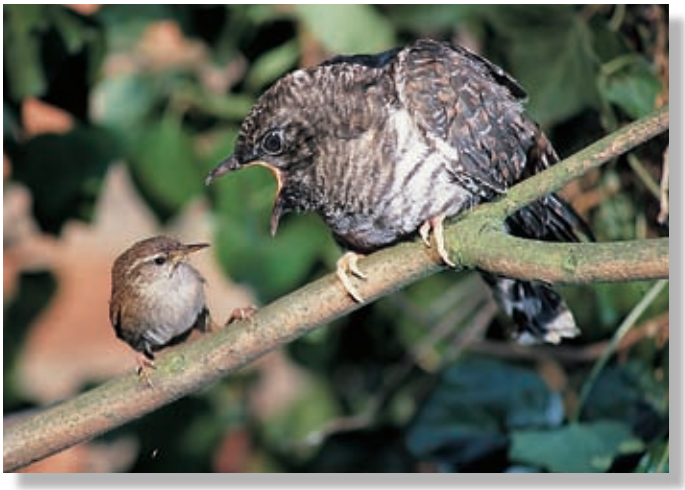
TENDER TRAP

1 Setting the bait...
A female flies over a reedbed. Reed warblers fly up to attack her, but in doing so they betray the location of their nest.

2 Laying...
The cuckoo slips down to the nest among the reeds. She removes and eats one of the warbler eggs and lays her own egg in the nest.

DID YOU KNOW?

- **The young cuckoo flies south about a month after its true parent, following the same route by instinct.**
- **Studies in England suggest three birds are most heavily exploited by cuckoos: 41% of cuckoos lay their eggs in dunnock nests, 17% in reed warbler nests and 10% in meadow pipit nests.**



3 Ejecting…
The cuckoo egg hatches before the warbler's own eggs. The newly hatched chick (still blind) pushes the other eggs from the nest.

4 Begging
In two weeks, the cuckoo chick is twice the size of the warblers, but their parental instincts make them feed the begging youngster.

FOOD & FEEDING

▲ **EXCLUSIVE MENU**
The cuckoo's odd diet is unpalatable to other birds.

The cuckoo feeds on insects, especially the hairy or toxic caterpillars that other birds avoid. Most commonly, the cuckoo sits on a lookout perch, scanning up to 150' around it for any sign of movement. It flutters down to pick off prey, then returns to its perch. Sometimes it hops over the ground, searching for prey.

After kneading a caterpillar in its bill to soften it, the cuckoo shakes it to ensure it's dead, then swallows it whole. The cuckoo's *gizzard* (a muscular chamber in the intestine) is specially adapted to cope with irritant or poisonous hairs; the gizzard's inner lining is periodically shed and coughed up, complete with embedded hairs.

The young is usually obliged to eat other food, because few other bird species eat the toxic caterpillars eaten by adult cuckoos. The chick's diet usually includes beetles, grasshoppers or snails.

CONSERVATION

The Eurasian cuckoo is still widespread and fairly common, but its populations have declined a little in recent decades, especially where its host species have lost their habitats. New housing, built over former rough grassland, destroys nesting sites for the meadow pipit; draining of wetlands affects the reed warbler. Intensive farming has reduced the availability of the cuckoo's food. The cuckoo hasn't, however, suffered from pesticides commonly used in farms and forests, perhaps because of the wide variety of caterpillars it eats.

PROFILE EURASIAN CUCKOO

The cuckoo's sharp eyesight, strong toes for perching and predatory appearance equip it well for a life spent usurping the nests of other birds.

BILL
The strong bill is used to catch caterpillars and then strip their skin.

EYES
The cuckoo's keen eyesight helps it spot the nests of foster parents. A "lash" of bristles protects the eye from toxic caterpillar hairs.

PLUMAGE
The drab coloring and barred breast helps camouflage the cuckoo as it perches, watching for the nests of small birds.

WINGS
Pointed wings are an adaptation to gliding. In flight, the cuckoo looks like a falcon; its plumage resembles a Eurasian sparrowhawk's. This similarity may help the cuckoo scare small birds from their nests and also escape birds of prey.

LEGS AND FEET
The cuckoo's legs are short, so it hops on the ground. Two toes point forward and two backward to help it hang onto foliage when feeding or at its nest.

TAIL
The tail, about 5–6" long, serves as a rudder in flight and helps the cuckoo balance as it perches.

VITAL STATISTICS

WEIGHT	3.5–5.5 oz.
LENGTH	12.5–13.5"
WINGSPAN	22–24"
SEXUAL MATURITY	1–2 years
BREEDING SEASON	Varies with location
NUMBER OF EGGS	1–25
INCUBATION PERIOD	11–13 days
FLEDGING PERIOD	17–21 days
BREEDING INTERVAL	Annual
TYPICAL DIET	Insects, especially hairy caterpillars
LIFESPAN	Up to 12 years

RELATED SPECIES

● **The family *Cuculidae* includes the roadrunner, couas and anis, such as the smooth-billed ani** (below)**. It also includes other cuckoos; not all are brood-parasitic.**

CREATURE COMPARISONS

The Eurasian cuckoo is one of the most familiar of the brood parasitic birds, but it's not the only bird to exhibit this trait. Although American cuckoo species rear their own nestlings, the black-billed cuckoo on rare occasions lays additional eggs in other birds' nests in years when food is plentiful. There are other brood parasitic birds beside cuckoos: the brown-headed cowbird, a North American blackbird species, lays its eggs in the nests of many other birds.

Eurasian cuckoo

Brown-headed cowbird

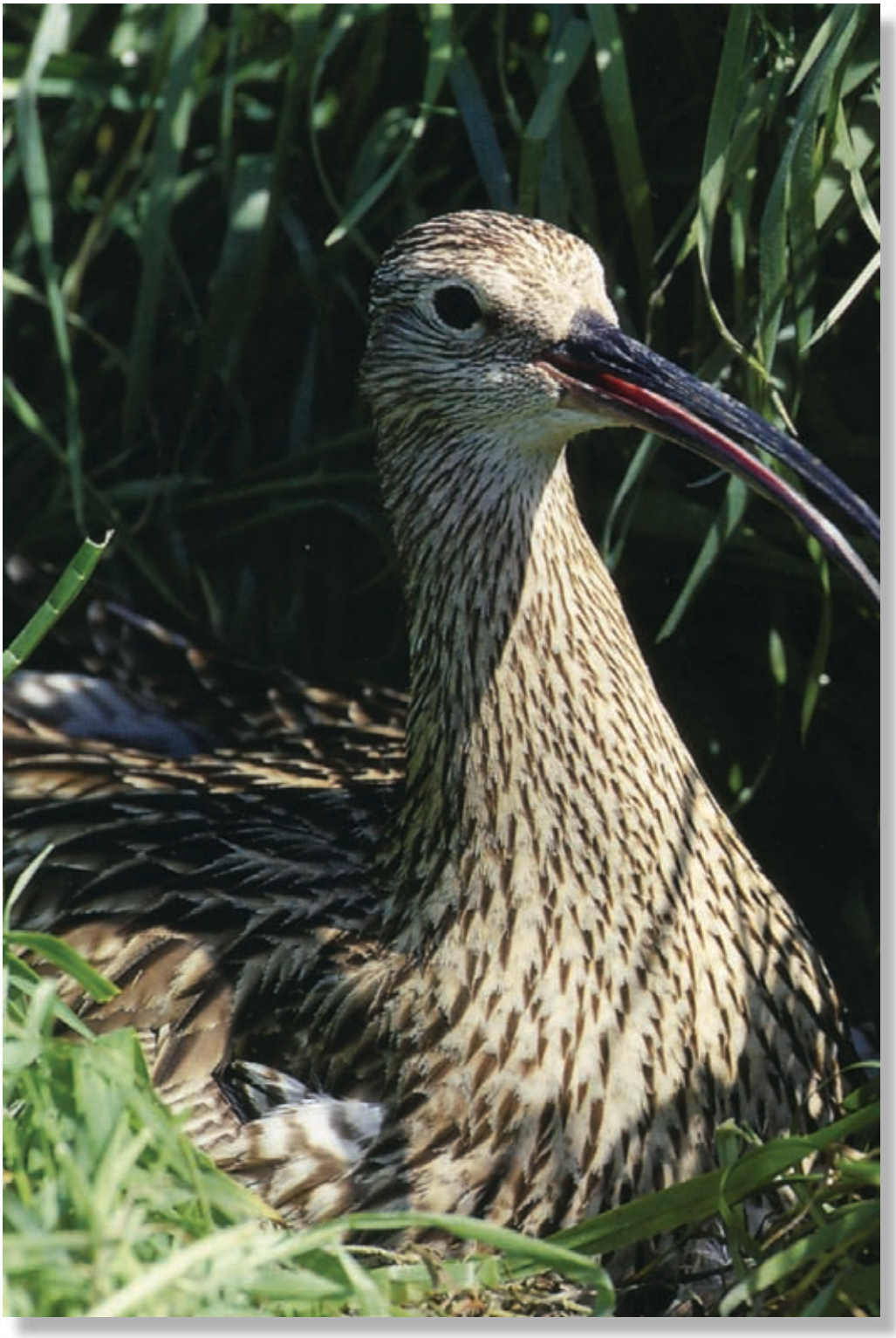
Black-billed cuckoo

Eurasian Curlew

• ORDER •
Charadriiformes

• FAMILY •
Scolopacidae

• GENUS & SPECIES •
Numenius arquata



KEY FEATURES

- Probes deep into mud or soft soil with a long, curved bill to locate and capture prey that is beyond the reach of other ground-probing birds
- Highly effective camouflaged plumage hides it when nesting on open ground
- Moves to a different habitat with changing seasons, migrating between inland sites and estuaries and coasts

WHERE IN THE WORLD?

Breeds from Britain and Ireland across Europe and Russia to northeast China; in winter, local populations migrate to the coasts of Europe, Africa, the Gulf States, India and the Far East

LIFECYCLE

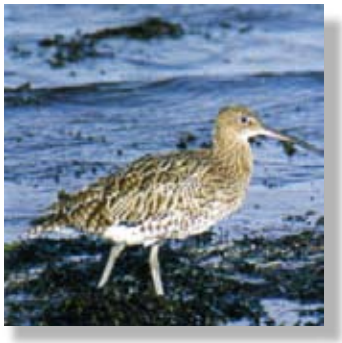
Wielding its long, sickle-shaped bill like a pair of giant tweezers, the Eurasian curlew can extract prey buried deep in mud or earth with surprising delicacy.

HABITAT

Often associated with open terrain in remote regions, the curlew is migratory and freely adapts to a variety of habitats. Its bill is highly specialized, but the bird can change its feeding techniques to take advantage of food provided by each habitat at different times of year.

The Eurasian curlew usually breeds on moorland, peat bogs, marshes and damp grassland, occasionally also breeding on heathland or among sand dunes. Some are even able to use wet meadows and other areas of nonintensive farmland. Birds arrive on their breeding grounds from as early as March and continue to arrive throughout April and early May, depending on the location.

In late summer and fall, curlews leave their nest sites. Most migrate to muddy coasts and estuaries, where there are plentiful supplies of aquatic food during the winter. However, smaller numbers of curlews head for the muddy shores of inland lakes and rivers instead.



▲ **LOW SEASON**
In winter, curlews migrate down to coasts and estuaries.

▼ **SUMMER HABITAT**
Curlews usually spend the summer at inland sites.

FOOD & FEEDING

The curlew's remarkable bill is designed for probing deep into soft ground to locate and extract buried prey, but is also used to pick out food under grass tussocks or from between stones. It can rapidly jab its bill into mud or soil or delicately pick prey from the surface.

Invertebrates are the curlew's main prey and it feeds on a wide variety, including marine worms, earthworms, insects, crabs and mollusks. It also eats berries and seeds, occasionally tackling vertebrate animals, such as small fish and frogs — or even young birds and rodents. This flexible diet enables curlews to live in the different habitats it occupies at various times of the year.

SENSITIVE PROBER

1 Search for clues...
A curlew patrols a muddy estuary, looking for signs of prey, such as small heaps of waste mud worms eject from their burrows.

2 Dig delicately...
Making regular test probes, the curlew plunges its bill deep into the mud, feeling for a concealed worm with its bill's ultra-sensitive tip.

BEHAVIOR

▲ **ONE OF A CROWD**
Curlews gather in large numbers when not breeding.

Outside breeding seasons, curlews form large flocks. By flocking, curlews gain safety as there are more eyes watching for danger. Migrating in flocks is also more efficient than flying alone, as all but the leading bird can fly in the slipstream of the one in front. In wintering areas with limited food supplies, however, individual curlews may defend small feeding territories by "steering" intruders away at the invisible boundaries.

At all times of year, the curlew is a vocal species. It has loud and haunting calls; some are contact calls letting birds in flocks or pairs keep in touch. The loudest are alarm calls, which warn of predators.

3 Make contact...
The bill's upper mandible is flexible and can bend up at the tip, allowing it to open and grab a worm without being withdrawn from the mud.

4 Extract and swallow
Still gripping the prey tightly, the curlew pulls it out of its burrow, washes it free of mud and then swallows with a jerk of the head.

▲ **CALLING ITS NAME**
In addition to its melodic song, the curlew has a loud, eerie call (*courlee*) which gives the bird its name.

DID YOU KNOW?

- **The curlew can swim well, but rarely makes use of this skill.**
- **Before eating a crab, a curlew usually shakes it violently and smashes it on the ground so that it can be swallowed more easily.**
- **Females have longer bills than males and take different prey during migration and in winter to avoid competition.**

CONSERVATION

Over its huge range, the curlew isn't threatened, but European populations have declined due to disturbance or pollution of coastal wintering grounds and from loss of breeding habitat through agriculture and moorland deforestation.

BREEDING

The curlew returns to the same nesting sites and pairs with the same mate every year. The male performs a display flight to mark the boundaries of his territory and reestablish the bond with his mate. He follows a circular route, flying low over the ground, then climbing steeply and hovering, before gliding down to earth with his wings in a V-shape. As he flies, he pours out his bubbling song, which carries far across the open habitats favored for breeding.

After courting, the male makes several shallow nest scrapes. The female chooses one and lines it with dry grasses and feathers. Both parents share incubation and caring for their chicks, which can run and feed soon after hatching. After five weeks or so, they're able to fly.

▼ **CAN YOU SEE ME?**
The eggs, chicks and adults are beautifully camouflaged.

PROFILE EURASIAN CURLEW

The Eurasian curlew's slender, down-curved bill is an adaptable tool that equips the bird to feed in a variety of habitats throughout the year.

FLOCK FORMATION

Outside breeding seasons, curlews gather in flocks of about 25–50 birds, forming larger flocks on migration. They may fly in a long line, but often adopt a V-shaped, or *chevron*, formation. Curlews save energy by flying in each other's wake to take advantage of the slipstream and upwash of air produced by the birds in front.

RUMP

The curlew has a white rump that extends onto its lower back in a triangle. Most visible in flight, this pattern may help curlews keep track of one another when flying in flocks.

PLUMAGE

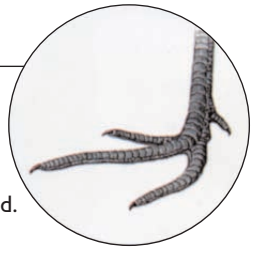
Breeding plumage is mainly brown with dark streaks, which camouflages the curlew against the terrain on which it nests. In winter, its plumage is paler and grayer, with more white on its underparts.

BILL

The down-curved (properly called *decurved*) bill has a sensitive, flexible tip. The curlew pushes it deep into mud to reach worms or thrusts it under tussocks of grass in search of beetles. The female's bill, at about 6" in length, is approximately 1" longer than the male's.

LEGS & FEET

The three front toes are long, which helps spread the bird's weight on soft mud.



VITAL STATISTICS

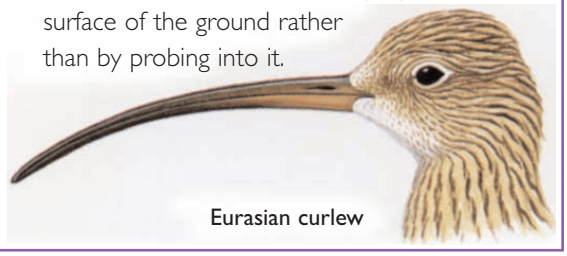
WEIGHT	1–3 lbs.; female larger than male
LENGTH	1.5–2'
WINGSPAN	2.5–3'
SEXUAL MATURITY	2 years
BREEDING SEASON	April–July
NUMBER OF EGGS	2–5, usually 4
INCUBATION PERIOD	27–29 days
FLEDGING PERIOD	32–38 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Worms, mollusks, crustaceans, invertebrates; berries, seeds
LIFESPAN	10–15 years

CREATURE COMPARISONS

The whimbrel (*Numenius phaeopus*) has similar plumage to the curlew and at a distance is easily mistaken for it. However, the whimbrel's head is distinctively marked with a dark eyestripe and a broad brown band across the crown.

Whimbrel

The whimbrel is smaller (only three-quarters the curlew's size) and has a shorter bill and legs. It feeds differently from the curlew, using its down-curved bill to snatch prey from the surface of the ground rather than by probing into it.



Eurasian curlew

RELATED SPECIES

There are 88 species of wader in the family *Scolopacidae*; 8 are curlews. The stone-curlew (below)**, a distant relative of the curlew, belongs to the family *Burhinidae* (thick-knees). Its name comes from its haunting, curlewlike calls and liking for dry, stony habitats.**

Eurasian Kingfisher

• ORDER •
Coraciiformes

• FAMILY •
Alcedinidae

• GENUS & SPECIES •
Alcedo atthis

KEY FEATURES

- Plumage is iridescent and appears to be either blue or green, depending on the light conditions
- Plunges into the water at great speed to catch fish in its long, pointed bill
- Burrows deep into a soft, sandy riverbank to build a secure nesting chamber

WHERE IN THE WORLD?

From the west of Ireland, through much of Europe, parts of Russia and Iran east to India, China, Japan and Southeast Asia; also parts of North Africa

LIFECYCLE

The Eurasian kingfisher is a small bird that makes a big splash in its surroundings — it flashes metallic color in its arrowlike flight and hits the water in a headlong plunge.

HABITAT

The Eurasian kingfisher, often called the river kingfisher, is found in bushy vegetation overhanging clear, slow streams or rivers and quiet lakes. In tropical parts of its range, it can be found in mangroves, swamps and wet grasslands. Whatever its habitat, the kingfisher uses waterside vegetation as a perch to watch for fish.

Apart from the belted kingfisher of North America, the Eurasian kingfisher is the most northerly breeding kingfisher species. When rivers freeze in northern areas, it spends winter along coastal waters, living in harbors, along estuaries or on rocky shores.

▼ **STILL LIFE**
The kingfisher lives by slow-moving waters.

BREEDING

The kingfisher pairs with one mate in the breeding season and a pair bond may last season to season. But it's not uncommon for a male to mate with two or more females.

The nest is an oval chamber at the end of a 3'-long burrow, which the kingfisher digs with its bill in the side of a riverbank. Both birds share the task of incubating the eggs, but only the female sits at night. A female may lay a new clutch of eggs at another nest site before the first chicks have fledged. In this way, a pair may rear 2–3 broods in one season.

▲ **TWO'S COMPANY**
When courting, a pair of kingfishers perches together and calls to each other alternately.

▼ **BREAK OUT**
Born naked and blind, hatchlings are fully feathered in 25 days.

CONSERVATION

Many kingfishers die during the hard winters of northern Europe, but the main long-term threats are water pollution and river management schemes that destroy its habitat.

FOOD & FEEDING

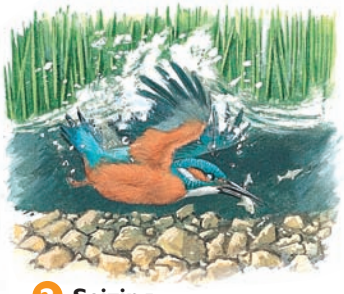
In freshwater, fish of all kinds fall prey to kingfishers (dace, minnows, small chub, pike, sticklebacks and perch). Aquatic insects (dragonfly larvae, water beetles and water bugs) and mollusks, amphibians and crustaceans are also taken.

The kingfisher has been driven away from many aquatic habitats because water pollution has killed the fish. As a result, the presence of the Eurasian kingfisher near a river has come to be a sign that the water is relatively clean.

▶ **TAKING THE PLUNGE**
The kingfisher doesn't stab prey, like this small frog, but grasps it with its open bill.

BOLT FROM THE BLUE

1 Watching…
From a branch on the bankside, the kingfisher watches the water below. If it spots a fish, it bobs its head to measure distance.



2 Seizing…
Diving down at high speed, the kingfisher enters the water above the fish and quickly grabs it with its bill.

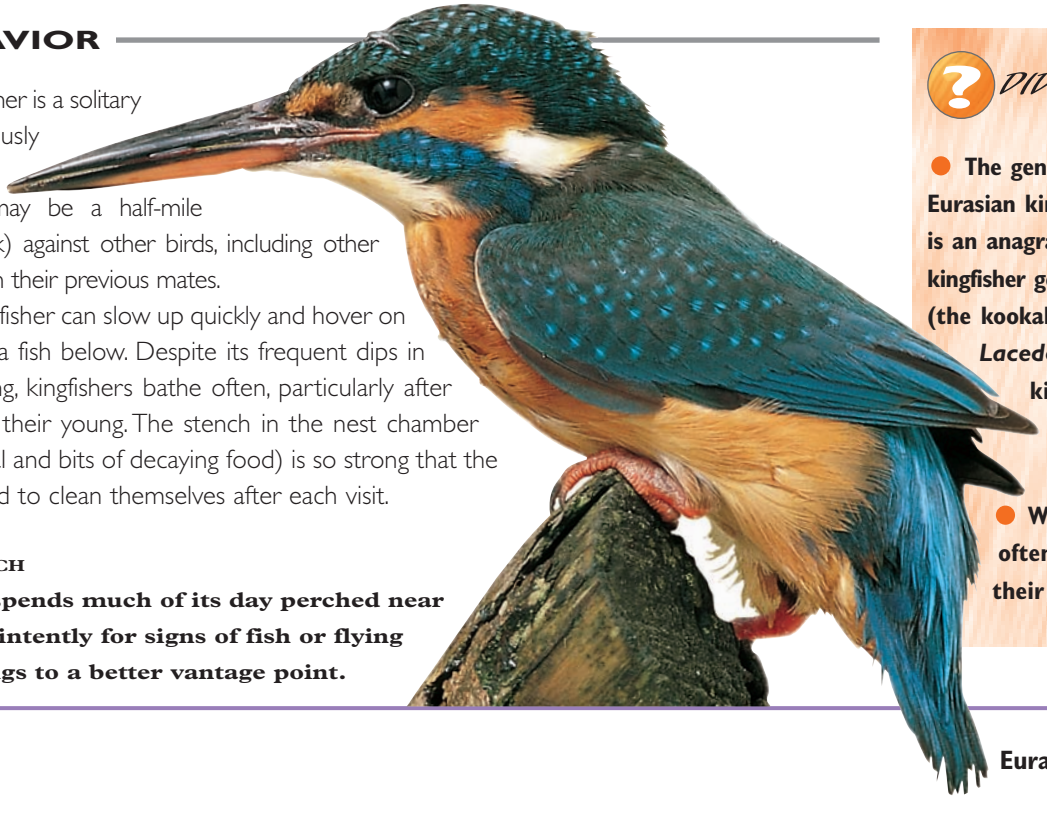
3 Uplifting…
Rising to the surface by flapping its wings, it breaks free of the water with strong downbeats, holding tightly onto its prey.

4 Delivery
A fish is hammered vigorously against a branch to kill it before being eaten at a waterside perch or taken back to the nest site.

BEHAVIOR

In winter, the kingfisher is a solitary bird and vigorously defends its feeding territory (which may be a half-mile stretch of riverbank) against other birds, including other kingfishers, and even their previous mates.

In flight, the kingfisher can slow up quickly and hover on the spot if it sees a fish below. Despite its frequent dips in water when feeding, kingfishers bathe often, particularly after delivering food to their young. The stench in the nest chamber (from fecal material and bits of decaying food) is so strong that the adults feel the need to clean themselves after each visit.



▶ **KEEPING WATCH**
The kingfisher spends much of its day perched near water watching intently for signs of fish or flying on whirring wings to a better vantage point.

DID YOU KNOW?

- **The generic name of the Eurasian kingfisher, *Alcedo*, is an anagram of two other kingfisher genera — *Dacelo* (the kookaburra) and *Lacedo* (the banded kingfisher of Southeast Asia).**
- **Weak fledglings often drown on their first dive.**

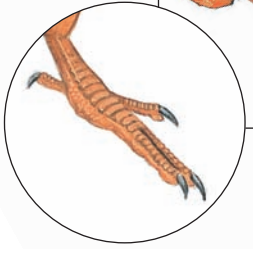
PROFILE EURASIAN KINGFISHER

The Eurasian kingfisher is an expert fisherman, plunging like a jewelled dart at speeds of up to 25 mph to catch prey in the water.

WINGS
Short, broad wings beat rapidly in flight, providing great maneuverability in tight-flying spaces and giving plenty of lift when rising from the water.

PLUMAGE
The plumage is iridescent — it appears to change color depending on the angle of the light striking it. At some angles, the light makes the feathers appear blue, while at others they appear green.

BILL
Long and daggerlike, the bill is used to catch fish and dig into soil in riverbanks when the bird makes its nesting burrow.

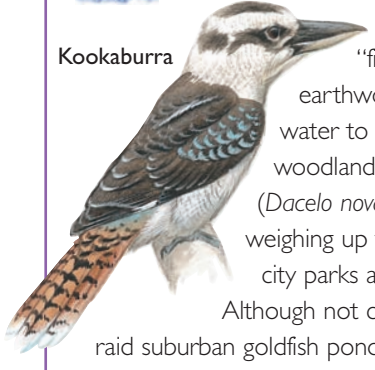


FOOT
The three, small, forward-facing toes on each foot are partly fused together — the middle and outer toes almost form a single unit. This is a condition known as *syndactylism*.

VITAL STATISTICS

WEIGHT	1.3–1.5 oz.
LENGTH	6.5–7"
WINGSPAN	10–10.5"
SEXUAL MATURITY	1 year
BREEDING SEASON	March–July in Europe; March–April in northwest Africa; April–July in India; January–June in Southeast Asia
NUMBER OF EGGS	Up to 10, but usually 6 or 7
INCUBATION PERIOD	19–20 days
FLEDGING PERIOD	24–25 days
TYPICAL DIET	Fish, aquatic insects, larvae
LIFESPAN	Up to 15 years

CREATURE COMPARISONS



Only one-third of all kingfisher species are true "fishers": others have varied diets of insects, snakes, earthworms, frogs, lizards, crabs and scorpions. Instead of diving into water to catch fish, they swoop down from perches in forests and woodlands to pick prey off the ground. The laughing kookaburra (*Dacelo novaeguinae*) of Australia is the largest of all kingfishers, weighing up to 18 oz. Its loud, territorial call sounds like human laughter. It may inhabit city parks and gardens and is common in dry eucalyptus forests of eastern Australia. Although not closely associated with water, it occasionally catches fish and may even raid suburban goldfish ponds. However, its diet mainly consists of snakes, lizards and rodents.

RELATED SPECIES

- **There are over 90 species of kingfisher in 14 genera in the family *Alcedinidae*, including the African pygmy kingfisher, *Ceyx picta*** (below)**, which weighs a mere 0.4 oz. It inhabits Africa's savannah woodlands and hunts insects and amphibians.**

Eurasian Nuthatch

• ORDER •
Passeriformes

• FAMILY •
Sittidae

• GENUS & SPECIES •
Sitta europaea

KEY FEATURES

- A colorful woodland bird that wedges nuts into bark crevices and breaks them open with its bill
- Walks head first down tree trunks — a habit that is unique to the nuthatch family
- Hides surplus food in autumn to help it survive the winter, and defends territory throughout the year

WHERE IN THE WORLD?

Europe and Asia, east to Kamchatka and south into India and Cambodia; isolated populations in Africa and Middle East

LIFECYCLE

The nuthatch may be small and hard to spot, but its presence is often betrayed by the sound of hammering as it cracks open nuts that it has wedged into the tree bark.

HABITAT

▲ **CONES GALORE**
Coniferous forests are home to nuthatches.

The Eurasian nuthatch is one of the most common woodland birds in many parts of its range. It lives in a wide variety of tree cover, from the ancient lowland woods of western Europe to the coniferous forests of Siberia. The nuthatch is especially numerous in areas with plenty of old trees and rotting timber, both of which are home to a host of insects and their larvae.

Oak, beech and sweet chestnut trees provide the nuthatch with a rich supply of nuts in autumn. In northern Russia and central Asia, the bird thrives in thick forests of spruce and pine, and it also occurs in the high cedar forests of northwestern Africa.

FOOD & FEEDING

▲ **SAFECRACKER**
A crevice serves as a vice in which to wedge a nut.

In the spring and summer, the nuthatch's diet consists mainly of beetles, ants, spiders, grubs and caterpillars. The nuthatch picks prey off bark and probes into small cracks to locate food that is out of sight.

The nuthatch often feeds high above the woodland floor, on tree trunks and large boughs or in the spreading branches of the sunlit treetops. It avoids saplings and small tree species and rarely forages on the ground.

DID YOU KNOW?

- **A Eurasian nuthatch uses three types of song and has about 12 calls, each with a different meaning.**
- **Few birds can climb head first down trees like the Eurasian nuthatch. One theory is that this rare skill enables it to spot food items overlooked by other birds.**
- **Unlike the woodpeckers it resembles, the Eurasian nuthatch is not able to drill into living wood.**
- **The Eurasian nuthatch is also known as the nuthack, nut-topper and mud-dabber.**

BREEDING

The nuthatch nests in tree holes made by fallen branches or rotting wood or in old woodpecker holes. Competition for holes is fierce, and a pair must defend its site from other nuthatches as well as starlings, flycatchers, tits and redstarts. The female keeps them out by plastering mud around the hole, making it smaller. This also stops squirrels, martens and other predators from gaining entry and provides protection from the wind and rain.

The female incubates the eggs, insulating them with moss or other material every time she leaves. When the chicks hatch, the female broods while the male brings insects. Young nuthatches fledge after just over three weeks.

CONSERVATION

The Eurasian nuthatch is common in most of its range. Mild winters in northern Europe have enabled it to move into areas where it was rare.

BEHAVIOR

Excitable, aggressive and noisy, the nuthatch is a highly territorial bird. Each pair stays in the same range throughout the year, defending it from neighboring pairs even in winter. Border disputes and fighting are common. The male bird announces ownership of a territory with trilling songs and whistling call-notes. He is loudest from December to late May, but his song can be heard all year.

The nuthatch's unsociable habits extend to its fledglings; they bicker over available perches. But adult nuthatch pairs join mixed feeding flocks of tits and other species.

◀ **CLEARED FOR LANDING**
The nuthatch's short tail enables it to alight directly on a vertical trunk.

▲ **ONE OF MY TURNS**
The nuthatch moves like a small woodpecker.

▼ **CONSTRUCTION SITE**
The female needs 2–3 weeks to build the nest.

EXPERT PLASTERER

1 Selection...
A female nuthatch inspects a hole excavated the year before by a pair of great spotted woodpeckers.

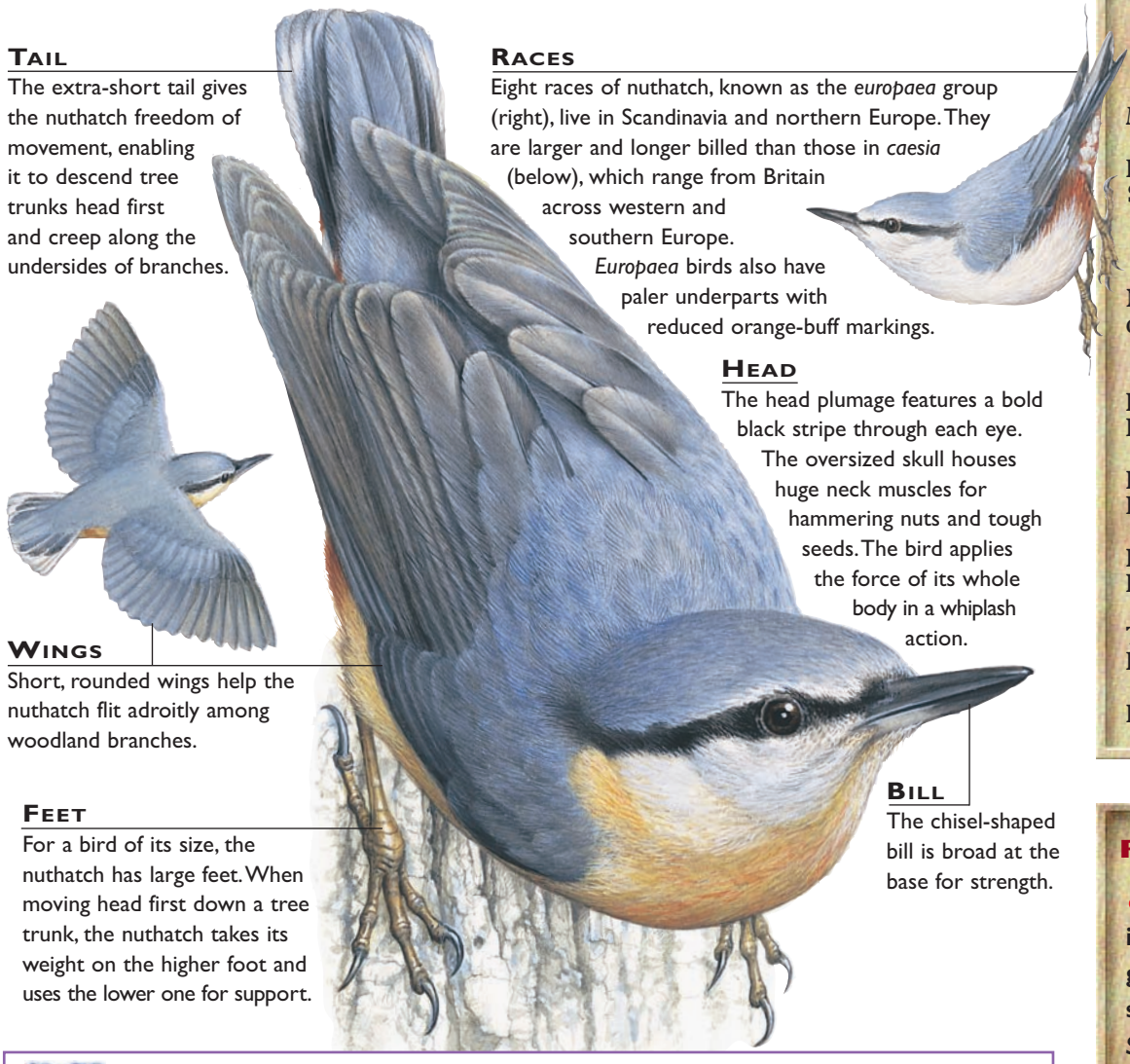
2 Interior decorating...
She repeatedly fills her bill with soft bark flakes, with which she lines the nest interior.

3 Raw material...
The entrance is much too large for a nuthatch, so she collects mud from the bank of a nearby stream.

4 Mud pack
She plasters the mud around the nest, inside and out, until the entrance fits her snugly.

PROFILE EURASIAN NUTHATCH

The Eurasian nuthatch's compact body and extremely strong legs enable it to move across tree trunks and branches in all directions.



TAIL
The extra-short tail gives the nuthatch freedom of movement, enabling it to descend tree trunks head first and creep along the undersides of branches.

RACES
Eight races of nuthatch, known as the *europaea* group (right), live in Scandinavia and northern Europe. They are larger and longer billed than those in *caesia* (below), which range from Britain across western and southern Europe. *Europaea* birds also have paler underparts with reduced orange-buff markings.

HEAD
The head plumage features a bold black stripe through each eye. The oversized skull houses huge neck muscles for hammering nuts and tough seeds. The bird applies the force of its whole body in a whiplash action.

WINGS
Short, rounded wings help the nuthatch flit adroitly among woodland branches.

FEET
For a bird of its size, the nuthatch has large feet. When moving head first down a tree trunk, the nuthatch takes its weight on the higher foot and uses the lower one for support.

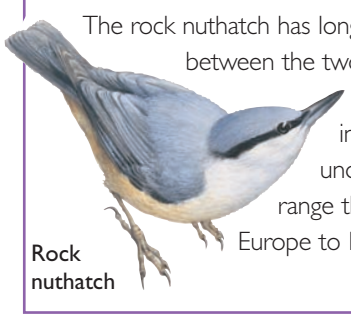
BILL
The chisel-shaped bill is broad at the base for strength.

VITAL STATISTICS

WEIGHT	0.7–1 oz.
LENGTH	About 5.5"
WINGSPAN	9–11"
SEXUAL MATURITY	1 year
BREEDING SEASON	April–July in north; February–June in south
NUMBER OF EGGS	Usually 6–9; sometimes up to 11
INCUBATION PERIOD	13–18 days
FLEDGING PERIOD	23–24 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Insects, seeds and nuts
LIFESPAN	Up to 10 yrs.

CREATURE COMPARISONS

As its name suggests, the rock nuthatch (*Sitta neumayer*) lives on rocky slopes and cliffs. It scales boulders and slabs of rock with the same agility that the Eurasian nuthatch displays climbing trees. The rock nuthatch has longer legs and shorter claws than its relative. A clear difference between the two is their plumage; the rock nuthatch's white underparts darken toward the tail, whereas Eurasian nuthatches in their range have overall orange-buff underparts. The rock nuthatch has a smaller range than the Eurasian nuthatch, from southeastern Europe to Iran. It usually lives in uplands at altitudes as great as 11,000'.



Rock nuthatch

Eurasian nuthatch

RELATED SPECIES

- **The Eurasian nuthatch is 1 of 24 species in the genus *Sitta*. This is the sole genus of the family *Sittidae* and is divided into tree and rock nuthatches. Nuthatches are closely related to the 2 species of sittella in the genus *Neositta*, and to the wallcreeper, *Tichodroma muraria*, the only species in its subfamily, *Trichdrominae*. The wallcreeper climbs using wings as supports.**

Eurasian Oystercatcher

• ORDER •
Charadriiformes

• FAMILY •
Haematopodidae

• GENUS & SPECIES •
Haematopus ostralegus

KEY FEATURES

- A wading bird of coasts, riverbanks and lakesides that forms large flocks in winter
- Breaks open shellfish with its bill or stabs between shell halves and pries them apart
- Forms strong pair bonds, usually staying with the same partner for life

WHERE IN THE WORLD?

Frequents the coasts and some inland areas of Europe, the Middle East, parts of Africa

LIFECYCLE

A familiar sight along much of the world's coastlines, the oystercatcher specializes in feeding on fully grown shellfish — an ability that sets it apart from all other waders.

CONSERVATION

The oystercatcher is common over much of its range and in many places is increasing. In Britain, numbers have grown by more than 50% since the 1960s, to reach about 40,000 pairs.

HABITAT

Although mainly a bird of rocky shores and muddy river estuaries, the oystercatcher is at home in a wide range of coastal habitats. It is found on beaches of sand and shingle, and often frequents low-lying inshore islands and the bases of cliffs. Inland, the oystercatcher nests on shingle banks and sits beside lakes, reservoirs and slow-flowing rivers, and also rough pasture and moors.

Many oystercatchers migrate to warmer areas for the winter. For instance, the vast flocks that cover Britain's salt marshes and estuaries in winter include birds that hail from as far away as Iceland, the Faeroe Islands and Scandinavia.

▶ **MOVING IN**
Because it is versatile in where it nests, the oystercatcher gradually extends its range inland.

BREEDING

▲ **UP IN DOWN**
The chicks are well developed on hatching and are soon on their feet.

After arriving at their breeding grounds, oystercatcher flocks split up into pairs. Each pair establishes a vigorously defended nesting territory. Courtship includes a spectacular display in which a group or pair of birds runs rapidly to and fro with necks outstretched and open bills pointing at the ground, uttering a piping call.

The nest, a depression in shingle, soft sand or turf, is lined with a few flowerheads, dead plants and shell fragments. The female lays a clutch of up to four spotted eggs, and both parents incubate them for about four weeks. The downy chicks leave the nest after a day or two and are fed by both parents. They run among short vegetation, stopping on the spot whenever they hear their parents' alarm calls. They can fly within five weeks.

DID YOU KNOW?

- **In spite of its name, the oystercatcher rarely feeds on oysters. It is not strong enough to open their shells, and oysters usually occur out of reach for this bird.**
- **On moonlit nights, the oystercatcher may feed long after nightfall.**
- **An oystercatcher pair sometimes defends two territories in summer — one for nesting and another for feeding.**

FOOD & FEEDING

The oystercatcher finds food in the intertidal zone and at the water's edge. It deals whelks and limpets a sharp blow with its bill to remove them from rocks before pecking out their flesh.

Mollusks with two shell halves, such as cockles and mussels, are attacked by one of two methods. If a mollusk is underwater with its shells agape, the bird stabs between the gap, then twists, to sever the muscle that closes the shells. If the shellfish's shell is firmly closed, the oystercatcher simply smashes its way in.

MUSSEL BOUND

1 Breakfast in bed…
Scouting a rocky shore, a flock of oystercatchers spots a bed of mussels.

2 Headbanger…
The birds descend and start feeding. To get at the flesh inside, one hammers at a closed pair of shells.

3 Cut it out…
Wedging its bill into the crack it has opened, the oystercatcher slices the shellfish from its casing.

4 Down in one
The mollusk is swallowed and its shell discarded before the bird picks another victim.

BEHAVIOR

▲ **SEASONAL GATHERING**
Living in pairs in the breeding season, oystercatchers assemble in flocks of up to 30,000 birds.

The oystercatcher is extremely wary, and is usually one of the first shorebirds to spot a predator, such as a fox or falcon. During summer, birds that are not sitting on eggs are quick to raise the alarm if danger threatens, screaming to their partner. They chase away any crows and gulls that venture too close before they have a chance to steal any eggs.

A young oystercatcher learns to open mollusks by copying its parents. Adults that specialize in stabbing prey tend to have offspring that act likewise; adults that hammer shellfish produce new "smash-and-grab" specialists. First, chicks practice pecking empty shells and scissoring out the morsels inside. Later, they take opened shellfish from their parents and learn to cut and scoop all the flesh by themselves.

PROFILE EURASIAN OYSTERCATCHER

Thickset for a wader and with a powerful bill, the oystercatcher is well equipped to break into the shellfish, its favorite food.

NAKED AREAS
The bill, legs and feet are pink to orange-red; the bill is always the brightest part.

BILL
The oystercatcher's 3.2"-long bill is strengthened by a bony core, and looks triangular when seen in cross section. Despite having a hard tip to withstand the constant battering against shellfish, the bill is worn and blunt in most adults.

NECK
Huge muscles are attached to the bill, giving the bird a rather stout appearance.

SIZE
The female is slightly larger than the male, with a bill that is about 0.32" longer. This may reduce competition for food in winter by allowing females to target bigger prey.

JUVENILE
The oystercatcher attains full adult plumage in 3–5 years. A young bird has a white half-collar and brownish-tinged upperparts.

FEET
The oystercatcher has three forward-facing toes and slightly webbed feet for support on sand and mud.

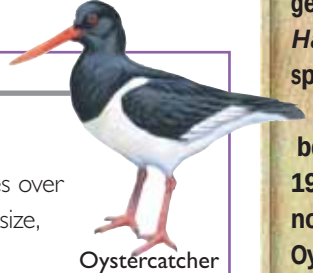
VITAL STATISTICS

WEIGHT	14–22.8 oz.
LENGTH	16–18"
WINGSPAN	32–34"
SEXUAL MATURITY	3–5 years
BREEDING SEASON	April–July
NUMBER OF EGGS	1–4; usually 3
INCUBATION PERIOD	24–27 days
FLEDGING PERIOD	28–32 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Shellfish, crabs, sandhoppers, worms, beetles, insect larvae
LIFESPAN	Up to 35 years

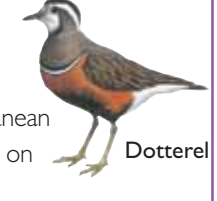
CREATURE COMPARISONS

Male and female oystercatchers look broadly alike, but in the dotterel *(Charadrius morinellus)* species, the female is more colorful than her mate. She has white stripes over her eyes and across her chest, and her orange belly is brighter. In body shape and size, the sexes are similar, and both have a short, stubby bill for snapping up insects and spiders from the ground.

Unlike the oystercatcher, the dotterel is a predominantly inland bird that runs across tundra, moors and mountain plateaus. It breeds in northern Scotland, Scandinavia, Siberia and the mountains of central Europe, and migrates to Mediterranean and North African steppes for the winter. Remarkably fearless, the dotterel sits tight on its eggs when approached, often allowing humans to walk within a yard of its nest.



Oystercatcher



Dotterel

RELATED SPECIES

- **The oystercatcher is 1 of 10 species in the genus *Haematopus*, the sole genus in the family *Haematopodidae*. Another species, the Canary Islands oystercatcher, has not been seen since the 1940s and is probably now extinct. Oystercatchers belong to the large order *Charadriiformes*, which contains many other long-legged bird species, such as snipes, stilts, avocets, sandpipers and plovers.**

Eurasian Robin

• ORDER •
Passeriformes

• FAMILY •
Turdidae

• GENUS & SPECIES •
Erithacus rubecula

KEY FEATURES

- One of Britain's best-loved birds, renowned for its red breast and the sweet song that it warbles
- Common in parks and gardens of northwestern Europe, becoming tame, but elusive elsewhere
- Defends territory, attacking its rivals with great energy, sometimes leading to injury

WHERE IN THE WORLD?

Found throughout Britain (except on Shetland), and across mainland Europe to the Middle East and western Siberia; also occurs in North Africa

LIFECYCLE

Far removed from its cheerful image depicted on Christmas cards, the Eurasian robin has a complicated social life and is ever-ready to fight with others of its kind.

HABITAT

The Eurasian robin thrives in a variety of woodlands, from deciduous forest to graveyards and wooded roadsides. It has spread to parks and gardens, which make an ideal substitute for its native habitat. But the species needs at least some trees and shrubs to provide cover for roosting and nesting.

In the far north and south of its range, the robin often lives in coniferous forests, especially those that have a mossy floor; reedbeds are an occasional winter home.

▲ **FOOD FOR ALL**
Gardens support many robins, thanks to the abundant supply of food.

FOOD & FEEDING

▲ **GARDENERS' FRIEND**
The robin fearlessly hunts insects in town gardens.

Ground-living invertebrates are the robin's main prey. It is fondest of beetles, ants, earwigs, spiders and worms. When foraging, the robin pauses, its head tilted to one side, to scan soil and leaf litter for movement. The bird also keeps watch from perches, including fence posts.

The robin often follows deer and pheasants, snapping up insects disturbed by their progress. It has even learned that tunneling moles drive worms to the surface. In winter, it feeds on berries and seeds.

BREEDING

For the Eurasian robin, the search for a mate begins in late December. The female usually takes the initiative, leaving her winter territory and cautiously venturing into that of a male, whose song becomes loudest and most varied at a time when most birds are silent.

The male may interpret the female's overture as a takeover bid and react angrily. Later, after singing and chasing, he accepts her. But they keep squabbling during the three or four months before nesting.

The female constructs the nest and incubates the chicks, although her mate helps bring food for them. As soon as the young leave the nest, the female lays a new clutch, leaving the male to guard the juveniles.

▶ **SURVIVAL OF THE FITTEST**
Each pair raises two or three broods a year to counter the high mortality rate among chicks.

CONSERVATION

In northwestern Europe, the Eurasian robin has benefited from human expansion. Gardens now substitute for woods that were cut down to create towns and fields, and scraps on bird feeders help more robins survive the winter. But domestic cats have become a major enemy, killing many young birds. The robin's total population is stable or increasing, with 4.5 million pairs in Britain.

BEHAVIOR

▲ **RED ALERT**
A sweet-sounding song is actually a warning to rivals.

ONLY THE STRONG SURVIVE

1 Creature comforts...
A female chooses a secluded spot for her cup-shaped nest of grass and moss. She makes a cozy lining from horsehair and spiders' webs.

2 One by one...
She lays an egg a day for six days, incubating only when she's finished to ensure that the eggs hatch together.

3 Five alive...
Just over two weeks later, five of the eggs hatch. The remaining egg was infertile and did not develop, staying in the bottom of the nest.

4 Dangerous times
The fledglings are unwary, weak fliers. Two soon fall victim to predators, leaving just three — half of the original clutch.

▼ **BAD-TEMPERED BIRD**
The robin threatens other species, such as blue tits.

An aggressive bird, the robin employs a three-stage strategy to defend its territory against a rival. It sings loudly to warn off the intruder, which may respond by entering into a singing "duel." If the opponent continues the challenge, the birds confront each other with orange breasts fully displayed. The intruder usually retreats, but fights do break out and can result in serious injury or even death.

In Britain, the majority of male robins remain on their breeding grounds for life, with the females defending their own separate territories. Birds in the north and east of the species range migrate south in the winter.

DID YOU KNOW?

- **Unusual robin nest sites include empty hats, boots, coat pockets and watering cans.**
- **In medieval times, the robin probably visited the forest camps of traveling woodcutters, eating insects disturbed by the workers.**
- **Some robins become so tame that they feed from the hands of humans. Mealworms, often sold in fishing tackle shops, are a favorite treat.**

PROFILE EURASIAN ROBIN

Usually thought of as a garden bird, the Eurasian robin has a wide range of adaptations for a life spent in woodland, its natural home.

WINGS
Broad, rounded wings help the robin maneuver in tight spaces, such as in woods and dense undergrowth.

SEXES
Sexes look identical and rely on different posture and songs to tell each other apart. Only the male (*right*) performs a territorial song in late winter and spring.

EYES
Large eyes enable the robin to see in poor light. It begins feeding before sunrise and continues after dusk.

TAIL
The robin flicks its tail frequently when perched, and fans it in displays of aggression.

FOOT
Slender toes enable the robin to perch on thin twigs and plant stems.

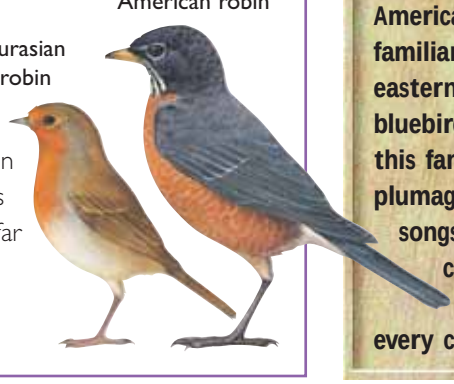
JUVENILE
A dull-brown, mottled plumage camouflages the young robin until it grows its first adult plumage in the autumn.

VITAL STATISTICS

WEIGHT	0.5–0.7 oz.
LENGTH	5.5"
WINGSPAN	8–9"
SEXUAL MATURITY	1 year
BREEDING SEASON	March–July
NUMBER OF EGGS	2–8; usually 4–6
INCUBATION PERIOD	12–15 days
FLEDGING PERIOD	10–18 (usually 12–15) days
BREEDING INTERVAL	2 or 3 broods a year
TYPICAL DIET	Invertebrates; seeds, berries and scraps in winter
LIFESPAN	Usually less than 2 years

CREATURE COMPARISONS

The American robin (*Turdus migratorius*), a species of thrush, was so named because its reddish belly plumage reminded the first European settlers in North America of the more familiar "redbreast" back home. At 10" long, it is by far the larger of the two species, with a proportionately stouter bill and longer, stronger legs. The American robin is found in a wide range of lightly wooded habitats, including large parks and gardens, even in cities. It migrates south for the winter, reaching as far as Central America and the Caribbean islands. American robins are occasionally spotted in Britain and western Europe; these are migrants blown off-course across the Atlantic Ocean by storms.



RELATED SPECIES

● **The robin is 1 of 6 species in the mainly European genus *Erithacus*, which is part of the family *Turdidae*. This large family of birds includes the American robin and familiar thrushes, such as eastern and western bluebirds. Most birds in this family have bright plumage and striking songs. *Turdidae* contains about 300 species, found on every continent.**

Eurasian Sparrowhawk

• ORDER •
Falconiformes

• FAMILY •
Accipitridae

• GENUS & SPECIES •
Accipiter nisus

KEY FEATURES

- A fierce, dashing, but secretive hawk that ambushes small birds, often catching them in the air with its talons
- Favors densely wooded countryside studded with fields and other open areas, where its hunting technique comes to the fore
- Many populations crashed due to use of pesticides in farming, but are now recovering

WHERE IN THE WORLD?

Widespread in Europe, the northwestern tip of Africa and northern Asia, as far east as Japan; wintering range extends into southern and eastern Asia

LIFECYCLE

Twisting and turning through trees or darting over garden walls, the sparrowhawk combines aerial agility with the element of surprise in order to seize unwary prey.

HABITAT

The sparrowhawk is primarily a woodland bird. Trees provide its nesting and roosting sites and, perhaps most importantly, the cover from which it ambushes passing birds.

The hawk is also found in open or cultivated country, punctuated by pockets or lines of trees, such as thickets, orchards and tall hedgerows. Farmland next to thick woodland offers the most productive hunting grounds.

▼ **GOING INTO TOWN**
The sparrowhawk often visits parks and gardens.

BREEDING

▲ **HARD FURNISHINGS**
The nest is made of sticks, twigs and bark.

In spring, sparrowhawks form pairs and perform aerial displays over a territory to reinforce the pair bond. The nest itself is located 20–40' above the ground, and the birds often use an old crow's nest as the foundation for the new structure.

Initially, the female incubates and broods the hatchlings while the male hunts to feed the family. But as the young grow, the female is forced to hunt, bringing back larger prey to the hungry chicks. The young become independent when they are about 8 weeks old.

FOOD & HUNTING

Most of the Eurasian sparrowhawk's victims are small, and include sparrows, finches and tits. Thrushes are also common prey, and the larger female can catch wood pigeons, jays and even gamebirds such as the partridge, grouse and pheasant. Both sexes take small mammals, lizards and large insects from time to time.

When hunting in woodland, the hawk moves from perch to perch until it sights prey before dashing in for the kill. Its aerial skills enable it to twist and turn rapidly as it swoops among branches and twigs, often concealed from view until it strikes. The bird also hunts in the open, utilizing ground contours and patches of cover to approach its prey. Usually it first locates its prey before flying, but the bird also makes prospecting flights or sweeps low along hedges and woodland edges and between farm buildings, hoping to flush out birds with its sudden appearance.

Having snatched a small bird in its talons, the hawk flies directly to cover. There, it settles on a favorite plucking post, such as a low tree stump, and removes legs, wings and other inedible parts before eating.

CONSERVATION

Until the middle of the 20th century, the Eurasian sparrowhawk was heavily persecuted by gamekeepers, who mistakenly regarded it as a threat. In the 1950s and 1960s, the introduction of pesticides devastated sparrowhawk populations. Females began to lay eggs with thin shells; this resulted in widespread breeding failure. However, strict controls on pesticide use have enabled the bird to recolonize former haunts.

BEHAVIOR

Outside the breeding season, the sparrowhawk is a solitary bird. It keeps to a localized stretch of countryside, visiting a small number of favored hunting grounds. The species is seldom territorial, and neighboring hawks cruise the same hunting grounds — but at different times of the day, to avoid competition. When not ambushing prey, the bird flies high above the treetops, soaring on broad wings as it scans the countryside for flocks of small birds.

Where the sparrowhawk breeds in the far north, it migrates several thousand miles to reach wintering grounds in southern Europe, North Africa and southern Asia.

▼ **FLYING ACE**
Talons outstretched, the sparrowhawk fans its tail to brake rapidly before landing.

DID YOU KNOW?

- **Only about 10% of sparrowhawk hunts are successful.**
- **A pair of sparrowhawks must make about ten kills a day to feed chicks — which adds up to perhaps 500 birds during the entire breeding season.**
- **The sparrowhawk has been known to prey on its own species, and the temporary nature of the pair bond is such that, when the breeding season is over, the smaller male may well be at risk from his former mate.**

◀ **SPECIALIST TOOL**
The bill plucks and dismembers prey.

▲ **BRIGHT-EYED KILLER**
The sparrowhawk hunts over 120 British species.

WINGED EXECUTIONER

1 Target sighted...
From a concealed vantage point, a sparrowhawk watches intently as a flock of sparrows flies past.

2 Cruise missile...
As the flock settles, the hawk sets off silently, making use of cover to screen its approach.

3 Caught in the bath...
Bursting over a wall, the hawk surprises the house sparrows as they indulge in a dust bath.

4 Instant death
The victim is seized and killed with a blow from the talons. The flock scatters in confusion.

PROFILE EURASIAN SPARROWHAWK

The Eurasian sparrowhawk's short, rounded wings and long tail enable it to skim over hedges and weave through dense woodland at high speed.

EYES

The sparrowhawk's vision is extremely sharp, enabling it to detect small birds deep within a shaded wood.

JUVENILE

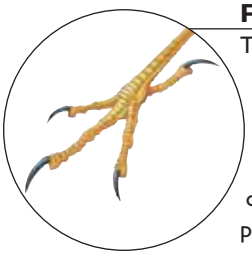
The young bird has dark-brown upperparts with a reddish tinge. The underparts are marked with brown bars.

BILL

The strong, hook-tipped bill enables the sparrowhawk to dismember its prey, pulling off and discarding feathers, bones and other inedible body parts.

PLUMAGE & SIZE

The two sexes look very different. The female is dark brown above and barred gray below, whereas the smaller male (*right*) has slate-gray upperparts and russet bars below.



FEET

The bird's principal weapons are its yellow feet armed with fearsome claws. Most of its victims are killed in the moment of capture by the gripping power of the talons.

VITAL STATISTICS

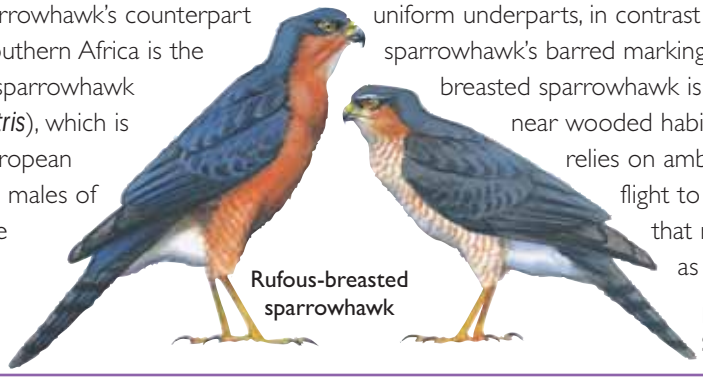
WEIGHT	Male 4–6 oz.; female 6.5–11 oz.
LENGTH	11–15"
WINGSPAN	22–28"
SEXUAL MATURITY	1 year
BREEDING SEASON	April–June
NUMBER OF EGGS	2–7
INCUBATION PERIOD	33–35 days
FLEDGING PERIOD	24–30 days
BREEDING INTERVAL	Annual
TYPICAL DIET	Small to medium-sized birds
LIFESPAN	8 years

RELATED SPECIES

- The Eurasian sparrowhawk and closely related species, such as the rufous-breasted sparrowhawk, Japanese sparrowhawk, goshawk and Cooper's hawk, all belong to the genus *Accipiter*. Together with other hawks, kites, harriers, buzzards, eagles and Old World vultures, they form the family *Accipitridae* — the largest family of birds of prey, with a total of 64 genera and 237 species.

CREATURE COMPARISONS

The Eurasian sparrowhawk's counterpart in eastern and southern Africa is the rufous-breasted sparrowhawk (*Accipiter rufiventris*), which is larger than its European cousin. While the males of both species have similarly gray upperparts, the African bird has uniform underparts, in contrast to the male sparrowhawk's barred markings. The rufous-breasted sparrowhawk is found in or near wooded habitats, where it relies on ambush and swift flight to catch birds that may be as large as a pigeon.



Rufous-breasted sparrowhawk

Eurasian Sparrowhawk

Eurasian Swift

• ORDER •
Apodiformes

• FAMILY •
Apodidae

• GENUS & SPECIES •
Apus apus

KEY FEATURES

- When not nesting, the swift spends all of its time in the air—it even mates while flying
- Feeds by trawling through swarms of insects
- Gathers in huge, screaming flocks when feeding and before migration
- Migrates, even sleeps on the wing at up to 6,000'

WHERE IN THE WORLD?

Breeds in Europe, North Africa and the Middle East to central Asia, extending as far east as northern China; migrates to Africa in winter

LIFECYCLE

Slim-bodied and long-winged, the Eurasian swift is the embodiment of aerial agility. Capable of any task in the air except nesting, it hunts, sleeps — even mates aloft.

HABITAT

The Eurasian swift's home is the sky itself, and this adaptable bird may be seen over almost any habitat except dense woodland. It favors areas of human settlement, which offer ideal nesting sites. Most swifts nest under the eaves of houses, in church towers or on other high buildings. Lakes and gravel pits also attract large flocks of swifts because they provide ideal breeding conditions for the flying insects on which the birds feed.

The swift also uses cliff ledges and tree hollows to nest. Such sites are also ideal resting sites during the Eurasian swift's long migrations to and from Africa, where it spends the winter.

▼ **TREE HOUSE**
A tree hollow provides a snug nest site for chicks.

CONSERVATION

The Eurasian swift is hunted in its African winter quarters, but it has benefited greatly from human settlement. However, its numbers are difficult to census and its status is uncertain.

BEHAVIOR

BREEDING

The Eurasian swift nearly always pairs for life. At the breeding grounds, adult birds select a nest site, often one used before. They collect feathers, straw, grasses and leaves that have drifted into the air and glue these materials to the nest site with saliva.

Eggs are incubated by both parents and hatch after about three weeks. If the fledging period is prolonged by poor weather and food shortage, young swifts lapse into a sluggish, inactive state. However, a long fledging period actually works in the swift's favor, since the young birds must be fully capable of feeding for themselves as soon as they fly from the nest.

LOVE IS IN THE AIR

1 Choose a partner...
Swifts are unique in their ability to mate in flight. Courtship begins with the male chasing a female through the skies.

2 Returned affection...
The female's first response to her pursuer is to raise her wings in a steep V, holding them almost vertically above her back.

Outside the breeding season, the swift lives on the wing. It sleeps at altitudes up to 6,000', cruising slowly to conserve energy. Indeed, the swift's long wings suit it so well to life in the air that it never lands on the ground by choice. If accidentally grounded, a young swift has difficulty taking off again — if it can't, it will starve.

Although agile, the swift is not notably fast. It flies at about 25 mph on migration and at 14 mph when feeding — slower than a sparrow. However, the swift's habit of flocking among dense insect swarms makes feeding easy. On warm spring evenings and later when offspring have fledged, large, screaming flocks fly near the colony. In poor weather, swifts may wheel over lakes, where they scoop up flying insects forced low by rain or cold.

◀ **WINGED WONDER**
What it lacks in speed, the swift makes up in agility.

3 Closing in…
The female glides down, pursued by the male, who is drawing closer. She quivers her wings, then resumes normal flight.

4 Contact
The male alights on the female's back as they fall into a shallow glide. Both birds spread and twist their tail feathers as they mate.

FOOD & HUNTING

▲ **DUSK FLIGHT**
Swifts flock to feed on dense insect swarms.

The swift feeds exclusively in the air, snapping up insects at low altitudes. Its wide gape (mouth) lets it catch several insects at a time. Where great insect swarms gather, flocks of swifts slice through the swarm, consuming as many as they can.

When it has nestlings to feed, an adult gathers insects in its throat; these gradually accumulate into a tight food ball. There may be 200 to 1,000 insects (0.04–0.08 oz.) in one food ball. The adult flies to the nest and passes the food ball to a nestling and returns between 6 to 40 times each day to keep the entire brood fed.

The swift's diet reflects the daily availability of prey locally. Flies are important in many habitats, as are flying ants, wasps, bees, beetles, bugs, butterflies, moths, flying aphids and spiders drifting on silken threads in the air. In parts of Europe, for example, more than 500 invertebrate species have been recorded as prey for the swift.

DID YOU KNOW?

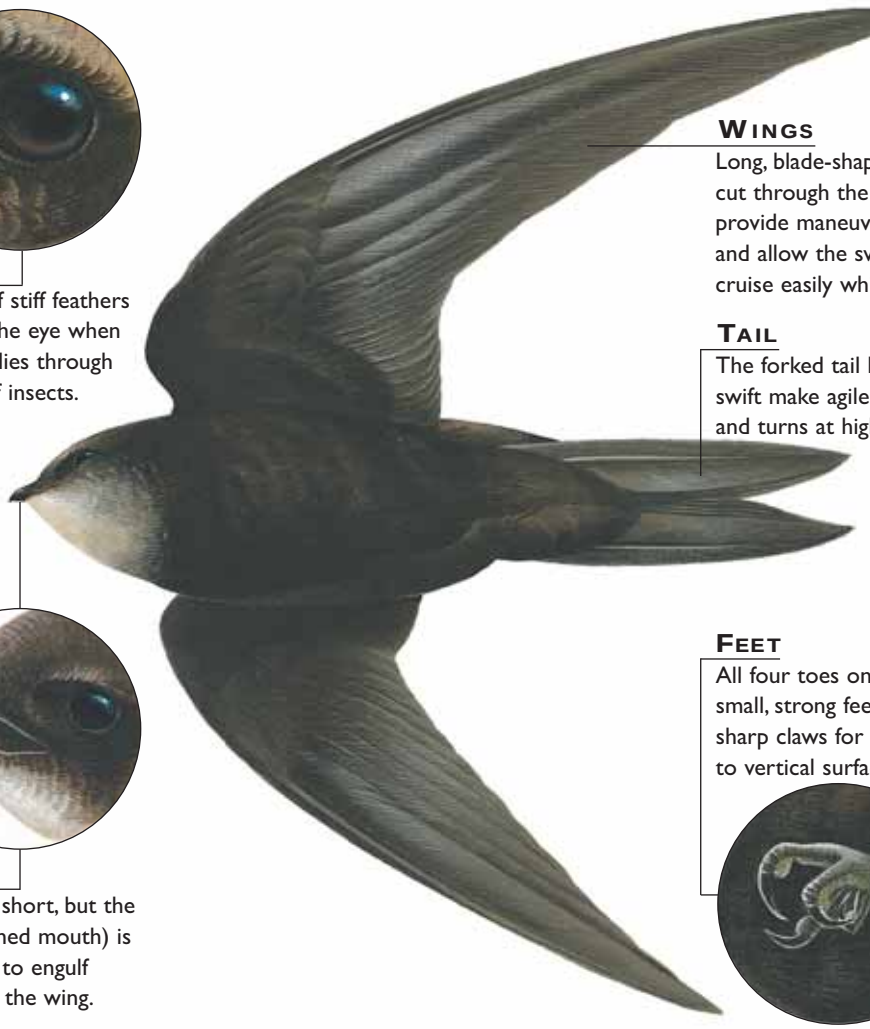
- **One swift species was clocked in Asia at 199 mph, but this is now dismissed as inaccurate recording.**
- **Some swift species use echolocation to find their way to nesting sites in caves.**
- **The swift is host to a parasitic louse fly that drinks its blood. At about 0.3" long, the fly is about 1/20th the bird's size. This would be like having a shore crab on your body—and a bird may harbor 20 flies!**

PROFILE EURASIAN SWIFT

The swift's scythelike wings help it twist and turn after prey, and its wide gape forms an efficient scoop for flying insects.

EYE
A patch of stiff feathers protects the eye when the swift flies through swarms of insects.

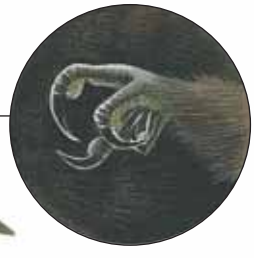
BILL
The bill is short, but the gape (opened mouth) is very wide to engulf insects on the wing.



WINGS
Long, blade-shaped wings cut through the air to provide maneuverability and allow the swift to cruise easily while asleep.

TAIL
The forked tail lets the swift make agile twists and turns at high speed.

FEET
All four toes on the small, strong feet have sharp claws for clinging to vertical surfaces.



VITAL STATISTICS

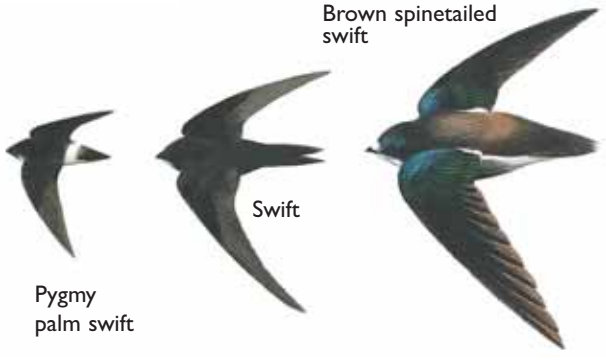
WEIGHT	1.3–1.5 oz.
LENGTH	6–6.5"
WINGSPAN	16.5–19"
SEXUAL MATURITY	1–2 years, but may not breed until 4 years old
BREEDING SEASON	Late April through early August
NUMBER OF EGGS	1–4; usually 2–3
INCUBATION PERIOD	19–27 days (usually 20)
FLEDGING PERIOD	5–8 weeks
BREEDING INTERVAL	Annual
TYPICAL DIET	Wide variety of flying insects and spiders
LIFESPAN	Up to 21 years

RELATED SPECIES

● Although they look like swallows and martins, swifts aren't related to them. The swift family *Apodidae* is placed in the order *Apodiformes* with four species of tree swift in the family *Hemiprocnidae* and 330 or more hummingbirds in the family *Trochilidae*. The 82 species in the swift family are classified in three subfamilies: *Apodinae*, *Cypseloidinae* and *Chaeturinae*.

CREATURE COMPARISONS

Swifts are found throughout the world in temperate and tropical regions. Although broadly similar in appearance, the species differ considerably in size. They range from the tiny pygmy palm swift of South America, which barely reaches 4" in length, to the brown spinetailed swift that measures more than 8".



Eurasian Woodcock

• ORDER •
Charadriiformes

• FAMILY •
Scolopacidae

• GENUS & SPECIES •
Scolopax rusticola

KEY FEATURES

- Feather pattern looks like dead leaves
- Feeds after dark in ditches and bogs
- Eyes are on the sides of its head so it can watch for danger from behind while feeding
- Female feigns injury to lure a predator away from her hidden young

WHERE IN THE WORLD?

Found from the Atlantic islands off North Africa, east to Japan; in winter, many woodcocks fly south to India, China, Korea, and Vietnam

LIFECYCLE

To protect itself from its many enemies, the ground-nesting woodcock has evolved a subtly patterned plumage that provides this secretive bird with a cloak of invisibility.

HABITAT

▲ **CAN YOU SEE IT? Camouflage conceals the woodcock superbly.**

The woodcock lives in a secret world of trees and rotting leaves, favoring oak, sycamore, and cherry with brambles and other shrubs growing thick on the ground. It also lives in pine-woods and other conifer stands, as well as damp heaths. Because it probes for worms, the woodcock needs access to wet hollows and ditches, where soft soil makes it easier to feed at night.

In fall, many woodcocks migrate south to warm, food-rich habitats. Birds of northern Europe spend winters in Britain, France, the Netherlands and Spain. Migrating woodcocks may cross European coasts, landing exhausted on sand dunes or heaths.

FOOD & FEEDING

The woodcock rouses itself in the evening to forage alone. For those that stay behind in winter, when the ground is hard and worms are out of reach, it may walk the forest floor by day, searching for berries and seeds, even a few scraps of flesh from dead birds.

Normally, however, the woodcock sinks its long, straight bill into the soft, deep soil and leaf mold, probing until it touches something it can eat. The gentle bobbing up and down movement makes it even harder to spot among trembling leaves and swaying twigs.

Once the woodcock has found an edible morsel, it pulls it from the ground and snaps it up. If the prey is small enough, the bird eats it without even withdrawing its bill from the soil.

DID YOU KNOW?

- **More than half of all woodcocks die before they are a year old. In parts of northern Europe, as many as three-quarters of those that hatch die within the first few months.**
- **A chick can walk around and pick at food close to the nest within a few hours after hatching.**
- **Woodcocks almost always feed alone. Groups of young stay together only for one or two weeks after they learn to fly.**

BEHAVIOR

The woodcock's key to secrecy lies in being active mainly at night and in crouching low if approached. It can feed entirely by touch in pitch darkness among long vegetation, inside ditches or under the leaves of ferns and brambles. In poor winter weather, however, it may move into open places to forage.

The bird is most conspicuous in the early summer, performing low courtship flights over the trees at sunset. Even then, it may only be visible as a silhouette against the sky.

HIDE AND SEEK

1 Feed…
A female and chicks peck for food, close to their nest in the forest. While feeding, she keeps watch all-around for predators.

2 Hide…
A fox arrives. The woodcock and her chicks instantly crouch down so their plumage merges with the surrounding leaf litter…

▲ **Cold comfort**
The snows of winter drive many woodcocks south to sunnier countries.

3 Trick…
…but the fox finds them. The female flies away in a haphazard manner, feigning a broken wing, to lead the fox away from her chicks.

4 Escape
Just in time, the woodcock flies up and eludes the fox. When the coast is clear, the bird returns to her chicks at the nest.

BREEDING

In spring, the male performs a special flight known as "roding" to advertise his presence to females in the area. He flickers over the treetops along regular routes, uttering croaking grunts and sharp whistles. Sometimes, the flight is also performed by a male to warn rivals away from his "patch." Males often chase each other, calling loudly or even fighting.

After the female has paired and mated, she lays her eggs on the ground among vegetation. The male woodcock may then leave her to find another mate.

Woodcock chicks start life covered in downy, mottled plumage that helps to conceal them from danger. Although the young birds can peck at food on their first day, their bills are still short, so they rely on an adult to bring them food. The chicks can flutter their wings at 10 days old, and fly properly at 15 to 20 days. They finally leave the nest only two or three weeks after hatching from the egg.

▲ **Sitting tight**
The female's camouflage allows her to brood safely.

▼ **Up and away**
The chick grows rapidly; the power of flight lets it escape ground predators.

CONSERVATION

The woodcock is considered a game bird; many are shot for sport every winter. Summer is usually a less difficult time for the woodcock, although very hot, dry weather can affect local populations because the birds need access to muddy feeding areas. Stretches of dense woodland are also important habitats, as are the habitats of its southern winter grounds. Because much of the remaining woodlands of Europe and Asia are protected, the woodcock's future is almost certainly secure.

PROFILE EURASIAN WOODCOCK

The secretive woodcock relies on its mottled plumage to hide among the leaf litter while it keeps a lookout for danger with its large, dark eyes.

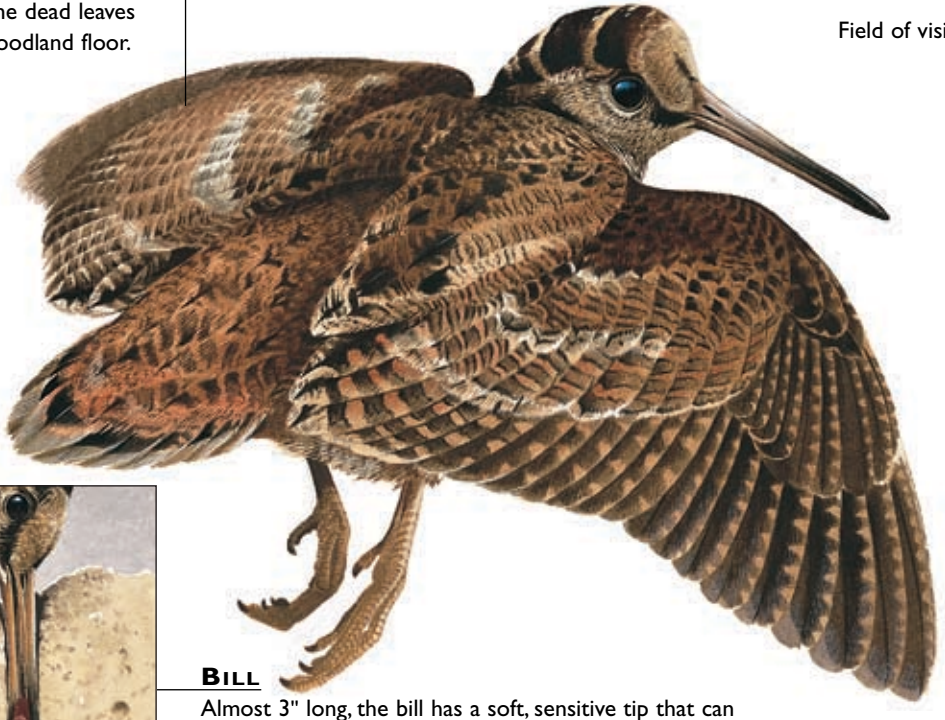
PLUMAGE

Upper parts are marked with brown, gray and buff in a pattern that makes the bird almost impossible to spot against the dead leaves of the woodland floor.

EYES

The eyes are on the sides of its head so it can see all-around without moving. A wide field of vision is vital to a ground-nesting bird, helping it spot predators.

Field of vision



BILL

Almost 3" long, the bill has a soft, sensitive tip that can feel prey underground. When the bird finds something edible, it bends back the upper mandible of its bill to open the tip and grip the prey, before pulling it from the soil.

VITAL STATISTICS

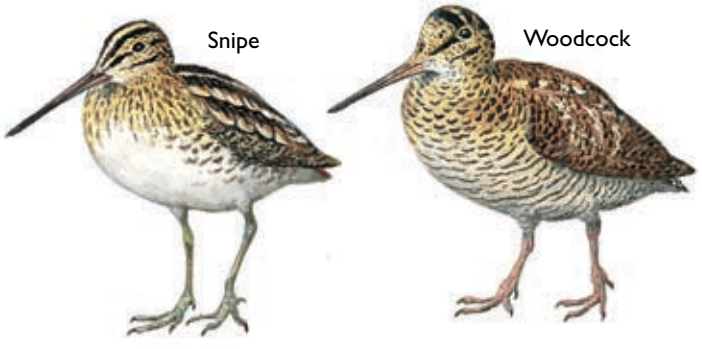
WEIGHT	8–14 oz.
LENGTH	14"
WINGSPAN	About 24"
SEXUAL MATURITY	Female 1 year, male 2 years
MATING SEASON	March through July
NUMBER OF EGGS	2–5
INCUBATION PERIOD	22 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Earthworms, beetles, insect larvae, crickets; some berries when the ground is frozen
LIFESPAN	12–15 years

RELATED SPECIES

● There are six species of woodcock in the family *Scolopacidae*, including the American woodcock, *Scolopax minor*, and the small Amami woodcock, which is found only on the Ryukyu Islands in the Pacific Ocean. Members of this family (most are shorebirds), include curlews, ruffs, sandpipers, snipes, and turnstones. These species typically breed in the Northern Hemisphere, flying south for the winter.

CREATURE COMPARISONS

Woodcocks and snipes belong to the *Scolopacidae*, a family whose members typically have long legs and a long, straight bill used for probing soft ground. Woodcocks spend much time in woods, while snipes prefer damper areas. Woodcocks therefore have proportionally shorter legs and bills than snipes.



European Starling

• ORDER •
Passeriformes

• FAMILY •
Sturnidae

• GENUS & SPECIES •
Sturnus vulgaris

KEY FEATURES

- One of the world's most successful birds; thrives in the U.S. and many cities in Europe and Asia
- Bold and boisterous; in winter it gathers into huge, noisy roosting flocks
- Song is a mixture of trills and rattles — it also mimics other birds and mechanical sounds

WHERE IN THE WORLD?

Britain and mainland Europe, and much of Asia; introduced in- North America, South Africa, Australia and New Zealand

LIFECYCLE

Often despised for its domineering ways, the European starling compensates with the dramatic beauty of its aerial maneuvers as it gathers in vast flocks on winter evenings.

HABITAT

▲ **DIGGING THE GARDEN**
The starling scans lawns and flowerbeds for food.

Few birds are as adaptable as the European starling. It thrives from Arctic tundra to the Australian Outback, and breeds at altitudes of up to 6,600'. In the U.S., it is as much at home in New York City parks as it is on cattle ranches of the west.

The starling occurs in cities, suburbs and lightly wooded country, but rarely enters dense forest unless attracted there by plagues of caterpillars or flying ants. The bird generally avoids evergreen plantations, except when it is roosting. The starling prefers open spaces in which to feed, but it may frequent coastal marshes and rocky shores.

BREEDING

LIFE IN THE CITY

1 Builder at work...
The male builds the nest before finding a mate. He uses straw, grass and small twigs to construct the foundations.

2 Soft furnishings...
Attracted by the male's display, a female-lines the nest with moss and feathers. The male may also add some fresh leaves or flowers.

DID YOU KNOW?

- **A superb mimic, the starling is very closely related to the mynah of Asia.**
- **Flocks of starlings are called "murmurations."**
- **In 1890, 120 starlings were released in the United States. The North American population now numbers many millions.**

BEHAVIOR

The European starling is unpopular with many people because of its apparent greed and aggressiveness when fighting over scraps at bird feeders — but such traits contribute to its success as a species. Alert and wary, the bird seldom becomes tame, even in towns.

By living in flocks, the starling increases its chances of spotting and avoiding predators. The greatest congregations assemble at dusk in winter, when flocks leave their feeding grounds to join a communal roost. Like a vast, billowing cloud, they wheel across the sky, swirling in unison before landing. The noise increases as each flock flies in, adding more warbles and whistles to the clamor.

Reedbeds are favorite roost sites, although the fragile stems often collapse under the weight of so many birds.

▶ **STARLING SWARM**
Flocking starlings are an awe-inspiring sight.

CONSERVATION

The European starling has spread with the growth of cities, but has suffered in the country due to pesticides and modern farming methods. The U.S. population is stable, but the British population has declined since the 1970s.

The male starling's choice of nest site varies by habitat, but it is always located in a cavity. In cities, many nests are built in holes in buildings or under the eaves of roofs. Natural sites include tree holes made by woodpeckers and tunnels excavated by sand martins; the starling often evicts other species from their new nests. The bird also occupies crevices in cliffs and rocks.

Once he has built the nest, the male attracts a female with a frenzy of singing and wing fluttering. After mating, and while the female incubates the eggs, the male may build another nest, to which he attracts a second female. He helps rear the two broods simultaneously.

Both sexes feed the chicks, which signal hunger with loud calls and gaping, yellow mouths. The young continue to beg after leaving the nest, often tripping in their eagerness to be fed.

3 Synchronization…
The female delays incubation until her clutch is almost complete. She leaves the nest unguarded between the laying of each egg.

4 Opportunism
Another female finds the nest and replaces an egg with one of her own. This often occurs during nest-site shortages.

FOOD & FEEDING

▲ **SUCCESSFUL HUNTING**
Nestlings need the protein provided by insect food.

The starling's diet consists mainly of insects and other invertebrates. When autumn arrives, it turns to berries, soft fruit and grain, together with peanuts, bread, and other bird-feeder scraps. These foods sustain the bird throughout the fall and winter when other food is scarce.

The starling has a special method for unearthing prey. Highly developed jaw muscles enable the bird to force open its bill after pushing it into the soil and snatching prey. The bird also follows grazing animals in search of insects disturbed by their hoofs.

The starling's most spectacular hunting method can be seen in summer, when it swoops, twists and glides to catch flying insects.

PROFILE EUROPEAN STARLING

Swift and direct in flight, the European starling has short, triangular wings and a stubby tail that give it the look of an arrowhead.

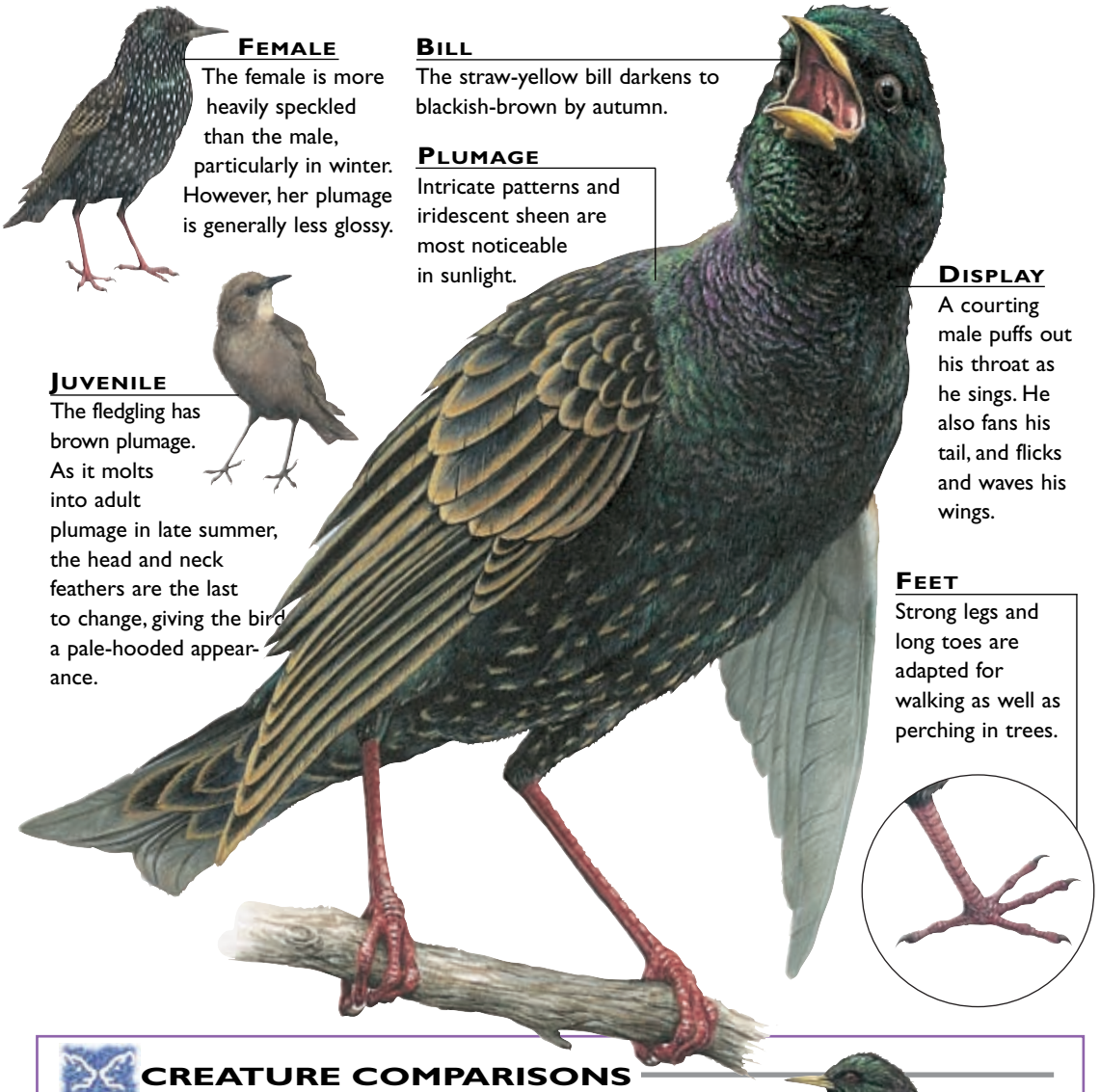
FEMALE
The female is more heavily speckled than the male, particularly in winter. However, her plumage is generally less glossy.

BILL
The straw-yellow bill darkens to blackish-brown by autumn.

PLUMAGE
Intricate patterns and iridescent sheen are most noticeable in sunlight.

DISPLAY
A courting male puffs out his throat as he sings. He also fans his tail, and flicks and waves his wings.

JUVENILE
The fledgling has brown plumage. As it molts into adult plumage in late summer, the head and neck feathers are the last to change, giving the bird a pale-hooded appearance.

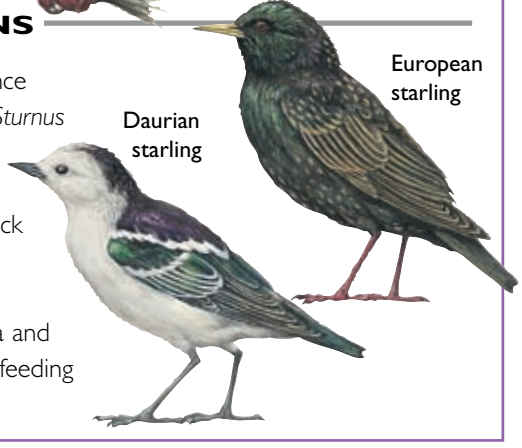


FEET
Strong legs and long toes are adapted for walking as well as perching in trees.

CREATURE COMPARISONS

In contrast to the European starling, which at a distance appears to be a uniform black, the Daurian starling (*Sturnus sturninus*) looks predominantly white from afar. Its pale-gray head and underparts are set off by a patchwork of purple, green, brown and buff on its back and wings. At 7" long, it is smaller than the European starling but shares its cousin's jaunty, upright stance.

The Daurian starling breeds in northeastern China and adjoining parts of Russia, before migrating to winter feeding grounds in tropical southeastern Asia.



VITAL STATISTICS

WEIGHT	2.5–3 oz.
LENGTH	8.5–9"
WINGSPAN	15–17"
SEXUAL MATURITY	1–2 years
BREEDING SEASON	April–June
NUMBER OF EGGS	4–7
INCUBATION PERIOD	11–15 days
FLEDGING PERIOD	20–22 days
BREEDING INTERVAL	1–2 broods a year
TYPICAL DIET	Insects, worms, fruit, seeds
LIFESPAN	Up to 20 years

RELATED SPECIES

● **The European starling is 1 of 16 species in the genus *Sturnus*, including the rosy-colored starling, *S. roseus* (below), a native of Asia and southeastern Europe. Starlings are in the family *Sturnidae*, which includes grackles and oxpeckers.**

Feral Pigeon

• ORDER •
Columbiformes

• FAMILY •
Columbidae

• GENUS & SPECIES •
Columba livia

KEY FEATURES

- One of the first birds to be domesticated by humans, it now exploits human settlement
- Descended from a coastal pigeon, it substituted concrete for cliffs in its new urban environment
- Has thrived wherever humans have taken it, adapting easily to new countries and climates

WHERE IN THE WORLD?

All continents except Antarctica; introduced into North America in the 17th century; most abundant where human populations are densest

LIFECYCLE

The feral pigeon owes its worldwide success to humans, yet it repays us with pollution. For many cityfolk, however, the pigeon provides a much-loved link with the natural world.

HABITAT

▲ **HOME FROM HOME**
The pigeon has given up the clifftop habitat of its ancestors for city rooftops.

The feral pigeon is essentially a town bird, using buildings as artificial cliffs and people as providers of food, so it's not surprising that the largest populations are found in huge cities. It frequently enters subways and train-station concourses, just as its wild counterpart uses caves for nesting and roosting. City parks are favored foraging grounds.

Some pigeons live a more rural life, where barns become their homes. Others, especially those in areas (such as coasts and deserts) inhabited by the rock dove, have reverted to a truly wild existence, living with native birds on cliffs or rocky outcrops.

CONSERVATION

In a rare twist to the usual conservation story, humans are trying to protect their own environment from the mess and diseases caused by pigeons. It has become so abundant because of humans that its sheer numbers are causing concern. Most attempts at controlling the bird have failed.

FOOD & FEEDING

The pigeon will eat more or less anything offered by humans and whatever it finds in the streets. City squares, where feeding pigeons is a tradition for city folk, serve as fly-through restaurants for thousands of birds; bread is usually at the top of the menu.

Although the pigeon is largely vegetarian, some will take fat and cooked meat; many also like chocolate. Such an artificial diet lacks the calcium needed for egg production, so breeding birds will eat loose mortar on buildings for its lime content.

In rural areas, the pigeon forages for seeds, including spilt grain, and sometimes damages crops. It's a potential health hazard when it finds its way into grain stores and contaminates cereals.

LIVING ON EASY STREET

1 Searching...
The pigeon's day begins when it leaves its roost with food on its mind. With luck, it will find a human willing to share a sandwich.

2 Feeding...
The pigeon is often tame enough to take crumbs from the hands of kindly passersby — often even perching on heads and shoulders.

BREEDING

After courting and mating, pigeon pairs usually nest in a roof space or on an open ledge. The male brings twigs, stems and sometimes garbage to the female, which arranges them into a flimsy platform.

The pigeon feeds its young on a liquid food made in its *crop* (throat pouch). Because this cropmilk is nutritious, the young, unlike plant-eating birds, don't need insects for protein. As a result, the pigeon can breed year 'round and not simply in insect-rich months.

The young pigeon (*squab*) pushes its wide, soft bill into an adult's throat for the milk. As the squab grows, its downy coat is replaced by feathers; its bill hardens and shortens.

◀ **REARED ON THE ROOF**
The squabs (chicks) are reared by both parents.

3 Drinking…
A blocked drain is a welcome watering hole. The pigeon can drink by sucking, so doesn't need to tip its head back between sips.

4 Nurturing
Refreshed, the parent returns to its nest on a ledge to feed its hungry youngsters on their special diet of cropmilk.

▲ **Any time, anywhere**
The pigeon can breed any time of year and may raise a brood every two months.

DID YOU KNOW?

- **In World War II, falcons were shot in England because of fears that they would kill pigeons bringing messages from France.**
- **Some "fancy" pigeons bred by humans have a tiny bill and bulging forehead and can't feed their chicks, which have to be fostered by "natural" birds.**
- **The Romans fattened pigeons for food in special towers called *columbaria*.**

BEHAVIOR

Feral creatures are domesticated stock that—through escape, straying or deliberate release by humans—have established viable populations in freedom. Many have had to adapt to conditions far removed from their natural habitat. It's this process of adaptation that has molded much of the behavior of the feral pigeon.

The pigeon's success is due mainly to its affinity to humans. It was first domesticated probably in Ancient Egypt, when wild rock doves started to breed in homes and people discovered that the plump chicks made good eating. Today, the pigeon has stayed where conditions suit it best, leading to large flocks in cities the world over.

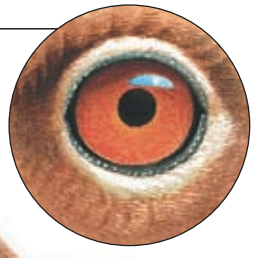
Buildings provide sheltered communal roosts and secure breeding sites. The pigeon's habit of nesting in dark roof spaces mirrors its ancestors nesting in cliff holes.

▼ **Slaking a thirst**
A city square fountain is a ready source of water.

PROFILE FERAL PIGEON

The feral pigeon has variable plumage, having been the subject of cross-breeding programs for more than 3,000 years.

EYES
Eyes are red. Some birds have prominent bare eye rings, inherited from domesticated pigeons.



FLIGHT
Long wings and powerful flight muscles make the feral pigeon a swift flier.

BILL
Nostrils are set in a fleshy bulge (*operculum*) above the short, stout and strong bill.

PLUMAGE
Reddish-brown birds derive mostly from homing pigeons. Many other birds have blue-gray plumage, often with black or white "checker" markings.

TAIL
Long tail provides an efficient rudder during high-speed flight. The male fans out his tail feathers when courting.

CREATURE COMPARISONS

The rock dove is the wild ancestor of pigeons and is barely distinguishable from the feral pigeon. It inhabits coasts and deserts, nesting in caves and on rocky outcrops. Larger than the feral pigeon, the woodpigeon is common in woodland and urban areas. The Victoria crowned pigeon, forest dweller of New Guinea, is the largest of all pigeons. It's more than 30" long and weighs 5 lbs.

Rock dove

Feral pigeon

Woodpigeon

Crowned pigeon

VITAL STATISTICS

WEIGHT	7–14 oz.
LENGTH	11–14"
WINGSPAN	23–27.5"
SEXUAL MATURITY	6–12 months
BREEDING SEASON	All year
NUMBER OF EGGS	2
INCUBATION PERIOD	16–19 days
FLEDGING PERIOD	35–37 days
BREEDING INTERVAL	3–6 clutches each year
TYPICAL DIET	Garbage, bread, grain and other seeds
LIFESPAN	Up to 16 years

RELATED SPECIES

● **Feral pigeon and wild rock dove are the same species — one of nearly 300 in a wide-ranging family that has no close relatives. Some pigeons are little bigger than a sparrow; others are the size of a large chicken. The passenger pigeon, *Ectopistes migratorius*, which numbered millions at the time of European settlement in North America, had been hunted into extinction for its tasty flesh by 1914.**

Flightless Cormorant

• ORDER •
Pelecaniformes

• FAMILY •
Phalacrocoracidae

• GENUS & SPECIES •
Phalacrocorax harrisi

KEY FEATURES

- Wings have evolved into small appendages, useless for flight
- Feeds mainly by diving in the waters near its isolated Galapagos Islands habitat
- Often rests with its stubby wings spread out to dry, as do birds that fly
- Relies on its strong, webbed feet for swimming and diving

WHERE IN THE WORLD?

Found only on the rocky shorelines and inshore waters of Fernandina Island and Isabela Island, 2 of the 13 main islands in the Galapagos; total range is limited to less than 250 miles of coastline

LIFECYCLE

Having lost the ability to fly, the flightless cormorant now permanently resides on the Galapagos Islands and is rarely found more than a half mile from its breeding grounds.

HABITAT

The Galapagos Islands are home to many unique animal species found nowhere else in the world, including the flightless cormorant. These islands lie in the Pacific Ocean about 600 miles off the eastern coast of South America. The flightless cormorant is limited to only Fernandina Island and the western and northern coasts of Isabela Island, 2 of the 13 islands of Galapagos.

The flightless cormorant favors a relatively cool, dry climate. It feeds exclusively on marine life in the cold, food-rich inshore waters, and shelters and nests along the rocky coastlines.

▲ **ISLAND HOME**
Once capable of flight, the flightless cormorant now only swims and walks around the beautiful Galapagos Islands.

DID YOU KNOW?

- **The El Niño event of 1982–1983 reduced the flightless cormorant's population by half, but 18 months later, their numbers were back to normal.**
- **In 1835, Charles Darwin used his observations of the Galapagos Islands when constructing his theory of evolution for the book *On The Origin of Species*.**

FOOD & HUNTING

The cormorant is an efficient daytime hunter with a voracious appetite. It feeds mainly on fish, octopus, squid and eel, along with the occasional invertebrate and crustacean. The bird dives and expertly swims after its prey. The indigestible parts of its prey, such as scales and bones, are regurgitated as pellets. The cormorant feeds at least once per day and normally does so alone, but, where food is abundant, large flocks can form.

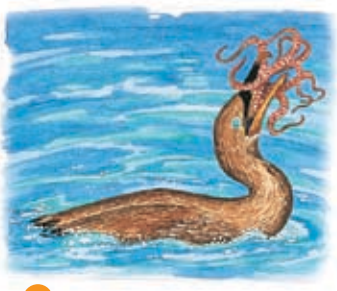
BREEDING

DIVE BOMBER

1 Dive…
With a little leap, the flightless cormorant dives from the shoreline into the cold water in search of food.

2 Swim…
Using its powerful feet for propulsion, the cormorant spots an octopus and quickly changes direction to catch it.

3 Pursuit…
Although it speeds off, the octopus is no match for the cormorant, which uses its hooked bill to catch and hold its prey.



4 Gulp
The cormorant returns to the water's surface and maneuvers the octopus by tilting back its head and gulping it down.

Breeding occurs throughout the year, but peaks from March to September. Unlike most cormorants, which begin courtship on land, the flightless cormorant starts its mating display on the water. This aquatic dance, which includes neck raising and bill movements, occurs from 10 days to 6 weeks before egg laying; the pair bonds at the nest site just before mating.

The female lays from 1–4 eggs in a large nest made of seaweed. Both sexes share incubation duties; the eggs then hatch after about 35 days. Born naked and helpless, chicks are fed regurgitated food by the parents and fledge at about 60 days. Relatively few chicks survive to adulthood, though: breeding success is low due to predators, such as feral dogs, which kill chicks and eat eggs.

◀ **ROCKY START**
The chicks start to swim after one month.

CONSERVATION

The flightless cormorant has been classified as vulnerable by the IUCN. This species has suffered tremendous declines with the introduction of predatory mammals such as feral dogs. These dogs now pose the biggest threat to nesting birds. The flightless cormorant is also accidentally killed in traps and nets used for catching lobsters and tuna. The population is estimated to be around 900–1,200 individuals.

BEHAVIOR

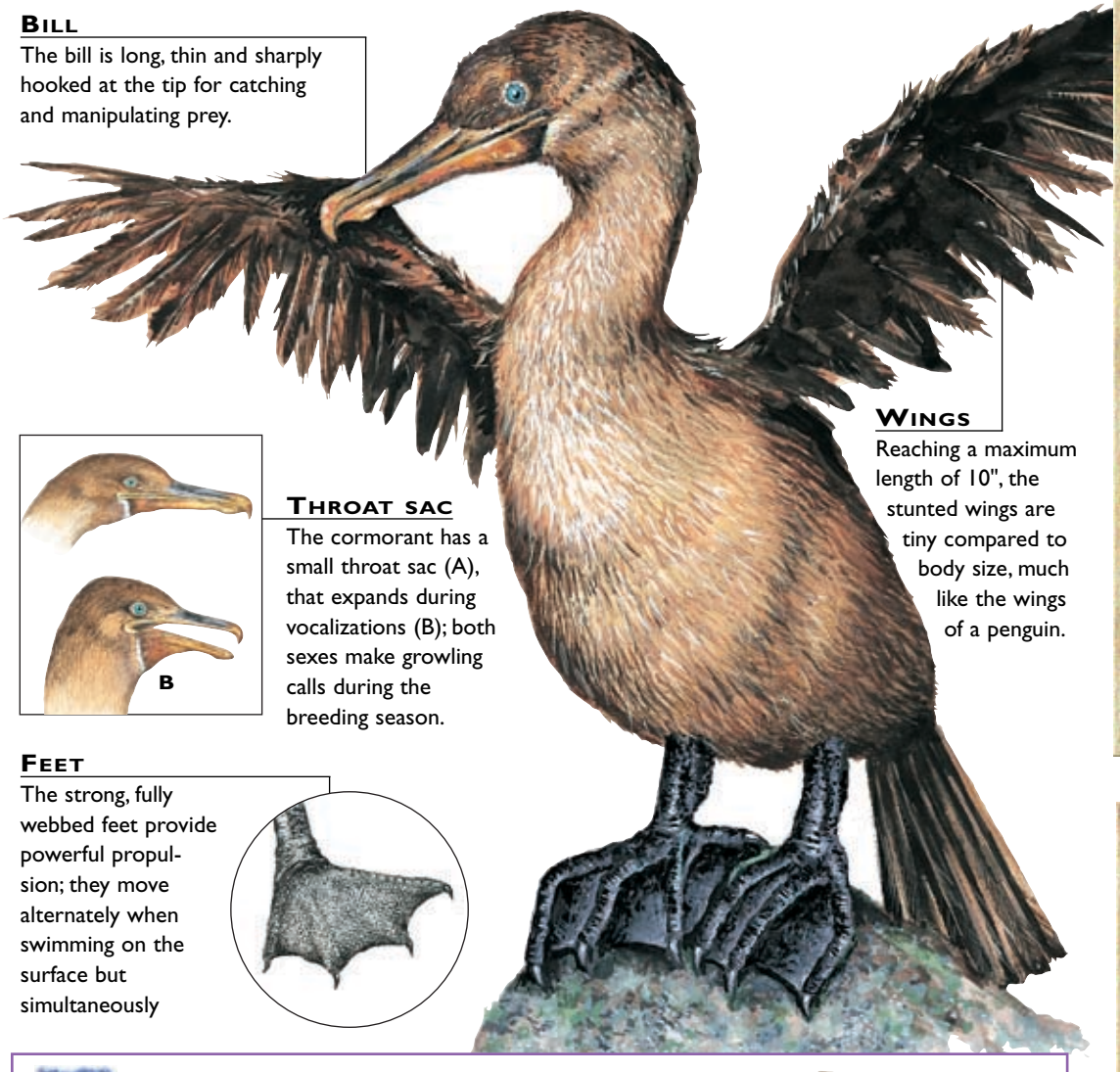
With an extremely limited range, the flightless cormorant has undergone several adaptations. The mild climate of the Galapagos means it doesn't need to migrate south in the winter; with abundant food nearby, it doesn't travel great distances to eat; and predators for many centuries were few. Thus, over time, the wings of this cormorant have become greatly reduced and are now about the size of penguin flippers. While the flightless cormorant has totally lost the power of flight, it has become a skilled swimmer and developed stronger feet than other cormorants. On land, the flightless cormorant waddles clumsily due to the shortness of its legs and its large, webbed feet; underwater it is swift and graceful.

▲ **NOISY NEIGHBORS**
The flightless cormorant associates in small colonies of up to 12 breeding pairs and their offspring.

PROFILE FLIGHTLESS CORMORANT

Unable to fly, the flightless cormorant uses its wings to maneuver easily underwater and pursue favorite foods, such as squid.

BILL
The bill is long, thin and sharply hooked at the tip for catching and manipulating prey.



WINGS
Reaching a maximum length of 10", the stunted wings are tiny compared to body size, much like the wings of a penguin.

THROAT SAC
The cormorant has a small throat sac (A), that expands during vocalizations (B); both sexes make growling calls during the breeding season.

FEET
The strong, fully webbed feet provide powerful propulsion; they move alternately when swimming on the surface but simultaneously

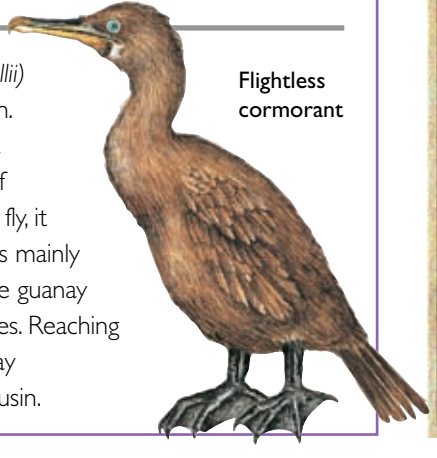
VITAL STATISTICS

WEIGHT	5.5–9 lbs.
LENGTH	35–40"
SEXUAL MATURITY	2 years
BREEDING SEASON	All year, but mainly March –September
NUMBER OF EGGS	1–4; usually 2–3
INCUBATION PERIOD	About 35 days
FLEDGING PERIOD	About 60 days
BREEDING INTERVAL	Usually 1 year, but may breed twice per year
TYPICAL DIET	Fish, eels, squid and octopus
LIFESPAN	Unknown

CREATURE COMPARISONS

Guanay cormorant

The guanay cormorant *(Phalacrocorax bougainvillii)* has a much wider range than its flightless cousin. It lives along the Pacific coast of South America from Peru to Chile and on the Atlantic coast of Argentina. Although the guanay cormorant can fly, it lives entirely in a marine environment and feeds mainly by diving, much like the flightless cormorant. The guanay cormorant feeds entirely on fish, such as sardines. Reaching a length of 30" and a weight of 7 lbs., the guanay cormorant is much smaller than its flightless cousin.



Flightless cormorant

RELATED SPECIES

● **The flightless cormorant belongs to the order *Pelecaniformes,* which contains tropicbirds, pelicans, gannets, boobies, darters and frigatebirds. There are65 species in the order, but the cormorant family, *Phalacrocoracidae,* is the largest, with 39 species in only 1 genus. Relatives include the great cormorant, *Phalacrocorax carbo* and the bank cormorant, *P. neglectus.***

Galapagos Ground-Finches

• ORDER •
Passeriformes

• FAMILY •
Emberizidae

• GENUS •
Geospiza

KEY FEATURES

- A genus of small, mostly seed-eating birds that spend the-majority of their time on the ground
- Species differ in body size and-shape-of bill, but are similar in overall shape
- All evolved from a single ancestor that flew to the Galapagos Islands thousands of years ago

WHERE IN THE WORLD?

All six species are confined to the Galapagos Islands in the Pacific Ocean; straddling the equator, the islands lie 600 miles west of Ecuador

LIFECYCLE

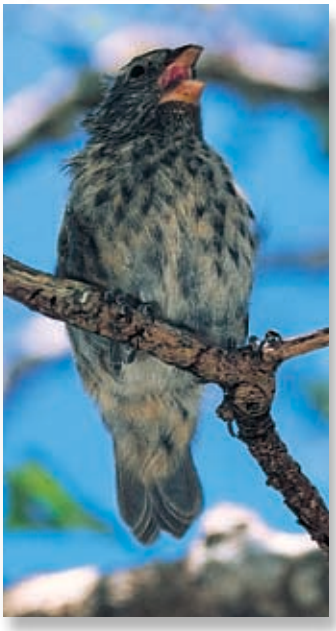
Evolved from a single species to fill several empty feeding niches, the Galapagos ground finches provide a fascinating insight into the evolution of island wildlife.

HABITAT

▲ **ROCK-HOPPING**
Ground finches are common in rocky thickets.

There are 24 islands and numerous smaller islets in the Galapagos archipelago, and ground finches occur on nearly all of them. As their name suggests, the birds spend much of their time on the ground but may also forage in vegetation. On mountainous islands, the finches avoid dense, high-altitude tree cover, and are more common in the coastal scrubland. Elsewhere, except where predators have been introduced, the birds are widespread. Much of the islands' vegetation is deciduous, coming into leaf and flower in the wet season to provide a short-lived bonanza of food. A few plants, like the *Opuntia* cactuses, flower and offer food throughout the year.

BEHAVIOR



▲ **ARBOREAL ANTICS**
Ground finches seek refuge from predators like the Galapagos hawk, short-eared owl, barn owl and various snakes.

Active by day, Galapagos ground finches spend most of their waking hours searching for a variety of food. Outside the breeding season, they often form flocks, sometimes of more than one species. Occasionally, as many as 400 of the birds may gather together.

Galapagos ground finches display a fascinating variety of behavior. On Hood Island, which has large areas covered by gravel, the cactus finch digs up hidden seeds by pressing its forehead and the bridge of its bill against a large stone and using its feet to push away smaller pebbles. The Wenman Island sharp-beaked finch follows the begging calls of booby nestlings in the hope of scavenging fish scraps from around their nests.

CONSERVATION

About 97% of the Galapagos Islands is a national park: the area is better protected than almost any other archipelago in the world. Because they are small, ground finches have never been of much interest to humans as food; their greatest threat comes from introduced mammals. Goats cause habitat loss through overgrazing, while cats hunt the finches.

BREEDING

Ground finches time their breeding to coincide with the bounty brought by the rains. Within six weeks of the first rainfall, most pairs have already raised their first broods and continue to breed until the rains end. Many small ground finches breed through the dry season, when there is light rain in the uplands where they nest. In the wettest years, populations of ground finches boom.

Males build spherical nests from grasses, usually in the branches of a tree or prickly pear cactus, and help the females line them with grasses, feathers and lichens. While the female incubates the eggs, the male provides her with food. For 14–28 days after leaving the nest, fledglings depend on their parents-for food. Later they begin to take soft seeds while their bills harden, ready for dealing with tougher varieties.

▶ **HARD-KNOCK LIFE**
It may take two years before juveniles can open seeds as efficiently as adults.

DID YOU KNOW?

- **The different bill shapes of the Galapagos ground finches may have inspired-Charles Darwin to write *On-The Origin of Species,* in-which he-put forth his-theory of evolution by natural selection.**
- **Unlike mainland birds, Galapagos ground finches have no fear of mammal predators, including cats, because none originally occurred on their remote island home.**

FOOD & FEEDING

Galapagos ground finches exhibit a diversity of feeding habits that is reflected in the shape, size and curvature of their bills. The large ground finch has a massive, thick bill to crush large, tough seeds, while the small ground finch has a more delicate bill, suited to its diet of soft seeds, berries, nectar and insects. The medium ground finch, midway between the two in body and bill size, eats average-sized seeds. Cactus finches shun seeds and feed mostly on the fruits and flesh of prickly pear and other cacti.

The sharp-beaked finch has the most unusual feeding habits of the Galapagos birds. As well as plant matter and insects, it eats fish scraps dropped by seabirds, breaks open birds' eggs to get at their contents and even drinks other birds' blood.

▲▼ **NECTAR MEAL**
The two species of cactus finch have a longer, more pointed bill than their seed-eating cousins.

WINNERS & LOSERS

1 Bound to satisfy…
A sharp-beaked ground finch approaches a blue-footed booby, a bird many times its size.

2 Vampire bird…
The finch pecks sharply at the booby's foot, and eagerly laps up the-blood flowing from the wound.

3 Higher purchase…
Giant tortoises go to places where ground finches abound and adopt a special posture, an invitation...

4 Ticking off
...to be cleaned of parasitic ticks under the reptile's shell. A passing finch soon obliges and tucks in.

PROFILE GALAPAGOS GROUND FINCH

Biggest of all the Galapagos finches, the large ground finch has evolved a massive bill to exploit a food source beyond the reach of other species.

MALE

Like all Galapagos ground finches, the male large ground finch is initially brown. But with molts, he gradually builds up an-entirely black plumage. The-female remains brown throughout her life.

WINGS

The rounded wings give the bird-adequate lift but, like all members of its genus, the large ground finch is a clumsy flier, mainly because of the reduced length of its tail.

TAIL

The large ground finch's tail is short and stumpy, making it-nearly useless in flight, but it serves as an effective counterbalance as the bird hops around.

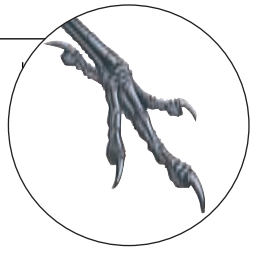
BILL

The large ground finch has the biggest bill of all the Galapagos finches. Hefty, thick and notched for grip, it-enables the finch to break open the largest and toughest seeds. The bills of all finches are black in the breeding season and pale at-other times.

Species illustrated:
Large ground finch,
Geospiza magnirostris (female)

FEET

Four splayed toes provide a platform when the finch stands on the ground, and can be curled around a twig or branch when the bird is perching.



VITAL STATISTICS

WEIGHT	0.35–1.4 oz., depending on species
LENGTH	Up to 6.6"
SEXUAL MATURITY	1 year
BREEDING SEASON	Jan.–May; some species year-round
NUMBER OF EGGS	1–5, usually 3
INCUBATION PERIOD	11–14 days
FLEDGING PERIOD	About 15 days
BREEDING INTERVAL	1 month
TYPICAL DIET	Seeds, plant matter; insects and blood from wounds
LIFESPAN	Unknown

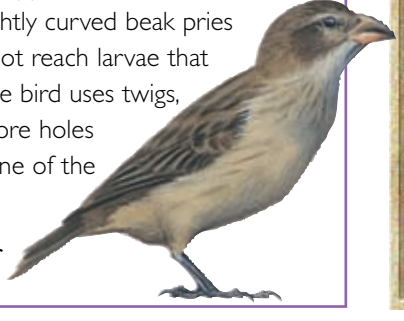
RELATED SPECIES

There are 6 species in the genus *Geospiza,* including the medium ground finch, *G. fortis,* the small ground finch, *G. fuliginosa,* the large cactus finch, *G. conirostris,* the cactus finch, *G. scandens,* and the sharp-beaked ground finch, *G. difficilis.* Eight other birds are believed to have evolved from the same ancestor. All Galapagos finches are placed in the bunting family, *Emberizidae.*

CREATURE COMPARISONS

Almost certainly related to the large ground finch, the woodpecker finch *(Cactospiza pallida)* is today placed in a separate genus because of its distinctive appearance and habits. The woodpecker finch feeds on grubs rather than seeds. Its slightly curved beak pries away bark and decaying wood near the surface but cannot reach larvae that bore into the wood. To overcome this limitation, the bird uses twigs, leaf stalks or cactus spines to probe into the bore holes and work the grubs into reach, making it one of the world's few tool-using birds.

Large ground finch



Woodpecker finch

GOLDCREST

• ORDER •
Passeriformes

• FAMILY •
Sylviidae

• GENUS & SPECIES •
Regulus regulus

KEY FEATURES

- Europe's smallest bird, dwarfed even by a sparrow
- Hunts tiny insects and spiders in treetops, where it flutters, hovers and climbs to track down prey
- Always on the move, it must feed at least 90% of the time each day in winter just to stay alive

WHERE IN THE WORLD?

Breeds from Britain and Ireland east across Europe, southern Siberia and parts of central Asia to Japan; northern populations go southward for winter

LIFECYCLE

One of the most hyperactive of all birds, the goldcrest spends its life in constant quest for food. In winter, it can't survive for more than an hour during the day without feeding.

HABITAT

▲ **HIGH FLIER**
Goldcrests spend their lives in the forest canopy.

For most of the year, the goldcrest is rarely found far from coniferous trees, especially spruce and fir. It breeds in all types of coniferous woodland, from the vast forests of Scandinavia and Siberia to commercial forestry plantations, scattered woods on heathland and even city parks and gardens. It breeds in lowlands and mountainous areas, occurring up to 7,260' in Switzerland.

In winter, when there is less choice of habitats, it also lives in deciduous woodland, hedges, areas of scrub or undergrowth, and even reedbeds. Populations from the extreme north of the species' range migrate southward to more temperate regions in late autumn, as persistent ice and frost kill off the goldcrest's insect prey, leading to its certain starvation if it stays put.

FOOD & FEEDING

As befits Europe's smallest bird, the goldcrest specializes in hunting the smallest types of insect and spider, which are often ignored by larger insect-eating birds. It picks its prey from fine twigs and pine needles high in the crowns of conifers, only descending to feed among lower branches or bushes in winter. The goldcrest consumes huge numbers of aphids in the warmer months, and also snaps up caterpillars, flies, moths and mites.

Without pausing to rest, the goldcrest quickly searches every part of a twig, hanging upside down to look underneath them to examine any crack or hole that might hide prey. Insects trapped in spiders' webs make an easy meal. The goldcrest also hunts insects on the wing, darting away from its perch and opening its bill to snatch them in air. By using several techniques, the goldcrest maximizes its feeding success.

▲ **HUGE APPETITE**
The goldcrest eats thousands of insects a day.

CONSERVATION

The goldcrest is common across most of its range. Its only significant threat is natural: in severe winters, it undergoes huge population crashes and becomes scarce in the most hard-hit regions of its range, but is able to recover within a few years. Recently, the goldcrest has benefited from the spread of commercial spruce forests in Scandinavia and Scotland.

DID YOU KNOW?

- **In winter, the goldcrest must find an insect or spider every 2.5 seconds to maintain its bodyweight.**
- **On rare occasions, hungry goldcrests have searched over the clothes of astonished humans for food.**
- **Bird-hunting hawks, such as the sparrowhawk, tend to ignore the goldcrest — it is not worth their time and effort chasing such tiny prey.**

BREEDING

Like most other small perching birds, the goldcrest has a short lifespan; most individuals do not reach their first birthday. To cope with its brief life expectancy, it lays a large clutch of 7–10 eggs and raises two broods each year, one after the other, which ensures that some chicks will survive to breed the next year.

In spring, the male sings to defend his breeding territory and attract a female. To court her, he raises his glowing yellow crest in a dramatic display. The pair builds a nearly closed-up nest of finely woven moss and lichens, bound together with spiders' webs. The female incubates the eggs alone for two weeks. The tiny, helpless chicks are fed insects during their three-week stay in the nest: a demanding task shared by both parents.

THE FAMILY TREE

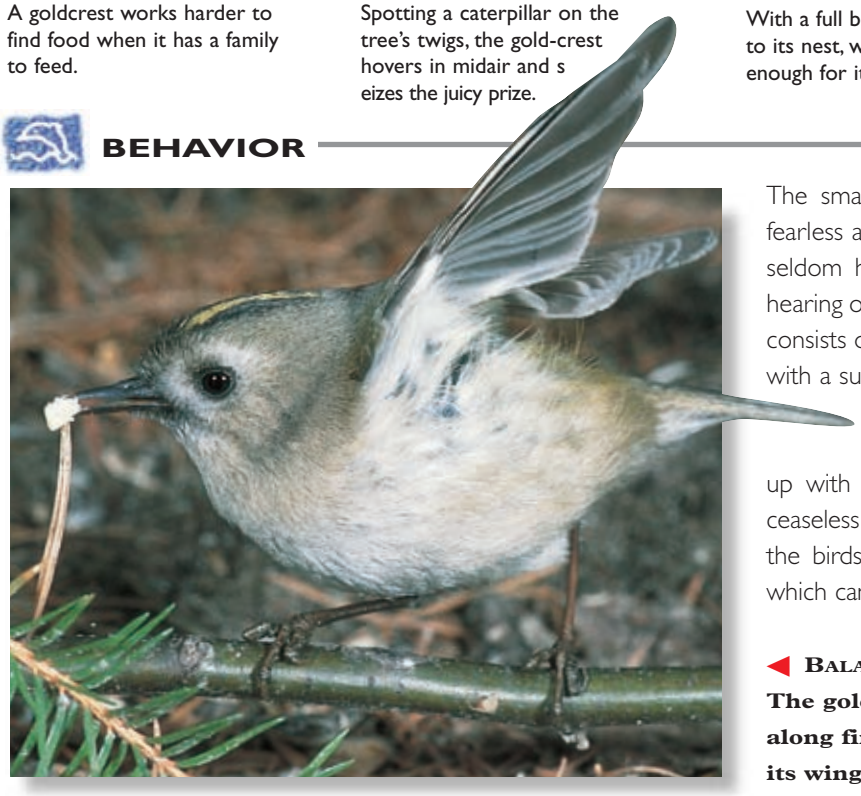
1 Search...
A goldcrest works harder to find food when it has a family to feed.

2 Hover...
Spotting a caterpillar on the tree's twigs, the gold-crest hovers in midair and s eizes the juicy prize.

3 Return...
With a full bill, the goldcrest returns to its nest, which is barely large enough for its fast-growing brood.

4 Feed
Chicks gape their bills to show bright-orange skin inside, which stimulates parent to feed them.

BEHAVIOR



The small goldcrest is often overlooked, but it is surprisingly fearless and may approach to within 3' of humans in winter. It-is seldom heard, since its high-pitched *zi-zi-zi* call is beyond the hearing of most humans. The male's courtship and territorial song consists of a frequently repeated series of treble notes that ends with a sudden flourish.

In winter, the goldcrest forms small feeding parties, which may defend exclusive territories, but usually join up with bands of chickadees, nuthatches and creepers in the ceaseless and desperate search for food. By gathering together, the birds increase their chances of finding good food sources, which can be shared by all.

The goldcrest hops and jumps among branches and twigs in a jerky, almost frenetic fashion, rather like a wren, and has very fast-whirring wings.

◀ **BALANCING ACT**
The goldcrest can run along fine twigs, using its wings for balance.

PROFILE GOLDCREST

Beautifully camouflaged in its lofty treetop home, the minuscule goldcrest is almost invisible to humans as it moves acrobatically in search of prey.

CREST

Although the male goldcrest usually hides his crest, flattening it along the top of his head, he raises and spreads it like a glowing flame when excited or courting a female. Black borders make the crest's brilliant-colors seem even brighter.

PLUMAGE

To help it blend in with its surroundings, the goldcrest has plain, grayish-green upperparts and pale buff underparts. The male has an orange flush to the center of his crest, but the female's crest is all yellow.

BILL

The tiny spike of a bill is adapted to picking prey off leaves or from narrow crevices in bark.

FEET

The goldcrest's short-toed feet have long, fine claws for grasping small twigs at the ends of branches and hanging upside down from them.

VITAL STATISTICS

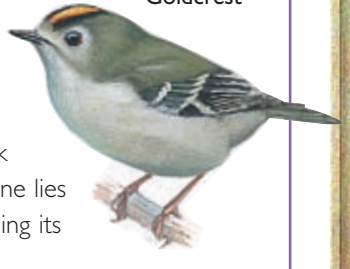
WEIGHT	0.14–0.28 oz.
LENGTH	3.5"
WINGSPAN	5.5–6.2"
SEXUAL MATURITY	1 year
BREEDING SEASON	April–August
NUMBER OF EGGS	7–10 in each clutch
INCUBATION PERIOD	15–17 days
FLEDGING PERIOD	17–22 days
NUMBER OF BROODS	Up to 2 each year
TYPICAL DIET	Tiny spiders, insects (mainly flies, aphids, caterpillars)
LIFESPAN	Up to 7 years, but usually less than 1 year

CREATURE COMPARISONS

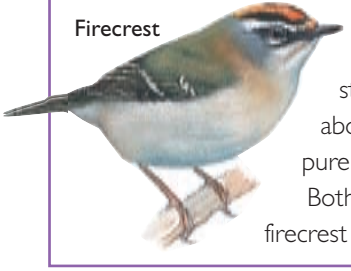
Competing with the goldcrest for the title of smallest European bird, the fractionally heavier firecrest (*Regulus ignicapillus*) is named after the vibrant, orange-red streak along the center of its crest. The firecrest is more easily distinguished from its relative by bolder patterning on its head plumage: a black stripe passes across the eye and a thick white one lies above it. The goldcrest has pale feathers surrounding its pure black eye.

Both species are very active, and both inhabit woodlands, although the firecrest does not share the goldcrest's preference for coniferous trees.

Goldcrest



Firecrest



RELATED SPECIES

- **The goldcrest belongs to a group of 6 tiny birds, known as kinglets, which includes the firecrest, Canary Islands goldcrest, Taiwan firecrest and ruby- and golden-crowned kinglets. They are often classed as subfamily (*Regulinae*) of the warbler family, *Sylviidae*, with 400 or so members: including whitethroats, leaf warblers and prinias. All are active, insect-hunting birds.**

Golden Eagle

• ORDER •
Falconiformes

• FAMILY •
Accipitridae

• GENUS & SPECIES •
Aquila chrysaetos

KEY FEATURES

- Able to soar effortlessly for long periods on its broad, 6.5'-long wings
- Ranges across territories as large as 80 sq. miles: an area similar to that of a medium-sized city
- Traditional nests, or *eyries*, may be used by generation after generation of golden eagles

WHERE IN THE WORLD?

Inhabits the western and northern U.S. and eastern Canada, parts of Europe, east through much of central and northern Asia; also parts of Africa

LIFECYCLE

A regal resident of the "roof of the world," the golden eagle naturally symbolizes power and majesty as it soars, swoops and strikes with graceful, yet deadly, effect.

HABITAT

▲ **EAGLE EYED**
The golden eagle surveys its domain from a perch.

The golden eagle, popularly called the "king of the birds," is the most widespread eagle of the Northern Hemisphere, favoring open, often mountainous, habitats. It avoids densely wooded areas, typically found just above the treeline, but below the level of permanent snow. It shuns heavily populated and farmed areas, perhaps as a result of past declines in numbers caused by human persecution and poisoning by agricultural chemicals.

In flat landscapes, such as green grassland and prairie regions, without cliffs to perch and scan for prey, the golden eagle uses rocky outcrops and hilltops to watch for its prey.

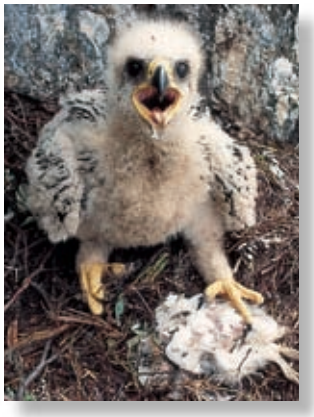
DID YOU KNOW?

- **The world population of golden eagles is estimated at 125,000–250,000 birds.**
- **The feathers of the golden eagle weigh more than its entire skeleton.**

BREEDING

Within a territory, a pair of eagles may have up to a dozen nest sites, called *eyries*, on cliff ledges or in old, tall trees. Each spring, the pair selects one eyrie and renovates it with fresh twigs. Egg-laying takes place from January in the south of the species' range and from May in the most northerly regions.

The female incubates her first egg immediately and lays a second egg 2–5 days later. The male takes only occasional shifts on the nest. When the first chick hatches in six weeks, the male brings food to the nest, which the female tears into morsels for the chick.



By the time the second egg hatches, the first chick is growing rapidly. When food is scarce, the second chick may be attacked and killed by the older chick. This ensures that at least one chick receives enough food to survive.

FEATHERING THE NEST

1 A nest...
A fork in the boughs of a large, tall tree is a favorite nest site. Both birds build the nest, which can measure 3' across.

2 that grows...
Over the years, a pair may establish several eyrie sites, but often return to a favorite one, adding fresh twigs and bracken.

3 and grows...
Later generations may continue to use their ancestors' eyries; some nests continue to be favored and grow ever bigger.

4 to be huge!
After decades of being added to, an eyrie may become a sprawling platform over 6.5' deep and contain masses of material.

FOOD & HUNTING

▲ **THE EAGLE HAS LANDED**
The golden eagle devours its prey on the spot. If it has young to feed, it carries the prey back to the nest.

The eagle's diet varies widely across its range. Typical prey are small to medium-sized mammals and birds, such as rabbits, hares, ground squirrels, marmots, young deer, grouse, partridges and pheasants. Prey is spotted by the eagle as it flies over, quartering the terrain. Then, in a high-speed glide, it drops and grabs its victim in its talons. Gamebirds, though, may be snatched in midair.

A pair of eagles sometimes hunt together, with one bird flushing out prey and the other swooping in to kill. Small prey is crushed by its talons; the sharp claw on each hindtoe pierces the victim's body to kill it swiftly. It then tears its catch apart on the spot. In winter, the eagle also feeds on carrion.

BEHAVIOR

Male and female eagles mate for life; once a pair has established a home territory, it stays there from year to year. However, eagles in the far north are migratory, flying to warmer lowlands farther south to avoid the winter. Although there are a few records of birds actively fighting over disputed territories, the golden eagle has often been observed making undulating display flights near the boundaries of its territory, which may help warn off other eagles.

In late winter, pairs are often seen soaring and swooping in another form of undulating display, called "sky-dancing." This is a mating, rather than territorial, ritual. During this display, the female may roll onto her back in flight, presenting her talons to the male as he swoops above her. Mating takes place on the ground, but is often followed by further sky-dancing.

Young eagles are driven out of their parents' territory about four months after fledging and become nomadic until they're old enough to breed at 4–5 years; some young birds travel up to 1,200 miles.

▶ **YOUNG BLOOD**
This juvenile golden eagle has yet to acquire the more uniform, golden brown plumage of an adult bird.

CONSERVATION

In the past, the golden eagle was persecuted in many parts of its range, mainly by farmers who believed that it killed lambs and by gamekeepers seeking to protect gamebird stocks. More recently, agricultural pesticides and pollution ingested through prey have resulted in the eagles laying eggs with such thin shells that they break in the nest before hatching. Today, stricter laws protect the eagle and though it isn't threatened overall, it's becoming increasingly rare.

PROFILE GOLDEN EAGLE

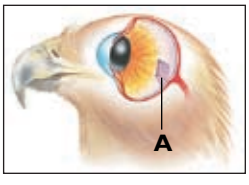
Flying high over great tracts of wilderness, the golden eagle uses its superkeen eyesight to scan the ground below for signs of potential prey.

EYES
Large, forward-pointing eyes give a wide field of binocular vision. Its eyesight is about eight times sharper than that of a human.

WINGTIP
The fingerlike wingtip feathers adust the airflow over the wing, allowing the eagle to fly slowly without "stalling."

BILL
Prey is torn up with the powerful, hooked bill. However, the female can use it with the delicacy of tweezers when feeding her young.

TALONS
Prey is grasped with the powerful *talons* (claws). The curved, viciously sharp hindclaw is its main killing tool.



INNER EYE
Cone cells that detect color and movement are highly concentrated in a zone at the back of the eye called the *fovea* **(A)**. This helps produce especially keen sight.

VITAL STATISTICS

WEIGHT	Male 6.5–11 lbs.; female 9–15 lbs.
LENGTH	
Head/Body	2.5–3'
Tail	10–14"
WINGSPAN	6.5–7'
SEXUAL MATURITY	4–5 years
BREEDING SEASON	February–July
NUMBER OF EGGS	Usually 2, but rarely 1 or 3
INCUBATION PERIOD	42–45 days
FLEDGING PERIOD	65–70 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Mammals, birds, lizards, carrion
LIFESPAN	Up to 25 years

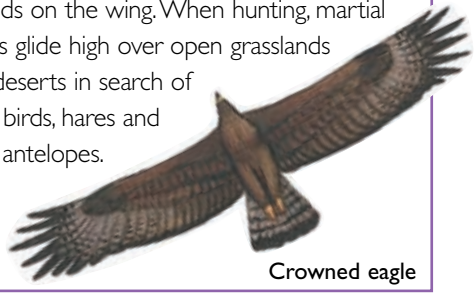
RELATED SPECIES

- **There are eight eagle species in the *Aquila* genus, including the lesser spotted eagle (*Aquila pomarina*) of central Europe and Asia, which has a wingspan of about 5'. Verreaux's eagle (*Aquila verreauxii*) of central and southern Africa has a 7.5' wingspan. The Spanish race of the imperial eagle (*Aquila heliaca*) is one of the rarest of all eagles, with only about 60 pairs remaining in the wild.**

CREATURE COMPARISONS

All eagles have broad wings with "fingered" tips, but there are many variations on wing shape. The crowned eagle (*Spizaetus coronatus*), which flies over dense forests of central Africa, has short, rounded wings to maneuver in tight spaces between the trees. The long, wide wings of the martial eagle (*Polemaetus bellicosus*) — the largest African eagle — are designed for long periods on the wing. When hunting, martial eagles glide high over open grasslands and deserts in search of large birds, hares and even antelopes.

Martial eagle


Crowned eagle

Golden Oriole

• ORDER •
Passeriformes

• FAMILY •
Oriolidae

• GENUS & SPECIES •
Oriolus oriolus

KEY FEATURES

- Hides amazingly well in the dense foliage, despite its brilliant yellow feathers
- Reveals its location with a characteristic whistling song
- Migrates thousands of miles each year to avoid the harsh winters of Europe and Asia
- Female builds a neatly woven, hammock-style nest

WHERE IN THE WORLD?

Breeds throughout Europe and parts of Asia, including England, Germany, France and Greece; migrates to parts of central Africa, as far south as Kenya and Tanzania for the winter

LIFECYCLE

Despite its bright colors, the golden oriole is more commonly heard than seen; its flutelike, whistling song signals the start and finish of the day.

HABITAT

▲ **A SECRET FOREST**
Dense foliage provides good hideouts for the oriole.

The golden oriole is the only European oriole. Widespread across Europe and Asia during the breeding season, the golden oriole nests in older deciduous forests and large parks where the dense foliage provides ample camouflage for the shy bird. The broad-leaved trees provide fruit and berries and attract insects for the adults and chicks, as well as protective nesting sites. In England, the bird limits itself exclusively to black poplar plantations.

The golden oriole migrates south for the winter. The birds form small clusters and even congregate into vast flocks to begin their journey in August. The island of Cyprus is one of many stops midway between its summer and winter homes. The birds rest from a few days up to a week before continuing their travels to Africa.

CONSERVATION

The golden oriole is not currently threatened; it remains common and widespread throughout Europe and Asia, wherever there is dense forest cover. But habitat destruction is an impending threat as older forests are cut for human use. Pesticides also pose a threat to this tree-dwelling bird.

DID YOU KNOW?

- **The golden oriole is not closely related to the orioles of the Americas, which are in an entirely different family, *Emberizidae*.**
- **When adding fat reserves for its long migration, the golden oriole will fly up to a mile in search of carbohydrate- and calorie-rich fruits and berries.**

BEHAVIOR

The golden oriole's flutelike, whistling song is often the only sign of its presence. The bird sings its fast, clear *choo-klee-klooee* in the early morning and evening from its hidden, treetop retreat. The oriole is solitary, but not territorial; it tolerates the presence of other birds. It can be seen flying to a new fruit tree or descending to the ground where, no longer camouflaged in the trees, its brilliant golden feathers shine in the sunlight. The bird rarely flies far during the breeding season; most flight is limited to the long-distance migrations.

◀ **ALONE**
The solitary oriole remains hidden for most of the day.

BREEDING

The return of the golden oriole migrants in April signals the start of the breeding season. With its pointed wings and short tail, the male golden oriole pursues the female during high-speed courtship chases. These ritual chases offer a rare glimpse of the birds before they retreat to their secluded nesting sites. The female builds a distinct hammocklike nest, weaving grasses, moss and lichens into a deep, protective basket suspended between a slender tree fork. She lays 3–4 white eggs with small blackish spots. The male then assists the female during a 2-week long incubation period, relieving the female while she feeds. The nestlings are fed insects by the parents and quickly mature; they are able to fly in about 14 days. Male juveniles are almost indistinguishable from females, since they do not yet have the brilliant golden plumage.

ME FIRST
The male brings food to the anxiously awaiting chicks and female.

FOOD & FEEDING

The golden oriole's feeding movements are slow and deliberate; it carefully searches high and low for caterpillars, which form the bulk of its diet. An opportunist, the oriole will settle for other insects, which it plucks from branches, or small vertebrates, such as mice. In the autumn, the bird switches its focus to fruits and berries, adding fat reserves in preparation for a long migration south. The bird occasionally descends to the ground to feed on fallen berries or crawling insects.

GOLDEN OPPORTUNITIES

1 Pluck...
A male golden oriole holds firmly to his perch and stretches out to reach a favorite insect, a slow-moving hairy caterpillar.

2 Beat...
The bird swings its head up and down, side-to-side, beating the insect to remove its irritating hairs before swallowing it.

3 Raid...
Making sure the coast is clear, it picks at a mouse found in the food cache of the shrike, a highly territorial bird.

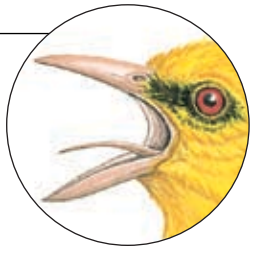
4 Bite
A male is joined by his two offspring as they fatten up on fruits before beginning their journey south.

PROFILE GOLDEN ORIOLE

The male golden oriole has stunningly colorful plumage, but he blends surprisingly well in his treetop home with his less-colorful mate.

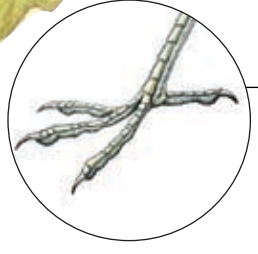
BILL

The oriole's sharp, stout bill easily plucks insects or berries, but it can also tear the flesh of small vertebrates.



FEMALE

The female is not as brightly colored as the male, but she still has the distinctive yellow coloration typically associated with orioles, along with additional olive streaks. The wings are dark olive-brown, compared to black in the male.



FEET

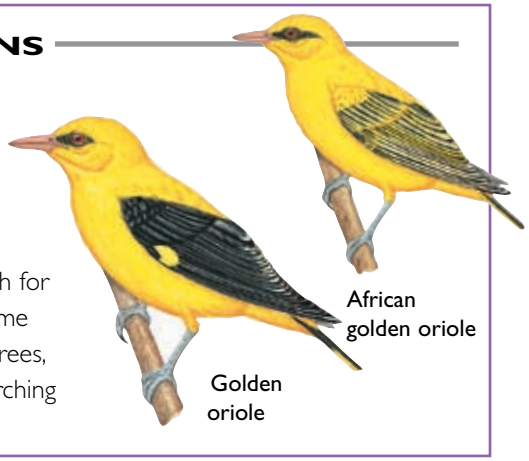
The oriole is *ansiodactylic:* three of its toes point forward, one back. This enables the bird to grip branches firmly.

VITAL STATISTICS

WEIGHT	About 2.3 oz.
LENGTH	8.25–10"
SEXUAL MATURITY	1 year
BREEDING SEASON	April–July
NUMBER OF EGGS	3–4
INCUBATION PERIOD	14–15 days
FLEDGING PERIOD	14–15 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Insects, including caterpillars, small vertebrates, fruits and berries
LIFESPAN	Unknown

CREATURE COMPARISONS

The African golden oriole *(Oriolus auratus)* is slightly smaller than the golden oriole. Both species are remarkably similar in coloration, but the African golden oriole has golden-yellow wing feathers mixed with the black and a larger black eye streak than the golden oriole. When the golden oriole migrates south for the winter, both birds can be seen in some of the same regions of Africa. The African golden oriole feeds in trees, while the golden oriole will occasionally be seen searching the ground for insects or fallen berries.



African golden oriole

Golden oriole

RELATED SPECIES

● **The golden oriole's genus, *Oriolus,* contains over 20 species of oriole, and is one of two genera in the small family *Oriolidae*. The other genus, *Sphecotheres,* consists of figbirds, including the yellow figbird, *S. flaviventris*. Overall, figbirds have subtler shades of olive green, gray and yellow than orioles have. Figbirds and orioles join other perching birds in the order *Passeriformes*.**

Golden Pheasant

• ORDER •
Galliformes

• FAMILY •
Phasianidae

• GENUS & SPECIES •
Chrysolophus pictus

KEY FEATURES

- Male performs spectacular courtship displays, showing off his stunning plumage and long tail in order to attract a mate
- Female survives without food for over three weeks while incubating to ensure that the eggs are safe from predators

WHERE IN THE WORLD?

Native to central China, but is naturalized in Britain, chiefly in Norfolk and Suffolk; also Galloway in southwestern Scotland, Spain and most of France

LIFECYCLE

One of the most brightly colored birds, the golden pheasant is surprisingly difficult to see as it skulks among bamboo in China or in the shade of British conifer plantations.

HABITAT

The golden pheasant's original habitat is markedly different from its adopted home in Britain. In its native China, the pheasant is found in rocky hill country where mountain slopes are clothed with bamboo thickets and low bushes. It spends virtually all its time in deep cover and avoids open country, where the showy male would be vulnerable to predators. It also shuns dense forest. Where its range overlaps that of the related Lady Amherst's pheasant, the two birds occupy different zones due to subtle variations in habitat preference.

In Britain, the golden pheasant is a forest species confined to lowland areas. It sometimes occurs in mixed woods, but prefers dense conifer plantations. It thrives where the crowns of pine and larch obscure light from the forest floor.

▼ **RARE APPEARANCE**
The golden pheasant rarely ventures from cover.

DID YOU KNOW?

- **Originally released in Britain for hunting, the golden pheasant proved unpopular because it does not fly when alarmed.**
- **The golden pheasant is the most common pheasant in bird collections. Breeders have developed a variety that is pale yellow.**

BREEDING

▲ **INSTANT MEALS**
The 5–12 chicks can feed themselves upon hatching.

The golden pheasant has a colorful courtship display that rivals even the famous birds of paradise. The performance is heightened by squeaks, clicks and whistles from the male, culminating in a snakelike hiss as he flicks up his golden cape and spreads his tail in the air. Most males pair with only one female, but the most successful performers acquire harems of up to eight hens.

The female, whose nest is a simple scrape, is a devoted mother. Even though her nest is well hidden, she sits continuously for more than three weeks, surviving on raindrops and dew. Once hatched, her chicks follow her from the nest. In two weeks they can flutter up to roost in trees.

FOOD & FEEDING

Bamboo buds, shoots and leaves form the bulk of the golden pheasant's diet in the hills of China. It also eats flowers, including rhododendrons, which grow profusely in many valleys.

In Britain, the pheasant eagerly snaps up insects and spiders, which probably make up most of its diet as the conifer plantations it inhabits are devoid of undergrowth. It is thought to consume large quantities of ants as well, as it scratches through the fallen pine needle litter. It also eats grain provided by gamekeepers for ring-necked pheasants.

SHOW BUSINESS

1 Sound effect...
At the start of the breeding season, female golden pheasants answer a male's crowing calls by visiting his territory.

2 No way out...
One of the females is not interested and starts to walk away. But the male blocks her retreat by frantically racing around her in wide circles.

3 Final approach...
As soon as she stops, the male halts his circling maneuvers and rushes up to the female for the climax of his spectacular display.

4 Look on the bright side
Posing side-on, he fans his cape over his face and slants his body towards her to show his golden rump and magnificent tail.

▲ **PICKING A WINNER**
The pheasant picks through low growth and leaf litter in search of fresh shoots and invertebrates.

BEHAVIOR

▲ **NONFLYING COLORS**
The pheasant usually only leaves the ground to roost.

A brief flash of fiery red as a golden pheasant dashes from cover across a woodland path is as much as a birdwatcher can hope to see of this elusive species in the wild. Although breeding territories are easily located from the male's distinctive calls, he rarely ventures into the open. When disturbed, he sprints away on his long legs, zigzagging between trees or rocks until he finds a safe hiding place. The female employs a different technique to avoid predators. At the first hint of danger, she squats down and remains motionless, relying on her camouflage to escape detection.

The golden pheasant is generally solitary outside the breeding season. Males are aggressive toward each other in the presence of females, and fierce fights often break out between them.

CONSERVATION

Although other pheasant species are in decline in China, the golden pheasant remains common there. In Britain, the feral population is fairly stable at 1,000–2,000 birds. It is unlikely to spread widely because suitable habitat occurs only in disjointed patches, and the bird has a sedentary nature.

PROFILE GOLDEN PHEASANT

Few birds can rival the resplendent plumage of the cock golden pheasant, which he uses to attract as many females as possible.

BILL
The bill is short but strong — ideal for pecking at the ground and stabbing at insects.

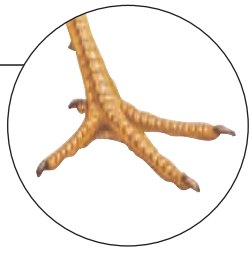
CAPE
Broad, square-tipped feathers comprise a distinctive cape, which is fanned in display.

FEMALE
A mixture of brown and buff, barred with black, helps to camouflage the shorter-tailed female at her nest.

PLUMAGE
The male's year-round orange, green and gold upperparts contrast with a fiery-red belly. He uses his unmistakable finery to attract females at the beginning of the breeding season.

TAIL
The male flourishes his long, curved tail during his mating display.

FEET & LEGS
The short hindtoe is typical of a ground-dwelling bird. The legs are long and slender, those of the male bearing small spurs for use in fighting.

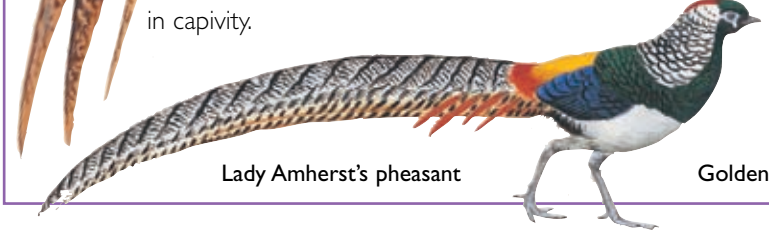


VITAL STATISTICS

WEIGHT	2.5–3.5 lbs.
LENGTH	
Head/Body	Up to 20"
Tail	Up to 30"
WINGSPAN	26–30"
SEXUAL MATURITY	Male 2 years, female 1 year
BREEDING SEASON	April–May
NUMBER OF EGGS	5–12
INCUBATION PERIOD	22–23 days
FLEDGING PERIOD	12–14 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Seeds, shoots, berries, leaves and insects
LIFESPAN	Up to 15 years

CREATURE COMPARISONS

Like the golden pheasant, Lady Amherst's pheasant (*Chrysolophus amherstiae*) is native to China and naturalized in Britain. The two males have very different plumage. Lady Amherst's pheasant is a little larger, with legs and bill that are blue-gray, not yellow. Both males have identical displays. The females look similar, but Lady Amherst's hen has bolder barring. The birds are so closely related that they interbreed in capivity.



Lady Amherst's pheasant

Golden pheasant

RELATED SPECIES

● The golden pheasant is 1-of some 50 pheasant species; 26 occur in China. Pheasants are among 155 species in 38 genera in the *Phasianidae*, the largest family in the order *Galliformes*. Other members of this family include partridges, francolins, tragopans, quails and junglefowl, the ancestors of domestic chickens.

Goliath Heron

• ORDER •
Ciconiiformes

• FAMILY •
Ardeidae

• GENUS & SPECIES •
Ardea goliath

KEY FEATURES

- World's largest heron, with an extraordinarily long neck, bill and legs
- A strong walker, the heron spends most of its time on the ground
- Special down feathers disintegrate to form powder, which is used for grooming
- More than 4' tall, it stands motionless in water until it is ready to spear its prey

WHERE IN THE WORLD?

Found in Africa, south of the Sahara, and in southern Iraq and Iran; breeds from Pakistan to Bangladesh and south into Sri Lanka; also in sub-Saharan Africa, south to Botswana and Natal

LIFECYCLE

Standing motionless and solitary, the Goliath heron is a highly specialized hunter that stalks its prey and staunchly defends its foraging grounds.

HABITAT

The Goliath heron favors inland lakes and rivers with shoreline vegetation: estuaries, reefs, papyrus swamps, coastal creeks and mangrove swamps, both salt- and freshwater. From sea level up to 6,900', the bird prefers sites surrounded by water where it can hunt for food. The Goliath heron usually remains in a limited area but will disperse in response to various seasonal changes and the availability of food supplies.

▲ **MARSHLAND**
The Goliath heron occurs in a variety of habitats, such as marshes.

▶ **ALL ALONE**
The heron prefers a solitary life over living in colonies.

DID YOU KNOW?

- **A Goliath heron was once seen eating a fish weighing 3 lbs.**
- **A heron's neck has 16–17 vertebrae; all mammals, including giraffes, have only seven.**
- **In flight, the Goliath heron can make 98 wingbeats per minute.**
- **This heron is normally solitary during breeding, but may nest with other birds in some areas.**

BEHAVIOR

Unlike other day herons, the Goliath heron is not sociable and is a solitary feeder. Its varied repertoire of calls is more extensive than that of other herons. Vocalizations often sound like a series of guttural honks, harsh noises, croaks, coos, and growls. The heron fiercely defends its large feeding grounds with its spearlike bill. In parts of South Africa, only one heron inhabits a territory of 2.3 sq. miles. Though not extremely agile in flight, it is capable of quick takeoffs and pinpoint landings; its acrobatic descent looks similar to a parachute dropping.

FOOD & HUNTING

The Goliath heron hunts large fish, some measuring up to 20" long, as well as frogs, lizards, snakes, crabs and even the occasional rodent. Long-legged, it often wades into water too deep for other herons. This solitary hunter uses its spearlike bill as a harpoon, snatching its live prey from the water or the ground. The heron waits patiently without moving, standing in an upright posture when looking for prey, then crouches, with neck and body parallel to the ground, when it is ready to strike. The bird hunts mostly during the day. Indigestible materials, such as crab shells, are regurgitated as pellets.

SKILLED HUNTER

1 Scoping the territory…
Standing upright, the Goliath heron maintains maximum visibility in the shallows of the lake as it scans the area for prey.

2 The next victim…
Switching to a crouching position, the heron spots a fin and a flash of scale just breaking the water's surface.

3 Man the harpoon…
The heron spears the huge 20"-long fish with its pointed bill, bringing the prey up to the water's surface to be eaten.

4 A meal in a bite
With a quick upward toss, the Goliath heron repositions the large fish so it can be swallowed whole and head first.

BREEDING

Most Goliath herons breed during the rainy season and are monogamous. The male arrives first at the nesting ground and begins to collect material to construct the nest; he then tries to attract a female while he defends his territory against other males. Vocal displays are very important in this solitary species, which loudly advertises its breeding readiness. The nest is built of sticks from trees, bushes or reed stems and situated near a body of water.

Both the male and the female incubate the clutch of 2–5 eggs. After 24–30 days, the young herons hatch at intervals and are born naked and blind. The adults regurgitate food to the intensely competitive chicks; the smaller chicks often die of starvation when food is scarce. It takes almost three months for the chicks to fledge, though they begin wandering from the nest much earlier.

▲ **MONOGAMOUS BOND**
Goliath herons mate for life, forming a lasting bond.

CONSERVATION

The Goliath heron is not globally threatened, but it is closely monitored in South Africa, where it once was considered rare. Habitat destruction has decreased its nesting areas in southern Iraq, as well as in Iran and the Indian subcontinent, but the bird is relatively common in east Africa and parts of Sudan. Predators range from reptiles, such as iguanas or crocodiles, to mammals and birds of prey.

PROFILE GOLIATH HERON

The majestic Goliath heron, easily identified by its rusty orange head, harpoons prey with a lightning-quick extension of its long, flexible neck.

SKULL & NECK

The long neck forms an S-shape. During flight, the neck is usually retracted, but is extended with ease to capture prey.

PLUMAGE

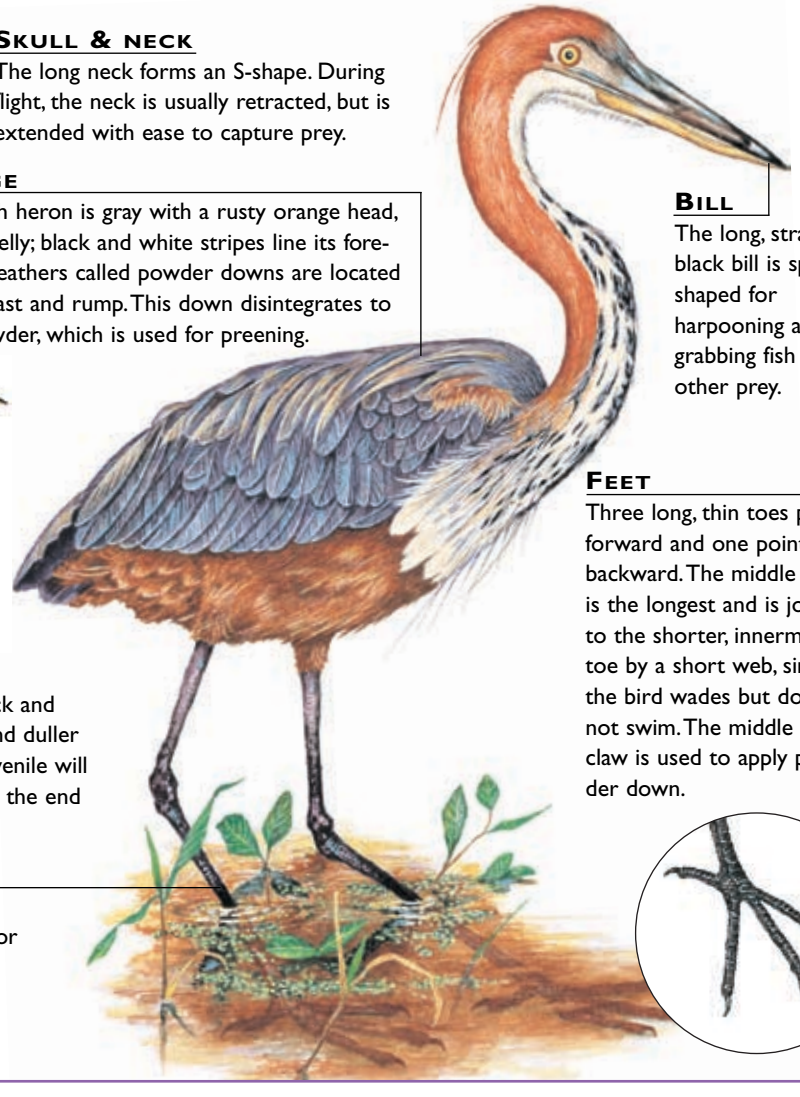
The Goliath heron is gray with a rusty orange head, neck and belly; black and white stripes line its foreneck. Soft feathers called powder downs are located on the breast and rump. This down disintegrates to form a powder, which is used for preening.

JUVENILE

The juvenile's head, neck and underparts are paler and duller than the adult's. The juvenile will attain adult plumage by the end of its first year.

LEGS

The Goliath heron has long, strong legs used for walking great distances while feeding.



BILL

The long, straight black bill is spear-shaped for harpooning and grabbing fish and other prey.

FEET

Three long, thin toes point forward and one points backward. The middle toe is the longest and is joined to the shorter, innermost toe by a short web, since the bird wades but does not swim. The middle toe's claw is used to apply powder down.

VITAL STATISTICS

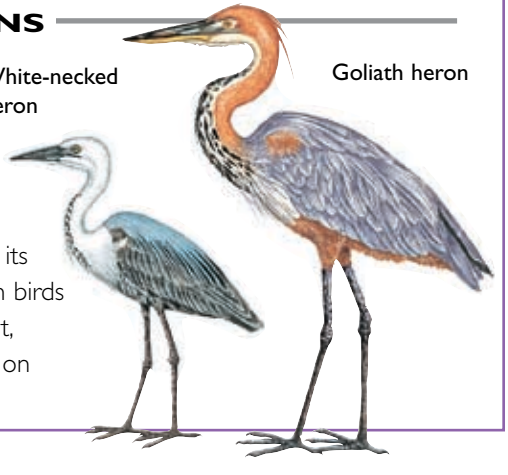
WEIGHT	Unknown
LENGTH	Up to 4.7'
WINGSPAN	Up to 7.6'
SEXUAL MATURITY	Unknown
BREEDING SEASON	Rainy season
NUMBER OF EGGS	2–5, usually 3
INCUBATION PERIOD	24–30 days
FLEDGING PERIOD	42–81 days
BREEDING INTERVAL	Up to 2 years
TYPICAL DIET	Large fish, frogs, lizards, snakes, rodents, crabs and prawns
LIFESPAN	Unknown

RELATED SPECIES

● **The Goliath heron is one of several species in the genus *Ardea*, also known as the large day herons due to their size and activity patterns. The genus also includes the great blue heron, *Ardea herodias*. These herons are among 60 species of heron, egret and bittern in the family *Ardeidae*. This family contains the snowy egret, *Egretta thula*, and the black-crowned night heron, *Nycticorax nycticorax*.**

CREATURE COMPARISONS

The white-necked heron *(Ardea pacifica)* measures up to 3.5' in length, much smaller than the Goliath heron. The white-necked heron inhabits shallow freshwater, flooded grasslands and floodplains and moves about seasonally in the Australian and Tasmanian wetlands, far removed from its relative, which occurs in similar habitats in Africa. Both birds are considered "day herons" and have similar diets but, due to its smaller size, the white-necked heron preys on smaller aquatic and terrestrial animals.



Gouldian Finch

• ORDER •
Passeriformes

• FAMILY •
Estrildidae

• GENUS & SPECIES •
Chloebia gouldiae

KEY FEATURES

- Its remarkable color patterns make this finch one the most beautiful birds in the world
- The Gouldian finch is endangered, mainly due to habitat destruction and the cage bird trade
- Rarely descends to the ground, but instead clings to grass stems and low twigs on bushes and trees

WHERE IN THE WORLD?

Found in northern territories of Australia in tropical savannah woodlands from the Kimberleys in western Australia east to Cape York Peninsula in Queensland

LIFECYCLE

Throughout the year, the Gouldian finch is more active in the heat of the afternoon than other birds, descending from its roosting perch to feed on grass seeds.

HABITAT

The Gouldian finch is found in the northern territories of Australia. Year-round grassland and water sources attract this colorful bird; during the breeding season, hollows of eucalyptus trees are a favorite. The largest known breeding population occurs in the Yinberrie Hills. The bird thrives in this warm climate, and avoids cooler climates. The finch's range has temperatures from 60–110°F.

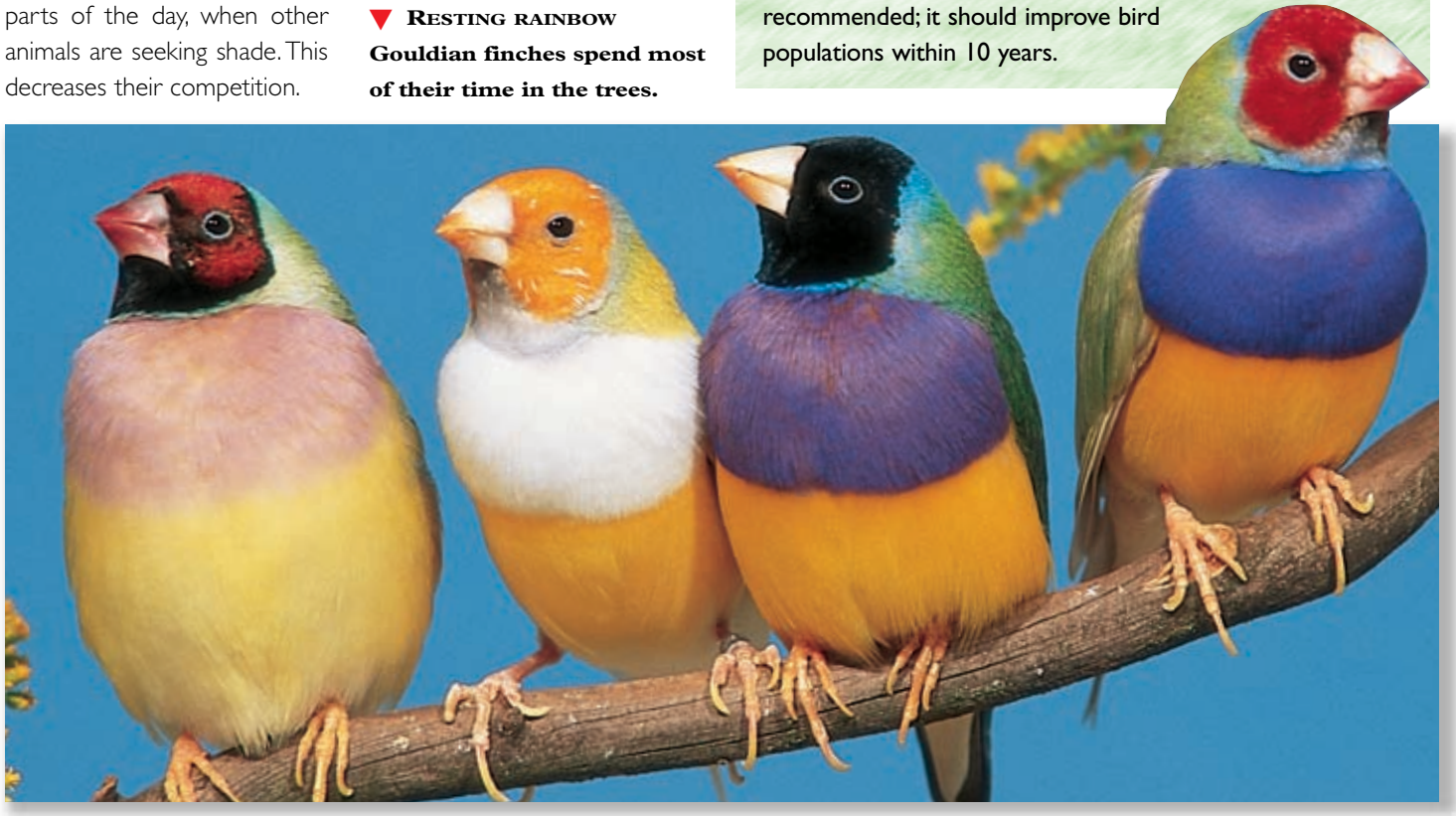
▲ **FAVORITE SITE**
The salmon gum, a eucalyptus tree, is a favorite nesting site for the Gouldian finch.

BEHAVIOR

Gouldian finches live in flocks, rarely descending from their roosting perches in trees and bushes except to feed. The birds often become nomadic during the dry season as they search for water holes and grass seeds. The birds are well adapted to heat; they may be most active during the hottest parts of the day, when other animals are seeking shade. This decreases their competition.

CONSERVATION

The Gouldian finch is endangered in its native Australia. Fewer than 2,500 mature birds are thought to exist in the wild. Fires, the cage bird trade, competition for food sources, feral predators and diseases all pose threats to this beautiful bird. In 1992 a recovery plan was recommended; it should improve bird populations within 10 years.

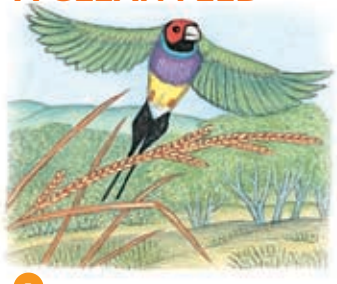


▼ **RESTING RAINBOW**
Gouldian finches spend most of their time in the trees.

FOOD & FEEDING

The Gouldian finch feeds mainly on grass seeds, using its short, strong beak to pluck and open tough outer layers. When feeding, the finch comes close to the ground but seldom touches it; instead, it prefers to harvest seeds directly from the plant. During the dry season, the bird feeds mainly on the seeds of sorghum, an annual grass, and on seeds of several perennial grasses throughout the wet season. During the wet monsoon season, tender green shoots, grass seeds and insects appear in abundance, and this is when breeding begins; the finch then adds insects to its menu, especially flying ants and termites, which it takes on the wing.

A CLEAN FEED



1 Seed ballet...
The Gouldian finch acrobatically plucks seeds from grass stems in the morning, coming close to the ground but rarely ever touching it.

2 Tough seed...
The finch spends the day feeding on grass seeds, effortlessly husking the outer shells with its strong bill.

3 Community drink...
A cattle trough provides fresh water for Gouldian finches and other birds nearby, including zebra finches.

4 Bath time
Tropical surroundings and plenty of moisture offer the Gouldian finch many outlets for bathing, drinking, or preening.

DID YOU KNOW?

- **John Gould, the first to describe this finch in 1841, named the bird in honor of his wife, hence the common name Lady Gould.**
- **Air sac mites are a threat to the Gouldian finch. If heavily infested with these tiny organisms, a bird can die in 2–7 days, even after treatment, from the accumulation of dead mites that obstruct the airways and cause asphyxiation.**

BREEDING

During the monsoons from November through February, tender shoots, green grass seeds and insects are plentiful; this abundance of food triggers the Gouldian finch's breeding cycle. Males and females of the species will breed before attaining full plumage, usually between 9 months and 1 year of age. During courtship, the male approaches the female with a piece of nesting material, usually grass. He then performs a bobbing dance, ruffling his feathers while bobbing his head and crowing. The female crouches and quivers if impressed. After mating, the female builds a simple nest, often in a eucalyptus tree, or occasionally in termite mounds. She lays 4–8 pure white eggs, with an average clutch size of five. Both parents incubate the eggs for a total of about two weeks. Luminous markings on the chicks' beaks make them easy for their parents to spot; they are fed mainly sorghum seeds. The young fledge at about 3 weeks of age but are not completely independent for about 3–4 weeks more. The adults often produce multiple broods per season, especially in extremely warm areas.

▲ **SEED FEED**
A parent brings its hidden chicks some food.

PROFILE GOULDIAN FINCH

Stunning colors make the Gouldian finch a favorite among birdwatchers; commonly called the Lady Gould, its brilliant hues are sharply defined.

JUVENILE

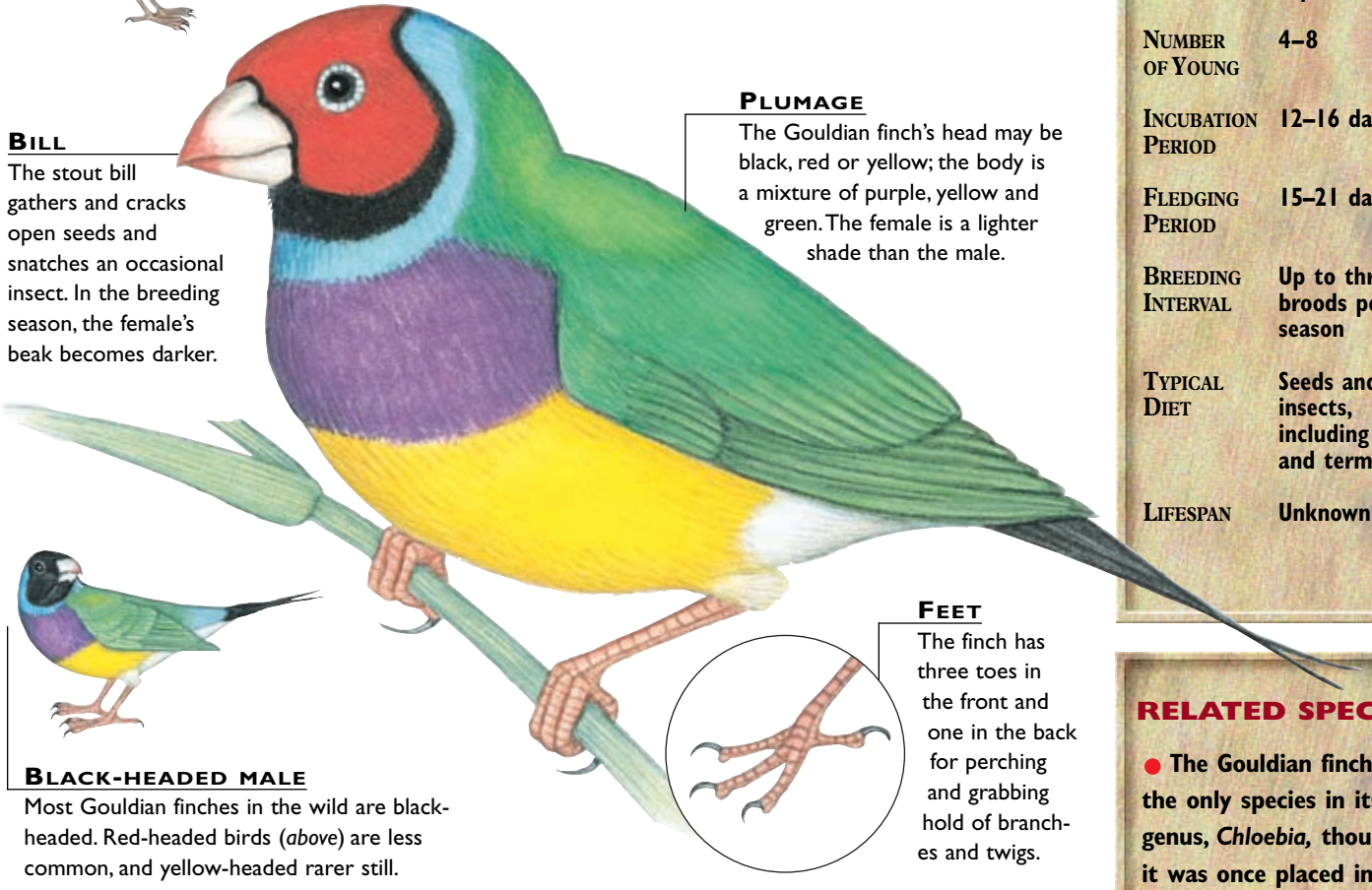
Juveniles are sage green above and grayish below. Young finches begin to attain their colorful adult plumage at about 2–3 months of age; the process may take up to nine months.

BILL

The stout bill gathers and cracks open seeds and snatches an occasional insect. In the breeding season, the female's beak becomes darker.

PLUMAGE

The Gouldian finch's head may be black, red or yellow; the body is a mixture of purple, yellow and green. The female is a lighter shade than the male.



BLACK-HEADED MALE

Most Gouldian finches in the wild are black-headed. Red-headed birds (*above*) are less common, and yellow-headed rarer still.

FEET

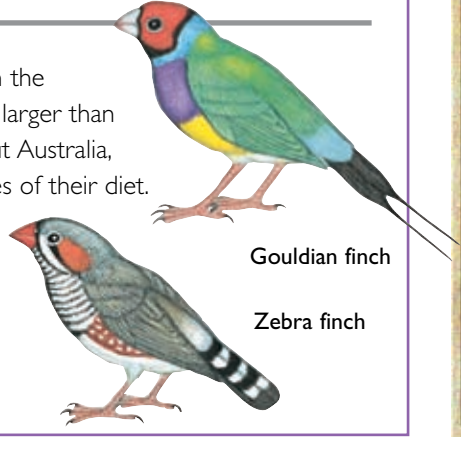
The finch has three toes in the front and one in the back for perching and grabbing hold of branches and twigs.

VITAL STATISTICS

WEIGHT	0.5 oz.
LENGTH	5–5.5"
SEXUAL MATURITY	9 months–1 year
BREEDING SEASON	February–September
NUMBER OF YOUNG	4–8
INCUBATION PERIOD	12–16 days
FLEDGING PERIOD	15–21 days
BREEDING INTERVAL	Up to three broods per season
TYPICAL DIET	Seeds and insects, including ants and termites
LIFESPAN	Unknown

CREATURE COMPARISONS

At 4", the zebra finch *(Poephila guttata)* is slightly smaller than the Gouldian finch, but much more plentiful. Their range is much larger than that of the Gouldian finch: zebra finches are found throughout Australia, except for Tasmania. Both species search for seeds, the staples of their diet. Zebra finches have been bred in captivity for many years; as a result, there are many different morphs of the bird, ranging from white to buff to pink and a dozen other variations. A common male zebra finch is gray with a white belly, chestnut cheeks, and gray and black stripes under the neck; it's black-and-white tailbars give rise to the name "zebra."



Gouldian finch

Zebra finch

RELATED SPECIES

● **The Gouldian finch is the only species in its genus, *Chloebia,* though it was once placed in the genus *Peophila* with the grass finches; some scientists argue that it actually belongs in the genus *Erythura* with the parrot finches, such as the blue-faced parrot finch, *E. trichroa.* There are about 133 species in the family *Estrildidae,* including the waxbills, finches, manakins and Java sparrows.**

Gray-crowned Crane

• ORDER •
Gruiformes

• FAMILY •
Gruidae

• GENUS & SPECIES •
Balearica regulorum

KEY FEATURES

- Leaps up to 7' in the air in elegant ritual dances that are performed by excited groups all year
- Most brilliantly colored and ornately plumaged of all the world's 15 species of crane
- Stamps on the ground to disturb invertebrate prey that it snaps up with its thick bill

WHERE IN THE WORLD?

Found from Kenya and Uganda south to South Africa with a band extending westward to northern Nambia and Botswana

LIFECYCLE

As if performing to a well-known piece of music, groups of gray-crowned cranes display their regal crests and plumage to dramatic effect in their balletic ritual dances.

HABITAT

▲ **PLAIN SAILING**
Long legs let this crane wade through "seas" of grass.

The gray-crowned crane lives in dry and wet lowland areas, including savannah grasslands, marshes, damp fields and the exposed shores of lakes and rivers. But unlike most other species of crane, it needs woodland to provide shade during the day as well as roost sites at night. Due to its size, it prefers open-canopied trees that afford excellent views from their high, bare branches.

Roost sites are rarely far from the best feeding areas; the crane usually makes its twice-daily journeys on foot. Although not migratory, it will fly off in search of food or water farther afield if local conditions deteriorate, such as during long periods of drought.

CONSERVATION

Extensive wetland drainage and tree loss have reduced the gray-crowned crane's habitat, but it's not yet under threat and is common in some areas. But eggs and young are taken for zoos and parks as its colorful plumage is much admired.

FOOD & FEEDING

The crane feeds mainly on the seeds of wild grasses and sedges, plucking them deftly with its stubby bill. But when it has the chance, it also takes advantage of cultivated crops, including millet, corn and rice.

Invertebrates, chiefly flies and grasshoppers, also form a significant part of the bird's diet. The crane either flushes these itself, by stamping on the ground, or wanders among cattle as they feed, waiting for them to disturb something edible. The crane also recognizes the potential of recently plowed land and searches and digs in the furrows for invertebrates brought to the surface. This powerful bird also captures and eats fish, amphibians and lizards.

DID YOU KNOW?

- **The long, hollow bones of the gray-crowned crane are made into flutes by local tribespeople.**
- **When unable to find shade from the sun, the gray-crowned crane cools itself by panting.**
- **The gray-crowned crane only utters its far-carrying, trumpeting calls when in flight: even its dramatic display dances are performed in total silence.**

BEHAVIOR

During and outside the breeding season, the crane performs dancing displays. These dances usually involve pairs, but other birds often join in to form dancing "troupes." Like ballet dancers, they move in choreographed precision. Prancing and leaping on slender legs, they crane their necks and flap their wings with fervor as the display progresses.

The crane is a social bird that forms large flocks in autumn and winter. At these times, the crane may be attracted to ripening agricultural crops. This can bring it into conflict with farmers, since a large flock can cause a significant amount of damage, as crops are eaten and trampled underfoot.

▶ **Picking its way**
The crane plucks seeds and insects from the ground as it walks.

NATURAL PERFORMERS

1 Opening moves...
A pair of cranes starts to display, bobbing up and down in unison, encouraging others to join in.

2 All in a flap...
Spreading their wings, the cranes hop and prance, moving away from each other, then regrouping.

3 Dancing on air...
At the height of the display, a crane leaps vertically up into the air, jumping twice its own height.

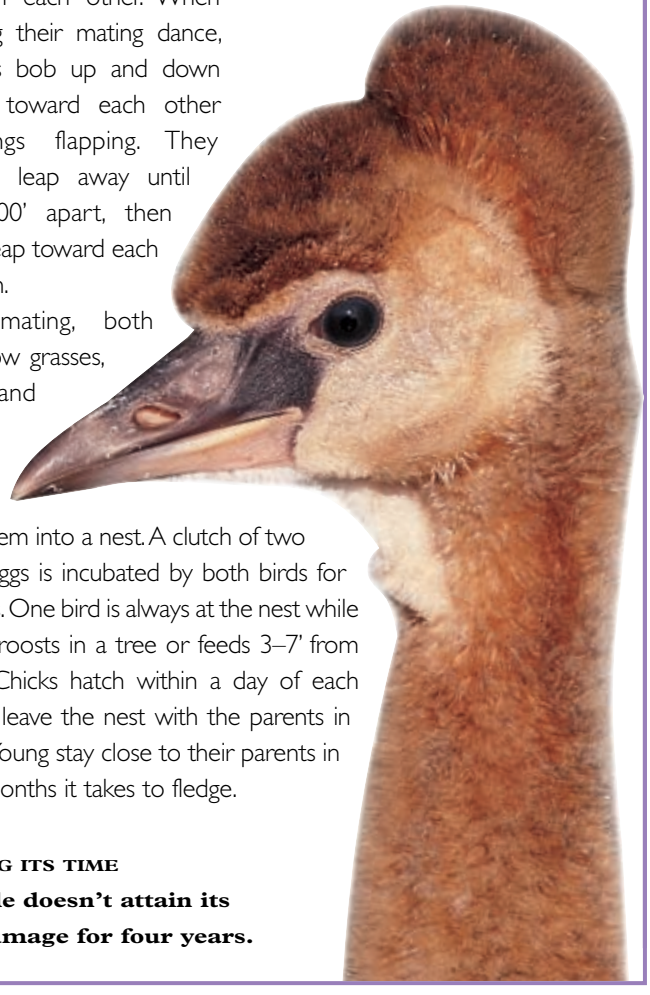
4 Back to earth
When the crane descends, it dangles its legs to slow its fall and cushion the impact.

BREEDING

During the breeding season, paired cranes are inseparable, rarely moving more than 10' away from each other. When performing their mating dance, both birds bob up and down and leap toward each other with wings flapping. They circle and leap away until they're 100' apart, then turn and leap toward each other again.

After mating, both adults throw grasses, sedges and rushes in a heap, then trample them into a nest. A clutch of two or three eggs is incubated by both birds for four weeks. One bird is always at the nest while the other roosts in a tree or feeds 3–7' from the nest. Chicks hatch within a day of each other and leave the nest with the parents in two days. Young stay close to their parents in the four months it takes to fledge.

▲ **Side by side**
Parents guard their offspring very closely.



▶ **Biding its time**
A juvenile doesn't attain its adult plumage for four years.

PROFILE GRAY-CROWNED CRANE

The striking gray-crowned crane is adapted to feeding in open country, wading through open grasslands on its long, strong legs to find food.

JUVENILE
Lacking the showy colors of its parents, the juvenile has dull plumage to blend in with the dry savannah.

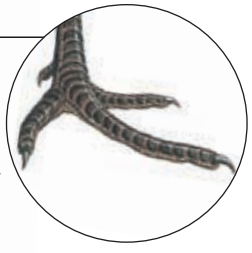
CREST & CROWN
A golden fan of stiff and bristly head-[illegible]hers forms a [illegible] behind the gray [illegible]own that gives the spe-[illegible]es its name.

BILL
The strong, stubby bill is powerful enough to kill prey as large as crabs and lizards, and also allows the crane to dig for insects and roots.

WINGS
The crane spends much time on the ground, but flies strongly and soars on thermals on its long, broad wings.

PLUMAGE
Some of the neck, back and wing feathers are elongated into elegant, trailing plumes. The male and female look alike.

FOOT
In common with other large, chiefly ground-living birds, the crane has strong, widely splayed toes.



LEGS
Extremely long legs enable the gray-crowned crane to wade into tall grassland to find food. They're also used to kick vegetation into an untidy heap when constructing its nest.

VITAL STATISTICS

WEIGHT	8 lbs.
LENGTH	3'
WINGSPAN	6–6.5'
SEXUAL MATURITY	4 years
BREEDING SEASON	July–January
NUMBER OF EGGS	2 or 3
INCUBATION PERIOD	28–31 days
FLEDGING PERIOD	16 weeks
BREEDING INTERVAL	1 year
TYPICAL DIET	Seeds, roots; insects, other invertebrates; crabs, lizards, fish and amphibians
LIFESPAN	Up to 20 years

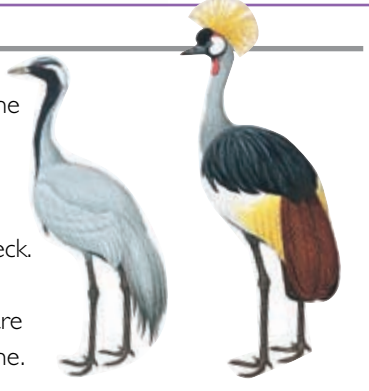
RELATED SPECIES

Once, the gray-crowned crane and black-crowned crane, *Balearica pavonina*, were thought to be two subspecies of crowned crane. Now, they're recognized as two of the 15 crane species in the family *Gruidae*, including the common, whooping, sandhill, sarus; black-necked, hooded, wattled, Manchurian; Japanese, Siberian white; demoiselle and Stanley's cranes, and the brolga.

CREATURE COMPARISONS

A little shorter than the gray-crowned crane, the demoiselle crane (*Anthropoides virgo*) appears to be much smaller because it lacks a crest and is paler in color. It's mainly gray, with black feathers on its face and neck that form a drooping "beard." The demoiselle has white "ear-tufts," which lie along the back of its neck.

Both have the long legs and neck typical of all cranes, but the demoiselle's neck is shorter in relation to its body. Its red eyes are very conspicuous, unlike the dark eyes of the gray-crowned crane. The demoiselle inhabits the dry grasslands of Eurasia, wintering in the Indian subcontinent, Sudan and Ethiopia.



Demoiselle crane

Gray-crowned crane

Gray Heron

• ORDER •
Ciconiiformes

• FAMILY •
Ardeidae

• GENUS & SPECIES •
Ardea cinerea

KEY FEATURES

- Wades in shallow water on elegant, stiltlike legs to fish for prey
- Hunts by standing statue-still and waiting for prey to drift into range, or by pacing slowly until it detects the slightest underwater movement
- Shoots its long neck out like a snake, stabbing prey with its bill
- Nests in noisy treetop colonies called *heronries*

WHERE IN THE WORLD?

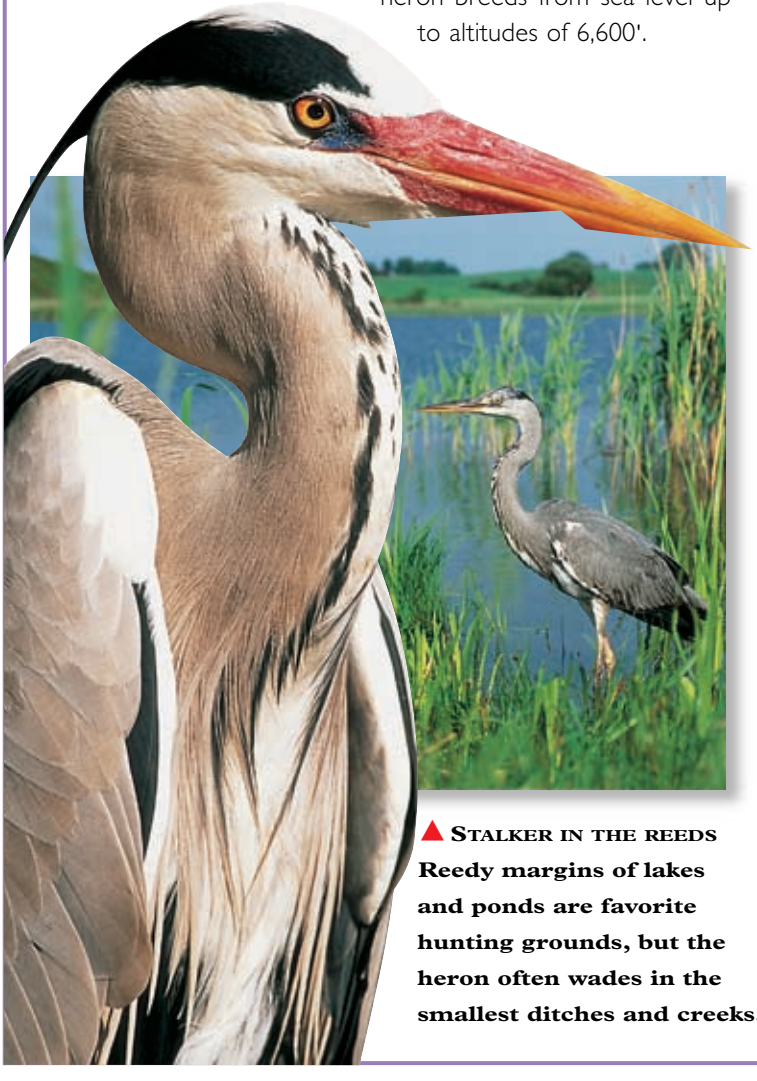
Breeds further north than any other heron, from Britain and southern Scandinavia across Russia to Japan, ranging south to India, the North African coast and other parts of Africa

LIFECYCLE

Hunting almost any small animal within striking distance, the gray heron moves with a blend of stately grace and deadly power, launching its killing blows without warning.

HABITAT

The gray heron is found wherever there's shallow water to hunt in, whether salty or fresh, stagnant or fast-flowing. Most of the year, its preferred habitats are low-lying rivers, ponds, lakes, reservoirs and marshes, but it also occurs in areas with waterlogged ground, such as floodplains, damp grassland and rice paddies. In the north, it moves to coastal mudflats, salt marshes, deltas and estuaries in winter, where the climate is mild and waters rarely freeze; in other areas it spends all year by the coast. The adaptable heron breeds from sea level up to altitudes of 6,600'.



▲ **STALKER IN THE REEDS**
Reedy margins of lakes and ponds are favorite hunting grounds, but the heron often wades in the smallest ditches and creeks.

BREEDING

▲ **FULL HOUSE**
Young fledge after about 6–7 weeks in the nest.

The heron breeds in treetop colonies, known as *heronries*, which have 10–200 nests, but are sometimes much larger. Pairs mate for life and return to the same nest each year, adding to the twig structure; eventually, the nest may collapse under its own weight. In areas where trees are scarce, the heron nests on cliffs, in reedbeds and bushes or on the ground.

In marked contrast to its silent nature, the gray heron is noisy and demonstrative at its colony, engaging in a neck-stretching courtship display and croaking deeply every time it arrives back at its nest. Both sexes incubate the eggs for about 3–4 weeks and then share the demanding task of keeping the chicks fed, regurgitating part-digested food straight into their bills.

DID YOU KNOW?

- **Herons occasionally visit garden ponds and will eat any fish they find.**
- **If heron eggs or chicks are destroyed, a pair will replace them up to three times.**

FOOD & HUNTING

Any small creature that lives in the heron's habitat may fall prey to this predator. As well as hunting fish, frogs and newts, it snatches insects, crustaceans, snakes and small mammals, such as water voles. Small waterbirds, and young ducks and wading birds in particular, risk their lives if they stray too close.

The heron uses two fishing strategies. It often lurks in ambush in the shallows, waiting for prey to approach. It also wades slowly and deliberately through the water with its neck pulled back in an S-shape while keeping watch for any movement that may betray a meal. When it spots prey, it darts its head forward at lightning speed, stabbing down with its bill to snap up or skewer its helpless victim. Small prey is swallowed headfirst, but larger victims are ferried to dry land to be dismembered and eaten piecemeal. Struggling eels often coil around the heron's neck, forcing it to wrestle them off before stabbing them.

LIGHTNING STRIKE

1 Stalk…
Ever poised to strike, a gray heron stalks slowly through the shallows at the margins of a lake, where small fish congregate.

2 Spot…
The heron slowly strides to a glittering shoal of fish, which remain unaware of the danger lurking above the surface.

3 Strike…
In one swift action, the heron straightens its neck and lunges forward, stabbing the water with its bill to snatch a victim.

4 Stab
The heron's prey squirms as it's hoisted out of the water, but in vain — the razor-sharp edges of its bill provide a secure grip.

BEHAVIOR

▲ **WELL GROOMED**
The heron cleans itself with "powder down" (like human talcum powder).

Cautious and wary, the heron lies low in the day, becoming active at dusk and dawn. It's solitary, as its hunting technique depends upon silent stealth, but it doesn't defend a territory.

In flight, the heron tucks its neck back to its body — unlike long-necked birds such as storks, which fly with the neck outstretched. Seen from a distance on its long broad wings, it resembles a bird of prey.

The grooming habits of the gray heron are unusual. To remove fish slime and sticky scales from its plumage, it applies a fine powder formed from the crumbling tufts of special downy feathers. This powder absorbs any slime and grease, letting it be combed away easily.

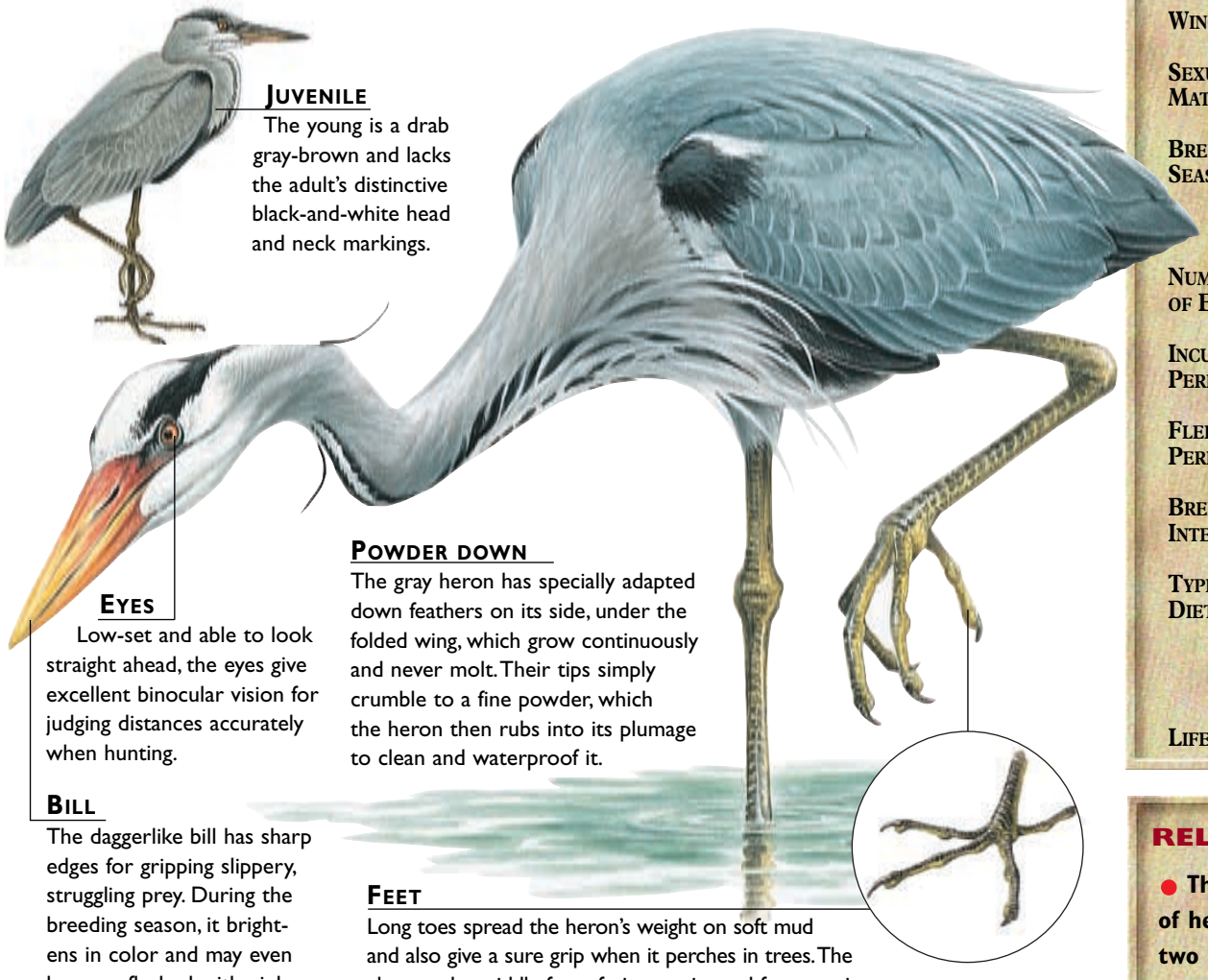
▼ **WARMING RAYS**
A heron stretching out its wings to catch the sun.

CONSERVATION

In some ways, it's surprising that the gray heron is an abundant species in much of its range. Large areas of its wetland habitats, especially lowland marshes, have been drained to create farmland, and its fishing skills make it so unpopular with fish farmers that many are shot each year — even in countries where it's protected (including Britain). But the heron hunts such a range of prey and lives in so many habitats that it's able to flourish regardless.

PROFILE GRAY HERON

Standing perfectly still, the gray heron is a patient predator. Suddenly, it strikes, unleashing the whiplash power of its neck to spear prey on its bill.



JUVENILE
The young is a drab gray-brown and lacks the adult's distinctive black-and-white head and neck markings.

EYES
Low-set and able to look straight ahead, the eyes give excellent binocular vision for judging distances accurately when hunting.

BILL
The daggerlike bill has sharp edges for gripping slippery, struggling prey. During the breeding season, it brightens in color and may even become flushed with pink.

POWDER DOWN
The gray heron has specially adapted down feathers on its side, under the folded wing, which grow continuously and never molt. Their tips simply crumble to a fine powder, which the heron then rubs into its plumage to clean and waterproof it.

FEET
Long toes spread the heron's weight on soft mud and also give a sure grip when it perches in trees. The claw on the middle front-facing toe is used for preening.

VITAL STATISTICS

WEIGHT	2.5–3.5 lbs.
LENGTH	3–3.5'
WINGSPAN	6–6.5'
SEXUAL MATURITY	2 years
BREEDING SEASON	Jan.–May in north; almost allyear in tropics
NUMBER OF EGGS	3–5
INCUBATION PERIOD	21–26 days
FLEDGING PERIOD	40–50 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Fish, snakes, invertebrates, birds, mammals, amphibians
LIFESPAN	25 years

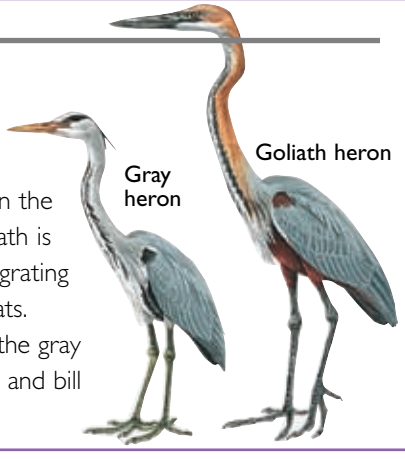
RELATED SPECIES

● **The 60-strong family of herons, *Ardeidae*, has two tribes: the day-active herons, 34 species that includes the gray heron, egrets and the purple heron, *Ardea purpurea*** (below)**; and the mainly nocturnal herons — the bitterns, night herons and tiger herons.**

CREATURE COMPARISONS

The long-legged, long-necked gray heron is a tall bird, but it's dwarfed by the goliath heron, *Ardea goliath*. This hunter of African and Middle Eastern swamps stands up to 5' high, but stalks its prey with stealthy efficiency, so is often overlooked in the dense reedbeds and mangroves. Like the gray heron, the goliath is intolerant of intruders; it will launch into the air with a deep, grating croak and flaps away over the marshes with leisurely wingbeats.

The goliath heron can wade into much deeper water than the gray heron, and fish make up a larger proportion of its diet. Its legs and bill are black, whereas those of its smaller relative are yellowish.



Gray Partridge

• ORDER •
Galliformes

• FAMILY •
Phasianidae

• GENUS & SPECIES •
Perdix perdix

KEY FEATURES

- Male's distinctive call has been compared to the grating squeak of a rusty gate being opened
- During severe winter weather, the partridge will roost by burrowing into the snow
- Even with broods of up to 20 chicks, only about 50% of the juveniles in a partridge family survive

WHERE IN THE WORLD?

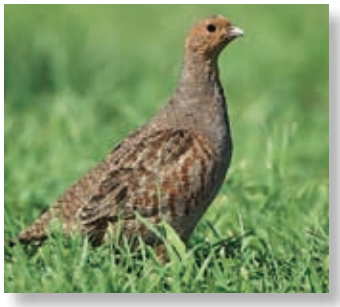
Found throughout Europe east to Turkey, Russia and western Siberia; also well established in the northern United States and southern Canada

LIFECYCLE

The gray partridge is an alert, wary bird that usually travels in groups called coveys; when flushed, the covey rises together and then the birds regroup.

HABITAT

The gray partridge prefers open, grassy areas in a cool, dry climate. Unlike other game bird species, however, the partridge can tolerate intensive agricultural development and actually seeks out habitats, such as farmland, on which most of the land is cultivated. Small, heavily cultivated farms of about 100 acres particularly appeal to the partridge. On these farmlands, the gray partridge requires an abundance of protective fence rows, shelter belts and undisturbed roadside cover. It uses these areas for escape routes and also for nesting, resting and winter cover. After a harvest, ground stubbles serve as feeding and roosting areas for partridge coveys. Brood numbers are limited by the abundance of insect prey for chicks, the amount of nesting cover and the level of predators present while nesting.



▲ **CLASS IN THE GRASS**
A proud partridge struts across an open field.

FOOD & FEEDING

Gray partridges eat mainly weed seeds, cultivated grains and green leafy plants. Young birds also feed on insects such as crickets and grasshoppers, but animal foods make up only about 10% of an adult partridge's diet. During the spring and early summer, partridges feed mainly on green leafy material, including dandelions, small grains and assorted grasses. In the summer and fall, weed seeds of plants including foxtail, wild buckwheat and linotweed are abundant sources of food. Cultivated grains, such as wheat, corn, oats and barley are another essential food source: such grains can account for over one-third of the bird's summer diet and become increasingly important through the winter. In many areas of the partridge's range, field stubble and waste grains (especially corn) constitute nearly all of its winter food supply.

BEHAVIOR

The gray partridge lives in a flock called a covey for 7–8 months of the year. A covey consists of a family group that includes last year's nonbreeding birds, or of two family groups that have joined to form a larger group. Such flocks can sometimes number 20 or more birds.

During warmer weather, partridges are most active in the morning and late afternoon, resting in cover during midday. Their range is very limited and usually does not exceed 0.25 mile, although the birds may fly as much as 0.5 mile in winter to search for food. The gray partridge covey feeds and roosts together and breaks up only during the breeding season.

Gray partridges have the unique ability to survive heavy winters in open, unprotected fields containing minimal cover. During severe weather, the birds "roost" in depressions in the snow, or by burrowing in. Partridges normally leave their winter roosts only during the warmest part of the day, when they fly out to the fields to feed. Juveniles are especially vulnerable in cold weather.

DID YOU KNOW?

- **The gray partridge's scientific name, *Perdix perdix*, is known as a tautonym, which means that both parts of the scientific name are the same.**
- **The gray partridge's nickname, "hun," is short for Hungarian partridge.**

◀ BIRD "BATH"
A gray partridge shuffles its wings to flick dust on its feathers to absorb excess oil.

CONSERVATION

Gray partridge populations have declined by up to 90% in some countries due largely to habitat destruction. The species has become extinct in Norway and is on the verge of extinction in Ireland and Switzerland. An increase in predators has hurt populations; because the partridge is a prize game bird, hunting is also a threat.

◀ PLENTY OF EAR
Corn is a staple of the gray partridge's diet in many locales.

BREEDING

Gray partridges begin the slow process of courtship in early winter. Both sexes perform numerous dramatic displays, including circling, neck-stretching and running with head lowered. In March, the males in a covey begin crowing with their "rusty gate" call, *kiERRR-R-R-R-Ik*, to advertise their presence, especially in the morning and evening. Crowing then leads to ritualized fighting between the males, which fly and peck at each other. Eventually, one male leaves the area, and the victorious bird remains to try and attract a female.

Following mating, usually in late April, the female builds the nest while the male stands guard nearby. The nest is usually located in grasses in open country or along roadsides, fences, hedgerows, ditches and banks.

Shortly after the nest is complete, the female lays her first egg. She continues laying one egg per day until her clutch of 9–20 olive-colored eggs is complete. The female incubates the eggs, often covering them with grass and leaves to hide them from predators when she leaves the nest to feed.

After about 25 days, the downy young hatch. Both parents care for the chicks, taking them out to feed on insects and green vegetation. Brood mortality is high, however, and nearly 50% of the brood may be lost before the chicks are two weeks old, mainly to predators, such as foxes. After about two months, the young partridges are able to fly, but they usually remain with their parents through fall and winter until the following breeding season.

PARTRIDGE PAIRS

1 Cozy covey…
Partridges form small groups of 10–15 birds called coveys, which stay together until the start of the breeding season.

2 Courtship rituals…
Partridge pairs must go through an elaborate courtship ritual before finally pairing off for the mating season.

3 Protective mama…
The female takes great care to build her nest in a protected area, filling a shallow depression behind a hedgerow with leaves and grass.

4 Proud papa
The male partridge broods the first-hatched chicks while the female incubates the remainder of her clutch of eggs.

PROFILE GRAY PARTRIDGE

If forced to take flight, the partridge attempts a hasty takeoff with its short wings, landing only a few hundred feet from its point of departure.

BILL
The short, sturdy bill is perfect for picking up seeds and vegetation, which is the gray partridge's preferred diet.

IN FLIGHT
The partridge rarely flies; its short wings and tail are not designed for it. After a great deal of noisy fluttering, the bird settles into a short glide.

PLUMAGE
Partridge plumage provides perfect camouflage in a variety of habitats. The face and throat are rusty-orange, while the breast is gray with a dark-chestnut horse-shoe mark on the upper abdomen.

CHICK
The newly hatched chick is covered in down. The young partridge remains with its parents until the following year, when it will be attired in full adult plumage and ready to breed.

LEGS & FEET
The legs are short and sturdy. Each foot has four toes, but lacks webbing — the feet are adapted for walking and running.

VITAL STATISTICS

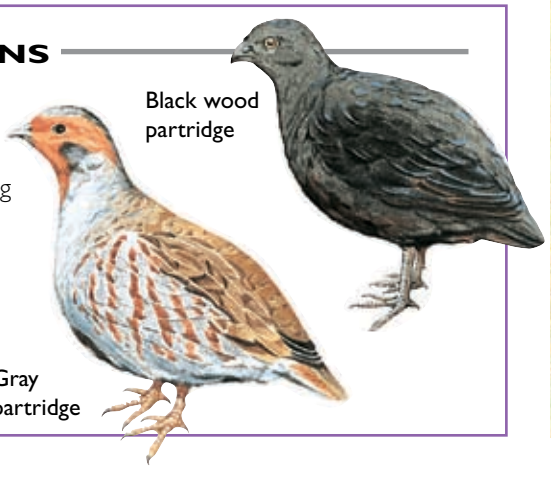
WEIGHT	Up to 1 lb.
LENGTH	11–12"
WINGSPAN	17.5–19"
SEXUAL MATURITY	1 year
BREEDING SEASON	April–September
NUMBER OF EGGS	9–20
INCUBATION PERIOD	24 days
FLEDGING PERIOD	40–60 days
TYPICAL DIET	Adults: mainly weed seeds, grains and leafy plants; young: insects, such as crickets and grasshoppers
LIFESPAN	Unknown

RELATED SPECIES

- Partridges belong to the *Phasianidae* family, which includes pheasants and quails. Members of this family have plumage that is commonly brown, gray and heavily marked. There are 94 species of partridge in 19 genera, ranging all over the world, from Africa and Europe to Asia and Australia. The family includes the red-legged partridge, *Allectoris rufa*, and the crested wood partridge, *Rollulus roul*.

CREATURE COMPARISONS

The black wood partridge (*Melanoperdix nigra*) measures 9.5–10.5" and is slightly smaller than the gray partridge. Both partridges have plumage befitting their names: the black wood partridge is almost entirely black and its cousin's breast is gray. The black wood partridge occurs singly or in pairs in the dense undergrowth of forests or woodlands; the gray partridge prefers to group together in coveys in open areas, farmlands and brush.



Graylag Goose

• ORDER •
Anseriformes

• FAMILY •
Anatidae

• GENUS & SPECIES •
Anser anser

KEY FEATURES

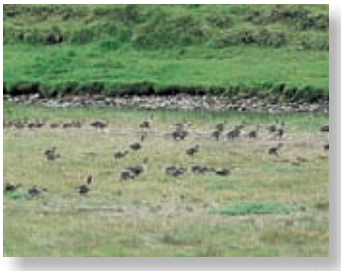
- Similar in color, the male and female maintain a pair bond throughout their lives
- Small feet and a long neck are adaptations for walking and grazing on dry land
- Moving from northern breeding grounds to milder climates in winter, migrating flocks are a familiar sight on farms near the coast

WHERE IN THE WORLD?

Breeds in Iceland, Britain, Scandinavia, central Europe and Russia to northeastern China; winters in parts of coastal Europe and southern Asia from northern India to southern China

LIFECYCLE

The graylag goose is gregarious and feeds in large flocks, often alongside other species of goose. However, it can be aggressive and occasional squabbles break out.



▲ **GAGGLE OF GEESE**
Damp grassland attracts geese (winter and summer).

CONSERVATION

The graylag goose is under no immediate threat. In western Europe, it's actually increasing, and the total population may now number several hundred thousand birds. However, in some parts of its range in Asia, there's growing concern over habitat alteration and destruction.

HABITAT

◀ **GOOSE STEPS**
The graylag goose spends most of its time on land.

In summer, the graylag goose frequents wetland areas, such as marshes, reed beds, lakes and boggy thickets, in Europe and central Asia. By September, it flies to its winter quarters, typically farther south in swamps, coastal lagoons and estuaries. In northwest Europe, however, particularly in Britain and the Low Countries, the graylag goose often overwinters on farmland adjacent to the coast.

BREEDING

The graylag is a sociable species and is the most widespread goose in Europe. It nests in swamps and on reedy lakes, but also on small islands near the coast. When breeding, it's often found in loose colonies surrounded by flocks of non-breeding, immature geese. This goose pairs for life, but the pair may become separated in the winter. At the nest site, though, they meet and build a nest together.

The shallow ground nest is made of reed stems and grasses, and lined with down. It's usually well concealed in tall, waterside vegetation to protect it from predators. The female lays up to a dozen eggs and incubates them while the male stands guard. All chicks in a clutch hatch at the same time. The *goslings* (chicks) emerge covered with down, can swim and walk quite long distances. To avoid predators, goslings immediately move to the safety of water.

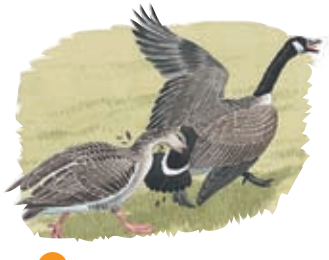
▲ **ON THE WATER**
Graylag chicks spend a lot of time on the water, leaving only to feed.

MOTHER GOOSE

1 Family picnic…
A female graylag doesn't feed her newly hatched chicks in the nest. She leads them to grassland to begin grazing for themselves.

2 Ticking off…
A gosling strays close to a Canada goose feeding nearby. The Canada goose teaches it a sharp lesson with a violent peck.

3 My baby..!
The gosling's mother bursts into action, rushing at the bullying Canada goose, with neck outstretched and head held low.



4 Henpecked
With all her protective instincts unleashed, the graylag pecks viciously at the Canada goose, delivering powerful nips.

BEHAVIOR

▲ **ON THE WING**
The graylag's wings are short, but they're broad and powerful, and the goose flies strongly on migration.

Like most waterfowl of high, northern latitudes, the graylag migrates south after breeding and spends the winter in warmer climates. Geese that nest in Iceland and Scandinavia migrate to Britain and coastal areas of southern Europe.

Unlike ducks, geese pair for life and form strong family bonds. Young stay with their parents throughout the winter, traveling south with them from the breeding grounds. When the family returns north again, the young leave the family and depart to find a mate.

DID YOU KNOW?

- **The name "graylag" is derived partly from the reference to the bird's overall color and from the word *lag*. Lag refers to its tendency to "lag behind" in Britain before migrating.**
- **The graylag is the ancestor of the European domestic goose, whose feathers were used in quill pens, arrow shafts and "birdies" for badminton.**

FOOD & FEEDING

The graylag goose is often regarded as the "sheep" of the bird world because it spends much time in large flocks grazing on land. Its heavy bill is adapted to shearing grass and pulling up or digging out roots and tubers. A field grazed by a large flock often looks to have been freshly mowed.

In winter, the graylag visits farmland, where it feeds on fallen grain, potatoes and vegetables. In late winter and early spring, when the first green shoots of crops appear, the goose feasts on the succulent, emerging vegetation. It can cause great damage to crops and is sometimes very unpopular with some farmers. However, its presence can also be beneficial. Chemicals in its large quantities of droppings act as a rich fertilizer on the soil.

▲ ▶ **OUT TO GRASS**
A long neck and low center of gravity are adaptations to feeding on ground vegetation.

PROFILE GRAYLAG GOOSE

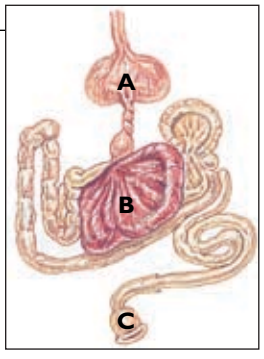
As a grazer, the graylag goose eats large amounts of food to gain sufficient energy and so is adapted for a life mainly spent feeding on land.

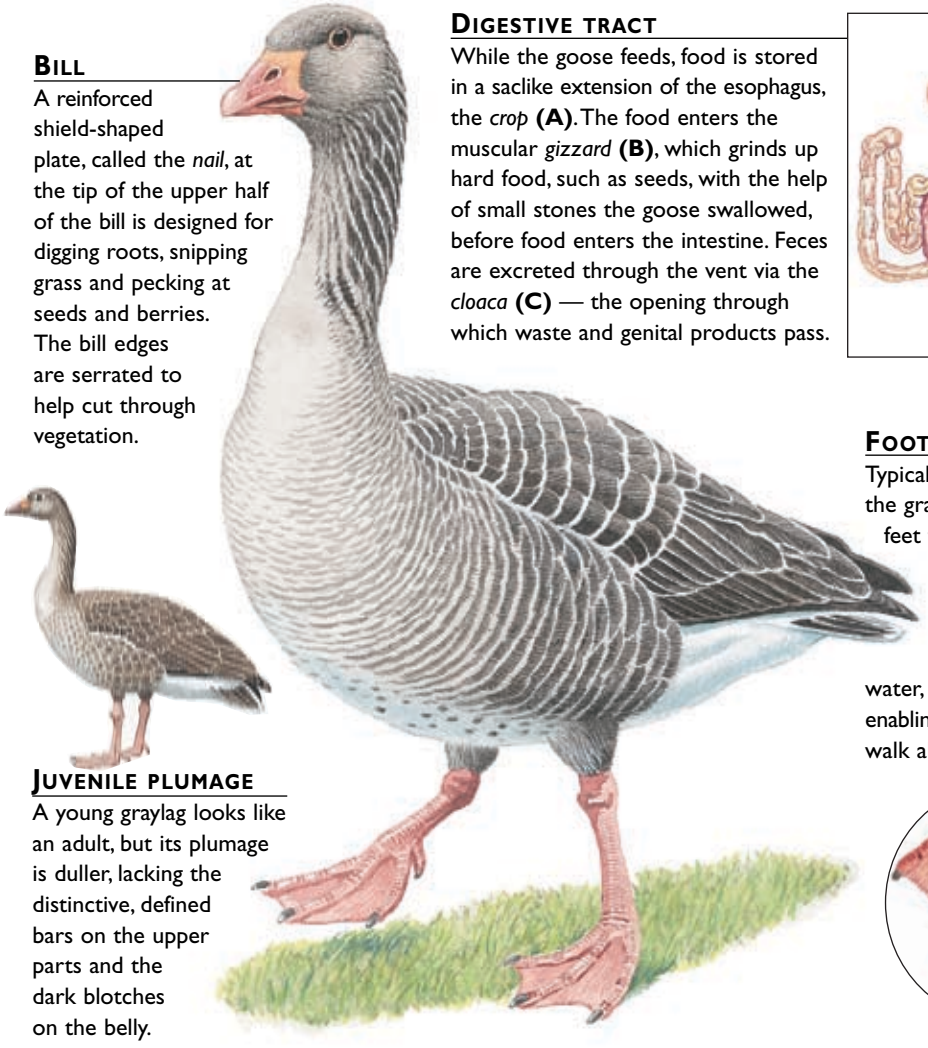
BILL

A reinforced shield-shaped plate, called the *nail*, at the tip of the upper half of the bill is designed for digging roots, snipping grass and pecking at seeds and berries. The bill edges are serrated to help cut through vegetation.

DIGESTIVE TRACT

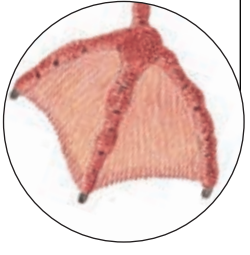
While the goose feeds, food is stored in a saclike extension of the esophagus, the *crop* **(A)**. The food enters the muscular *gizzard* **(B)**, which grinds up hard food, such as seeds, with the help of small stones the goose swallowed, before food enters the intestine. Feces are excreted through the vent via the *cloaca* **(C)** — the opening through which waste and genital products pass.





FOOT

Typical of aquatic birds, the graylag has webbed feet for swimming. But unlike those species that spend a lot of time on water, the feet are small, enabling the graylag to walk about more easily.



JUVENILE PLUMAGE

A young graylag looks like an adult, but its plumage is duller, lacking the distinctive, defined bars on the upper parts and the dark blotches on the belly.

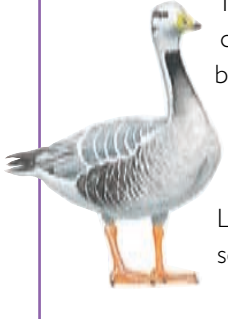
VITAL STATISTICS

WEIGHT	5.5–9 lbs.
LENGTH	2.5–3'
WINGSPAN	5–6'
SEXUAL MATURITY	3 years
BREEDING SEASON	March–August
NUMBER OF EGGS	3–12; usually 4–6
INCUBATION PERIOD	27–28 days
FLEDGING PERIOD	50–60 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Grass, roots, leaves, seeds and fruits of a wide variety of plants
LIFESPAN	10 years in the wild

RELATED SPECIES

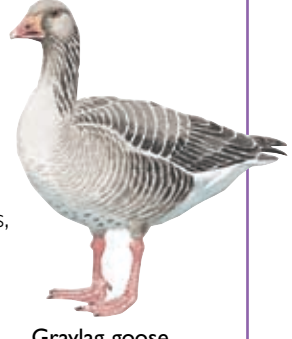
- **Geese are members of the family *Anatidae* (148 species that also includes swans and ducks). Geese are bulkier and longer necked than ducks and feed on land; ducks tend to feed in water. There are 10 species in the genus *Anser*; the graylag goose is one of 6 species in this genus known as gray geese; the others are the pink-footed, white-fronted, lesser white-fronted, bar-headed and bean goose.**

CREATURE COMPARISONS



Bar-headed goose

The bar-headed goose, *Anser indicus*, is one of the most distinctive-looking geese. The white head crossed by two black bands is unique, as is the vertical neck stripe. It's a high altitude species breeding on plateau wetlands at 13,200–16,500' in central Asia. It winters south on lowland marshes and lakes in northern India, Bangladesh, Pakistan and Burma. Like the graylag goose, it's mainly vegetarian, feeding on grasses, sedges and plant roots. Its future in China, where there are 10,000 breeding pairs, is threatened by human persecution (egg-collecting, hunting and habitat destruction).



Graylag goose

Great Argus Pheasant

• ORDER •
Galliformes

• FAMILY •
Phasianidae

• GENUS & SPECIES •
Argusianus argus

KEY FEATURES

- Displays the most remarkable plumage of any pheasant species
- Boasts an extensive repertoire of calls, and is more often heard than seen
- Males perform an intense foot-stomping dancing ritual during breeding

WHERE IN THE WORLD?

Found in lowland forest areas in Borneo, Sumatra and the Malay peninsula in Southeast Asia near the South China Sea

LIFECYCLE

The male great argus pheasant struts about fanning his grand display of feathers with a dazzling array of golden eyespots in an attempt to impress a female.

HABITAT

The great argus pheasant favors mature forests up to 4,000' above sea level. In Malaysia, it is found in lowland and dipterocarp forests. (Dipterocarps, native to Asia, have unusual "winged" seeds, which drift instead of falling straight down.) In the north, the bird frequents hillsides with evergreen vegetation. In Borneo, the bird dwells in lowland forests and in forests as high as 3,000'. At Kuala Lumpur, most argus pheasants prefer soil that is no more than 600' from permanent water.

FOREST-DWELLER
The great argus pheasant can be found in a variety of leafy settings.

DID YOU KNOW?

- **In Greek mythology, Argus was a god who had many eyes, which enabled him to see in all directions. The species name *argus* comes from the *ocelli* (eyes) that line the wings.**
- **Males begin calling at about 1 year of age and perfect their calls before they are 2 years old.**

BREEDING

The male great argus pheasant performs an elaborate courtship display in a specially prepared area that is 72 sq. feet or larger. He meticulously cleans his dancing site, then attempts to impress females with his foot-stomping dance, concluding with an impressive display in which he creates a fan of feathers with his wings. He peeks through the funnel of *ocelli* (eyespots) with one eye to see if the female accepts. Copulation lasts only a few seconds. Once the birds mate, the female flies deep into the jungle where she lays her clutch, often near a large rainforest tree. The males do not appear to have any role in the nest or its defense. After almost a month of lone incubation, the female feeds the down-covered chicks for more than 40 days. She brings insects in her bill and passes them directly to the chicks' mouths. The nestlings begin to hop with a series of consecutive jumps in preparation for flying.

THE MATING DANCE

1 A clean house...
A male great argus pheasant advertises his cleared dancing arena by calling out to females early in the morning.

2 Step into my pad...
A female accepts the invitation and ventures into the male's dancing ground. He circles around her, stomping his feet.

FOOD & FEEDING

The great argus pheasant slowly meanders and pecks at leaf litter on the ground and occasionally at the leaves on shrubs. Fallen fruits and ants top the menu, but the bird also eats other insects, as well as mollusks, leaves, nuts and seeds. The bird lifts its head after each peck to survey its surroundings for potential danger. Females forage for food with their young, while the males embark on solitary searches.

ANTS IN THE PLANTS
A pheasant looks up to scan for predators before continuing to feed on ants and other insects.

BEHAVIOR

The reclusive great argus pheasant is more likely to be heard than seen. It spends most of the daytime perched, and is usually most active at sunrise and sunset. The male call is a loud, prolonged, musical *kwow-wow,* which carries great distances in the heavy forest. Nocturnal calling is frequent and at its loudest between February and August, the breeding season. At this time, the birds become more active and males have vocal contests for display sites. Males clean their display site by throwing leaves with the beak, pecking at overhead vegetation and beating their wings to fan away light debris. Both sexes are extremely fast runners, but poor fliers; they rely on acute hearing to warn them of impending danger.

3 A fancy display...

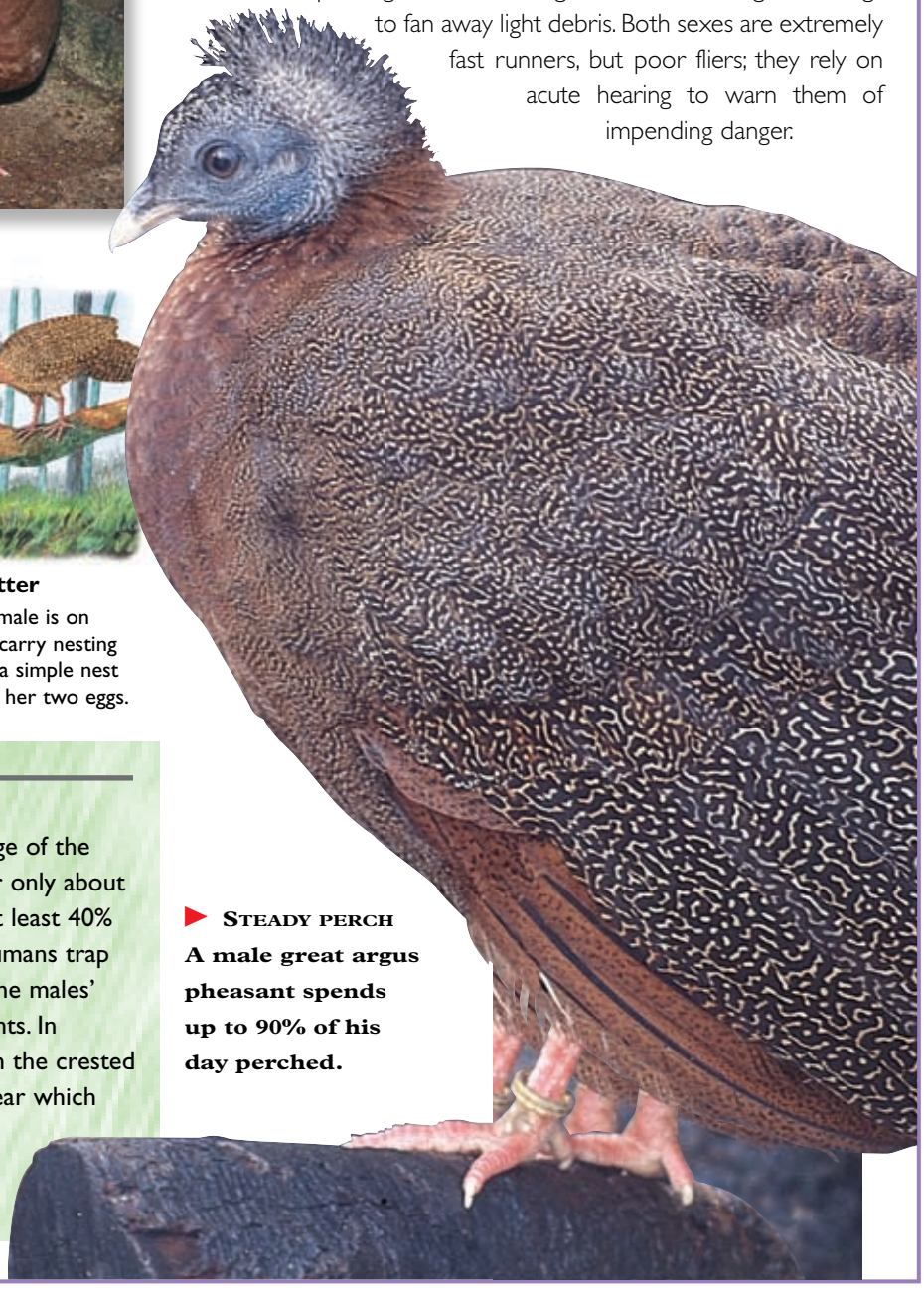
The show begins; the male curves his wings upward and around, forming a huge funnel as he vibrates his tail and plumage

4 A family matter

After mating, the female is on her own; unable to carry nesting material, she forms a simple nest in a tree hollow for her two eggs.

CONSERVATION

Forest destruction has limited the Malaysian range of the great argus pheasant. Lowland forests now cover only about 15% of the peninsula. Borneo is in less danger; at least 40% of its land area is covered by lowland forests. Humans trap the birds at display sites that are advertised by the males' loud calls, and use the birds' feathers as ornaments. In addition, the great argus pheasant competes with the crested argus pheasant for its habitat, though it is not clear which species excludes the other. Currently, the great argus pheasant is raised in aviaries around the world.

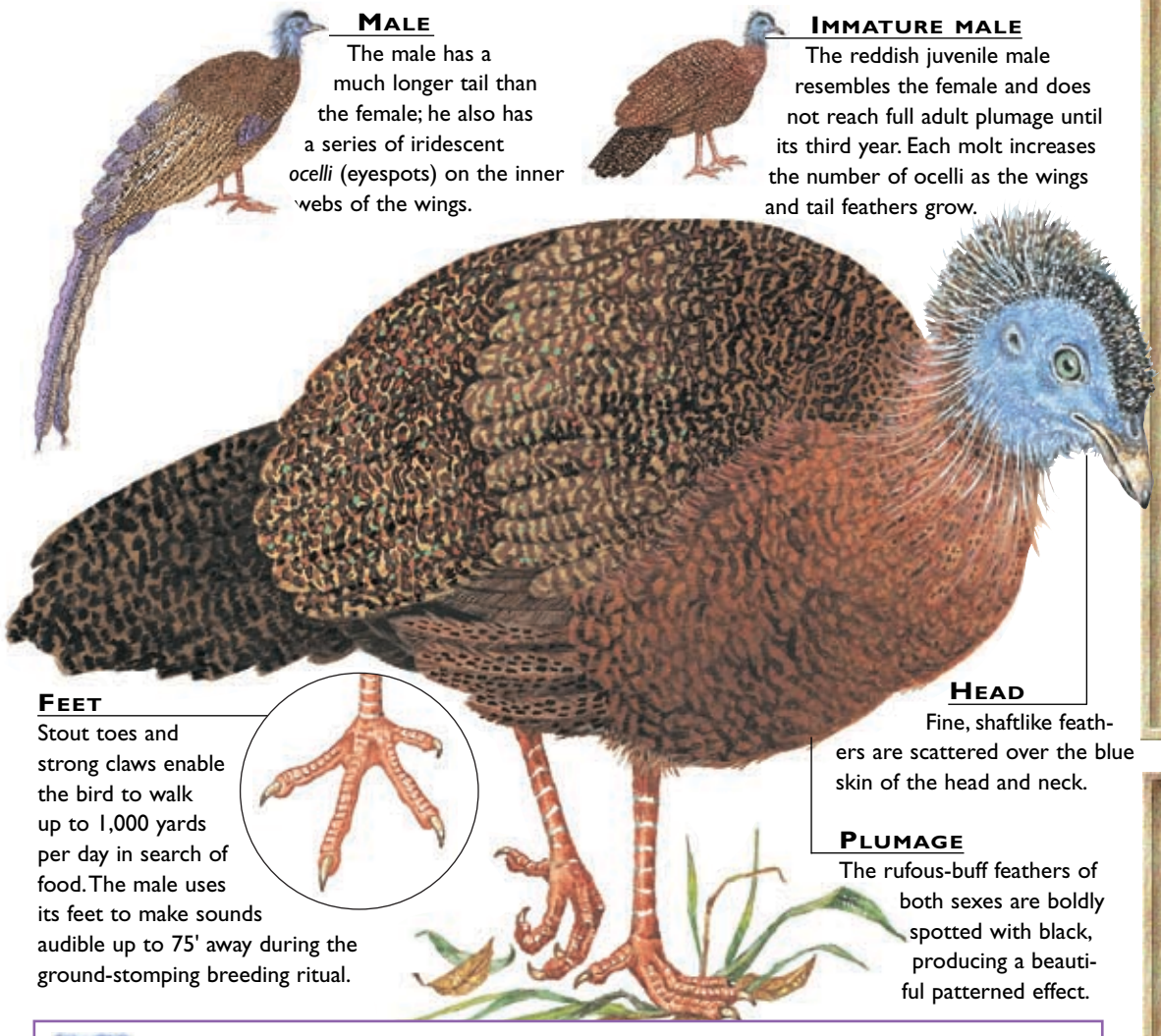


STEADY PERCH

A male great argus pheasant spends up to 90% of his day perched.

PROFILE GREAT ARGUS PHEASANT

The great argus pheasant normally has a drab appearance — but the male displays elegant underwing plumage during courtship rituals.



MALE
The male has a much longer tail than the female; he also has a series of iridescent *ocelli* (eyespots) on the inner webs of the wings.

IMMATURE MALE
The reddish juvenile male resembles the female and does not reach full adult plumage until its third year. Each molt increases the number of ocelli as the wings and tail feathers grow.

FEET
Stout toes and strong claws enable the bird to walk up to 1,000 yards per day in search of food. The male uses its feet to make sounds audible up to 75' away during the ground-stomping breeding ritual.

HEAD
Fine, shaftlike feathers are scattered over the blue skin of the head and neck.

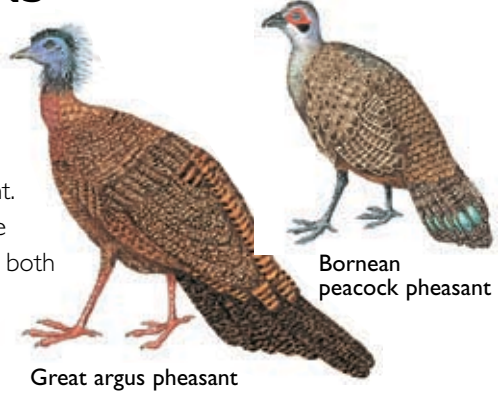
PLUMAGE
The rufous-buff feathers of both sexes are boldly spotted with black, producing a beautiful patterned effect.

VITAL STATISTICS

WEIGHT	Male 4.5–6 lbs.; female 3.5–3.75 lbs.
LENGTH	Male up to 7'; female up to 2' (including tail)
SEXUAL MATURITY	3 years
BREEDING SEASON	February–August
NUMBER OF EGGS	2–4
INCUBATION PERIOD	24–26 days
FLEDGING PERIOD	Up to 40 days
BIRTH INTERVAL	More than 1 brood a year
TYPICAL DIET	Ants, plants, leaves, nuts and seeds
LIFESPAN	Unknown

CREATURE COMPARISONS

Like the great argus pheasant, the Bornean peacock pheasant *(Polyplectron schleiermacheri)* inhabits lowland forests of Borneo, but it is the only peacock pheasant found in the region. At 17–20" long, it is much smaller than the great argus pheasant. The female of both species (*shown at right*) lacks the longer tails common in their male counterparts. But both sexes of the Bornean peacock pheasant have *ocelli* (eyespots) on their upperparts; ocelli are completely absent in the female great argus.



Bornean peacock pheasant

Great argus pheasant

RELATED SPECIES

● **The great argus pheasant is the only species in the genus *Argusianus*, which joins 15 other genera in the family *Phasianidae*. The family includes quails, partridges, pheasants, spur fowl, francolins and peafowl. The bobwhite quail, *Colinus virginianus*, a native of North America, is named for the male's song, "bob-white." The painted quail, *Excalfactoria chinensis*, is only 6" long.**

Great Black-backed Gull

• ORDER •
Charadriiformes

• FAMILY •
Laridae

• GENUS & SPECIES •
Larus marinus

KEY FEATURES

- With a wingspan of 5' or more, it is the largest gull in the world
- Prefers scavenging to hunting, but will attack seabirds and small animals such as toads
- Opens mollusks by dropping them onto rocks from a great height

WHERE IN THE WORLD?

Found around the world; nests along coasts in northern Europe, Britain, Russia, Great Lakes region and eastern seaboard in the U.S.

LIFECYCLE

Belligerent, particularly to other seabirds, the great black-backed gull dominates gull colonies; this giant predator kills other birds in midflight to satisfy its enormous appetite.

HABITAT

Found along fresh- and saltwater shorelines and offshore islands, the great black-backed gull has been spotted up to 100 miles offshore. Frequently nesting in rookeries with other varieties of gull, it frequents the rocky coasts of the British Isles, France, Iceland, Northern Europe and Russia. In the New World, the great black-backed gull is found from Greenland down the Atlantic seaboard to Bermuda. While it prefers rocky shoreline or cliffs for roosting, the great black-backed gull will settle for dunes, buildings or virtually any other place that provides a perch. Due to its fondness for garbage dumps, the black-backed gull is also found far from the shore and is common in the Great Lakes area of the midwestern United States and central Canada.

DID YOU KNOW?

- **The great black-backed gull will often team with another black-backed gull to attack and kill other birds in midair.**
- **A bully to other seabirds, the great black-backed gull interbreeds with herring gulls where their breeding colonies overlap.**

BREEDING

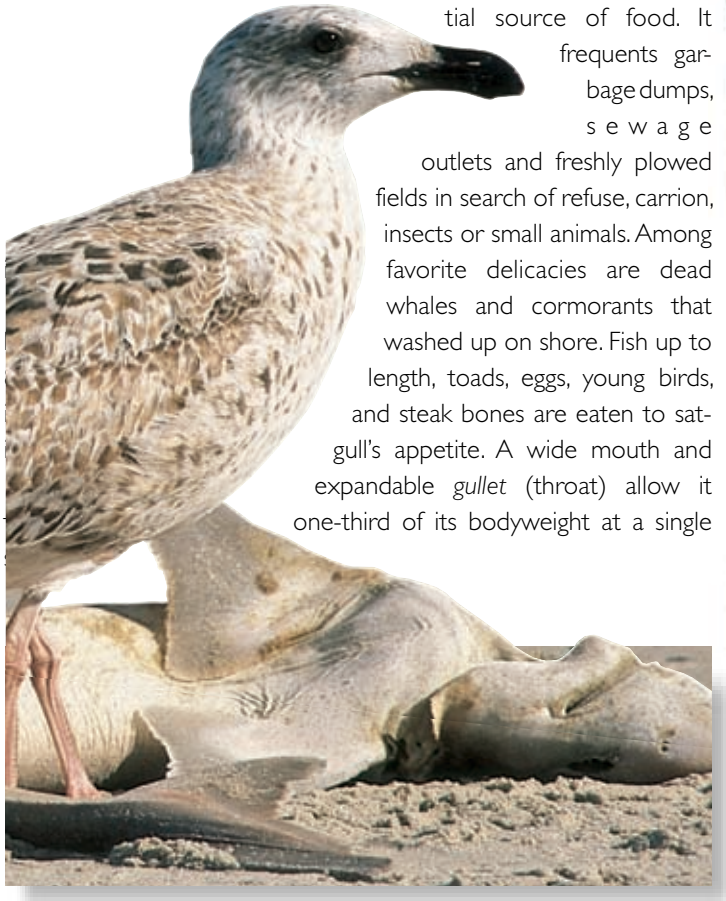
During courtship, the great black-backed female gull assumes a hunched posture while the sexes preen each other. The male also feeds the female. Once paired, the birds usually build a small, solitary nest on rocky shores, sand dunes or buildings. While the nest may be built in an area that is heavily colonized by various types of gulls, it will be set apart from the larger population. Nests are usually constructed in a hollow or depression atop a good vantage point, and lined with seaweed, grasses, moss, feathers and sticks. The 2–3 spotted, brownish-olive eggs incubate for 26–28 days. The chicks are fed regurgitated food by both parents until they are large enough to begin scavenging on their own. The chicks are able to fly 42–56 days after hatching. The young go through three stages of juvenile plumage before reaching their adult markings; they reach sexual maturity when they are 3 years old. There is little visible difference between males and females.

▼ **ROCKY TOP**
Black-backed gulls prefer rocky coasts.

▼ **STAGE ONE**
Young gulls go through three stages of plumage before reaching adulthood.

FOOD & FEEDING

Preferring scavenging to hunting, the great black-backed gull will follow fishing boats, garbage boats and any other potential source of food. It frequents garbage dumps, sewage outlets and freshly plowed fields in search of refuse, carrion, insects or small animals. Among favorite delicacies are dead whales and cormorants that washed up on shore. Fish up to gull's appetite. A wide mouth and expandable *gullet* (throat) allow it one-third of its bodyweight at a single



AGGRESSIVE APPETITE

1 Surprise attack...
An unwary puffin strays too close to a gull's cliff-face roost. It tries to dive to safety, but it falls victim to the gull's powerful bill.

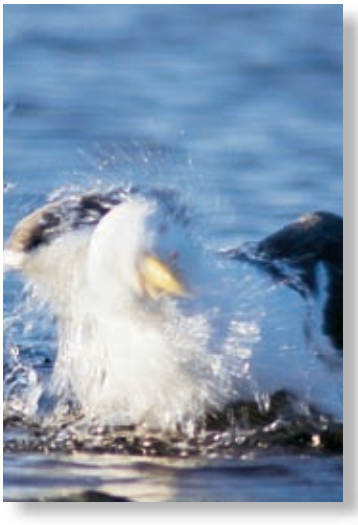
2 A quick snack...
The gull tears away the puffin's flesh, its razor-sharp beak making quick work of the smaller bird.

3 Still hungry...
Not sated after devouring the puffin, the gull finds a tasty mussel wedged between some rocks alongside a tidal pool.

4 Drop-by dinner
The gull picks up a mussel and soars into the air. It drops the mussel on the rocks, breaking it open to reveal the delicate flesh.

BEHAVIOR

A bold bird, the great black-backed gull is always on the lookout for its next meal. It follows boats and hangs around harbors where food, such as refuse, can be easily found. The gull will sometimes lounge about in loose flocks and mix with other gulls on land or water. Great black-backed gulls roost and breed in colonies, and often fly in formation to conserve energy when searching for food. This aggressive bird often attacks other birds close to its own size in midair, stunning them with sharp blows of its beak. On the ground, the gull stabs them with its beak and shakes them to death. While it can swim on the surface, it does not swim well underwater, and prefers to stick only its head and neck under the surface.



▶ **REFRESHING PAUSE**
Gulls are good swimmers but not divers.

CONSERVATION

With a worldwide population in excess of 200,000 pairs, the great black-backed gull faces no immediate threat to its survival. With the steadily increasing supply of refuse for it to feed on, gull populations have actually increased and show little sign of declining.

PROFILE GREAT BLACK-BACKED GULL

The great black-backed gull often attacks colonies of other seabirds and crushes the life from their chicks with its scimitar-shaped bill.

JUVENILE
The young gull shows barred patterns on its back and checkered patterns elsewhere. It reaches adult plumage by its third year.

BILL
One of the gull's most readily identifiable characteristics is the red spot on the lower edge of the bill, called the gonydeal spot.

FEET & LEGS
The large webbed feet, driven by long, strong legs, provide excellent propulsion when swimming.

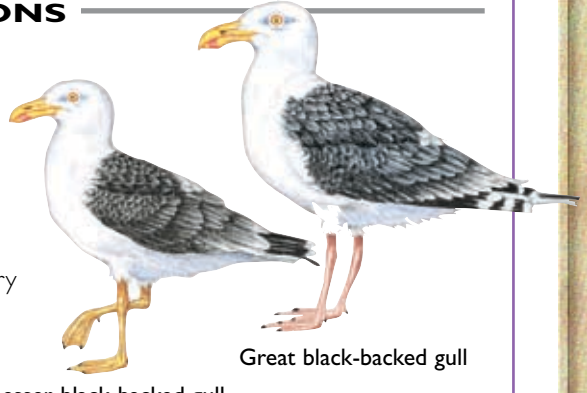
ADULT PLUMAGE
The plumage of an adult is snow-white with a dark-black mantle and a distinct white edge on the wings.

VITAL STATISTICS

WEIGHT	2.5–3 lbs.
LENGTH	2.5–3'
WINGSPAN	5–5.5'
SEXUAL MATURITY	3 years
BREEDING SEASON	May–June
NUMBER OF EGGS	2–3
INCUBATION PERIOD	26–28 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Carrion, refuse, birds, small animals, mollusks, crustaceans and insects
LIFESPAN	About 20 years

CREATURE COMPARISONS

As its name implies, the lesser black-backed gull *(Lurus fuscus)* is the smaller cousin of the great black-backed gull. Found in more temperate regions than its larger relative, the lesser black-backed gull frequents coastal areas from the Persian Gulf to Africa to the U.S. Only two-thirds as long and not nearly as fierce as its more predatory cousin, the lesser black-backed gull relies more on scavenging than hunting for food. It is often found in places where carrion and refuse are plentiful.



Great black-backed gull

Lesser black-backed gull

RELATED SPECIES

● The family *Laridae* contains about 82 species of gulls and terns. The genus *Laru* is the largest in the family, containing 38 species of gulls. Close relatives of the great black-backed gull include the Pacific gull, *L. pacificus,* the common gull, *L. canus,* the slaty-backed gull, *L. schistisagus,* and the little gull, *L. minutus*. The 7 other species of gulls comprise 6 other genera.

Great Bustard

• ORDER •
Gruiformes

• FAMILY •
Otididae

• GENUS & SPECIES •
Otis tarda

KEY FEATURES

- One of the worlds' heaviest flying birds; roams sparsely populated plains and farmland searching for food
- Groups of turkey-sized males perform spectacular courtship displays in spring
- Declining fast due to habitat destruction and disturbance; now classed as vulnerable by the IUCN (World Conservation Union)

WHERE IN THE WORLD?

Once found throughout much of the Eurasian lowlands; now confined to isolated populations in Spain, eastern Europe, Ukraine and neighboring regions, and northeastern China

LIFECYCLE

In one of the most extraordinary courtship displays of any bird, the male great bustard spreads and twists his wings and tail, turning himself into a mass of feathers.

HABITAT

The great bustard inhabits plains of European lowlands and the high steppes of central and eastern Asia. It favors inland areas where hot, dry summers and cold winters prevent grass and other plants from growing too tall.

Extremely shy, the great bustard prefers places that offer an unrestricted view in at least three directions, so it avoids wooded, rocky and hilly country. But the open, flowery groves of cork oaks and olive trees that cover large parts of southern Spain and Portugal support thriving populations.

▲ **EVER WATCHFUL**
Open fields help the bustard anticipate danger.

CONSERVATION

Outside its strongholds in Spain, Hungary and central Asia, the great bustard is in rapid decline. It is very sensitive to the slightest change in its habitat, especially monoculture, in which vast fields of one crop replace a patchwork of cereals, vegetables and pasture. Low-flying and fairly clumsy, the great bustard is also killed in collisions with power lines and irrigation equipment and a wide range of other obstacles. Illegal hunting is another problem in some areas.

BEHAVIOR

Though a powerful flier, the great bustard is reluctant to take to the air. It may go for weeks without once leaving the ground.

Males gather in flocks, known as droves, while the females look after the young. When the breeding season is over, the females and young form droves of their own. In harsh weather or when food is scarce, several different droves often combine to form a gathering of up to 200 birds, which then scours the countryside for food.

Asian populations of great bustards are migratory, heading for warmer southern feeding grounds when the winter arrives; they then return north in spring.

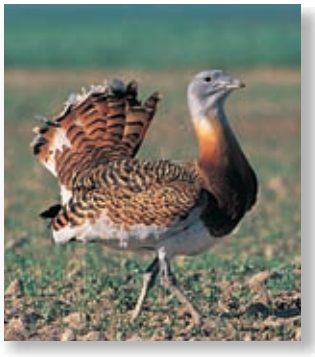
DID YOU KNOW?

- **After years of decline, the great bustard became extinct as a British breeding bird in 1832.**
- **The heaviest recorded great bustard was a male weighing 46 lbs., although hunters claim to have shot birds as heavy as 52 lbs.**
- **Males displaying on open land can be seen from nearly 2 miles away, but it is easy to mistake them for a flock of sheep — especially if-the birds are half-hidden among vegetation.**

FOOD & FEEDING

Primarily a plant eater, the great bustard paces through fields and grasslands using its short, stout bill to snap up fresh shoots, flowers, seeds and leaves, many of which offer it a good supply of water. In late summer and autumn it frequents stubble fields, which are a rich source of grain.

The great bustard is also an opportunistic feeder, seizing any large insects that it comes across as it forages, with beetles and grasshoppers as its main targets. If the bustard spots a small mammal, amphibian or even a nestling bird, it stalks it carefully before lunging forward and stabbing the helpless animal. It swallows prey whole, but may first kill victims by thrashing them against the ground.



▲ **VARIED DIET**
The bustard feeds in areas of mixed farming.

BREEDING

The great bustard is slow to reach adulthood. The female does not breed until her second year, while the male takes at least five years. Even then, younger males are unlikely to mate with more than one or two partners.

The adult male devotes all his energies to displaying and mating. He plays no further part in raising his family, and may leave the area completely. Meanwhile, the female scrapes a simple hollow in the soil for her clutch of eggs. She incubates the eggs for 3–4 weeks, depending on the weather. The downy chicks are superbly camouflaged and follow their mother immediately. They can fly at 5 weeks of age, but only become fully independent after another 6–12 weeks.

▲ **Wild drovers**

By gathering in sizeable droves, the great bustard increases its chances of finding scarce food.

THEATRICAL COURTSHIP

1 To breed or not to breed…

Several male great bustards feed together in a bachelor flock. Two are in full breeding plumage, and are ready to compete for a mate.

2 Take the stage…

Shortly after dawn, a male flies to join other mature males at a traditional lek, or display ground, to begin his performance.

3 Inflated ego…

The male fills his throat with air and bends his legs. He fans his tail and turns his wings upside down, revealing the white undersides.

4 The leading lady

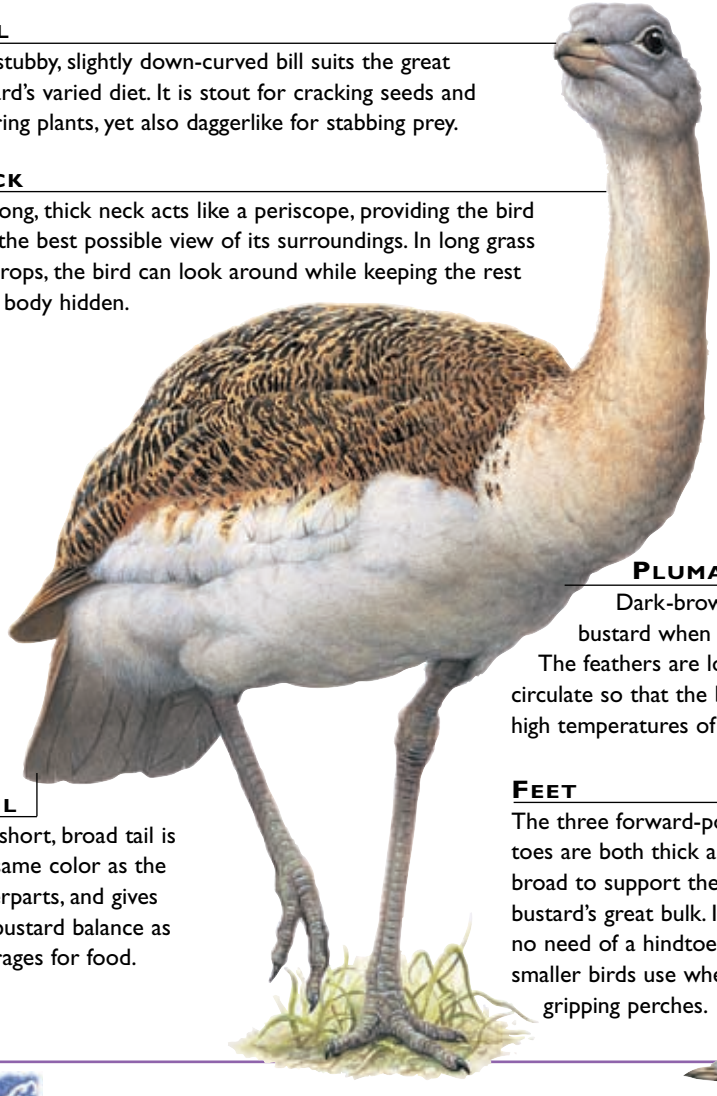
In this contorted pose, each male either stomps around or stands on an elevated site, hoping that a female will succumb to his charms.

PROFILE GREAT BUSTARD

Shaped rather like a small ostrich, the great bustard strides along slowly on powerful legs, but its massive wings also enable it to fly.

BILL
The stubby, slightly down-curved bill suits the great bustard's varied diet. It is stout for cracking seeds and shearing plants, yet also daggerlike for stabbing prey.

NECK
The long, thick neck acts like a periscope, providing the bird with the best possible view of its surroundings. In long grass and crops, the bird can look around while keeping the rest of its body hidden.



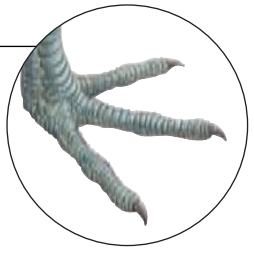
FLIGHT

To take off and stay aloft, the bustard needs huge wings that are broad along their whole length. Large white panels on both surfaces of the wings may help bustards spot one another at long range.

PLUMAGE
Dark-brown wings camouflage the bustard when it is feeding on the ground. The feathers are loosely packed, allowing air to circulate so that the bustard can withstand the high temperatures of its dry inland environment.

TAIL
The short, broad tail is the same color as the upperparts, and gives the bustard balance as it forages for food.

FEET
The three forward-pointing toes are both thick and broad to support the bustard's great bulk. It has no need of a hindtoe, which smaller birds use when gripping perches.



VITAL STATISTICS

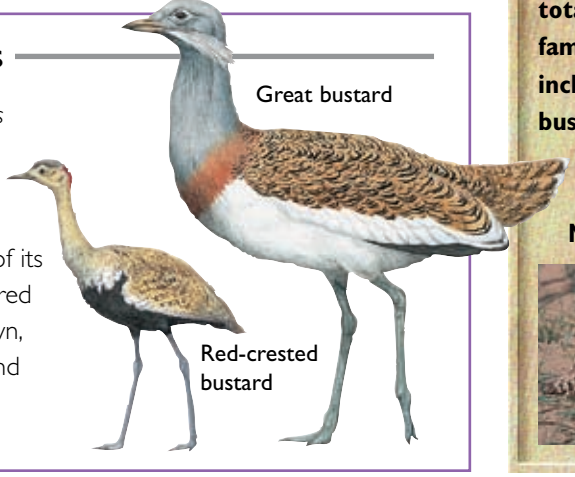
WEIGHT	Male 13–40 lbs.; female 8–12 lbs.
LENGTH	30–40"
WINGSPAN	6–9'
SEXUAL MATURITY	Male 5–6 yrs.; female 2–3 yrs.
BREEDING SEASON	April–August
NUMBER OF EGGS	1–4
INCUBATION PERIOD	21–28 days
FLEDGING PERIOD	30–35 days
BREEDING PERIOD	1 year
TYPICAL DIET	Plant matter, insects, small vertebrates
LIFESPAN	Unknown

RELATED SPECIES

● **The great bustard is the sole member of the genus *Otis*. There are 10 other genera of bustards, totaling 24 species, in family *Otididae*. These include the houbara bustard, *Chlamydotis undulata*** (below)**, of North Africa and the Middle East.**

CREATURE COMPARISONS

Like the great bustard, the red-crested bustard (*Eupodotis ruficrista*) has a dramatic courtship display. The male rises for 60' before performing a backflip, folding his wings and plummeting to the ground as a fluffy ball. The red-crested bustard has the strong legs and upright posture of its relative, but weighs just 24 oz. on average. Both have barred upperparts, but whereas the great bustard has dark-brown, wavelike markings, the red-crested bustard's are cream and arrow-shaped. Also, instead of throat whiskers, the male red-crested bustard is adorned with a long crest.



Great Cormorant

• ORDER •
Pelecaniformes

• FAMILY •
Phalacrocoracidae

• GENUS & SPECIES •
Phalacrocorax carbo

KEY FEATURES

- Pursues fish underwater at high speed, following their every twist and turn with its sinuous body
- Lacks naturally water-repellent plumage, so it must spend hours sunbathing to dry its feathers
- This sociable species fishes, roosts and breeds in groups — often with other waterbirds

WHERE IN THE WORLD?

Scattered populations on coasts, rivers and lakes in Greenland, eastern North America, Europe, Africa, Asia, India, Japan and Australia

LIFECYCLE

The great cormorant's loafing habits and its ungainly movements on land belie its agility underwater; here it's a devastatingly effective predator that streaks along as if jet-propelled.

HABITAT

Equally at home in freshwater and saltwater, from the Arctic to the tropics, the cormorant exploits a huge habitat range. At sea, it's rarely found far from the coast, feeding in shallow waters, often around sheltered bays and estuaries. Inland, it occurs on lakes, wide rivers, flood-waters and lagoons.

As the cormorant regularly needs to leave water to dry its plumage, it usually stays close to convenient perches. These include rocks, banks of mud or sand, partially submerged trees, buoys and utility poles.

Colonies nest on cliffs or rocky coasts, but inland it tends to seek out stands of tall trees beside water. Occasionally, it breeds in reedbeds or simply on bare ground.

▲ **STICKS...**
Droppings from a colony of cormorants coat trees white, often killing them.

▼ **...AND STONES**
Coastal colonies of the cormorant are usually based on cliffs or boulders.

FOOD & FEEDING

FAST FISHER

1 Down in one...
A cormorant juggles a large flatfish caught in its last dive so it can be consumed whole. It tosses back its head to swallow.

2 Down again...
Dipping its head under the water's surface, the cormorant cranes its snakelike neck in all directions to locate prey. It dives without a splash.

DID YOU KNOW?

- **The cormorant fishes cooperatively with the dalmatian pelican in northern Greece. The pelican helps the cormorant fish by blocking out the sun's glare with its shadow. In return, it picks off the fish that flee to the surface to escape the cormorant.**
- **The ancient practice of training cormorants to "fish" for their masters continues today in China. A collar around a bird's throat prevents it from swallowing fish it captures; the fish are retrieved when it surfaces beside the fishing boat.**

BEHAVIOR

The cormorant often flies fast and low over the water. Its dives tend to be short and energetic and are followed by periods of preening and sunbathing. It performs these chores out of the water, unlike many other diving and swimming birds.

As dusk falls, the cormorant leaves the water and flies off to roost in groups. Sometimes, it flies at quite high altitudes. It travels in V-formation or single-file from its feeding grounds to the roost site, which is usually woods or a cluster of tall trees.

In dives lasting about a minute, the cormorant seeks its favorite food: flatfish, blennies and sandeels. Unlike many diving birds, it doesn't have water-repellent plumage. But it turns this to its advantage by using the weight of its waterlogged plumage to reduce its buoyancy. The wet plumage weighs down the bird, enabling it to swim faster and with precision.

◀ **STICKING ITS NECK OUT**
Fish up to 24" long fall prey to the cormorant.

3 Streaks ahead...
Powerful feet, set far back on the body, propel the cormorant at great speed underwater and produce spurts of acceleration.

4 No escape
The bird singles out a victim and pursues it relentlessly, echoing its every twist and turn. Small fish are swallowed immediately.

CONSERVATION

The great cormorant isn't in any immediate danger. But, like all seabirds, it fares badly where oil spills contaminate the seas. Fish farmers also persecute inland populations.

▼ **FEATHER MANICURE**
Cleaning plumage is a time-consuming daily task.

BREEDING

▲ **HIGH SOCIETY**
Usually silent, the cormorant communicates with various deep grunts at breeding colonies.

The cormorant seeks the company of other waterbirds when nesting, especially in the tropics. The mixed breeding colonies of cormorants, ibises, spoonbills, herons and egrets in waterside trees are a common sight throughout its tropical range. In the U.S., it often nests near gull and seabird colonies.

The male selects the nest site, then brings material for his mate to build a nest. This is a platform of sticks, reeds and other vegetation, lined with seaweed in coastal areas and grass or leaves inland. Nest-building takes up to five weeks; during this time the pair may fend off neighbors that try to steal their nest material.

Both parents brood and feed their chicks, which hatch naked and dark-colored. After a week, chicks are covered with down. Even when they fledge (after seven weeks), young continue to beg food from their parents, on whom they depend for 2–3 months more.

PROFILE GREAT CORMORANT

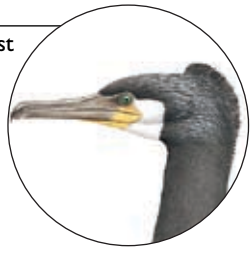
After out-maneuvering fish in brief but frenetic underwater chases, the great cormorant must stretch out in the sun to dry its wings.

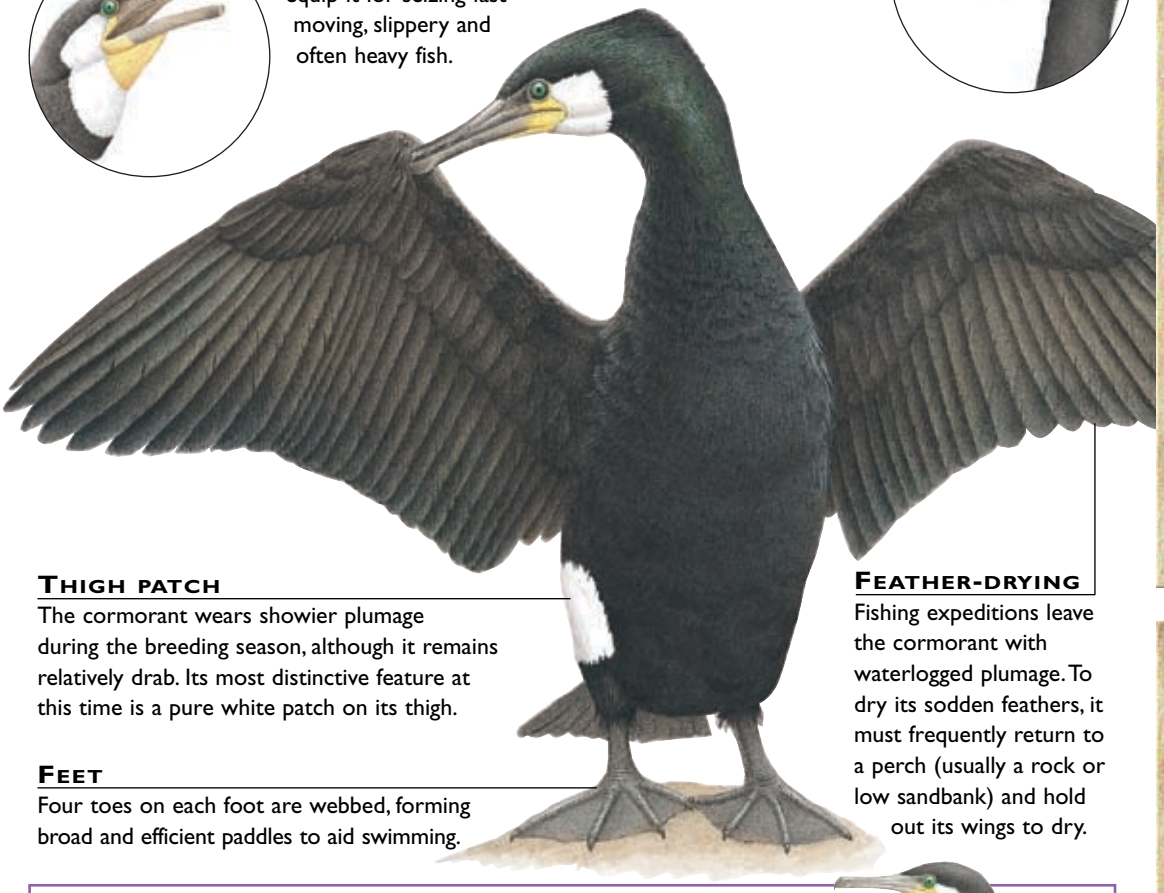
BILL

Long and tipped with a formidable hook, the bill's mandibles deliver a crushing bite. The tongue also has a very rough surface. These adaptations equip it for seizing fast-moving, slippery and often heavy fish.

BREEDING PLUMAGE

When breeding, a subtle crest develops and slender white feathers (*filoplumes*) appear on the head and neck.





THIGH PATCH

The cormorant wears showier plumage during the breeding season, although it remains relatively drab. Its most distinctive feature at this time is a pure white patch on its thigh.

FEET

Four toes on each foot are webbed, forming broad and efficient paddles to aid swimming.

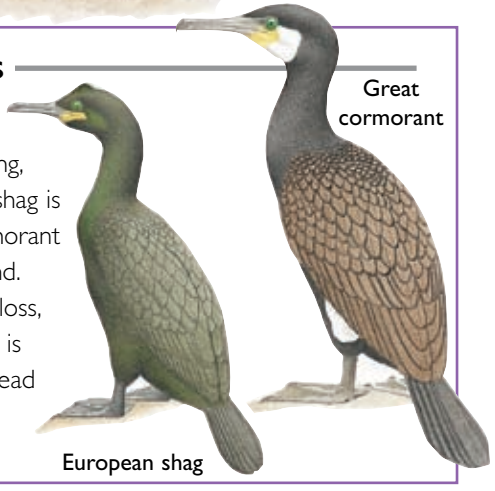
FEATHER-DRYING

Fishing expeditions leave the cormorant with waterlogged plumage. To dry its sodden feathers, it must frequently return to a perch (usually a rock or low sandbank) and hold out its wings to dry.

CREATURE COMPARISONS

Over a large part of its European range, the great cormorant shares its marine habitat with the similar-looking, but smaller, European shag (*Phalacrocorax aristotelis*). The shag is an almost exclusively fish-eating, saltwater species of cormorant that inhabits rocky coasts and islands. It rarely moves inland.

When breeding, the shag's plumage acquires a green gloss, which matches its emerald-green eyes. Its breeding dress is completed by a small crest that protrudes from its forehead when erect. Both birds have a reptilian appearance with their serpentine necks and scaly-looking plumage.



VITAL STATISTICS

WEIGHT	4–6 lbs.
LENGTH	2.5–3'
WINGSPAN	4–5'
SEXUAL MATURITY	3–5 years
BREEDING SEASON	April–June in Northern Hemisphere; all year in tropics
NUMBER OF EGGS	2–6, normally 3 or 4
INCUBATION PERIOD	27–31 days
FLEDGING PERIOD	50 days
TYPICAL DIET	Fish, with some crustaceans and also amphibians
LIFESPAN	10–12 years

RELATED SPECIES

There are 29–33 species of cormorant in the *Phalacrocoracidae* family. All are aquatic and completely black or blackish with white patches. Ten species are endemic to islands — they're each confined to just a few remote islands in southern oceans. The Galapagos cormorant (*Phalacrocorax harrisi*) cannot fly. Close relatives include pelicans, gannets and boobies.

Great Crested Grebe

• ORDER •
Podicipediformes

• FAMILY •
Podicipedidae

• GENUS & SPECIES •
Podiceps cristatus

KEY FEATURES

- Pursues prey underwater, propelled by rear-set legs with lobed feet for maximum driving power
- In the breeding season, both sexes grow elegant crest feathers for elaborate, ritualized displays
- Builds a floating nesting platform out of aquatic vegetation on clean lakes, rivers and reservoirs

WHERE IN THE WORLD?

On freshwater and coasts across parts of Europe and central Asia as far east as China; also in southern and eastern Africa, New Zealand and Australia

LIFECYCLE

Rarely if ever leaving water, except to fly between different feeding areas, the elegant great crested grebe is highly efficient at catching fish in its own element.

HABITAT

Quiet lakes and large ponds circled by aquatic vegetation and slow-moving rivers with pools and backwaters provide the great crested grebe with ideal habitat.

The bird has taken to many man-made aquatic habitats, such as ornamental lakes, ponds and reservoirs. Outside the breeding season, it may inhabit estuaries and coastlines.

In Africa and New Zealand, the grebe lives on high-altitude lakes, even tolerating harsh conditions, such as choppy waves and ice-bound water.

The grebe needs open, clean water with a plentiful stock of fish, invertebrates, amphibians and insects, which provide essential food supplies.

▶ **QUIET BACKWATER**
Tranquil reed-fringed lakes are ideal habitat.

DID YOU KNOW?

- **Grebes are among the oldest and most primitive of all groups of birds: fossils of their ancestors from 80 million years ago have been discovered.**
- **Grebes eat large amounts of their own feathers. The feathers slowly decompose and line the stomach — probably to protect it from injury by sharp fish bones.**

BEHAVIOR

The elegant, stately appearance of the grebe belies its nature. It can be extremely aggressive, especially near the nest, and attacks any intruder that comes too close. Outside breeding seasons, the grebe becomes more sociable and sometimes joins others of its kind to form large flocks in winter. On the Black Sea coast in Turkey, as many as 20,000 grebes congregate. At other times of the year, it's usually solitary.

Maintaining its plumage in waterproof condition occupies a great deal of the bird's time. After feeding, it preens itself meticulously, using its bill to spread oil from a gland at the base of the tail through its feathers.

FOOD & FEEDING

The grebe's long, slim neck and pointed bill are used for catching fish underwater. At least 20 species of freshwater fish, including eels, make up its diet in Europe. When it moves to sea coasts in winter, it also feeds on many sea fish species. An individual may eat 5–7 oz. of fish a day, supplemented by a variety of invertebrates, such as snails and crustaceans — especially crayfish and shrimps. In the breeding season, insects also are an important part of the diet.

The grebe dives underwater to search for prey. It may remain underwater for up to 30 seconds and normally dives to about 17'. When it spots a fish, it accelerates in pursuit, twisting with the fish's every movement until it's close enough to strike with its bill.

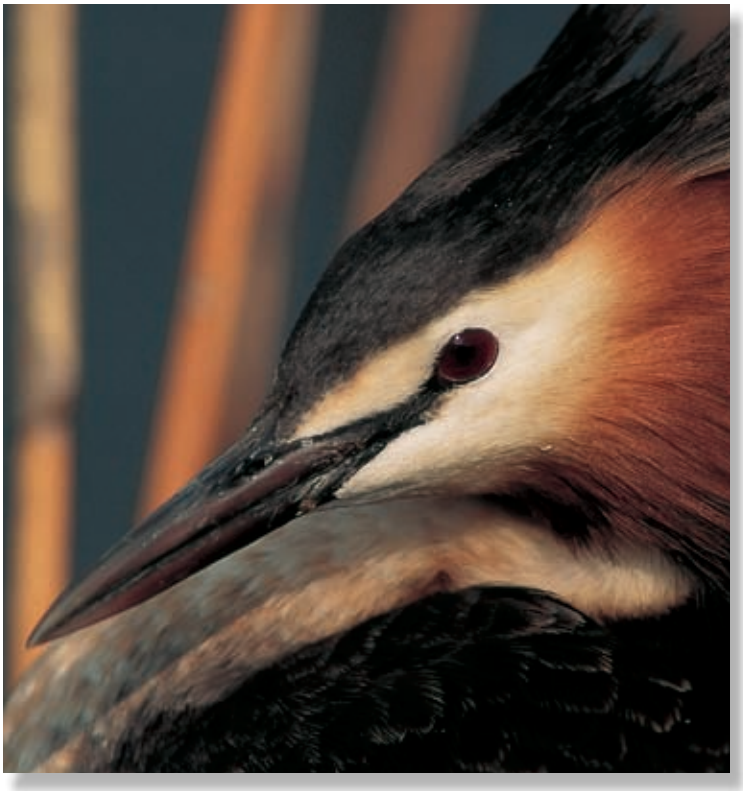
▲ **EXPERT FISHERMAN**
Fish caught underwater are gulped headfirst at the surface.

CONSERVATION

In the 19th century, the great crested grebe was hunted for its head plumes and breast feathers, almost to extinction in many parts of Europe. More recently, by taking advantage of man-made waters, the species has recovered well and isn't currently in any danger. However, extensive gill-net fishing on some lakes in East Africa has led to its disappearance from many places there.

▼ **TO THE POINT**

The fine bill is ideal for catching and holding fish.



BREEDING

▲ **WATER BED**

The nest rises and falls with the water level.

In the breeding season, the grebe performs complex displays using its ornate head plumes in head- and bill-shaking and ritualized "dances." These displays strengthen each pair's bond.

Both sexes build the nest (a floating platform of aquatic plants anchored to surface vegetation). The female lays 3–5 eggs and the down-covered, black-and-white-striped chicks hatch about four weeks later. They're carried away from the nest on their parents' backs, nestled in their warm feathers.

Almost at once, the chicks can dive and, if threatened, remain totally submerged except for the bill tip. When the chicks are six weeks old, the parents divide their brood and each adult feeds and protects half the chicks.

CEREMONY OF THE WEEDS

1 Let's dance...

Perfectly synchronized, the male and female dive together and then resurface, each carrying a clump of aquatic weed in its bill.

2 Mutual embrace...

The birds move toward one another and suddenly rise up, almost touching breast-to-breast, treading water to keep position.

3 Shaking of the heads...

The ceremony reaches its climax with both birds elegantly rocking their heads from side to side in a beautiful, swaying dance.

4 Performance over

With the ritual complete, the birds flatten their crest and fan feathers. They settle back on the water and swim off side by side.

PROFILE GREAT CRESTED GREBE

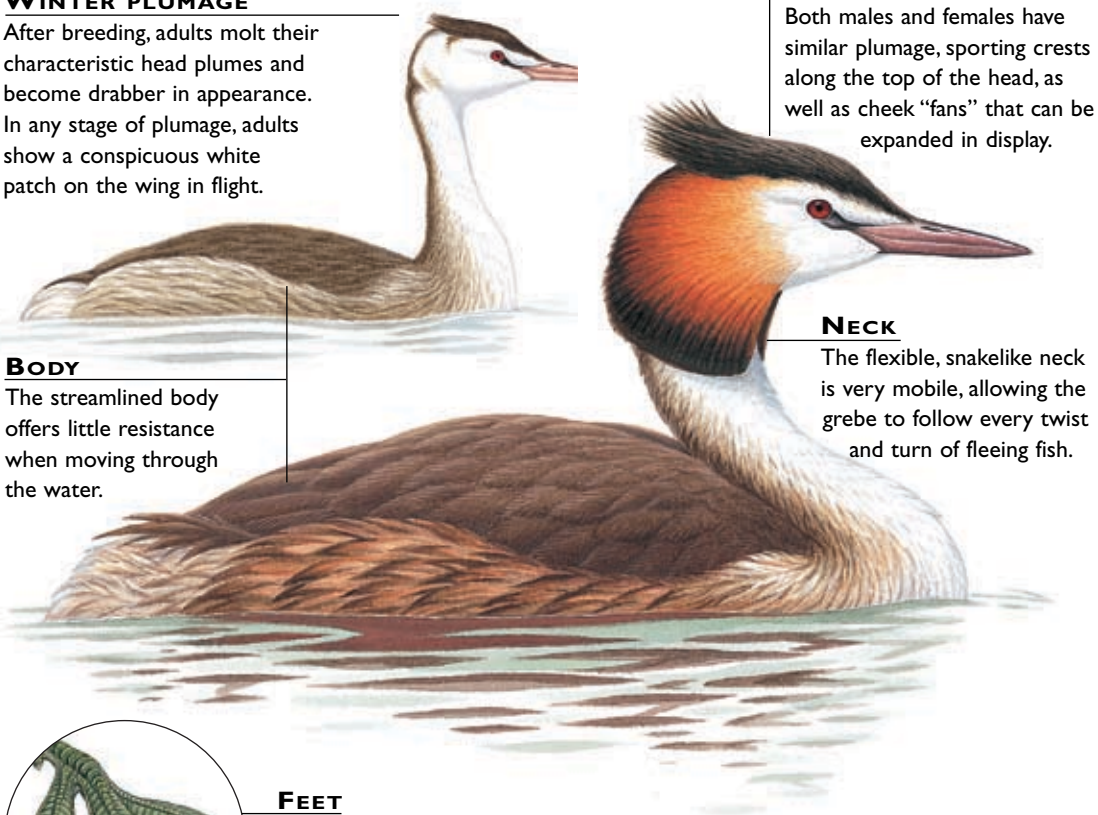
A fast and agile swimmer both on the water surface and beneath it, the great crested grebe is designed for high-speed pursuit of aquatic prey.

WINTER PLUMAGE
After breeding, adults molt their characteristic head plumes and become drabber in appearance. In any stage of plumage, adults show a conspicuous white patch on the wing in flight.

CREST
Both males and females have similar plumage, sporting crests along the top of the head, as well as cheek "fans" that can be expanded in display.

NECK
The flexible, snakelike neck is very mobile, allowing the grebe to follow every twist and turn of fleeing fish.

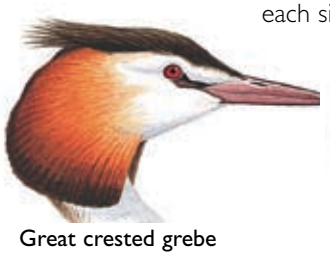
BODY
The streamlined body offers little resistance when moving through the water.



FEET
The feet give the grebe its power and agility in the water. Each of the three toes is encased in flattened flaps of skin, called *lobes*. The lobes fold back with each forward stroke of the leg for minimum resistance and open out on the power (or back) stroke, providing maximum thrust. The claws are flattened like human nails.

CREATURE COMPARISONS

The great crested grebe, like many grebes, has head feathers in the form of crests, ruffs or tufts for breeding displays. Several species also have bright decorative plumes behind the eye, which contrast with the color of the rest of the head, as in the eared grebe, *Podiceps nigricollis*, of North America and Europe. The horned grebe, *P auritus*, which occurs across the north of the same two continents, has elongated golden tufts lying along each side of a black head.



Great crested grebe

Eared grebe

Horned grebe

VITAL STATISTICS

WEIGHT	1–3 lbs.
LENGTH	18–24"
SEXUAL MATURITY	2 years
BREEDING SEASON	April–July in Europe; year-round in Africa; Nov.–March in Australia
NUMBER OF EGGS	1–7; usually 3–5
INCUBATION PERIOD	25–31 days
FLEDGING PERIOD	71–79 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Small fish, frogs, tadpoles, crayfish, insects, mollusks
LIFESPAN	Up to 15 years

RELATED SPECIES

● **There are 21 grebe species in five genera. The little grebe, *Tachybaptus ruficollis* (below), also called the dabchick, eats invertebrates and has a short and sturdy bill. Fish-eating grebes, such as Clark's grebe, *Aechmophorus clarkii*, have long, pointed bills.**

Great Curassow

• ORDER •
Galliformes

• FAMILY •
Cracidae

• GENUS & SPECIES •
Crax rubra

KEY FEATURES

- Similar in appearance to a turkey, this game bird is the largest of the curassows
- Species has three different and unique female morphs but only one color for males
- Males have a loud booming call, which is amplified through an elongated windpipe

WHERE IN THE WORLD?

Found in Mexico, Central America, Colombia, Ecuador; also in Cozumel, the coast of Yucatan, Panama and Costa Rica

LIFECYCLE

A very poor flier, the great curassow uses its long legs to forage for food on the ground and flee for safety into the deep cover of its forest home.

HABITAT

The sedentary great curassow rarely strays far from its forest habitat. This shy and reserved bird favors undisturbed, humid evergreen forests in South America and areas off the Mexican Gulf coast. However, its primary habitat is the heavy rainforest in tropical and lower subtropical zones, particularly lowlands, and foothills up to 4000'. Sometimes it will stray higher — in Panama, the bird has been spotted at 6,300'. The great curassow also can be found in mangroves on the Pacific coast. It occurs seasonally in Costa Rica in drier forests and sometimes ventures into ravines and partially cleared areas. If left undisturbed, the curassow will even wander onto plantations.

▼ **STANDOUT**
The bird's bill and plumage contrast with its forest home.

BEHAVIOR

Considering its relatively massive size, the great curassow shows surprising agility as it moves among the branches of its lush forest home. In flight, however, the large bird is nowhere near as elegant. With its rounded wings, the great curassow either glides or flutters awkwardly, with labored wingbeats, to the ground from its treetop perch. The mainly terrestrial curassow is not capable of sustaining prolonged flights and prefers to use its rather long legs to get around. In fact, when disturbed in its roost or while foraging for food on the ground, the great curassow will run, rather than fly, to safety. During elaborate courtship rituals and in the face of danger, males produce a loud, booming call that is amplified by an elongated trachea.

▶ **ON HIGH**
The great curassow perches gracefully on a tree branch.

◀ **STRIKING FIGURE**
The male's yellow bill knob and crest give him a dignified air.

CONSERVATION

Though not globally threatened, the great curassow is disappearing because of loss of habitat to the logging business; the bird is also hunted for its high-quality meat. However, healthy populations exist in protected national parks and reserves.

DID YOU KNOW?

- **One female great curassow that was kept in captivity actually continued breeding until age 23.**
- **The name curassow comes from the island of Curacao, which is located in the Caribbean, where Europeans first discovered the bird.**
- **The great curassow is actually a relative of the domestic chicken, and is a prized game bird.**

FOOD & FEEDING

The curassow flies down from the trees in its forest habitat to forage on the ground for fruit, berries or leaves, but it prefers to walk from place to place once it is on the ground. Using its powerful feet, the bird will scratch at the soil and leaf litter, picking up leaves and fallen fruit; the curassow especially favors figs and the exotic fruit of the Chione and Casimira trees. The curassow will pluck fruit from low branches or shrubs and glean insects from foliage. By swallowing small stones from the forest floor and using them to grind food in its gizzard, the game bird is able to digest even unripened fruit that is still green and hard. The curassow usually forages alone or in small groups of up to six birds.

LOW-DOWN FEEDER
The great curassow forages on the forest floor for fruits and leaves.

BREEDING

The curassow's courtship ritual involves a series of sequenced movements. The male adopts a display posture, leaning forward with his breast very low to the ground. He then raises his head and tail and fluffs out his white abdomen feathers. He may stop to pick up a pebble and then toss his head back; he then drops the pebble before making the booming call. Following these displays, the female will enter his territory. Pairs are monogamous and breed from late winter to spring, depending on the region. Both sexes build an untidy nest of twigs and leaves in a bush or tree, no more than 6' above the ground. There, the female lays her two eggs, which she incubates for 32 days with the male remaining nearby. Since the young are born with well-developed flight feathers, they are ready to leave the nest within a few hours.

PUTTING ON A SHOW

1 Show of style...
A male great curassow walks through a forest clearing in front of two females that are peering at him through the undergrowth.

2 Making a move...
In a seemingly simple gesture, the male picks up a pebble from the ground in his bill. The tail is raised in display.

3 Theatrical flair...
The male dramatically throws his head against his back and drops the pebble to the ground, urgently flapping his wings several times.

4 Resounding boom
The male squats and opens his bill, emitting a booming call that captures the attention of one of the nearby females.

COZY COUPLE
The protective mother watches over her chick.

PROFILE GREAT CURASSOW

With his yellow bill knob, curly crest and glossy-black plumage, the male great curassow is a striking figure; females blend better into their habitat.

CREST
The curly crest is very well developed and more prominent in the male.

BILL
The great curassow male has a distinctive yellow knob extending from its sharp, hooked bill. Females lack the bill knob.

FEMALE
There are three female morphs in this species. The rare barred morph has an extensive white crest; the dark morph (*left*) has a black crest with a broad white median band; the rufous morph resembles a dark morph.

WINGS
The great curassow's dark wings are rounded and blunt, making the large bird incapable of sustaining prolonged flight.

FEET
Big feet and claws are well suited for ground-foraging and scratching. This arboreal bird uses its sharp claws for grasping shrubs and low-hanging branches.

PLUMAGE
Males are glossy black with a white lower belly. Immature males resemble the dark morph female.

TAIL
The male's long and heavy tail is used in courtship displays.

VITAL STATISTICS

WEIGHT	10.5 lbs.
LENGTH	30–37"
SEXUAL MATURITY	Probably 2 years
BREEDING SEASON	February–May
NUMBER OF EGGS	2
INCUBATION PERIOD	32 days
FLEDGING PERIOD	Unknown
BREEDING INTERVAL	1 Year
TYPICAL DIET	Fruit, leaves, berries and insects
LIFESPAN	24 years in captivity

RELATED SPECIES

● The great curassow is 1 of 7 species in the genus *Crax*, including the yellow-knobbed curassow, *C. daubentoni*, the bare-faced curassow, *C. fasciolata*, and the red-billed curassow, *C. blumenbachii*. There are 11 genera and 50 species in the family *Cracidae*, which includes chachalacas and guans. The curassows' 4 genera include *Pauxi*, *Mitu*, *Crax* and *Nothocrax*.

CREATURE COMPARISONS

Like its relative, the razor-billed curassow *(Mitu tuberosa)* is also found in South America; it ranges in Amazonia, southeast Colombia, Brazil, Peru and Bolivia. Like other curassows, this species favors humid forest and swampy areas in forests near streams. Its diet and feeding habits are also similar to those of the great curassow's, consisting mostly of fruits, seeds, leaves and insects. The razor-billed curassow is smaller than the great curassow at 33–35". While its crest is not as prominent as the great curassow's, the razor-billed bird sports a massive casquelike red bill. Its plumage is similar to the curassow's, but not as glossy.

Great curassow

Razor-billed curassow

Great Gray Owl

• ORDER •
Strigiformes

• FAMILY •
Strigidae

• GENUS & SPECIES •
Strix nebulosa

KEY FEATURES

- Feeds mainly on voles and other small rodents
- Stealthy in attack, its dense plumage and soft flight feathers allow it to swoop silently on prey
- Able to hear the movements of a vole many yards away under a blanket of snow
- Largest of the forest owls, it is notable for the aggression with which it defends its nest

WHERE IN THE WORLD?

Coniferous and mixed forests at high northern latitudes; in North America, ranges from central Alaska to Ontario and into Montana; it also occurs from Scandinavia east to Siberia

LIFECYCLE

Vocal in courtship and defense of its nest, the great gray owl maintains a deathly silence when cruising through cold, dark northern forests in pursuit of rodent prey.

HABITAT

In North America the great gray owl lives in tracts of mature coniferous forest. It haunts a similar habitat across the Eurasian taiga — the vast boreal forest belt that extends from Finland east to Siberia's Pacific coast.

These dark forests are bitterly cold — more so on occasion than the open, icy tundra to the north — and are blanketed in deep snow for six months of the year.

The owl prefers to hunt in the open — particularly in the summer, when breezes bring relief from the mosquitoes, blackflies and midges that fill the air.

▲ **LAND OF LARCHES**
Remote northern forests are home to this huge owl.

BREEDING

In early spring, the male uses a deep, booming call to attract a mate. A breeding pair usually adopts an unused stick nest of a goshawk or buzzard. The female owl lays her white eggs — usually up to six — at two-day intervals. She sits throughout the incubation, and it falls to the male to fetch food for them both.

As a result of the staggered laying process, the chicks hatch over several days. During seasons when food is scarce, the eldest and strongest owlet eats at the expense of younger siblings, which quickly starve. This brood reduction, though seemingly cruel, ensures that at least some young have the best possible start in life.

Owlets leave the nest after three weeks, but depend on their parents for a couple of months before dispersing.

▶ **THE ODD COUPLE**
Owlets are able fliers within nine weeks or so.

FOOD & HUNTING

The great gray owl prefers to hunt in the half-light of dawn and dusk that prevails for much of the day in high latitudes. It sits for long periods on a favorite perch, although it occasionally soars over its territory to search for prey. With its acute hearing, the owl can not only hear a vole scurrying through its snow tunnels but also pinpoint its exact location. In flight, the owl can thread its way adroitly through the branches and dive feet first into a snowdrift.

The owl's maneuverability is remarkable for a bird of its size. In addition, the edges of its flight feathers have small, comblike structures that mask the sound of air passing over the wing, muffling the bird's approach.

▶ **PATIENT CUSTOMER**
The owl perches to listen for prey movements.

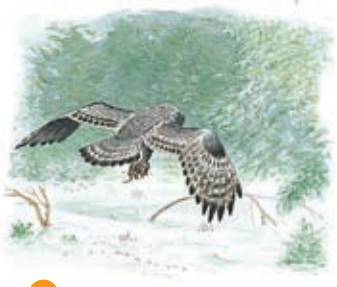
GOING UNDERCOVER

1 Scanning…
In a silent clearing, a great gray owl listens from its perch. It tilts its head to place the sound of faint scratching.

2 Investigating…
The owl takes to the air. It is relatively light in relation to its wing surface area,-which accounts for its relaxed, heronlike flight.

3 Breakthrough…

Hovering briefly above the source of sound, the owl strikes blindly through the upper layer of snow and sinks its talons into the vole.



4 Catch and carry

With the prey gripped in its-vicelike talons, the owl crosses the clearing to its perch and enjoys its meal.

DID YOU KNOW?

- **The great gray owl can detect prey as far away as 300', and strike accurately up to 18" beneath the surface of the snow.**
- **When guarding its nest, the owl utters a menacing, piglike grunt. It attacks any humans who come too close, and has plucked out eyes and broken cheekbones.**

CONSERVATION

Fur trappers routinely kill the owl because it is believed to hunt fur-bearing animals, such as the mink. This makes little impact on the species, whose habitat remains vast and remote. However, a long-term threat is posed by peat-cutting, logging and mining in the Eurasian taiga.

BEHAVIOR

The great gray owl remains solitary outside the breeding season, although birds may gather in relatively large numbers where vole populations are high. It is frequently nomadic in winter, but not through choice: temperatures in the Siberian taiga can plummet to -76°F, and the owl must occasionally seek milder conditions at lower latitudes. Periodical crashes in localized vole populations also force the owl to abandon its territory and fly hundreds of miles to a food-rich area. At such times the owl may stray into farmland or settlements, where it faces unfamiliar dangers. It defends itself fearlessly from intruders, snapping its bill and even swooping in attack.

▼ **EARLY WARNING**

Keen hearing alerts the owl to intruders.

PROFILE GREAT GRAY OWL

In its frequently snowbound habitat, the great gray owl relies on streaked gray plumage for concealment and on finely tuned hearing to detect prey.

FACIAL DISK

The owl's facial disk acts like a reflector to collect and focus sound into the ears.

EAR

The unusually large, slitlike ear openings provide an acute sense of hearing. One opening is positioned higher than the other, enabling the owl to accurately pinpoint the source of a sound.

OWLET

The hatchling has a snug coat-of white down. As the owlet matures, the down is gradually replaced by adult plumage, starting with the wing feathers.

FEET

The owl's feet have two toes pointing forward and two backward. Each toe is armed with a pin-sharp, curved talon. Powerful ligaments in the feet give a vicelike grip: once captured, prey has no chance of escape.

VITAL STATISTICS

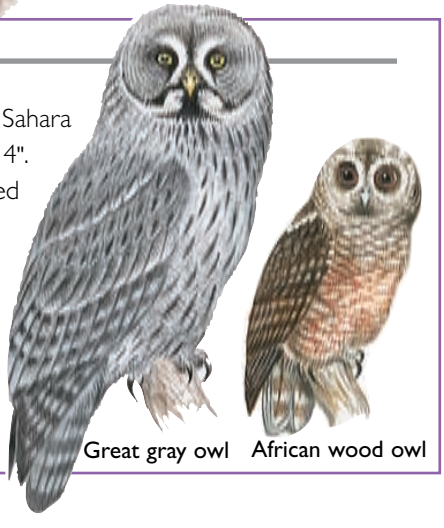
WEIGHT	Male 1–2 lbs.; female 2–4 lbs.
LENGTH	26–34"
WINGSPAN	4–5'
SEXUAL MATURITY	2 years
BREEDING SEASON	March–May
NUMBER OF EGGS	Up to 9; usually 3–6
INCUBATION PERIOD	28–30 days
FLEDGING PERIOD	60–65 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Small rodents, shrews, small birds
LIFESPAN	7–10 years

RELATED SPECIES

● **The great gray owl is 1 of 13 species in genus *Strix*. The owl family, *Strigidae*, ranges in size from the elf owl, *Micrathene whitneyi*, to one of the heaviest owls, the northern eagle owl, *Bubo bubo* (below).**

CREATURE COMPARISONS

The African wood owl (*Strix woodfordii*), found south of the Sahara in Africa, is considerably smaller than the great gray owl at 14". It has dark-brown eyes, spotted brown upperparts and barred lower underparts. Individuals vary in color more than the great gray owl, sporting a range from rust to dark brown. Unlike its mainly vole-eating cousin, the wood owl has a varied diet, taking snakes, small birds, shrews and rodents. It can even catch insects in flight. Like the great gray owl, the wood owl relies on its hearing when hunting and has a large, dished face that helps to direct sound into the ears.



Great gray owl African wood owl

Great Gray Shrike

• ORDER •
Passeriformes

• FAMILY •
Laniidae

• GENUS & SPECIES •
Lanius excubitor

KEY FEATURES

- Can overcome birds and insects in flight, but is more closely related to crows than to birds of prey
- Stores food by impaling carcasses of insects, small mammals, reptiles and birds on thorns or barbed wire
- Survives in colder climates than other shrikes, making small migrations southward when food is scarce

WHERE IN THE WORLD?

Found in a wide band around the northern hemisphere; common across Canada and northern United States, Europe and Asia; some winter farther south, into the Middle East and Africa

LIFECYCLE

Using surprise attacks to catch its prey, the great gray shrike is an aggressive predator that-stores up a larder of dead animals during seasons when food is plentiful.

HABITAT

A widely distributed bird, the great gray shrike breeds in Europe, Asia, Africa and across northern North America, as far as the Arctic Circle. In most of these areas, it is resident all year, being very cold tolerant, but at the most northerly edges of the shrike's breeding range, it may migrate south in severe weather. In central Asia, the bird also breeds in semi-arid areas — as long as there are enough hunting perches.

The great gray shrike avoids bare, rocky terrain and dense forest and hills above 3,000', preferring habitats with scattered bushes and trees such as scrubland, farmland and orchards. Although a hunter itself, it needs plenty of hiding places in which to take refuge from larger birds of prey such as owls and hawks.

▲ **THORNY REFUGE**
A thick hedge offers good cover for nesting.

DID YOU KNOW?

- **Shrikes are called "butcher birds" because they impale prey like meat on a hook.**
- **The shrike has been seen attacking mammals up to the size of a weasel.**
- **In parts of Germany some shrikes catch small fish and aquatic crustaceans.**
- **The great gray shrike often returns to food that it has stored on thorns or barbed wire months before.**

BEHAVIOR

Outside breeding season the great gray shrike is a solitary bird, but it may be seen in small groups when moving south to winter feeding grounds. The migrating shrike normally uses the same breeding and wintering areas each year, although in warmer years it may not have to travel.

The shrike roosts alone in thorn bushes but abandons these once the leaves drop, moving to evergreen bushes to hide from predators. It may roost near magpies; the presence of the larger birds protects the shrike. When threatened, the shrike makes harsh, rattling calls, in contrast to its normal trills and chattering, mouselike squeaks.

▲ **TAIL DISPLAY**
At the start of breeding season, males show off to attract a partner.

FOOD & HUNTING

Using a tall tree or post as a vantage point, the great gray shrike watches for prey on the ground below. If there is no convenient perch, the shrike glides or hovers above the grass, scanning the ground. Once it spots a victim, it settles nearby and hops over. It seizes the prey and kills it with repeated strikes to the head with its sharp bill. More rarely, the shrike pursues and catches birds and insects in flight, swooping over hedges and walls to surprise its quarry.

The shrike swallows small insects but carries larger animals back to a perch. It often wedges prey in a crook of a branch or impales it on a thorn, either for storage or merely to anchor the carcass so that it can be torn apart.

Beetles are among the shrike's favorite prey, although it commonly takes small mammals, reptiles and birds.

▶ **MOUSE MORGUE**
The great gray shrike often cannot tear up prey without first anchoring it.

LIGHTNING SHRIKE

1 **Low-level flight...**
Skimming the tops of bushes, the great gray shrike hopes to surprise a small bird or mammal.

BREEDING

Upon returning to the breeding grounds in spring, the male great gray shrike heralds his presence by singing lustily and performing tail displays from a conspicuous perch.

Both sexes bring twigs, plant stems, grasses and mosses for the construction of the nest, which the female usually builds. The partners then line the structure with flowers, fibers, hair and feathers. The nest is commonly located in the fork of a tree or branch about 10' from the ground. In the absence of suitable trees, the shrike nests deep within impenetrable, thorny bushes.

The female lays 4–7 eggs and incubates them for about 16 days. Both parents feed the young. When there is plenty of food available, the male may continue feeding the first brood while the female lays another clutch. The young often leave the nest before they can fly, but are fully fledged within 19 days of hatching.

DOWN THE HATCHLING

A pair of great gray shrikes must hunt ceaselessly to feed a large brood of hungry nestlings.

2 Unsuspecting prey…

The shrike spots a small flock of sparrows engrossed in dust-bathing and veers towards them.

3 Direct hit…

Before the sparrows are aware of danger, the shrike strikes, pinning one of the sparrows with its feet.

4 Storage

The shrike takes the sparrow back to its larder and impales it on a spine to be eaten later.

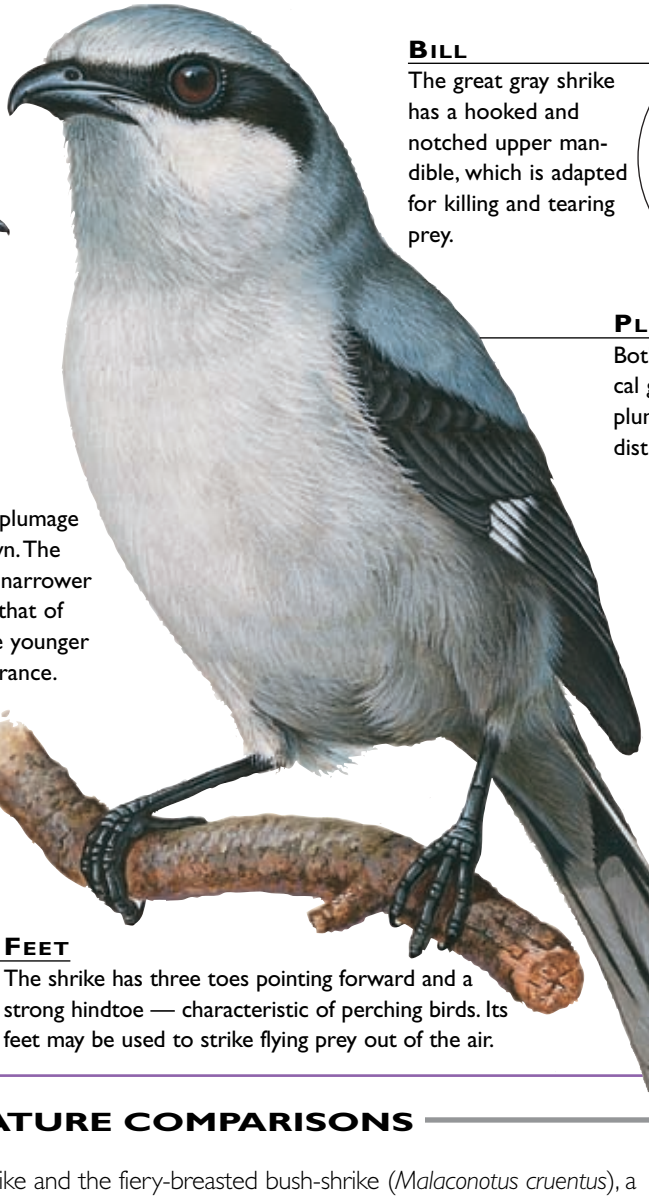
CONSERVATION

Early in the 20th century, forest clearance in central Europe offered the great gray shrike open ground for hunting, and its range expanded. But farming has reduced prey, nest sites and places to perch. Over the last few decades the shrike's numbers have fallen throughout its central and southern European range, and the bird has disappeared from most of its haunts in Britain. If low-intensity farming is encouraged, the open, scrubby habitat favored by the shrike may be preserved, halting the bird's decline.

PROFILE GREAT GRAY SHRIKE

The great gray shrike has keen eyesight and a pointed, hooked bill, enabling it to catch and kill insects, small mammals and birds.

JUVENILE
The juvenile's gray plumage is tinged with brown. The black on its face is narrower and less bold than that of the adult, giving the younger bird a softer appearance.



BILL
The great gray shrike has a hooked and notched upper mandible, which is adapted for killing and tearing prey.

PLUMAGE
Both sexes share identical gray, white and black plumage, with the distinctive black "mask."

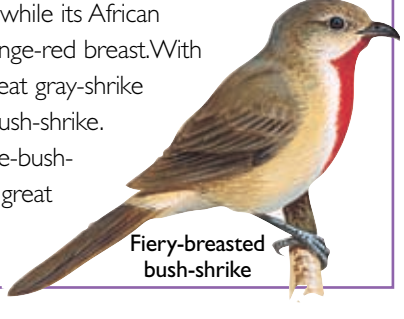
TAIL
The long, stiff tail is used as a rudder in flight and also to provide balance when the bird perches.

FEET
The shrike has three toes pointing forward and a strong hindtoe — characteristic of perching birds. Its feet may be used to strike flying prey out of the air.

CREATURE COMPARISONS

The great gray shrike and the fiery-breasted bush-shrike (*Malaconotus cruentus*), a bird of West Africa, are about the same size but their colors differ greatly. The great-gray-shrike is predominantly black and white, while its African relative has olive and yellow upperparts and an orange-red breast. With its black stripe and heavier, shiny black bill, the great gray-shrike has a more aggressive appearance than the bush-shrike. Although the species have similar diets, the bush-shrike hunts in forest undergrowth, the great gray shrike in more open country.

Great gray shrike



Fiery-breasted bush-shrike

VITAL STATISTICS

WEIGHT	2–3 oz.
LENGTH	9.5–10"
WINGSPAN	12–13"
SEXUAL MATURITY	1 year
BREEDING SEASON	March–May, depending on region
NUMBER OF EGGS	4–7
INCUBATION PERIOD	14–19 days
FLEDGING PERIOD	15–18 days
BREEDING INTERVAL	1–3 broods a year
TYPICAL DIET	Insects, small mammals, birds, reptiles
LIFESPAN	Oldest ringed bird: 5 years, 9 months

RELATED SPECIES

● **The great gray shrike belongs to genus *Lanius*. The genus is part of the family *Laniidae*, which contains 70 species of songbirds with a hooked and slightly flattened bill, including the four-colored bush-shrike, *Telephorus quadricolor* (below).**

Great Horned Owl

• ORDER •
Strigiformes

• FAMILY •
Strigidae

• GENUS & SPECIES •
Bubo virginianus

KEY FEATURES

- One of the largest and most powerful of all American owls; reaches up to 26" in length and boasts an impressive 5' wingspan
- Relies on its cryptic plumage for camouflage when roosting during the day
- Powerful hunter, it kills a variety of prey, including other owls and birds of prey

WHERE IN THE WORLD?

Found in North, Central and South America from Alaska and Canada, south through the U.S., Mexico and Central America, to the tip of South America

LIFECYCLE

Using its acute senses of sight and hearing, the great horned owl hunts for prey from atop a tall perch; it then swoops down on its unsuspecting victims with totally silent flight.

HABITAT

The great horned owl ranges from central Alaska and most of Canada southward to Argentina; no other owl in the Americas lives in such a wide variety of habitats and climates. Extremely adaptable, this owl inhabits almost any type of environment, including boreal forests, deciduous woodlands, foothill ravines, open grasslands, mangrove forests, deserts and city parks from sea level to over 14,000'. The horned owl prefers areas that provide plenty of shade trees for roosting during the day; however, it is also found in the rocky canyons and steep gullies throughout its range. It favors conifer trees that furnish cover throughout the winter, but it can also be found roosting in deciduous trees such as oaks.

UNDER COVER
Great horned owls rely on dense forests for cover.

CONSERVATION

Although the great horned owl has very few natural predators and is not globally threatened, its population is declining throughout its range. Known as the fiercest of all predatory birds, the great horned owl has been shot and trapped by farmers and hunters for years throughout its entire range. Since it relies upon trees for roosting and nesting, the clearing of forests for agriculture has not only reduced its numbers but also the populations of its prey. The great horned owl is also killed when struck by automobiles and dies after becoming entangled in wire fences. This bird is listed on Appendix II of CITES, and like all owls is protected by law in the U.S.

BREEDING

The great horned owl's breeding season varies with its geographic location; egg-laying occurs as early as December and January in parts of the U.S. Normally solitary and territorial throughout the year, both the male and female perform noisy courtship displays that include hooting while bowing and fluffing the white feathers below their chins. After mating, the female lays 1–6 (usually 2–3) eggs in an abandoned stick nest built by birds such as the red-tailed hawk; it may also use the empty nests of eagles, osprey, herons and even squirrels. The female incubates alone while the male hunts for food; he provides his mate, and later his brood, with an abundance of prey, which he deposits in or near the nest. After 26–35 days, the young owls hatch, covered in white downy feathers and totally dependent on their parents. After 9–10 weeks, the chicks are able to fly and soon begin hunting for prey for themselves, usually small animals such as lizards. They remain dependent upon their parents for about one year and do not reach sexual maturity until they are about two years old.

DID YOU KNOW?

- **One great horned owl nest contained a mouse, a muskrat, a woodcock, a rabbit, two eels, four catfish, four grouse, and 11 rats — all for the owl's brood.**
- **The hoot of the great horned owl can be heard up to 1 mile away on still moonlit nights.**
- **The great horned owl can fly at speeds up to 40 mph.**

BEHAVIOR

Although the great horned owl is active during both day and night, it is mainly nocturnal and emerges to hunt for food after sunset. During the day, the owl roosts in the thick tops of evergreen trees. With its camouflaged plumage, it blends well into its surroundings and remains inconspicuous as it roosts silently in the dense vegetation; its long ear tufts, which resemble broken branches, also help it hide. Like most owls, the great horned owl maintains and defends a territory from other birds, threatening any that come close (*right*). Well known for its attacks on other owls and hawks, the great horned owl has also been known to attack larger birds, such as bald eagles and golden eagles. These attacks minimize competition for food and nesting sites.

AGGRESSIVE NEIGHBOR

1 Perching…
A great horned owl perches on the top of a tall aspen tree at dusk and looks out over an open field for prey.

2 Attacking…
Spotting a long-eared owl perched on a dead branch, the great horned owl goes in for the attack.

3 Defending…
Highly territorial, the great horned owl kills the long-eared owl in defense of its territory and to protect its food sources.

4 Killing
During the day, the great horned owl attacks and kills other birds of prey, such as the American kestrel.

FOOD & HUNTING

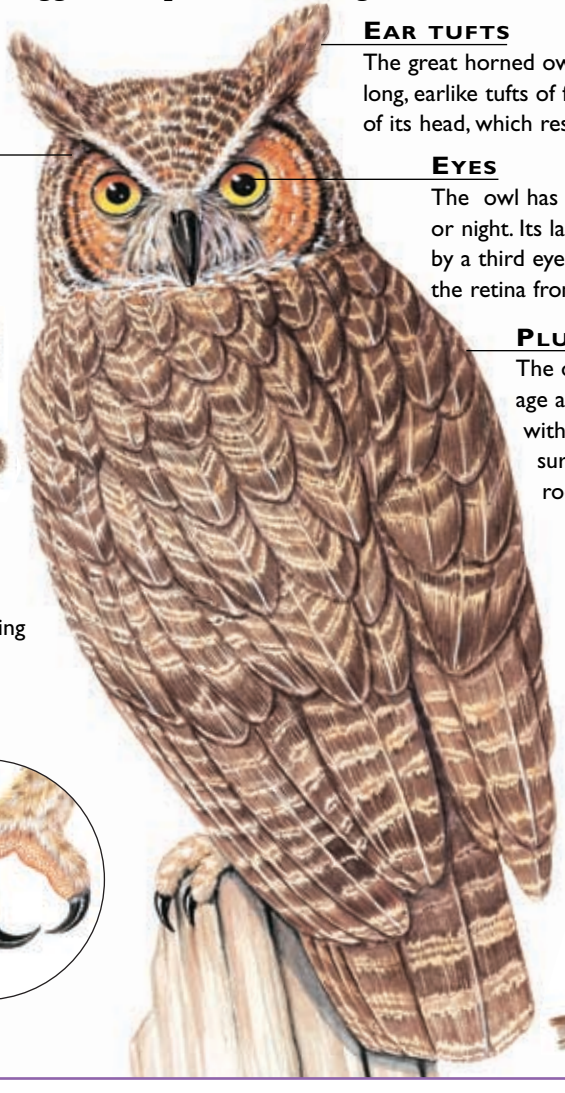
The great horned owl is a voracious predator that feeds on a wide variety of prey. Its diet consists mainly of mammals, especially rabbits, hares, mice, meadow voles, bats and squirrels; however, it also eats birds, reptiles, scorpions, fish and insects. Due to its large size and heavy weight, this owl is able to attack and kill other birds of prey, including eagles, hawks and other species of owl. Hunting from a tall tree or other vantage point, the horned owl scans the ground below for prey. Once prey is spotted, the owl silently swoops down and catches its victim in its powerful feet while the sharp talons deliver a fatal blow. The horned owl then returns to its feeding roost, usually an unoccupied nest or hollow stump, and devours its prey. Daily, the owl regurgitates pellets containing undigested material, such as bones, fur and feathers.

▶ **FIERCE HUNTER**
The horned owl fiercely hunts for prey, such as mice.

◀ **STAYING ON A WHILE**
Young owls remain with their parents for one year.

PROFILE GREAT HORNED OWL

With its strong talons and sharp, hooked beak, the great horned owl is a fierce and aggressive predator throughout the Americas.



EAR TUFTS
The great horned owl is named for its long, earlike tufts of feathers on the top of its head, which resemble horns.

FACIAL DISKS
The large facial disks around the eyes funnel sound waves to the owl's ears.

EYES
The owl has excellent vision day or night. Its large eyes are covered by a third eyelid, which protects the retina from bright sunlight.

PLUMAGE
The owl's barred plumage allows it to blend with its surroundings while roosting.

IN FLIGHT
The great horned owl has soft, saw-toothed edges on its flight feathers that reduce noise, allowing it to fly silently when hunting.

CHICKS
Chicks are covered in white, downy feathers. At 3–4 weeks, they begin to acquire the adult's distinct barred plumage.

FEET
The large, powerful feet are fully feathered and equipped with sharp talons for seizing and killing prey.

VITAL STATISTICS

WEIGHT	1.5–5.5 lbs.; female larger than male
LENGTH	18–26"
WINGSPAN	3–5'
SEXUAL MATURITY	About 2 years
BREEDING SEASON	Varies with location
NUMBER OF EGGS	Up to 6, usually 2–3
INCUBATION PERIOD	26–35 days
FLEDGING PERIOD	9–10 weeks
BREEDING INTERVAL	1 year
TYPICAL DIET	Mostly birds and mammals
LIFESPAN	Up to 30 years in captivity

RELATED SPECIES

- **The great horned owl is 1 of about 15 species in the genus *Bubo;* close relatives include the Eurasian eagle owl, *B. bubo,* and the forest eagle owl, *B. nipalensis*. The family *Strigidae* contains about 175 species of true owls found throughout the world. The order *Strigiformes* comprises about 185 species of owl including 10 species of barn owl in the family *Tytonidae*.**

CREATURE COMPARISONS

Spotted eagle owl

The spotted eagle owl *(Bubo africanus)* inhabits the open woodlands, savannahs and riverine woods of Africa south of the Sahara Desert, far removed from the great horned owl, which occurs in the woods and forests of North, Central and South America. Reaching up to 18.5" and weighing about 1.5 lbs., the spotted eagle owl is much smaller than its western cousin and therefore hunts much smaller prey, such as insects and lizards. Both owls have similar barred plumage, which allows them to blend with their surroundings during the day.

Great horned owl

Great Indian Hornbill

• ORDER •
Coraciiformes

• FAMILY •
Bucerotidae

• GENUS & SPECIES •
Buceros bicornis

KEY FEATURES

- Very long bills are topped with a rectangular casque that extends over the head like a hat
- Prefers figs to all other foods, using its huge bill to husk a variety of fruits
- During the breeding season, the female may seal herself behind a wall she has built at the entrance of the nest

WHERE IN THE WORLD?

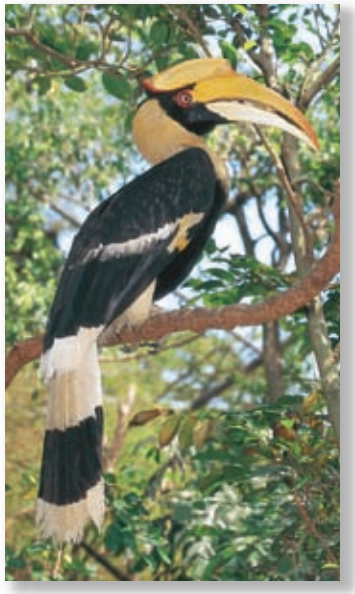
Found in India, southwestern China, Bangladesh, western Thailand, mainland Southeast Asia, including Laos and Cambodia, the Malaysia Peninsula and Sumatra

LIFECYCLE

Despite its strong preference for figs, the omnivorous great Indian hornbill is an accomplished hunter, using its enormous bill to batter prey.

HABITAT

Found mostly in India, as its name implies, the great Indian hornbill lives primarily in evergreen and moist deciduous forests, mainly on the lowland plains; it also can be found along the Himalayan foothills and in northern Thailand, extending up to elevations of 6,500'. The hornbill is rare in the Yunnan province in China, but fairly common throughout South Vietnam. An isolated population of great Indian hornbills inhabits West Ghats along the peninsula, from Kolaba to Tenmalai, and the area along the base of the Himalayas from Utta Pradesh to Assam. The great Indian hornbill regularly uses communal roosts in the forests, perching in the topmost branches, with 3–4 birds per tree.



▲ **PROMINENT PROFILE**
The hornbill's striking pied plumage and large, heavy bill are very conspicuous as it perches in its forest home.

CONSERVATION

The great Indian hornbill, also known as the great pied hornbill, is on Appendix II of CITES and listed as vulnerable because of decreasing populations. The decline can be attributed to clearing of forests, which eliminates the birds' nesting sites and foraging grounds. In addition, hornbills have been hunted for many years in India and Indonesia for both food and as an ingredient in local medicines and rituals. Unfortunately, nesting coincides with the honey-gathering season, and the hornbill's nesting cavities are discovered along with the bees' honey in the large trees.

DID YOU KNOW?

- **Kadar tribesmen believe the hornbill chick's blood comforts the soul of the deceased.**
- **The largest known Indian hornbill casque measured 7.5" long, 4.1" wide and 2.1" high.**

BREEDING

During the breeding season, monogamous hornbills form pairs and return to breeding territories, braying loudly near fruiting trees. Males fight in the air, casque to casque, in order to protect their territories. Courtship rituals, which occur in special breeding areas called leks, include branch-banging and hanging upside down. In addition, the male feeds the female fruit for up to five months before mating, and also will regurgitate fruit into the empty nest, which is usually built in the hollow of a tree. The pair seals off the entrance with droppings, chewed pieces of wood and debris; the female works from inside, the male from outside. The female incubates the 1–3 white eggs for 38–40 days, after which time the female and chicks break down the sealed nest by pecking repeatedly in order to receive food from the male. The parents feed the hatchlings for up to five months by regurgitation; the parent's gullet may be distended with up to 50 grape-sized fruits. Juveniles join parents in flight upon emerging from the nest.

▼ **KING AND QUEEN**
The male's "crown" *(left)* differs from the female's.

FOOD & FEEDING

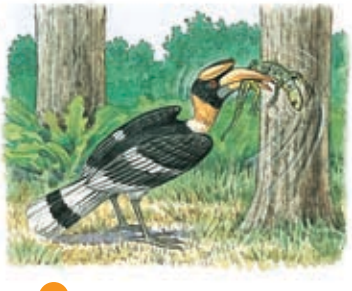
Though the hornbill has a strong preference for figs, the bird also hunts insects, lizards, snakes and nestlings. When it comes to eating, the hornbill is adaptable, employing various feeding methods including picking food up, digging into rotting wood, swooping down from a perch or plucking an item from foliage while in flight. Groups of up to 20 hornbills often make treks after fruit. The bird covers large areas daily by air, targeting fruit trees often within bamboo forests. The great Indian hornbill batters larger prey against tree branches to kill the victim, and softens it up using its bill to crush the dead animal if it is too large to swallow.

A MIXED BAG

1 Food show…
An abundant supply of figs sates the hearty appetites of a flock of hornbills. A douc langur takes in the show from above.

2 Stay away…
A hornbill, through its posture and threatening approach, warns the monkey to stay away from its figs. The langur quickly complies.

3 Quick ambush…
The hornbill eyes a large oriental long-tailed lizard walking along the ground and prepares to pounce on its unlucky prey.



4 Meal preparation
The bird grabs the lizard and pounds it against a tree, which softens the flesh, making it easier to swallow.

BEHAVIOR

The great Indian hornbill is a social bird. It travels in pairs, small family groups or flocks of up to 40 during monsoon season. This noisy bird's calls range from low guttural sounds to a loud, reverberating *kok* that may be repeated at regular intervals. Nestlings make feeble croaking sounds, alternating with whistling noises, while older chicks utter harsh *churrs*, gradually working up to guttural squeals when handled. The bird also growls loudly when defending the nest from intruders in the trees.

The great Indian hornbill flies with 3-4 quick, deep flaps, followed by a long glide through the air. This tree-dwelling bird travels between branches by hopping sideways; the hornbill rests in what appears to be a "kneeling" position.

▶ **DRYING OFF**
A hornbill sunbathes after bathing in wet foliage.

PROFILE GREAT INDIAN HORNBILL

After bathing, the great Indian hornbill perches and extends its wings for hours, until it dries off and regains its body heat.

BILL
Hornbills are the only birds with the first two neck vertebrae fused together. This helps the hornbill hold its head up and accommodate its long, heavy bill, used to peel off husks and bark and batter prey.

CASQUE
The light, hollow, bony casque is used to recognize the age, sex and species of an individual. It begins to develop at about 6 months but is not complete until the fifth year. The casque is flat, and blocklike and tinged yellow from preen gland oils. The male (*left*) has more black in his casque.

PLUMAGE
The hornbill's plumage is a mix of black and white. The upper wing coverts and back have a metallic green gloss.

IN FLIGHT
In the air, the great Indian hornbill produces a loud rushing noise as air passes over its primary feathers. This feature is unique to hornbills.

FEET & LEGS
For extra support the feet have broad soles, and the anterior toes have fused bases. The legs are short, better suited for hopping than walking.

FEMALE
With the same overall coloration as the male, the female is smaller and her casque is yellow to orange, without black marks. The eyes are white with black eyelids forming a ring, while the bare skin around the eye area is red.

VITAL STATISTICS

WEIGHT	4.7–7.4 lbs.
LENGTH	37–41"
WINGSPAN	Up to 63"
SEXUAL MATURITY	4–5 years
BREEDING SEASON	January–April; depends on region
NUMBER OF EGGS	1–3
INCUBATION PERIOD	38–40 days
FLEDGING PERIOD	72–96 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Fruit, snakes, lizards, nestlings and insects
LIFESPAN	Over 41 years in captivity

RELATED SPECIES

- **The great Indian hornbill, often called the great pied hornbill, is 1 of 4 species in the genus *Buceros;* the other species are the great rhinoceros hornbill, *B. rhinoceros;* great Philippine hornbill, *B. hydrocorax;* and great helmeted hornbill, *B. vigil.* There are 9 genera and 54 species in the family *Bucerotidae,* which includes the northern ground hornbill, *Bucorvus abyssinicus.***

CREATURE COMPARISONS

The great Philippine hornbill *(Buceros hydrocorax)* weighs 3.5 lbs. and measures 25.5" in length, considerably smaller than the great Indian hornbill. The adult Philippine hornbill has a casque and similar coloring to its larger relative, and it ranges in the Philippines on the islands of Luzon and Arinduque. Like its Indian cousin, this hornbill feeds on fruit and prefers figs, but it also forages for seeds. Both birds rarely descend from their treetop habitats, and both seal their nesting entrances.

Philippine hornbill

Great Indian hornbill

Great Spotted Woodpecker

• ORDER •
Piciformes

• FAMILY •
Picidae

• GENUS & SPECIES •
Dendrocopos major

KEY FEATURES

- Male makes a loud drumming noise to attract a mate and proclaim his territory
- Beak is used like a combined hammer and chisel to drill into trees and branches and carve out deep nest holes
- Skull has strong bone structure and shock-absorbing cartilage around the bill to protect the brain and other organs when hammering

WHERE IN THE WORLD?

Widespread through Europe and Asia; absent from Ireland and the northernmost reaches of Scandinavia and Scotland; present where there are trees with enough growth to accommodate nest holes

LIFECYCLE

Most invertebrate-eating birds migrate to warmer climates in winter, but the great spotted woodpecker stays in its territory, where its diet of insect larvae is just beneath the bark.

HABITAT

▲ **TOURING THE TREETOPS**
Broadleaf, open woodland is the preferred habitat.

Within its range, the great spotted woodpecker can live in virtually any habitat that has mature and dying trees with sufficient trunk girth for nest holes. Boreal forests, temperate woodlands and alpine forests up to an altitude of 6,600' all support populations. The great spotted woodpecker favors deciduous, conifer and mixed woodlands. In agricultural areas, it inhabits tree-lined hedgerows linking small woods.

BREEDING

In February, before the onset of the breeding season, the male woodpecker drums to signal for a mate. Selecting a hollow tree or dead branch with promising resonant qualities, he taps rapidly on the bark with his bill, making a rattlelike drum roll that is startlingly loud and carries for a considerable distance through the woodland.

Both adults carve out a nest by hammering and chiseling into a tree trunk. The nest chamber has an entrance hole at least 10' above the ground. A short tunnel opens into a pear-shaped cavity 10–12" deep. The female lays up to seven glossy-white eggs in the dark chamber. Parents take turns incubating the clutch and later feeding the grayish, red-capped fledglings. The young leave after three weeks, and attain adult plumage by fall. A pair raises one brood each summer, and may return to the nest if it hasn't been taken over by starlings or owls.

◀ **PICK A PECK**
The fledglings grow rapidly on a protein-rich diet of insect larvae.

DID YOU KNOW?

- **The great spotted woodpecker opens the closed flower heads of thistles and other flowers to eat the insects inside.**
- **When drumming, the woodpecker's bill hits the wood at a rate of 18 times per second. It performs thousands of these violent head blows every day while searching for food and building its nest.**

BEHAVIOR

The great spotted woodpecker spends much of its time foraging on tree trunks and in the canopy. It's easily identified by its call or the sound of the male drumming. The call is loud, harsh and explosive; the bird utters it while at rest or when flying.

The great spotted woodpecker is a resident bird; it abandons its territory only when food is scarce. Information from ringed birds has revealed that one woodpecker remained in its 63-acre territory for six years.

During disputes with rivals, the male utters a harsh chatter with a long trill. He drums on branches all year-round to proclaim his territory. Each male has his own drumming sequence and stops to listen to the replies of males nearby.

▶ **STALWART GUARDIAN**
The woodpecker guards its territory jealously, keeping watch over sites that are suitable for breeding.

CONSERVATION

Great spotted woodpeckers in western Europe have increased over the past 20 years and are now stable, partly as a result of proper forest management. The species has extended its range, spreading north in Britain, Belgium and in the boreal forests of Finland. It is relatively safe due to its ability to adapt to new habitats and foods.

FOOD & HUNTING

Ever adaptable, the great spotted woodpecker has a varied diet, feeding on insects and their larvae, as well as spiders. During winter, when animal food may be scarce, it also feeds on fruit, nuts, seeds and other plant material.

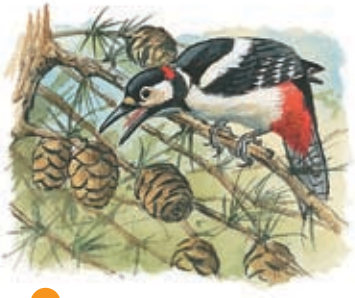
The woodpecker flies to the base of a tree and spirals up the trunk in short hops, looking for food. To find larvae buried inside trees, it taps the trunk and listens for a hollow ring that identifies a grub's tunnel. A few pecks expose the tunnel, and it hooks the grub with the spiky tip of its tongue.

Great spotted woodpeckers also use cracks in the bark to store food, and as "vices" to hold fir cones and nuts while it hammers them open. It also takes other birds' nestlings.

CONE HOTLINE

1 Roller-coaster…
The great spotted woodpecker has an undulating flight, most often seen in open woodland during the spring breeding season.

2 Pull up…
It swoops to make a landing, braking by spreading its wings and tail and bringing up its feet for the touchdown.



3 Let's twist again…
Pine, larch and spruce cones are rich sources of seeds. To pick a cone, the-woodpecker pecks at the stalk or twists it firmly.

4 Drum solo
Carrying the cone to another tree, the bird wedges it into the bark, securing it as if in a vice. It is now free to peck out the seeds.

PROFILE Great Spotted Woodpecker

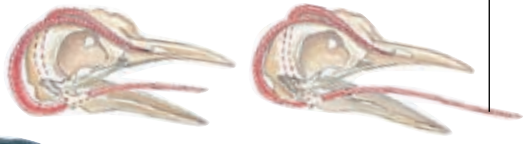
Solid and strong, the great spotted woodpecker is perfectly adapted to life as a percussion drill for nest-building and searching tree trunks for food.

Plumage

The back, neck and face are white patched. The-male also has a bold red-patch of feathers at-the-nape of his neck.

Tongue

The tongue is in a bony tube that extends from the lower jaw and passes up behind the ears to the skull roof. It can extend 1.5" from the bill to extract prey.

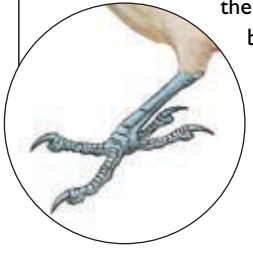


Wing

The short wings are broad with a rounded tip. The primary (wingtip) feathers are patterned with bold white spots that are clearly visible in flight. A large white patch covers each shoulder.

Feet

The great spotted woodpecker has two forward-facing toes and two that point to the rear. The strong toes, equipped with long, sharp claws, cling with ease to even the smoothest bark.



Vital Statistics

Weight	2.5–3.5 oz.
Length	8.8–9.2"
Wingspan	13.5–15.5"
Breeding Season	April–July
Number of Eggs	4–7
Incubation Period	10–13 days
Fledging Period	20–24 days
Breeding Interval	1 year
Typical Diet	Insects, wood-boring larvae; spiders, worms, mollusks; nuts, seeds, fruits, sap; nestlings and eggs of other birds
Lifespan	Up to 11 years in the wild

Related Species

- The-*Picidae* family is divided into 3 subfamilies. Woodpeckers belong to the subfamily *Picinae*, which has 169 species; it's represented in Europe, U.S., Africa and Asia. There are 2 wryneck species in the subfamily *Jynginae*. Wrynecks are small, brown, ground-feeding birds in Europe, Africa and Asia. In the subfamily *Picumninae* are 29 species of piculet, which inhabit tropical America, Africa and Asia.

Creature Comparisons

Nubian woodpecker

The Nubian woodpecker (*Campethera nubica*) has olive-gray upperparts with small, yellowish spots. Its underparts are white with black spots, and the nape of the neck is bright red. The male has red feathers over his crown and a red stripe under each eye. At 7", this bird is smaller than the great spotted woodpecker.

The Nubian woodpecker is widespread in Sudan, Uganda, Kenya and Tanzania, living in open bush country and thorny woodlands. Like its relative, it taps fruits of the baobab tree to induce ants to emerge, which it then scoops up with its long, sticky tongue.

Great spotted woodpecker

Great White Pelican

• ORDER •
Pelecaniformes

• FAMILY •
Pelecanidae

• GENUS & SPECIES •
Pelecanus onocrotalus

KEY FEATURES

- Assembles in "fishing fleets," each bird playing its part in a cooperative quest for food
- Birds dip their heads in unison to scoop fish into their huge throat pouches
- In this gregarious species, even the chicks form their own flocks for communal safety

WHERE IN THE WORLD?

Strongholds are the Rift Valley in Tanzania and the Danube delta in Romania; smaller colonies are widely scattered in Africa, eastern Europe and Asia

LIFECYCLE

Great white pelicans live in sociable colonies. They also go fishing together, using a perfectly choreographed technique to capture schools of fish in their bill pouches.

HABITAT

The pelican favors shallow freshwater lakes, rivers and wetlands, but will only establish colonies where reedbeds, sandbanks or small islands provide protection and allow undisturbed roosting and nesting. An equally essential requirement is that there are rich fishing areas nearby, preferably within 30 miles or so of the colony.

The pelican is also found, though less commonly, in saltwater habitats within its range, including the land-locked seas of central Asia.

▼ **AT HOME IN A CROWD**
The pelican lives in crowded colonies, which can number 40,000 pairs.

CONSERVATION

Fragmented distribution of the great white pelican reflects a steady decline in population. Like other pelicans, it's very sensitive to human disturbance, which may cause colonies to desert their eggs. Wetland drainage reduced the number of suitable nesting sites, and the bird has been persecuted by fishermen. Other threats are pollution, disease and flooding.

FOOD & HUNTING

FISHING FLEET

1 Herding...
Flotillas of pelicans swim in a V- or U-formation to drive schools of fish into shallow water, where they are easy prey.

2 Dipping...
As the birds close in on the school, each pelican submerges its head simultaneously to herd the fish into a "net" of distended bill pouches.

BREEDING

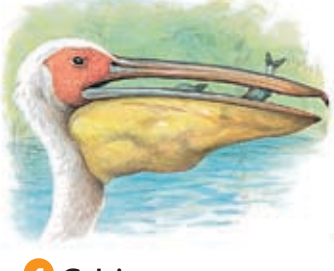
Courtship for pelicans is a low-key affair. Males display in groups, raising their bills and uttering *moo* calls. When a male has been chosen by a female, he struts behind her until she decides where to nest, prior to mating. The nest is a heap of vegetation, made by the female from material brought in her mate's pouch. Both sexes share incubation and rearing.

Young receive regurgitated food for the first two weeks, then take fish from the parents' pouches. Chicks soon leave the nest to form nurseries or pods of up to a hundred. Podding gives safety in numbers while parents fish. At eight weeks, the young leave to practice fishing before they take flight.

The pelican has developed a technique of fishing in teams with flawless coordination. Parties of up to about 20 birds form a wide arc or a neat V-shape and swim towards the shore, driving fish into the shallows where they become easy prey. They plunge their pouches in perfect synchronization to scoop up the fish, which are swallowed live. Sometimes two arcs of pelicans link up to encircle fish in more open water.

Pelicans are voracious feeders. One large colony studied at Lake Nakuru in Kenya was found to eat 5 tons of fish each day. Such teamwork is not always necessary, however. When fish are large and plentiful, an individual will fish by itself to catch the 2.5 lbs. of food it requires each day.

3 Netting...
Underwater, the huge pouches of the closely bunched pelicans billow to form a continuous barrier, giving the fish little chance of escape.



4 Gulping
A pouchful may have more than 3 gallons of water and several fish. The bird gets rid of the water, then swallows the fish whole.

◀ **Little brown birds**
Pelican chicks are clad in dark-brown down.

▲ **Nursery days**
The vulnerable chicks are guarded in "pods."

BEHAVIOR

Sociable by nature, the pelican lives communally without the constant bickering of many other gregarious birds. Rival pelicans squabble at courting time, but usually the only sound to come from a colony is the deep, restful hum made by the birds' resonant *mooing*.

Large flocks of pelicans may gather at traditional roosts, which are also used as daytime resting sites after fishing trips. They may perch in trees, but usually roost on the ground.

The great white pelican is one of the most impressive of all birds in flight, although takeoff is achieved only after a labored, splashing run across the water. Once airborne, flocks assemble into precise V-formations or lines, each pelican timing its wingbeats to benefit from the slipstream created by the bird in front of it.

▲ **Air power**
Great white pelicans are majestic in flight.

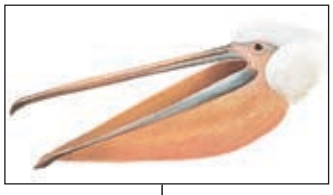
▲ **Birds of a feather**
Great white pelicans often retire to favorite resting sites after a fishing trip.

DID YOU KNOW?

- **Fossils of birds resembling pelicans have been discovered in rocks about 40 million years old, which suggests the pelican family is one of the world's oldest bird groups.**
- **Two adult pelicans need to catch about 500 lbs. of fish to feed themselves and a single chick during the 10 weeks that the chick remains with them.**

PROFILE GREAT WHITE PELICAN

The pelican swims strongly and with precise control, dipping its long, flexible neck to scoop a slippery catch in its bizarre pouched bill.



POUCH

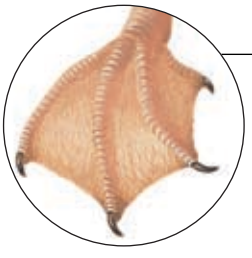
A supple pouch distends to take in 3.5 gallons of fish and water. It drains the water, tilts its bill and swallows the entire catch.

BILL

Up to 18.5" long, the bill has a specially modified lower mandible to support the great pouch and its heavy load.

PLUMAGE

Coarse feathers and a long molt mean the pelican often looks unkempt. The pink tinge acquired by breeding birds is believed to come from colored oil secreted by the preen gland.



LEGS AND FEET

Large, paddlelike feet on short, sturdy legs make the pelican a strong swimmer. The bird's four toes are connected by webbing.

HEAD

In the mating season, the male's facial skin becomes pinkish-yellow; the female turns bright orange. Both sexes develop a swollen forehead and a short, ragged crest.

VITAL STATISTICS

WEIGHT	20–26 lbs.
LENGTH	54–66"
WINGSPAN	108–132"
SEXUAL MATURITY	Probably 3–4 years
BREEDING SEASON	Varies with location
NUMBER OF EGGS	1–3; usually 2
INCUBATION PERIOD	29–36 days
FLEDGING PERIOD	9–10 weeks
BREEDING INTERVAL	Annual
TYPICAL DIET	Fish, mostly freshwater species
LIFESPAN	Up to 15 years

RELATED SPECIES

● **There are eight pelican species. The largest is the 6'-long (including its bill) endangered Dalmatian pelican** (below)**; its range overlaps with the great white pelican's in Europe and Asia. Three others are confined to Africa, Asia and Australia; three more breed in the Americas.**

CREATURE COMPARISONS

The American white pelican looks like a great white pelican, but grows a flattened plate on top of its bill as an adornment in breeding seasons. The brown pelican and the similar Peruvian (or Chilean) pelican are confined to the Americas. They prefer the sea to freshwater and catch fish by plunge-diving.

American white pelican Great white pelican Brown pelican

Greater Flamingo

• ORDER •
Phoenicopteriformes

• FAMILY •
Phoenicopteridae

• GENUS & SPECIES •
Phoenicopterus ruber

KEY FEATURES

- Inhabits tropical salt pans, lagoons and alkaline lakes
- Skin on feet and legs can withstand burning effects of caustic soda, found in alkaline lakes
- Breeds in huge colonies — over a million individuals
- Uses extraordinary specialized bill to filter food in shallow water

WHERE IN THE WORLD?

Mainly on lagoons and large inland lakes in Africa, the Middle East, India and Sri Lanka, extending into subtropical southern Europe; deep pink variety in Caribbean and Galapagos Islands

LIFECYCLE

The greater flamingo steps elegantly through shallow lakes and lagoons, sweeping its highly specialized bill from side to side to filter tiny food items from the water.

HABITAT

The greater flamingo inhabits lagoons, salt pans and large, shallow lakes, from sea level to altitudes of over 9,900'. Conditions across its range are very harsh with high temperatures. The salt waters can be very alkaline and contain high levels of caustic soda. However, the heat and salt stimulate the growth of plankton, algae and aquatic invertebrates. Few animals could exploit such hostile waters but the flamingo is equipped to thrive.

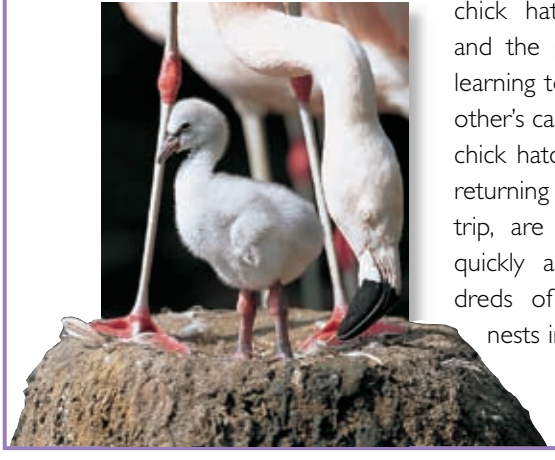
▲ **IN THE PINK**
Lake Nakuru, in Kenya, supports huge flocks of greater flamingos.

DID YOU KNOW?

- **Many chicks die from exhaustion and starvation when their legs become encrusted with salt from around the nest.**
- **The silhouette of a flamingo was used by the ancient Egyptians to symbolize the color red.**
- **The flamingo's pink feathers are a vital stimulus for reproduction. Poor diet can cause a bird to lose its color and the opportunity to breed.**

BREEDING

Throughout its tropical and subtropical range, the flamingo breeds when food supplies are good and the water level is high enough to soften the shoreline mud (from which it builds its nest). The nest's platform structure protects the egg from searing heat by exposing it to breezes and drawing up moisture to cool the nest as it evaporates. The height of the nest helps the leggy flamingo when incubating, as it can straddle the nest. The nests are built in large colonies on mudflats, salt pans and islands. Pairs defend the nest with threat postures, but fights among neighbors are rare.



Several days before the chick hatches, it cheeps and the parents respond, learning to recognize each other's calls. Then, after the chick hatches, the parents, returning from a feeding trip, are able to find it quickly among the hundreds of other identical nests in the colony.

FLAMINGO DANCING

1 Inciting…
When a few flamingos begin a breeding display, other adults join in. Eventually a forest of flamingos may join the performance.

2 Posing…
Pointing their bills to the sky, males strive to stretch higher than rivals, then rhythmically turn their heads from side to side.

3 Displaying…
To further impress females, males spread and flash their wings, exposing the crimson underwing, edged by black flight feathers.

4 Nest building
Once paired, the flamingo builds a mud nest with a shallow bowl on top. The single chalky-white egg is incubated by both parents.

BEHAVIOR

▲ **FLAMINGO MILK**
Adults produce milky fluid in their digestive tracts, which they feed to the chick.

Often found in large groups, the flamingo gathers on shorelines of tropical lagoons and salt lakes where it can wade in the shallows on its long, stiltlike legs. It can live in temperatures that climb daily to more than 104°F and drink water that is twice as salty as the sea. Highly sociable, the flamingo's communal nature extends to caring for young. When a chick fledges, it joins a nursery supervised by a few adults, allowing the other parent birds to feed.

CONSERVATION

Apart from the Caribbean where populations are hunted for food or sport, the flamingo is under little threat, partly because its harsh, remote habitat isn't exploited by humans.

FOOD & FEEDING

The greater flamingo has a specialized system of feeding that is unique among birds. The bill is held upside down, facing backwards, and horizontal to the water surface. The flamingo walks slowly forward. swinging the bill from side to side. The tongue works like a piston, pumping water 5–6 times a second through the partly opened mandibles. Food items — algae, tiny crustaceans, mollusks and aquatic insects — are filtered by a special comblike structure lining the bill, then scooped off by the tongue to be swallowed.

In shallows, the flamingo dips its bill upside down just under the surface. In deeper water, it uses its long neck to reach bottom mud. On alkaline lakes, however, the flamingo can only feed on the surface, because its eyes would be burned by the powerful chemicals.

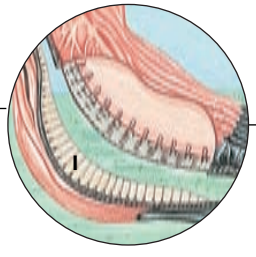
▼ **FOODBILL**
The flamingo may eat up to 9.5 oz. of tiny filtered food particles each day.

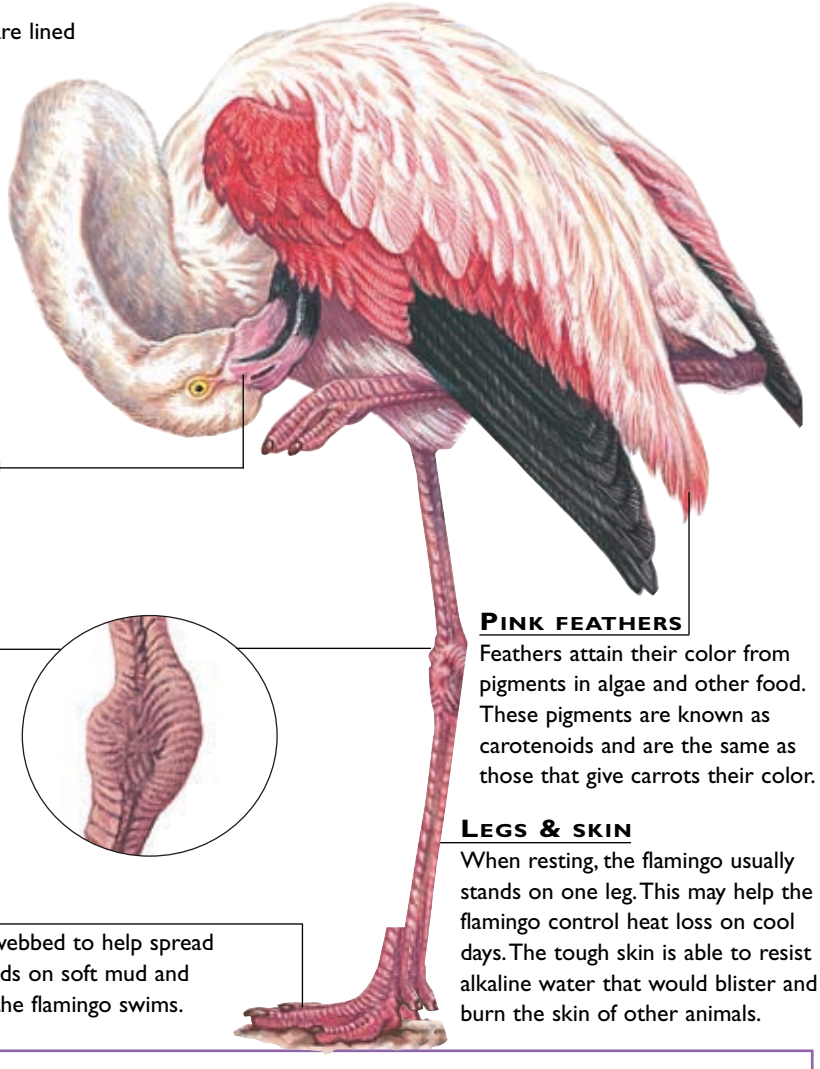
PROFILE GREATER FLAMINGO

The greater flamingo has legs that resist burning chemicals in some feeding waters and a special bill to trap tiny organisms.

BILL

Edges and inner surfaces are lined with lamellae **(1)** — fine platelike outgrowths of the bill that can be raised and lowered. Tiny organisms are trapped as the tongue is pushed forward and water is squeezed through the lamellae.





ANKLE

The joint appearing to be the knee is actually the ankle. This joint allows the long legs to bend at a pivotal point to make sitting in a nest as easy as possible.

PINK FEATHERS

Feathers attain their color from pigments in algae and other food. These pigments are known as carotenoids and are the same as those that give carrots their color.

LEGS & SKIN

When resting, the flamingo usually stands on one leg. This may help the flamingo control heat loss on cool days. The tough skin is able to resist alkaline water that would blister and burn the skin of other animals.

FEET

The three main toes are webbed to help spread the bird's weight as it stands on soft mud and also act as paddles when the flamingo swims.

CREATURE COMPARISONS

The roseate spoonbill (*Ajaia ajaja*), another pink-plumed bird found alongside the flamingo in the Caribbean has a similar-shaped bill. Holding its mandibles slightly open and bill vertical, the spoonbill feeds by sweeping from side to side through shallow water. The spoon-shaped bill is equipped with numerous vibration-sensitive receptors. When aquatic organisms touch the receptors the bill rapidly snaps shut. Both species rely on their bill structure to feed without actually seeing their food.

Greater flamingo

Roseate spoonbill

VITAL STATISTICS

WEIGHT	4.6–9 lbs.
LENGTH	4–4.8'
WINGSPAN	4.6–5.4'
SEXUAL MATURITY	5–6 years
BREEDING SEASON	Variable, according to locality
NUMBER OF EGGS	1, rarely 2
INCUBATION PERIOD	27–31 days
FLEDGING PERIOD	65–90 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Mainly aquatic invertebrates and algae
LIFESPAN	Up to 33 years in the wild; 45 in captivity

RELATED SPECIES

- **The Puna and Andean flamingo, (*Phoenicoparrus jamesi* and *P. andinus*), have restricted ranges in South America, living at high altitudes on the salt lakes of Peru and Bolivia, Argentina and Chile. Both have yellow, not pink, on their bills, and no hindtoe. Known for huge gatherings in East Africa, the lesser flamingo (*Phoeniconaias minor*) also occurs in northwest India and Pakistan.**

Greater Prairie Chicken

• ORDER •
Galliformes

• FAMILY •
Tetraonidae

• GENUS & SPECIES •
Tympanuchus cupido

KEY FEATURES

- Famous for their booming courtship displays, the males' drumming sounds are heard more than 2 miles away
- Prominent, stiff winglike feathers (pinnae) on the neck give rise to their other common name, the pinnated grouse

WHERE IN THE WORLD?

Inhabits the midwestern United States, including Kansas, Nebraska, South Dakota and Oklahoma, along with small populations in six other states

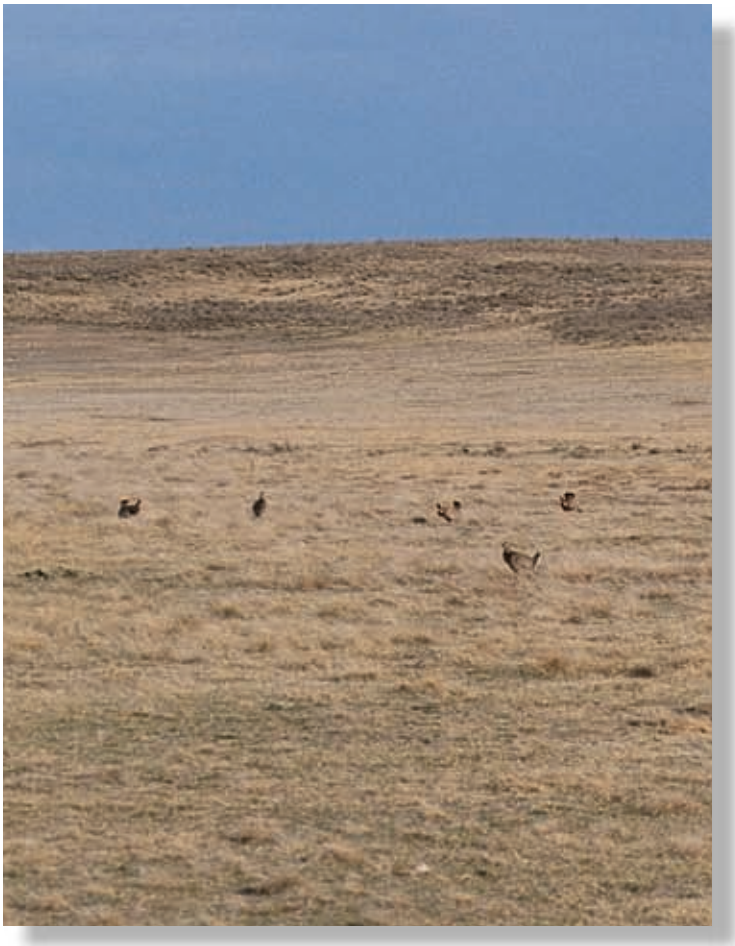
LIFECYCLE

The greater prairie chicken is an extremely social bird, forming winter flocks of up to 300, which help them stay warm in their cold weather habitats.

HABITAT

As its name suggests, the greater prairie chicken is at home on the prairies or rolling grasslands that are found mostly in midwestern U.S. But with the conversion of the virgin prairies into grain farms, the the greater prairie chicken's current habitat is characterized by medium and tall prairie grasses that are often mixed with cropland. In the spring and summer, the grassland is necessary for the greater prairie chicken to roost, socialize and nest. In winter, cultivated grains provide a stable source of food.

▼ **STRUTTING THEIR STUFF**
The males gather on the open prairie to dance.



BEHAVIOR

Most prairie chickens roost on the ground in sheltered sites, where they hide from predators. During the winter, they make snow roosts by digging 5–10" beneath the surface of the snow, then tunneling horizontally for about 1'. These roosts work like an igloo, protecting the prairie chickens from cold winds. Preening is a common behavior among greater prairie chickens and occurs mainly while roosting, socializing and feeding. The greater prairie chicken spends the majority of its time on the ground, but frequently flies between its breeding, feeding, nesting, socializing and roosting sites. The bird can fly nonstop for more than 7 miles between favored habitats.

▲ **ON ALERT**
When predators approach, adults remain motionless with necks extended.

▼ **IN DISPUTE**
Two males dispute territory on a booming ground in the prairie.

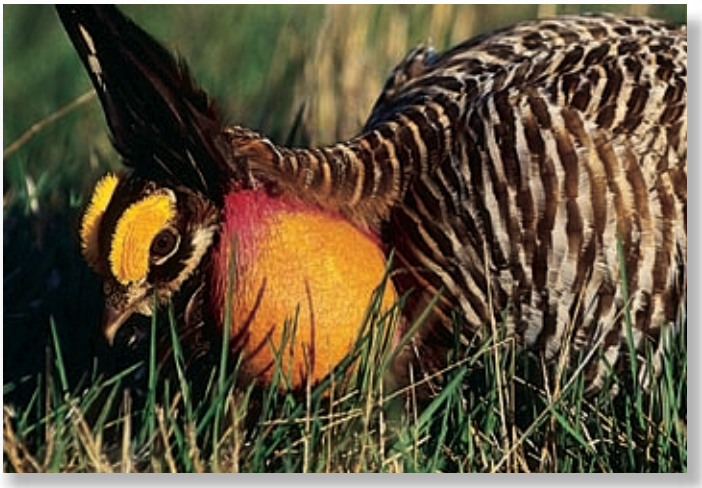
DID YOU KNOW?

- **Prairie chickens can fly up to 50 mph when traveling to and from roosting sites.**
- **Prairie chickens have a high mortality rate. As many as 50–60% of adults die each year.**
- **Pheasants lay their eggs in the nests of prairie chickens. The pheasant eggs hatch first, and the mother prairie chicken raises them as her own, neglecting her own eggs — which then never hatch.**

FOOD & FEEDING

The greater prairie chicken forages on the ground, only occasionally lighting on a tree branch to feed. Groups search for food mainly in the early morning and early evening, and typically rest in thick cover during the day. The winter diet of the greater prairie chicken is almost completely vegetation: leaves, seeds and cultivated grains such as corn, sorghum and wheat. In the spring, leaves, seeds, buds, fruits and insects dominate the diet, the latter being an important source of protein for juveniles. Although the greater prairie chicken may drink from stock tanks when available, it relies mainly on dew from plants to obtain the water it needs.

▼ **OPEN HOUSE**
The open prairie provides shelter as well as food.



CONSERVATION

The greater prairie chicken is in danger of extinction in 15 states. However, they are numerous enough to be legally hunted in four states: Kansas, South Dakota, Nebraska and Oklahoma. Declining numbers are caused by the conversion of prairie land to farmland, where it has suffered the most from human activities. Other threats come from natural predators, such as skunks, foxes and coyotes.

BREEDING

Greater prairie chickens mate at lekking sites, with the females generally mating once. However, each season some females breed a second time, because their nest is taken by a predator. The female builds her nests alone, forming a bowl-shaped depression in the ground and lining it with feathers, dry grass and leaves. She lays a clutch of 11–12 eggs and incubates them for 23–25 days. Immediately after hatching, the chicks are able to feed themselves. Their diet initially consists of insects, but they gradually develop a taste for seeds, leaves and grains. After 8–10 weeks, the chicks become fully independent.

BREEDING RIVALRY

1 Gathering…
In the spring, the males gather together at the lekking site, which is typically located on open, grassy terrain.

2 Defending…
Each male establishes and defends a territory through various displays and deep resonating sounds called booms.

3 Face off…
Males occupying the central territories are dominant and carry out most of the mating over the entire booming ground.

4 Battle of the dances
When females visit the lek, the males perform fluttering jumps and leaps into the air and flap their wings while booming.

PROFILE GREATER PRAIRIE CHICKEN

A bird known for its courtship rituals, the male performs one of the most intriguing mating displays to attract a female hen.

MALE

The male's brilliant orange inflatable air sacs, called the tympani, are designed to attract a mate with their radiant color and their magnificent courtship sounds, called booms, which can be heard for miles.

FEET

The feathered foot of the greater prairie chicken has tooth-like projections of skin that allows it to walk in the snow.

FEMALE

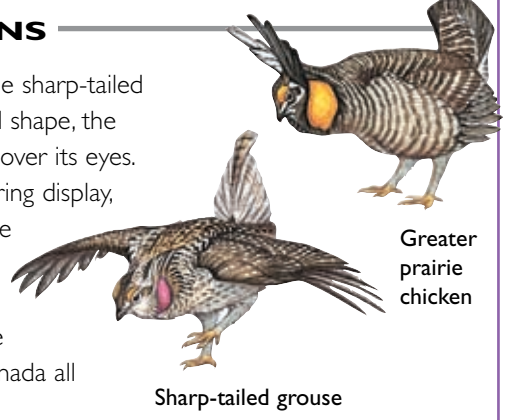
The female lacks both the yellow comb over the eyes and the orange esophageal air sacs of the male. She can also be identified by her shorter pinnae and barred crown and tail feathers.

VITAL STATISTICS

WEIGHT	Male 2–3 lbs.; female 1–2 lbs.
LENGTH	16–19"
WINGSPAN	22"
SEXUAL MATURITY	1 year
BREEDING SEASON	March–May
NUMBER OF EGGS	11–12
INCUBATION PERIOD	23–25 days
FLEDGING PERIOD	8–10 weeks
BREEDING INTERVALS	1 year
TYPICAL DIET	Insects, buds, prairie grass, seeds, leaves and grains
LIFESPAN	2–3 years

CREATURE COMPARISONS

The greater prairie chicken is easily confused with the sharp-tailed grouse *(Tympanuchus phasianellus)*. Similar in size and shape, the sharp-tailed grouse also has an inconspicuous comb over its eyes. Pinkish to pale-violet airsacs on the neck expand during display, though not to the degree found in the greater prairie chicken. The sharp-tailed grouse can be recognized by its long, narrowly pointed tail compared to the short, rounded tail of the greater prairie chicken. The sharp-tailed grouse can also be found in parts of Canada all the way down to Utah.



Greater prairie chicken

Sharp-tailed grouse

RELATED SPECIES

- **The prairie chicken belongs to the order *Galliformes*, which includes quail, grouse, pheasants and turkeys. Four subspecies have been recognized: the eastern heath hen *(Tympanuchus cupido cupido)*, extinct since 1932; the endangered Attwater's prairie chicken *(T.c. attwateri)* on the Texas Gulf coast; the lesser prairie chicken *(T.c. pallidicinctus)* in the west; and the greater prairie chicken *(T.c. pinnatus)*.**

Greater Rhea

• ORDER •
Struthioniformes

• FAMILY •
Rheidae

• GENUS & SPECIES •
Rhea americana

KEY FEATURES

- Though flightless, the greater rhea is a swift runner and a good swimmer
- Heaviest New World bird, but it can almost disappear from view when it flattens its body on the ground
- Several females lay up to 30 eggs in one nest; a single male incubates them and takes care of the chicks after hatching

WHERE IN THE WORLD?

Found on the open plains in central and southern regions of South America, with main concentrations in Brazil, Uruguay, Paraguay, Bolivia and Argentina

LIFECYCLE

The greater rhea is highly sociable and lives in mixed groups of males, females and juveniles; males prepare nests and incubate the eggs, which is unusual among birds.

HABITAT

▲ ALWAYS ALERT
Two rheas look and listen for danger lurking in the savannah grasses.

The greater rhea resides in South America's savannahs and in sparse woodlands, called chacos. It can also be found in Brazil's *campos* regions, areas of dense grassland and scrub with scattered trees. In Argentina the rhea occurs at altitudes as high as 6,500'; it also frequents the edges of woods and feeds near farmland. The regions rheas inhabit have no distinct dry season, so food and water are plentiful year-round.

DID YOU KNOW?

- **Deeply rooted in South American culture, the rhea often appears in folklore as a theme to popular songs or through the use of feathers in some dances.**
- **The rhea inflates its esophagus with swallowed air to increase the effectiveness of its calls.**
- **Charles Darwin first noted the difference between the greater and lesser rhea while eating a cooked rhea leg; he saw a difference in size and bone structure.**
- **The rhea sleeps sitting on its heels (tarsi) with its neck folded over to one side in an S-shaped curve.**

BREEDING

In their efforts to attract females, males compete with each other for the best territories. During the courtship display, the male puffs out the feathers along his neck and produces a booming call. This deep, resounding call sounds more like a large mammal's roar than the sound a bird might make. The male copulates with several females, which then lay their eggs in a single nest prepared by the male. Unlike most bird species, the male rhea incubates the eggs, which can number up to about 30. The females completely abandon the eggs and go off to mate with other males. After 35–40 days, the chicks emerge with a down coat that's marked with grayish and white stripes. Males keep chicks together through a series of whistles. Chicks stay with the male for about six months, then usually remain in small groups until they reach maturity at about age 2.

THE MATING GAME

1 Competing for space...
Two male greater rheas circle each other during a biting match. Their necks become entwined as they fight over territory.

2 Victor makes his play...
After winning the battle, the victorious male puffs his feathers, hoping to attract a nearby female with his wing display.

BEHAVIOR

The rhea is active during the day and forages with a group of about 5–8 males, females and juveniles, though flocks can number over 50. Though gregarious, rheas remain a few feet apart from one another. When threatened, the bird throws its head forward and hisses repeatedly. Equipped with excellent eyesight and hearing, the rheas can quickly identify approaching danger, including humans and birds of prey such as the caracara. Reaching speeds of over 35 mph, rheas can easily outrun most predators, but during a chase they often squat down suddenly among bushes and flatten their bodies on the ground to hide, eluding the pursuer. The bird is also a surprisingly good swimmer, with the ability to cross rivers.

▶ FLIGHTLESS FEATHERS
The fluffy wings are used for balance, not for flying.

CONSERVATION

Though not considered threatened, the greater rhea has suffered a decrease in its population, especially in Argentina, where it has been legally protected since 1981. The main threat facing the bird is the reduction of its habitat through the conversion of the plains to farmland or pastures for cattle to graze. The rhea also has been hunted for food and sport. The Convention for International Trade in Endangered Species (CITES) limits the export or import of rheas.

3 Step into my parlor…
After mating, the male leads the female to his nest, already filled with 10 eggs camouflaged with dried-out vegetation.

4 Male mama
After his brood hatches, the male leads a flock of young rheas to some large tussocks of grass in search of food.

FOOD & FEEDING

Rheas tend to wander while feeding with their flock. They often are seen with herds of pampas deer and even cattle and sheep. Rheas prefer clover, but consume all kinds of plant matter, such as roots, fruits, seeds and leaves. The bird also eats insects and small vertebrates, such as lizards and frogs, and will catch flies and any small animals within reach. By eating burrlike seeds and thistle growths, the rhea actually aids sheep, since the prickly plant parts often become tangled in the sheep's wool. The rhea drinks little water, since most of its liquid requirements are satisfied by plants.

▲ **PERSISTENT PROBE**
A rhea explores the savannah floor for food.

PROFILE GREATER RHEA

Sometimes called a South American ostrich, the flightless but long-legged greater rhea can reach speeds of more than 35 mph.

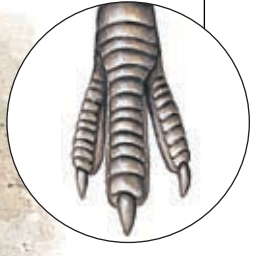
BILL
The wide, flat bill is adapted for grazing on vegetation and seizing insects and small vertebrates.

MALE PLUMAGE
During the breeding season, the male develops a black bib and collar at the base of the neck.

WINGS
Though incapable of flight, the wings can be held out like sails for balance when the bird runs. Strong claws on each wing can be used as a weapon.

FEMALE
The female is smaller than the male and has lighter-colored neck and chest feathers. She lacks the male's black bib and collar.

FEET & LEGS
The three-toed feet are almost hooflike and can also be used as weapons. Together with the huge legs, they are built for running great distances at tremendous speeds.



VITAL STATISTICS

WEIGHT	Up to 55 lbs.
LENGTH	Up to 4.6'
WINGSPAN	5'
SEXUAL MATURITY	2–3 years
BREEDING SEASON	Varies according to region; lasts 3 months
NUMBER OF EGGS	13–30 per nest
INCUBATION PERIOD	35–40 days
BROODING PERIOD	6 months
TYPICAL DIET	Leaves, seeds, roots, fruits, insects and small vertebrates
LIFESPAN	20 years in the wild; 40 years in captivity

RELATED SPECIES

● **The family *Rheidae* contains two genera, each with one species. The genus *Rhea* contains the greater rhea, while the genus *Pterocnemia* contains the lesser rhea. Relatives of the rhea include ostriches in the family *Struthionidae*, order *Struthioniformes*. Rheas, cassowaries, emus and kiwis also all belong to this order and are also called ratites; they lack the keel for the attachment of flight muscles.**

CREATURE COMPARISONS

Greater rhea

At 3.25' tall, the lesser rhea (*Pterocnemia pennata*) is more compact than the greater rhea. This smaller species is quicker than the greater rhea, but has less stamina when it runs. The lesser rhea prefers the southerly regions of open scrub in South America, particularly Peru, Bolivia, Argentina and Chile. The bird also can be found in the *puna* (cold, dry mesa) of the Andean plateau at altitudes over 11,000' high, an area the greater rhea doesn't inhabit. Both rheas grow grayish plumage with smooth, soft feathers; however, the lesser rhea has varying numbers of white spots on its back, which allows the bird to blend with vegetation.

Lesser rhea

Greater Roadrunner

• ORDER •
Cuculiformes

• FAMILY •
Cuculidae

• GENUS & SPECIES •
Geococcyx californianus

KEY FEATURES

- Conserves energy during cold desert nights by becoming sluggish, then warms in the morning by exposing its dark dorsal skin to the sun
- Uses sticks, mesquite pods, snakeskin and cattle dung to build its nest in arid, treeless regions
- Escapes the fierce desert heat by seeking shade

WHERE IN THE WORLD?

Found in Mexico and the southwest U.S. — Arizona, New Mexico, Texas and in parts of California, Nevada, Utah, Colorado, Kansas, Oklahoma, Arkansas and Louisiana

LIFECYCLE

The greater roadrunner lives up to its cartoon-character image as it dashes across North American desert highways at breakneck speed in pursuit of its prey.

HABITAT

The roadrunner lives in dry, open country, especially semi-arid scrub known as chaparral, (alternative name is "chaparral cock"). The bird is common at altitudes below 3,300'.

▲ **STOP-GO PREDATOR**
The roadrunner sprints in short but very rapid bursts, pausing frequently to look around for prey.

Some roadrunners live on open farmland and around outskirts of towns. The bird is attracted to cattle ranches, where it dashes onto the pasture occasionally to snap up insects disturbed by the grazing livestock. Although the roadrunner spends most of its life on the ground, it occasionally perches on fence posts and in trees.

A familiar bird of "cowboy country," the roadrunner is held in high esteem. It is the state bird of New Mexico; in Mexico its popularity is reflected in its local name *el paisano*, meaning "fellow countryman." Some Native American tribes used the roadrunner's feathers and cross-shaped footprints to drive away evil spirits.

BREEDING

BEHAVIOR

The roadrunner, which earned its name by running in front of stage-coaches, has entered American folklore on account of its bizarre behavior. It's so reluctant to fly that, when threatened by a predator, its first defense is to lie motionless on the ground.

The roadrunner flees on foot only when danger gets too close for comfort. When running at full speed, the bird holds its head and tail horizontally. If really necessary, the bird takes clumsily to the air, but usually running in a series of sudden changes of direction leaves its pursuer baffled and beaten.

SPEED RACER

1 Cooling down...
The roadrunner conserves energy through cold nights by letting its body temperature drop, so it becomes sluggish.

2 Warming up...
In morning, the bird raises its back feathers to let the sun reach dark skin that acts like a solar panel, absorbing heat and warming blood.

The male courts his intended mate by cooing to her and dancing around her with tail fanned and wings drooping. Once having paired, the two adults remain together for life.

The nest is built in cactus or shrub, several feet above the ground. It's built from sticks and lined with feathers, leaves, snakeskins and dried cow dung.

Chicks are fed insects and small lizards at first, but can catch some of their own food at less than three weeks old.

◀ **TEMPTING OFFER**
The male will present his partner with a lizard only after she's mated with him.

DID YOU KNOW?

- **The average speed of a roadrunner is about 15 mph: the bird takes about 12 steps per second. Its legs move so rapidly that they appear as a blur beneath the body.**
- **If a predator comes too close to its nest, the roadrunner will try to distract it by pretending to have a broken wing.**
- **The greater roadrunner's song is *coo-coo-coo-oo-oo-oo* and not *beep-beep* as portrayed in cartoon films.**

3 Back in action…
The heat on the special patch of skin quickly restores its normal body temperature. Soon, the bird is fully alert again, ready to hunt.

4 Seeking shade
The roadrunner adjusts its daily behavior to escape the heat. During the hottest hours, it finds a shady shelter from the sun.

FOOD & HUNTING

▲ **FEEDING DUTY**
Adults reserve part of their catch for the young.

The roadrunner typically runs a short distance before halting and spying for prey, with its neck stretched high and tail cocked. It repeats this procedure until it spots a potential meal.

When hunting snakes, however, the roadrunner relies on stealth, speed, agility and power, as it isn't immune to venom. It outwits its victim in a fast-moving skirmish, seizing the snake by its head and beating it violently on the ground. Despite its prowess as a snake-catcher, the roadrunner feeds mainly on spiders and large insects snatched from the ground or flushed from plants.

CONSERVATION

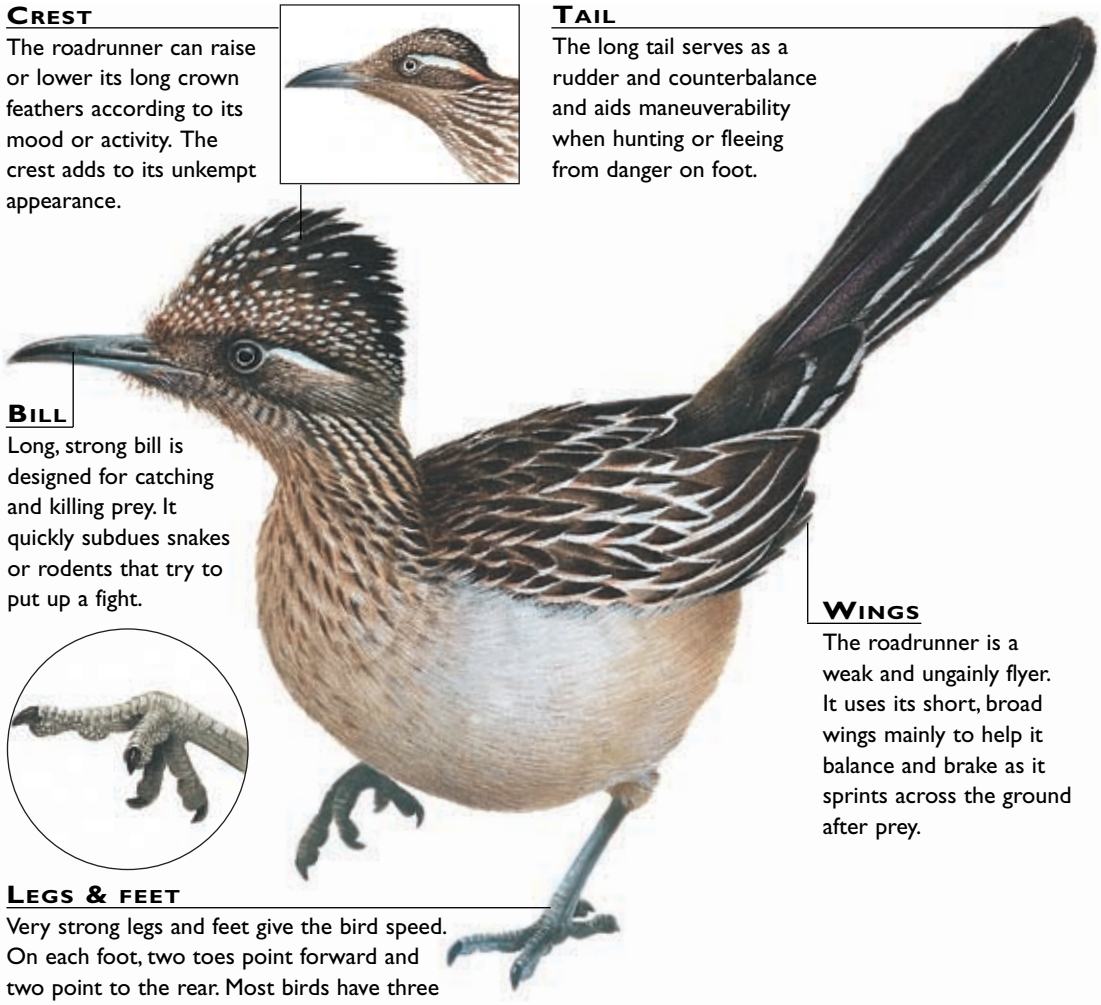
The naturally harsh and sparsely populated environment in which the roadrunner lives is one of its best safeguards for survival, as this bird is fully equipped to survive extreme conditions of drought and heat. The species was once hunted in the mistaken belief that it preyed on gamebirds, but its popularity among local peoples outweighs any resentment once felt. Of the 127 species in the cuckoo family as a whole, fewer than 20 are considered threatened to any extent.

PROFILE GREATER ROADRUNNER

Built for life on foot, the roadrunner acquires an intimate knowledge of its territory and uses this to catch prey and escape predators.

CREST
The roadrunner can raise or lower its long crown feathers according to its mood or activity. The crest adds to its unkempt appearance.

TAIL
The long tail serves as a rudder and counterbalance and aids maneuverability when hunting or fleeing from danger on foot.



BILL
Long, strong bill is designed for catching and killing prey. It quickly subdues snakes or rodents that try to put up a fight.

WINGS
The roadrunner is a weak and ungainly flyer. It uses its short, broad wings mainly to help it balance and brake as it sprints across the ground after prey.

LEGS & FEET
Very strong legs and feet give the bird speed. On each foot, two toes point forward and two point to the rear. Most birds have three toes at the front and one at the back.

VITAL STATISTICS

WEIGHT	7–13 oz.
LENGTH	20.4–24.4", including a 10" tail
WINGSPAN	16–20.4"
SEXUAL MATURITY	1 year
MATING SEASON	Usually April –May; second brood July–September
NUMBER OF EGGS	2–7; usually 3–5
INCUBATION PERIOD	17–20 days
NUMBER OF BROODS	1, sometimes 2
TYPICAL DIET	Insects, lizards, snakes, birds, rodents, eggs, fruit, seeds
LIFESPAN	Up to 9 years

RELATED SPECIES

● **The greater and lesser roadrunners are the only species in the *Geococcyx* genus, within a group of 13 species called ground-cuckoos. The lesser roadrunner is similar to the greater, but has a southerly range in Central America. Road-runners are among about 130 species in the widespread cuckoo family, *Cuculidae*. These include 50 species of "true" cuckoo, which all lay eggs in the nests of other species.**

CREATURE COMPARISONS

The yellow-billed cuckoo, *Coccyzus americanus*, is another North American relative of the roadrunner. Unlike the roadrunner, however, it flies gracefully. The Eurasian cuckoo, *Cuculus canorus*, is a relatively strong flier traveling direct and low on rapidly beating wings and is capable of covering long distances.

Yellow-billed cuckoo

Eurasian cuckoo

Greater roadrunner

Green Jay

• ORDER •
Passeriformes

• FAMILY •
Corvidae

• GENUS & SPECIES •
Cyanocorax yncas

KEY FEATURES

- South American population employs as many as 10 "helpers" per breeding pair; they assist in feeding young and defending the nest
- During breeding season, a paired male and female frequently perch together at midday, sometimes in close bodily contact

WHERE IN THE WORLD?

Found in southern Texas, through Mexico to Honduras; also in South America, from Columbia and Venezuela through Ecuador to Bolivia

LIFECYCLE

The green jay is a colorful, lively and raucous bird; nonmigratory, it prefers to remain in its temperate hideaways where it announces its presence with a cacophony of calls.

HABITAT

▲ **GORGEOUS GREENS**
The jay's shades of green match those of the forest.

In the U.S., the green jay is most numerous in the willow trees and tall brush along the lower Rio Grande and its tributaries in Texas; but it is also at home, especially during the summer, in mesquite woodlands away from water. In cooler months, when mesquite leaves are sparse, many green jays retreat to the concealment of evergreen trees and shrubs. In places where native evergreens have been cleared, troops of green jays bound and flit through citrus groves. As spring approaches, the noisy flocks partially disband, and pairs search out remaining thickets. Central American green jay populations prefer humid forests, rain forests, lowlands, plantations and mountains. In South America, the green jay is found in humid mountain forests and forest borders, clearings and secondary woodland.

DID YOU KNOW?

- **The green jay has been seen covering its feathers with smoke from smoldering logs, probably to kill parasites.**
- **The species name, *yncas*, comes from the first scientific reports of the green jay hailing from Peru, the land the Incas.**

FOOD & FEEDING

The green jay is omnivorous: it feeds on animals as well as seeds and fruits. Large insects are its favorite source of protein. After hopping around or taking short flights to examine new surroundings, the jay forages in family flocks. When foraging in trees, it moves in a spiral from the lower portion of a tree up through its branches. When foraging on the ground, it turns over dry leaves and twigs by sweeping its bill from side to side. The jay also frequents highway rest stops in Texas, zooming down from the trees to pick up the remains of human lunches.

During the breeding season, both parents bring food to the chicks. Once the green jay chicks leave the nest, the female continues to feed them for at least three weeks. Insects make up the major portion of the meals. In Colombian flocks, all members cooperate in bringing food to the young and continue feeding the chicks for at least 20 days after they leave the nest.

▼ **CAREFUL EXAMINATION**
An observant green jay scrutinizes a fallen tree for scurrying insects or scattered seeds.

BREEDING

Central American green jays are solitary nesters, while South American and Texas jays are social, building nests near other jays. The nest is a platform of thorny twigs and roots, lined with mosses, lichens, dried grasses and leaves. Nests are usually found in dense thickets, trees and bushy shrubs, well hidden at 6.5–10' off the ground. Both the male and female participate in choosing the nest site and building the nest. The green jay is monogamous, and during the breeding season a breeding pair rarely parts. The female usually lays 3–5 oval eggs that are greenish buff or white and spotted with various shades of brown and lavender. The female incubates the eggs for 17 days. The male feeds the female, sometimes up to 6 times a day. After the unfeathered chicks have hatched, the male continues to bring food to the nest for five days, then both parents bring insects to the growing chicks.

BEHAVIOR

Most green jays are nonmigratory, but the Honduras populations migrate locally. The southern Texas and South American populations of green jay retain related juveniles and immature birds to serve as "helpers" at the nest. These flocks contain a breeding pair, the current year's nestlings and the juvenile helpers. The helpers provide territorial defense, but are ejected from the Texas flocks when the current season's chicks have fledged. Colombian green jays retain helpers year-round. Usually, the more helpers a flock has, the higher the survival rate of its fledglings.

The green jay's flight is strong and steady but rarely sustained for very long periods of time. When an intruder is encountered, members of a family flock will call loudly and often swoop down, passing within 1" of the intruder. The jay's first line of defense against predators is to stay hidden, but if threatened, the jay may scare off intruders with loud, raucous calls. The green jay has a variety of calls, and flocks are often noisy and conspicuous in the breeding season. Frequent green jay calls are a rapid, vigorous *cheh-cheh-cheh-cheh* sound and a slower *cleep-cleep-cleep-cleep* sound. They also make a dry, throaty rattle. These calls are given year-round, but the rattle is more frequent in spring.

A South American green jay's nasal plumes and wide-open eye form an inquisitive expression, as the bird turns its head while perching.

TENDING THE NEST

1 Feeding...
While a female green jay feeds her chicks, the male stands guard from a safe distance.

2 Flying...
A "helper bird" does its duty, bringing a fresh earthworm meal to the nest.

3 Helping...
The team effort of a breeding pair and a helper gives new chicks the best chance of survival.

4 Defending
Several green jays mob a raccoonlike coati, which hopes to make an easy meal of their eggs.

PROUD PARENTS
Green jays are cooperative breeders: both parents and helper green jays provide defense for their nesting territory in southern Texas.

CONSERVATION

The green jay is not endangered, but populations are limited by the amount of breeding habitat available. The bird is also vulnerable to traps set for other animals.

PROFILE GREEN JAY

The dazzling green jay's yellow, blue and green plumage blends perfectly with patches of sunlight and shadows in woods and thickets.

BILL

With its sturdy black bill, the jay picks at a variety of food items, from grasshoppers to seeds and fruit. It sweeps its bill from side to side, turning over leaves and twigs in search of food.

PLUMAGE

The northern race, *Cyanocorax yncas glaucescens*, has a prominent forehead, crown and neck that are colored various shades of blue. The back, rump and upper tail are bright green. The sides of the neck, chin and throat are black, in contrast with its long blue-green tail with yellow outer tail feathers.

IN FLIGHT

Flight is strong and steady but rarely sustained for long periods of time. During flight, the jay's brilliant green plumage is visible on its back and wings.

Species shown:
Green jay, northern race,
Cyanocorax yncas glaucescens

ANDEAN RACE

Cyanocorax yncas galeatus of South America is a little larger than the Texas green jay, and has longer nasal and frontal plumes that form a bushy crest. It also is more bluish-green in color.

FEET

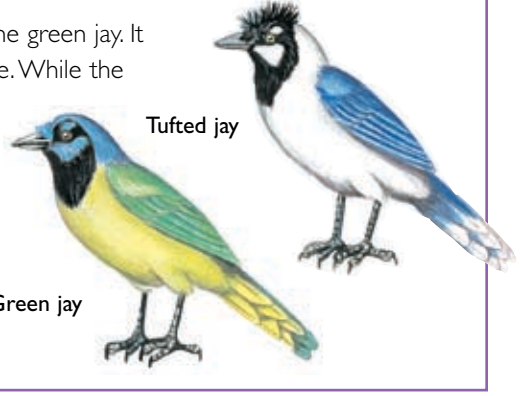
The long hind toe (*hallux*) points backward and helps the green jay secure a foothold on tree branches or other awkward perches.

VITAL STATISTICS

WEIGHT	2.3–3.9 oz.
LENGTH	9.75–13"
WINGSPAN	15"
SEXUAL MATURITY	About 1 year
BREEDING SEASON	March–July
NUMBER OF EGGS	3–5
INCUBATION PERIOD	17–18 days
FLEDGING PERIOD	19–21 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Arthropods, vertebrates, seeds and fruits
LIFESPAN	Up to 10 years

CREATURE COMPARISONS

The tufted jay (*Cyanocorax dickeyi*) is similar in size to the green jay. It emits harsh, high-pitched calls, similar to its close relative. While the tufted jay shares the green jay's black markings, the rest of its plumage is markedly different, with a blue mantle and wings and broad white tips on its tail. The tufted jay thrives in mountainous forests, usually from 4,400–7,000' but, unlike the green jay, it has a very restricted range, from the Sierra Madre in California to the borders of the states of Sinaloa, Durango and Nayarit in Mexico.



RELATED SPECIES

● There are 12 species in the genus *Cyanocorax* including the purplish jay, *C. cyanomelas*, the cayenne jay, *C. cayanus* and the azure jay, *C. caeruleus*. These three species are found in South America. With 103 species, members of the family *Corvidae* are found the world over, except in Antarctica, New Zealand and some oceanic islands. This family includes crows, ravens, jays and magpies.

Guianan Cock-of-the-rock

• ORDER •
Passeriformes

• FAMILY •
Cotingidae

• GENUS & SPECIES •
Rupicola rupicola

KEY FEATURES

- With dazzling plumage and a unique fanlike crest, the male is a magnificent bird
- To attract a mate, males use bright color, rapid movement and weird sounds
- The female's drab brown plumage camouflages her as she sits on the nest to incubate the eggs

WHERE IN THE WORLD?

Inhabits lowland forests in northeast South America, from French Guiana west to eastern Colombia and south to northern Brazil; occurs at up to 6,600' in Venezuela

LIFECYCLE

As superbly colored as the female is dull, the male Guianan cock-of-the-rock leads a solitary, "bachelor" lifestyle away from the display grounds where these two birds meet.

HABITAT

The Guianan cock-of-the-rock inhabits undergrowth and midlevels of dense rainforest that cover much of the lowlands of northeastern South America. It favors areas where rivers wind through the forest and rocky outcrops thrust up through the canopy. Here the bird finds the fruit on which it feeds and the rocks on which it builds its nest.

In the breeding season, the gaudy male cock-of-the-rock seeks forest clearings, where its spectacular displays can be easily witnessed by the modestly plumaged females. Females also make frequent trips to the banks of forest streams, which provide them with the soft mud they use to construct their nests.

▼ **IN THE THICK OF IT**
Mature forest is home to the cock-of-the-rock.

FOOD & FEEDING

Foraging alone, the cock-of-the-rock flies unobtrusively through the forest, deftly plucking fruit off branches as it goes. Fruit dominates its diet and one scientific study showed that the cock-of-the-rock feeds on the fruits of as many as 26 different plant species. Most are rich in fats and proteins and are an excellent source of nutrition. Some studies suggest that occasionally the cock-of-the-rock supplements its diet of fruit with insects and small frogs snatched from the foliage.

BREEDING

▲ **SINGLE PARENT**
The female builds the nest and raises the chicks alone.

In the weeks prior to breeding, a female builds or renovates her nest. This is a saucer-shaped construction of mud, sticks and other vegetation that she attaches to a sheer rock face, sheltered from the weather and safe from predators. Due to the shortage of suitable nest sites, many birds may nest together.

After mating, the female lays two eggs (about two days apart) and incubates them alone for about four weeks. During this period, she spends up to three-quarters of each day on the nest, only leaving the eggs (for up to ten minutes at a time) to feed. The chicks are fed on regurgitated fruit, but little else is known about their development.

DID YOU KNOW?

- **According to the angle at which light hits his plumage, the male cock-of-the-rock appears gold, red or bronze.**
- **The male's specially modified primary wing feathers produce a whistling sound on take off and landing.**

FRUITFUL The bird uses its sturdy bill to feed on a wide variety of nutritious fruit.

CONSERVATION

The cock-of-the-rock is under no serious threat and is locally common in parts of Suriname. But as with all rainforest birds, it's vulnerable to forest clearance. It's also sought by cagebird collectors, despite the fact that most captured birds die soon after they're caught.

BEHAVIOR

In March and April, males gather in forest clearings at communal display grounds, known as *leks*. Each male has his own "arena," a circular patch of bare ground a couple of feet in diameter, above which are display perches. His performance in this arena will determine whether or not he wins a mate.

Flaunting their iridescent plumage and uttering crowlike *caws*, catlike *meows* and strange cracking sounds, males perform to the females drawn to the spectacle. Usually 5–10 males share the lek, but where population densities are high, as many as 40 may participate in the vigorous dancing sessions.

SHOWDOWN

1 Dramatic entrance...
A mature male cock-of-the-rock arrives at the display ground, or *lek*, landing with a flourish and a loud squawk.

2 Sizing each other up...
The new arrival is challenged by another male; the pair engage in a brief threat display, exposing their striking white wingbars.

3 Let the show begin...
Assembled males then start to dance, assuming grotesque postures to show off their plumage to females in the trees.

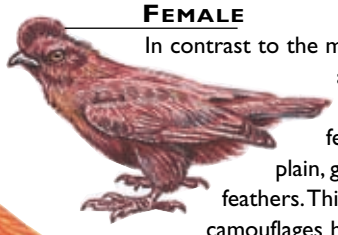
4 Take your partners
After the display reaches its climax, the males crouch motionless for several minutes. Each female then approaches her chosen mate.

PROFILE Guianan Cock-of-the-rock

The fiery colored and ostentatiously crested male cock-of-the-rock appears quite unrelated to the duller females his plumage is intended to impress.

Crest
The permanently erect, fan-shaped crest of the male starts just above the bill, falling over the upper mandible before sweeping over his head in a perfect semicircle. The female's crest is smaller and less obvious.

Female
In contrast to the male's orange-and-black plumage, the female has plain, gray-brown feathers. This coloring camouflages her against the dark rock faces on which she nests and so reduces the risk of attack by predators.



Feet
The bird's feet are sturdily built, perhaps for its energetic displays. With three toes pointing forward and one facing backward, its feet are suited to perching, hopping and walking.

Breeding plumage
When the male is in breeding condition, the upper tail coverts develop into a spray of fine orange plumes that conceal most of the bird's black tail.

Vital Statistics

Weight	5 oz.
Length	11"
Wingspan	Unknown
Sexual Maturity	Probably 2–3 years
Breeding Season	March–July
Number of Eggs	2
Incubation Period	27–28 days
Fledging Period	Unknown
Typical Diet	Forest fruits; also some insects and frogs
Lifespan	Unknown

Related Species

● **Cocks-of-the-rock in the genus *Rupicola* are two of 65 species in the family *Cotingidae*. Most cotingas, such as the barred fruiteater** (below), **have distinctive plumage. Many have crests or bare skin patches on the head.**

Creature Comparisons

The Andean cock-of-the-rock (*Rupicola peruviana*) is found at higher altitudes than the Guianan species, along forested streams in the Andes (from Venezuela to Peru). Its gray-and-black wings and tail contrast with its deep-red (almost scarlet) body plumage. The Guianan species has an erect, vertical crest; the Andean species' crest falls to one side of its bill and forehead. Both are shy and live in dense vegetation: their loud calls are usually the only sign of their presence. Unlike its relative, the Andean species performs its courtship display on a tree branch.

Andean cock-of-the-rock

Guianan cock-of-the-rock

Gyrfalcon

• ORDER •
Falconiformes

• FAMILY •
Falconidae

• GENUS & SPECIES •
Falco rusticolus

KEY FEATURES

- The largest and most powerful falcon
- Its plumage ranges from almost pure white, through shades of brown and gray, to nearly black
- Breeds farther north than any other bird of prey, nesting on coasts and tundra in the High Arctic and sub-Arctic
- A superb hunter, it snatches prey in midair or from the ground

WHERE IN THE WORLD?

Found in a broad band across northern Eurasia and North America, including coastal areas of Greenland and Iceland; moves south in winter, sometimes reaching northwestern and central Europe

LIFECYCLE

Power and grace combine effectively in the gyrfalcon, one of the top predators in the snowy wastes of the far north. The falcon's stealth ensures that it usually goes unseen.

HABITAT

Seemingly immune to cold conditions, the gyrfalcon lives in the belt of treeless tundra that lies between the Arctic Ocean and the vast coniferous forests to the south. It also haunts rocky coasts and small inshore islands, where seabird colonies provide plenty of food supply. Farther south, it frequents moors and mountains.

▼ **OUT IN THE OPEN**
The gyrfalcon is at home in rocky landscapes.

BEHAVIOR

In flight, the gyrfalcon generates great power and speed with its shallow wingbeats, which are slower and more measured than those of smaller falcons. A large female can take off with a kill weighing almost 4.5 lbs.

▲ ▶ **SUPERSENSE**
Excellent twilight vision enables the gyrfalcon to hunt in the winter gloom.

The gyrfalcon is naturally scarce and normally occurs singly or in pairs. Groups of young birds, sometimes seen in autumn, are likely to be brothers and sisters, which tend to remain together for several months after becoming independent of their parents.

DID YOU KNOW?

- **A nesting gyrfalcon attacks anything that dares approach its eggs or chicks, including golden eagles, red foxes and even wolverines.**
- **The white, dark and intermediate morphs (color varieties) of the gyrfalcon often interbreed, producing mixed-color broods.**
- **The Romans first trained gyrfalcons for hunting.**

BREEDING

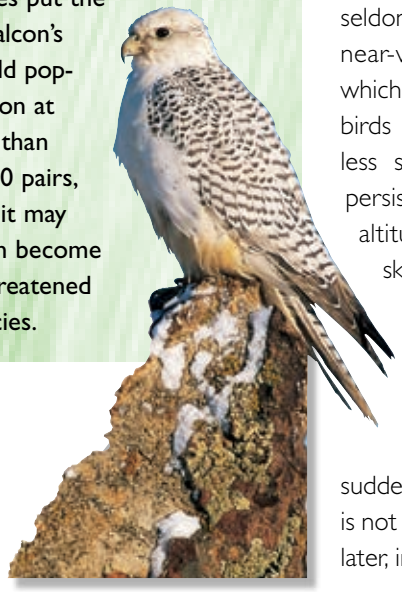
The spectacular aerobatic skills of the gyrfalcon can be seen at the onset of the breeding season, when the male displays to attract a mate to his territory. His performance includes sideways rolls and vertical loops as he rises and falls in the sky. He flies back and forth close to the nest site, wailing loudly while carrying prey in his clenched feet. When a female arrives, the two birds fly in formation. The female rolls over and presents her talons as he dives past.

The gyrfalcon does not build its own nest. Instead, it uses a depression on a rocky ledge or takes over a raven's abandoned stick nest. An average clutch consists of 3–4 eggs, but the female may lay up to seven eggs if prey is abundant, or none at all in famine years. The female takes care of most of the incubation, while her mate brings food, which he continues to do after the downy chicks hatch. The female starts hunting for the family when the nestlings are 2–3-weeks old, and they are independent within two months.

▼ **ROOM WITH A VIEW**
A nest is often just a sheltered cliff ledge.

CONSERVATION

The gyrfalcon has escaped pesticide poisoning in its remote homelands — a fate suffered by many falcons living farther south. But growing numbers of its eggs and young are stolen to provide birds for falconry. Some estimates put the gyrfalcon's world population at less than 5,000 pairs, and it may soon become a threatened species.



FOOD & HUNTING

The gyrfalcon's diet consists mostly of ptarmigan. On coasts, it takes gulls, auks, ducks and geese; mammal prey includes ground squirrels, lemmings, voles and hares.

The gyrfalcon attacks most of its prey on or close to the ground, so it seldom performs the high, near-vertical dives with which the peregrine knocks birds out of midair. Making less spectacular, but more persistent dives from lower altitudes, the gyrfalcon skims the ground to flush out and kill hidden quarry. If the prey evades the initial assault, the gyrfalcon gives chase until it can finish the hunt with a sudden rise and a swift and deadly dive. Some prey is not eaten at once but stored on a cliff ledge for later, in case bad weather prevents hunting.

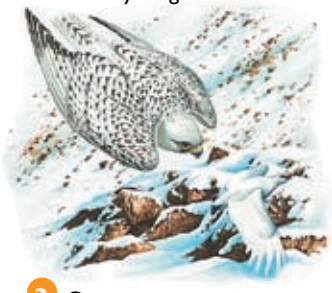
SNOW BUSINESS

1 Scans…

A female white-morph gyrfalcon surveys her snowbound territory from a lofty crag.

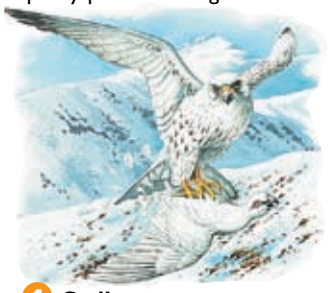
2 Startles…

She spots a ptarmigan and makes a silent, low-level approach. The quarry panics into flight.



3 Stoops…

As the ptarmigan zigzags to try and shake off its attacker, the gyrfalcon gains height to launch a dive.



4 Strikes

Feathers fly as the gyrfalcon's strong talons strike their target with tremendous force.

PROFILE GYRFALCON

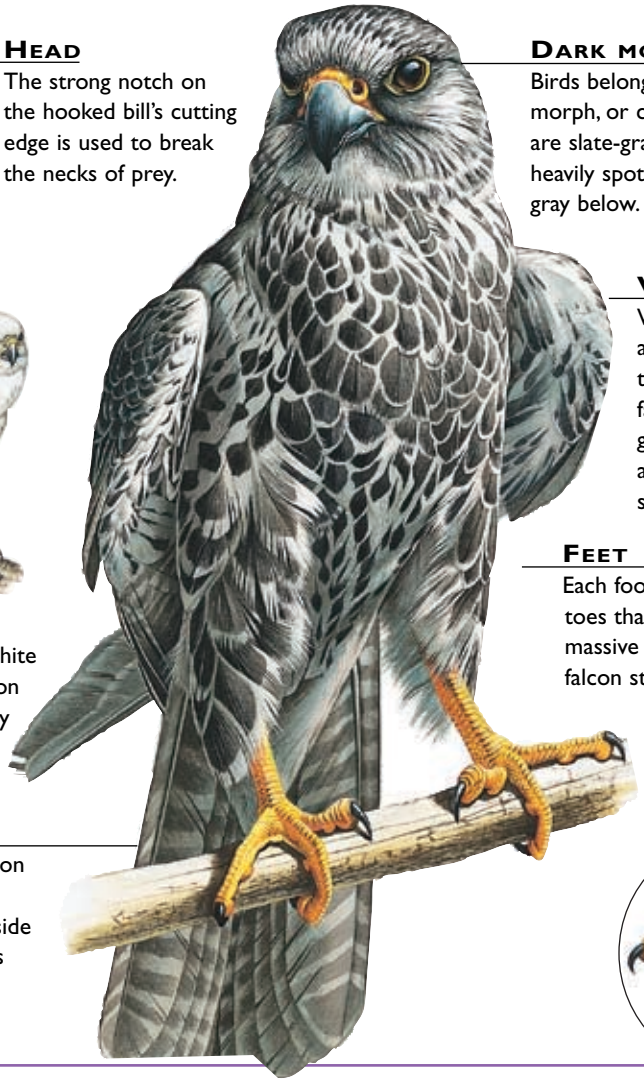
The gyrfalcon is nearly twice as heavy as the peregrine falcon, which enables it to kill bigger prey and helps it survive the bitter Arctic cold.

HEAD
The strong notch on the hooked bill's cutting edge is used to break the necks of prey.

DARK MORPH
Birds belonging to the dark morph, or color variety (*left*), are slate-gray above and heavily spotted with dark gray below.

WINGS
Wings are broader and less pointed than those of smaller falcons, giving the gyrfalcon greater acceleration and speed in the air.

WHITE MORPH
Birds belonging to the white morph have dark flecks on their white plumage. They are most common in northern regions.

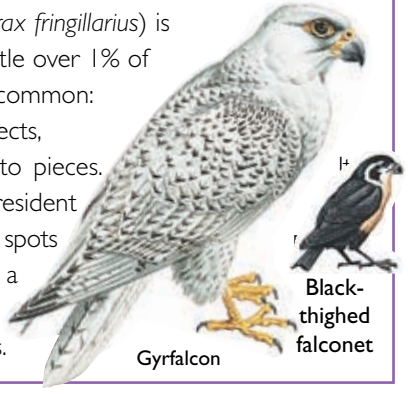


FEET
Each foot has four large toes that can withstand massive impact as the falcon strikes its prey. The sharp talons sink into the flesh of victims to hold them fast.

TAIL
In rapid flight, the gyrfalcon keeps its long tail closed and tilts it from side to side as a rudder. The bird fans its tail feathers when soaring or landing.

CREATURE COMPARISONS

No bigger than a sparrow, the black-thighed falconet (*Microhierax fringillarius*) is the world's smallest bird of prey, weighing a mere 1 oz. — a little over 1% of a female gyrfalcon's weight. But the two species have much in common: the falconet has sharply clawed feet for catching its prey of insects, lizards and small birds, and a hooked bill for tearing food into pieces. eyesight is keen, and its wings proportionately long. A resident tropical forests in Thailand, Malaysia and Indonesia, the falconet spots perching on a branch, often at the edge of a clearing or beside a river. It sometimes hunts in groups of up to ten birds, with the members working together to outmaneuver the largest victims.



VITAL STATISTICS

WEIGHT	Male 2–3 lbs.; female 2.5–4 lbs.
LENGTH	19–24"
WINGSPAN	4–4.5'
SEXUAL MATURITY	2–3 years
BREEDING SEASON	April–July
NUMBER OF EGGS	Up to 7; usually 3 or 4
INCUBATION PERIOD	34–36 days
FLEDGING PERIOD	46–53 days
TYPICAL DIET	Small to medium-sized birds, especially grouse and seabirds; some lemmings and other mammals
LIFESPAN	Up to 13 years

RELATED SPECIES

- **The gyrfalcon is 1 of 37 species in the genus *Falco*, or falcons. Its closest relatives are the peregrine falcon, *F. peregrinus*, which occurs on every continent, and the saker, *F. cherrug*, which breeds in the open steppes of central Asia. The falcons are members of the family *Falconidae*, along with 9 species of falconet and pygmy-falcon, 5 species of forest falcon, 9 species of caracara and the laughing falcon.**

Hamerkop

• ORDER •
Ciconiiformes

• FAMILY •
Scopidae

• GENUS & SPECIES •
Scopus umbretta

KEY FEATURES

- A strange wading bird that builds a huge nest, with a roof strong enough to support the weight of a-man
- Normally silent and solitary, it indulges in a-bizarre and noisy "back-standing" ritual when in the company of-neighbors
- An important feature of many tales in African folklore, often appearing as a bird of ill omen

WHERE IN THE WORLD?

Throughout Africa, south of the Sahara Desert; also breeds on Madagascar, and in an area of southwest Arabia bordering the southern shores of the Red Sea

LIFECYCLE

In tribal legend, the hamerkop uses magical powers to conjure various creatures from its gigantic nest. In reality, other animals are indeed found there — but not by invitation.

HABITAT

The hamerkop occurs near shallow water, from the edges of large lakes to-the banks of small streams. It also lives in grasslands and semiarid plains, and in coastal regions it is found on mudflats in estuaries, mangrove swamps and rockpools. The hamerkop can also survive in reservoirs, farm ponds and rice paddies.

▼ **PADDLING PARADISE**
The hamerkop favors wooded areas near rivers.

BEHAVIOR

Although not normally gregarious, the hamerkop sometimes forms small groups to indulge in a unique and unexplained aspect of its behavior. Known as false-mounting, it involves birds of either sex repeatedly jumping on each others' backs. This bizarre ritual seems to have nothing to do with mating, but may be a means of social interaction. The performance is accompanied by a loud cackle. False-mounting is preceded by head-bobbing and wing-beating ceremonies, similar to those used in courtship.

Flocks of nonbreeding birds may congregate at roost sites in trees or reedbeds. The hamerkop has a peak of activity at dawn and shortly before going to roost at sunset. It spends much of the day resting in shade.

The hamerkop does not migrate, and mated pairs remain within their breeding territories throughout the year.

▶ **FISHING BY SIGHT**
A hamerkop pair scans for fish and frogs.

DID YOU KNOW?

- **Pigeons and geese use abandoned hamerkop nests as breeding sites. Smaller birds, and even bees, breed in-crevices in the nests even while the hamerkops are in-residence.**
- **The hamerkop often decorates the roof of its nest-with bones, dead animals-and snake skins.**
- **A hamerkop pair may build as many as five nests in-a year. It may occupy some-nests for a few months, while others remain unused for the whole year.**

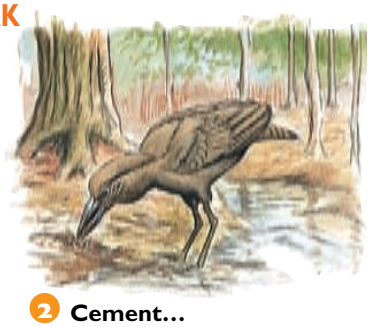
BREEDING

The hamerkop's nest is a massive monument to its building skills, yet often seems a waste of energy: owls frequently commandeer the fortresslike nest before the rightful owners can use it. This may explain why hamerkops are almost always constructing new nests.

The nest is usually sited in the fork of a tree (*far right*), and can be over 6' tall-and almost as wide, with 12"-thick walls and a 3'-deep roof. Entry is by way of a hole in the base, through which the hamerkop rockets after closing its wings at the last second. The female lays 3–6 white eggs, but lizards,mongooses and snakes prey heavily on eggs and nestlings. Such losses leave the hamerkop with a low reproduction rate. A pair rarely raises more than one chick a year, and many a brood has been known to fail completely.

FORTRESS IN A TREE FORK

1 Foundations...
A pair begins its nest by making a flat platform of long sticks. The birds then add more branches to build up solid wooden walls.



2 Cement...
A hamerkop collects mud, mixes it with grass and leaves, and smears the paste onto the nest; the mixture acts as cement.

3 Roof...
After finishing the walls, the pair builds a huge roof. The birds usually gather nest-building material within 300' of the site.

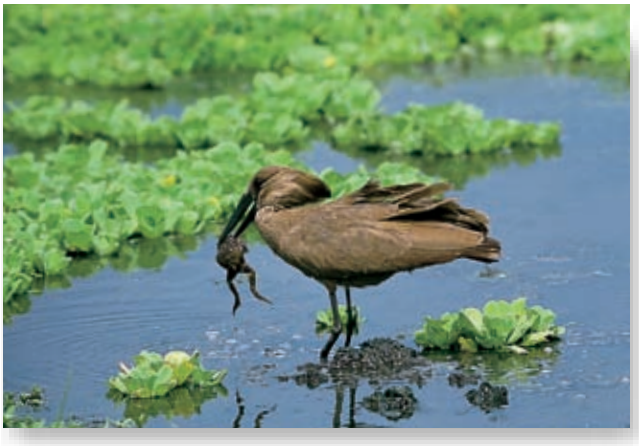
4 Housing
The structure houses a mud-lined nesting chamber roughly 24"x16". The eggs are soon stained brown with mud.

CONSERVATION

A traditional belief in many parts of Africa —that disaster will befall anyone who harms a hamerkop — has kept the species free from persecution. Secure in the feeling that it will not be harmed, it-often lives close to humans. Here it-finds better feeding and breeding conditions than in many areas of its more natural habitat.

FOOD & FEEDING

The hamerkop feeds on tadpoles, frogs and fish, and supplements its diet with small crustaceans. It catches some food by probing in mud with its large bill, but locates many items by sight. When the water is too deep for wading, the bird may ride on a hippopotamus or launch an airborne attack. It flies low and slowly, picking out tadpoles and tiny fish from just below the surface. The hamerkop also stirs up mud with its feet, pecks and pulls at floating plants or rapidly opens and closes its wings in the hope that the sudden movement will frighten prey out of hiding.



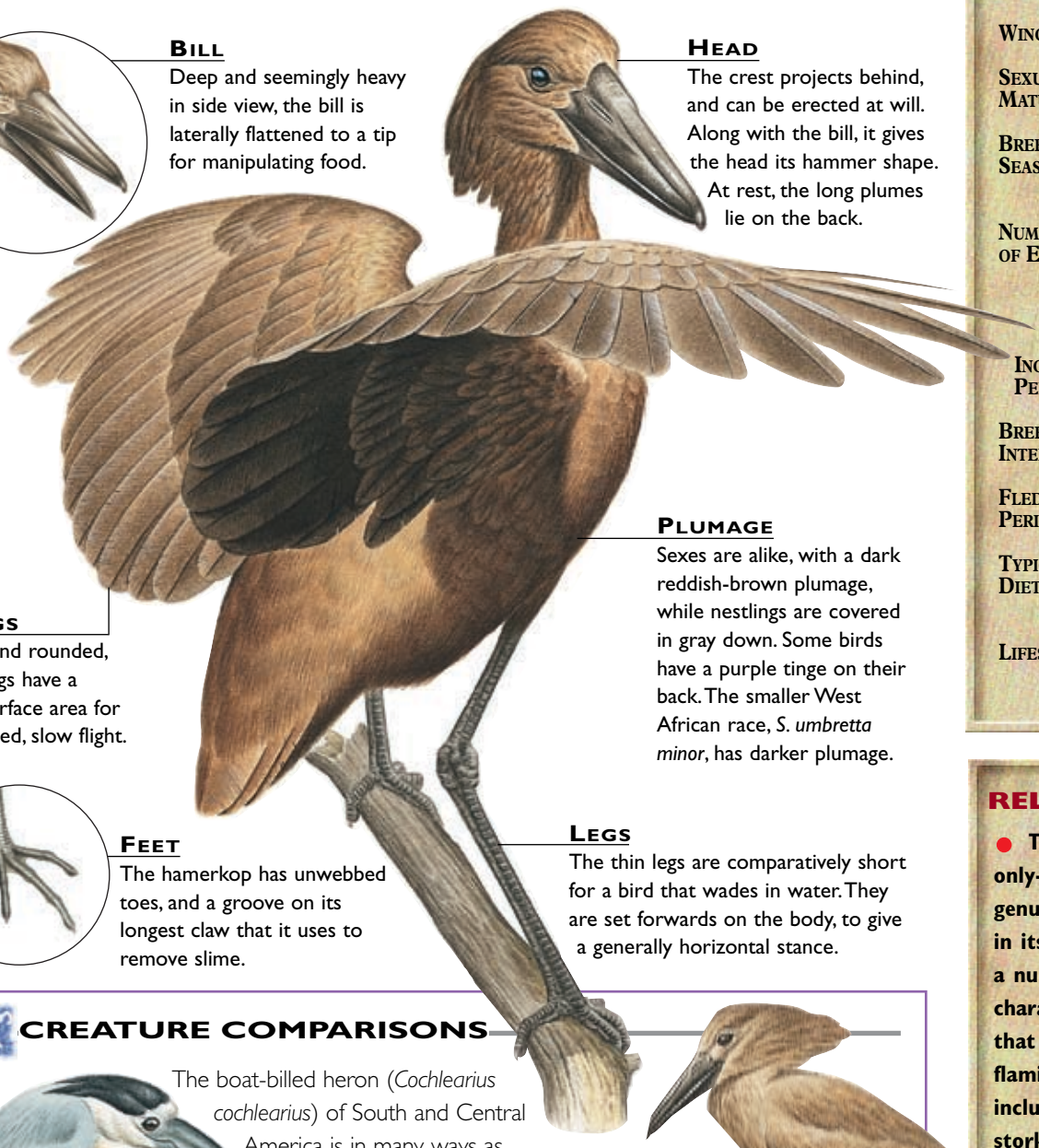
▲ **DOUSED BULLFROG**
The hamerkop rinses muddy prey before eating.

PROFILE HAMERKOP

With its big bill and matching crest, the hamerkop often looks large in photos, but it is much smaller than many more-familiar herons.

BILL
Deep and seemingly heavy in side view, the bill is laterally flattened to a tip for manipulating food.

HEAD
The crest projects behind, and can be erected at will. Along with the bill, it gives the head its hammer shape. At rest, the long plumes lie on the back.



WINGS
Broad and rounded, the wings have a large surface area for controlled, slow flight.

PLUMAGE
Sexes are alike, with a dark reddish-brown plumage, while nestlings are covered in gray down. Some birds have a purple tinge on their back. The smaller West African race, *S. umbretta minor*, has darker plumage.

FEET
The hamerkop has unwebbed toes, and a groove on its longest claw that it uses to remove slime.

LEGS
The thin legs are comparatively short for a bird that wades in water. They are set forwards on the body, to give a generally horizontal stance.

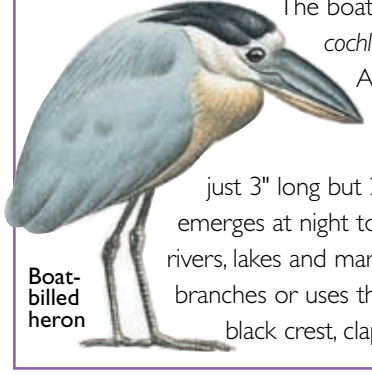
VITAL STATISTICS

WEIGHT	14.5–16 oz.
LENGTH	20–22"
WINGSPAN	30–32"
SEXUAL MATURITY	Unknown
BREEDING SEASON	Year-round, with seasonal peaks
NUMBER OF EGGS	3–6, rarely 7
INCUBATION PERIOD	28–32 days
BREEDING INTERVAL	1 year
FLEDGING PERIOD	44–50 days
TYPICAL DIET	Frogs, fish, crustaceans and insects
LIFESPAN	Unknown

RELATED SPECIES

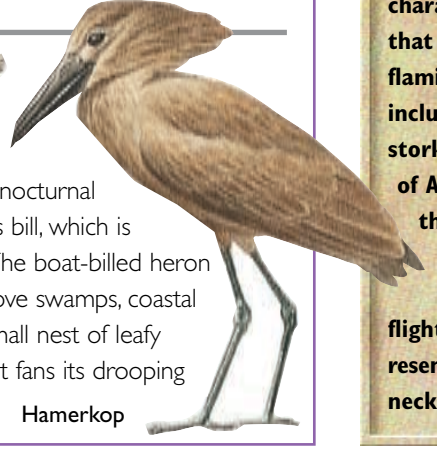
- **The hamerkop, the only-member of the genus *Scopus*, is placed in its own family. It has a number of unique characteristics and others that link it to herons, flamingos and storks, including the rare shoebill stork, *Balaeniceps rex*, of Africa. When soaring, the hamerkop extends its neck rather like a stork, but in normal flight it more closely resembles a heron, with its neck partly retracted.**

CREATURE COMPARISONS



Boat-billed heron

The boat-billed heron (*Cochlearius cochlearius*) of South and Central America is in many ways as unusual as the hamerkop. A large-eyed nocturnal bird, its most extraordinary feature is its bill, which is just 3" long but 2" wide and almost the same in depth. The boat-billed heron emerges at night to scoop up fish and shrimp from mangrove swamps, coastal rivers, lakes and marshes. Unlike the hamerkop, it builds a small nest of leafy branches or uses the nest of another species. In courtship, it fans its drooping black crest, claps its bill and croaks like a frog.



Hamerkop

Harlequin Duck

• ORDER •
Anseriformes

• FAMILY •
Anatidae

• GENUS & SPECIES •
Histrionicus histrionicus

KEY FEATURES

- Spends almost all its life in or near white water, swimming against strong currents with skill
- Nests on fast-flowing rivers at the water's edge: the chicks leap in and swim as soon as they hatch
- Moves to rocky coasts in winter, riding the surf and diving down to pry shellfish from the seabed

WHERE IN THE WORLD?

Five major populations exist: in Alaska and northwest Canada, Labrador region of eastern Canada, southern Greenland, Iceland and northeastern Siberia

LIFECYCLE

Enduring a rough-and-tumble life amid the wild, bitterly cold rivers and seas of the far north, the tough harlequin duck relies on its masterful swimming and diving skills.

HABITAT

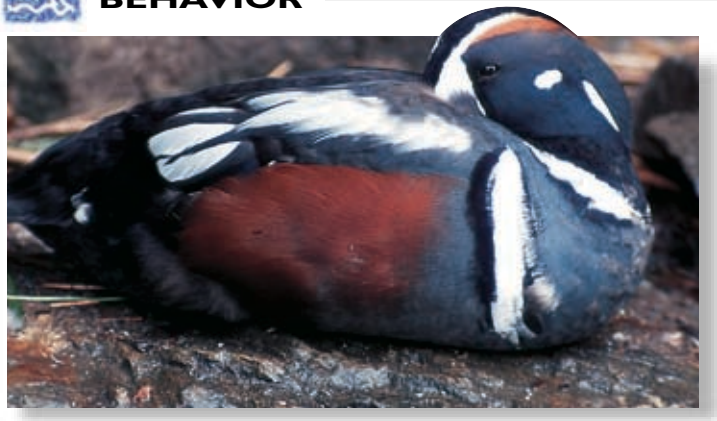
▲ **WHITE-WATER RAFTING**
A group of males clings to boulders in midstream.

The harlequin duck inhabits the turbulent, almost-freezing waters high in the northern hemisphere. It spends most of spring and summer on swift-flowing streams and rivers in upland areas, sometimes at high altitudes in Iceland and the Rocky Mountains of North America. It seeks watercourses rich in animal life, such as spring-fed rivers and outlets into lakes; hollows under rocks provide plentiful nest sites.

In fall, the harlequin duck flies downstream to the sea, remaining close to the shore. Shunning sheltered bays, it prefers exposed headlands and rocky beaches under steep cliffs. In April, it migrates upstream to breed.

▼ **WET FEET**
The harlequin duck rarely moves far from water.

BEHAVIOR



▲ **TAKING A BREAK**
An energetic lifestyle demands frequent rests.

When it moves upstream in spring, the duck travels by both flying and swimming. It rides high in the water, making a bobbing movement of the head with each stroke of its legs. In the rushing torrents that it inhabits in spring, the rocks are always wet, but the duck can climb the slippery surfaces with ease. It can also walk underwater along the riverbed by facing into the current, closing its wings and thrusting with its legs. Outside the breeding season, the harlequin lives in flocks of up to 50 birds in the Atlantic and in larger gatherings in the Pacific. The birds form "rafts" on the water and fly low over the waves in dense flocks.

FOOD & FEEDING

Along the streams and rivers where it breeds, the duck dives repeatedly to a depth of 3–7', searching underwater rocks and gravel for food. It hunts larvae of caddis flies, blackflies and mayflies, also taking freshwater shrimps and beetle larvae. The harlequin feeds in tight-packed flocks in winter, diving through surf in groups to tear periwinkles, mussels and other shellfish from rocks on the seabed. Sometimes, it also preys on small crabs and fish.

▲ **PLUNGE POOL**
The harlequin duck feeds by diving and "head-dipping."

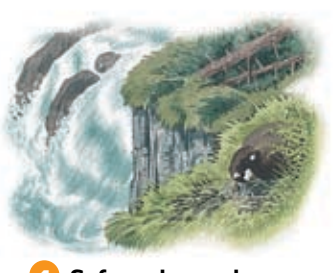
The duck feeds rapidly. Most dives last 15–18 seconds, but it can stay submerged for twice as long. It dives from the surface or rocks. In shallows, it dips its head under while wading or swimming.

WATER OF LIFE

1 Round the bend…
The harlequin duck flies fast and low, following every twist and turn in a river's course to avoid crossing land.

2 Against the flow…
To travel upstream, the duck makes use of eddies, backwaters and slack water near the bank.

3 Uphill struggle…
White water is no obstacle. The duck negotiates rapids by fluttering and pattering over the water surface.



4 Safe and sound
When it's time to nest, a female chooses a site safe from flooding hidden in bankside vegetation.

DID YOU KNOW?

- **The harlequin duck is named after the male's bold pattern of stripes and spots, reminiscent of the costumes worn by the human "harlequin": a clownlike figure in traditional comedies.**
- **Although it's sociable with others of its kind, the harlequin rarely mixes with ducks of other species.**
- **Harsh winters or severe storms may drive harlequin ducks south, as far as Hawaii, Florida and Britain.**

CONSERVATION

Human activity has had little impact on this duck, as it rarely encounters humans in its mountainous breeding areas or the isolated coasts where it winters. With a world population of over one million birds, the harlequin isn't in any danger. Its eggs were once collected in Iceland for export to wildfowl collections, but it's now protected. However, pollution, such as oil spills, in its wintering areas may yet become a threat.

BREEDING

Harlequins form pairs in December, when the birds are still living in winter flocks. Several males display to one female, uttering high-pitched whistles and squeals. Toward the end of April, the paired ducks move inland, but courtship displays continue through the first part of the breeding season, and the male must defend his mate from other males. Once she has laid her clutch of 5–7 eggs, he deserts her and takes no further part in the rearing of the young.

The female lays her eggs in the last week of May or the first week of June in a simple nest — a well-concealed depression lined with leaves and twigs. After an incubation period of four weeks, the downy chicks hatch. They're well developed, capable of walking, swimming and feeding within a very short time, but their mother broods them at night while they're small. Young fledge after 35–42 days, then the female leads them to the sea and independence.

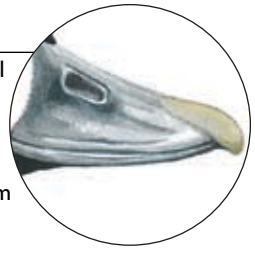
▼ **SHORT-LIVED ROMANCE**
Pairs form in late winter and spring but separate when the female begins to incubate her eggs.

PROFILE HARLEQUIN DUCK

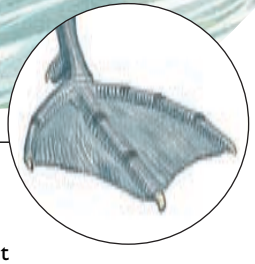
A master swimmer on rushing torrents and crashing ocean waves, the harlequin duck drives its buoyant, compact body with strong, webbed feet.

WINGS
The harlequin flies fast with rapid wingbeats, skimming low over the water surface.

BILL
The heavy-duty bill is used to lever periwinkles, mussels and other shellfish from underwater rocks.



FEMALE
Three pale patches on the face are the only distinctive features of the female's drab, mainly brown plumage.



FEET
Webbed feet set at the rear of the body generate the thrust to power the duck through turbulent white water.

VITAL STATISTICS

WEIGHT	1–1.5 lbs.
LENGTH	1–1.5'
WINGSPAN	2–2.3'
SEXUAL MATURITY	2 years
BREEDING SEASON	May–August
NUMBER OF EGGS	5–7
INCUBATION PERIOD	27–29 days
FLEDGING PERIOD	35–42 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Mussels, other shellfish; aquatic insects, crustaceans; small fish
LIFESPAN	Unknown

RELATED SPECIES

● Known as wildfowl or waterfowl, *Anseriformes* includes the 3 species of screamer and all ducks, geese and swans. Screamers (noisy, gooselike birds from South America) belong to the *Anhimidae* family. All other wildfowl are in the *Anatidae* family. The harlequin duck is the only member of the genus *Histrionicus*, but shares features with eiders, goldeneyes, scoters and the long-tailed duck.

CREATURE COMPARISONS

The male black, or common, scoter (*Melanitta nigra*) has a glossy black plumage, with only a yellow splash and knob on its bill. The female has a drab, gray-brown plumage to camouflage her when she's incubating eggs. She lacks the yellow patch on the male's bill and the "knob" at its base.

The black scoter is larger than the harlequin. It breeds on the tundra of northern Eurasia and North America, alongside the harlequin in Iceland and Alaska.

Harlequin duck (male)

Black scoter (male)

Hawfinch

• ORDER •
Passeriformes

• FAMILY •
Fringillidae

• GENUS & SPECIES •
Coccothraustes coccothraustes

KEY FEATURES

- Huge bill and powerful jaw muscles crack open hard seeds, especially fruit pits
- Shy and elusive, spending most of the time high in the treetops and avoiding open ground
- During courtship, the male performs elaborate displays using his wings

WHERE IN THE WORLD?

Found across much of temperate Europe and Asia and in northwestern Africa; absent from Ireland, Scotland and most of Scandinavia

LIFECYCLE

A master seed buster, the hawfinch is a quiet resident of woodlands and orchards. With its outsize bill, stocky body and colorful wings, it could be easily mistaken for a small parrot.

HABITAT

▲ **CLOSED ENVIRONMENT**
The hawfinch needs tree cover in its habitat.

Over its extensive range, the hawfinch is a characteristic bird of mature broad-leaved woodland, especially in open mixed oak and hornbeam forests. It also lives among other trees that provide large fruits to eat, particularly beech, ash, elm and maple or sycamore. Where it's common, the hawfinch breeds in old orchards, in large gardens or parks, sometimes in towns and cities.

In the north, the hawfinch favors broad-leaved trees along rivers in otherwise coniferous woodland. In the south, it inhabits Mediterranean olive groves and orchards, steppe woodlands and thorn thickets fringing the North African deserts. The bird is found up mountains to the upper limit of broad-leaved woodland.

DID YOU KNOW?

- **Local names for the hawfinch include berry breaker and cherry finch.**
- **Experiments have shown that the hawfinch exerts a force of over 110 lbs. to crack open an olive stone — a feat for a bird weighing only 2 oz.**
- **A feeding flock of hawfinches can sometimes be located by the sound of cracking fruit pits.**
- **The hawfinch is generally nonmigratory, although some northerly birds winter south of their breeding ranges.**

BREEDING

▲ **SHARING DUTIES**
The parents take turns feeding the chicks.

FOOD & FEEDING

The hawfinch feeds on tree seeds, such as those of hornbeam, beech and elm, and is also fond of fruit pits, such as cherries, holly, roses and hawthorns. In the Mediterranean, the hawfinch eats olive pits, acorns and the seeds of nettle trees. Like other finches, it grips small seeds in the grooves inside its beak while splitting and dehusking them, but uses the serrated edges at the back of the bill for clamping fruit pits and other large seeds.

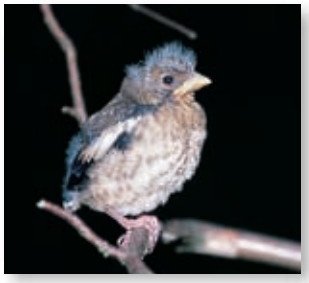
GET CRACKING!

1 Picking...
A hawfinch plucks a cherry from a twig and peels off the flesh with the lower mandible.

2 Gripping...
Holding the stone firmly, the bird uses incredible force to break the husk and get to the nutritious kernel.

The hawfinch pairs in winter or early spring. The male performs a waddling "penguin walk" to impress his intended mate, holding his body almost vertical and drooping his wings. He may also bow deeply, lowering his bill until it's almost between his legs and ruffling up the gray feathers at the back of his neck. In early stages of pair formation, a female may react aggressively. If the female relents, the pair performs a cautious bill-touching display.

The female builds the nest and takes sole responsibility for incubating her eggs (usually four or five) for two weeks. Both parents care for the hatchlings; the family may stay together until November.



◀ STARTING OUT
The chick leaves the nest after about 11 days.

CONSERVATION

The hawfinch isn't a threatened species. Its numbers have increased since the 1960s in parts of Europe, but have fallen in Britain because of the disappearance of old orchards.

BEHAVIOR

The hawfinch is a quiet bird, even in the breeding season. The male utters a simple, halting song from time to time in the trees. However, a flock of hawfinches makes hard, explosive *ptik* calls in flight.

The hawfinch lives in pairs or family parties during the breeding season and by the end of the summer, has begun to gather in flocks. By winter, large flocks of 300 or more birds may gather in the most popular feeding sites.

◀ CAUGHT ON THE HOP
The hawfinch is wary when ground-feeding.

◀ DOWN TO EARTH
In autumn, the ground is littered with fallen seeds.

▶ SHARP EDGE
The finely serrated bill helps the hawfinch grip seeds.

3 Foraging…
Later, in beechwood where it lives, the hawfinch searches in the leaf litter for insects and fallen seeds.

4 Snacking
Spotting some movement in the soil, the hawfinch hops forward and grasps a-beetle in its great bill.

PROFILE HAWFINCH

The hawfinch's superstrong bill, reinforced skull and thick neck enable it to feast on the seeds that are too tough for other birds to break into.

NECK
Neck is short and packed with muscle to withstand the stress of cracking hard seeds.

FLIGHT FEATHERS
Middle flight feathers of the wing are curiously notched and curled at their tips, unlike any other finch's. They're important in courtship displays and may produce the whistling sound that is heard when the hawfinch

BILL
The mandibles are powered by bulging jaw muscles attached to a thick skull. Each mandible also has a pair of serrated pads to grip hard seeds and fruit pits. Both sexes change their bill color in winter, from steely blue-to brown.

TAIL
The short tail combines with the large head, chunky neck and stocky body to give the hawfinch a top-heavy appearance.

VITAL STATISTICS

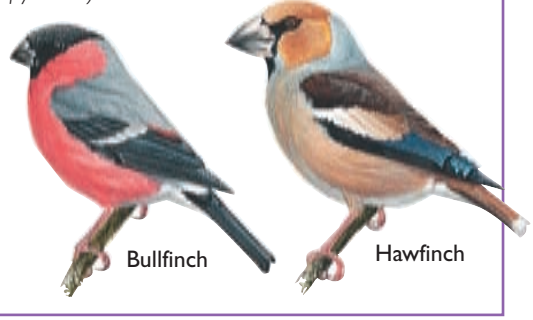
WEIGHT	1.5–2 oz.
LENGTH	7"
WINGSPAN	12–13"
SEXUAL MATURITY	1 year
BREEDING SEASON	April–August
NUMBER OF EGGS	2–7; usually 4–5
INCUBATION PERIOD	11–13 days
FLEDGING PERIOD	12–13 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Large tree seeds and fruit pits; also tree buds and shoots; insects
LIFESPAN	Up to 11 years

RELATED SPECIES

● Of the 124 species of finch in the family *Fringillidae*, 3 are fringilline species (2 chaffinches and the brambling), while the rest are in the *Carduelinae* subfamily. The hawfinch is one of 9 similar species in the genus *Coccothraustes*, which also contains the beautiful evening grosbeak, *C.-vespertinus*, that visits feeders of the northern United States during the winter.

CREATURE COMPARISONS

Next to the great rosefinch (*Carpodacus rubicilla*), the hawfinch is the second-largest European finch. Another woodland finch is the bullfinch (*Pyrrhula pyrrhula*). Like the hawfinch, the bullfinch is thickset, but is smaller with a stubbier bill. This lets it strip buds rapidly from trees, but it can't crack pits and large seeds like the hawfinch. Adult bullfinches share a glossy black cap and bib, white rump and black tail, but the male and female differ markedly, unlike the hawfinch: the bullfinch male has gray upperparts and pinkish-red underparts; the female and young birds are duller.



Helmeted Guineafowl

• ORDER •
Galliformes

• FAMILY •
Numididae

• GENUS & SPECIES •
Numida meleagris

KEY FEATURES

- Most gregarious species in the *Galliformes* order; up to 2,000 helmeted guineafowl congregate at watering holes
- Male guineafowl chase each other in wild dashes for up to 10 minutes as part of dominance rituals
- Flocks of helmeted guineafowl march in single-file lines to both foraging and drinking areas

WHERE IN THE WORLD?

Found in Africa south of the Sahara; from Senegal, east to Somalia, south to South Africa, as well as Morocco in the northwest, Comoros Islands and Madagascar in the southeast

LIFECYCLE

Flocks of helmeted guineafowl resemble soldiers as their troops advance single file toward a watering hole or form a close-knit cluster to protect their young.

HABITAT

▲ **BEAUTIFUL BOTSWANA**
A roost, foraging patch and drinking hole are a home's essential features.

The helmeted guineafowl inhabits Africa's open country, from the gulf of Guinea (hence the name) to South Africa. The flock usually chooses a roosting tree as the central point of its home range. The guineafowl travels 0.5–15 miles from its roost each day, but always returns at night. It searches for new water sources and large patches of vegetation. The helmeted guineafowl is most common in moist, grassy savannahs with scattered acacia and baobob trees, but it roams from forest edge to arid plains to thorny scrubland. The 20–50" of rain each year in these areas supports vegetation for foraging, and the guineafowl can usually be found in the areas where the scattered rains are heaviest.

DID YOU KNOW?

- **The helmeted guineafowl's eggs are only 2" long, but have a shell thick enough to withstand grass fires.**
- **The only time the helmeted guineafowl leaves the flock is during the breeding season. It returns with its keets after 3 months.**

FOOD & FEEDING

The guineafowl forages twice each day, once at dawn and once in the afternoon. Departing from home base, the flock proceeds single file toward a watering hole for a communal drink. Dominant males act as the leaders of the line and lookouts. After a drink, the guineafowl sweep the savannah. Walking shoulder to shoulder, they patrol the tall grasses and peck at the ground, randomly picking up food. Seeds form the bulk of the guineafowl's diet, along with wheat and other grains that are available. In the dry season, the birds scratch the ground to expose highly nutritious tubers, bulbs and roots. Corn kernels are also a staple, but the birds are not considered pests because they feed only on fallen or discarded cobs. Spiders and insects, especially grasshoppers, are targets, too.

▼ **LAST BUT NOT LEAST**
All guineafowl benefit equally from the flock's single-file march to find food.

BREEDING

At the start of the breeding season, guineafowl males confront each other and then race to gain the right to mate. Up to eight males may join the competition, which can last up to 10 minutes. The females observe the race carefully and pair up with the winners. The female selects the nest site and forms a scrape in the earth about 3" deep, lined with grass and feathers. She incubates the 8–15 eggs alone, but is later rejoined by the male; he then helps feed the chicks. The downy chicks (keets) all hatch simultaneously and mature quickly; they can fly short distances in two weeks and reach adult size in a month, but usually stay with the flock for about three months.

◀ **WAITING FOR THE CALL**
Distinct mating calls distinguish the two sexes.

CONSERVATION

The helmeted guineafowl is the most common species of guineafowl. Since 400 BC, it has been raised for meat and kept as a pet. The subspecies *N. m. galeata* is found on farms worldwide. *N. m. sabyi,* of Morocco, is endangered due to habitat destruction and hunting.

BEHAVIOR

Standing at attention under a tree, the helmeted guineafowl blends into the shadows with near-perfect camouflage. The pale-white dots on the guineafowl's dark feathers create countershading that helps hide the bird while it is in the shade.

Out in the open, however, the camouflage is much less effective. If a fellow guineafowl sounds the alarm call, the guineafowl crouches for cover. It sinks low amid the grasses and puts its bright-blue head flush against the ground. When a jackal or snake approaches the flock, the adults often remain standing and assemble into tight formation around the young. Though its short, rounded wings make the bird poorly equipped for long flights, the guineafowl occasionally flies up into trees if chased by a predator. If confronted by a predator, the male also uses its wings in an aggressive stance; it arches its wings above its back in order to appear larger.

THE DAILY GRIND

1 Descending…
Helmeted guineafowl descend from their tree roost each day at dawn.

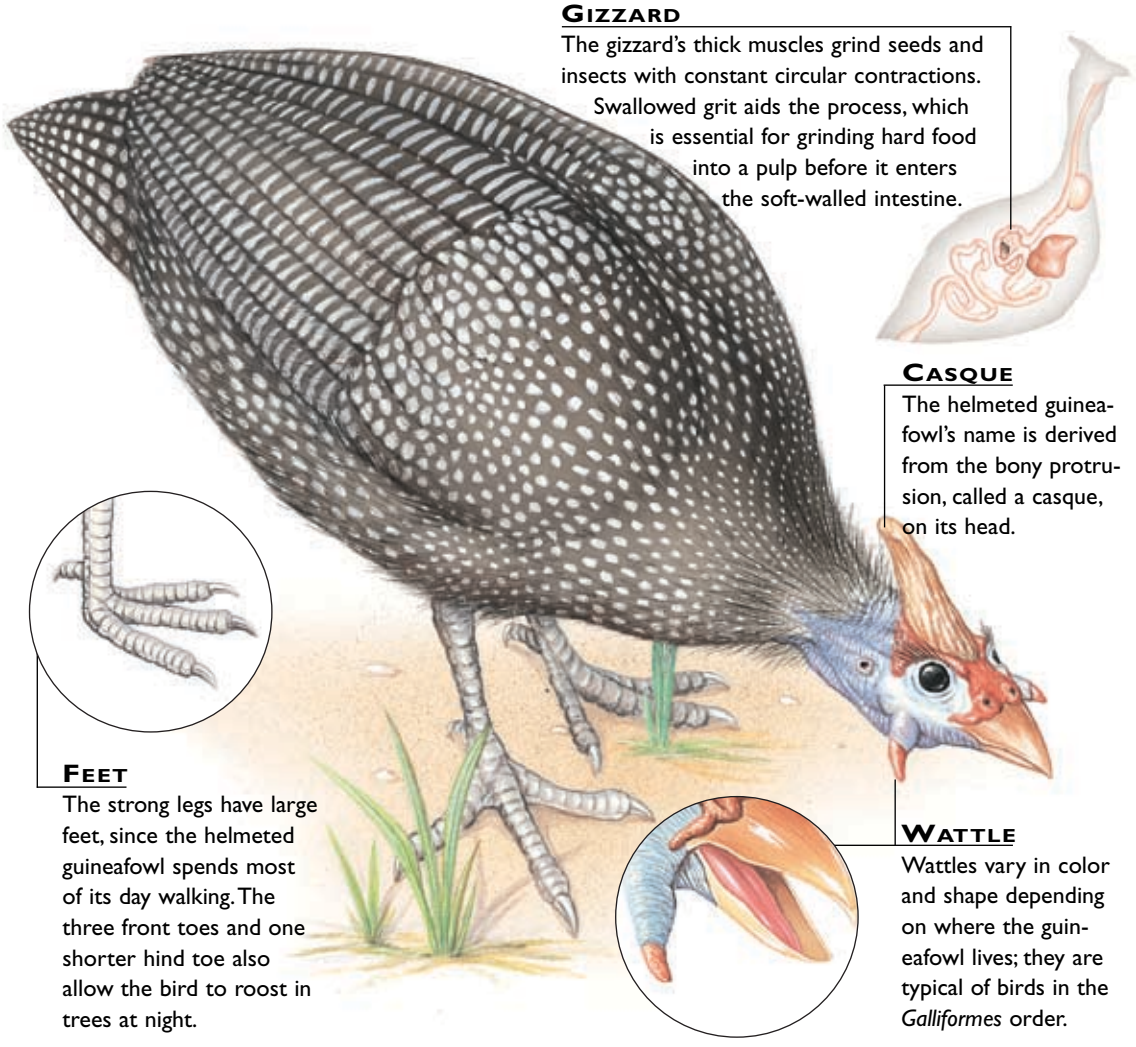
2 Digging…
The flock sticks together while scratching for underground tubers, bulbs and roots.

3 Dust bathing…
At midday, the birds cool off in the shade; one bird takes a dust bath to rid itself of parasites.

4 Drinking
In the late afternoon, before returning to the roost, the helmeted guineafowl grab a drink.

PROFILE HELMETED GUINEAFOWL

The helmeted guineafowl, with its distinct "military headgear," marches daily to forage for everything from seeds and insects to tender grasses.



GIZZARD

The gizzard's thick muscles grind seeds and insects with constant circular contractions. Swallowed grit aids the process, which is essential for grinding hard food into a pulp before it enters the soft-walled intestine.

CASQUE

The helmeted guineafowl's name is derived from the bony protrusion, called a casque, on its head.

FEET

The strong legs have large feet, since the helmeted guineafowl spends most of its day walking. The three front toes and one shorter hind toe also allow the bird to roost in trees at night.

WATTLE

Wattles vary in color and shape depending on where the guineafowl lives; they are typical of birds in the *Galliformes* order.

VITAL STATISTICS

WEIGHT	2.5–3.5 lbs.
HEIGHT	21–25"
SEXUAL MATURITY	About 7 months
BREEDING SEASON	Start of the rainy season
NUMBER OF EGGS	6–12
INCUBATION PERIOD	24–28 days
FLEDGING PERIOD	14 days
BREEDING INTERVAL	Up to 1 year
TYPICAL DIET	Omnivorous; mainly plant parts, including seeds and tubers, but also insects and spiders
LIFESPAN	20 years

RELATED SPECIES

- **The six species of guineafowl in seven genera all inhabit Africa, though domesticated species have been introduced worldwide. Guineafowl are large birds with a proportionately small head covered by either a bony casque or feathered crest. Almost the size of chickens, guineafowl join turkeys, curassows, grouse and megapodes in the order *Galliformes*.**

CREATURE COMPARISONS

Measuring up to 20", the crested guineafowl (*Guttera pucherani*) is slightly smaller than the helmeted guineafowl. Both birds have black plumage with small spots; the crested has blue spots, the helmeted, white. While both are found in similar regions of Africa, the crested guineafowl is easily distinguished by the curly feathers that cover the top of its head. The crested guineafowl is more elusive than its relative and seeks shelter at the edge of forests.

Helmeted guineafowl

Crested guineafowl

Herring Gull

• ORDER •
Charadriiformes

• FAMILY •
Laridae

• GENUS & SPECIES •
Larus argentatus

KEY FEATURES

- A versatile feeder that takes carrion and scraps as well as live prey, which it hunts with great skill and expertise
- A bold bird prepared to take advantage of the many feeding and nesting opportunities provided by humans
- Gregarious and lives in flocks, yet it fiercely defends a small breeding territory from unwanted intruders

WHERE IN THE WORLD?

Breeds in North America, coastal Europe and northern Asia; some stay in the north for winter; others migrate to Iberia, the West Indies, Central America and coasts of the South China Sea

LIFECYCLE

A fierce predator and effective scavenger, the herring gull is one of the most successful and abundant gulls in the world as a result of its flexible and opportunistic feeding habits.

HABITAT

▲ **POSTED ASHORE**
Most herring gulls live on or near the coast.

The herring gull is seldom seen a long way from the coast. It breeds mainly on rocky islands and cliffs, but on flatter coasts, may nest on sand dunes. Herring gulls even nest on tundra and high moorland. This sociable gull doesn't shy away from humans and nests freely on buildings in coastal towns and seaports.

In autumn, herring gulls that live in the far north of their range migrate south in search of food. Elsewhere, many birds stay at their breeding areas or move inland to fields, lakes or parks.

BREEDING

CHICK FEED

1 On patrol...
Catching coastal updrafts to soar effortlessly for long periods, a gull scans the ground below, looking for food for its chicks.

2 Waiting patiently...
A chick waits patiently for the adult bird to return home with a meal. At this early stage, it relies entirely on both parents for food.

DID YOU KNOW?

- **The herring gull attacks puffins in the air, throwing them to the ground to kill them and eat them.**
- **Although good swimmers, herring gulls rarely dive and submerge completely.**
- **The herring gull is often referred to as the "seagull."**
- **Other gull species, including glaucous gulls, interbreed with herring gulls.**

BEHAVIOR

Outside the breeding season, the herring gull spends much of its time in loose flocks, which often contain several hundred birds and occasionally several thousand. These flocks may be made up of herring gulls alone, but may have a variety of gull species. A flock gathers to roost up to three hours before sunset. When roosting, the birds usually keep a distance of at least 1' from each other to avoid fights and squabbles breaking out over individuals' space.

Herring gulls can be extremely aggressive toward one another, especially in the breeding season when unattended eggs or chicks are snatched by gulls in the breeding colony. Usual aggressive behavior involves snapping at an intruder's wings or an upright warning posture directed to a potential nest robber. A herring gull advances on an intruder with wings held away from the body and bill held down as though about to lunge. The intruder usually backs down and the nest owner looks away, pecking and pulling at the grass where the other bird stood, as if exacting ritualized punishment.

▲ **IN FLIGHT**
When airborne, the gull flaps its gently bowed wings with deep, but lazy, beats or soars on the breeze with wings outstretched.

▶ **PREENING TIME**
The gull conditions and cleans its plumage by preening. A preen gland on the rump has oil that the gull spreads through its feathers.

Herring gulls normally breed in colonies or as solitary pairs on undisturbed sloping ground, cliff tops and islands, but they may also choose inland sites on buildings and near lakes. Gulls pair for life and each year build a new nest out of vegetation and claim a small territory around it, which the pair defends fiercely.

Two or three eggs are laid by the female and incubated for four weeks by both parents. When the young hatch, at intervals of two or three days, they're covered in down. They remain in the nest for a few days and are fed and cared for by both parents. The chicks don't move far from the nest, staying in the home patch. The young take about six weeks to fledge and become fully independent about one or two weeks later.

3 Feed me now...

Rising up, the chick tries to tap the red spot on its parent's mandible. This indicates that it's hungry and wants to be fed.

4 Fast food

In response, the adult regurgitates the food from its crop, opening its bill wide so the chick can reach right in to feed.

FOOD & FEEDING

The gull is an opportunist that kills live prey, scavenges for carrion and scraps, steals food and feeds on vegetation.

▲ **HANGERS ON**
Gulls follow fishing boats, finding easy meals from discarded fish offal.

On land, the gull walks in search of food, occasionally paddling the ground with its feet to bring invertebrates to the surface. Birds' eggs and chicks are plucked from their nests; shellfish are caught on the shoreline. The gull also hunts small rodents. Garbage dumps are another important source of food, and flocks of herring gulls are frequent visitors inland. To catch fish, the gull either swoops down on its prey when in flight or, while swimming, ducks its head and neck into the water to grab a passing victim.

CONSERVATION

The herring gull is one of the most abundant coastal birds in North America and Europe. Due to its habit of preying on young birds, it's considered a pest in some parts of its range.

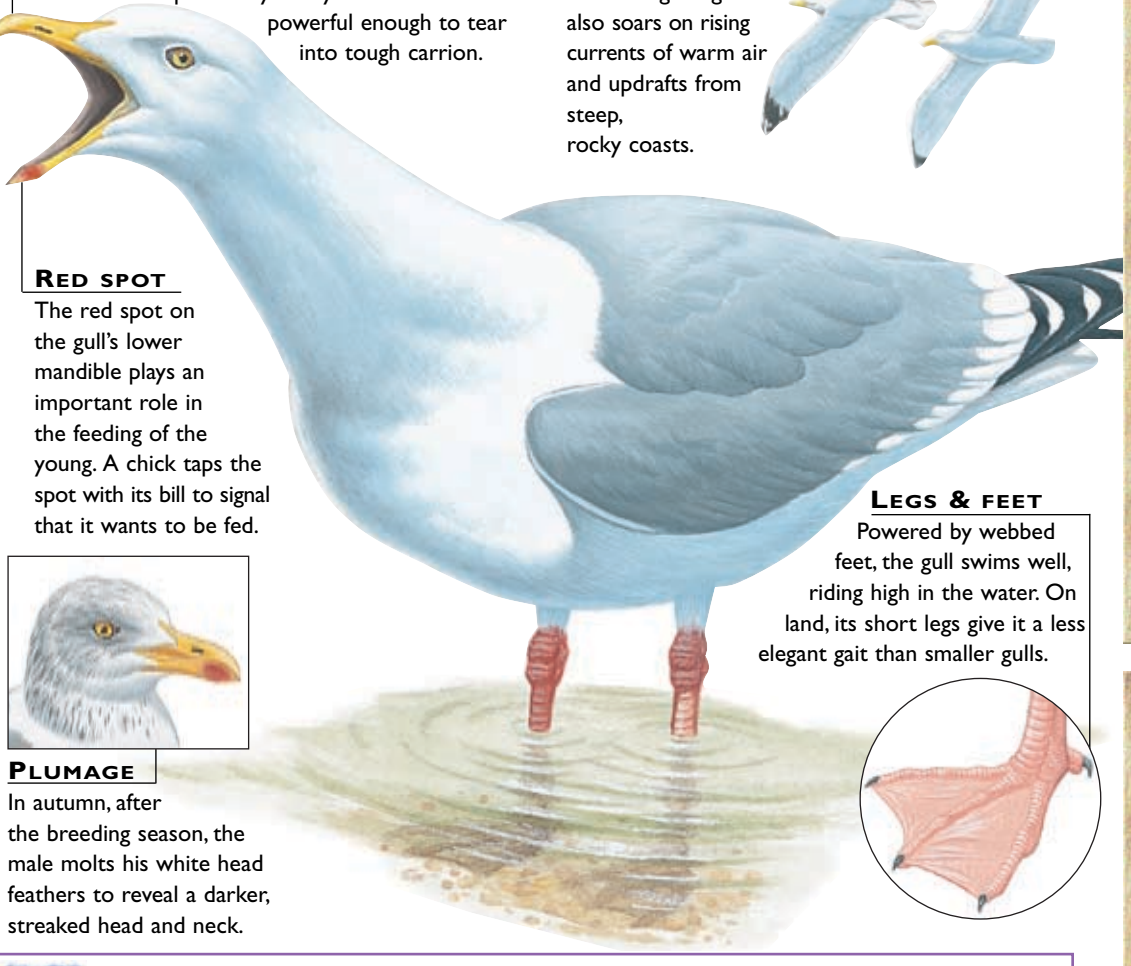
PROFILE HERRING GULL

The large and heavily built herring gull is a versatile bird, equally equipped to soar the skies, "sail" the seas and stroll about on the ground.

BILL
The heavy, hooked bill is adapted to the gull's predatory lifestyle. The bill is also powerful enough to tear into tough carrion.

WINGS
The gull flies strongly on its long wings. It also soars on rising currents of warm air and updrafts from steep, rocky coasts.

RED SPOT
The red spot on the gull's lower mandible plays an important role in the feeding of the young. A chick taps the spot with its bill to signal that it wants to be fed.



PLUMAGE
In autumn, after the breeding season, the male molts his white head feathers to reveal a darker, streaked head and neck.

LEGS & FEET
Powered by webbed feet, the gull swims well, riding high in the water. On land, its short legs give it a less elegant gait than smaller gulls.

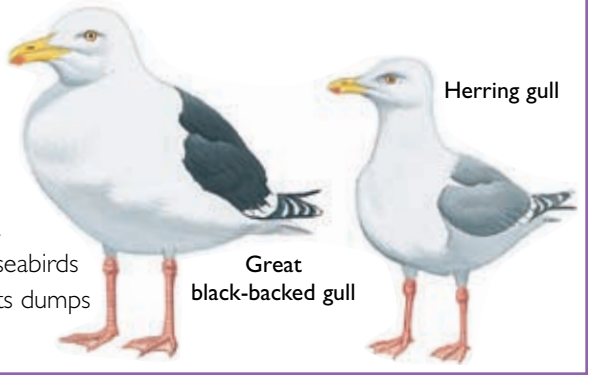
VITAL STATISTICS

WEIGHT	1.5–3 lbs.
LENGTH	1.8–2.2'
WINGSPAN	4–5'
SEXUAL MATURITY	3–7 years; usually 5 years
BREEDING SEASON	April–June
NUMBER OF EGGS	2 or 3
INCUBATION PERIOD	28–30 days
FLEDGING PERIOD	40–45 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Fish, shellfish, worms; small mammals, birds; plant matter; scraps
LIFESPAN	Up to 32 years

CREATURE COMPARISONS

Even the larger male herring gulls are dwarfed by the great black-backed gull, *Larus marinus*, which may reach 2.5' from head to tail. More powerfully built than the herring gull, the great black-backed gull's head and neck are thickset and its wingbeats are very deep and powerful.

In the breeding season, the predatory great black-backed gull feeds almost exclusively on seabirds and, if available, small mammals. It also frequents dumps and scavenges around fishing ports for scraps.



RELATED SPECIES

● **The herring gull is one of 47 gull species in the family *Laridae*. Another member is the striking swallow-tailed gull, *Creagrus furcatus* (below), from the Galapagos Islands. The herring gull's relations in the order *Charadriiformes* include terns and skuas.**

Hill Mynah

• ORDER •
Passeriformes

• FAMILY •
Sturnidae

• GENUS & SPECIES •
Gracula religiosa

KEY FEATURES

- A colorful relative of the European starling
- Feasts on the fruit and nectar of tropical trees; in return, it propagates the seeds
- Extremely noisy, with a vocabulary of whistles, wails and squawks; a superb mimic in captivity
- Roosts are so packed, birds fight over perches

WHERE IN THE WORLD?

Found from India and Sri Lanka to southeastern China and south to Borneo, Java and Sumatra; also occurs on some small islands in Indian Ocean

LIFECYCLE

Colorful flocks of hill mynahs are among the most evocative sights in Asia's tropical forests, since the mynahs constantly call to each other and are almost always on the move.

HABITAT

▲ **FOREST FARE**
Fruits, flowers and insects abound in the treetops.

The hill mynah is found in the lush tropical woodlands and forests of Southeast Asia. It descends from the canopy only occasionally and avoids the densest jungle, preferring clearings or areas of forest edge. The mynah also visits plantations and other cultivated areas around villages, and is often seen near streams or pools, where it bathes daily to clean sticky fruit juices from its plumage.

The largest populations of the hill mynah occur on the forested lower slopes of mountain ranges, including sites at up to 6,600' in the Himalayas, but the species is also common on lowland plains.

DID YOU KNOW?

- **Apart from the human voice, captive hill mynahs have learned to imitate the sounds of footsteps, ringing telephones, creaking doors, car horns, dripping taps and even church bells.**
- **The hill mynah learns some of its calls by copying its parents when it is very young.**
- **Escaped pet mynahs have established a small feral population in Florida.**

BEHAVIOR

Although the hill mynah is able to mimic the human voice so expertly in captivity, it does not imitate the sounds of other animals when in the wild. However, it does copy the calls of neighboring mynahs. Consequently, mynahs living together in one area can be distinguished from those in another simply by listening to the unique "dialect," or localized calls, used by each area's birds. Every hill mynah uses 15 or so musical whistles and harsh squawks.

The hill mynah is a sociable and energetic bird that spends most of its time in small, fast-moving flocks. The largest (and loudest) flocks, sometimes hundreds strong, are those that form at the species' traditional roost sites. At dusk, amid a cacophony of raucous calling, mynahs congregate at favored trees and fight for space on the highest, bare branches. As night falls, the birds split up and fly to individual perches in tree trunk cavities or on sheltered branches close to the trunk.

▲ **WHAT'S GOING ON?**
Compared to most medium-sized birds, the hill mynah is quite curious and fearless and investigates any loud or strange sounds.

▲ **GOING TO GROUND**
Fallen fruit and water entice the mynah to leave its tree.

FOOD & FEEDING

Wild figs are the hill mynah's favorite food, and are gathered by the hundreds when the fig trees are in full fruit. The mynah flies from tree to tree to track down the ripest fruit. It swallows small fruits whole but has to slice larger ones apart with its powerful bill, before devouring each segment. The hill mynah is also fond of nectar, the energy-rich liquid dispensed by flowers in exchange for pollination by insects, birds and mammals. When a mynah pushes its bill into a flower to reach the nectar inside, pollen sticks to its head. This pollen is then transferred to the blooms of the next tree visited by the bird.

The hill mynah supplements its mainly vegetarian diet by hunting insects; it flies into swarms of termites and snaps them up in midair. From time to time, the mynah even hunts small rodents and lizards, killing them with hammer blows from its bill.

SOWING THE SEED

1 Land...
A hill mynah spots a tree laden with ripe figs and lands on an exposed branch to gorge itself.

2 Feed...
The mynah is interested only in the fig's juicy flesh but cannot avoid swallowing some of its seeds.

3 Deposit...
The fruit is easy to digest, but the hard seeds pass through the bird's digestive system still intact.

4 Germinate
The bird's nitrogen-rich droppings act as fertilizer, so that a few seeds grow into new fig trees.

CONSERVATION

The hill mynah is scarce in some parts of its range due to huge numbers of chicks being taken from nests to be sold as pets, but the mynah is not endangered. Stricter laws controlling the trade in cagebirds have at last been passed, which should lead to a gradual recovery of mynah populations.

BREEDING

Male and female hill mynahs pair for life and nest in bustling colonies. Quarrels over nest sites, located 33–50' above ground level, are boisterous but rarely cause injury. Once a pair of mynahs has established a site, only a small area around the nest is defended against other birds. In fact, several pairs may breed in the same tree.

The hill mynah nests in an old tree hole, often made by a woodpecker, and lines it with twigs, grass, leaves and feathers. Two or three naked and blind chicks hatch after an incubation of 2–3 weeks. Insects rather than fruit form the bulk of the chicks' diet, but by the time they leave the nest, 3–4 weeks later, the young are feeding on fruit, flower buds and nectar as well.

MARATHON TASK
Adult mynahs seek food nonstop for their chicks.

PROFILE HILL MYNAH

Thanks to its eye-catching plumage and raucous calls, the hill mynah is hard to miss — even its wings make a noise as it flies overhead.

BILL
The hill mynah's short but stout bill enables it to pluck and tear into a wide variety of fruits.

HEAD
Both sexes have bright yellow wattles, which are large and fleshy lobes of skin in some races and simple patches of naked skin in

WINGS
The large *primary*, or wing-tip, feathers make a musical hum in flight and have broad white markings. The hill mynah flaps its wings so deeply that their tips touch above and below its body.

PLUMAGE
The glossy plumage appears mainly black at first, but iridescent green, blue and purple tones are visible from certain angles.

FEET
The mynah's three forward-facing toes, of varying lengths, provide a secure grip on even flimsy

VITAL STATISTICS

WEIGHT	5–9.5 oz, depending on subspecies
LENGTH	10–15"
WINGSPAN	17–26"
SEXUAL MATURITY	1 year
BREEDING SEASON	April–July
NUMBER OF EGGS	2–3
INCUBATION PERIOD	13–19 days
FLEDGING PERIOD	21–30 days
TYPICAL DIET	Fruit (especially figs), nectar and insects, with a few small rodents and lizards
LIFESPAN	8–15 years

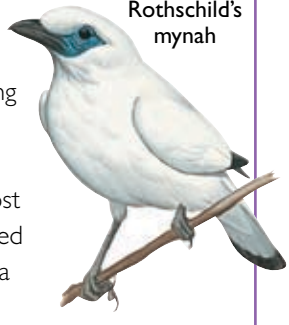
CREATURE COMPARISONS

Hill mynah

Rothschild's mynah (*Leucopsar rothschildi*) and the hill mynah share compact body plans, but the former is smaller and slimmer. Sometimes known as the Bali starling, Rothschild's mynah can erect a crest of long plumes along the back of its neck. Instead of wattles, it has a bare, blue skin area between its bill and eyes.

Although starlings and mynahs include some of the most abundant and adaptable birds, the cagebird trade has reduced the wild population of Rothschild's mynah to just 200, in a stretch of forest on the Indonesian island of Bali.

Rothschild's mynah



RELATED SPECIES

● **The hill mynah has 11 races with varied size and wattle pattern; it's 1 of 10 mynah species in the starling family, *Sturnidae*. Many of the 110 species of *Sturnidae*, including East Africa's superb starling, *Spreo superbus*** (below)**, have plumage that glints in the sunlight.**

Himalayan Snowcock

• ORDER •
Galliformes

• FAMILY •
Phasianidae

• GENUS & SPECIES •
Tetraogallus himalayanensis

KEY FEATURES

- Flies down hillsides in pairs or groups in the early morning to search for water
- Spends the day feeding during its climbing ascent back to its hillside roost
- Coloration blends well with the environment for excellent camouflage against predators, such as snow leopards

WHERE IN THE WORLD?

Found on the open slopes of the western Himalayas of China; also the Tien Shan mountains of Russia and China, the Pamir range of Russia and mountains of Tadjikistan and Afghanistan

LIFECYCLE

This noisy gamebird will try to outrun its pursuers, scurrying between boulders before resorting to flying, when it will soar downhill on broad wings.

HABITAT

The Himalayan snowcock inhabits the rocky alpine slopes of western and central China. In the summer, the bird resides in the western Himalayas — Kashmir, Laddaakh, Punjab, Garhwal, Kumaos, western Nepal — between 13,000–18,000'. The snowcock descends to elevations of 8,000' or lower during severe winters.

▼ **HIMALAYAN HIDEAWAY**
The snowcock's home is beautiful but isolated.

BREEDING

During the breeding season, from April to June, the male snowcock is especially noisy, repeating a prolonged whistle as he stands on a rock or mound. The monogamous male pursues the female in a crouched position with his tail held vertically in the air. The courtship ceremony continues as he walks around the female with his head lowered, making periodic dashes for a rock or mound. While mating, the female gets so badly mauled by the male that her crown is often left bare of feathers and her skin bruised and red.

The female scratches out a nest hollow among stones and boulders in the open or under a ledge, and lays 5–7 eggs. The oval eggs vary in color from pale yellow to reddish buff with specks of red-brown. The female has developed two brood patches, one on either side between the thighs, which help keep the large clutch warm, and she incubates the eggs for about 31 days. Newly hatched chicks are covered in down. The upperparts are variegated stone gray with black tips and pale buff markings. The head is very pale creamy buff with four black lines. Their feet are yellow but will turn the adult reddish color as the birds mature.

◀ **COURTSHIP CROUCH**
The male snowcock's neck and tail feathers expand during crouching courtship displays designed to impress the female. The white neck feathers with their black webs resemble a ruffled tuxedo shirt.

BEHAVIOR

A strong runner, the Himalayan snowcock rarely flies except to escape from danger. With its rounded wings, the bird cannot sustain flight for long periods of time and remains sedentary within a few miles of its birthplace. When the bird does fly, however, it usually takes off from a rock and makes a steep dive down the hillside, often without flapping its wings. The snowcock travels in pairs or parties of up to 20, scrambling down hillsides during the day in search of water and then back up by nightfall. When faced with natural predators, such as the snow leopard, the snowcock either bursts into sudden flight, flapping its wings rapidly, or runs uphill on its short, strong legs with a waddling gait; its plumage blends with the background.

NARROW ESCAPE

1 Feeding under cover…
Four snowcocks feed on grass seed heads in a hollow surrounded by rocks, which provide partial cover from nearby predators.

2 Alarm warning…
One of the birds spots a snow leopard. It stands in an upright position, calling out a warning to the others of impending danger.

3 Run for your lives…
Grazing snowcocks scramble up a rocky slope in an attempt to put a safe distance between them and the stalking snow leopard.

4 Fly away home
As the snow leopard closes in and it appears hopeless for the birds, the snowcocks surprise the big cat as they disperse into flight.

FOOD & FEEDING

▲ **GRASSY GLORY**
Seeding grass heads are a staple of the Himalayan snowcock's diet.

The Himalayan snowcock begins its day by descending in the morning from its mountain-top home to seek a drink of water at ground level. As the day warms up, the bird begins its slow ascent, usually in a party of 3–5 birds; it feeds on roots, tubers, berries, green vegetable matter, grass and seeds that it digs up with its stout bill. The bird also swallows a great deal of grit, which is used in the muscular part of the stomach (gizzard) to help grind the tough plant parts that the snowcock eats. The grit is usually retained in the gizzard, while the rest of the food continues its passage through the digestive tract. While on the ground, the Himalayan snowcock uses its powerful feet to scratch for buried insects and bulbous roots that grow on the slopes. The bird is a noisy eater and continually clucks as it feeds; the clucks change to cackles if danger is encountered. During the winter, the snowcock forages for vegetable material not covered by snow.

DID YOU KNOW?

- **The Himalayan snowcock emits a strong and disgusting stench within a few hours after being killed.**
- **When it is quickly and properly cleaned, Himalayan snowcock meat is said to have both an excellent flavor and texture.**

CONSERVATION

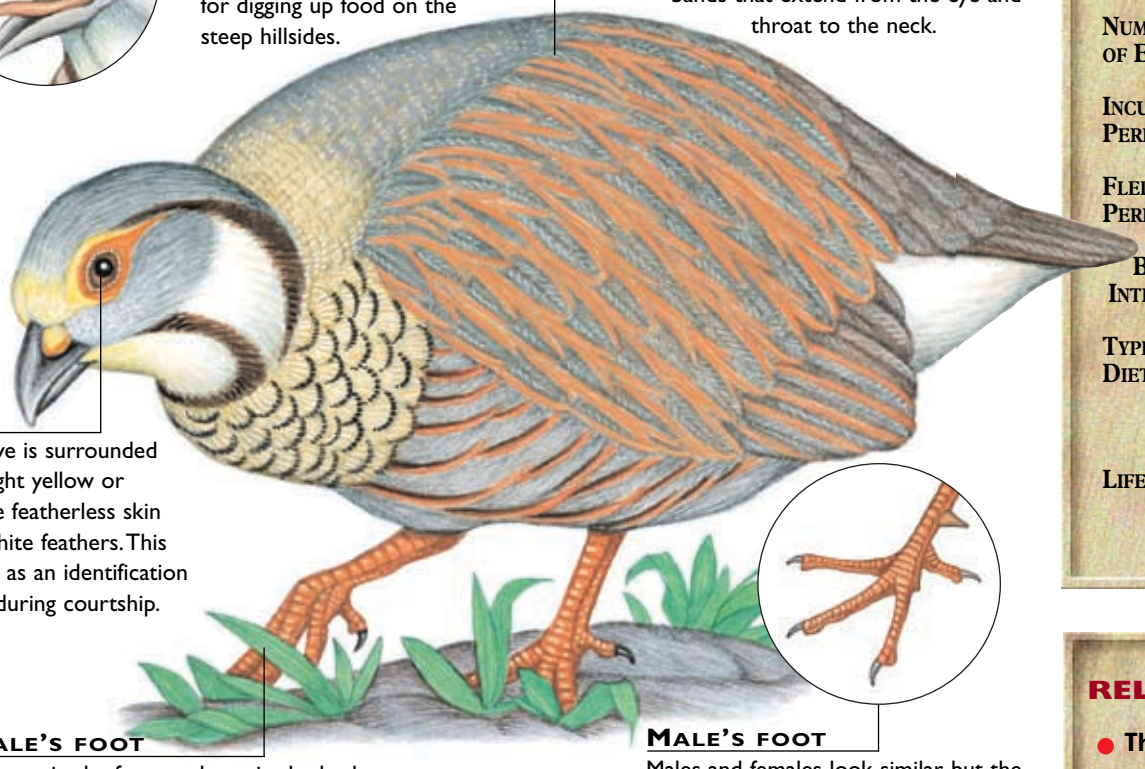
The Himalayan snowcock is currently not threatened, but its limited range poses a potential threat to its continued success. Although the snowcock is hunted throughout its range, its roosts are fairly inaccessible to most inexperienced hunters because of the high altitudes.

PROFILE HIMALAYAN SNOWCOCK

The Himalayan snowcock is a stout gamebird with strong legs and feet designed to get a good grip on steep, rocky mountainsides.

BILL
The Himalayan snowcock has a short, strong bill used for digging up food on the steep hillsides.

PLUMAGE
A mixture of gray, white and buff plumage camouflages the snowcock as it moves through its mountain home. The bird also has chestnut bands that extend from the eye and throat to the neck.



EYE
The eye is surrounded by bright yellow or orange featherless skin and white feathers. This serves as an identification mark during courtship.

FEMALE'S FOOT
Three toes in the front and one in the back provide optimum balance. Strong, short legs enable this ground-dwelling bird to move up and down mountains easily.

MALE'S FOOT
Males and females look similar, but the monogamous males have rear tarsal spurs, which are used in fights with other male snowcocks for females.

VITAL STATISTICS

WEIGHT	4–6 lbs.
LENGTH	22–28"
SEXUAL MATURITY	About 2 years
BREEDING SEASON	April–June
NUMBER OF EGGS	5–10
INCUBATION PERIOD	27–31 days
FLEDGING PERIOD	Unknown
BREEDING INTERVAL	Up to 1 year
TYPICAL DIET	Roots, tubers, green plants, berries and seeds
LIFESPAN	Unknown

RELATED SPECIES

- **The Himalayan snowcock is 1 of 5 species in the genus *Tetraogallus;* all are found in Asia, including the Tibetan snowcock, *T. tibetanus* and a subspecies, the Central Tibetan snowcock, *T. t. centralis*. There are about 174 species in the *Phasianidae* family, which includes quails, partridges, pheasants, spur fowls, francolins and peafowls.**

CREATURE COMPARISONS

The Tibetan snowcock (*Tetraogallus tibetanus*), at 21", is slightly smaller than the Himalayan snowcock. Its plumage is very similar to the Himalayan's, with some differences in the amount of buff, white and gray streaking on the upperparts; it also lacks the chestnut bands on the head. Like the Himalayan snowcock, this Tibetan neighbor inhabits the mountain slopes of China, but at higher, more northern elevations, including Tibet; in fact, the Tibetan snowcock lives at the highest elevation of any bird, at up to 10,000'. Both species' calls range from a clucking sound to a whistle that echoes through the mountains.

Himalayan snowcock

Tibetan snowcock

Hoatzin

• ORDER •
Cuculiformes

• FAMILY •
Opisthocomidae

• GENUS & SPECIES •
Opisthocomus hoazin

KEY FEATURES

- Unique bird of South American river and marsh edge
- Chicks have claws on their wings, letting them scramble among the tree branches
- Adapted to digest the tough, rubbery vegetation by swamps and rivers of the Amazon and Orinoco
- Flies in short bursts of 100' or so

WHERE IN THE WORLD?

Found in northeastern South America, particularly in the rainforests formed by the Amazon and Orinoco rivers; forested borders of streams provide leafy food and nesting sites

LIFECYCLE

The colorful hoatzin has evolved a variety of highly unusual features that suit it to life in the permanently lush and leafy wetlands of South America.

HABITAT

The hoatzin is found over a large part of South America, from Guyana and Brazil west to Ecuador and Bolivia. This region is characterized by permanently flooded forests along the overgrown banks of the Amazon, Orinoco and other river systems.

Two factors affect the hoatzin's range: anatomy and diet. With weak wings, the hoatzin is better at scrambling along branches than flying. This, coupled with the chick's ability to swim, suits the hoatzin to a landscape where a mass of tree limbs hangs over water. Tough, tropical marshland vegetation, such as arum and the white mangrove, provides essential ingredients in its diet.

▼ **BIRDS OF A FEATHER**
The hoatzin lives in a small group or colony.

CONSERVATION

The greatest threat to the hoatzin is that of the Amazon region in general. Widespread clearing of forests has reduced the hoatzin's range, depriving local populations of their habitat. Captive-breeding programs are unlikely to restore populations because the hoatzin's restricted diet makes it difficult to rear outside its natural habitat. Hoatzins rarely survive more than a year in captivity.

BEHAVIOR

A DANGEROUS OUTING

1 Explore…
Using the claws on its wings as "hands" to grasp vegetation, an adventurous young hoatzin sets out from its nest.

2 Escape…
The hoatzin spots a deadly palm viper coiled on branch. The young hoatzin simply drops from the tree into the water below…

BREEDING

Hoatzins breed through the year; breeding increases just before the rainy season and occurs in groups of 2–6 birds. Both parents build the thin platform of a nest in branches over the water.

Parents take turns sitting on the eggs. Newly hatched young are almost naked but soon grow a downy plumage. They stay in the nest for about 14 days, then start exploring, using their curious ability to swim. As the chick grows, it loses its wing claws, learns to fly and loses the ability to swim. It continues to use its spread wings for balance as it scrambles about, often losing a few feathers in the process.

The hoatzin is most active in morning and evening. It spends the hottest part of the day in dense foliage on a branch over the water, which provides a vital escape route if predators pass by.

A poor flier, the hoatzin prefers to climb to the tops of low trees. With such a vantage point, the hoatzin can look out for danger or promising feeding areas. Occasionally, the hoatzin flies, gliding between small creeks or bays, to a new perch, where it slumps down with its callused rump resting on the branch.

Hoatzins live in a colony of 10 to 20 members. Cooperative parents accompany young on their first awkward scrambles and spread their wings to screen a chick from predators.

DID YOU KNOW?

- **The hoatzin's name is an Indian word, mimicking the bird's call. Other local names include *catinguero,* meaning "musk-smelling," and *cigana,* meaning "gypsy," which refers to the colorful plumage.**
- **Hoatzin fossils dating back 50 million years to the Oligocene Epoch have been uncovered in South America, establishing the ancient origins of this unusual bird.**

FOOD & FEEDING

▲ **EASY MEAL**
Leafy food is close at hand in the lush forests.

The hoatzin feeds mainly on arum and mangrove foliage. It picks at leaves with its beak, forms the pieces into a ball in its mouth and swallows the food in large chunks.

The leaves that make up the hoatzin's diet are rubbery and tough, and few birds can digest them. The hoatzin's crop, a storage cavity in the chest, is so powerfully muscled that leaves are broken down with ease. The crop is also divided into sections: both these factors help with digestion. Swallowed balls of leaves are ground into a fine mash in the crop before passing through the gizzard and small intestine to be digested.

3 Swim…
…and puts distance between itself and the palm viper by swimming off in the sluggish water. It uses both wings and feet to swim.

4 Return
The hoatzin watches the snake and looks for other threats. When the coast is clear, the bird clambers back to safety.

◀ **BROOD ON THE BRANCH**
Two or three eggs are laid in an untidy stick nest.

▼ **SELF-SERVICE**
The chick probes its parent's beak for regurgitated food.

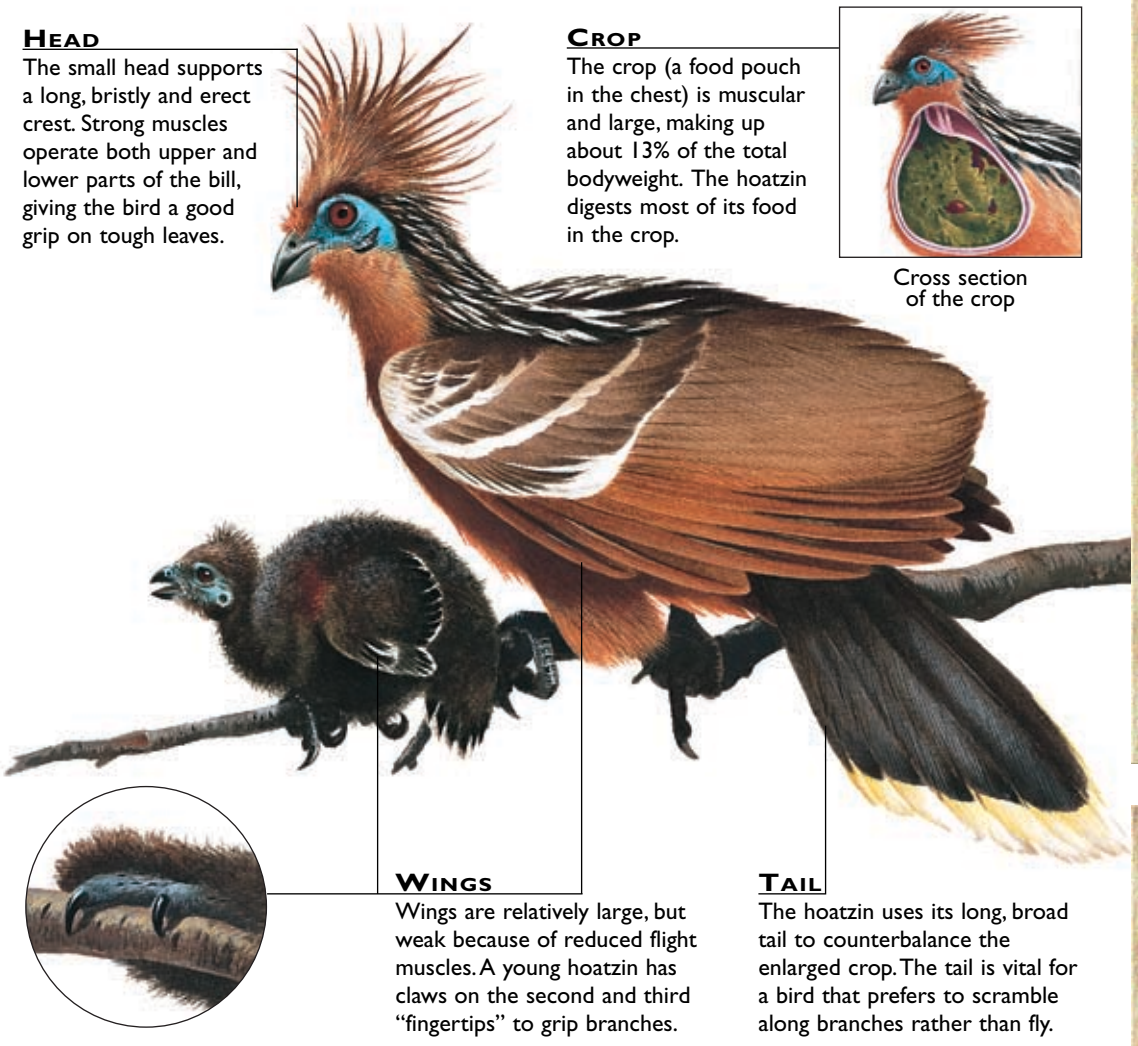
PROFILE HOATZIN

The ungainly hoatzin does not need to fly far in search of food. In fact, its wings are more useful as stabilizers than for flight.

HEAD
The small head supports a long, bristly and erect crest. Strong muscles operate both upper and lower parts of the bill, giving the bird a good grip on tough leaves.

CROP
The crop (a food pouch in the chest) is muscular and large, making up about 13% of the total bodyweight. The hoatzin digests most of its food in the crop.

Cross section of the crop



WINGS
Wings are relatively large, but weak because of reduced flight muscles. A young hoatzin has claws on the second and third "fingertips" to grip branches.

TAIL
The hoatzin uses its long, broad tail to counterbalance the enlarged crop. The tail is vital for a bird that prefers to scramble along branches rather than fly.

VITAL STATISTICS

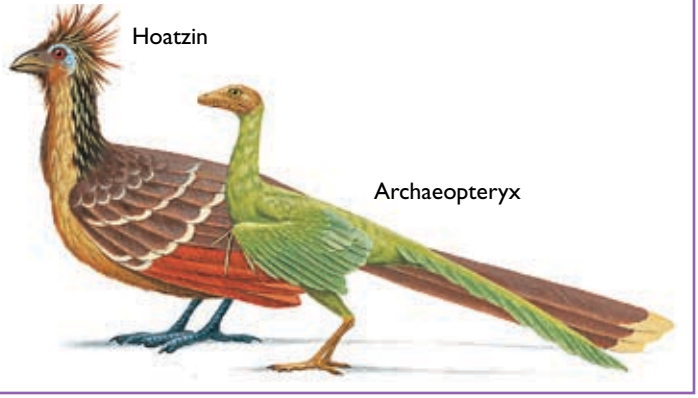
WEIGHT	26–28 oz.
LENGTH	24.4"
SEXUAL MATURITY	1–2 years
MATING SEASON	Onset of rainy season (once or twice a year)
NUMBER OF EGGS	2–5; usually 3
INCUBATION PERIOD	4 weeks
BIRTH INTERVAL	6 months or 1 year
TYPICAL DIET	Fruit and leaves, particularly those of arum and mangrove
LIFESPAN	Unknown

RELATED SPECIES

● **Since 1837 the hoatzin has been linked to eight different bird orders, with birds such as pigeons, cranes, parrots and cuckoos. Placed in a family and a genus of its own, the hoatzin was then attached to the *Galliformes* (turkeys, pheasants, partridges and quails). The hoatzin now belongs to the order *Cuculiformes*, which includes coucals, cuckoos and roadrunners.**

CREATURE COMPARISONS

Many features of the hoatzin, such as muscle attachments, skeletal structure and the chick's wing claws, resemble those of the archaeopteryx, an ancient bird that lived about 150 million years ago in the Jurassic period. Similarities such as these have helped to fuel debate about the evolution of flight in birds.

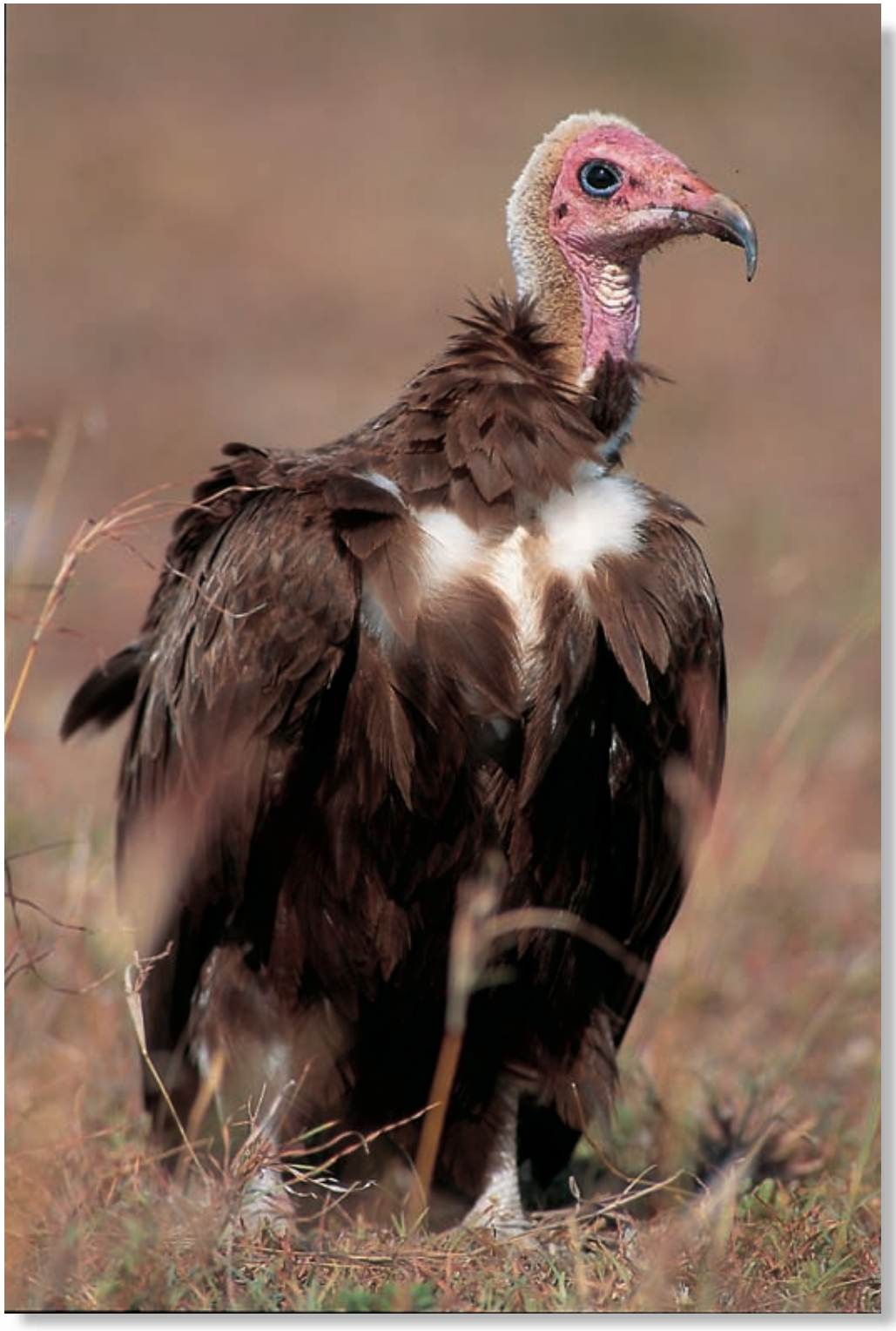


Hooded Vulture

• ORDER •
Falconiformes

• FAMILY •
Accipitridae

• GENUS & SPECIES •
Necrosyrtes monachus



KEY FEATURES

- Widespread in Africa, where it has learned to live closely alongside humans in many parts of its range
- Scavenges almost any organic matter and so performs a garbage-disposal service around towns and cities
- Attracted to farmland habitats, where carcasses of domestic livestock provide rich pickings

WHERE IN THE WORLD?

Found in Africa from Mauritania and Senegal east to Ethiopia and south to South Africa; absent from the dense forests of western central Africa and Madagascar

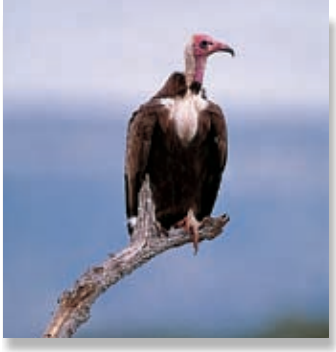
LIFECYCLE

A familiar visitor to sub-Saharan settlements in Africa, the hooded vulture boldly exploits human leftovers, scavenging scraps and waste from markets and city garbage dumps.

HABITAT

The vulture lives in a variety of African habitats, from coastal lowlands though semideserts to open woodlands and forests. It's most widespread in savannahs and grassland, particularly near human settlements.

Towns and villages offer rich pickings to this scavenger. In parts of the sparsely populated grasslands of Tanzania and Kenya, the vulture settles near cattle ranches, gleaning scraps and carrion from around farms.



▼ **LANDING SITE**
The vulture frequents African grasslands.

▲ **KEEPING AN EYE OUT**
A dead branch provides an ideal vantage point.

CONSERVATION

The hooded vulture isn't threatened overall, but is listed in Appendix II of CITES. Its populations are increasing locally around many human communities, but in parts of western and southern Africa, the species has been deliberately poisoned; in recent years it's disappeared from much of the Sudan. However, the bird's widespread integration with the human community will help ensure its survival.

BEHAVIOR

FOOD & FEEDING

Almost all of the vulture's food is carrion and waste scraps. In open habitats, the vulture is often first to arrive at a carcass. This may not guarantee it a meal, though — its long, fine bill can't tear through tough skin, and it may have to wait for bigger species to start the job. Even then, there may be a long wait while bigger, stronger birds have first pickings. Eventually, when the others have left, the hooded vulture can dig in, picking into the tiny crevices and spaces too small to be probed by heftier bills.

In villages and towns, the vulture strolls the streets and markets in search for food. Almost anything is eaten: garbage-dump scraps, slaughterhouse waste, even human excrement.

LAST BUT NOT LEAST

1 The early bird...
The hooded vulture alights beside the carcass of a domestic ox, but its bill is too delicate to rip open the tough hide.

2 Mob rule...
Two Cape griffon vultures swoop down and aggressively drive away the hooded vulture. Their bills are able to tear into the carcass.

3 Second best...
Driven by hunger, the hooded vulture resorts to pecking for scraps of garbage at a dump on the outskirts of a village.

4 Next time around
A day or two later, the hooded vulture returns to the carcass. Little remains on the bones, but it reaches in to glean a few morsels.

The vulture tends to stay in the same area all year, roosting nightly in a tree and flying out daily to forage. Being smaller than other vultures, it tends to take flight earlier in the day. Its lighter body requires milder thermals (warm updrafts) to keep it aloft, so it doesn't have to wait long for the morning sun to heat up the air.

Vultures often flock in large numbers at rich feeding sites, especially near towns and villages and squabble noisily over food.

◀ **DINING OUT**
A baboon carcass draws a squabbling crowd.

BREEDING

▲ **BOSOM FRIENDS**
Vultures pair for life and share parental duties.

The vulture's breeding season varies according to location, but is usually timed so the egg is laid during, or just after, the local rainy season, to ensure a reliable supply of food.

Adult birds, which pair for life, mate after a brief courtship. Their nest, built from sticks and lined with grass, bits of skin, hair or rags, is usually sited high in a tall tree; the same nest may be used for several years in succession. Incubation is carried out mainly by the female, and the single chick hatches less than two months later.

The hatchling is feeble and helpless at first, needing care and attention from the adults, who take turns at brooding and feeding it. After remaining in the nest for about 14 weeks, the chick first climbs out to investigate the surrounding branches, but it may be another three weeks or so before it fledges and is ready to try its wings. Even then, the young vulture may remain roosting at the nest for a further month before finally leaving to become independent.

DID YOU KNOW?

- **The hooded vulture's scientific name *Necrosyrtes monachus* comes from Greek words that mean "monklike corpse-dragger," referring to its cowl-like crown plumage and scavenging habits.**
- **Vultures feature in many superstitions of native peoples. In parts of South Africa, there's a belief that the hooded vulture always lays two eggs and that one of them hatches into a fly.**

PROFILE HOODED VULTURE

The hooded vulture's lean frame allows it to soar away on the mild, early morning air currents, giving it an advantage over heavier vultures.

HEAD

Sparse, beige down covers the crown. Thin, gray down covers the pink face and neck, which become flushed when the vulture is agitated.

FLIGHT

Wings are long and broad and show six, deeply slotted primary (wingtip) feathers in flight.

PLUMAGE

The upper parts appear mainly dark-brown, and flight feathers become paler toward the base. The crop (gullet) area of the chest and upper legs are covered by downy white feathers.

BILL

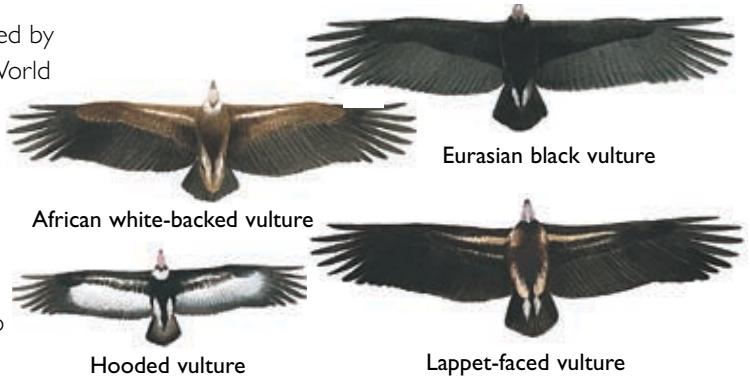
The bill is too small to tear open large carcasses, but is suited to teasing out tiny morsels and can be used delicately, like tweezers, to pick insects and larvae from soil and dung.

VITAL STATISTICS

WEIGHT	3.3–5.8 lbs.
LENGTH	26–27.5"
WINGSPAN	66–69"
SEXUAL MATURITY	1 year
BREEDING SEASON	Year-round, but season varies with location
NUMBER OF EGGS	Usually 1
INCUBATION PERIOD	46–54 days
FLEDGING PERIOD	89–130 days; usually 95–120 days
TYPICAL DIET	Any form of carrion; dung and garbage; insects and their larvae
LIFESPAN	Not known

CREATURE COMPARISONS

The hooded vulture is dwarfed by some other species of Old World vulture. These include the African white-backed vulture (wingspan of 7' and a weight of 16 lbs.), the lappet-faced vulture (spans up to 9' and weighs 20 lbs.) and Eurasian black vulture (wingspan up to 9'8" and more than 27 lbs.).



RELATED SPECIES

● **The hooded vulture is the only species in its genus. It's related to other Old World vultures, such as the Egyptian vulture** (below)**. As a member of the family *Accipitridae*, it's related to hawks, kites, harriers and eagles.**

Hoopoe

• ORDER •
Coraciiformes

• FAMILY •
Upupidae

• GENUS & SPECIES •
Upupa epops

KEY FEATURES

- A colorful, medium-sized perching bird that lives in warm grassland and lightly wooded areas
- Probes for and snaps up insects with its long, slender bill
- Fans its elegant crest when nervous, and during displays
- Female lays her eggs in a tree hole directly on the ground, or even underground

WHERE IN THE WORLD?

Breeds throughout sub-Saharan Africa, and from northwestern Africa across much of southern and central Europe to southern Asia and China; birds in some areas migrate south for the winter

LIFECYCLE

With its adorned head, the hoopoe looks like a pickax in action as it probes the ground for its insect prey. In the trees, it displays acrobatic grace as it gleans the foliage.

HABITAT

An adaptable bird that thrives in a wide variety of habitats, the hoopoe prefers warm areas. It favors open, level land with scattered trees or tree-lined streams and rivers, which provide nesting and roosting sites as well as cover from predators.

In Asia, the hoopoe is a bird of wooded plains, river valleys, foothills and glades in scattered pine- and oakwoods. Its European haunts include vineyards, olive groves, orchards and open country with mature trees, and the bird is most common in warmer, drier regions. The hoopoe tends to avoid dense, forested areas and, in Africa, is generally absent from coastal West Africa and the vast expanses of the equatorial Congo Basin. It is, however, common and widespread throughout the rest of the continent, frequenting woodland and savannah habitats and regularly invading suburban gardens.

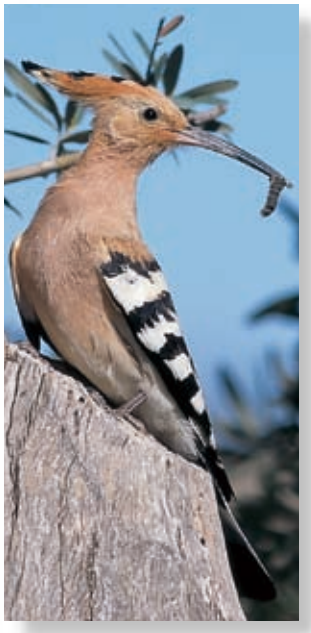
BRANCHING OUT
Woodland trees provide shade, nest sites and perches for hoopoes.

CONSERVATION

Hoopoe numbers have declined in northern Europe due to the increased use of pesticides on farmland. These toxins reduce the food for insect-eating birds and also enter the food chain, slowly poisoning adult birds and their young.

FOOD & FEEDING

The hoopoe searches for its food on bare or sparsely covered ground. It also uses its long, sharp bill to probe for prey, jabbing the ground as it walks along. Strong muscles allow the bird to open its beak while probing underground. In places where game and livestock occur, the hoopoe probes dung and even carrion in search of insects and their larvae. The bird also uses its bill to drum on wood, probably to disturb hidden insects.



The hoopoe eats a wide variety of prey, from maggots, mole crickets, beetles, wasps and grasshoppers to spiders, centipedes, snails and even frogs, toads, small snakes and lizards. Before swallowing large prey items, the bird often stuns them by battering them on the ground. It regurgitates the indigestible parts of insects, such as legs, wingcases and thorax pieces, in the form of a small pellet.

BEHAVIOR

With his head bowed, neck inflated and crest lowered, the male hoopoe sings his soft but resonant *hoop-hoop-hoop* call from a treetop, sometimes for hours, in the hope of attracting a mate. He defends his territory against other males, and drawn-out "song duels" often occur as rivals attempt to outdo each other. Fights also break out in which two birds stand breast to breast, with raised crests, and wrestle with their bills while fluttering their feathers.

The hoopoe's striking cinnamon plumage and slow, erratic flight — reminscent of a large butterfly — make it an easy target for predators. It is the favorite prey of the sooty and Eleanora's falcons. However, its striking black-and-white wingbars may actually help to break up the bird's outline as is flies for cover when alarmed.

In the north of its range, the hoopoe moves from summer breeding grounds to winter feeding grounds in sub-Saharan Africa or southern Asia.

LANDING GEAR
When it comes into land after flying, the hoopoe holds its crest upright.

A BILL FOR ALL OCCASIONS

1 Stabbed to death...
The hoopoe easily deals with large prey-items. On spotting a lizard, the bird repeatedly pecks it on the head until it is dead.

2 Ripped to pieces...
Using its bill as a precision tool, the-hoopoe tears off the lizard's tail and tosses it into the air before swallowing it.

3 Drill-like bill...
The hoopoe also finds food in the ground. Keeping its bill steady and moving its body around, the bird digs to unearth a tasty grub.

4 Acrobatic moves
The hoopoe can hang from a branch while searching for insects under leaves.

BREEDING

The male hoopoe courts a female by running around her with his wings partly opened. He also "kisses" her by repeatedly inserting his closed bill into her open mandibles. The hoopoe nests in a tree hole, a termite mound or a crevice in a building or old wall, which it often lines with grass, moss or leaves. But if such sites are not available, the female lays her eggs among stones or rocks, tree roots or even underground.

The female lays 7–8 speckled eggs that vary in color from buff to pale blue. She incubates them for about 18 days, while the male feeds her. The female stays with the chicks for about a week, then she helps the male gather insect larvae for them. The young fledge after 3–4 weeks.

▲ **Noisy brood**
Chicks demand food by making a hissing noise.

DID YOU KNOW?

- **Unlike most birds, the hoopoe allows its nest to become smelly. This keeps predators at bay.**
- **The hoopoe has been seen at an altitude of 21,000' in the Himalayas, while migrating between its breeding grounds and winter quarters.**
- **The male hoopoe's song has a pure tone and sounds like the noise that is made by blowing into a bottle.**

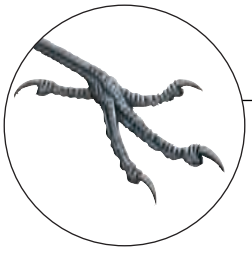
PROFILE HOOPOE

With its striking plumage both at rest and in flight, its graceful crest and slender bill, the hoopoe is one of Europe's most exotic-looking birds.

TAIL
The long tail feathers aid balance and act as a prop when the hoopoe perches at its nest hole.

CREST
The hoopoe often fans its spectacular crest. When the crest is lowered, it forms a spike of feathers that points backward from the forehead.

WINGS
When spread in flight, the hoopoe's wings reveal a black-and-white pattern that transforms the bird's appearance.



FEET
To improve stability, two of the forward-facing toes are partly fused.

BILL
The slender, curved bill is about 2" long. It enables the hoopoe to extract grubs from crevices and soft soil. The bill is accurate enough to snap flying insects from the air.

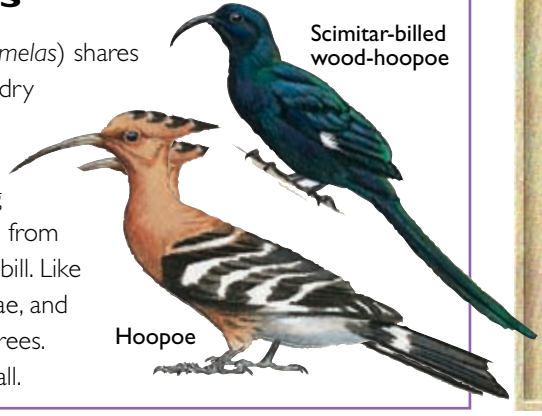
JUVENILE
When it fledges, the juvenile hoopoe is not fully developed. The bill is short and straight, the crest is not fully formed and the tail is short.

VITAL STATISTICS

WEIGHT	1.75–3 lbs.
LENGTH	About 11"
WINGSPAN	17–19"
SEXUAL MATURITY	1 year
BREEDING SEASON	Varies by region
NUMBER OF EGGS	4–10; usually 7 or 8
INCUBATION PERIOD	15–16 days
FLEDGING PERIOD	26–29 days
TYPICAL DIET	Mainly insects including pupae and larvae; spiders, centipedes, small lizards and snakes
LIFESPAN	Unknown

CREATURE COMPARISONS

The scimitar-billed wood-hoopoe (*Rhinopomastus cyanomelas*) shares much of its crested cousin's African range. Common in dry thornbush savannah and open broad-leaved woodland, the scimitar-billed wood-hoopoe also builds its nest in tree holes created by woodpeckers and tree-burrowing animals. It too is an acrobatic bird, hanging upside down from branches to probe for food with its long, down-curved bill. Like the hoopoe, it feeds almost entirely on insects and larvae, and its long tail feathers help it balance as it forages in the trees. The scimitar-billed wood-hoopoe has a high, whistling call.



RELATED SPECIES

● **The hoopoe is the sole member of genus *Upupa*, the only genus in the family *Upupidae*. Its closest relatives are the 8 species of wood-hoopoe, including the red-billed wood-hoopoe** (below) **and the white-headed wood-hoopoe, in the family *Phoeniculidae*.**

House Sparrow

• ORDER •
Passeriformes

• FAMILY •
Passeridae

• GENUS & SPECIES •
Passer domesticus

KEY FEATURES

- One of the world's most widespread and successful songbirds
- Able to live in every habitat within its range, except for dry deserts, thick forests and mountain peaks
- Enjoys a closer relationship with humans than does almost any other species of bird, and has actually benefited from the growth of cities and towns

WHERE IN THE WORLD?

Formerly restricted to North Africa and Eurasia,-but has spread throughout the world during the last 150 years; now represented on six continents; absent only from polar extremes

LIFECYCLE

Most animals are made homeless when their habitats are replaced by farmland and towns — but the house sparrow has benefited greatly from cultivation and urbanization.

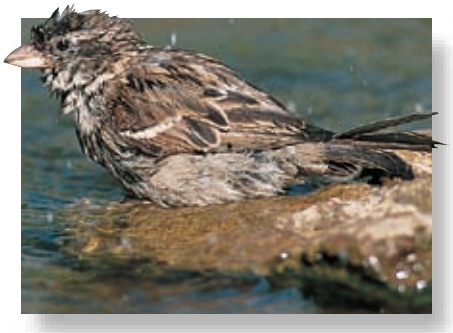
HABITAT

Few parts of the world are too hot, cold, wet or dry for the house sparrow. It is found well above the Arctic Circle in Scandinavia, and at the equator in South America and eastern Africa.

But the species was not always so widespread. Until the early 19th century, the sparrow was confined to lowlands in southern and central Eurasia and to a few parts of North Africa. Since then, urbanization and the planting of cereal crops, like wheat, have enabled this grain eater to colonize much of the world.

▼ **WORLD RESIDENT**
The sparrow can survive almost anywhere.

BEHAVIOR



It is unusual to see a house sparrow on its own; the species feeds in parties, breeds in loose colonies and roosts communally. One reason for flocking together is to increase the chance of spotting danger. Additionally, since each sparrow in the flock spends less time checking for predators, it can feed longer. The house sparrow has many enemies, even in towns; a large number of nestlings and juveniles falls victim to cats.

Breeding sparrows sleep near the nest. At other times, they assemble in huge numbers at favored sites: a roost in Egypt housed about 100,000 birds. By repeating a chirping call, a flock of roosting sparrows is capable of producing a deafening noise.

The house sparrow frequents many dusty habitats, so it must clean its plumage regularly. Flocks often settle to bathe in park lakes, fountains and puddles. The sparrow also takes dust baths, flicking sand and soil with its wings, to remove parasites. Occasionally it perches on the rim of a chimney to expose its feathers to the smoke.

▶ **TOP SEED**
The house sparrow is a pest in some regions due to its eating habits.

DID YOU KNOW?

- **The house sparrow has learned that insects trapped in spiders' webs and car radiators make an easy meal.**
- **The house sparrow annoys gardeners by tearing and shredding yellow flower petals, for which it has a fondness.**

BREEDING

FOOD & FEEDING

The house sparrow feeds mainly on grass seeds, herbs, wildflowers and cereal crops, especially wheat, barley, oats, millet and sorghum. It gathers food by pecking on the ground, but also tugs the seeds from low-growing plants and perches on ripe seed heads to strip them. Large flocks gather to feast in ripening corn fields, becoming a pest and occasionally destroying whole crops. Flocks also raid grain stored at farmyards, railway depots and ports, even stealing food from cattle in winter.

The house sparrow is an opportunist, quick to exploit any source of food. Depending on the season, it nibbles at fresh plant shoots and buds, extracts the sweet pulp from fruits and hunts insects.

In urban areas, food is plentiful all year. The house sparrow scavenges a wide range of scraps from shops, markets, parks and open-air cafés; it also visits bird feeders to take the food put out by humans. Indeed, some city-dwelling sparrows eat almost no "natural" food at all.

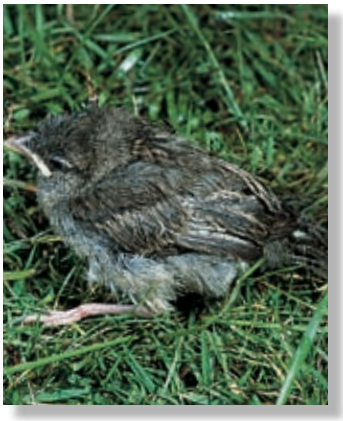
CONSERVATION

The house sparrow continues to expand its range alongside human expansion, especially in South America and oceanic islands. But in Britain, flock numbers have dropped from 19 birds in 1970 to 12 in 1995.

The house sparrow breeds in colonies of 10–20 birds. Nest sites vary from cliff faces to windowsills and rooftops. The sparrow may also take over the old nests of other birds; whole colonies can fit inside the bulky nests of herons or storks.

Both parents incubate the clutch of up to five eggs. To feed the chicks, the parents regurgitate a partly digested mixture of seeds and insects into the nestlings' bills. The young leave the nest after 2–3 weeks, when they learn to fly, but still beg food from their parents. After five weeks, the young become independent.

◀ **PAIR-BOND**
Both parents contribute to raising young.



▲ **ONE OF MANY**
In favorable conditions a female sparrow can raise seven broods in a year.

HOUSE PARTY

1 Guests arrive…
A flock has discovered a garden bird feeder laden with seeds. The sparrows help themselves to this lucky find.

2 Confrontation…
The sparrows squabble, jostling each other for the best positions. With his bill agape, one male threatens a rival.

3 Top feeder…
The aggressive sparrow's threat display and large bib keep the smaller-bibbed male away from the prime feeding spot.

4 Bonus
The top male gets the pick of the food and attracts the female, while the less showy male is left hungry and without a mate.

PROFILE HOUSE SPARROW

With a versatile, powerful bill and a broad diet, the resourceful house sparrow manages to thrive in a variety of habitats.

FEMALE

The female has a cream-colored stripe above each eye and a pale yellowish bill. She's usually smaller than the male.

COLORATION

Both sexes have patterned brown upperparts and pale underparts. The male (*right*) has a black bib, gray crown and rump, chestnut temples and a silver-gray bill.

BIB

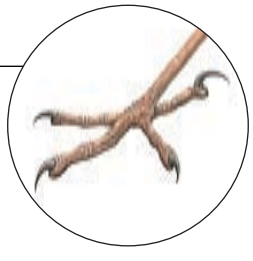
Males have varying amounts of black on the throat and breast. Those with the largest black patches (bibs) have the highest levels of testosterone and are more attractive to females. Outside the breeding season, the bib is flecked with gray feathers.

BILL

The thick, cone-shaped bill can split seeds and tear morsels from scraps. The sparrow's muscular tongue helps it to maneuver seeds into position for cracking and swallowing.

FEET

The sparrow's relatively stout feet enable it to hop along the ground and grip perches securely, but they are of little use for walking or holding food.



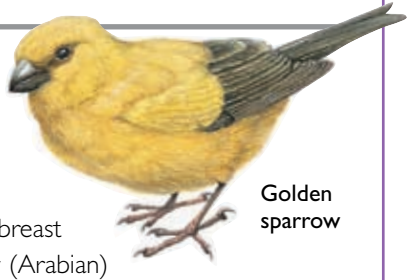
VITAL STATISTICS

WEIGHT	0.85–1.33 oz.
LENGTH	5.5–6"
WINGSPAN	8.5–10"
SEXUAL MATURITY	1 year
BREEDING SEASON	Spring and summer; all year in tropics
NUMBER OF EGGS	3–5 per clutch
INCUBATION PERIOD	9–18 days
FLEDGING PERIOD	11–19 days
BREEDING INTERVAL	2–4 broods a year; up to 7 a year in tropics
TYPICAL DIET	Seeds, berries, buds, insects; refuse scraps
LIFESPAN	1–5 years

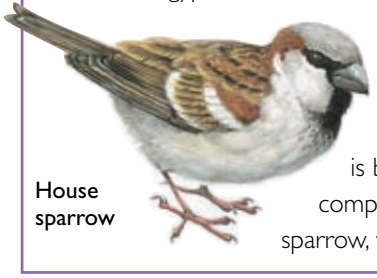
CREATURE COMPARISONS

A bird of arid, sandy habitats, the golden sparrow (*Passer luteus*) is found in Africa from Mauritania and Senegal to southern Egypt, Sudan and Eritrea, with a smaller population in the Middle East.

The male has a yellow head, breast and belly, and his back is yellow (Arabian) or red-brown (African). The female is paler than the male, but is bright enough to make the female house sparrow seem drab by comparison. The golden sparrow is about 15% smaller than the house sparrow, with a shorter gray bill that turns black during the breeding season.



Golden sparrow



House sparrow

RELATED SPECIES

● **The sparrow family, *Passeridae*, contains 34 species in 3 genera: the house sparrow and 20 other species in the genus *Passer*; 6 species of rock and bush sparrow in the genus *Petronia* and 7-species of snow finch in the genus *Montifringilla*. Sparrows are related to weavers, queleas, bishops and fodies. As a family, they are generally brown or gray, with short legs and poor singing ability.**

Hyacinth Macaw

• ORDER •
Psittaciformes

• FAMILY •
Psittacidae

• GENUS & SPECIES •
Anodorhynchus hyacinthinus

KEY FEATURES

- This rare, majestic blue bird is the longest of all parrots
- Does not reach breeding maturity until the age of 10 years
- Prefers to lay its eggs in the holes of dead palm tree stumps
- Tremendously strong beak is mainly used to crack open nuts — but is capable of tearing apart a wrought-iron cage

WHERE IN THE WORLD?

Found mainly in jungles and forests in central South America; through interior northeastern Brazil and extending into eastern Bolivia and northern Paraguay

LIFECYCLE

Hyacinth macaw pairs form a close bond that can last for life; though they both care for their chicks through early life, the survival rate is low, due to predators and climate.

HABITAT

The hyacinth macaw is found mainly in the inland tropical jungles, swamps, forests and palm groves of Brazil. The three main areas of distribution include Amazonia in Brazil; around the pantanal habitats of the upper Rio Paraguay basin extending into Bolivia; and through interior northeastern Brazil.

▲ **CALM IN THE PALM**
A small flock of hyacinth macaws rests close to its abundant food source.

DID YOU KNOW?

- **The two-toned tongue of the hyacinth macaw is black and yellow.**
- **In addition to water, macaws drink fluid from unripe palm fruits.**
- **The hyacinth macaw rubs its two bill sections against each other; this not only sharpens them but also prevents excessive growth, which would impede feeding.**

FOOD & FEEDING

The macaw eats a variety of fruits, nuts and seeds, but it favors the nuts of palm trees, using its strong bill to simultaneously crack a nut and mash the kernel. The fleshy tongue helps to keep large particles out of the throat. The macaw has discovered that rodents eat the outer layers from fallen nuts, but cannot manage to crack the kernels — the tasty portions the macaws prefer. The clever macaw cuts and drops fruits to the ground for the rodents, such as agoutis, then returns the following day to grab the dehusked kernels.

► **FAVORITE FOOD**
A macaw can turn in all directions to reach a nut.

CONSERVATION

Considered rare and vulnerable, the hyacinth macaw has been on the IUCN (World Conservation Union) Red List in Bolivia, Brazil and Paraguay since 1994. With populations between 2,550–5,000, the hyacinth macaw is at risk of becoming extinct if humans continue to exploit its habitat. Illegal capture and hunting, as well as logging, agriculture and hydroelectric projects, are major threats to this bird's survival and habitats.

BREEDING

In the early phases of courtship, the male hyacinth macaw will perform a number of displays for the female, such as dipping his head, spreading out his tail and lowering his wings; he will also contract his pupils and offer her food. The female will reciprocate with similar exhibitions. Both members of the pair will peck and nibble each other gently as signs of affection. The female nests high in a hollow tree hole just large enough for her to fit through; this helps protect her eggs from predators and temperature changes. She lays 2–3 white eggs, which she alone incubates for 27–30 days.

Young chicks are sensitive to the outside elements and do not leave the parents' care until about 12 weeks of age. It is rare for more than one youngster to be successfully reared to fledging because the chicks are especially susceptible to damp weather conditions and threats from poachers, who sell them for captive breeding. Juveniles reach maturity at 10 years of age.

► **PECK AND PREEN**
A courting pair of hyacinth macaws affectionately nibble while cleaning hard-to-reach head feathers.

BEHAVIOR

Mostly sedentary, the hyacinth macaw circulates in small flocks or pairs into areas where food is available. Though capable of flying to great heights, the hyacinth macaw stays low, flapping its wings steadily. The small flocks will stay together during many night journeys, remaining active and quite visible on moonlit nights. In flight, the hyacinth macaw utters loud, repetitive cries and will draw from an extensive repertoire of sounds during courtship rituals, including *trarrree-arree* and *kru* calls. The sound of the bird's harsh warning calls has often been compared to the growling and whimpering of a small dog.

▲ **POWERFUL PERCHER**
The macaw grasps a branch with its thick toes.

BONDING TOGETHER

1 Showing off…
Two macaws perch on a dead branch; one hangs upside down as the other watches with interest.

2 House hunting…
The breeding pair searches for the perfect home. A tree cavity will provide adequate protection.

3 Room for one more…
After laying and rearranging her eggs, the female remains in the snug nest for about 30 days.

4 Caring parents
The adult birds steadfastly care for this one remaining chick, a survivor of damp weather and predators.

PROFILE HYACINTH MACAW

With its powerful bill and brilliant blue coloring, the majestic macaw is a portrait of strength and beauty.

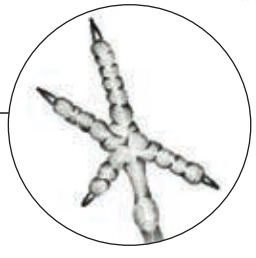
SKULL
The powerful jaws are controlled by strong muscles used to crack open the toughest seeds.

EYES
Despite limited eye movement, the macaw's vision is good; the bird turns its head and neck to change its view. The black iris is circled by a yellow band.

PLUMAGE
The macaw's vivid violet-blue color stands out in its forest home. The undersides of its long, pointed wings and tail are black.

BILL & TONGUE
The stout, curved bill is hooked and hinged, which offers leverage for cracking nuts and tearing fruits. The prehensile tongue helps remove flesh from these foods.

PREENING GLAND
A preening gland, located at the base of the tail, supplies an oil that is applied to the feathers for grooming and insulation.



FEET
Two toes in the front and two in the back give the bird great agility in climbing and also may be used to grasp seeds and fruit while feeding.

VITAL STATISTICS

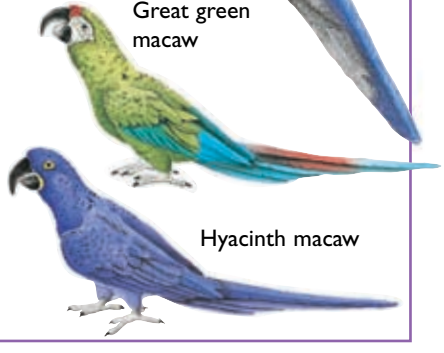
WEIGHT	3–4 lbs.
LENGTH	Up to 40", including a 24" tail
SEXUAL MATURITY	10 years
BREEDING SEASON	December–March
NUMBER OF EGGS	2–3
INCUBATION PERIOD	27–30 days
FLEDGING PERIOD	100–110 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Nuts, seeds, fruit
LIFESPAN	Unknown

RELATED SPECIES

● **The hyacinth macaw is 1 of 3 species in the genus *Anodorhynchus*; the others are the indigo macaw, *A. leari*, and the glaucous macaw, *A. glaucus*. All three species have striking blue plumage and reside in South America. There are 332 species in 78 genera of parrot in the *Psittacidae* family. Parrots join the cockatoos of the family *Cacatuidae*, in the order *Psittaciformes*.**

CREATURE COMPARISONS

The great green macaw (*Ara ambigua*) is slightly smaller than its blue counterpart, the hyacinth macaw. The green macaw has much in common with its relative: it is very rare; it has a large head and hooked beak; and it favors nuts and seeds. The green macaw's plumage is mostly olive-green with a contrasting red and blue tail. Both species lay 2–3 eggs and prefer to travel in small family units or pairs. The great green macaw is found only in the Atlantic lowland of Central America in Costa Rica and in northern Colombia, generally farther north and west than the hyacinth macaw.



Japanese Crane

• ORDER •
Gruiformes

• FAMILY •
Gruidae

• GENUS & SPECIES •
Grus japonensis

KEY FEATURES

- Dances with its partner and other cranes, in rituals that extend beyond courtship into everyday life
- Graceful but raucous ballet seems sometimes to be performed out of sheer joy
- Japan's revered tancho, or "bird of happiness," this affectionate crane forms a lifelong pair bond and is upheld as a symbol of fidelity in marriage

WHERE IN THE WORLD?

Breeds as a resident species in the northeast of Hokkaido island, northern Japan; those that breed in eastern Siberia and northern China migrate to winter south in eastern China and Korea

LIFECYCLE

Almost all cranes "dance" to their partner, but few take their "fun" so seriously as the Japanese crane, which skips and frolics through almost every week of its life.

HABITAT

The Japanese crane lives in freshwater wetlands close to lakes and rivers. It favors marshy moorland and damp, sparsely wooded areas, where dense beds of tall reeds or grasses screen its nest.

About 600 cranes live on the Japanese island Hokkaido, one-third of the entire world population. They survive severe winters by moving to farmland, where they're artificially fed. Cranes in Siberia and China migrate south to spend winter on coastal marshes, mudflats and paddy fields.

For safe roosting, it prefers to stand in shallow water on submerged sandbars in rivers.

◀ **FIELD FARE**
Damp grassland provides shelter and nest material.

CONSERVATION

The Japanese crane's plight began in 1868, when westernization followed the ousting of the Shoguns (feudal governors who had long protected the tancho). Hunting controls disappeared; by the early 1900s European hunters shot the crane into presumed extinction. When 20 survivors were discovered in 1924, rescue efforts began; the crane's population now stands at about 1,800 birds. It's still listed as vulnerable and, although cherished by the Japanese nation, remains threatened by habitat loss, pesticide use and fires.

DID YOU KNOW?

- **Crane designs feature in Japanese marriage ceremonies to symbolize happiness, long life and fidelity.**
- **In feudal Japan, Shogun leaders let only one crane be killed a year, as a gift for the Emperor's feast.**

BREEDING

▲ **TENDER TWO-STEP**
Cranes form and strengthen lifelong pair bond with dances.

▼ **SOFT START**
Tawny down is replaced by feathers after eight weeks.

Cranes pair for life, reinforcing the bond with dancing. Flocks disperse early in the breeding season and pairs take up their nesting territories, which may be several miles apart.

Nest-building is a joint effort. The male brings plant stems to his mate, who builds a mound 12" high and 5' across. Nests are usually sited in, or at the edge of, shallow water.

Both sexes incubate and rear the chicks, which leave the nest in three days of hatching. The adults are diligent parents, bringing tiny morsels, such as insects, to their chicks. They supply food for several months, until the chicks are capable of feeding themselves.

BEHAVIOR

The crane dances almost year-round and at any age; its antics play a key role in almost every aspect of its life. Its routines are used to attract mates, stake out nesting territories, greet other members of the flock and warn of possible danger. Frequent and spectacular dances are performed on snow-covered fields in late winter, when a solo display may inspire a flock into a frenzy.

During their autumn migration, the Asian mainland flocks soar high or fly in V-formation, with a characteristic wing action in which the powerful downbeat is followed by a quick upward flick. The Japanese crane becomes flightless during the summer molt of its wing feathers; during this time it hides in thick cover while the new quills grow and spread into feathers.

TAKE YOUR PARTNER!

1 Duetting…
Graceful and lively, the dance follows no set routine, but the birds usually start by lifting their heads and bugling loudly.

2 Bowing…
One crane curtsies, while its mate accepts the compliment. The bowing bird may hold a stick or reed, which it tosses into the air as it rises again.

3 Craning…
Some postures reveal why "craning" describes awkward movements of the human neck. Dancing birds also make much play with their wings.

4 Leaping
Joyous jumps are performed frequently during the display. When dance fever spreads, an entire flock may hop and skip.

FOOD & FEEDING

The crane's powerful bill and long reach of its flexible neck let it exploit a range of food on land and in water. It obtains much of its food by digging in mud, probing deep for grubs, worms and other invertebrates. It also forages for vegetation, roots, seeds and buds.

The crane captures fish, frogs, snakes and flying insects with a rapid jab of its bill. It also snaps up small mammals and ducklings or other young birds in a similar manner. When faced with prey items too large to swallow whole, the crane shakes them vigorously in its bill to break them into more manageable pieces.

◀ **SHARP SPEAR**
The crane uses its long bill to stab at vegetation and small prey in shallow marshes and rivers.

For the cranes resident on the island of Hokkaido, the staple diet switches in winter to corn, provided at special feeding stations by farmers and conservationists.

PROFILE JAPANESE CRANE

The crane's long legs and neck aren't only useful for feeding; they also enhance the statuesque elegance of its dance rituals.

CROWN
The naked patch of red skin on the crown becomes enlarged and more intensely colored in threat or courtship display.

BILL
Long, strong and pointed, the bill is both a dagger and a digger, used for stabbing at fish and animal prey, as well as rooting out food from the soil.

JUVENILE
The immature crane differs from the adult bird in having a brown neck and black tips to the primary (wing-tip) feathers.

WINGS & TAIL
When the wings are folded, the short, white tail is hidden beneath a black bustle, formed by elongated and pointed inner wing feathers, known as *tertials*.

LEGS AND FEET
Long legs are typical of large birds that wade in water. Adult cranes do not swim, but chicks can swim remarkably well.

CREATURE COMPARISONS

All tall and elegant, cranes vary greatly in size. Smallest is the demoiselle crane of Asia and Africa, which stands half the height of the Japanese crane. With its golden topknot, the 3'-tall crowned crane is a striking inhabitant of the African savannah. Up to 4' tall, the sandhill crane lives in Siberia and North America. Like the Japanese crane, it has a red crown.

Demoiselle crane

Japanese crane

Crowned crane

Sandhill crane

VITAL STATISTICS

WEIGHT	13–20 lbs.
HEIGHT	4'
WINGSPAN	7'
SEXUAL MATURITY	3–4 years
MATING SEASON	March–May
NUMBER OF EGGS	2
INCUBATION PERIOD	4–5 weeks
FLEDGING PERIOD	11–13 weeks
BREEDING INTERVAL	1 year
TYPICAL DIET	Plants, grain, roots, insects, reptiles and small mammals
LIFESPAN	Up to 25 years

RELATED SPECIES

● **The Japanese, or Manchurian, crane is one of 14 crane species; seven are threatened. The rarest (and most closely related to the Japanese) is North America's whooping crane (below), with a population of about 300.**

Kakapo

• ORDER •
Psittaciformes

• FAMILY •
Psittacidae

• GENUS & SPECIES •
Strigops habroptilus

KEY FEATURES

- The world's only flightless parrot and, at about 100 times the weight of a budgerigar, the heaviest
- Almost wiped out in its natural habitat by predators introduced by humans, it now survives on a few small islands under strict protection
- Unusual for a parrot, it's almost always solitary

WHERE IN THE WORLD?

Native to New Zealand, but extinct across its former natural range on the mainland; introduced to three nearby islands: Little Barrier Island, Codfish Island and Maud Island

LIFECYCLE

Unable to fly, the kakapo relies on camouflage as its defense. Very vulnerable to predators introduced by humans, it's now among the world's rarest birds.

HABITAT

The kakapo was widespread in beech and podocarp (a dwarf conifer) forests of southern New Zealand, but Maoris and, later, European settlers, cleared 75% of this native vegetation. Settlers also introduced "alien" predators, including cats, stoats, weasels and dogs. Grazing animals, such as sheep, also drastically altered its habitat.

In the face of these threats, the kakapo declined until only a handful of birds were left. To ensure their future, these birds were captured and released into safe sites. Remaining birds now live only on a few small islands off the coast of New Zealand's mainland islands.

▲ **NEW ISLAND HOME**
Kakapo habitat on Little Barrier Island, New Zealand.

▼ **GREEN HABITS**
The kakapo is colored to blend in with its habitat.

CONSERVATION

The species was abundant in the south and west of New Zealand's South Island until 1900; fewer than 60 kakapos now survive. In the 1970s and 1980s, the birds remaining on Stewart Island (a stronghold off the south coast of South Island) were moved to remote islands where all introduced predators were exterminated. Relocated populations require supplementary feeding; these islands support few trees that produce the high-protein fruits needed for successful breeding.

DID YOU KNOW?

- **An old English name for the kakapo is "owl parrot," a reference to its owl-like face and nocturnal habits.**
- **Unlike many species of parrot, it has so far proved impossible to create the right conditions to keep and breed kakapos in captivity. The species can only survive in the wild.**
- **Unusual for a bird, the kakapo has a strong and distinctive smell and may scent-mark its surroundings like a mammal.**

BEHAVIOR

Unlike other parrots, the kakapo is solitary — except in the breeding season. Each bird occupies a territory of about 0.2 sq. mile, spending the day under shrubs, in burrows under tree-roots or in rock crevices. At dusk, the almost entirely nocturnal kakapo feeds.

The kakapo can't fly, but is an agile climber, using its feet and bill while balancing with outspread wings. It moves with surprising speed downhill by running with a clumsy gait and gliding for short distances. When kakapos move to higher ground to feed or breed, they tend to follow the same routes; over the years, their movements wear away tracks through the undergrowth.

FOOD & FEEDING

Strictly vegetarian, the kakapo feeds on a variety of fruits, seeds, shoots, leaves, roots, moss, fungi and tubers. It searches for food on the ground, climbs into the lower branches of shrubs and trees or digs up roots and tubers with its sturdy bill. With an action similar to that of a pair of gardening shears, the bill can slice through tough stems.

Kakapos chew food with their bill, unlike the great majority of birds, which use a muscular part of the stomach, called the *gizzard*, to grind their food. The kakapo's bill, though, is equipped with a series of ridges on the inside of the upper mandible. These work against the tongue and lower mandible to shred tough, fibrous food.

◀ Loner
Most parrots are sociable, but not the kakapo.

▼ Undercover
During the day, kakapos rest under rocks, roots or shrubs.

▲ Feet first
The kakapo often grasps large or tough food items with one of its feet.

BREEDING

The kakapo doesn't breed every year; its normal diet is too poor in nutrients. High-protein seeds and fruit are needed before males can perform energetic courtship rituals and females come into breeding condition. Good crops are produced only every few years, and the kakapo is restricted to breeding at these times.

▲ Sound system
A male's shallow "bowl" amplifies his loud calls in the breeding season.

When breeding, males share a network of tracks leading to shallow "bowls" in the ground, set on prominent ridges, forming a group courtship arena, or *lek*. Each male occupies his own bowl and "booms" continuously for 6–8 hours every night from December to March. Females travel several miles to visit the lek, choose a male and mate.

A female builds a nest, incubates the eggs and raises the offspring by herself. They fledge at around 10–12 weeks.

BIG BOOMER

1 Boom in the gloom...
Males gather at a traditional courtship arena at night. Sitting in their bowls, they boom loudly, as if blowing over the top of bottles.

2 Dancing partner...
Rival males try to get the females' attention by performing a dancing display. Most females mate with dominant males.

3 Sitting it out...
The female builds a simple nest and incubates her 2–3 white eggs. She receives no help from the male in these tasks...

4 Single parent
...and for the first 4 weeks, broods the chicks all day, feeding them by night. By 8 weeks, she visits only once or twice a night.

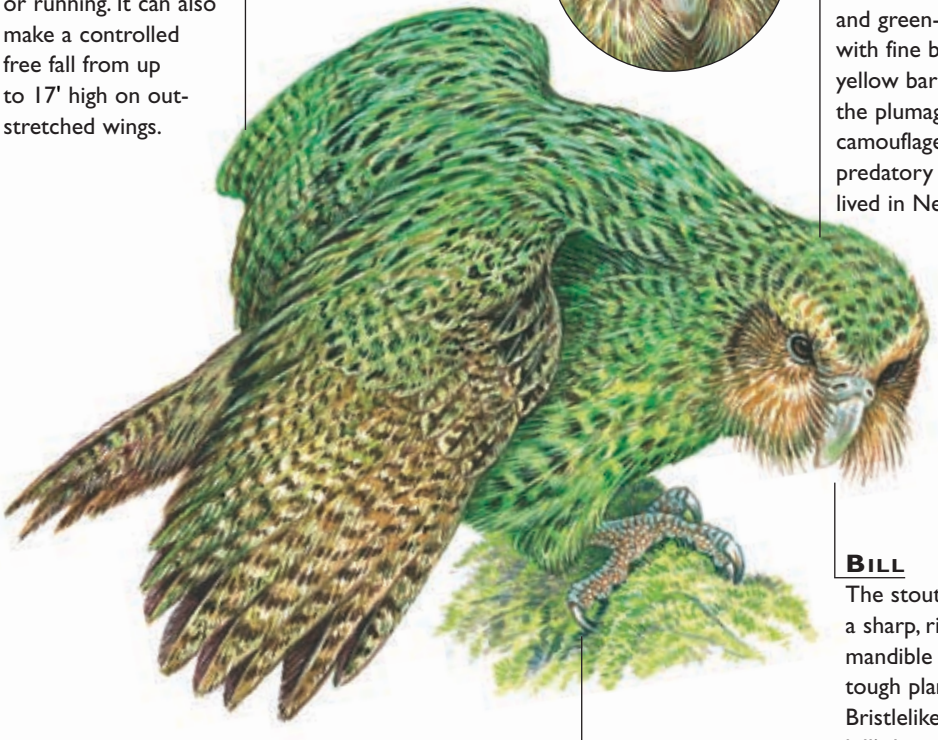
PROFILE KAKAPO

As large as a domestic cat and flightless, the kakapo is an owl-like parrot that is adapted to earn a living on the ground, under cover of the night.

WINGS
Although the kakapo can't fly, it opens its broad wings to help it balance when climbing or running. It can also make a controlled free fall from up to 17' high on outstretched wings.

FACIAL DISC
The bowl-like facial disc is defined by small feathers. The disc, common to owls, helps focus sound.

PLUMAGE
The kakapo's plumage is dull, moss-green above and green-yellow below, with fine brown and yellow bars. In the past, the plumage provided camouflage against giant predatory birds that once lived in New Zealand.



BILL
The stout, blunt bill has a sharp, ridged lower mandible that can cut tough plant material. Bristlelike feathers at the bill's base may function as sensitive whiskers to help the kakapo feel its way around at night.

FEET
Strong and sturdy, the feet have two forward-facing toes and two that point to the rear.

VITAL STATISTICS

WEIGHT	Male 5.5 lbs.; female 4 lbs.
LENGTH	2'
SEXUAL MATURITY	6–8 years
BREEDING SEASON	December –May
NUMBER OF EGGS	2–4
INCUBATION PERIOD	30 days
FLEDGING PERIOD	10–12 weeks
BREEDING INTERVAL	3–5 years; "relocated" birds breed more frequently
TYPICAL DIET	Fruits, seeds, leaves, stems and roots
LIFESPAN	At least 20 years; some reach 30–40

RELATED SPECIES

● **The kakapo's closest relatives are probably the ground parrot and the little-known night parrot of Australia. There are six parrot species native to New Zealand. The red-crowned parakeet (below) is the only one to occur elsewhere: on Norfolk Island and New Caledonia.**

CREATURE COMPARISONS

The kakapo resembles another large parrot native to New Zealand: the kea (*Nestor notabilis*). But the kea is a powerful and agile flier; its bill is much larger than the kakapo's and is strongly hooked with a long, sharply pointed upper mandible. The kea isn't exclusively vegetarian; it uses its bill to dig up burrowing invertebrates and as a meat hook to tear into carrion — especially sheep carcasses.

Kakapo Kea

Kea

• ORDER •
Psittaciformes

• FAMILY •
Psittacidae

• GENUS & SPECIES •
Nestor notabilis

KEY FEATURES

- Labeled a sheep killer, it occasionally feeds on meat but is mainly a vegetarian
- Its far-reaching call echoes from the swirling mists of the mountain tops high in the New Zealand Alps
- It's the only parrot in the world that can survive in snow; frequently remains in high altitudes throughout the winter

WHERE IN THE WORLD?

Limited to the southern portion of the island of New Zealand; found only on South Island, from northwestern city of Nelson through the regions of Marlborough and Fiordland

LIFECYCLE

The multitalented kea shows both brains and brawn in its daily activities, especially in its exploitation of a wide range of available food sources.

HABITAT

▲ **PERFECT PANORAMA**
From the snow-capped mountains to the shining sea, the kea's New Zealand home offers an unequaled island view.

Today, the kea is limited to South Island, the largest of New Zealand's islands. The sturdy kea is at home in the trees or on the ground and is found from just above sea level up to 7,000' in the New Zealand Alps. It prefers higher altitudes, living mainly in the high alpine basins and steep valleys. It is the only parrot in the world that can survive in the snow, frequently remaining in the high altitudes throughout the winter. But it often descends to the low-land river flats, especially on the western side of the southern Alps. The mountain flax plant is common throughout the kea's range, especially on exposed, windswept hillsides. Its flowers provide a sweet treat throughout the summer. During tourist season, the kea frequents camp grounds and ski resorts, looking for food.

CONSERVATION

Since kea scavenge on sheep, which are of economic importance in New Zealand, the birds have unfairly earned a bad reputation. Thousands of kea were killed prior to 1970, but in 1986 the bird, with its near threatened status, received full governmental protection. There are currently about 5,000 kea.

BREEDING

The kea lives in loose flocks, sometimes numbering up to 50 birds, but only a few males and females breed. A small percentage of males, occasionally only 10%, mate in any one season; however, a single male kea may occasionally have several female breeding partners. The pair strengthens their bond by mutual preening. Their nest is made of twigs, grasses, moss and lichens, and sits on the ground — under a log, in a cavity or at the base of a rock outcrop within the forest. Only the female incubates the 2–4 white eggs. The male continues to feed the female after the white down-covered chicks hatch, and brings food for the chicks. After a few weeks, the female finally leaves the nest, and forages for food for the developing nestlings. The male remains with the chicks while the female is gone. Even after the young fledge at 13–14 weeks of age, the parents remain close, accompanying the young for another month to six weeks.

▶ **GROWING UP**
With each molt, the juvenile looks more and more like its parents; it reaches sexual maturity at about 3 years of age.

BEHAVIOR

In flight, the kea announces its arrival with a loud call, *"keee-aa."* Nonterritorial, the kea moves from place to place, searching for food from snowy ski resorts to flower-filled valleys. Instead of wasting energy by flying, the kea climbs like a monkey to reach berries and buds. The parrot proficiently anchors its bill, then quickly maneuvers its feet.

DID YOU KNOW?

- **The playful kea has been observed "sledding" down the A-frame roof of an alpine resort on its back.**
- **The kea is a member of the *Psittacidae* family, which has the largest number of threatened species of any bird family; about 90 species are at risk.**

FOOD & FEEDING

The kea's menu varies from day to day and season to season — it may include anything from sweet fruits to carrion. The kea's selected staples include berries, buds, shoots and roots. It spends much of its time foraging on the ground, digging for roots and underground insects with its trowel-like beak. The bird also delicately removes nectar from flowers in the spring and summer with its comblike tongue. In addition, the kea eats berries and fruits and maneuvers food from bill to foot and back to the bill again with finesse.

Like all parrots, the kea is a very opportunistic bird, and does not pass up the chance to exploit New Zealand's approximately 50 million sheep. It mainly scavenges carrion, but occasionally kills sick or elderly sheep if food is scarce in the winter. The powerful bill, strong enough to tear through sheet metal, is used to rip flesh, much like an eagle's beak.

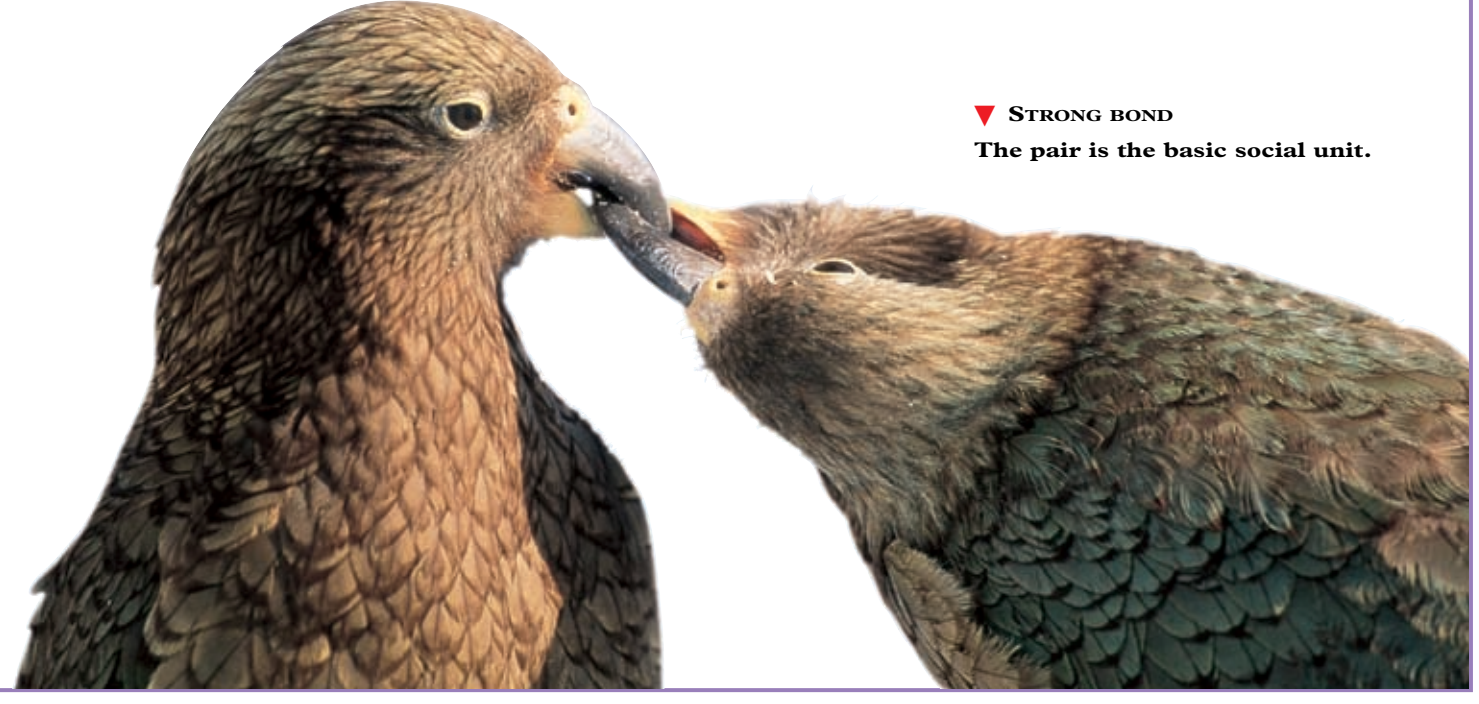
ANNUAL FARE

1 November...
During the summer, the kea laps up nectar from the common mountain flax plant.

2 January...
Late in the season, the kea dexterously feeds on snow totara berries, expertly coordinating its feet, bill and tongue.

3 March...
As winter approaches and temperatures fall, sick and elderly sheep die, and the opportunistic kea feeds on the carrion.

4 May
Young kea frequent ski resorts in the cold, snowy winter and scavenge for feasts of food scraps in open refuse bins.



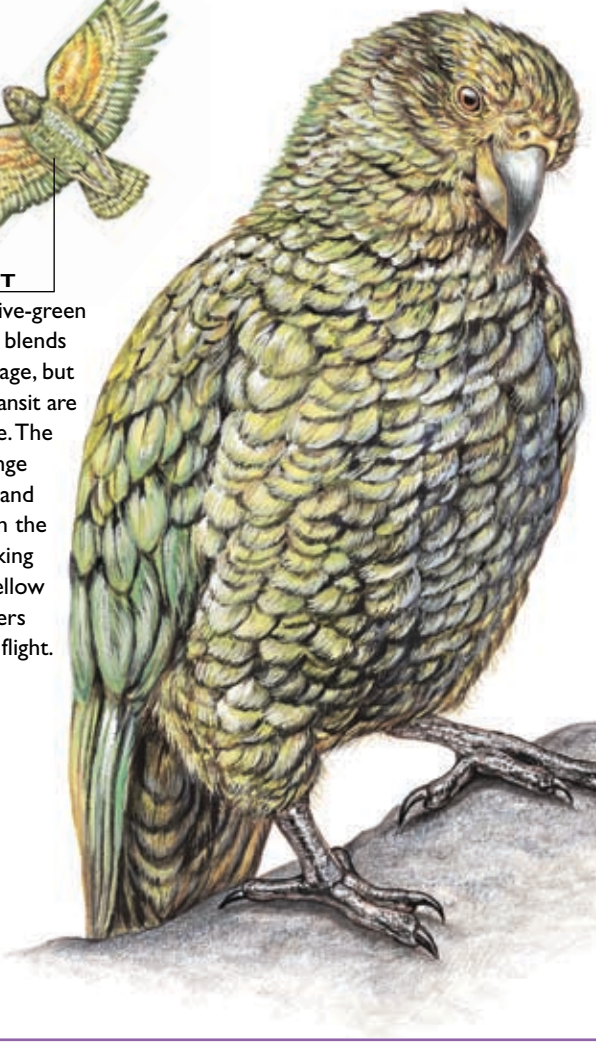
▼ **STRONG BOND**
The pair is the basic social unit.

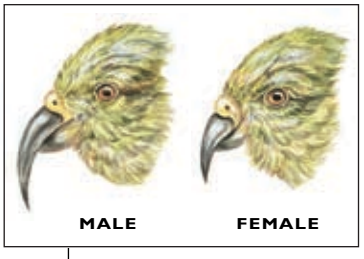
PROFILE KEA

The green kea cleverly manipulates food with its beak and feet, climbs like a monkey and shows off its brilliant colors.

IN FLIGHT

The kea's olive-green color subtly blends with the foliage, but parrots in transit are unmistakable. The reddish-orange underwings and rump flash in the sunlight, making it easy for fellow flock members to follow in flight.



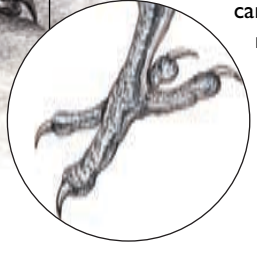


BILL

Measuring up to 2" from base to tip, the upper mandible functions as a trowel and is slightly shorter in females. The bill manipulates and prepares food, but can also help pull the kea up when climbing.

FEET

The toes form an X, with two toes forward and two toes projecting behind. This allows the kea to grasp branches tightly and also carefully manipulate food to the bill.



VITAL STATISTICS

WEIGHT	Male up to 2.2 lbs.; female up to 1.8 lbs.
LENGTH	Up to 18"
WINGSPAN	Unknown
SEXUAL MATURITY	Over 3 years
BREEDING SEASON	July–March
NUMBER OF EGGS	2–4
INCUBATION PERIOD	About 24 days
FLEDGING PERIOD	90–100 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Berries, shoots, roots, seeds, nectar, insects, larvae, carrion
LIFESPAN	About 20 years

CREATURE COMPARISONS

The 18" long olive-brown kaka *(Nestor meridionalis)* is the same length as the kea but, at about 1.3 lbs., weighs one-third less. The kaka is more widespread on New Zealand than the kea and inhabits lower-altitude forests on both North and South Islands.

Like the kea, the kaka includes berries, nectar and insects in its diet. But the kaka also chisels away bark to reach the larvae of Kanuka longhorn beetles and licks the honeydew secretions of scale insects.

Kea

Kaka

RELATED SPECIES

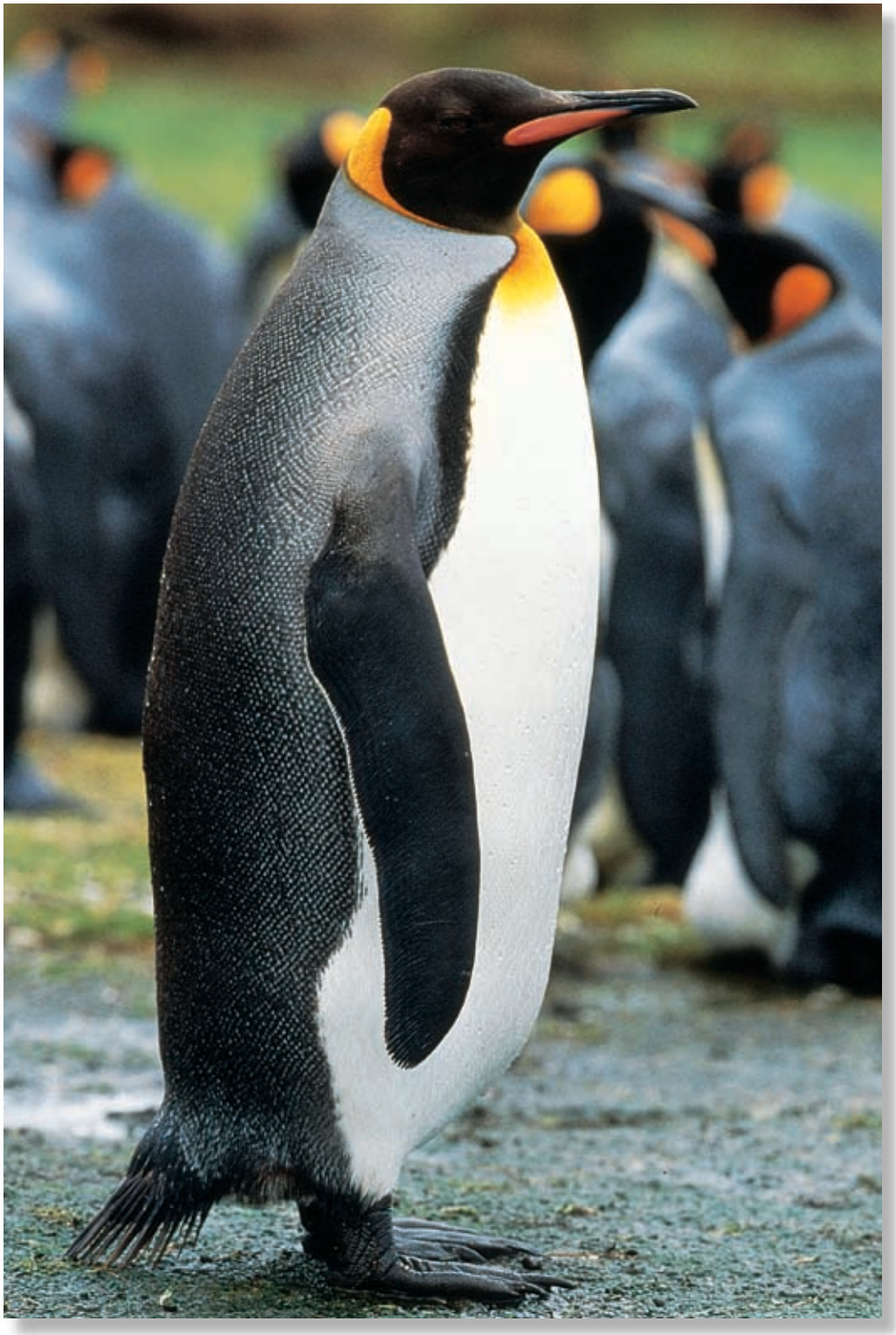
● **Along with the kaka, *Nestor meridionalis,* the kea is one of two species in the genus *Nestor*. They join over 300 species in the parrot family, *Psittacidae*. More adept at climbing than most birds, the family members include amazons, cockatiels, lorakeets and rosellas. Also found on New Zealand is the kakapo, *Strigopshabroptilus,* the world's only flightless parrot.**

King Penguin

• ORDER •
Sphenisciformes

• FAMILY •
Spheniscidae

• GENUS & SPECIES •
Aptenodytes patagonica



KEY FEATURES

- Holds record among all birds for longest fledging period (up to 13 months)
- Can distinguish its chick's call out of thousands when returning from the sea with food
- Survives the intense cold with the help of increased metabolism, a thick layer of blubber beneath the skin and specialized feathers

WHERE IN THE WORLD?

Found on at least eight sub-Antarctic islands, including Marion and Macquarie Islands, in the southern Atlantic and Pacific Oceans between 46-55° S

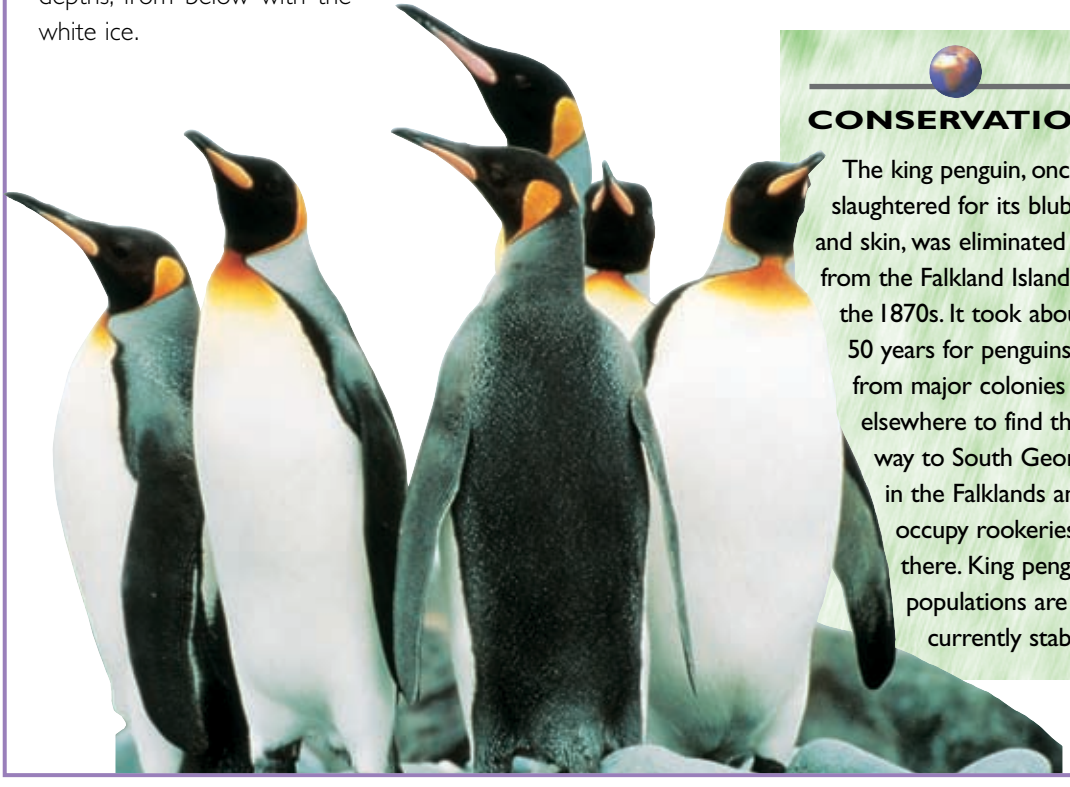
LIFECYCLE

A black-and-white blanket forms over sub-Antarctic islands as king penguins cluster during incubation. The mass of huddled juveniles resembles a giant fuzzy carpet.

HABITAT

The king penguin spends most of its time in the icy waters of the Antarctic; penguins gather on land mainly to reproduce and molt on sub-Antarctic islands such as Crozet and Macquarie. Penguin colonies of hundreds of thousands huddle together to combat the intense cold. Natural enemies in these frigid temperatures include leopard seals and killer whales. Penguins avoid these predators with countershading: from above they blend with the jet-black depths, from below with the white ice.

▲ **A CHILL IN THE AIR**
Warmer than the Antarctic, sub-Antarctic islands are still intensely cold.



BREEDING

King penguins remain in colonies throughout the year, but always return to their ancestral nesting sites to lay their eggs and rear their young. The penguin builds no nest. Instead, it balances a single egg on top of its feet, bending over so that a skin fold covers and warms the egg. Parents take turns incubating the egg. Upon hatching, the soft, downy chick remains on its parent's feet for about 35–40 days until it grows too large to be warmed. When both parents go off to sea in order to feed their chick's growing appetite, chicks gather together in large creches that help keep them warm and protected from the skua, a predatory bird. Returning parents find their chick by listening for its call, which is literally unique among thousands. It enables parents to identify and feed their own chick. The egg-laying and chick-rearing process takes about 15 months, which is why king penguins breed only twice in three years.

CONSERVATION

The king penguin, once slaughtered for its blubber and skin, was eliminated from the Falkland Islands in the 1870s. It took about 50 years for penguins from major colonies elsewhere to find their way to South Georgia in the Falklands and occupy rookeries there. King penguin populations are currently stable.

FROM EGG TO ADOLESCENT

1 Getting ready...
"Wall-to-wall" on muddy flats while incubating their egg, king penguins keep their neighbors in place by the jab of a beak.

2 New arrival...
The female has returned to feed some regurgitated fish to its 2-week-old. The male now goes out to sea for a meal.

3 Baby food...
Groups of chicks, called creches, provide warmth and protection when both parents go to search for food.

4 Growing up
A 10-month-old chases its mother, begging for more food. It will join the creche until both parents return with more food.

FOOD & FEEDING

As Antarctic ice breaks up during the longer summer days, tiny floating plants, known as phytoplankton, grow rapidly. These plants supply nutrients for zooplankton and the shrimplike krill, a staple of the king penguin's diet. Krill swim in schools in the top 150' of the sea, a depth easily reached by the penguin. Diving an average of 160' with a maximum dive of 800', the penguin seems to "fly" through the water in pursuit of prey, which includes lanternfish and squid. The king penguin can ingest larger food than other penguins since the span between the tips of its opened bill is greater.

◀ **A RAVENOUS CHICK**
The chick's blubber serves as an energy source to cope with the irregular feedings from its parents.

BEHAVIOR

Gregarious king penguins flock together on land and in the sea. They waddle comically, tilting their heads to and fro, focusing with one eye then the other. Since they glide faster than they walk, penguins often toboggan toward their nesting sites, following a voluntary leader.

▲ **MY CHILD'S CALL**
Parents can distinguish their own chick's call among thousands when returning from feeding trips at sea.

At sea, the paddlelike wings propel the penguin, while the legs, feet and tail provide steerage. The penguin leaps through the air every few yards, clearing the surface mainly to breathe. Leaping also keeps it from becoming easy prey. Insulation alone is insufficient to maintain a safe body temperature in the water, so the penguin's metabolism increases during its dives. The penguins return to land to molt. During molting, islands are covered in feathers, as the penguin loses them in large patches while new ones appear. The new feathers will not become waterproof for several weeks. As a result, the penguin is unable to dive in the water in search of food and often loses 30% or more of its bodyweight.

DID YOU KNOW?

- **Early Antarctic explorers thought the brown, down-covered king penguin chicks were a totally separate species and called them the woolly penguins.**
- **The name "penguin" was originally given to the now extinct great auk, a large, flightless, black-and-white bird with an extremely upright stance.**
- **The egg has a chalky-white surface that can easily be removed. Underneath is a harder layer with a pale-green color that intensifies during incubation.**

PROFILE KING PENGUIN

A flightless bird, the king penguin is adapted for aquatic existence and is able to "fly" underwater with great speed and agility.

FEATHERS

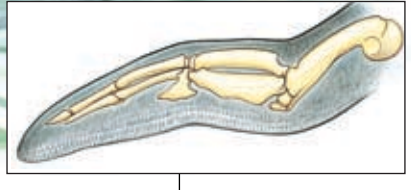
Small muscles attached to each feather allow the angle between the feather and the king penguin's body to change. On land, feathers are held erect, trapping an insulating layer of air next to the skin. In water, feathers are flattened, forming a watertight barrier for the skin and downy underfeathers.

BILL

The bill, with its bright yellow-orange lower beak, has a razor-sharp cutting edge. The tongue is covered with spiky, inward-pointing spines that grip and prevent the escape of captured fish.

FEET

Strong webbed feet, tucked behind the body when swimming, add to the streamlined shape of the penguin in the water. The three hooked toes grip slippery rocks and ice when the penguin waddles on land.



WING

Powerful muscles attach the heavy-boned, paddlelike wings to the sternum.

CREATURE COMPARISONS

The gentoo penguin (*Pygoscelis papua*) is a close relative of the king penguin but is considerably smaller at 30". The gentoo's black head and irregular white patch above the eye contrast with the large orange patches on the sides of the king penguin's head and neck. The gentoo's breeding grounds range from the Falklands to the South Georgia and Kerguelen Islands, much like the king penguin. Unlike the king penguin, which makes no nest, the gentoo penguin builds a nest out of bones, feathers, grass and stones. It lays two eggs, as opposed to the king penguin's one, but like the king, both male and female share incubation.

Gentoo penguin

King penguin

VITAL STATISTICS

WEIGHT	30–40 lbs.
LENGTH	36–38"
SEXUAL MATURITY	3–8 years, usually 5–6
BREEDING SEASON	November–April; lays egg early one season, late the following season
NUMBER OF EGGS	1
INCUBATION PERIOD	54 days
FLEDGING PERIOD	10–13 months
BREEDING INTERVAL	Breeds twice in 3 years
TYPICAL DIET	Fish, squid and krill
LIFESPAN	17–20 years

RELATED SPECIES

- **Penguins are the largest group of flightless birds, with 17 species in six genera. While most species have black backs, the king, emperor and little blue penguin have blue-gray backs. The low mortality rate in the king penguin's genus, *Aptenodytes*, seems to be linked to the laying of a single egg. King and emperor penguins each lay one egg.**

King Vulture

• ORDER •
Falconiformes

• FAMILY •
Cathartidae

• GENUS & SPECIES •
Sarcoramphus papa

KEY FEATURES

- A powerful scavenger that soars over the forests of Central and South America
- One of the most strikingly colored and odd-looking of all birds of prey
- Often the first vulture to feed at a large carcass; its strong bill can rip through the toughest hide

WHERE IN THE WORLD?

Ranges from central Mexico through Central America into South America, as far south as northern Argentina; also found on the island of Trinidad in the Caribbean

LIFECYCLE

The king vulture often relies on other vulture species to find a meal. But at a carcass, it lives up to its name when others stand back, giving way to the power of its mighty bill.

HABITAT

The king vulture is a bird of the lowland tropics, but occasionally is found up to 8,250' on the slopes of the Andes mountains. It prefers to fly over large, undisturbed areas of forest, but may hunt on open savannah and grassland, although usually only where there is woodland close by. It's at home in the unbroken rainforests of the Amazon as well as in the dry, deciduous forests of parts of Central America, Venezuela, eastern Brazil, Paraguay, Bolivia and northern Argentina.

▲ **LONER**
The king vulture is at home in the deep gloom of dense rainforest.

FOOD & FEEDING

The king vulture is a scavenger, feeding on carcasses of a wide range of wild and domestic animals. Soaring high, it uses its superb eyesight to spot carrion far below in grassland or forest clearings. But above dense forest, it relies on other vultures to guide it to food. Unlike the king vulture — and most other birds — the turkey vulture and two species of yellow-headed vulture, which share the king vulture's range, have a keen sense of smell and use it while soaring at low level to trace carcasses other species can't see. The king vulture takes advantage of this, often shadowing the smaller vultures. When they drop to feed, it follows close behind. It dominates the others at a carcass, but may tolerate their presence while it feeds.

The king vulture has a stronger bill than its relatives, and can even rip into the "armor" of an armadillo *(above right)*. This sometimes benefits the smaller vultures as they can't break into such carcasses themselves.

FIT FOR A KING

1 Search...
Soaring high, a king vulture spots turkey vultures below as they fly in circles — a sign that they've scented food hidden in the forest.

BREEDING

Courtship begins in March with a pair of vultures opening and closing their wings and lowering their heads to show off their crowns.

Like other New World vultures, king vultures don't build a nest. The female lays her one white egg in a hollow tree stump or on the ground, occasionally on cliffs, and sometimes in the old nests of other birds. The egg is incubated for 8 weeks, in some pairs by both sexes; in others, only by the female. The chick (covered in white down) and the female are fed on regurgitated carrion by the male. Later, the female helps feed her offspring.

The chick regularly wanders from the nest as it develops and fledges in three months. The parents keep a close watch on their young for possibly as long as two years, before it leaves and becomes independent.

▲ **PRINCE**
This youngster has yet to grow full adult plumage.

2 Follow…
The king vulture follows the turkey vultures to the carcass of a river dolphin that washed up on the bank and drives them away.

3 Tear…
The king vulture soon rips the dolphin open and begins feeding on the skin and tougher parts while the other vultures look on.

4 Full
When the king vulture has eaten its fill, the turkey vultures draw close, waiting to feed on the softer parts left behind.

DID YOU KNOW?

- **The king vulture's species name, *papa*, is the Latin word for bishop and relates to the bird's similar appearance to the finery worn by a bishop.**
- **In Brazil, the turkey vulture — the frequent feeding partner of the king vulture — is called the minister vulture, reflecting its sometimes privileged, but subordinate, position.**
- **Like its relatives the storks, the king vulture shoots its white, liquid droppings onto its legs to cool itself in hot weather.**

CONSERVATION

It's difficult to estimate the king vulture's population, as the bird is rarely seen, spending much of its time in the forest canopy or soaring high in the sky. The species doesn't appear to be threatened and may even benefit from the growing number of cattle ranches, provided it has access to patches of undisturbed forest for breeding. But it suffers when forests are cleared or where populations of large mammals are reduced.

BEHAVIOR

The king vulture isn't very social and is usually found singly, in pairs or in family groups of two parents and a youngster. It spends its time soaring or perching on treetops or resting on river sandbanks. It's a silent bird; along with its relatives, it lacks the *syrinx* (voicebox) of most birds and can make only weak hissing sounds.

The unusual pattern of brightly colored bare skin on the king vulture's head probably helps it recognize members of its own species as well as advertise an individual's status.

▲ **CLEAN-SHAVEN**
A featherless head is easy to clean after feeding.

▼ **MORNING SPRUCE-UP**
The sun's heat straightens feathers bent by hours spent soaring.

PROFILE KING VULTURE

A powerful build and intimidating bill enable the colorful king vulture to dominate other South American vultures and rip into tough carcasses.

HEAD & NECK
Head is adorned with brightly colored, grooved *wattles* (loose folds of bare skin); the neck has bright, bare skin.

BILL
Heavy bill is hooked for tearing skin. Its fleshy base, the *cere*, is bright orange and bears a bright, multilobed wattle.

PLUMAGE
The male and female look alike with bold creamy-white-and-black plumage. A bare patch of skin on the chest overlies the *crop* (a food storage sac in the bird's gullet) which may bulge when the bird has eaten a large meal.

FEET
The feet and talons are weak and are designed for walking. They aren't adapted to tearing flesh or carrying food like most other birds of prey.

EYES
The eyes are colorful, with a gleaming white iris surrounded by a bright-red ring.

RUFF
A thick grayish ruff of short feathers surrounds the base of the neck.

JUVENILE
A juvenile lacks the bold colors of an adult, being an overall grayish-black with similarly drab bare skin areas. It gains adult colors gradually over about four years.

VITAL STATISTICS

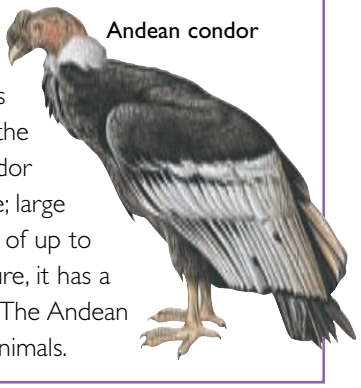
WEIGHT	6.5–8 lbs.
LENGTH	2–2.7'
WINGSPAN	6–6.5'
SEXUAL MATURITY	3–4 years
MATING SEASON	March–August
NUMBER OF EGGS	1
INCUBATION PERIOD	53–58 days
FLEDGING PERIOD	About 3 months
BREEDING INTERVAL	1 year
TYPICAL DIET	Carrion of a wide variety of species
LIFESPAN	Unknown

RELATED SPECIES

● The king vulture is one of 7 species of New World vulture in the *Cathartidae* family, which includes the American black vulture, California and Andean condors, the lesser and greater yellow-headed vultures and the turkey vulture. New World vultures, classified in the bird-of-prey order *Falconiformes*, are now thought to be more closely related to storks, family *Ciconiidae*, in the order *Ciconiiformes*.

CREATURE COMPARISONS

Two other species of vulture from the New World are even larger than the king vulture: the California condor, *Gymnogyps californianus*, and Andean condor, *Vultur gryphus*. The latter is in the same family as the king vulture and is the world's largest bird of prey. The Andean condor can be four times heavier than the king vulture; large males weigh up to 26 lbs. It has an overall length of up to 4' and a wingspan of up to 10.5'. Like the king vulture, it has a bare neck to prevent soiling when feeding on carrion. The Andean condor has also been known to kill sickly or dying animals.



Kiwis

• ORDER •
Struthioniformes

• FAMILY •
Apterygidae

• GENUS & SPECIES •
Apteryx sp.

KEY FEATURES

- Nocturnal, flightless birds that spend the day sheltering in dense cover or hollow logs
- Use long, probing bills and a highly developed sense of smell to search out underground prey
- Produce enormous eggs that are incubated for longer than any other species of bird

WHERE IN THE WORLD?

The brown kiwi is found only on North, South and Stewart Islands, New Zealand; the little spotted kiwi is on four offshore islands; the great spotted kiwi is found on South Island

LIFECYCLE

Kiwis are extremely secretive birds, spending their days hidden in dense vegetation and emerging only under cover of darkness to probe for food buried in the ground.

HABITAT

The three species of kiwi are found in a variety of habitats across New Zealand. Preferred natural habitat is among the wet forests of *podocarps* (evergreen coniferous shrubs) and hardwoods, but they're also found in dry, open forests, scrubland and meadows surrounded by woodland. Because of clearance of native forests in New Zealand (which is now controlled), kiwis are also found in nonnative pine forest plantations and even on agricultural land.

Little is known about kiwis' precise habitat requirements. But soil texture appears to be an important factor; it has to be soft enough for kiwis to probe for food, yet firm and supportive enough to allow safe excavation of nest sites. Soil must also be rich to attract worms and small invertebrates on which kiwis feed.

▼ **UNDERCOVER**
Flightless, kiwis need thick vegetation for cover.

DID YOU KNOW?

- **Kiwis have poor eyesight; they can see only about 3' in daylight and 7' in the dark.**
- **While incubating eggs, male kiwis lose as much as a fifth of their bodyweight.**

BREEDING

Once a kiwi chooses a breeding partner, the pair stays together for life. After mating, a female lays one or two eggs in vegetation, a hollow log or between tree roots. A second egg may be laid up to 30 days after the first. Eggs are huge, weighing up to a fifth of the female's bodyweight. The male takes over, incubating the eggs for three months (the longest incubation period of any bird). Hatching may take three days; in a week, the chicks are strong enough to leave the nest to search for food.

◀▶ **ON THE NEST**
A newly hatched brown kiwi *(left)* and a week-old great spotted kiwi *(right)*.

KIWI FRUIT

1 Preparation...
A little spotted kiwi uses its strong legs and feet to excavate a nest hole among the tree roots.

2 Big egg...
The female then lays her enormous egg, the largest of any bird in the world relative to her bodyweight.

CONSERVATION

Full protection was given to kiwis in 1921, but by then the birds had suffered from relentless hunting for food and feathers, and by the destruction of their habitat. Deforestation continues, but conservationists are translocating kiwis to new areas before their forests are cut down and holding some birds in captivity to set up breeding programs.

BEHAVIOR

Many of the kiwis' habits are more akin to those of mammals than birds. They live in pairs all year and keep in contact within a home range by using calls. They're also aggressively territorial, and although they chase away intruding kiwis, they also use droppings to mark out their territories as many mammals do.

Kiwis are nocturnal; because they're flightless, the dark offers safety against predators. In fact, kiwis appear to have a strong dislike of daylight and when roosting, bury their heads beneath the feathers of their rudimentary wings.

3 Big break…
The chick hatches after three months' incubation by the male. It breaks through the shell with its feet.

4 Freedom
Both parents feed the chick. In a week, it leaves the nest and is independent at 14–20 days.

▼ **Night bird**
Kiwis leave their shelters only after dusk.

FOOD & FEEDING

Kiwis rely on their highly developed senses of smell and hearing to find food during their nighttime foraging. These nocturnal birds scratch through leaf litter and soil with their powerful claws for earthworms, millipedes, beetles, insect larvae, crickets and spiders. Kiwis also employ their long, sensitive bills to target prey, peppering the ground with holes up to 0.4" wide and 6" deep. Seeds and berries are also eaten; kiwis pick them off the forest floor with a tweezerlike bill action. As they feed, kiwis make a snuffling sound as they breathe in to pick up the scent of prey and as they breathe out, possibly to clear dirt from the nostrils after probing in the soil.

When food is plentiful, kiwis amass fat (may total one-third their weight), which they draw on during food shortages.

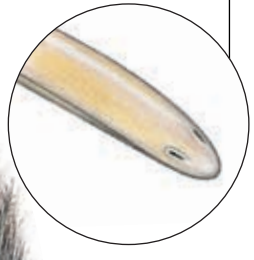
▼ **Bill of fare**
Kiwis can smell prey hidden beneath the surface.

PROFILE KIWIS

Oddities of the bird world, the flightless kiwis have no visible wings and plumage that looks more like a coat of long hair than feathers.

BILL
Female's bill is up to a third longer than the male's, which means she can reach food at a deeper level and avoid competition for the same resources.

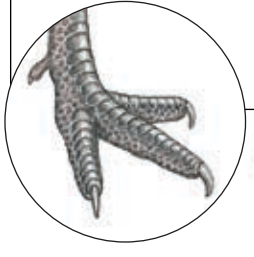
NOSTRILS
Unlike other birds, kiwis have nostrils at the tip of their bills to help sniff out prey in the ground.



PLUMAGE
Plumage is dense and hairlike, protecting kiwis as they move through prickly vegetation. Two short wings, about 2" long, are hidden under the feathers.

BRISTLES
Long bristles around the bill act as feelers to help kiwis navigate in the dark.

LEGS & FEET
Powerful, muscular legs with large, clawed, stout-toed feet help kiwis run swiftly, scrape soil and kick out in defense.



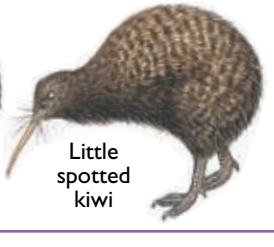
EARS
Kiwis have good hearing and cock their heads to listen for prey moving in the soil.

CREATURE COMPARISONS

Size is the principal difference between the three kiwi species. The largest is the brown kiwi; some females weigh 8 lbs. At the other end of the scale is the little spotted kiwi, which weighs only 2 lbs. The great spotted kiwi is slightly larger. The species can also be told apart by their coloring. The brown kiwi is uniform brown, the little spotted kiwi is brown with lighter barring and the great spotted kiwi has an overall brown-streaked appearance.

Brown kiwi

Great spotted kiwi



Little spotted kiwi

VITAL STATISTICS

WEIGHT	2–8 lbs.; female heavier than male
LENGTH	1–2'
WINGSPAN	1.5–2"
SEXUAL MATURITY	5–6 years
BREEDING SEASON	August–January
NUMBER OF EGGS	1 or 2
INCUBATION PERIOD	71–84 days
FLEDGING PERIOD	14–20 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Insects, worms and berries
LIFESPAN	Unknown in wild; 30 years in captivity

RELATED SPECIES

- There are 3 species of kiwi in the *Apteryx* genus (the great spotted, *A. haasti*, little spotted, *A. owenii, and* brown, *A. australis*). All are in the *Struthioniformes* order (flightless birds), which includes the emu, *Dromaius novaehollandiae* (below).

Kori Bustard

• ORDER •
Gruiformes

• FAMILY •
Otididae

• GENUS & SPECIES •
Ardeotis kori

KEY FEATURES

- At nearly 40 lbs. and with a wingspan of nearly 8', the kori bustard is one of the world's heaviest flying birds
- The bustard will breed in an area just after animal herds have moved through, possibly looking for stirred-up insects to feed its young

WHERE IN THE WORLD?

Found in eastern and southern Africa; stretching from southern Angola and Namibia east through Botswana to southern Zimbabwe

LIFECYCLE

Both sexes of the kori are well camouflaged with their cryptic plumage, but the polygamous male invites attention by inflating his neck and ruffling his neck feathers.

HABITAT

The kori bustard prefers flat, arid and mostly open country, generally below 700', with a short herb layer. The bird typically favors locations where the grass is not too long and where stony outcrops are present. It frequents grassland, bushveld, scrubland and savannahs, as well as floodplains, duneland and fossil valleys. The bustard doesn't shy away from man-made habitats, such as wheat fields. During the hot, dry season in Kenya, many birds move into woodland.

▲ **HITCHING A RIDE**
On the plains, a bustard gives a bee eater a ride.

FOOD & FEEDING

Equipped with an all-purpose bill, the kori bustard is an opportunistic feeder. The bustard is well known for taking advantage of swarming locusts and grasshoppers, and after bush fires has been known to feed on the victims, including dead and dying insects as well as vertebrates, mainly small snakes and lizards. Additionally, the bird exploits a wide range of vegetable and animal resources, such as seeds, berries, bulbs, Acacia gum, snails, rodents and small birds. In fact, research has shown that vegetable matter, including seeds, berries and roots, makes up a surprisingly large proportion of the kori bustard's extremely varied diet.

WINE AND DINE

1 Join the crowd...
The kori is not afraid of larger animals, and actually nests in areas where herds have passed through.

3 Salad with dinner...
The kori bustard's sharp bill can also be used to peck at a small shrub, where it pulls off leaves.

DID YOU KNOW?

- **Plant materials consumed by the bustard include the gumlike sap of acacia trees, which may be the basis for the kori bustard's Afrikaans name *Gompou*, or "rubber peacock."**
- **Prehistoric man seems to have valued the kori bustard; cave drawings and rock engravings feature the bird as game. Currently, the kori bustard features prominently in the dances and songs of Botswana's African bushmen.**

BEHAVIOR

The kori bustard male exhibits grand and vibrant displays, most notably its strutting and booming call. During the strutting "balloon display," the male gulps air and inflates his gular pouch, an expanded area of the bird's esophagus, or gullet. The pouch can be inflated to four times its normal size and held in this inflated state for an indefinite period. The bird's "booming" call consists of three pairs of drumlike sounds: *ump-ump, ump-ump, ump-ump*. The kori bustard often associates with herds of large ungulates, such as wildebeest or zebras; the bird feeds on disturbed insects or on insects, such as the dung beetle, that are attracted to the dung piles left behind by these large animals.

▲ **BALLOON DISPLAY**
The male bustard can greatly inflate his neck.

2 Sight and snatch…
Striking out at a dung beetle, the kori bustard uses its bill to snatch the tasty insect.

4 After-dinner drink
A thirsty bustard crouches at a small pool in its grassland home and drinks by filling its bill.

BREEDING

The kori bustard breeds from September to February in South Africa and December through August (depending on the rains) in East Africa. In fact, in East Africa, breeding success is greater when the wet season is longer. Males mate with several females, and while courting, the male walks slowly around the female or stands within 30' of her, bowing with his body tilted forward and neck inflated; the head never reaches below the level of the shoulders. The booming display is performed with a fully inflated neck, the wings drooping, and the tail lowered so as to form a straight line with the wings. The nest is built by the female; it is often a simple scrape on the ground with a thin lining of grass. Nests may be built near rocks or a clump of grass, sometimes in partial shade. The bustard will often breed in an area just after herds have moved through; there, they find fresh insects for their young, which have been stirred up by the mammals. The female usually lays two eggs, but only one in drier years. The incubation period lasts around 25 days, and chicks are capable of flight by 5 weeks of age.

CONSERVATION

The kori bustard is not globally threatened, but is listed on CITES Appendix II. If undisturbed, the bird can still be common, as it is in parts of Botswana. Around 5,000 individuals inhabit Zimbabwe, but the species is declining there due to habitat destruction, hunting pressure and disturbance. The kori bustard is also threatened in South Africa for the same reasons.

DAZZLING DANCE
Bustards perform an elaborate courtship dance.

PROFILE KORI BUSTARD

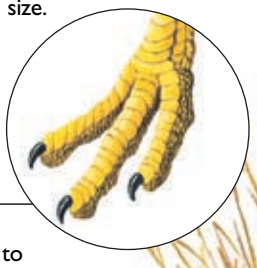
The kori bustard's large size deters many predators; a walker rather than a runner or flier, it sometimes passes weeks without taking wing at all.

BILL
Equipped with a daggerlike, all-purpose bill, the kori bustard is an opportunistic feeder, snatching up snails, insects, rodents, lizards and snakes.

CREST
Both sexes display a straggly black crest of head feathers; the male raises his during courtship displays.

FEMALE
Much smaller than the male, the female kori bustard also has less black on the crown of her head.

NECK
During the courtship display or shows of aggression, the kori bustard has the ability to inflate its neck up to four times its normal size.



FEET
Lacking a hind-toe with which to grip a perch, the kori bustard is highly terrestrial. Its three short, broad toes are small for the relatively large size of the bird.

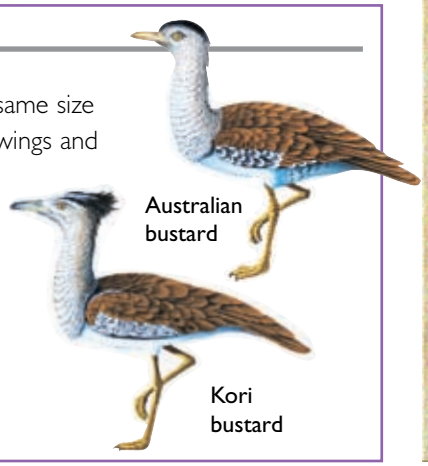
PLUMAGE
The kori bustard's cryptic back, wings and central tail are brown, tinged with a fine buff, providing it with excellent camouflage in its habitat; its white wing panels are spotted with black.

VITAL STATISTICS

WEIGHT	About 40 lbs.
LENGTH	4.5'
WINGSPAN	8'
SEXUAL MATURITY	Probably 1 year
BREEDING SEASON	September–February in southern Africa; December through August in East Africa
NUMBER OF EGGS	1–3
INCUBATION PERIOD	25 days
FLEDGING PERIOD	4–5 weeks
BREEDING INTERVAL	1 year
TYPICAL DIET	Seeds, lizards and snails
LIFESPAN	Unknown

CREATURE COMPARISONS

At 47", the Australian bustard (*Ardeotis australia*) is roughly the same size as the kori bustard. Its cryptic plumage is also similar; the back, wings and central tail of the Australian bustard are brown with fine, dark marbling, but its neck spots look more like freckles, in contrast to the kori bustard's bars. Both birds inflate their necks during courtship displays; in addition, the Australian bustard's throat pouch nearly touches the ground in its dramatic "balloon display." The birds' ranges are different: the Australian bustard is found in dense grassland in Australia and New Guinea, while the kori bustard makes its home in the open plains of Africa.



RELATED SPECIES

● There are 11 genera and 25 species in the family *Otididae*. The kori bustard is 1 of 4 species in the genus *Ardeotis*, which also contains the Arabian bustard, *A. arabs*, the Great Indian bustard, *A. nigriceps*, and the Australian bustard, *A. australis*. There are a variety of bustard relatives in the order *Gruiformes*, including trumpeters, rails, buttonquails and cranes.

LAMMERGEIER

• ORDER •
Falconiformes

• FAMILY •
Accipitridae

• GENUS & SPECIES •
Gypaetus barbatus

KEY FEATURES

- One of the world's largest birds of prey, this vulture has bold plumage and an impressive "moustache"
- Magnificent in the air, with a striking flight silhouette and the ability to soar effortlessly for hours on end
- Obtains most of its food by scavenging for carrion and breaking bones to expose the nutritious marrow

WHERE IN THE WORLD?

Ranges in central and southwest Asia, from Turkey to China and Mongolia; also found in East and South Africa, the Atlas Mountains of Africa, Corsica, Greece, the Pyrenees and the Arabian Peninsula

LIFECYCLE

The lammergeier is a scarce but legendary hunter and scavenger, renowned not just for its majesty in the air, but also for its spectacular use of gravity to break open bones.

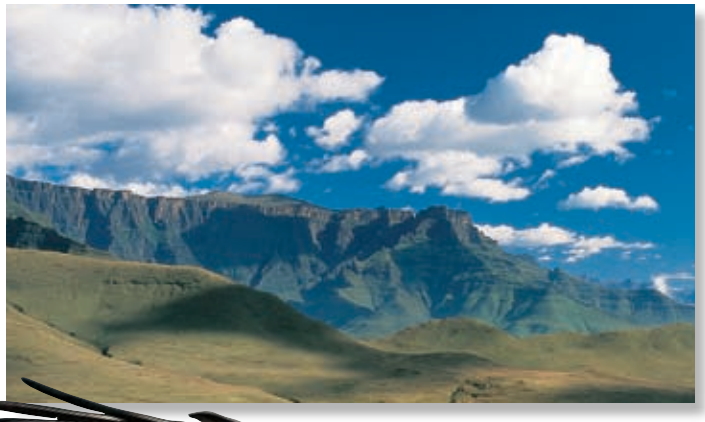
CONSERVATION

The lammergeier is extinct in many areas due to hunting and poisoning. Since 1986 a conservation program has reintroduced 60 birds to the Alps of France, Switzerland, Austria and Italy.

HABITAT

The lammergeier favors wild, rugged mountainscape altitudes of 3,300–9,900', but it's sometimes found on peaks, up to 14,850' that are free of permanent ice. Its common haunts are crags and steep ridges where there are flat, level rocks that can be used as bone-breaking platforms. The lammergeier also occurs in lowland wilderness, including open steppes and tropical plains, exploiting thermals that rise over the latter.

The lammergeier is scarce in Europe, where it is confined to the most remote sites.



▼ **RIDING THE THERMALS**
The lammergeier lives in South Africa's Drakensberg Mountain.

BEHAVIOR

▲ **EYE IN THE SKY**
The lammergeier soars high over its range on thermals and updrafts.

Although a lone hunter, a pair of lammergeirs occupies and carries out most of its feeding in home ranges as large as 120-sq miles. Within this living space, the pair typically uses up to five different roost sites and maintains several alternative eyries, used in rotation from one nesting season to the next.

With apparent ease, a lammergeier may fly over 24 miles in one day while hunting. After a few heavy downstrokes to lift itself from its perch, the bird sets off with its great wings held straight, soaring upward on warm thermals with barely a wingbeat, or gliding parallel to the ground with an occasional flap. At times the lammergeier flies to great heights, but it also spends more time than most vultures in the lower airspace, a few yards from the ground.

To descend, the bird spreads and angles back its wings-— rather like a falcon — then glides or swoops, pulling up at the last moment to settle gracefully.

The lammergeier perches with its body held in a more oblique posture than do most vultures, with its head held up and the wingtips free of the tail. Its powerful legs enable it to walk over ground with ease.

▶ **TELL TAIL**
In flight, the lammergeier's tail appears as a distinctive, elongate wedge.

DID YOU KNOW?

- **Owing to its prominent beardlike bristles that grow forward along the bill, the lammergeier is sometimes referred to as the "bearded vulture."**
- **In parts of Asia the lammergeier may visit rural settlements on ritual slaughter days, hoping to snatch scraps from freshly butchered carcasses.**

FOOD & HUNTING

The lammergeier is primarily a scavenger. Despite its size, it usually waits until other raptors, such as vultures, have had their fill before visiting a carcass. It bites clean through small bones, or holds them in its bill and bashes them against rocks.

To extract the marrow from larger bones, this bird repeatedly drops them onto an "ossuary," an outcrop of flat rock. It does the same to crack tortoise shells. Occasionally it attacks sickly goats on rocky slopes, dislodging them by furiously flapping its wings.

▲ **CLEANING UP THE SCRAPS**

The lammergeier eats bones as long as 4" without breaking them. Digestion begins on the bone end in the stomach while the other end is still in the bird's bill.

BONE-BREAKER WITH PATIENCE

1 A deserted carcass…

The lammergeier returns to a carcass after other scavengers have fed on it; it specializes in hacking into tough skin and bones.

2 With no meat left…

Grasping a heavy leg bone in its talons, the lammergeier flies to one of its bone-breaking sites. It climbs to a height of 165–264'.

3 But I'll settle for bones…

As it approaches the spot, the bird dips slightly to increase momentum; it drops the bone, then turns abruptly and follows it down.

4 If I can break them

Up to 50 drops may be needed before the bone breaks on the rock. Further blows against the hard ground expose the marrow.

BREEDING

Breeding lammergeier pairs stay together for life. Up to three months before breeding, the pair re-establishes their nest site in a niche in a cliff. The birds strengthen their pair-bond with exchanges of food, mutual preening and spectacular aerial dances involving spirals, dives, rolls and twists. In one flight display, the birds chase each other before gripping claws and tumbling to within yards of the ground. The pair refurbishes the nest with wool and dry dung before the female lays her clutch of mottled eggs.

Compared with other large raptors, the male lammergeier plays a major part in caring for the young. Both sexes take turns incubating the clutch and feeding the nestlings; they continue to bring food morsels for a few weeks after the chicks have their flight feathers.

▲ **BLOODLINE**

The adult lammergeier brings food back to the nest for its partner and hungry fledglings.

PROFILE LAMMERGEIER

Massively built, the lammergeier has the long and slender wings of a glider and the strength to lift heavy bones into the sky.

BILL

Long, dark bristles obscure the true size of the lammergeier's hooked bill, which is nearly 3" long from flattened tip to wide base and the same length as the rest of the head.

NECK

Most vultures have a bare head and neck for probing inside carcasses, but the lammergeier has feathers that extend over its throat, forehead and nape.

JUVENILE

The first full plumage of a lammergeier is more subdued in color — gray-brown with dark-brown neck and flight feathers — than that of a mature adult.

FEET

The large feet, strong toes and sharp, curved claws are ideal for lifting and carrying food items. Other vultures can carry only food in the bill.

VITAL STATISTICS

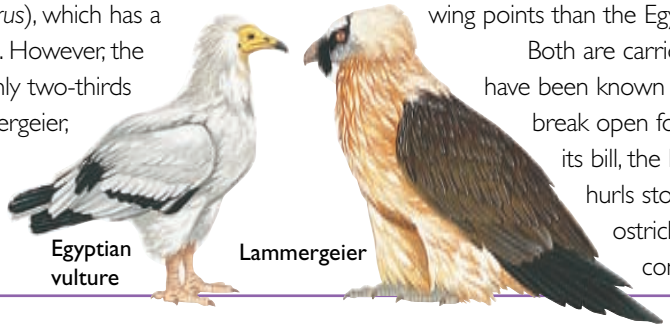
WEIGHT	10–15.5 lbs.
LENGTH	3.5–3.8'
WINGSPAN	8.75–9.3'
SEXUAL MATURITY	5 years
BREEDING SEASON	Varies according to region; January–July in southern Europe
NUMBER OF EGGS	Usually 1 or 2, occasionally 3
INCUBATION PERIOD	55–60 days
FLEDGING PERIOD	100–110 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Hunts small mammals and birds; carrion
LIFESPAN	Unknown

RELATED SPECIES

● **Birds of prey form a large order, *Falconiformes*, of 5 families. *Accipitridae*, the biggest family, includes hawks, buzzards, kites, harriers, eagles and Old World vultures. The lammergeier is sole member of its genus, but the family has 13 other vulture species with 8 genera. The 7 species of New World vulture form a separate family, *Cathartidae*, and are not related to their Old World counterparts.**

CREATURE COMPARISONS

The bird that most resembles the lammergeier in general shape is the smaller Egyptian vulture (*Neophron-percnopterus*), which has a similarly broad range. However, the Egyptian vulture is-only two-thirds the size of the lammergeier, with a striking white plumage and a more delicate bill free of bristles. In both species the juvenile has dark plumage, but the lammergeier is larger in size with narrower wing points than the Egyptian vulture. Both are carrion feeders and have been known to use rocks to break open food items. Using its bill, the Egyptian vulture hurls stones against ostrich eggs to get its contents.



Egyptian vulture

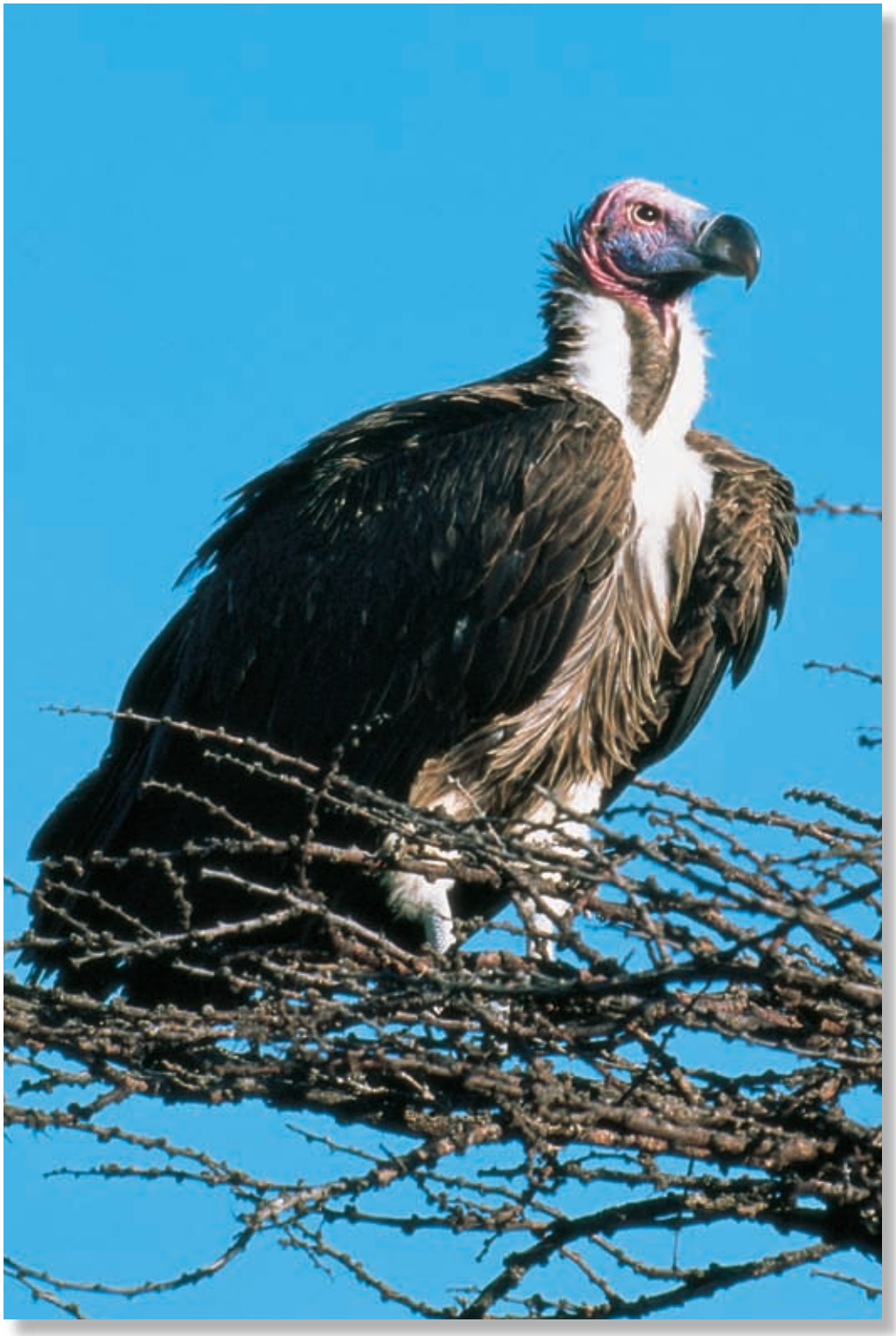
Lammergeier

Lappet-faced Vulture

• ORDER •
Falconiformes

• FAMILY •
Accipitridae

• GENUS & SPECIES •
Torgos tracheliotus



KEY FEATURES

- The lappet-faced vulture is the largest, and among the rarest, of all of the African vultures
- Its lappets — loose folds of skin on its face — look like ears, hence its other common name, African eared vulture
- Has the strongest beak of any vulture, easily tearing into the tough hide of almost any animal

WHERE IN THE WORLD?

In Africa, from the Sahara, east to Ethiopia, south through Kenya, Tanzania and into South Africa, and west to the Namib Desert; also the deserts of Israel and the Arabian Peninsula

LIFECYCLE

Other vultures gather around tough-hided carrion and wait for the lappet-faced vulture, the most powerful of all of the vultures, to arrive and rip the carcass open with its beak.

HABITAT

The lappet-faced vulture prefers the bright sun and warmth of the semi-arid deserts and savannahs of Africa, Israel and the Arabian Peninsula. This massive bird frequents open desert areas with desert scrub; it nests in the shortest trees in the area, commonly thorny acacias. These large, open areas with little cover make it easier for the lappet-faced vulture to spot the dead and dying animals upon which it feeds. Though quite dominant at feeding sites, the lappet-faced vulture prefers to build a solitary nest, away from other breeding pairs.

▼ **WIDE, OPEN SPACES**
The lappet-faced vulture relies on large, open areas for hunting.

DID YOU KNOW?

- **It is thought that some nonindigenous species of plants and trees in the Negav Desert area of Israel were brought there as seeds on the feet of migrating lappet-faced vultures.**
- **The vulture's bare head is thought to be an adaptation to prevent germs and bacteria, acquired when sticking its head into putrid carcasses, from causing infections. A head covered with feathers is harder to clean thoroughly.**

FOOD & FEEDING

The lappet-faced vulture is a voracious eater and is capable of cleaning a carcass down to the bones. When it locates a piece of carrion, it uses its powerful beak to rip holes in the animal's tough hide. The vulture's long neck allows it to probe deep into carrion in search of the large meaty muscles. It then rips off large pieces of meat while holding the carcass with its feet. The largest of all vultures, the lappet-faced is well respected at carrion sites — other animals, including hyenas, are easily driven away when confronted. Due to the scarcity of carrion, especially in the desert areas, the vulture feeds heavily at each sitting, and its crop, an enlargement of the esophagus, can store more than 13 lbs. of food at a time. Once food is digested, the lappet-faced vulture, like all birds of prey, regurgitates pellets of hair and feathers. Although largely a scavenger, it also hunts live game when carrion is scarce. Its prime targets are flamingos, both young and adult, hares, gazelle calves and even locusts and termites.

BEHAVIOR

The lappet-faced vulture is one of the shiest and most solitary of the Old World vultures —-except when feeding. Then, the vultures congregate, occasionally gathering in groups of up to 100 birds. Once, 35 lappet-faced vultures were observed surrounding a single dead donkey. The lappet-faced vulture is normally a silent bird but, when gathered around a piece of carrion, it grunts, growls, hisses and yelps. The strongest and most dominant vulture at kill sites, it can easily bully other vultures and even the largest eagle into submission. It usually moves to the outskirts of the feeding group and attacks others by rushing toward them with its head lowered and wings and neck outstretched. The lappet-faced vulture regularly visits water holes, where it washes off its messy face after eating.

▶ **BACK OFF!**
The vulture protects its meal from other animals.

COMMANDER IN CHIEF

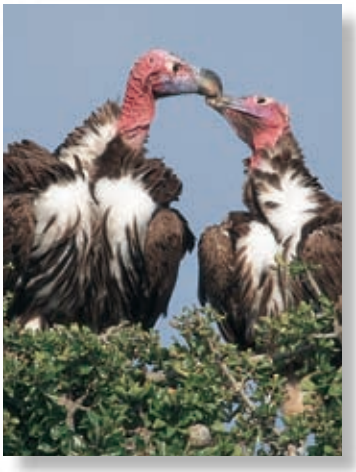
1 Needy citizens...
Many vultures are not strong enough to rip through the tough hide of a buffalo, and rely on the lappet-faced vulture to do so.

2 Saving the day...
With the largest and one of the most powerful beaks, the lappet-faced vulture easily tears through the hide of almost any animal.

3 First in line...
The immense lappet-faced vulture commands the scene; it is the first to eat and even takes food from the others.

4 A job well done!
After a meal, the lappet-faced vulture finds a water hole where it can bathe and wash off the mess from its head and neck.

BREEDING



▲ **WORKING TOGETHER**
Both members of a breeding pair share in the parental duties.

Lappet-faced vultures are solitary nesters and prefer to be far away from other nesting pairs. Intensive nest defense, mate-guarding and courtship-feeding are all part of the mating rituals. Both the male and female lappet-faced vulture work together to build a massive nest of sticks, up to 10' in diameter, usually atop a thorny tree in the open sun. Once the base of the nest is built, they line it with fur from carcasses and grass. During the nest's construction the pair roosts nearby; even when the nest is finished, they will not use the nest until the egg is laid. The female lays one dull-white egg with brown spots and blotches, and the male and female take turns incubating the egg and searching for food. The chick hatches after about 55 days; one parent remains with the chick, while the other scavenges for food. The adults feed the chick regurgitated carrion, including splinters of bone that provide essential calcium. After about 135 days, the young lappet-faced vulture takes its first flight. The adults often return to the same nest for several years.

CONSERVATION

Though not currently on the endangered list, the lappet-faced vulture is declining in southern Africa because of poisoning and shooting, electrocution by high-voltage towers and a shortage of calcium in the diet of chicks. It is listed in Appendix II of CITES, which strictly controls its export out of Africa.

PROFILE LAPPET-FACED VULTURE

With its strong beak, broad wings and featherless neck and head, the lappet-faced vulture is well suited for finding and feeding on carrion.

IN FLIGHT
Immensely broad wings and widely spaced primary feathers allow the lappet-faced vulture to glide for long periods.

LAPPETS
The lappets are loose folds of skin hanging off the side of the face; featherless, they pick up less of the putrid fluids and flesh that the vulture devours.

EYES
The vulture's eyesight is very keen; it can spot a dead or dying animal from over 1 mile away.

TONGUE & BILL
The rasplike tongue helps grasp and move chunks of meat to the mouth. The large, powerful bill rips holes in carrion.

FEET
The lappet-faced vulture's feet are much weaker than those of other birds of prey and are designed more for running than grasping.

VITAL STATISTICS

WEIGHT	12–21 lbs.
LENGTH	3–4'
WINGSPAN	9–9.5'
SEXUAL MATURITY	About 6–9 years
BREEDING SEASON	Varies with location
NUMBER OF EGGS	1–2; usually 1
INCUBATION PERIOD	54–56 days
FLEDGING PERIOD	125–135 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Mostly carrion; also hunts flamingos, hares and insects
LIFESPAN	About 40 years

CREATURE COMPARISONS

The white-headed vulture *(Trigonoceps occipitalis)* has a wingspan of 6.5' and length of 2.75', much smaller than those of the lappet-faced vulture. The white-headed is one of the most colorful vultures in Africa; it has a downy, white head, bright orange and blue beak, pink legs and face, and white secondary feathers and tail leading up the middle of the wing. The white-headed vulture is known as "the searcher," since it sets out earlier in the day in search of food than do other vultures. It is often forced to the outskirts of feeding groups when other vulture species arrive and is left to eat the less nutritious scraps.

White-headed vulture

Lappet-faced vulture

RELATED SPECIES

● **The lappet-faced vulture is 1 of 15 species of Old World vultures in the family *Accipitridae*, found across Africa, Europe and Asia. They are joined by the New World vultures in the family *Cathartidae* in the order *Falconiformes*. But the Old World vultures actually are more closely related to hawks and eagles, also in the family *Accipitridae*, than to the New World vultures.**

Laughing Kookaburra

• ORDER •
Coraciiformes

• FAMILY •
Alcedinidae

• GENUS & SPECIES •
Dacelo novaeguinae

KEY FEATURES

- An opportunistic predator of Australia's bush, this crow-sized kingfisher grabs and stabs prey with its bill
- Master reptile killer that thrashes snakes and lizards to death, often after dropping them from high in the air to stun them first
- Extremely noisy, with a vocabulary of loud calls that sound like chuckles and side-splitting laughs

WHERE IN THE WORLD?

Over much of eastern Australia in a broad band (Queensland in the north to Victoria and southwestern South Australia); introduced to a corner of western Australia and Tasmania

LIFECYCLE

A startling array of humanlike "laughs" have contributed to the celebrity of the laughing kookaburra, one of the most conspicuous and charismatic Australian birds.

HABITAT

The kookaburra is found in some of eastern Australia's most arid habitats, especially dry, open eucalyptus forests, but it prefers to be close to a water source. It also occurs in lightly wooded farmland and vast expanses of scrub (the "bush"). It has also adapted well to urban environments and is common in parks and gardens, which it visits to raid bird tables. Living in a sun-drenched climate, the kookaburra needs the shade offered by trees while waiting patiently to swoop on prey.

▼ **HIGH PROFILE**
High perches, especially those close to open spaces, attract kookaburras.

DID YOU KNOW?

- **Although not especially skilled at fishing, the laughing kookaburra often snatches fish from shallow ornamental garden ponds.**
- **The laughing kookaburra is nearly 10 times heavier than the Eurasian kingfisher and 50 times heavier than the African dwarf kingfisher.**

FOOD & HUNTING

Although it's a kingfisher, the kookaburra doesn't hunt over water for fish. But its hunting method is similar to other kingfishers'. It mounts an ambush by watching and waiting from a high vantage point and then, when it spots movement on the ground below, dives down to grab prey in its strong bill. Frequently, it launches its attacks from a perch in a tree, although it also makes use of powerlines, especially in built-up areas.

Australia has a large and abundant range of reptiles, especially snakes; these make up a significant part of the kookaburra's diet.

CONSERVATION

The laughing kookaburra is common throughout its range, thriving in towns, cities and natural habitats. Recent estimates based on the density of territories (number of breeding pairs per given area) in a sample of habitats suggest that its population is in excess of 60 million birds. This kookaburra isn't facing any serious threats and, indeed, receives protection under the same Australian law that forbids the trade of all wild animals.

BREEDING

Holes in tree trunks or cavities in dead and rotten wood make ideal kookaburra nest sites. It also takes over vacant nests of tree termites or occupies holes in the walls of buildings. After mating, the female lays two or three white eggs on the bare floor of the nest chamber.

The male and female pair for life and cooperate to rear their brood. They also receive assistance from nonbreeding "helpers" — offspring from a previous year that haven't yet found mates. Helpers may assist for up to four years before attempting to breed themselves, participating in most activities associated with nesting, such as incubating, feeding the young and defending the territory. The young fledge after six weeks, but remain entirely dependent on their parents and helpers for another two months.

A STUNNING PERFORMANCE

1 Swoop to kill...

Scanning the ground from a tree at the edge of a clearing, a kookaburra spots a snake. It silently launches an attack.

2 Snake bite...

Striking quickly, it seizes the snake in its bill and shakes it violently.

3 Backbreaking work...

The kookaburra thrashes it against the hard earth. While the snake is stunned, the kookaburra repeats its shaking, breaking the snake's back.

4 Down in one

Returning to its favorite perch with the dead snake, the kookaburra swallows it whole without fear of injury.

▲ **STICKING TOGETHER**

The kookaburra pairs for life, and both birds share the tasks of maintaining their territory and caring for the eggs and chicks.

BEHAVIOR

Named after its most famous call, the laughing kookaburra is especially vocal in early morning and after sundown. The "laugh" itself lasts for ten seconds, beginning and ending with a series of deep chuckles. In between is the loud, remarkably humanlike sound.

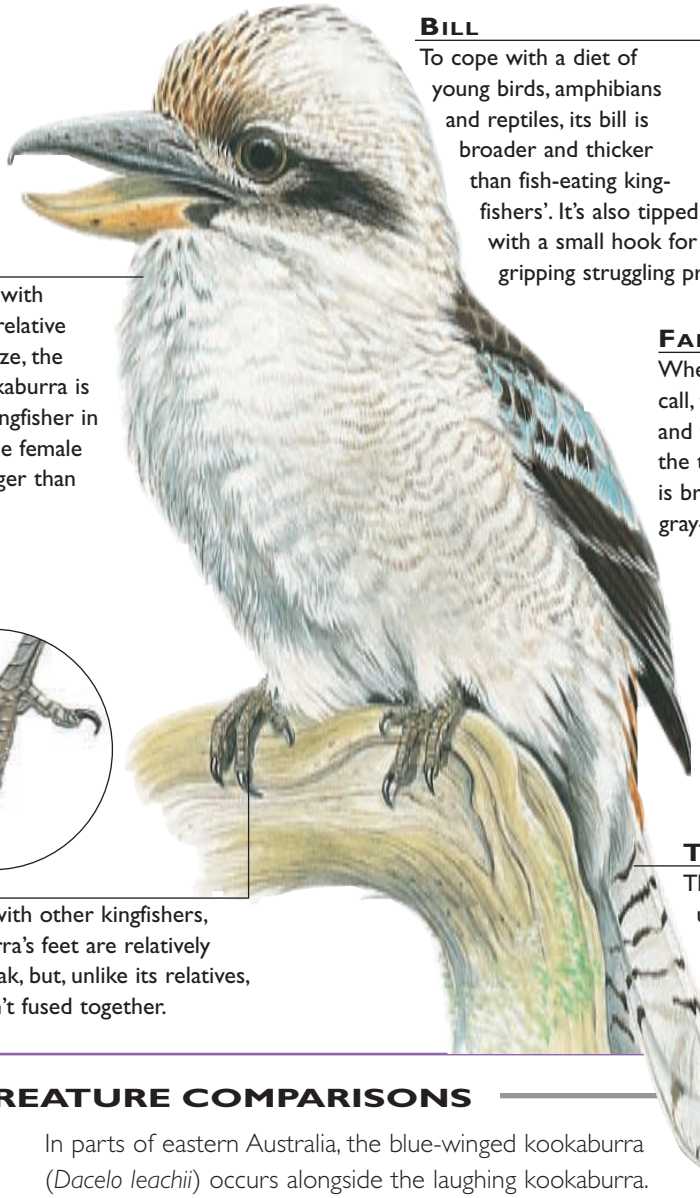
When calling from a perch, the laughing kookaburra adopts a characteristic posture, with its tail cocked and bill pointing upward.

▼ **HAVING A LAUGH**

The kookaburra makes its range of raucous or throaty calls year-round to advertise territory ownership.

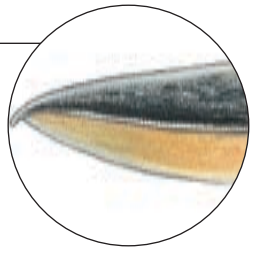
PROFILE LAUGHING KOOKABURRA

A true giant among kingfishers, the laughing kookaburra's stocky frame and sturdy bill enable it to tackle sizeable, often dangerous prey.



BILL

To cope with a diet of young birds, amphibians and reptiles, its bill is broader and thicker than fish-eating kingfishers'. It's also tipped with a small hook for gripping struggling prey.



BODY

Heavily built, with a huge head relative to its body size, the laughing kookaburra is the largest kingfisher in the world. The female *(shown)* is larger than the male.

FANNING

When making its laughing call, the kookaburra cocks and fans its tail. This displays the tail's underside, which is brown and white with gray-brown bars.

FOOT

In common with other kingfishers, the kookaburra's feet are relatively small and weak, but, unlike its relatives, the toes aren't fused together.

TAIL

The tail's banding breaks up the bird's outline as it swoops when hunting, helping it take prey by surprise.

CREATURE COMPARISONS

Blue-winged kookaburra

In parts of eastern Australia, the blue-winged kookaburra (*Dacelo leachii*) occurs alongside the laughing kookaburra. Similar in size, both have a daggerlike bill. The blue-winged kookaburra has paler eyes and a whiter head. Its tail, rump and areas of its wings are blue.

Where the ranges of the two overlap, the blue-winged kookaburra is found in damper habitats — in wet forests and tall stands of trees beside watercourses. It has a wider distribution than the laughing kookaburra, across northern Australia and north to southern New Guinea, where it sometimes inhabits coastal mangrove swamps.

Laughing kookaburra

VITAL STATISTICS

WEIGHT	11–17 oz.
LENGTH	16–18"
WINGSPAN	20–24"
SEXUAL MATURITY	1 year
BREEDING SEASON	September–December
NUMBER OF EGGS	2 or 3
INCUBATION PERIOD	24–26 days
FLEDGING PERIOD	33–39 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Rodents, frogs, lizards, snakes, insects, earthworms, crayfish, nestling birds
LIFESPAN	6–10 years

RELATED SPECIES

- **The kingfisher family *Alcedinidae* belongs to the order *Coraciiformes*, which includes bee-eater, roller and hornbill families. *Alcedinidae* has 87 species of kingfisher; 22 species feed exclusively on fish. Four nonfishing species are in the laughing kookaburra's genus *Dacelo*: large laughing and blue-winged kookaburras and small rufous-bellied and spangled kookaburras.**

Lovebirds

• ORDER •
Psittaciformes

• FAMILY •
Psittacidae

• GENUS & SPECIES •
Agapornis spp.

KEY FEATURES

- Family of tiny, highly acrobatic parrots
- Each pair spends long periods nestled side by side, nibbling each other's feathers to strengthen their pair bond
- Some species carry nest material buried among their feathers
- Males and females of different species can mate and produce hybrid offspring

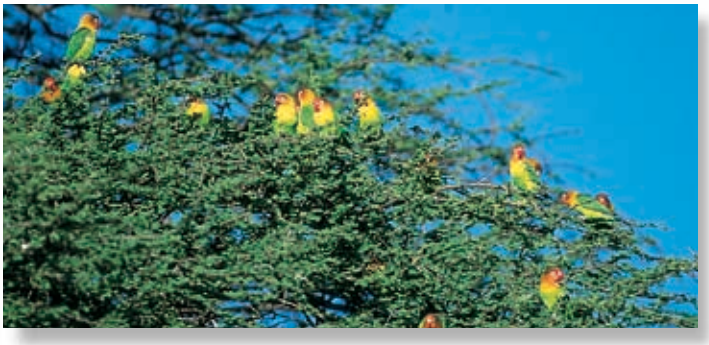
WHERE IN THE WORLD?

Found in tropical and subtropical forests in Africa, from Guinea east to Ethiopia, Kenya and Tanzania, and in parts of Mozambique, Zambia, Malawi, Angola and Namibia; one species confined to Madagascar

LIFECYCLE

Lovebirds are named after their "affectionate" habit of billing and preening each other as if in a loving embrace. This behavior reinforces the bonds between the male and female.

HABITAT



Lovebirds are found in tropical and subtropical forests and more open types of woodland. Each species favors slightly different habitats, but more than one species can be found together.

The red-faced lovebird, which has the widest distribution of any lovebird, lives in primary rainforest broken by clearings, secondary forest and wooded plains up to an altitude of 4,950'. Some lovebird species prefer lowland evergreen forests, while the black-winged lovebird inhabits juniper forests in the highlands of Ethiopia.

Even arid or rocky country is a suitable habitat to such species as the peach-faced lovebird, which is found in dry steppes in southwestern Africa; a few others adapt readily to fields. Nyasa and black-cheeked lovebirds are specialized; both are restricted to open stands of the low-growing mopane tree.

▲ **TREETOP JEWELS**
Flock of Fischer's lovebirds in savannah woodland.

▲ **CLIFF-HANGER**
Peach-faced lovebirds nest in cliffs instead of trees.

DID YOU KNOW?

- **Most small birds mate for a few seconds at a time, but lovebirds stay coupled for up to six minutes.**
- **Up to 25 Nyasa lovebirds may roost together in a single tree hole. They enter one at a time and tail-first.**

FOOD & FEEDING

Lovebirds do not travel far, so their home ranges must provide a reliable, year-round supply of food. Most lovebird species live on flowers, seeds, fruit and leaf buds — depending on seasonal availability — which the birds supplement with insects and grubs. Some species, such as the black-collared lovebird, feed mainly on figs in treetops, but others, including the red-faced and gray-headed lovebirds, gather grass seeds at ground level.

▼ **PRETTY IN PINK**
Plants in full flower attract hungry lovebirds.

The lovebirds' superb bill–foot coordination enables them to use its four-clawed feet as a clamp to hold food while the bird breaks up the morsel with its bill. The lovebird may also use a foot to transfer food to its bill. Lovebirds also have a strong tongue to remove seeds from husks.

CONSERVATION

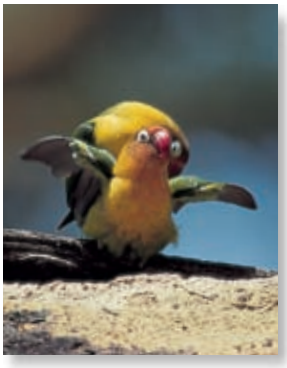
Lovebirds are very popular pets and trapping to supply the cage-bird trade has led to serious declines in the populations of most species. Today, legal protection has helped increase lovebird numbers again, but recovery is a slow process. The black-cheeked lovebird remains endangered and is found only in a 2,400 sq. mile stretch of wooded river valley.

BREEDING

Most lovebirds breed in colonies, but some nest in isolated pairs. Lovebirds make their nests in cliff faces, termite mounds, holes excavated by woodpeckers and nests of swifts, weavers, sparrows and other birds.

The female builds and guards the nest, incubates the eggs for three weeks, then broods the chicks. The male doesn't help her until the chicks are older, when he starts to bring food to them. The young lovebirds are born blind and helpless, and fledge after six weeks in the nest. A pair of lovebirds usually manages to raise three or four offspring a year.

▼ **THE LOOK OF LOVE** **Pair of Fischer's lovebirds (*right*) mating. *Far right*: the peach-faced lovebird.**



LABOR OF LOVE

1 Caress...
To reaffirm the bond between them, a male peach-faced lovebird treats his mate to gentle preening at the pair's chosen nest site.

2 Collect...
Encouraged by his attention, the female flies to a nearby tree and tears off thin strips of bark to use as nest material.

3 Load...
Using her bill, she tucks the bark into her soft rump feathers and stows away more strips until her plumage can carry no more.

4 Carry
She drops some bark pieces as she flies back to her mate, but holds onto enough to start building her nest.

BEHAVIOR

Like many members of the parrot family, lovebirds are highly sociable. From sunset until daybreak, they roost together. During the day, they're usually seen in flocks of 20 or so, but gatherings of up to 300 occur at a particularly rich food source, such as a fig-laden tree or a field of ripe grain.

When they're not searching for food, lovebirds devote much of their time to their bill and feathers. They repeatedly nibble at hard objects, such as branches, to keep their continuously growing bill at a perfect length. The lovebird uses its feet to take oil from a gland near the base of its tail, then applies it through its plumage. Lovebirds bathe regularly; the gray-headed lovebird cleans its plumage by hanging upside down from a branch in the rain.

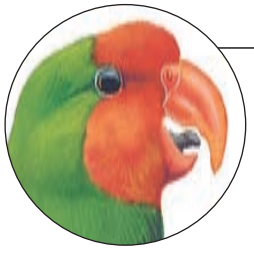
Lovebirds communicate with high-pitched calls and by adopting specific poses, such as lowering their head and opening their wings to show hidden colors.

PROFILE LOVEBIRDS

Dexterous feet and miniature, lightweight bodies make all lovebirds more agile than many of their larger relatives in the parrot family.

FLIGHT PROFILE

The combination of a large head, stocky body and short tail with long, tapering wings gives lovebirds a distinctive silhouette in the air.

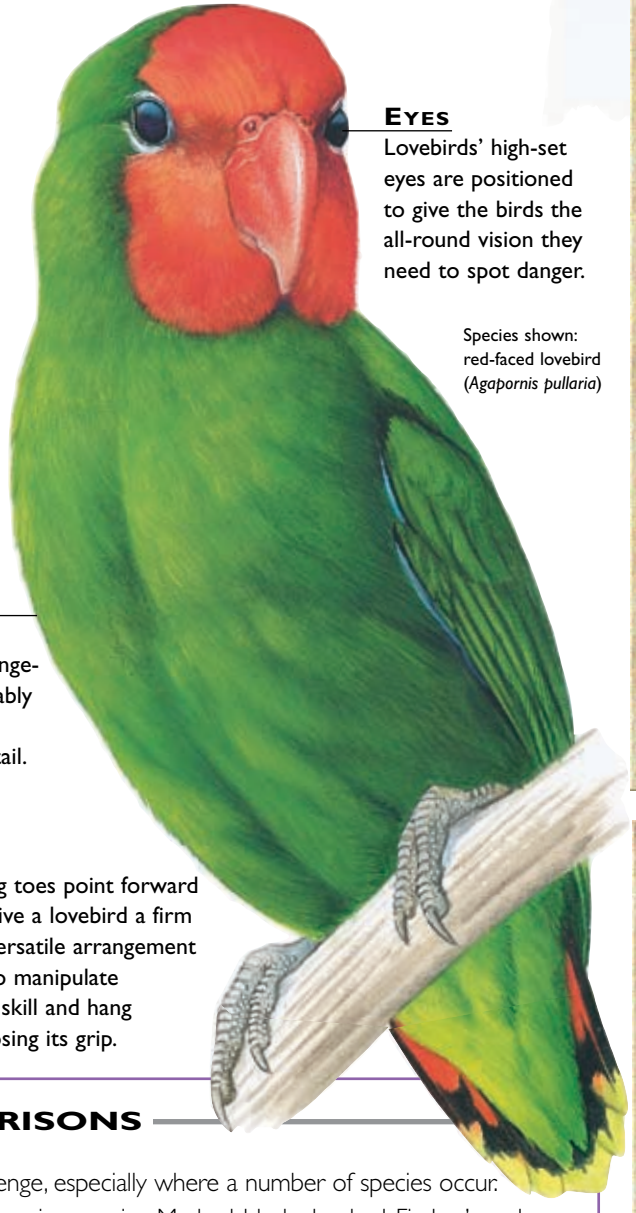


BILL

Broad, powerful bills crack seeds and tear into fruit. The strongly hooked upper mandible fits into the smaller, lower mandible like a jigsaw piece.

EYES

Lovebirds' high-set eyes are positioned to give the birds the all-round vision they need to spot danger.



Species shown: red-faced lovebird (*Agapornis pullaria*)

PLUMAGE

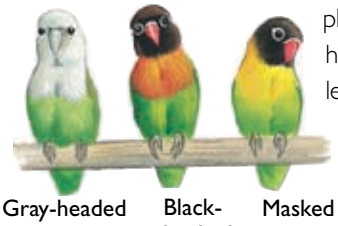
A male red-faced lovebird (*right*) wears a mainly green plumage that contrasts sharply with his orange-red bill, cheeks and forehead — which are noticeably more orange in the female. Both sexes have a bright blue patch, or rump, at the base of their tail.

FEET

Two of the short, strong toes point forward and two backward to give a lovebird a firm hold on perches. This versatile arrangement also allows a lovebird to manipulate food with consummate skill and hang upside down without losing its grip.

CREATURE COMPARISONS

Identifying lovebirds in the wild can be a challenge, especially where a number of species occur. These six examples illustrate differences among nine species. Masked, black-cheeked, Fischer's and Nyasa lovebirds have broad, naked eye rings; both sexes have similar plumage. Red-faced, Abyssinian and gray-headed (or Madagascar) lovebirds have less prominent feathered eye rings; the sexes have dissimilar plumage. Peach-faced and black-collared lovebirds have characteristics from both groups.



Gray-headed (male) | Black-cheeked | Masked

Fischer's | Peach-faced | Abyssinian (male)

VITAL STATISTICS

WEIGHT	1–2 oz.
LENGTH	5–6.5"
WINGSPAN	9–12"
SEXUAL MATURITY	1 year
BREEDING SEASON	Varies between species and regions
NUMBER OF EGGS	3–8; usually 3 or 4
INCUBATION PERIOD	22–23 days
FLEDGING PERIOD	38–50 days; 43– 44 days in most species
BREEDING INTERVAL	1 year
TYPICAL DIET	Seeds, flowers, fruit, leaf buds; some insects
LIFESPAN	About 12 years in captivity

RELATED SPECIES

● **Lovebirds, cockatoos, parrots, lories, parakeets, parrotlets and macaws all belong to the *Psittacidae* family, which has about 350 species, including the Senegal parrot, *Poicephalus senegalus*** (below).

Luzon Bleeding-heart

• ORDER •
Columbiformes

• FAMILY •
Columbidae

• GENUS & SPECIES •
Gallicolumba luzonica

KEY FEATURES

- Most striking of all the bleeding-heart pigeons; its breast markings resemble a deep, bleeding wound
- Only bleeding-heart pigeon to lay two eggs; all others lay just one
- Spends most of its time on the ground, eating whatever edibles it can swallow whole
- Produces crop milk to feed nestlings

WHERE IN THE WORLD?

Found on only Luzon and Polillo, two islands in the Republic of the Philippines, an archipelago made up of over 7,000 islands; these are part of the Malay archipelago off the southeast coast of Asia

LIFECYCLE

True to its plumage, the Luzon bleeding-heart fulfills the role of the faithful lover — male and female mate for life. But it also plays the victim, crouching when alarmed.

HABITAT

The Luzon bleeding-heart is named for one of the two islands it inhabits. Luzon is the largest of over 7,000 islands in the Republic of the Philippines. The bird also lives on Polillo, a much smaller island to the east. The Philippine Islands are part of the Malay archipelago, the largest group of islands in the world. About 35% of the islands are woodlands, as are Luzon and Polillo. The mountainous regions and fertile plains on these islands offer an abundance of food for the resident bleeding-heart.

The largest freshwater lake in Southeast Asia, Laguna De Bay, is found on Luzon; it is a vital source of freshwater for the Luzon bleeding-heart.

▼ **VOLCANIC LUZON**
The Luzon bleeding-heart is found on the island of Luzon in the Philippines.

DID YOU KNOW?

- **Crop milk contains 65–81% water, so parents must drink more water each day to compensate for the drain on their reserves.**
- **When the Luzon bleeding-heart gets something in its eye, it will rub its eye on its shoulder — this is unusual, since most birds only blink.**

BREEDING

The Luzon bleeding-heart mates for life. The male utters a mournful *crooo* to attract a mate. With a second, similar call, the male declares his loyalty. The two calls are distinct, varying in loudness and intensity, in order to communicate the correct message. After bowing and other courtship displays, the birds use small twigs, roots and grasses to build a nest, low in a bush or tree. The female lays two eggs and incubates for about 17 days. During incubation, both the male's and female's crops, an extension of the esophagus, begin to secrete milk, which will be used to feed the down-covered nestlings. After the first few days, the parents add seeds and insects and regurgitate the mixture for the chicks. Luzon bleeding-heart chicks grow quickly with the help of the protein, fat, minerals and vitamins A and B that crop milk supplies. The chicks begin searching for their own seeds and insects by 4 weeks of age.

THE MATING GAME

1 Chasing 'round...
A Luzon bleeding-heart male is strongly attracted to a female and runs after her in an attempt to get her attention.

2 Puffing up...
Interested, the female stops and the courtship show begins. The male inflates his breast enlarging the blood-red patch.

FOOD & FEEDING

The Luzon bleeding-heart is a casual forager — it walks along and turns over soil with flicks of its bill. The bleeding-heart eats fallen seeds, berries, snails, ticks and other insects — almost anything that it can swallow whole, since the bird cannot bite, chew or de-husk its food. If food is not conveniently found on the ground, the bird grabs and tugs to pull suitably sized morsels from plants. The bleeding-heart pigeons all tend to eat more animal food than most other pigeons.

To wash all of the various food items down, the Luzon bleeding-heart drinks at least once a day, usually more. Like all pigeons, the bleeding-heart drinks quickly by sucking in a continuous motion, not lifting the head up to swallow. This ability is unique among birds.

◀ **OUT TO LUNCH**
A bleeding-heart searches the ground for food.

BEHAVIOR

The Luzon bleeding-heart spends most of its time on the forest floor. It searches for food by turning over leaf litter and dirt; it also stretches quite often, for comfort and possibly to keep its wings loose for a quick getaway if predators approach. To stretch, the bird pulls its folded wings upward while lowering its head and tail, and also stretches one leg backward while extending the wing on the same side. When the bleeding-heart does fly, it is usually with its mate to a nesting site or in small flocks to find water. Highly territorial, the male defends its area, first with warning calls and, if necessary, by fighting to the death. The Luzon bleeding-heart is successfully raised in aviaries around the world, but cannot be mixed with smaller species because of its aggressive nature. When confronted with a larger bird of prey in the wild, the bird emits a grunting, panting or gasping sound. This distress call is often sounded at the sight of other predators, including humans. The bird then flies a short distance, lands and continues its escape by running.

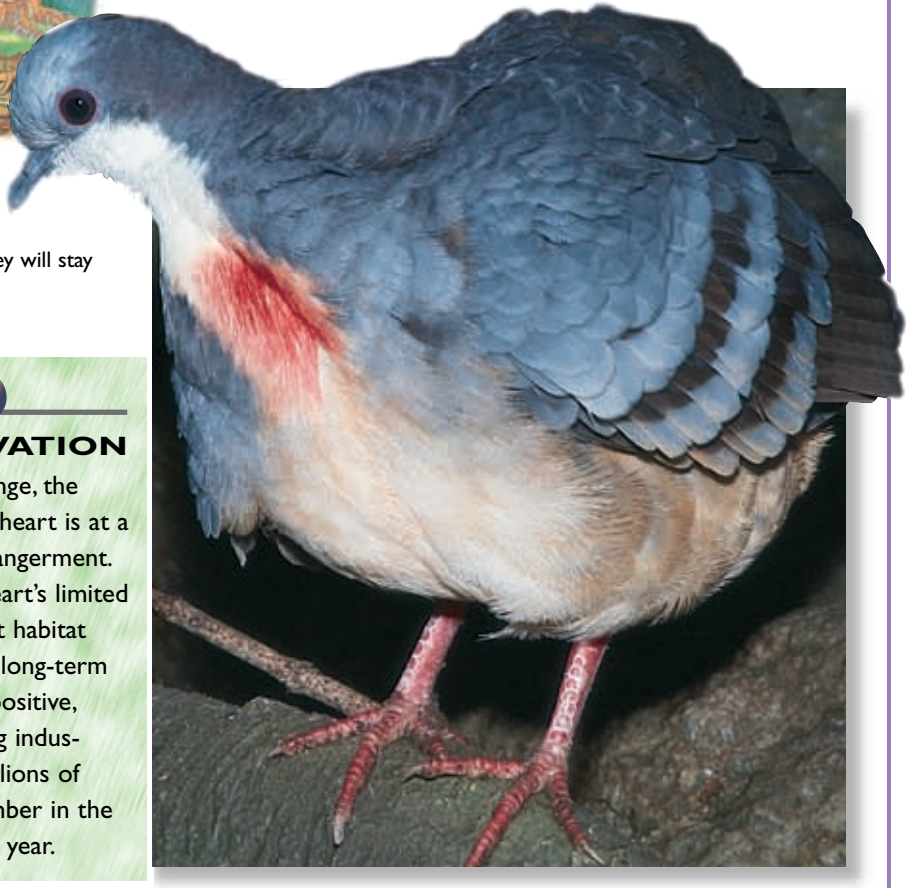
▼ **A TOPNOTCH WATCH**
A Luzon bleeding-heart perches and scans for unwelcome intruders.

3 Bowing down…
The male then lowers his head, with his tail pressed firmly to the ground, and emits a rapid "*croo-coo*."

4 All grown-up
The female accepts the male's advances and the pair mates; they will stay together for life.

CONSERVATION

In its natural range, the Luzon bleeding-heart is at a low risk of endangerment. The bleeding-heart's limited range and forest habitat make the bird's long-term prospects less positive, since the logging industry destroys millions of cubic feet of timber in the Philippines each year.



PROFILE LUZON BLEEDING-HEART

The Luzon bleeding-heart appears mortally wounded with its indented breast feathers that are colored blood red.

IN FLIGHT

A strong flier, the bleeding-heart has light-gray wings with dark-red bars; the body's dark-gray feathers have iridescent fringes, giving the bird an amethyst purple or bronze-green appearance in the sunlight.

FEMALE

Eye color is an important distinguishing feature between males and females, since both have similar plumage. The female's iris is purplish-gray, while the male's is blue.

BODY SHAPE

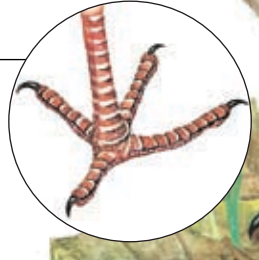
Like all members of the pigeon family, the bleeding-heart has a plump body, a short neck and a small head.

BREAST FEATHERS

The feathers in the middle of the breast are shorter than the surrounding white feathers. The indentation, with its blood-red color, gives the illusion of a deep gash.

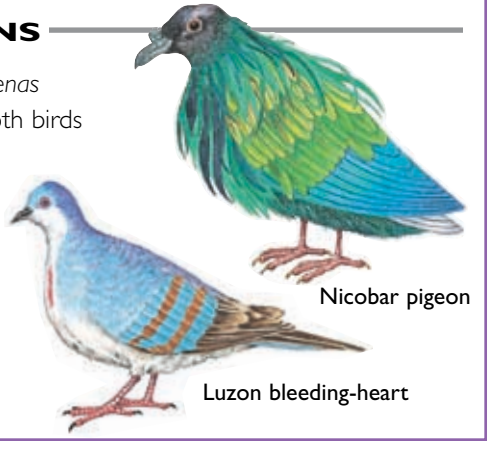
FEET

The dark red feet seem stained from its "wound." The three toes pointing forward and one toe pointing backward allow the bird to perch at its roosts, and also allow it to run during courtship displays.



CREATURE COMPARISONS

Measuring almost 16" long, the Nicobar pigeon *(Caloenas nicobarica)* is larger than the Luzon bleeding-heart. Both birds live in the Philippines, where they search for seeds, fruit and insects on the ground. But whereas the Luzon bleeding-heart inhabits the Philippines' largest island, Luzon, the Nicobar pigeon is found only on small wooded islands and the islets off the larger land masses. The Nicobar pigeon is also found west of the Philippines on the Nicobar Islands, hence its common name.



Nicobar pigeon

Luzon bleeding-heart

VITAL STATISTICS

WEIGHT	Unknown
LENGTH	12"
WINGSPAN	About 14"
SEXUAL MATURITY	18 months
BREEDING SEASON	March–June
NUMBER OF EGGS	2
INCUBATION PERIOD	About 17 days
FLEDGING PERIOD	About 12 days
BREEDING INTERVAL	Up to 1 year
TYPICAL DIET	Seeds, fruits and invertebrates, including insects
LIFESPAN	Over 20 years

RELATED SPECIES

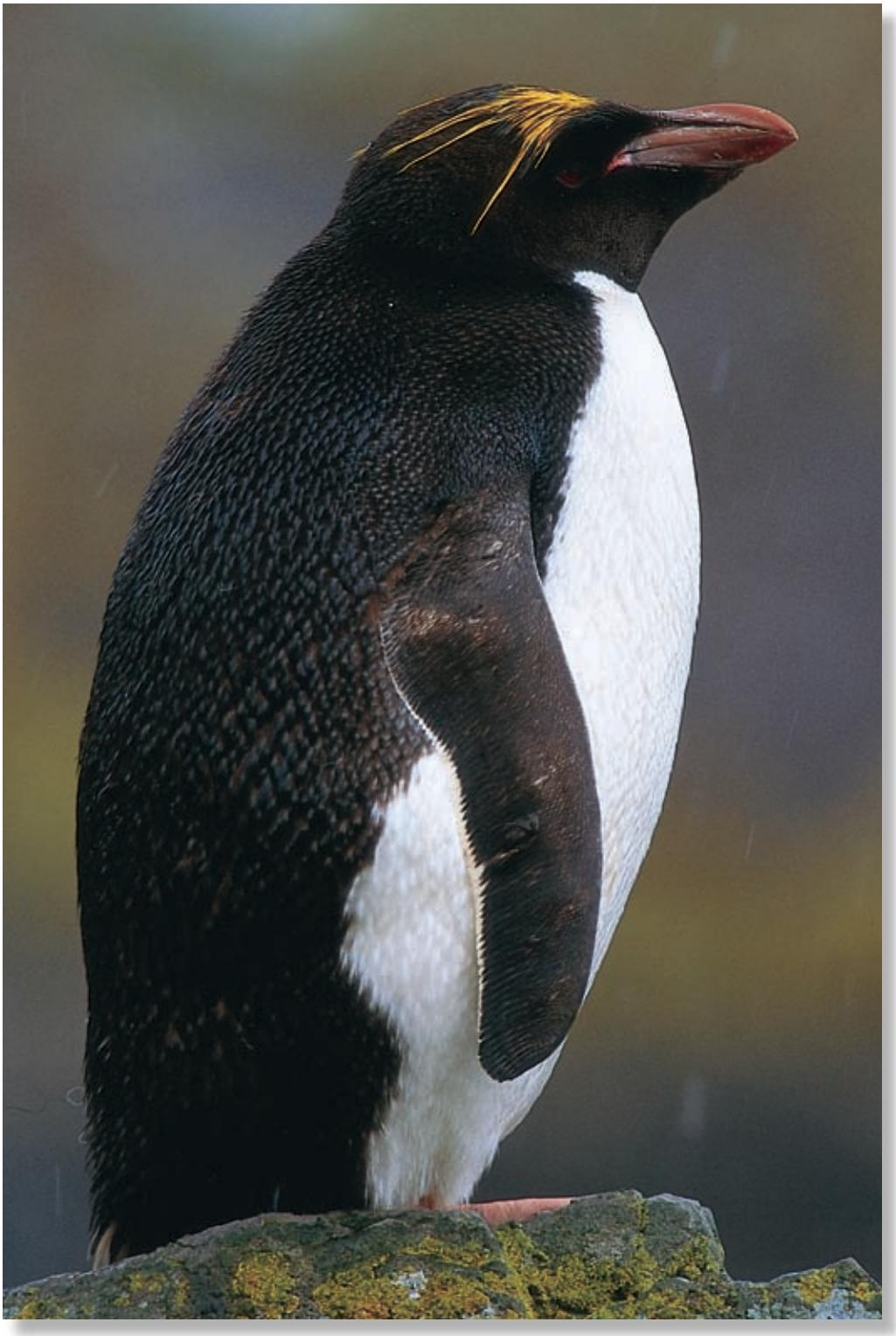
- **The family *Columbidae* includes over 300 species of pigeons and doves in 42 genera, found worldwide except Antarctica. The Luzon bleeding-heart is one of 19 species in the genus *Gallicolumba*. The bleeding-heart pigeons, the less ornamented golden-heart, *G. rufigula*, and the Celebes quail dove, *G. tristigmata*, are found in the Malay archipelago. Most islands contain only one species; New Guinea has three.**

Macaroni Penguin

• ORDER •
Sphenisciformes

• FAMILY •
Spheniscidae

• GENUS & SPECIES •
Eudyptes chrysolophus



KEY FEATURES

- Named for its long golden crests, which resemble the flashy feathers worn by 18th-century Englishmen
- Breeds in extremely dense colonies and interacts socially within them
- Monogomous and devoted parents, macaroni penguins will spend up to 45 days fasting when caring for chicks

WHERE IN THE WORLD?

Found on sub-Antarctic islands in the South Atlantic and Indian Oceans and the Falkland Islands off of Argentina; also in the waters south of South America and Africa

LIFECYCLE

Macaroni penguins spend two years with their chick. While one parent ventures out, sometimes for several days, the other parent cares for the young and fasts.

CONSERVATION

With over 11,000,000 breeding pairs, macaroni penguin populations are stable with no major threats, although some species of gull will feed on abandoned eggs, and leopard and Atlantic fur seals will occasionally feed on adults at sea.

HABITAT

The macaroni penguin has two separate habitats. Outside the breeding season, the bird is believed to be completely *pelagic*, living in the open waters of the Antarctic and sub-Antarctic; it cannot be found at nesting colonies or other land areas. Breeding colonies are established on steep rocky slopes, headlands and on level ground areas of the islands falling within its general habitat range. Although the macaroni prefers areas devoid of vegetation, some have been known to nest on patches of tussock grass on the edges of large breeding colonies.

PLENTY OF PENGUINS
Macaroni penguin breeding colonies can consist of up to 100,000 breeding pairs.

BEHAVIOR

With such a crowded, complex and social living structure, it is not surprising that macaroni penguins exhibit a wide variety of gestures and vocalizations. Calls seem to be associated with location of a mate, fighting and sexual activity, and tend to vary in length, pitch and associated gestures. Macaronies are extremely vocal during territory establishment and pair formation, with much chattering and trumpeting. However, despite their often massive size, breeding colonies tend to be rather quiet during incubation, with occasional spurts of activity occurring whenever one parent returns from a foraging trip and during the "changing-of-the-guard" at the nest. Parents recognize each other as well as their chicks by voice; they use loud trumpeting from a distance and a quivering, chattering call when close up. Quite social with each other, some colonies will also nest in harmony with different species of albatross living just outside their colony.

TAKING THE PLUNGE
A penguin prepares to dive in for a hunt.

ROCKY HOME
Macaroni penguins prefer steep, rocky slopes.

LIGHTNING STRIKE

1 Do not disturb...
Macaroni penguins attempt to make their way through the crowded nesting site without disturbing other birds by following access routes.

3 Take that!
Sometimes the aggression may lead to bill jousting, where both parties will lock bills and attempt to force each other to the ground.

BREEDING

Macaroni penguins tend to be at sea from April through October and arrive at colonies between October and November. Once they find their mate within the colony, they greet each other with much trumpeting, head shaking and bowing. The pair, which mates for life, will then construct a nest consisting of a shallow scrape in the mud or gravel lined with a few small stones. In late November to December, a clutch of two eggs is laid, the first being about 60% smaller then the second. Incubation takes about 33–37 days; both parents incubate the eggs for the first 8–12 days, the female incubates them for the following 12–14 days, and the male incubates them for the last 9–11 days. Hatching of the young takes 24–48 hours from pipping (first breaking through the shell) to emergence from the egg, but usually just the larger second chick survives. The father guards the nest for another 25 days while the female forages for food. After 25 days several chicks will convene together to form nurseries. The father then returns to sea to forage. For about 10–20 days the chicks will be fed by both parents at increments of about every 1–2 days, and the fledging period lasts about two months.

▶ **CHANGING SHIFTS**
Both parents take turns protecting the vulnerable nest and greet each other vocally whenever one returns after searching for food for the chick.

FOOD & HUNTING

During the nonbreeding season, the macaroni penguin feeds primarily on crustaceans, cephalopods and small fish. When the chicks are young, they are fed crustaceans, with cephalopods and small fish being added to the diet as the chicks grow larger. The tongue and palate are equipped with spines in order to better grip fish, squid, krill and other slippery prey. The macaroni usually forages during the day, with trips averaging 12 hours, but during chick-rearing, trips last 25–50 hours. Macaroni penguins are superb divers; during a long foraging trip, they spend about 10% of their hunting time diving underwater in search of prey. When diving, they can reach depths of almost 400', although they average about 130' during the day and 10' at night. Though they can be underwater for several minutes, the average length of a dive is 1.5 minutes.

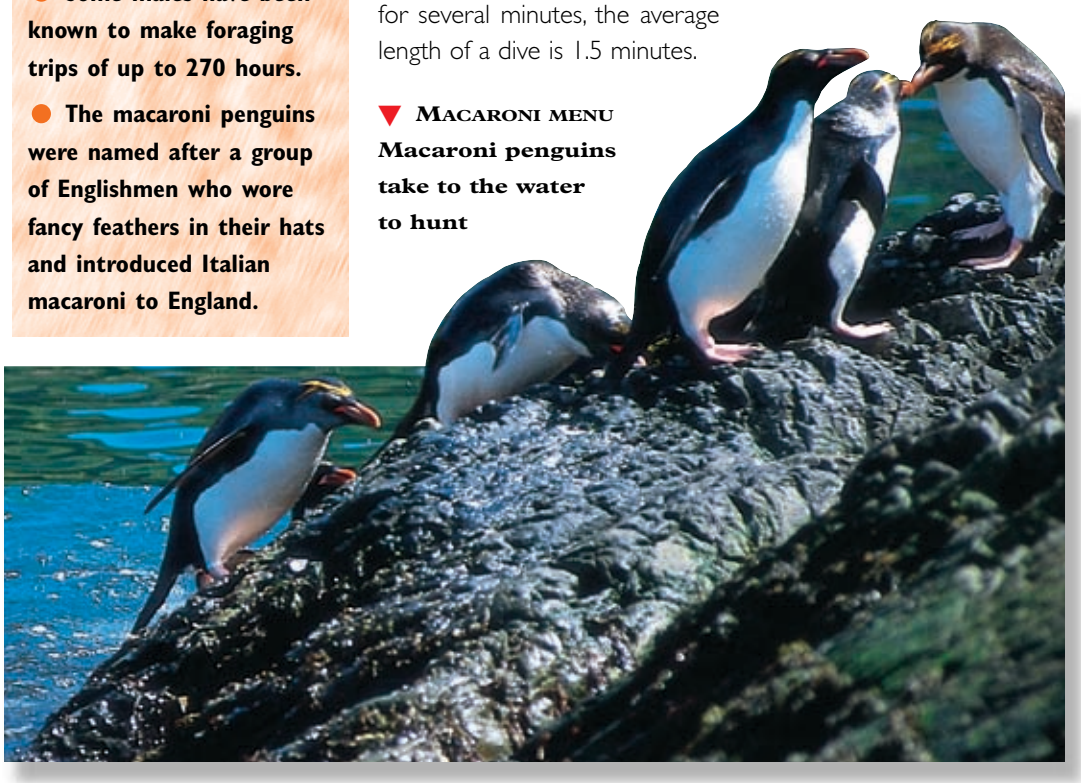
2 No trespassing…
Although usually peaceful, other birds, when disturbed, may exhibit aggressive behavior with loud calls and even flipper smacks.

DID YOU KNOW?

- **Some males have been known to make foraging trips of up to 270 hours.**
- **The macaroni penguins were named after a group of Englishmen who wore fancy feathers in their hats and introduced Italian macaroni to England.**

4 Home sweet home
When the penguin reaches home, the pair greet each other with vocalizations and bowing as they prepare for nest relief.

▼ **MACARONI MENU**
Macaroni penguins take to the water to hunt



PROFILE MACARONI PENGUIN

With its three layers of feathers and stores of fat, the macaroni penguin is superbly equipped for living in the chilly waters of the Antarctic.

FACE
The black face of the macaroni penguin distinguishes it in appearance from its close relative, the royal penguin.

BILL
The large, bulbous bill has ridges at the base of the upper mandible to give it a better grip on fish, squid or other slippery prey.

CHICK
Young chicks lack the distinctive head plumes, which do not begin to appear until 1 year of age.

FLIPPER
The strong, stiff flippers, which lack flight feathers, can propel the macaroni through the water at speeds of 6 mph.

FEET
The webbed feet are pink on top with black soles that help control heat loss; when swimming, the penguin's feet serve as rudders in conjunction with the tail.

JUVENILE
At 2 years old, the macaroni has acquired short plumes and is ready to molt and leave the colony.

VITAL STATISTICS

WEIGHT	11–13 lbs.
HEIGHT	28"
SEXUAL MATURITY	Female 5 years; male 6 years
BREEDING SEASON	October–December
NUMBER OF EGGS	2, with only 1 surviving
INCUBATION PERIOD	60–70 days
FLEDGING PERIOD	2 years
TYPICAL DIET	Fish, squid, crustaceans, and krill
LIFESPAN	Unknown

RELATED SPECIES

- The *Spheniscidae* family consists of 6 genera and 17 species of penguins, all of which are flightless birds living in or around Antarctica. The genus *Eudyptes* is the largest of the genera and is made up of 6 species of crested penguins. All penguins stand upright and walk with a shuffling gait. They range in size from the little blue penguin, *E. minor,* to the emperor penguin, *Aptenodytes forsteri.*

CREATURE COMPARISONS

Royal penguin

Macaroni penguin

The royal penguin *(Eudyptes schlegeli)* is nearly identical to the macaroni penguin; the main difference is the white face of the royal relative. The royal penguin is slightly larger than the macaroni penguin, but these two species are so similar that many scientists regard the royal penguin as a subspecies of, or merely a color variation of, the macaroni penguin. Some macaroni penguins have appeared with coloring similar to the royal penguin's, but it is unknown whether these are mutations or hybrids. The royal penguin consists of about 85,000 breeding pairs in about 57 colonies all located on Macquarie Island off of southern Australia.

Magnificent Frigatebird

• ORDER •
Pelecaniformes

• FAMILY •
Fregatidae

• GENUS & SPECIES •
Fregata magnificens

KEY FEATURES

- An aggressive pirate of the skies, it forces other seabirds to give up their catch of fish
- Long wings, a streamlined shape and low weight give it great maneuverability in the air
- Snatches fish from the sea's surface and steals eggs and chicks from other birds' nests

WHERE IN THE WORLD?

Along coasts from Florida to Brazil and Baja California to Ecuador; on the Galapagos Islands and off the West African coast on the Cape Verde Islands

LIFECYCLE

Despite being a poor swimmer and lacking waterproof feathers, the magnificent frigatebird is an ocean predator, notorious as a fearless pirate of the tropical seas.

HABITAT

▲ **LOCAL BRANCH**
Mangroves are popular roosting and nesting sites.

The frigatebird is found along the tropical coasts of the Americas and western Africa. Warm trade winds, which blow year-round with variable force toward the equator, have an influence on its distribution. These winds produce thermals night and day, letting the frigatebird soar freely while searching for squid, a favorite food, which come close to the sea's surface at night.

The frigatebird is closely tied to mainland coastal areas and is rarely seen midocean. It breeds along coasts or on small offshore islands, especially in stands of mangrove trees. On the Galapagos Islands, it may even nest in a large cactus plant. Where vegetation is scarce, such as on the Cape Verde Islands, off West Africa, the frigatebird may be forced to construct a nest on the bare ground.

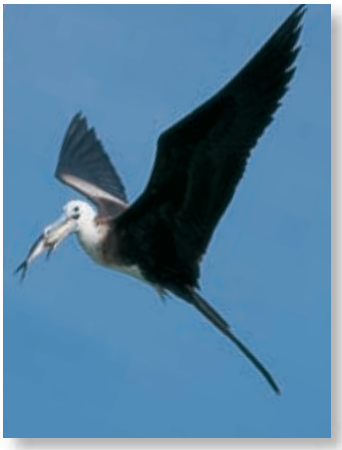
DID YOU KNOW?

- **"Frigatebird" may come from the comparison of the bird to the fast frigate ships once used by pirates to attack merchant vessels.**
- **The magnificent frigatebird has the highest wingspan-to-weight ratio of all seabirds. The skeleton is less than 5% of total weight.**

CONSERVATION

With a world population of several hundred thousand, the magnificent frigatebird isn't under threat, but habitat destruction is a potential danger. The tiny colony on the Cape Verde Islands has been reduced to about 12 pairs. Precise figures are difficult to assess because some non-breeding birds remain at sea in the nesting season.

BEHAVIOR



▲ **FISH OUT OF WATER**
A juvenile swallows its catch, head first, in flight.

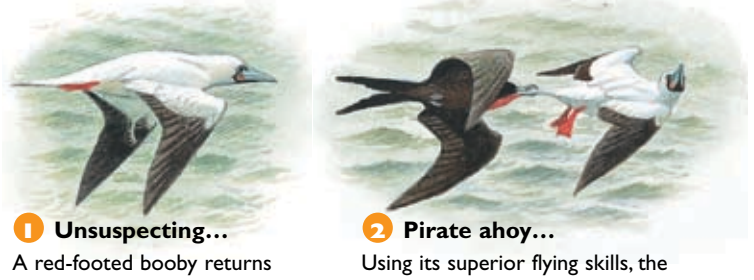
FOOD & FEEDING

The frigatebird follows schools of dolphins or tuna and uses its agility to snatch fish that break surface to escape underwater predators. Squid and jellyfish are also part of its diet. These are usually taken in a more leisurely fashion; the frigatebird drifts down from a height to grab its prey from the surface of the sea.

Seabirds' eggs and chicks, particularly those of terns, are plundered from nesting colonies, and hatchling turtles are scooped up from the beaches. Magnificent frigatebirds have, like many other seabirds, learned to exploit the opportunities presented by humans and will follow fishing boats to feed on the scraps and offal thrown overboard.

The frigatebird's reputation rests on its spectacular pursuit of other seabirds, harassing them until they give up their catch.

BOOBY PRIZE



1 Unsuspecting…
A red-footed booby returns from a successful fishing trip, as yet unaware of the aerial pirate about to swoop to the attack.

2 Pirate ahoy…
Using its superior flying skills, the frigatebird homes in on its victim, tugging fiercely at its wing and tail feathers with its sharp bill.

Leaving its roost on land in early morning, the frigatebird soars out to sea in search of food. It forages alone, but may congregate around concentrated sources of food, such as fishing boats. When not soaring, it rests on perches provided by ships' masts, buoys and fishing posts.

Dissipating excess heat is a problem for birds in tropical climates, but the frigatebird prevents overheating in a couple of ways. Males and females use 'gularfluttering.' This is similar to panting and involves the bird passing air over the mucous membranes in its throat. Mucus then evaporates, causing heat loss. Also, by ruffling its feathers, the bird lets the breeze draw heat directly away from its skin.

Unlike most other seabirds, the frigatebird drinks freshwater when it has the opportunity, flying low over the surface and scooping water into its bill.

3 Boarding party...
In danger of injury through being knocked out of the sky, the harassed booby regurgitates part or all of its fish load and quickly flies off.

4 Booty
As the prize falls rapidly to the sea, the frigatebird dives after it, swooping down and deftly catching the fish in midair.

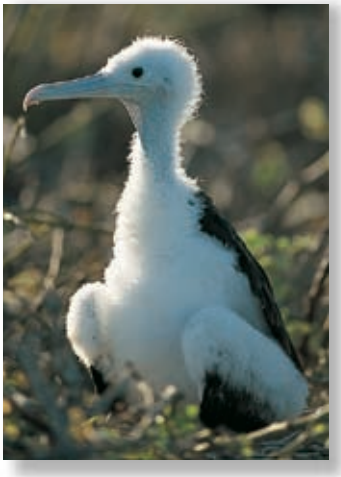
BREEDING

The cue for the frigatebird to start breeding arrives when the trade winds begin to blow strongly. Then, the male collects twigs, leaves and seaweed for the female who constructs a flimsy nest platform, usually 7–17' up in a tree. Frigatebirds often nest close to each other to form a colony. Both parents incubate the egg and feed the chick when it hatches. Adults may have difficulty catching enough food to feed their young and often resort to stealing it from other birds.

The frigatebird has one of the longest breeding cycles of all seabirds because of the chick's slow development and the long period of care (5–7 months) needed after leaving the nest. The female breeds only once every two years.

▲ **HOME TO ROOST**
When this male attracts a mate, the female will organize the nest and add material of her own.

▼ **FEATHER WEIGHT**
The single chick is naked on hatching, but soon develops fluffy white down.



PROFILE MAGNIFICENT FRIGATEBIRD

Well adapted to an aerial existence, the magnificent frigatebird is a marauder of the tropical coasts of North and South America.

HOOKED BILL

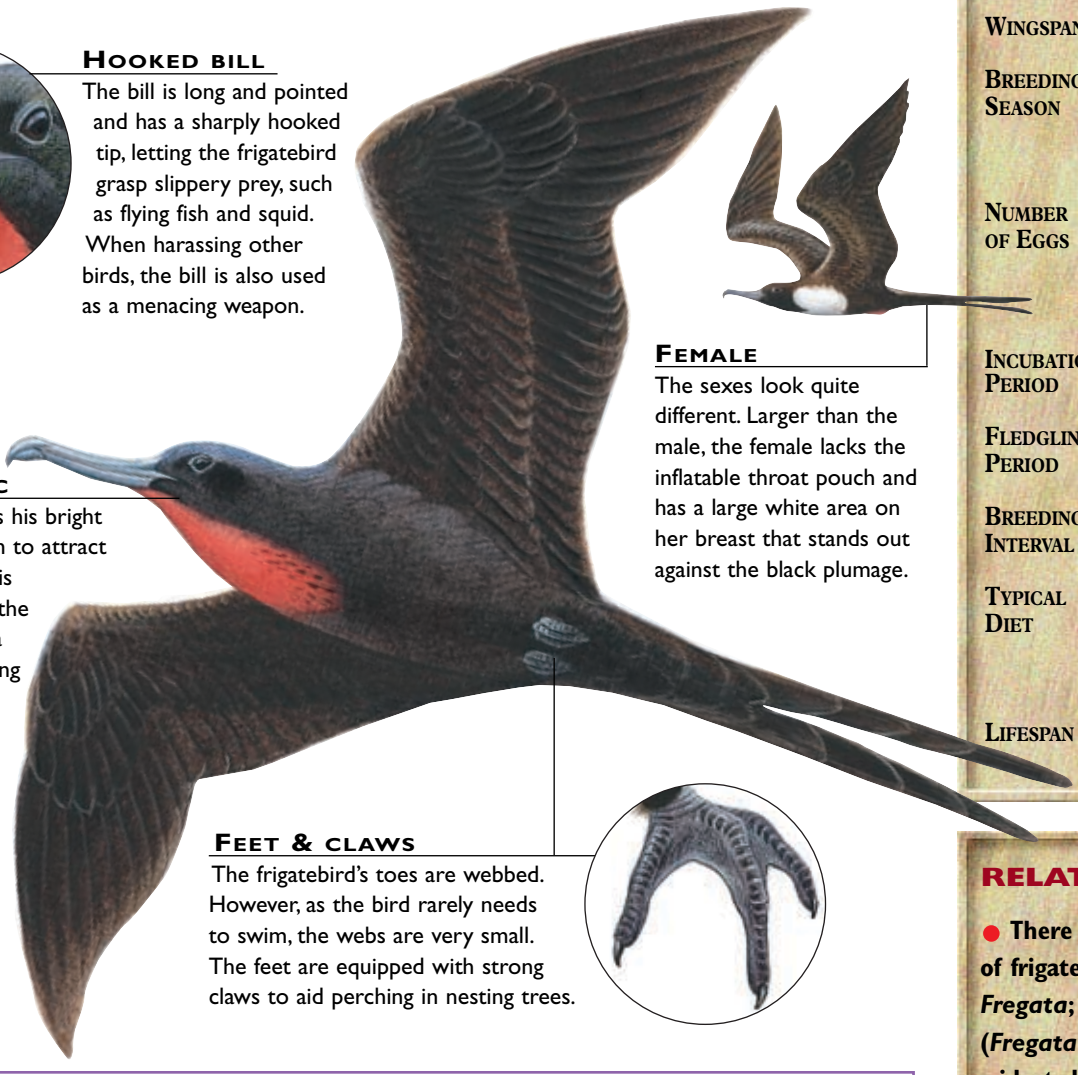
The bill is long and pointed and has a sharply hooked tip, letting the frigatebird grasp slippery prey, such as flying fish and squid. When harassing other birds, the bill is also used as a menacing weapon.

FEMALE

The sexes look quite different. Larger than the male, the female lacks the inflatable throat pouch and has a large white area on her breast that stands out against the black plumage.

THROAT SAC

The male inflates his bright red throat pouch to attract females. The bill is vibrated against the sac to produce a peculiar drumming sound.



FEET & CLAWS

The frigatebird's toes are webbed. However, as the bird rarely needs to swim, the webs are very small. The feet are equipped with strong claws to aid perching in nesting trees.

VITAL STATISTICS

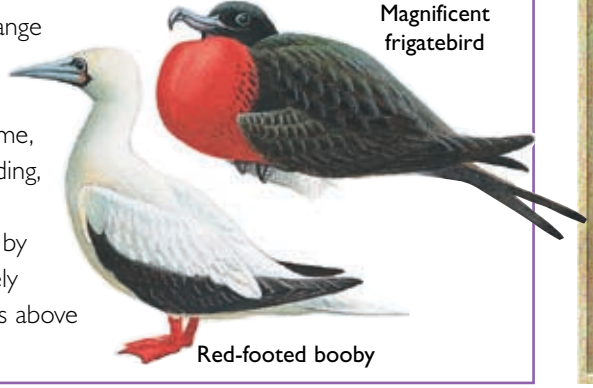
WEIGHT	2–3 lbs.
LENGTH	3–4'
WINGSPAN	7–8'
BREEDING SEASON	Throughout the year; in some locations favors dry season
NUMBER OF EGGS	1
INCUBATION PERIOD	40–50 days
FLEDGLING PERIOD	20–24 weeks
BREEDING INTERVAL	2 years
TYPICAL DIET	Flying fish, squid, offal, scraps, seabird eggs and chicks
LIFESPAN	Up to 30 years; average 12–15

RELATED SPECIES

- There are five species of frigatebird in the genus *Fregata*; great frigatebird (*Fregata minor*) has the widest distribution. *F. aquila* is confined to breeding on Ascension Island and *F. andrewsi* to Christmas Island. The smallest is the lesser frigatebird, *F. ariel*. Frigatebirds belong to the *Pelecaniformes* order, which also includes pelicans, gannets, boobies and cormorants.

CREATURE COMPARISONS

The red-footed booby (*Sula sula*) has the same range as the magnificent frigatebird and often nests in the same colony. The frigatebird is very buoyant in the air; the booby appears cumbersome, with its heavy body and labored flight. When feeding, the booby dives vertically from 30–100' into the sea, submerging itself for fish and propelling itself by its webbed feet. Unlike the frigatebird, which rarely gets wet, the booby has well-developed oil glands above the tail that provide essential waterproofing.

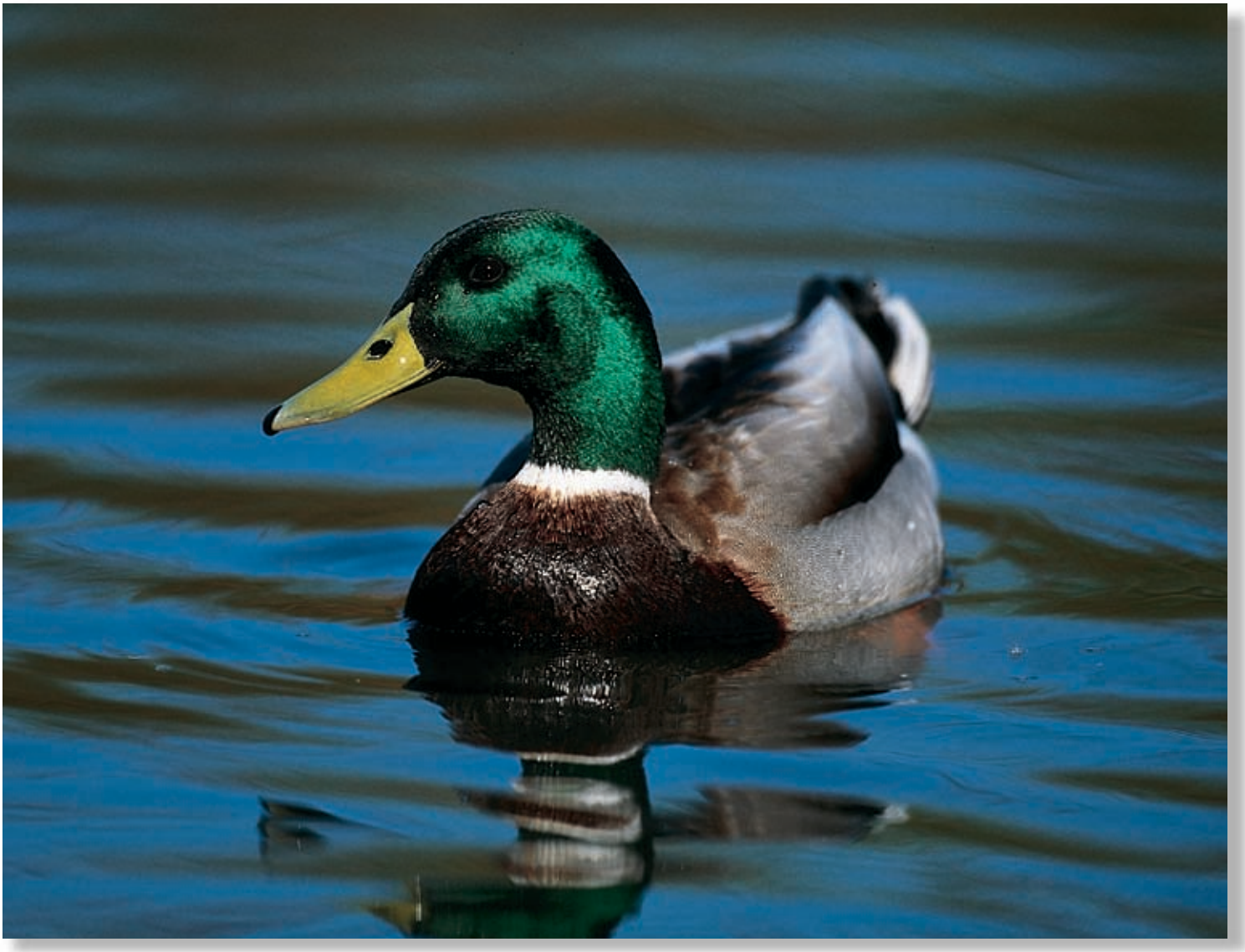


Mallard

• ORDER •
Anseriformes

• FAMILY •
Anatidae

• GENUS & SPECIES •
Anas platyrhynchos



KEY FEATURES

- The world's most abundant species of duck
- Feeds on submerged plants by upending and pushing its long neck underwater
- Male abandons his mate after egg-laying
- Ducklings stay close to their mother for protection, often swimming behind her in a long line

WHERE IN THE WORLD?

Found in a huge range that includes nearly all of Northern Hemisphere's temperate zone; introduced populations in Australia and New Zealand

LIFECYCLE

The mallard can raise a family in any wetland habitat, including the smallest pool and park lake, but each pair must produce a large brood to ensure enough chicks survive.

HABITAT

▲ **PARK LIFE**
Even busy parks have quiet corners for nesting.

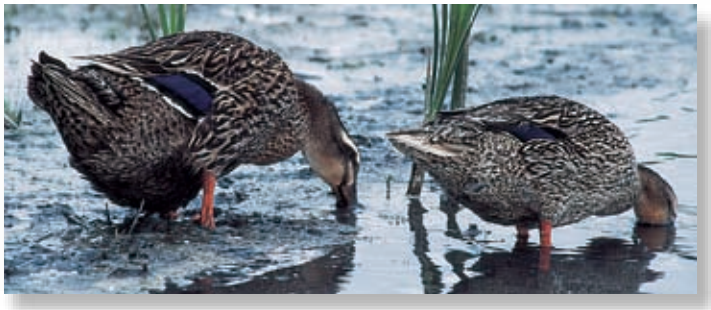
The mallard prefers to live in shallow waters with lush bankside vegetation. Although it can adapt to most every type of wetland, it ignores the deepest lakes and open seas. The mallard rarely moves far from its breeding grounds, but some fly to estuaries in winter, where there is a rich supply of food all year-round.

Mallards are tolerant of humans and are a common sight in garden ponds, park lakes and sewage farms.

CONSERVATION

Although hunted, the mallard has a stable world population of 28 million birds. However, in some areas the species' genetic purity is threatened by breeding with domesticated ducks.

FOOD & FEEDING

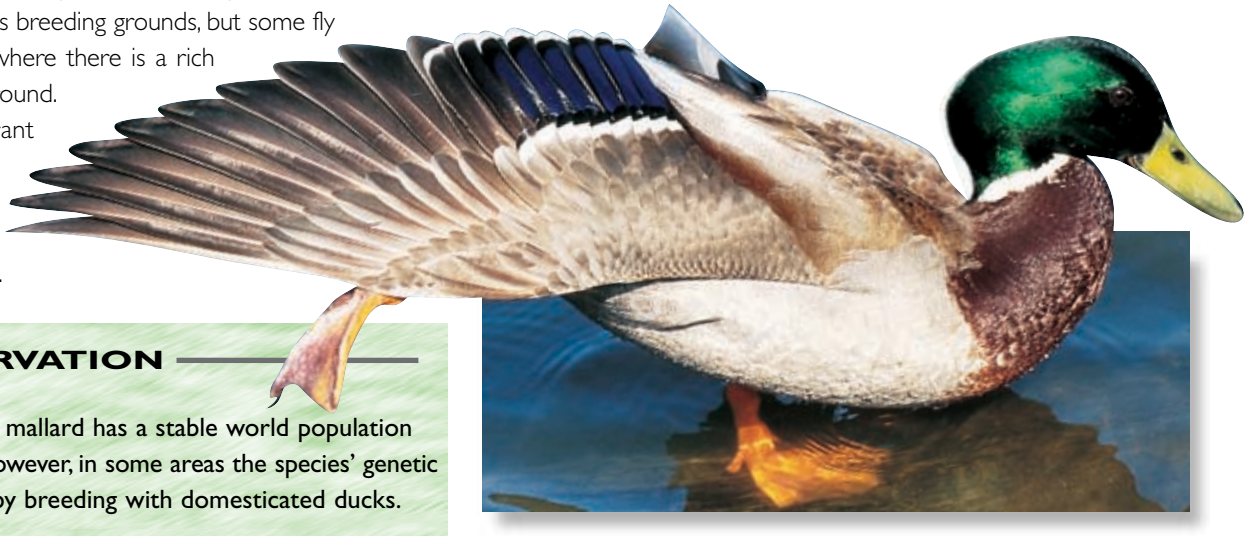


▲ **FILTER FEEDERS**
Souplike mud at the water's edge teems with a wide range of invertebrate prey.

The mallard employs a number of methods to find food. Out on the water, it paddles with its feet to disturb food items, which it then snaps up from the surface, or it sieves water through the sides of its bill to extract tiny animals. It up-ends in the water to browse water weed, or grab seeds, small snails and invertebrates from the bottom. On land, the mallard grazes short grass, browses shoots, and picks up whatever food it comes across, including scraps thrown by humans.

BEHAVIOR

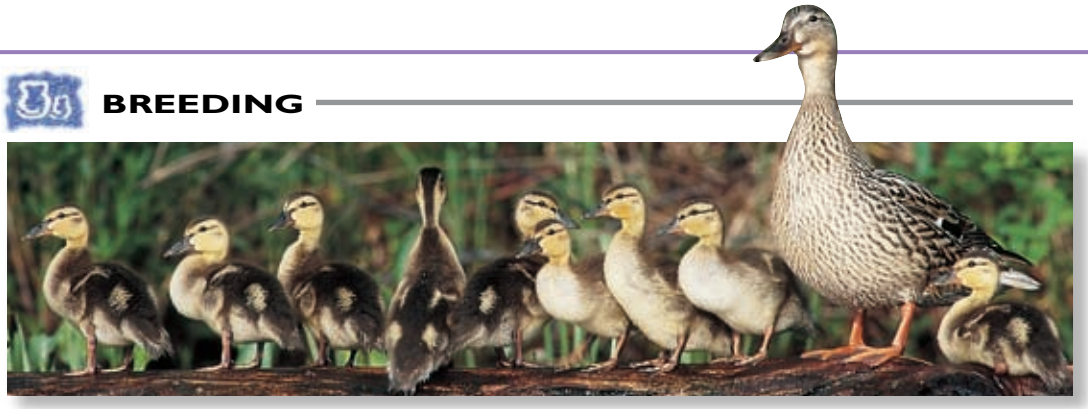
Outside the breeding season, mallards gather in flocks of hundreds or even thousands of birds, which tend to take part in the same activity at the same time. For example, the whole flock may feed, preen, bathe or simply rest together. In late winter, the flocks disperse into groups of several pairs each to search for suitable nest sites. But, even during the breeding season, neighboring pairs of mallards often associate in loose groups.



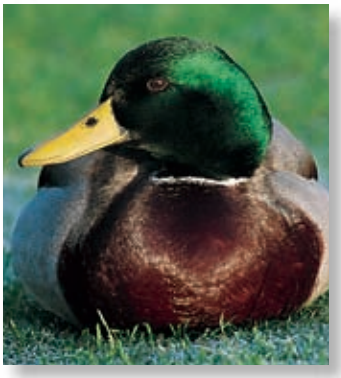
DID YOU KNOW?

- **Only female mallards can "quack." The male has a feeble, high-pitched call.**
- **Both sexes molt their feathers in midsummer and become flightless for about 4 weeks.**
- **Pools heated by thermal springs allow the mallard to stay in Iceland all winter.**
- **Young mallards have many enemies, including bass, snapping turtles and raccoons.**

BREEDING



Groups of male mallards chase and display to females all winter long, but especially in February and March. Once a drake has attracted a mate, he stays at her side to prevent her mating with other males. When she has laid her clutch of 9–13 eggs, he takes no part in rearing the young. The downy chicks leave the nest 24 hours after hatching, and can feed themselves, but need their mother's protection for two months. Even so, as few as one in ten reach adulthood.



▲▶ **SINGLE PARENT**
The drake (*right*) deserts his mate, so she cares for her large family alone.

◀ **WELL GROOMED**
Preening and wing-stretching maintain feathers.

▲ **FEEDING FRENZY**
Large flocks soon form at rich feeding grounds.

WATER OFF A DUCK'S BACK

1 Land...
Several mallards drop down to a lake to feed. They spread their feet to act as brakes; just before hitting the water, they flap backward.

2 Feed...
While the mallards are upending to browse underwater weed, a peregrine falcon flies overhead in search of its own meal.

3 Fly...
Most of the mallards spot the falcon and leap into the air to fly to safety, but one drake is unaware of the danger and continues to feed.

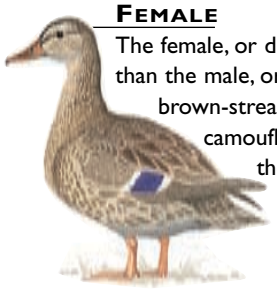
4 Dive
The lone mallard is, in fact, safe on the water, as the falcon hunts only in midair. The hunter heads off in search of airborne prey.

PROFILE MALLARD

A highly versatile body plan allows the mallard to exploit a wide range of feeding opportunities, making it the world's most successful duck.

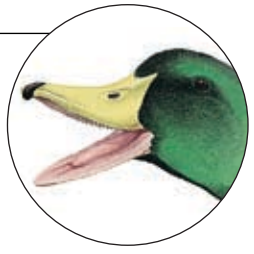
FEMALE

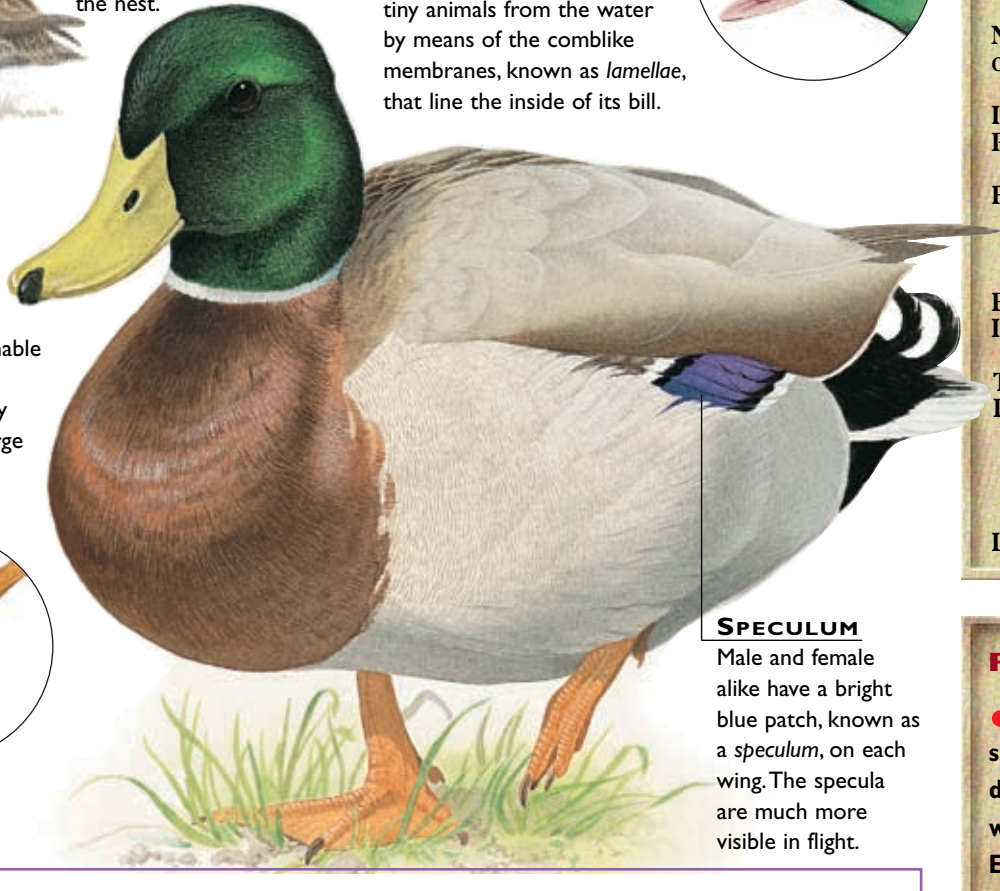
The female, or duck, is slightly smaller than the male, or drake, and has a drab, brown-streaked plumage to camouflage her when sitting on the nest.



BILL

The sharp "nail" on the tip of the bill is used to graze grass and pick up small prey. The mallard can also filter tiny animals from the water by means of the comblike membranes, known as *lamellae*, that line the inside of its bill.





FEET

Webbed feet enable the mallard to paddle efficiently and half-submerge itself to reach aquatic plants.

SPECULUM

Male and female alike have a bright blue patch, known as a *speculum*, on each wing. The specula are much more visible in flight.

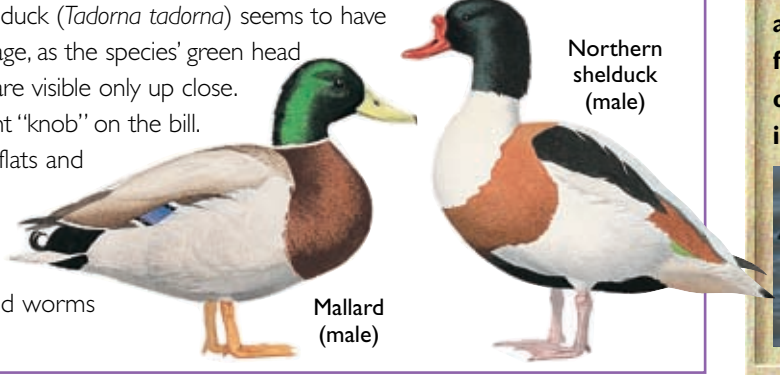
VITAL STATISTICS

WEIGHT	1.5–3.5 lbs.
LENGTH	20–26"
WINGSPAN	30–40"
SEXUAL MATURITY	1 year
BREEDING SEASON	February–June
NUMBER OF EGGS	9–13
INCUBATION PERIOD	About 28 days
FLEDGING PERIOD	50–60 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Shoots and seeds of aquatic plants, grass, insects, snails, worms
LIFESPAN	Up to 29 years in captivity

CREATURE COMPARISONS

From a distance, the northern shelduck (*Tadorna tadorna*) seems to have a patterned black-and-white plumage, as the species' green head and orange-chestnut breast band are visible only up close. The male shelduck has a prominent "knob" on the bill.

A bird of Eurasia's coastal mudflats and estuaries, the shelduck is rarely found far inland. It has a more specialized diet than the mallard, feeding on small shellfish, snails and worms from the mud.



RELATED SPECIES

● **The mallard is 1 of 36 species of surface-feeding duck in the genus *Anas*, which also includes the Eurasian wigeon, *A. penelope*** (male, below), **and the pintails, shovelers and teals. Ducks are in the family *Anatidae* in the order *Anseriformes*, which includes geese and swans.**

Malleefowl

• ORDER •
Galliformes

• FAMILY •
Megapodiidae

• GENUS & SPECIES •
Leipoa ocellata

KEY FEATURES

- Builds large mounds of soil and plant matter in which it lays its eggs
- Eggs are incubated using heat generated by rotting matter inside the mound and by the sun's rays
- Rare across its range; the IUCN (World Conservation Union) classifies it as vulnerable

WHERE IN THE WORLD?

Once distributed over large areas of southern Australia; now restricted to scattered semiarid areas of the southwestern and southern mainland

LIFECYCLE

The hard-working malleefowl faces a life of unremitting toil. Although only a small bird, it builds a huge nesting mound and spends up to 11 months of the year tending it.

HABITAT

▲ **MOVING MOUNTAINS**
The mound may be up to 17' in diameter and 5' high.

The malleefowl needs a reliable food supply of seeds and fresh young shoots. It finds this in the vast expanse of semiarid land in southern Australia. This region encompasses areas where mallee (a dwarf eucalyptus) and acacia are abundant.

Preferring open areas at ground level, the malleefowl looks for territory with shrubby undergrowth nearby in which to find food, and an almost complete canopy above to shield it from the sun.

DID YOU KNOW?

- **If an adult malleefowl comes across an emerging chick when tending the mound, it simply kicks the chick out as if it were an item of mound material.**
- **The malleefowl may move up to 300 tons of soil a year regulating the mound's temperature; 35 cu. feet may be added or removed at a time.**

BREEDING

The malleefowl uses heat, generated by sun and decomposition of buried vegetation within its mound, to incubate its eggs. The male begins building the mound in early winter, digging a hole 10–13' in diameter and 3' deep, then filling it with vegetation.

In early spring, once rain wets the vegetable matter and begins the decomposition process, the birds dig a chamber into which the female lays her eggs. The parent birds then cover the whole mound with sandy soil. Throughout incubation the birds add or remove soil to maintain an ideal temperature of 91°F.

Upon hatching, each chick digs to the surface where it must fend for itself. It can fly almost immediately.

▶ **BIRTHDAY SUIT**
The hatchling already has camouflaging plumage.

TENDING THE NEST

1 Thermometer bird...
Using heat-sensitive areas in its mouth, the malleefowl tests the mound's temperature, which should be about 91°F.

2 When the going gets hot...
If the mound feels too warm, the malleefowl scrapes away some of the soil and vegetation to let the excess heat escape.

FOOD & FEEDING

3 Chilled out...
The malleefowl replaces mound material once the temperature reaches the correct level. The male does the majority of the digging.

4 Breakthrough
After hatching, a chick digs through 3' of soil to reach the surface, a feat that leaves it exhausted for several hours.

The adult malleefowl eats a variety of plant matter including seeds, buds, flowers, leaves and fruit. It typically searches for food by walking slowly along the woodland floor, scratching among leaf litter and in the soil with its powerful feet. Without actively seeking them, the malleefowl also eats any invertebrates and insects that it finds, inadvertently picking them up while foraging.

The young chick feeds almost entirely on invertebrates at first; they are readily available and more easily converted into energy and muscle than plant matter. It gives the chick the best possible start in life — which is vital since it has to fend for itself as soon as it leaves the mound. As it matures, the young malleefowl eats a greater proportion of plant matter until, as an adult, its diet consists mostly of tender young shoots and seeds.

◀ **SURROUNDED BY FOOD**
The malleefowl often eats sand to grind down food.

BEHAVIOR

Although the malleefowl mates for life, the male and female are solitary and are seldom seen together away from the mound. The male tends the mound every hour, and so forages, sunbathes and roosts close to it. The female, however, wanders across the pair's range in search of food to sustain her heavy egg production; she visits only for short periods.

The malleefowl's range varies from 0.4–1.6 sq. miles. It is smaller in rainy areas due to greater densities of malleefowl.

▼ **TOP OF THE HEAP**
Old mounds are often reused in later years.

CONSERVATION

The total population of malleefowl is now thought to be fewer than 10,000, following a dramatic decline in recent years. The greatest threat to the species is the destruction of its habitat by wheat-growing and sheep-farming. Many eggs are taken by the introduced European fox and there is significant predation by feral cats.

PROFILE MALLEEFOWL

Specially adapted legs and feet enable the chicken-sized malleefowl to move huge amounts of soil and vegetation to construct nesting mounds.

BILL
The bill is short and unspecialized. Sensitive areas on the tongue or parts of the mouth may help gauge the mound's temperature.

HEAD
The bare skin around the male's eyes and ears becomes brighter during the breeding season.

PLUMAGE
The intricately marbled plumage is perfect for camouflaging the bird in the mallee scrub.

TAIL
The short, stubby tail enables the bird to maneuver through tangled undergrowth.

FEET & LEGS
Large, powerful legs and feet are ideal for mound-building and foraging.

VITAL STATISTICS

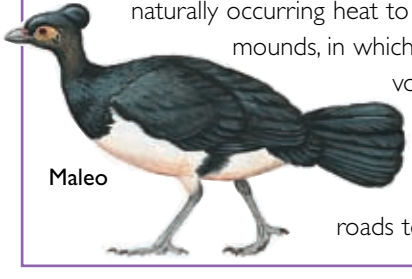
WEIGHT	Male 5–6 lbs.; female 3–5 lbs.
LENGTH	24"
WINGSPAN	12–13.5"
SEXUAL MATURITY	Usually 4 years
BREEDING SEASON	June–February
NUMBER OF EGGS	15–24
INCUBATION PERIOD	62–64 days average
FLEDGING PERIOD	Independent on hatching
BREEDING INTERVAL	Annual but not during droughts or rainy periods
TYPICAL DIET	Omnivorous, but mainly eats buds, flowers, fruits, seeds
LIFESPAN	Up to 25 years

RELATED SPECIES

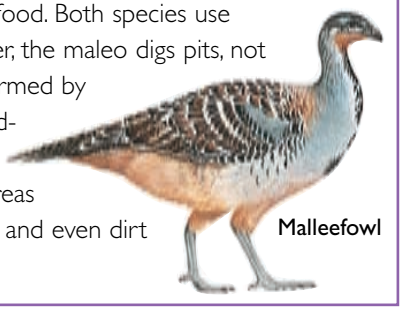
- The malleefowl belongs to genus *Leipoa*, family *Megapodiidae*, a group of birds found almost exclusively in the Australasian region. There are 7 genera and 19 species within the family, the largest genus being *Megapodius*. The *Megapodiidae* are among the most distinctive members of order *Galliformes*, which contains 274 species including pheasants and curassows.

CREATURE COMPARISONS

A close relative of the malleefowl, the maleo (*Macrocephalon maleo*) has a distinctive black, helmetlike knob on its crown; its purpose is unknown. The maleo is native to Sulawesi in Indonesia, and, like the malleefowl, eats both plant and animal food. Both species use naturally occurring heat to incubate their eggs. However, the maleo digs pits, not mounds, in which to lay eggs, often in soil warmed by volcanic activity. Like its mound-building cousin, it uses the warmth of sun-exposed areas such as beaches, riverbanks and even dirt roads to-incubate its eggs.



Maleo



Malleefowl

Mandarin Duck

• ORDER •
Anseriformes

• FAMILY •
Anatidae

• GENUS & SPECIES •
Aix galericulata

KEY FEATURES

- Extravagant plumage of the drake (male) makes it one of the most easily recognized of all ducks
- Native to Asia, but escapees from waterfowl collections established populations in Britain
- Prefers wooded habitats near water and usually nests in tree holes

WHERE IN THE WORLD?

Occurs naturally in eastern China, eastern Russia and Japan; feral populations exist in parts of Europe — the majority in southeast England

LIFECYCLE

Though it seldom strays far from rivers and lakes, the mandarin duck is just as much a woodland bird as a waterfowl, adapted for flying, perching and nesting among trees.

HABITAT

The mandarin duck's natural haunts lie in broad-leaved, temperate forests of northeast Asia. It typically lives along forest streams or pools lined with thick bankside vegetation (trees, shrubs or reeds). Open ground and broad expanses of water are usually avoided, but small flocks do enter rice fields to feed after breeding. Birds from the north of the range migrate south each year to spend the winter in the milder climate south of China's Yangtze River.

As many as 300–400 pairs live in the wild in Britain. Escapees from collections have established a number of breeding areas; colonies exist in most counties of southeast England, as well as sites in Norfolk, Cheshire, Gloucestershire and Tayside.

▼ **IDEAL HOME**
The mandarin duck favors woodland near water.

CONSERVATION

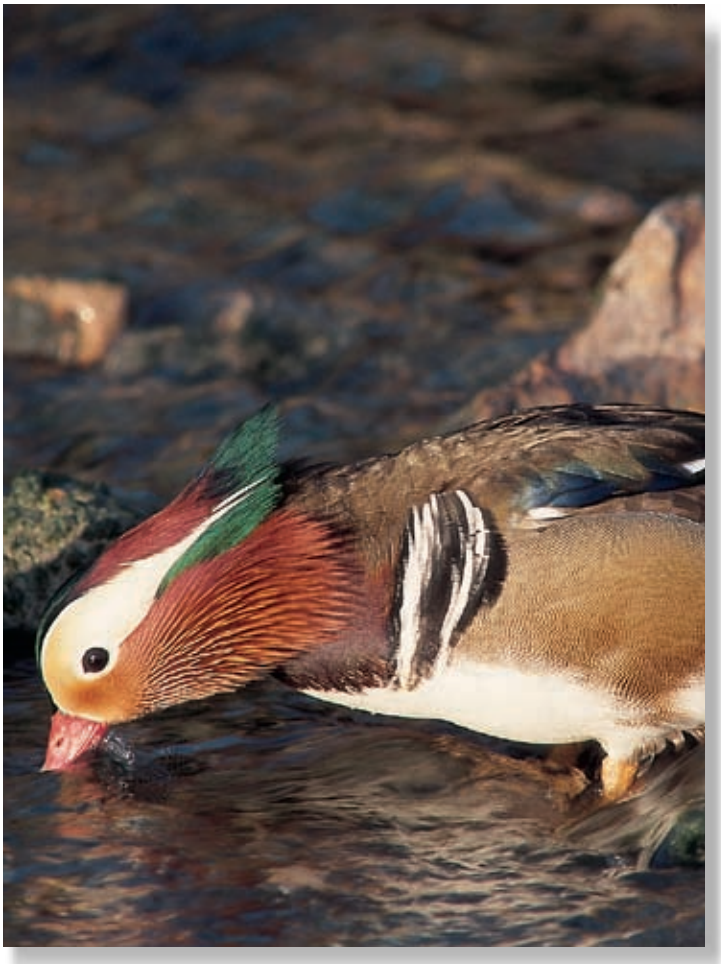
The status of the mandarin duck in its Asian homeland is unclear — few studies have been undertaken there. Because of forest clearance and other habitat disturbances in Asia, conservationists suspect its numbers are declining. However, the wild population in Britain is slowly on the rise.

FOOD & FEEDING

The mandarin duck finds food both in and out of the water. It forages among debris on the bank, dabbles at the water's edge or while swimming and occasionally up-ends to reach deeper, submerged food.

Vegetation makes up the bulk of its diet, but the duck will also snap up small creatures (mostly insects); at certain times of the year, animal food predominates. In early autumn, land snails are an important food source. Flocks studied in Russia eat a variety of seeds (including those from aquatic plants), acorns, insects (such as beetles) and small fish. In Britain, the summer diet consists of waterside and aquatic insects; acorns, beechmast and chestnuts provide sustenance the rest of the year.

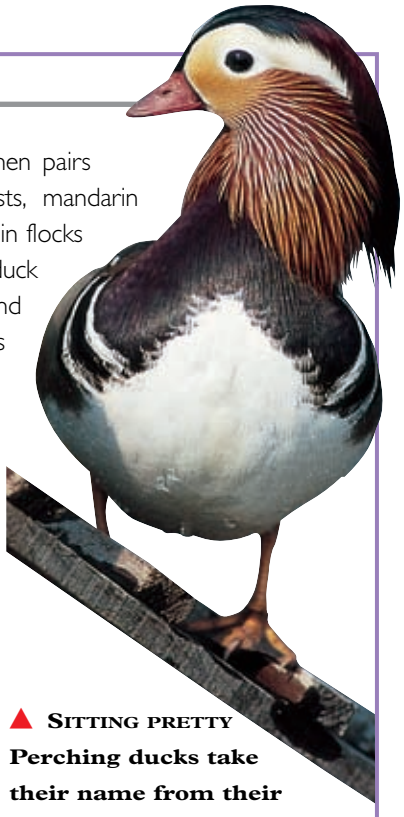
▼ **FEELING PECKISH**
Though known as a surface-feeding duck, the mandarin duck feeds in a variety of ways in and out of the water.



BEHAVIOR

Outside the breeding season, when pairs have finished tending their nests, mandarin ducks are social birds that gather in flocks (sometimes more than 60). The duck is most active in mornings and evenings, but feeding continues intermittently throughout the day and night. The mandarin duck is perfectly at home on the water or land, both swimming and walking with ease.

The agility of the mandarin duck extends to its power of flight. With strong, rapid wingbeats, it can rise steeply into the air from the water surface or land. This, and its ability to twist and turn tightly in flight, lets the duck negotiate its way at speed through the confined spaces of its woodland home.



▲ **SITTING PRETTY**
Perching ducks take their name from their ability to "sit" on slender branches.

BREEDING

Antics of courtship take up a good deal of a mandarin duck's time. Starting as early as September, well before the spring mating season, flocks of drakes gather for communal displays designed to impress females.

By spring, most females will have selected a partner; the pairs engage in further displays to strengthen their bonds prior to mating. During the nesting period, the drake stays nearby while the female incubates the eggs. A few days after hatching, the ducklings feed themselves. In six weeks, they're fully independent.

THE HOLE STORY

1 Tree house…
Old trees typically provide the preferred nesting cavities. The favorite nest site is a hole several feet above the ground.

2 Home-making…
No nesting material is taken into the hole. The female uses her body to mold a depression in debris already there and lines it with feathers.

3 Egg factory…
Laying at a rate of one per day, the female produces 9–12 eggs. Once the last is laid, the female begins a four-week stint of incubation.

4 Flying the nest
Shortly after hatching, ducklings scramble to the light and launch themselves from the nest entrance under the watchful eye of mother.

DID YOU KNOW?

- **The first captive mandarin ducks were brought to Britain as early as 1747. In 1971, the species was formally accepted on the list of Britain's wild birds.**
- **A mandarin duck that escaped from London's St. James's Park in 1930 turned up months later in Hungary, 900 miles away.**
- **In ancient China, the mandarin duck was a symbol of faithfulness, and newlyweds were presented with a pair of live ducks as a good luck token.**

PROFILE MANDARIN DUCK

With rich colors, ornate patterns and fanciful "whiskers" and "sails," the male mandarin duck is one of the most beautiful of all waterfowl.

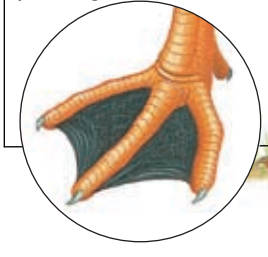
PLUMAGE
Immediately after the breeding season, the drake molts his colorful feathers and takes on "eclipse" plumage, which is similar to the female's.

FEMALE
Though dowdy in comparison with the drake, the female's prominent eye ring and eye stripe distinguish her from other gray-brown ducks.

WING FEATHERS
The most unusual feature of the drake's plumage is the pair of orange "sails" formed from an enlarged and upturned set of wing feathers.

WINGS & TAIL
Strong wings that beat rapidly and a long tail give the bird excellent maneuverability, compared to other ducks, when flying among trees.

FEET
Sharp claws on the toes of its webbed feet help the mandarin duck get a secure grip when perching on branches.



VITAL STATISTICS

WEIGHT	1–1.5 lbs.
LENGTH	16–20"
WINGSPAN	27–30"
SEXUAL MATURITY	1 year
BREEDING SEASON	Spring
NUMBER OF EGGS	9–12
INCUBATION PERIOD	4 weeks
FLEDGING PERIOD	6 weeks
BREEDING INTERVAL	1 year
TYPICAL DIET	Seeds and nuts; some insects and snails
LIFESPAN	3–6 years

CREATURE COMPARISONS

The wood duck of North America is the mandarin duck's cousin. It, too, is a woodland dweller that nests in tree holes; it is also a popular captive bird in Europe. Though similar in size and shape to the mandarin drake, the male has plumage embellished with glossy greens and browns and bold, white stripes. The female, like the mandarin duck, is mostly gray-brown.

Male wood duck

Male mandarin duck

RELATED SPECIES

● **The mandarin duck is one of 13 species of perching ducks and perching geese in the *Cairinini* tribe. Different species are scattered across the globe, but all share adaptations to live in wooded habitats. The largest is the spur-winged goose of Africa; others include the muscovy duck of Central and South America, the African pygmy goose and maned wood duck of Australia.**

Manx Shearwater

• ORDER •
Procellariiformes

• FAMILY •
Procellariidae

• GENUS & SPECIES •
Puffinus puffinus

KEY FEATURES

- Spends eight months a year out at sea, following currents and winds for fish and squid
- Glides effortlessly, skimming the ocean waves and only rarely flapping its long, slender wings
- Nests on remote islands, but travels to and from its burrow by night as it's defenseless on land

WHERE IN THE WORLD?

Breeds on offshore islands in the northeastern Atlantic (Iceland south to Madeira), along the east coast of North America and in the Mediterranean; wanders the South Atlantic from August until April

LIFECYCLE

A master of navigation and energy-saving flight, the Manx shearwater spends much of its life flying over the open Atlantic, coming to land for only a few months each year.

HABITAT

▲ **NEST HOLES**
Colonies look deserted by day: all birds are at sea or incubating underground.

One of the Atlantic Ocean's great wanderers, the Manx shearwater only comes ashore to breed, nesting on offshore islands in huge colonies. It arrives at its Northern Hemisphere breeding grounds in April: the timing depending on the latitude of each colony.

In the breeding season (just over four months), the shearwater stays within a couple hundred miles of its colony. In August, it begins a marathon journey to the South Atlantic, where it spends the Southern Hemisphere's summer in the warm seas between Brazil, Uruguay and Argentina in the west and South Africa in the east.

DID YOU KNOW?

- **The Manx shearwater is named after the Isle of Man, in the Irish Sea, but it no longer breeds there.**
- **The wailing of breeding Manx shearwaters was once thought to be evil spirits.**
- **By the time it fledges, a well-fed juvenile can weigh twice as much as its parents.**
- **A leg-banded juvenile was found in Brazil 17 days after it left its burrow in Britain — over 4,350 miles away.**

BEHAVIOR

The shearwater is a highly social bird and is rarely seen on its own. It flies in tightly packed flocks, which dart over the sea like squadrons of low-flying aircraft, twisting and turning in sequence to take advantage of the air rising up between waves. As it rarely has to flap its wings, flying is effortless and uses little energy.

The shearwater's amazing "homing" ability, which isn't fully understood, but may involve an internal "map" of the sun and stars, lets the bird find its way across expanses of open ocean, with unerring accuracy.

▲ **NOCTURNAL CROONER**
Silent most of the year, the shearwater cackles and "moans" at its colonies.

BREEDING

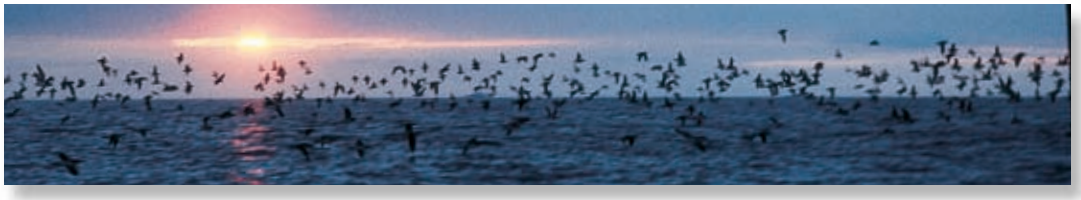
▲ **FINDING ITS WAY**
A shearwater finds its burrow, remembering certain "landmarks."

▶ **CHANGE OF OWNER**
The shearwater may nest in an old rabbit burrow; the Atlantic puffin may use it next.

CONSERVATION

The Manx shearwater faces few threats at sea. It isn't dependent on a single type of prey and is less vulnerable to oil slicks than seabirds that spend most of their time on the water's surface. But the story is mixed at its colonies. On some islands, introduced predators (foxes, cats and rats) reduced local populations. However, where islands have been made into nature reserves, the bird thrives.

FOOD & FEEDING



▼▲ **SUNSET STRIP**
As the sun sinks, the birds fly from their feeding grounds at sea *(above)* to their colony *(below)*, to feed their chicks.

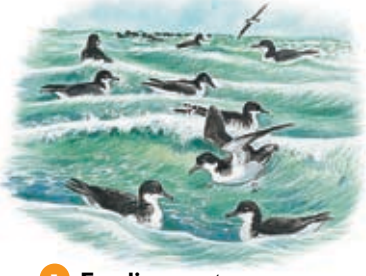
The shearwater hunts fish, small squid and crustaceans that live close to the sea's surface. It catches its prey in two different ways: by snatching it from the surface while paddling or by plunging underwater to give chase. Its dives are fairly shallow and last just a few seconds, but the shearwater has been found trapped in lobster traps in over 100' of water, proving that it dives deeply if necessary.

Where food is plentiful, hundreds or thousands of shearwaters gather on the sea in scattered groups known as *rafts*; squabbles may break out, but the birds usually feed together in peace. When parents have a chick to feed, they make the nightly flight back to their burrow with food; at other times, they stay at their feeding grounds. Unlike other seabirds, such as gulls and gannets, the Manx shearwater doesn't follow ships to pick up scraps thrown overboard.

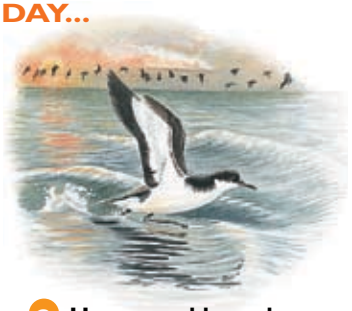
In the early spring, shearwaters congregate off coastal islands to prepare for their annual return to dry land. This takes place under the cover of darkness, as their awkwardness on land makes them vulnerable. Birds that have bred in previous years search out their old nest burrows and renovate them, but young adults must find an abandoned burrow or dig one. With thousands of shearwaters breeding close together, the competition for burrows is intense.

The female lays one large egg, which both parents incubate in shifts for 7–8 weeks: while one bird is sitting on the egg, the other feeds at sea, often wandering hundreds of miles away. Once the chick hatches, the male and female leave it unattended during the day while they hunt, each feeding it at night. It quickly becomes fat, but by the end of August, its parents stop feeding it and leave the colony. Driven by hunger, the chick makes the hazardous journey down to the sea and sets off on its long journey south for the winter.

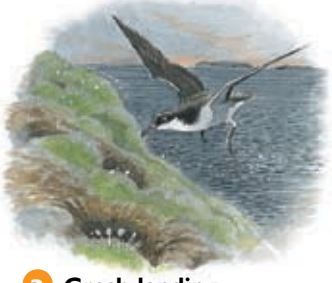
AT THE END OF THE DAY...



1 Feeding party...
By day a raft of shearwaters may float on the surface, plundering a large shoal of surface-feeding fish.



2 Homeward bound...
As dusk falls, flocks of birds begin to leave, "pattering" along the sea to gather speed to take off.



3 Crash landing...
Back at the colony, each shearwater finds its own burrow, flopping down on legs poorly adapted for walking.

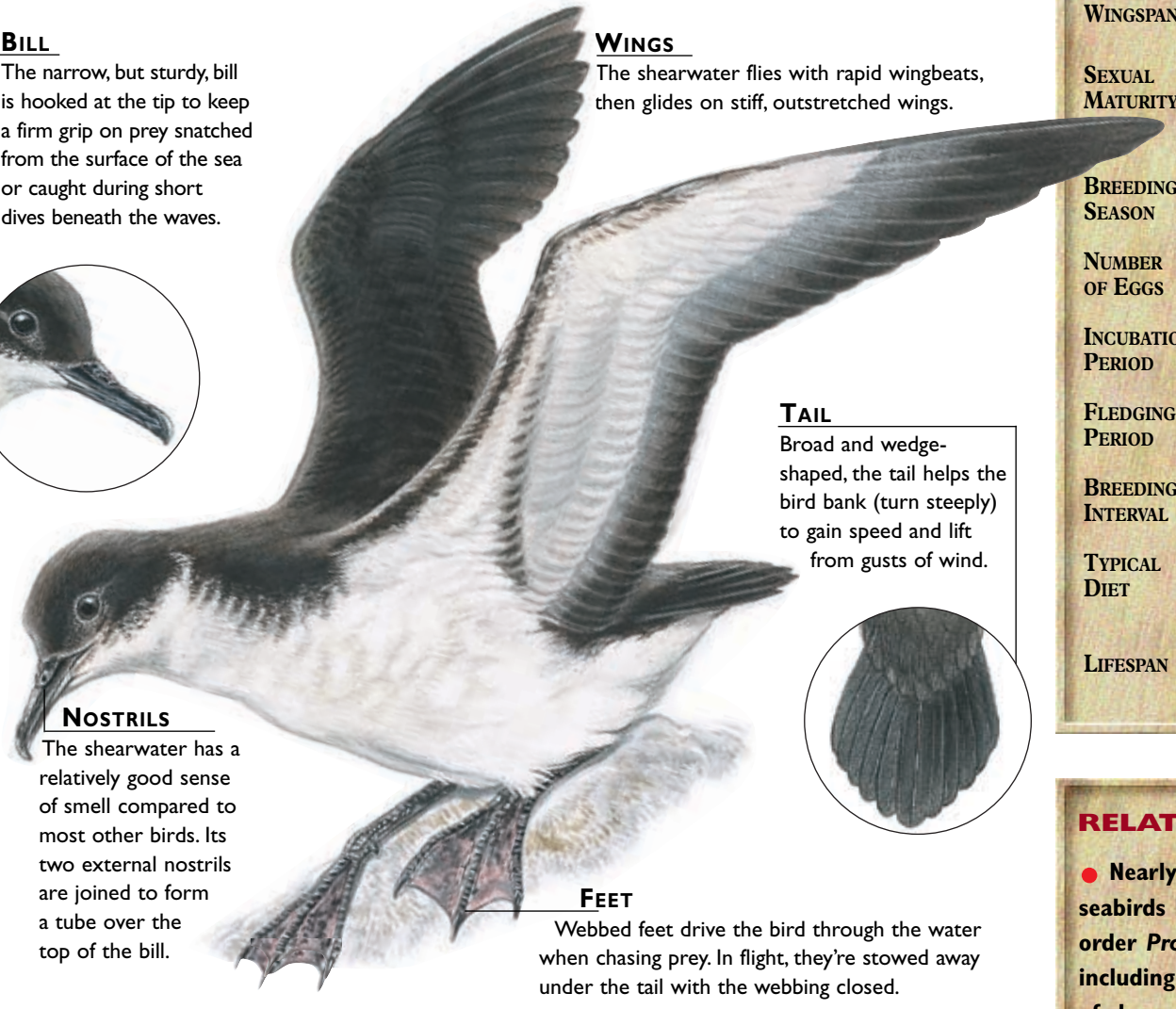
4 Messy business
A parent crawls into the nest to regurgitate a mix of oil and partly digested fish for its chick.

PROFILE MANX SHEARWATER

Gliding on its long, straight wings, the Manx shearwater is completely at home above the vast open ocean, where it can smell prey from afar.

BILL
The narrow, but sturdy, bill is hooked at the tip to keep a firm grip on prey snatched from the surface of the sea or caught during short dives beneath the waves.

WINGS
The shearwater flies with rapid wingbeats, then glides on stiff, outstretched wings.



TAIL
Broad and wedge-shaped, the tail helps the bird bank (turn steeply) to gain speed and lift from gusts of wind.

NOSTRILS
The shearwater has a relatively good sense of smell compared to most other birds. Its two external nostrils are joined to form a tube over the top of the bill.

FEET
Webbed feet drive the bird through the water when chasing prey. In flight, they're stowed away under the tail with the webbing closed.

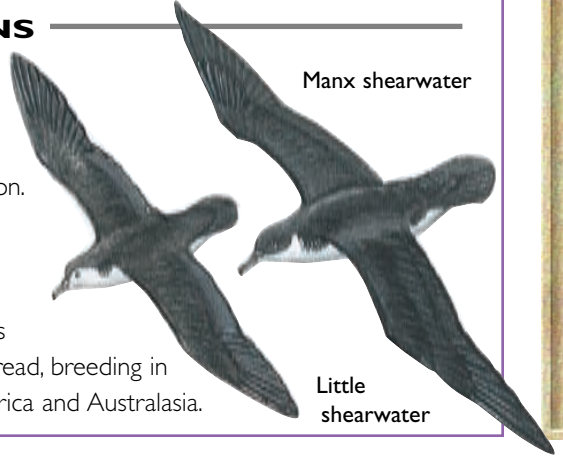
VITAL STATISTICS

WEIGHT	12–16 oz.
LENGTH	1'
WINGSPAN	3'
SEXUAL MATURITY	5 years
BREEDING SEASON	April–August
NUMBER OF EGGS	1
INCUBATION PERIOD	51–54 days
FLEDGING PERIOD	70 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Fish, small squid and crustaceans
LIFESPAN	Up to 20 years

CREATURE COMPARISONS

It's difficult to tell shearwaters apart, since they fly fast and low over the ocean, disappearing into wave troughs and only come to land after sunset. The Manx and little shearwaters (*Puffinus assimilis*) are no exception.

But the little shearwater is one of the smallest true shearwaters, with a wingspan of just 2'. Although both have dark, blackish upperparts that contrast with pale undersides, the little shearwater has more white on its face, giving it a different facial "expression." It's widespread, breeding in the North Atlantic and the oceans between South Africa and Australasia.



RELATED SPECIES

● **Nearly a third of all seabirds belong to the order *Procellariiformes*, including the 20 species of shearwaters, and prions, albatrosses, fulmars and petrels. The tiny Wilson's storm petrel, *Oceanites oceanicus*** (below)**, is the most common of all seabirds.**

Marabou Stork

• ORDER •
Ciconiiformes

• FAMILY •
Coniidae

• GENUS & SPECIES •
Leptoptilos crumeniferus

KEY FEATURES

- Signals dominance by inflating a gular pouch, which hangs down from the neck
- Soars effortlessly using thermals to rise high in the air
- Constructs a huge nest that balances high in the treetops
- Devours almost any animal matter, dead or alive, including carrion scraps, fish and even crocodiles and birds

WHERE IN THE WORLD?

Found in many parts of tropical Africa; from Senegal east to Ethiopia and Somalia; south through Botswana and northeastern Namibia, down to South Africa

LIFECYCLE

Adapted for wading, the large marabou stork also roosts and nests comfortably on branches 120' high and uses thermal soaring to fly effortlessly thousands of feet above the ground.

HABITAT

Like all birds, the marabou stork's choice of habitat is dependent upon the availability of food. Most marabou storks live in open country in arid or semiarid areas, but there is always a body of water within its flying range. The marabou hunts for fish and aquatic insects in large lakes, rivers and even small ponds. It also feeds on carrion, and for this reason, can be found scavenging near vulture attacks. With their wide variety of refuse, slaughter houses and garbage dumps also attract the hungry marabou stork. Euphorbia, acacia and baobob trees are the favorite communal roosting and nesting sites of the stork.

▼ **MADE TO WADE**
The marabou stork's long legs and partly webbed feet are well suited for wading in shallow water across its tropical African range.

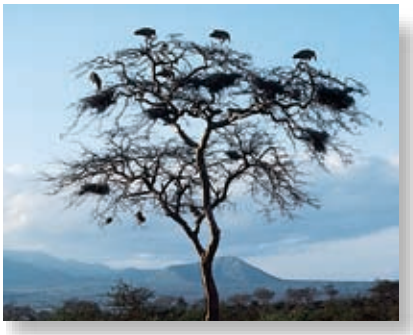
▶ **FULL DEPENDENCE**
At 40 days old, the chick remains dependent on its parents for food for 90 more days.

BREEDING

The finished nest of a pair of marabou storks is impressive, measuring 3' in diameter and 1' thick. First, a 6–7 year old male selects a site, 6–120' high in a tree and waits for a courting female. She must persistently perform submissive displays because the male rebuffs both males and females approaching his territory. Once a pair is established, the male collects coarse sticks for their platform nest, which is built almost entirely by the female. She lays 2–3 eggs and both parents share incubation duties. After about 30 days, the eggs hatch at 1–3 day intervals. The hatchlings are pink and wrinkly. Both parents feed fish to the young by regurgitating food onto the floor of the nest.

DID YOU KNOW?

- **The marabou's fluffy undertail feathers, known as "marabou down," were used extensively in years past as hat ornaments.**
- **The marabou stork is the only species in its genus with a dark iris. The sepia-brown to grayish-brown iris gives the eye an overall brown color.**



▶ **ALL TOGETHER NOW**
The silhouette of a communal roost reveals storks and their large nests.

FOOD & FEEDING

From tiny termites to colossal carrion pieces, the marabou stork eats essentially any animal matter, including baby birds. But fish and insects provide the bulk of the marabou's diet. While wading in shallow water, the marabou stork immerses its slightly opened bill, snapping it shut when it comes in contact with prey. The bird also spreads its wings slightly, luring fish into the shade, then stabbing them with its sharp bill. The marabou also consumes frogs, rodents and even young crocodiles, but it won't pass up the plant matter found among all the animal scraps in the garbage dumps it frequents.

FLAMINGO FEAST

1 In the air...
Using warm thermals for lift, the marabou stork soars high above Lake Magadi, searching for food.

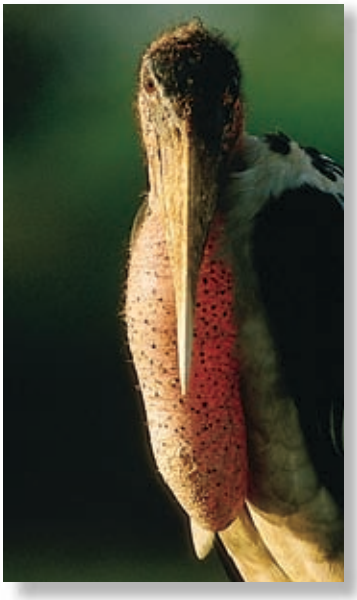
2 Wall to wall...
Spotting a breeding colony of lesser flamingos with many unattended nests, the marabou descends rapidly.

3 Panic attack...
A frightened chick attempts to stand in its unguarded nest, while nervous adults watch, waiting for the inevitable.

4 Fair and square
With no parent to attempt a defense, the chick is snatched by the marabou stork, and the adult flamingos flee the scene.

BEHAVIOR

A large bird, the marabou also gathers in large numbers at communal roosts containing up to a thousand other storks. The marabou is normally silent, since its voice box has no muscles, but it does emit grunts and squeals while roosting. Perching high in the tree, it has a perfect takeoff site for its early morning flights to feeding grounds. The marabou stork uses one of the most energy-efficient ways of flying: thermal soaring. Thermals are accumulations of the early morning heat that rise, often becoming visible as tufts of cloud, which the bird easily identifies. The stork uses the rising air to ascend, then glides to the base of the next thermal. It often soars thousands of feet high, and it can be almost invisible from the ground. But it is easily distinguished from other birds in flight; its long legs are held slightly away from the body and trail behind the bird.



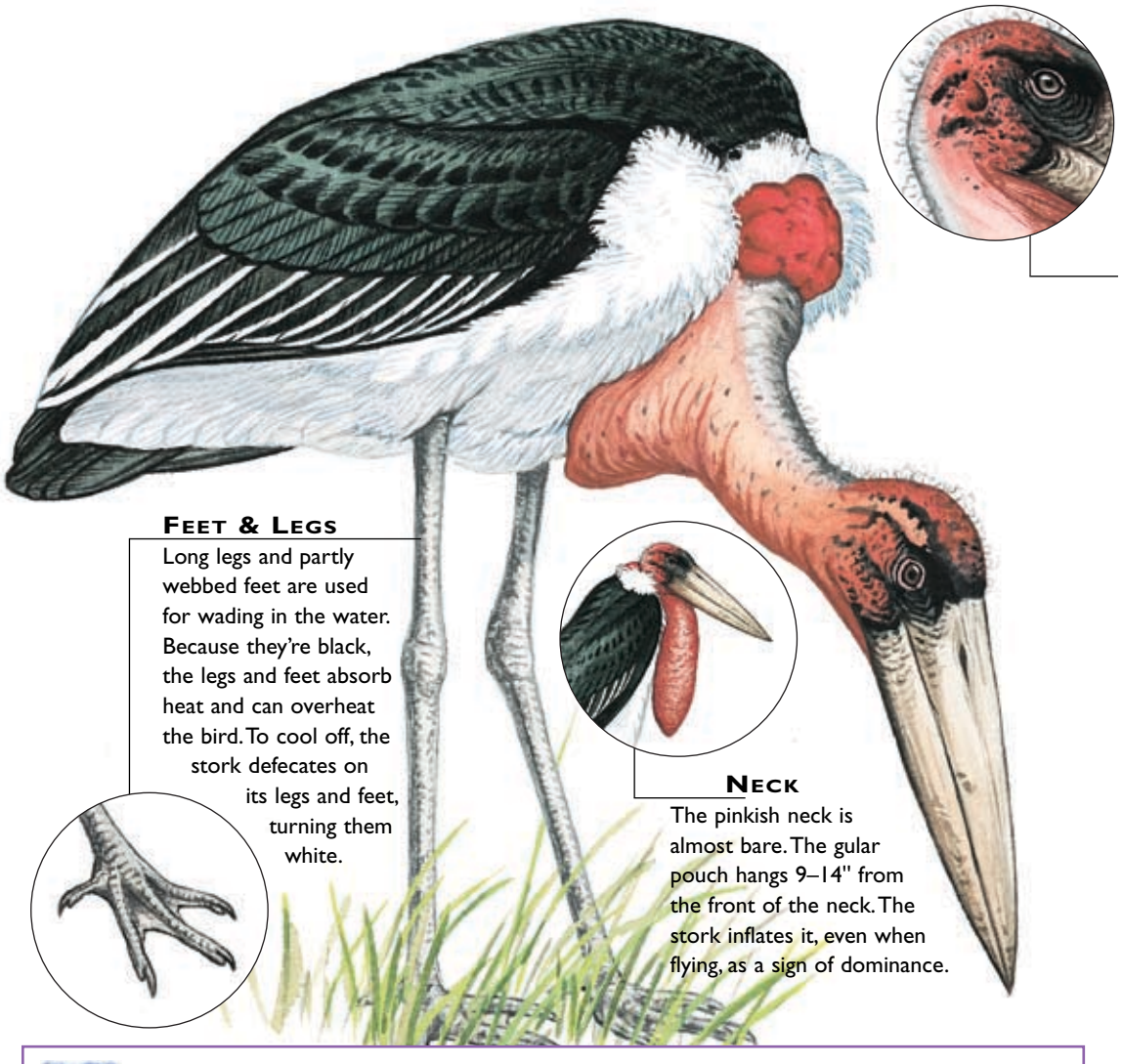
INFLATE TO DOMINATE
The stork inflates its gular pouch as a sign of dominance and territoriality.

CONSERVATION

Marabou stork populations in Africa are stable. They are often tame and may be kept as pets. The marabou stork is increasing in numbers in some parts of its African range, since it appears to benefit greatly from its exploitation of urban areas with their plentiful supply of refuse. The birds now rely on garbage dumps and other sites of accumulated waste for scavenging.

PROFILE MARABOU STORK

The marabou stork is a large bird but has almost no voice; its most formidable features are its inflated gular pouch and large pointed bill.



FEET & LEGS

Long legs and partly webbed feet are used for wading in the water. Because they're black, the legs and feet absorb heat and can overheat the bird. To cool off, the stork defecates on its legs and feet, turning them white.

NECK

The pinkish neck is almost bare. The gular pouch hangs 9–14" from the front of the neck. The stork inflates it, even when flying, as a sign of dominance.

VITAL STATISTICS

WEIGHT	Up to 20 lbs.
LENGTH	About 4'
WINGSPAN	7–9'
SEXUAL MATURITY	4–7 years
BREEDING SEASON	Varies according to region
NUMBER OF EGGS	1–4, usually 2–3
INCUBATION PERIOD	29–31 days
FLEDGING PERIOD	91–115 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Carrion, fish, insects, birds, crocodile eggs
LIFESPAN	More than 41 years in captivity

RELATED SPECIES

- **The order *Ciconiiformes* includes ibises, spoonbills and herons, as well as storks. All are wading birds, and they have three characteristics in common: long legs, long necks and large, usually pointed, bills. These features are ideally designed for capturing fish and insects while wading in shallow water. The jabiru, *Jabiru mycteria*, is the largest stork in the Americas.**

CREATURE COMPARISONS

The marabou lives in Africa, while the greater adjutant stork *(Leptoptilos dubius)* lives in Asia. Habitat aside, the two birds are very similar. The greater adjutant is slate gray above, white below, much like the marabou's dark slate-gray upperparts and white underparts. Both storks stand approximately 4' tall, though the greater adjutant can grow up to 5'. A distinct feature of the marabou is its ladderlike band of white on the upper surface of the wing. This is only a single pale band of gray in the greater adjutant.

Greater adjutant stork

Marabou stork

Martial Eagle

• ORDER •
Falconiformes

• FAMILY •
Accipitridae

• GENUS & SPECIES •
Polemaetus bellicosus

KEY FEATURES

- Largest of all the African eagles
- Extremely powerful, with the strength to kill a small-antelope
- Eyesight so sharp it can spot large prey from about 3 miles away
- Hunts over an area in excess of 80 sq. miles

WHERE IN THE WORLD?

Found throughout much of Africa south of the Sahara Desert; avoids heavily forested areas and is most common (but not numerous) on savannah grasslands

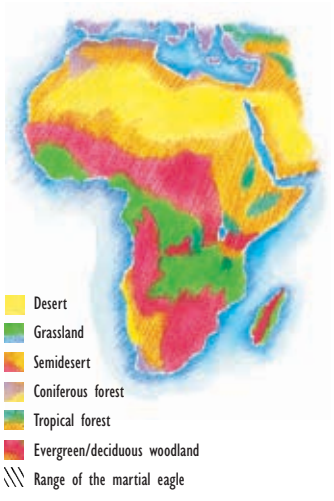
LIFECYCLE

Soaring high above the African grasslands on-rising currents of warm air, the mighty martial eagle is always alert, poised to dive with deadly precision on its prey.

HABITAT

The eagle's aerial view of its habitat is a rolling savannah with occasional trees dotting the landscape. It often flies over open woodland and along river valleys, hoping to spot prey unprotected by cover.

The martial eagle uses one of several favored trees for overnight roosting and regular nest sites. Important, too, is an unfailing supply of water for the regular bathing it needs.



▲ **EATING ALOFT**
Perched in the crown of a tree, the eagle uses its hooked bill to shred strips of flesh from a carcass.

▶ **KILLING FIELDS**
Open grassland is an ideal habitat for the eagle, as it offers little shelter for its prey.

CONSERVATION

The martial eagle is a rare sight because each pair of eagles ranges over a huge area in search of prey and dislikes competition from other pairs. Usually seen over savannah grassland, the eagle sometimes hunts over farmland; some farmers believe it attacks livestock and will shoot it on sight. A greater danger to this bird is habitat destruction. The use of pesticides on crops is also a grave threat, which affects the species' breeding success.

BREEDING

A female rarely lays more than one egg each season; breeding pairs invest a lot of time in their chick. For the first two months, the smaller male does most of the hunting; the female guards the nest. On his return, the male passes the food to his mate rather than directly to the chick. This lets her claim a share of the spoils.

After six months or so, the eaglet is ready to take to the air. Once it has made its first flight, it spends more and more time aloft. It flies alongside its parents, sharing their prey and learning how to hunt for itself. After a few successful kills, the young eagle leaves to find a territory of its own.

BEHAVIOR

The martial eagle hunts by sight so, like all birds of prey, it waits until the sun is up before leaving its tree roost to patrol the skies. The eagle also waits to take advantage of the sun's warmth, because the morning sun heats the ground, causing columns of warm air to rise. This broad-winged eagle is perfectly adapted for soaring on these thermals like a glider.

Launching itself into the air, the eagle flies over its domain until it senses a warm upcurrent, then starts to circle. It climbs ever higher, adjusting its slotted flight feathers to harness the wind. All the time it scans the ground for prey. If none can be found, it slips out of the thermal and glides or flies across country until it finds another thermal. The eagle may travel vast distances every day, covering a home range of 80 sq. miles or more with little effort.

▶ **TAKE-OFF**
From an acacia tree perch, the eagle launches into the sky. Once airborne, it catches a thermal and soars to a great height.

▲ **Precious young**
A female patiently shields her chick from the sun.

▶ **Youthful warrior**
This juvenile isn't ready to leave the nest, but can probably kill for itself.

DID YOU KNOW?

- **The martial eagle needs to bathe daily to keep its flight feathers clean and working efficiently.**
- **If an eagle attacks a young antelope, it may have to deal with its mother. The eagle spreads its wings, hisses and lashes out with its sharp talons to drive her away.**
- **The martial eagle's eyesight is superb. One was seen to swoop down from a hilltop and seize a guinea fowl a mile away.**

FOOD & HUNTING

An eagle will attack virtually any mammal, reptile or bird it can overpower. When it selects its prey, the eagle folds its wings slightly and dives, accelerating as it rushes downward. At the last moment, it brakes hard with wings spread and thrusts its talons forward, but still strikes with enough force to tumble and even kill its prey. The eagle usually eats at the site of the kill. It may feed from a big carcass for up to five days, roosting on a nearby tree between meals.

▼ **Out of the blue**
By sheer force of impact, a-diving eagle can strike down larger prey, such as young gazelle. Smaller prey is usually killed outright by the blow.

SWOOPING FOR THE KILL

1 Reconnaissance…
The eagle soars high above the ground, riding the breezes and relying on its superb vision to detect movement below.

2 Attack…
A long, shallow dive brings the eagle swooping down on its prey. It tilts and turns in the rushing wind to adjust its course.

3 Strike…
The eagle brakes sharply, and too late its prey realizes its plight: the needle-sharp talons lock forward and slam home with fatal force.

4 Success
Straddling its prey, the eagle tears flesh with its hooked bill. If the carcass is small, the eagle may take it into a nearby tree.

PROFILE MARTIAL EAGLE

With its rapier-sharp talons, the martial eagle makes a fearsome aerial predator, swooping down to strike its prey with terrible force.

EYES
Large and set forward in the head with jutting, protective brows, the eyes give excellent binocular vision. They can spot even small prey at a distance of over a mile.

WINGS
Broad wings equip the eagle perfectly for its hunting technique. It rises high above the plains on warm air currents, where it can soar for hours on end, conserving its energy for the moment of attack.

LEGS
The legs can deliver a killer blow to prey at the moment of impact. They're fully feathered to the feet, partly for protection when the eagle strikes venomous snakes.

FEET
Powerful feet have fairly short toes tipped with sharp talons. These are lethal weapons, able to crush the life out of the prey or penetrate its body to pierce a vital organ.

TAIL
The tail is broad and rounded for soaring. It's also used to steer the bird during its dive and to act as an air brake just before the strike.

VITAL STATISTICS

WEIGHT	11–13 lbs.
LENGTH	32–34"
WINGSPAN	7–9'; female larger than male
SEXUAL MATURITY	5–6 years
MATING SEASON	Varies with location
NUMBER OF EGGS	Rarely more than 1
INCUBATION PERIOD	55 days
BIRTH INTERVAL	1–3 years
TYPICAL DIET	Young antelope, ground squirrels, hares, guinea fowl, snakes, lizards
LIFESPAN	About 16 years

RELATED SPECIES

● **The martial eagle is in the family *Accipitridae*, which includes hawks, harriers, Old World vultures and kites. This is also the same family as the bald eagle and Bonelli's eagle** (below) **of Europe, Africa and Asia.**

CREATURE COMPARISONS

All eagles have sharp, hooked bills to tear up prey. The bill's shape reflects the eagle's diet. The bald eagle of North America has a sharply hooked bill for ripping through the scales of slippery fish. The golden eagle's bill is a little less hooked, like the martial eagle's. It's better suited to the tough skin of rabbits, hares and birds that form a large part of its diet.

Bald eagle

Golden eagle

Martial eagle

Mute Swan

• ORDER •
Anseriformes

• FAMILY •
Anatidae

• GENUS & SPECIES •
Cygnus olor

KEY FEATURES

- One of the heaviest flying birds, celebrated for its pure white plumage and effortless elegance
- A notoriously aggressive bird that has the power to inflict serious injuries
- Quieter than other swans, but still hisses and snorts loudly when agitated

WHERE IN THE WORLD?

Native of Eurasia; found in populations from Britain to China; introduced to North America, South Africa, Japan, Australia and New Zealand

LIFECYCLE

Portrayed as a gentle, peaceful creature in fairy tales, the majestic mute swan is actually a temperamental bird that is capable of extreme acts of aggression.

HABITAT

▲ **SWAN LAKE**
The mute swan prefers still or slow-flowing water.

Although the elegant mute swan is associated with park lakes and middle reaches of lowland rivers, most populations tend to live in wilder habitats, such as salty estuaries, coastal lagoons and marshes. Wherever it lives, the mute swan requires a plentiful supply of food, in the form of vegetation, and secure nesting sites near or in the water. However, the swan can be found nesting on industrial wastelands along visibly polluted water.

Not all mute swans are migrants, but those in northern regions, such as Scandinavia, tend to fly to temperate zones in the winter.

CONSERVATION

A long association with people has made the mute swan tolerant of humans, enabling it to flourish in areas where much of its wild habitat has disappeared. It suffers from disturbance, though; some populations have been hard hit by pollution. Nevertheless, the mute swan is still thriving.

BREEDING

Most mute swans pair for life. They mate in spring, when a pair builds a nest together on the water's edge or in a reedbed. Once eggs are laid, the female incubates them while the male stands guard. However, the male may take over at night while his partner feeds.

Eggs all hatch at once; the downy chicks leave the nest within a day or so to swim with their parents. Although the young can feed themselves, adults use their feet to stir up food particles. At 13 weeks, chicks lose their down and obtain grayish-brown plumage; when the swans are 4–5 months old, they fly. By the following spring, most juveniles are independent and live in flocks with other non-breeding swans. Over the next two years the swans begin their search for a mate.

▼ **BRINGING UP BABIES**
Both parents care for the young, but usually drive them away after a year.

▼ **MUSIC IN THE AIR**
On a still day the rhythmic throb of the swan's slow, powerful wing beats can be heard up to half mile away.

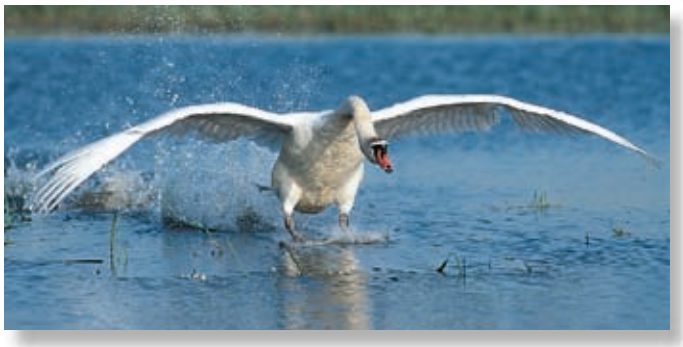
FOOD & FEEDING

Although the mute swan's main diet consists of aquatic vegetation, it occasionally extends to insects, fish, frogs and other aquatic life. In estuaries, the mute swan grazes the tender shoots of salt marsh grasses and can be seen cropping the grass in pastures near rivers and lakes. Such food is not particularly nutritious, so the mute swan spends several hours a day feeding.

▶ **FROZEN FOOD**
Slim pickings in winters may force swans south.

When feeding in water, the swan seldom dives for its food; it plunges its head and neck below the surface to reach bottom-growing plants. With long neck and legs, the mute swan tends to feed in deeper waters than the ducks and other waterfowl in its habitat; therefore, it does not compete with them for food.

BEHAVIOR



▲ **CLEARED FOR TAKEOFF**
Swans live on large bodies of water where they make long runs to get airborne.

The mute swan is bad-tempered, especially during breeding season. Each pair defends a small territory around its nest, driving away intruders with hisses and snorts. The male is particularly fierce, charging through the water with his wings raised in an awesome display of aggression. If this fails to deter an intruder, there may be a fight, with both swans beating each other with their wings. Outside the breeding season, in winter, mute swans may gather in large feeding and roosting flocks on open water with adequate food. Even here, violent conflicts between birds may occur.

Among the heaviest of flying birds, the mute swan's ascent into the air is a lengthy and spectacular show. Once airborne, however, it flies with powerful deliberation, reaching speeds of 48–54-mph. The swan's beating wings also produce a unique throbbing sound as the air is forced through the feathers.

BODYGUARD

1 Brooding…
Incubating her eggs on a nest of sticks and reeds, the female would be vulnerable to intruders if her mate were not ready to defend her.

2 Brave defense…
A Canada goose wandering too close finds itself in trouble as the male swan bursts out of the reeds in all his feathered glory.

3 Beating the retreat…
The goose beats a rapid retreat with the swan in close pursuit. The swan's hooked beak and heavy wings are powerful weapons.

4 Basking in the glory
The male returns and performs a triumph ceremony — his wings arched over his back and plumage proudly fluffed up.

DID YOU KNOW?

- **Mute swan's feathers were once used as quill pens. The shafts would be stripped of their filaments, baked hard in a low oven, then the nib would be cut.**
- **In Britain, all mute swans legally belong to the Queen.**
- **An adult mute swan eats up to 9 lbs. of vegetation a day.**

PROFILE MUTE SWAN

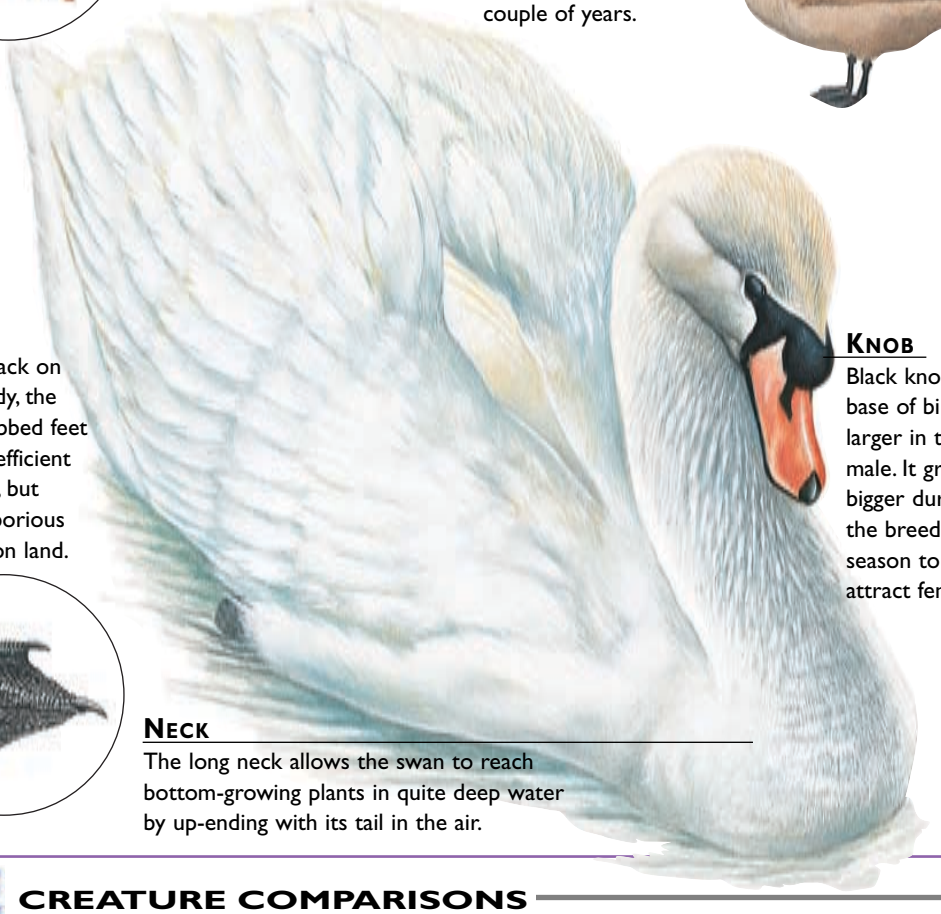
The pristine plumage and balletic beauty of the mute swan mask its true nature as a bird of enormous weight and power.

BILL

The sturdy, orange bill is slightly hooked at the tip; has serrated edges that act like a strainer when the swan is sifting food particles from the water.

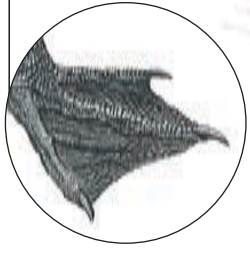
JUVENILE

The juvenile mute swan gradually obtains the white plumage of the adult during its first couple of years.



FEET

Set well back on swan's body, the broad, webbed feet make for efficient swimming, but clumsy, laborious progress on land.



KNOB

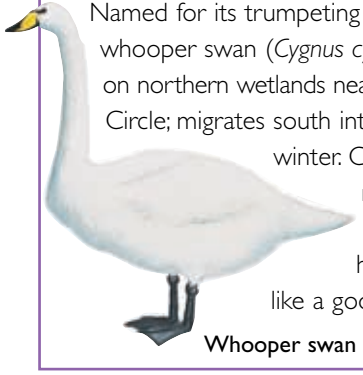
Black knob at base of bill is larger in the male. It grows bigger during the breeding season to attract females.

NECK

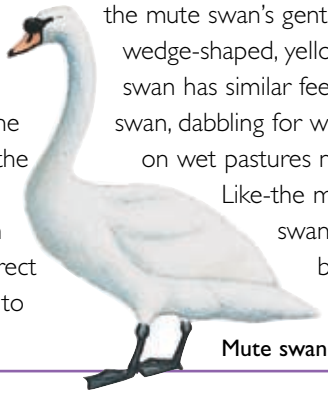
The long neck allows the swan to reach bottom-growing plants in quite deep water by up-ending with its tail in the air.

CREATURE COMPARISONS

Named for its trumpeting call, the whooper swan (*Cygnus cygnus*) breeds on northern wetlands near the Arctic Circle; migrates south into Europe for the winter. Close in size to the mute swan, the whooper swan holds its neck erect like a goose, in contrast to the mute swan's gentle curve, and has a more wedge-shaped, yellow bill. The whooper swan has similar feeding habits to the mute swan, dabbling for water plants or grazing on wet pastures near rivers and estuaries. Like-the mute swan, the whooper swan has audible wing beats, but the sound is more of a whistle than a throb.



Whooper swan



Mute swan

VITAL STATISTICS

WEIGHT	15.5–31 lbs.
LENGTH	4–5.5'
WINGSPAN	6.5–8'
SEXUAL MATURITY	3 years
BREEDING SEASON	Spring
NUMBER OF EGGS	3–12, but usually 5–7
INCUBATION PERIOD	About 36 days
FLEDGING PERIOD	120–150 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Water plants, grasses and small aquatic animals
LIFESPAN	Up to 20 years

RELATED SPECIES

- **Mute swan is 1 of 6 species of swan in genus *Cygnus*; also includes the trumpeter swan, *Cygnus buccinator*, of North America, and the black swan, *C. atratus* (below), of Australia. It belongs to family *Anatidae*, which contains 147 species of swan, goose and duck.**

Namaqua Sandgrouse

• ORDER •
Pterocliformes

• FAMILY •
Pteroclidae

• GENUS & SPECIES •
Pterocles namaqua

KEY FEATURES

- When faced with danger, this bird escapes by jumping from the ground directly into flight
- Male soaks water into his belly feathers, which he then takes to the nest for his young to drink
- Male incubates the eggs at night, while the female remains at the nest during the day

WHERE IN THE WORLD?

Found in southern Africa from Angola and Nambia to Zimbabwe and Botswana; also in the Kalahari Desert and South Cape Province

LIFECYCLE

The sandgrouse's activities revolve around getting water; like clockwork, flocks visit water holes to drink, and males soak their belly feathers for transport to their chicks.

HABITAT

The Namaqua sandgrouse inhabits the deserts and desert fringes of southern Africa. It prefers flat or rolling country with short, thin grass and dry, sandy soil that is covered with scattered shrubs and succulent plants. The bird also lives in more heavily wooded dry savannahs. In the Kalahari desert, the bird occurs on sandy savannahs with denser vegetation but is most common in areas that receive little rainfall. The sandgrouse will fly miles over desert terrain in search of water. If a watering hole dries up, it will journey with large flocks until another hole is found.

▲ **WIDE BUT WET**
Sandgrouse favor open areas with water holes nearby.

FOOD & FEEDING

Seeds are the main staple of the Namaqua sandgrouse, which forages over large areas — not the typical small range of most birds in the sandgrouse family. The bird prefers seeds high in protein, like legumes, picking them off the ground with its short bill. It feeds in the daylight hours and rests in the shade of a bush during the extreme heat of the midday. The bird will sometimes eat plant material and insects or mollusks that happen to be on plants, and occasionally grit to help grind down seeds in the gizzard. The Namaqua sandgrouse needs to drink water every day and may fly up to 50 miles to find a watering hole. The bird is joined by other large flocks, which all arrive at the same time: usually between 8 to 10 a.m. but sometimes in late afternoon. The birds may land as far as 5 miles from a water hole, rest from their long flight, and then walk the rest of the way. The sandgrouse will quickly take about 10 gulps, raising its head to swallow between each one.

BREEDING

Namaqua sandgrouse breed all year, but most mating occurs from July to November, when rainfall is more plentiful. During courtship, the male sandgrouse struts after the female with his tail raised and fanned and his head drawn to his shoulder. The female sometimes reciprocates with her own similar ground display. Monogamous pairs form strong pair bonds; mates stay together in small parties and sometimes in large breeding flocks. The nest is a simple scrape in bare soil or among stones, grass tufts or scrub, and the birds' nests are usually more than 60' apart.

A clutch usually consists of three eggs, though it may have two to nine; the eggs are never left unattended during the 21-day incubation period. The male incubates mainly at night from 14–18 hours, while the female's daytime duty rarely exceeds 10 hours. When the bird is relieved during incubation, it throws small stones to one side with its bill; the reason is unknown. Once the yellowish-brown chicks hatch, one parent always carries the eggshells away from the nest to avoid attracting predators, such as foxes and jackals. Chicks feed on seeds within hours of hatching, with their mother close by. Young sandgrouse are half their adult size and fully feathered at 3 weeks, and are flying at 6 weeks. The male provides chicks with water from birth until at least two months after they start to fly, since chicks usually still cannot get to the watering hole. He soaks up water in his belly feathers and returns to give it to the chicks, standing erect as they drink from a central groove in his plumage.

▲ **WHERE SANDGROUSE GATHER**
Flocks visit a water hole every morning. Some travel great distances and spend only 15 seconds getting a drink.

ALWAYS INVOLVED

1 Excavator…
A Namaqua sandgrouse male helps his mate form a shallow nest hollow in the very dry ground of the African desert.

2 Incubator…
The sandgrouse male relieves his mate each evening at dusk and takes his turn incubating their eggs for up to 18 hours.

3 Defender…
After the chicks have hatched, the male carries the egg shells away from the nest to prevent predators from locating the chicks.

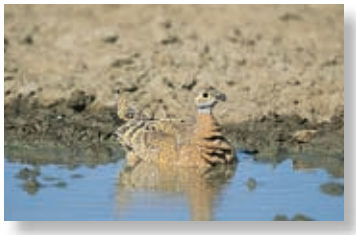
4 Dispenser
The male brings water back to the nest in his wet belly feathers. The young appear to nurse as they eagerly clamor for a refreshing drink.

CONSERVATION

Though not globally threatened, certain populations of Namaqua sandgrouse, including the Orange Free State birds, have disappeared because of severe drought and habitat destruction. But the future appears bright for the bird, due to decreased hunting and the availability of watering holes created by agricultural projects.

BEHAVIOR

Namaqua sandgrouse are not very territorial birds, nor are they demonstrative in courtship displays. But they are very protective of their young, taking great pains to keep predators at bay. If threatened, the bird will lower its head and run at its enemy. Sandgrouse vocalizations include a mellow whistle and a chuckle, usually heard during flight. Because they are a favorite target of birds of prey, which frequent watering holes, Namaqua sandgrouse crouch in the ground to avoid detection, and can lift off quickly. In high temperatures, the bird tends to become inactive, seeking shade and drooping its wings, holding them away slightly from the body to increase heat loss.



▲ **A SANDGROUSE SPONGE**
A male transports water to his young in his feathers.

DID YOU KNOW?

- **The crop of a chick a few days old contained 1,400 tiny seeds — some as small as grains of sand.**
- **The male Namaqua sandgrouse can carry 1.5–2 oz. of water in its belly feathers. After a journey of 20 miles in half an hour, they can give their chicks 0.75–1 oz. Water loss is due mainly to evaporation.**

PROFILE NAMAQUA SANDGROUSE

Dry desert conditions are no threat to the Namaqua sandgrouse: its thick-soled feet can withstand hot sand, and its belly feathers carry water.

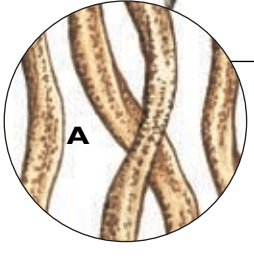
BILL
The base of the bill is feathered, which insulates the bird against extreme temperature and protects nostrils against windblown sand and dust.

MALE
A white and chestnut pectoral band and brown belly are distinguishing characteristics of the male.

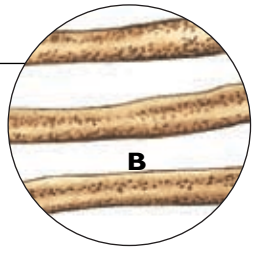
FEMALE
The slightly-smaller female is mottled above with barred underparts; her belly is barred brown and white. Juveniles look similar to the female.

WINGS
With long, pointed wings, the Namaqua sandgrouse can make quick getaways from danger.

LEGS & FEET
The legs are short and three front toes are stout, fairly broad and thick-soled, well suited for walking great distances on loose sand.



BELLY FEATHERS
Males soak water into their belly feathers to carry back to the nest for their chicks. The barbules of the feather are spiral shaped when dry (A) and are tightly coiled together to give maximum cohesion. When wet (B), the barbules uncoil and join to form a bed, which holds the water like a



VITAL STATISTICS

WEIGHT	5–7 oz.
LENGTH	11"
SEXUAL MATURITY	1 year
BREEDING SEASON	Year-round; mainly after rains and in cooler months
NUMBER OF EGGS	2–9, usually 3
INCUBATION PERIOD	21 days
FLEDGING PERIOD	28 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Mainly seeds
LIFESPAN	Unknown

CREATURE COMPARISONS

Measuring up to 16" in length and weighing up to 11 oz., the Pallas's sandgrouse (*Syrrhaptes paradoxus*) is larger than the Namaqua sandgrouse. Both females (*shown*) have mottled plumage. Unlike its relative, the Pallas's sandgrouse has no hindtoe, and its legs and feet are completely feathered, an adaptation for the cooler temperatures in its habitat. The bird lives in steppe and semidesert areas, from Kazakhstan through China, Asia, Siberia and Mongolia, far from the Namaqua sandgrouse. But the birds have very similar behavior: they both eat seeds and visit watering holes daily, and males of both species provide water to the chicks through their water-laden belly feathers.

Namaqua sandgrouse

Pallas's sandgrouse

RELATED SPECIES

The Namaqua sandgrouse is 1 of 14 species of sandgrouse in the genus *Pterocles*, including the spotted sandgrouse, *P. senegallus*, and Madagascar sandgrouse, *P. personatus*. All have three front toes and a small, raised hindtoe. Two other species of sandgrouse in the genus *Syrrhaptes* (Greek for "sewn together") have only forward-facing toes that are fused together.

New Holland Honeyeater

• ORDER •
Passeriformes

• FAMILY •
Meliphagidae

• GENUS & SPECIES •
Phylidonyris novaehollandiae

KEY FEATURES

- The brush-tip tongue of the New Holland honeyeater lets it absorb all of a flower's nectar in less than a second
- A combative bird, it staunchly defends its nectar sources from other honeyeaters
- Spider webs help bind together a cup-shaped nest made mainly from bark, twigs and leaves

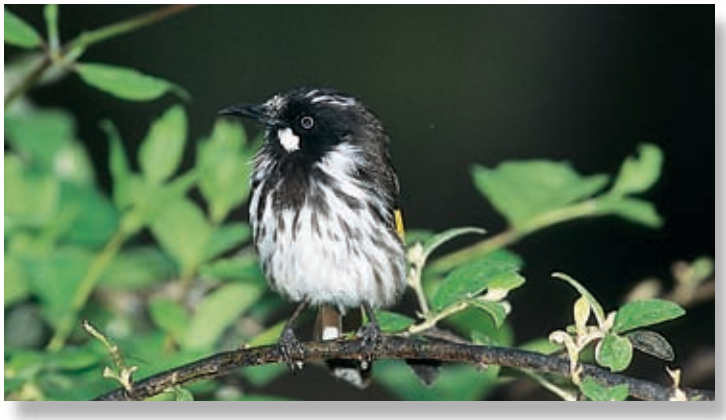
WHERE IN THE WORLD?

Found in southern Australia from 60–100 miles inland to the coasts of Victoria, southern Queensland, New South Wales, South Australia and Tasmania

LIFECYCLE

Impatient and intolerant of other birds, the honeyeater stays alert to any intruders that might want to steal a sip of nectar from its favorite feeding grounds.

HABITAT



▲ **A WOODLAND WELCOME**
The varied terrain of southern Australia is home to the New Holland honeyeater.

The New Holland honeyeater establishes permanent residence in eucalyptus, banksia and melaleuca trees. The sweet nectar in the large banksia flowers makes this plant a prime choice of the honeyeater. In the bird's woodland home, trees tower up to 75', but low grassy and shrubby cover is abundant. The New Holland honeyeater also thrives in the coastal heath of southern Australia, where smaller evergreen and hard-leafed plants abound.

▶ **VERY AWARE**
Ready to defend its nectar sources.

FOOD & FEEDING

The honeyeater's remarkably efficient tongue gathers fluids from flowers in less than a second. Resembling an artist's brush at the tip, the tongue extends into the nectar about 10 times per second; the sweet nectar adheres to the licking tongue. Nectar and fruits provide a carbohydrate-rich diet for the honeyeater, but it also supplements its diet with sugary insect secretions such as honeydew, a fluid excreted by aphids. Aphids suck the sap from leaves and excrete the honeydew from their thorax onto plants, leaving the honeyeater with a sweet snack. In order to balance its meals, it also eats insects, which provide protein and other nutrients.

Several different species of honeyeater may occupy the same range, each feeding on its own favorite flowers and insects. The New Holland honeyeater will staunchly defend its favorite plants from other honeyeaters and other species of small birds. Partial to bushy flowers such as the wooly banksia, the New Holland honeyeater will feed from them until the end of their flowering cycle, then use the dried down to line its nest. Despite this preference for fluffy plants, the honeyeater isn't picky; it will feed from over 100 different flowering plant species.

BEHAVIOR

A belligerent bird, the New Holland honeyeater refuses to share its nectar supplies. It closely guards the many fluid-filled plants found in its territory from other New Holland honeyeaters and other smaller species. The bird flits restlessly from flower to flower and chatters loudly if disrupted. Honeyeaters occasionally gather for group displays, called "corroborees," but given their usual quarrelsome nature, the reason for this assembly is unknown.

The New Holland honeyeater builds extravagant nests. The basic structure is made of twigs and leaves, but it is bound together and attached to its perch with pilfered spider silk, the universal cement of bird architects. The interior of the nest is lined with the down of the dried wooly banksia flower or other similar plants. The soft, secure nest is a luxurious home for the honeyeater.

CONSERVATION

Honeyeaters are one of the most populous bird families in Australia and are currently not threatened. The wide variety of nectars and insects that the honeyeater feasts on have enabled it to thrive in a variety of habitats. Several different species of honeyeater may often occupy the same range.

DID YOU KNOW?

- **At least one species of honeyeater lives in every type of environment in Australia.**
- **The further a honeyeater extends its tongue, the less efficient the tongue becomes.**
- **Honeyeaters are important pollinators; they transfer pollen that clings to their feathers while flitting between flowers.**

◀ **ARTIST AT WORK**
Like a paintbrush, the tongue collects nectar.

BREEDING

Since male honeyeaters usually outnumber females, they perform displays to attract a female during the breeding season. The male flaps in the air and emits a piping call before gliding in a steep descent to its perch. Once she has chosen a mate, the female builds a sturdy, cup-shaped nest, found 3-6' above the ground. The pinkish-buff or white eggs are laid within three days, and incubated for two weeks. Both parents feed the hungry chicks their first meals of insects, and the chicks are ready to leave the nest in about two weeks.

NESTING NEEDS

1 Building...
The cup-shaped nest is almost complete. The female adds a few more strands of grass to finish the lining of her creation.

2 Checking...
It has taken three days to lay a clutch of three pinkish white eggs. She inspects them before beginning her lone incubation.

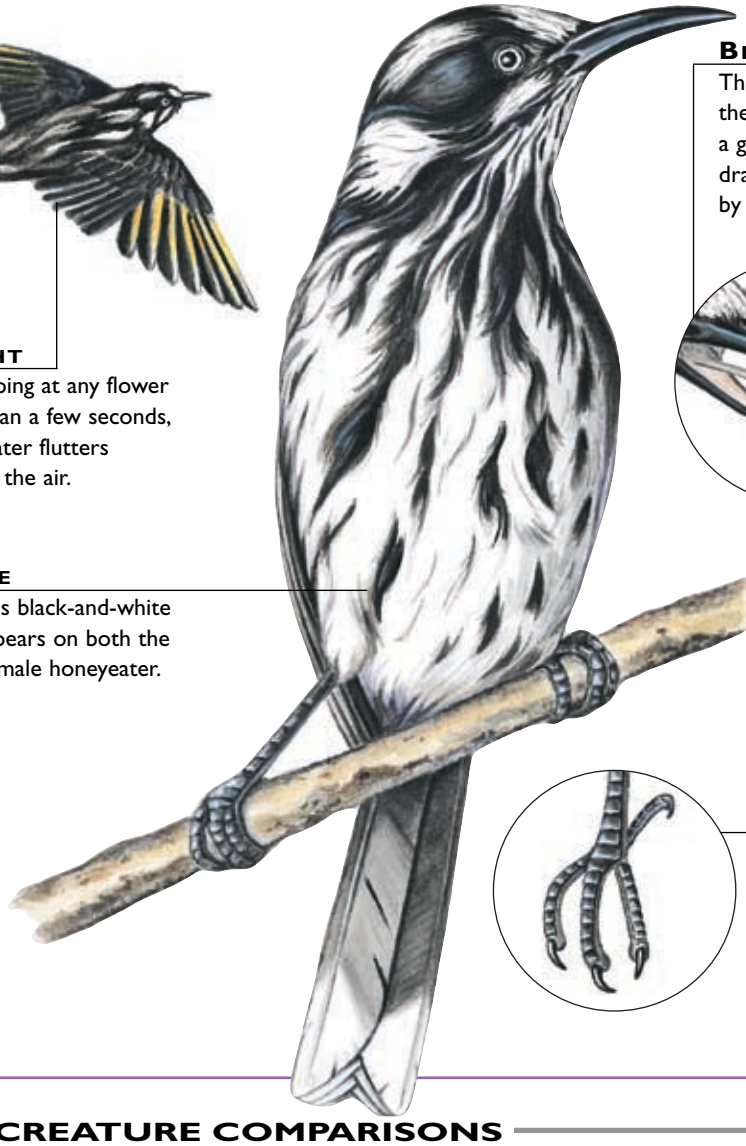
3 Gathering...
In 2 weeks the chicks have hatched. The male begins his parenting duties and collects insects for the chicks.

4 Feeding
The male feeds the chicks their high-protein meal while the female gets ready to take her turn gathering food.

PROFILE NEW HOLLAND HONEYEATER

-The New Holland honeyeater is a speedy feeder as it darts from flower to flower, its tongue instantly absorbing nectar.

IN FLIGHT
Rarely stopping at any flower for more than a few seconds, the honeyeater flutters restlessly in the air.



BILL & TONGUE
The long beak enables the honeyeater to probe a great variety of flowers, drawing out sweet nectar by the adhesive action of the brushlike tongue.

PLUMAGE
Conspicuous black-and-white plumage appears on both the male and female honeyeater.

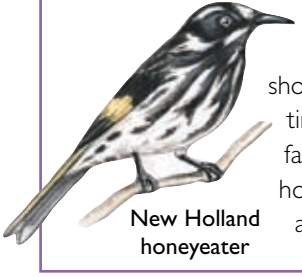
LEGS & FEET
The honeyeater's feet are designed for perching: three toes point forward and one projects behind.

VITAL STATISTICS

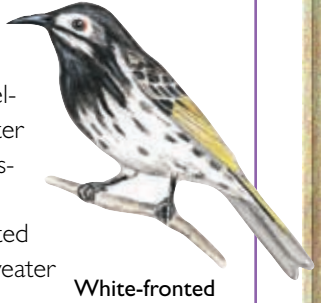
WEIGHT	1 oz.
LENGTH	6.5–7.5"
SEXUAL MATURITY	Unknown
BREEDING SEASON	Year-round, except February
NUMBER OF EGGS	2–3
INCUBATION PERIOD	About 2 weeks
FLEDGING PERIOD	About 2 weeks
BREEDING INTERVAL	Up to 3 times each year
TYPICAL DIET	Nectar, fruit, insects and insect secretions, including honeydew
LIFESPAN	Unknown

CREATURE COMPARISONS

The white-fronted honeyeater (*Phylidonyris albifrons*) is about the same size as the New Holland honeyeater, with females smaller in both species. Both honeyeaters have touches of yellow on their wings, with the white-fronted honeyeater showing a hint of red behind its eye in contrast to the distinct white iris on the New Holland honeyeater's black face. Both birds live in woodlands, but some white-fronted honeyeaters venture into areas the New Holland honeyeater avoids, including arid shrubland and desert areas.



New Holland honeyeater



White-fronted honeyeater

RELATED SPECIES

- **The order *Passeriformes* contains perching birds such as broadbills, warblers, larks and honeyeaters. The honeyeater's genus, *Phylidonyris,* is one of 39 genera in the family, *Meliphagidae*. *Phylidonyris* contains six yellow-winged species, including the white-fronted honeyeater, *P. albifrons,* and the white-cheeked honeyeater, *P. nigra*.**

Nightingale

• ORDER •
Passeriformes

• FAMILY •
Turdidae

• GENUS & SPECIES •
Luscinia megarhynchos

KEY FEATURES

- One of the world's most famous songbirds; the male uses his melodious voice to attract a female
- Hardy enough to live in areas of dry shrubland, this secretive bird nests in bushy undergrowth
- Spends the winter months in Africa, returning north in summer to breed

WHERE IN THE WORLD?

Breeds in Europe, northwest Africa, the Balkans and southwest-central Asia; winters south of the Sahara, from West Africa to Uganda

LIFECYCLE

More likely to be heard than seen, the nightingale skulks in dense undergrowth singing its melodious songs during the warm nights of spring and early summer.

HABITAT

▲ **SHELTERED LIFE**
Nightingales favor habitats like hedges.

The nightingale prefers low, tangled cover, which it finds-in open deciduous woodland, thickets and hedgerows. Over most of its range, the nightingale is a lowland bird, but it has been recorded at 8,580' in the mountains of central Asia, and in Switzerland it can breed at 3,600'.

Many territories are near streams or pools, although the nightingale may inhabit dry hillsides in hotter parts of its range and sometimes lives in low-growing shrubs among coastal sand dunes.

DID YOU KNOW?

- **When singing during the day, the nightingale frequently changes perches, but nocturnal songs are usually delivered from the same position.**
- **The nightingale often sings in two three-hour sessions at night, the first ending at around midnight and the second beginning early in the morning.**

FOOD & FEEDING

▶ **OPEN SEASON**
Chicks thrive on summer insects.

During the breeding season, insects and other invertebrates form the nightingale's staple diet. In late summer, the bird adds berries to this intake.

Leaf litter is the nightingale's favorite hunting ground. It hops about in search of ants and beetles. If there are none, it eats caterpillars, spiders and earthworms.

The nightingale may drop on prey from low branches, or pick it from the bark of its perching tree. On rare occasions, it takes winged insects, such as moths and small butterflies, from the air. Autumn brings a wealth of new feeding opportunities, and the nightingale seeks out wild cherries, elderberries, sloes and currants.

BREEDING

BEHAVIOR

The voice of a male nightingale is celebrated as one of the most beautiful of the bird kingdom. His song varies by season and circumstances. It is richest, loudest and most often performed in late spring, when the male sings at night to attract a mate and to proclaim territory. These arias are delivered from the same perches night after night, often high up and exposed. By day, his songs are less varied and are delivered in shorter bursts.

The male performs a quieter version of his song when courting a female, and maintains contact with her with short fragments of song. In the event of danger, both sexes have croaking alarm calls.

▲ **CHANGE OF TUNE**
The male nightingale has a wide repertoire of songs.

The nightingale selects a new partner each year, often returning to a previous site. The male returns from his overwintering grounds before the female to establish a territory. He attracts potential mates by singing and then displays at close range.

After mating, the female builds a cup-shaped nest of dead leaves and coarse grass. She incubates the eggs alone, but both parents feed the nestlings during the two weeks of rapid growth between their hatching and leaving the nest.

◀ **PULLING OUT**
The mother keeps the nest clean by removing the nestlings' fecal sacs.

MAKING LOCAL CALLS

1 Serenade…
The male nightingale stands stiffly with his wings spread as he sings to inform migrating females of his presence at a breeding territory.

2 Court…
He lowers his voice as a female arrives, then displays to her at close range, fanning his tail and excitedly quivering his wings.

3 Conceal…
After mating, the female collects dead leaves to make the foundation of her nest under vegetation, near or on the ground.

4 Beg
The orange mouths of the chicks may stimulate the parent into bringing food. The most aggressive chick is often fed first.

CONSERVATION

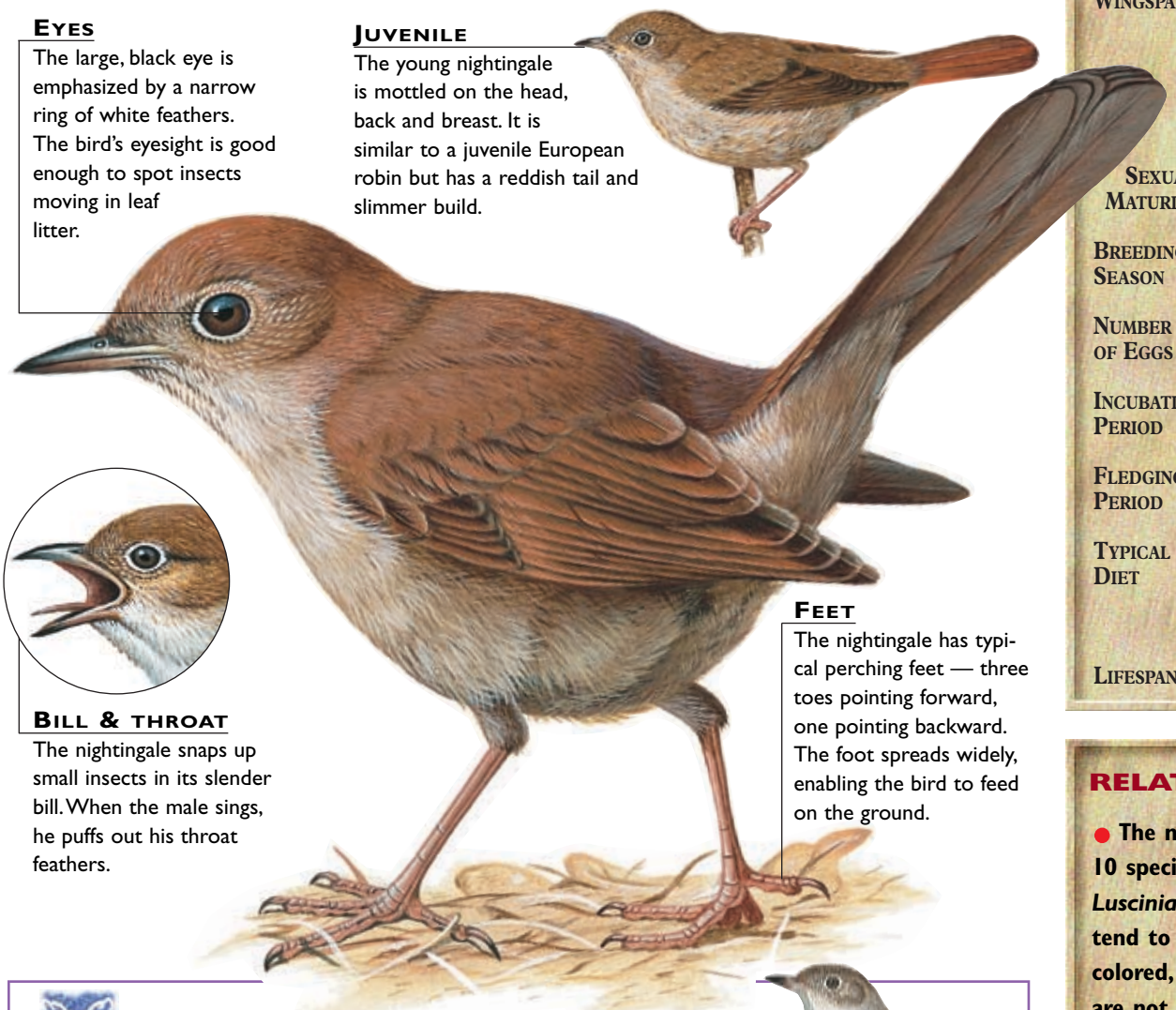
Like most songbirds, the nightingale suffers as habitats dwindle and pollutants enter the food chain. Numbers fluctuate year to year and vary locally: of the 10,000 pairs in the Netherlands, more are in the west than in the south and east. British populations, currently around 6,000 pairs, are declining. Overall, however, the species is not in serious decline.

PROFILE NIGHTINGALE

Long legs and large feet enable the nightingale to hop among leaf litter; it is camouflaged by its reddish-brown plumage.

EYES
The large, black eye is emphasized by a narrow ring of white feathers. The bird's eyesight is good enough to spot insects moving in leaf litter.

JUVENILE
The young nightingale is mottled on the head, back and breast. It is similar to a juvenile European robin but has a reddish tail and slimmer build.



BILL & THROAT
The nightingale snaps up small insects in its slender bill. When the male sings, he puffs out his throat feathers.

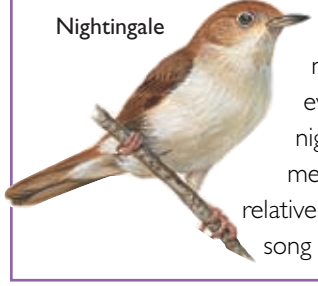
FEET
The nightingale has typical perching feet — three toes pointing forward, one pointing backward. The foot spreads widely, enabling the bird to feed on the ground.

VITAL STATISTICS

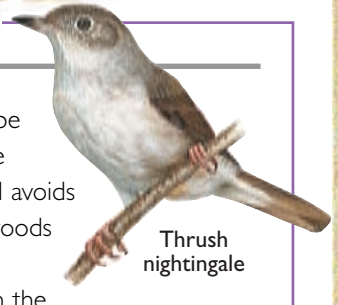
WEIGHT	0.6–1 oz.
LENGTH	6.5"
WINGSPAN	9–10.5"
SEXUAL MATURITY	1 year
BREEDING SEASON	May–June
NUMBER OF EGGS	4–5
INCUBATION PERIOD	13 days
FLEDGING PERIOD	11 days
TYPICAL DIET	Insects and their larvae, spiders, fruit and berries
LIFESPAN	Up to 8 years

CREATURE COMPARISONS

The nightingale's counterpart to the north and east of its range in Europe and Asia is the thrush nightingale (*Luscinia luscinia*). Unlike its relative, the thrush nightingale is restricted to lowlands and avoids dry areas. However, both birds are found in woods near water. The two species are similar-looking; even their voices are hard to tell apart, although the nightingale is the more versatile singer. The song of the nightingale is more melodic and contains fewer harsh sounds, but it is weaker than that of its relative. The thrush nightingale has obscure gray breast spots, like those of the song thrush (hence the name) and duller upperparts than the nightingale.



Nightingale



Thrush nightingale

RELATED SPECIES

● **The nightingale is 1 of 10 species in the genus *Luscinia*. The other species tend to be more brightly colored, but their songs are not as melodic as the nightingale's. They include the Siberian rubythroat, *L. calliope*, and the bluethroat, *L. svecica*, which breeds in Europe, Scandinavia and northern Asia. *Luscinia* belongs to family *Turdidae*, which has more than 300 members worldwide.**

North American Bittern

• ORDER •
Ciconiiformes

• FAMILY •
Ardeidae

• GENUS & SPECIES •
Botarus lentiginosus

KEY FEATURES

- Shy and timid, the North American bittern stalks its prey in dense marshes at night
- Brown plumage keeps it well camouflaged in marsh habitat during the day; remains motionless when threatened
- Constructs solitary nests on the ground, unlike other herons, which nest in large colonies in trees

WHERE IN THE WORLD?

Ranges in North and Central America, from south and central Canada southward throughout the U.S. and Mexico, and south to Panama; also found in Cuba and the West Indies

LIFECYCLE

The booming courtship call of the North American bittern is a common sound on warm spring evenings, as the reclusive male tries to attract a mate.

HABITAT

▲ **WALKING TALL**
The North American bittern prefers areas with tall vegetation to escape from danger.

The North American bittern is widely distributed throughout North and Central America. It inhabits a variety of habitats, including marshes, wet meadows and bogs with fresh, brackish or saltwater. This bittern lives among tall vegetation, such as cattails, reeds, and bulrushes, relying on its streaked coloration to blend with its surroundings. Unlike other bitterns, it rarely perches in trees and is usually found on the ground. Despite being widely distributed and fairly common, the North American bittern remains out of sight; often, the only sign of its presence is its call.

CONSERVATION

The North American bittern is threatened in some areas of the world. Numbers are declining in the United States, especially in the central states, due to habitat loss. The North American bittern is endangered in Illinois, Indiana and Ohio, and is designated a species of special concern in other states by the USDI (United States Department of the Interior).

BEHAVIOR

▶ **WHERE'S THE BITTERN?**
The bittern's camouflage is very effective.

During the day, the North American bittern roosts among the reeds and rushes of the marsh. When it senses a threat, it hides by becoming completely still, pointing its bill upward and contracting its body. It blends so well with its surroundings that the intruder usually passes without spotting the bird.

North American bitterns are largely migratory in the northern parts of their range. From September to November the birds migrate south, traveling only at night. They spend the winter months in the southern United States, Mexico, Central America and the West Indies. The birds return in spring.

FOOD & FEEDING

Like most bitterns, the North American bittern is largely nocturnal and ventures out at dusk to forage for food. It typically feeds alone while slowly walking in shallow water, but will occasionally feed by running after its prey. Rather than stabbing food with its sharp, pointed bill, the bittern instead grabs the food before swallowing it whole. Its diet is variable but mainly consists of aquatic prey, including eels, catfish and perch.

DID YOU KNOW?

- **The bittern thrusts its head skyward in its camouflaging posture. Most birds would be left looking at the sky in this position, but the bittern's eyes are set so low, it can still see straight ahead through the reeds.**
- **The courtship booms of the North American bittern sound like an old pump, inspiring the common name, "thunder pumper."**

SLIPPERY MEAL

1 Catch...
With its hooked bill, the bittern pulls an eel from the shallow water. Gripped firmly, the eel tries to curl itself around the bird's head.

2 Eat...
As the bittern swallows the eel, the feathers on the bird's head and neck become soiled from the slimy meal.

3 Collect...
After finishing its meal, the bittern collects the powdery down from its breast feathers to clean its soiled plumage.

4 Comb
The bittern then uses the fine teeth of its elongated middle toe as a comb and removes the slime from its plumage.

BREEDING

North American bitterns are well known for their distinct booming calls during the breeding season. Males court females from April to July by calling out in the night. They fill their distended esophagus with air from the lungs and emit a distinct *pump-er-lunk* several times. The sound can carry over 0.5 mile. Males then perform displays, strutting around females with their pair of white, fanlike ruffs raised over the back.

No pair bonds are formed, and the female performs most of the parental duties. After mating, the female builds a solitary nest on a platform of dead reeds in areas of dense covering. She lays from 2–7 eggs and incubates them alone for about 30 days. The chicks fledge after about 2 weeks.

▲ **GROWING FAST**
The downy chicks are born helpless, but can fly in a few weeks.

▼ **PROTECTION**
The female protects and guards her young in the nest.

PROFILE North American Bittern

The North American bittern is a master of disguise, using its streaked plumage and upright pose to blend with its marshland habitat.

Air sac

By gulping air into its specialized esophagus andforcing it out, the bittern creates a distinctive booming call, commonly heard during breeding season.

Tail

The bittern's tail is short and slightly rounded, an adaptation to its walking lifestyle. In flight, the long legs are held straight back and used as a rudder for steering, instead of the tail.

Nestling

Bittern chicks are born helpless and covered with yellow-olive downy feathers.

Feet

The feet are equipped with long, unwebbed toes that give the bittern support when walking on soggy ground. The extra-long middle toe has 36 fine teeth used like a comb for grooming.

Vital Statistics

Weight	1–2 lbs.
Length	24–34"
Wingspan	Up to 50"
Sexual Maturity	Unknown
Breeding Season	April–July
Number of Eggs	2–7; usually 3–5
Incubation Period	28–29 days
Fledging Period	About 2 weeks
Breeding Interval	1 year
Typical Diet	Mainly fish, eels, frogs, toads, snakes and insects
Lifespan	Unknown

Related Species

- The order *Ciconiiformes* contains 113 species in 38 genera and includes herons, bitterns, hamerkops, storks, shoebills, ibises and spoonbills. The North American bittern is one of 12 species of bitterns in the heron family, *Ardeidae*. There are 4 species in the genus *Botarus*, including the Eurasian bittern, *Botarus stellaris* and the Australasian bittern, *B. poiciloptilus*.

Creature Comparisons

North American bittern

The South American bittern *(Botarus pinnatus)* lives in Central and South America from eastern Mexico southward to Brazil. This bittern inhabits freshwater swamps and marshes among stands of tall, dense vegetation and, unlike its North American cousin, is rarely found in brackish or saltwater. Like the North American bittern, the South American bittern feeds at night on fish, eels and other vertebrates. The South American bittern appears to be a year-round resident in its range, compared to the North American bittern, which is largely migratory.

South American bittern

Northern Cardinal

• ORDER •
Passeriformes

• FAMILY •
Emberizidae

• GENUS & SPECIES •
Cardinalis cardinalis

KEY FEATURES

- Both male and female sing year-round and have an extensive repertoire of calls
- Bright-red plumage and bold nature make the bird a familiar sight
- The cardinal rarely migrates and usually does not wander more than a few miles from its home
- Can adapt to habitats ranging from deep forests to city gardens

WHERE IN THE WORLD?

Found in Canada, the United States from Maine to Florida and as far west as Minnesota and the western prairies in the Southwest, south to Mexico and Belize; also in Bermuda and Hawaii

LIFECYCLE

The Northern cardinal displays a unique combination of bold song, color and character; it prefers to stay close to the place of its birth and rarely migrates.

HABITAT

Also known as the red-bird, the northern cardinal lives in dense thickets along field borders, in hedges, swamps, stream banks, parks and gardens. The habitat of this mainly nonmigratory bird is temperate, but its range can include desert conditions. On the arid Marias Islands off Mexico, the cardinal gets enough water by drinking the early-morning dew. The cardinal lives year-round from the Dakotas, southern Ontario, and Nova Scotia to the Gulf Coast, and from southern Texas west through Arizona and south through Mexico to Guatemala. The bird was introduced in Hawaii in 1929.

▲ **STAYING PUT**
The cardinal tolerates the cold across its

DID YOU KNOW?

- **Northern cardinals are named for the brilliant red robes worn by the Roman Catholic cardinals.**
- **The cardinal is the state bird of several northern and southeastern states, including Illinois, Indiana, Kentucky, North Carolina, Ohio, Virginia and West Virginia.**
- **According to Cherokee legend, the northern cardinal was originally brown in color. The bird helped a wolf, which, in thanks, told the cardinal where to find a rock with red paint. The cardinal then painted himself red.**

FOOD & FEEDING

Seeds, fruits, insects and spiders make up the cardinal's diet. In the wild, the cardinal gleans food from nearby trees and shrubs. Its wedge-shaped beak allows the bird to eat all kinds of seeds, which it holds with its grooved, upper mandible while moving the lower mandible forward to crush and husk the seed. The bird then swallows the seed's inner "meat." During fall, the cardinal ascends to tops of trees and bushes in search of grapes and berries; in the winter, the bird picks up seeds and forages around haystacks at farms. The more domesticated cardinals collect food from town gardens as well as from backyard bird feeders, favoring sunflower seeds and cracked corn. Their full menu includes 51 kinds of insects and spiders, 33 kinds of fruit and 39 types of seeds.

BEHAVIOR

The cardinal's song plays a role in all aspects of its life, from socialization to courtship to nesting. The male swells his throat, spreads his tail and drops his wing as he sways from side to side, appearing to delight at the sound of his own voice. Females begin singing their softer song in March, while males sing year-round. Both sexes defend their territories, usually a few acres in size, through the songs that they sing. The female drives out intruding females, and the males fiercely guard against other males. Songs also serve as signals, letting respective partners know when they are coming or going. The young can sing as early as 3 weeks old, but they do not aquire adult phrasing for two months.

▶ **A SPLENDID SIP**
A cardinal fans its wings as it prepares to swallow.

THE ART OF FEEDING

1 Follow the holes...
A male cardinal maintains a tight grip on a willow tree as it drinks from a hole previously drilled by a sapsucker.

2 Patience pays off...
A female cardinal, using her strong beak as a probing tool, discovers a large grub beneath the loose bark.

3 Easy dinner...
This cardinal pair finds its next meal without much effort on one of many bird feeders supplied by helpful humans.

4 Skilled shellers
Their broad, strong beaks manipulate the sunflower seeds; they make cracking open seeds appear almost effortless.

BREEDING

▲ **SINGLE PARENT**
The male brings food to the two hungry chicks, while the female prepares another nest.

Fiercely loyal, the cardinal forms strong bonds and mates for life. During courtship, the male not only serenades his prospective mate but also feeds her. The love serenade is clear and sweet, often lasting all day. Nest building starts in March and April. The female builds a cup-like nest made of dry leaves and twigs, usually in a tree 4–5' above ground near a stream used for drinking and bathing. She adds grass and grapevines to complete the woven structure, before adding a final lining of softer materials, including rootlets and hair. It takes her about 3–9 days to complete the structure; she builds for a few hours in the morning, then a few more in the evening. The male continues his song as the female incubates the 3–4 dull white eggs with brown spots. The hatchlings are blind and helpless, with pink skin sparsely covered with gray down. Depending on the region, the cardinal pair raises from 2–4 broods during the season. The male brings insects to the young, which have large gaping mouths with red linings — easy targets when being fed. The male also guards the first nest, while the female prepares a new nest, usually about 30' away. Once the new young hatch, the juveniles of the first brood, about 3–4 weeks old, are chased from the parents' territory.

CONSERVATION

With the northern cardinal's ability to adapt to almost any environment, this abundant species does not appear to be in any immediate danger. The bird has adapted to the Everglades of Florida and the evergreens of New York, the deserts of Mexico and suburban gardens of New Hampshire. Though sought after for the caged-bird trade in the 19th century because of its songs and brilliant plumage, the northern cardinal is currently protected. Its domestic nature, brilliant color and pleasant song make the bird welcome at bird feeders in gardens and backyards in populated areas throughout its range.

PROFILE NORTHERN CARDINAL

The northern cardinal is a familiar and welcome sight in its year-round homes, with its rich red plumage and melodic songs.

BILL
The short, wedge-shaped red bill has sharp edges, which allow the cardinal to crack open large and tough seeds. The lower mandible is broader than the upper mandible and very strong.

FEMALE
The predominantly brown female has a crest similar to the male's; her tail, however, is proportionately shorter than the male's. The base of the bill has a blackish-gray area, but it is not as noticeable as the male's.

MALE PLUMAGE
Apart from its black mask and bib, the male cardinal's colorings are eye-catching shades of scarlet. The male's brilliant red plumage is slightly glossed; the tufted crown is pointed, and can be raised and lowered at will.

FEET
The strong legs and feet are adapted mainly for perching. The feet have three toes facing forward and one behind; all toes have slender claws for support.

JUVENILE
The young cardinal resembles an adult female, but is a richer brown with a darker bill. Its crown feathers are not as long as an adult's. By the end of the first fall molt, the juvenile will attain adult plumage, but the bill-color change takes a few extra weeks.

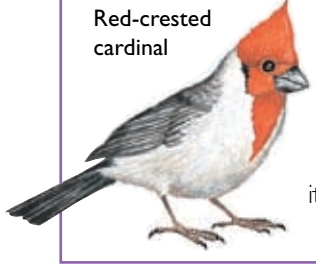
VITAL STATISTICS

WEIGHT	1.25–2 oz.
LENGTH	7.5–8.5"
WINGSPAN	10.25–12"
SEXUAL MATURITY	1 year
BREEDING SEASON	March–August
NUMBER OF EGGS	2–5, usually 3–4
INCUBATION PERIOD	12–13 days
FLEDGING PERIOD	10–11 days
BREEDING INTERVAL	Up to 4 broods a year
TYPICAL DIET	Seeds, berries and insects
LIFESPAN	Up to 28.5 years in captivity

CREATURE COMPARISONS

Measuring up to 7.5", the red-crested cardinal (*Paroaria coronata*) is slightly smaller than the northern cardinal. Its gray upperparts and white underparts are accented by a large red crest on its head, throat and upper breast, quite different from the primarily red coloring of the northern cardinal. The red-crested cardinal inhabits South American savannah in Brazil, Uruguay, Paraguay, Bolivia and Argentina, where it sings from the treetops or bushes. Its path never crosses that of its northern cardinal cousin, which resides mainly in North America.

Red-crested cardinal



Northern cardinal

RELATED SPECIES

- **The northern cardinal is one of several species in the genus *Cardinalis*. Its closest relative in North America is the pyrrhuloxia, *C. sinuatus*; a South American relative is the vermilion cardinal, *C. phoeniceus*. These birds are among 47 species in the family *Emberizidae*. The family includes the yellow cardinal, *Gubernatrix cristata*, as well as the red-capped cardinal, *Paroaria gularis*.**

Northern Flicker

• ORDER •
Piciformes

• FAMILY •
Picidae

• GENUS & SPECIES •
Colaptes auratus

KEY FEATURES

- Devours more ants, whether carpenter, black or red ants, than any other North American bird
- Traps insects in a gluelike substance on the surface of its flicking tongue
- Lays an indeterminate number of eggs; if one is removed by a predator, the flicker will lay another egg to replace it

WHERE IN THE WORLD?

Widespread over North America; from Manitoba, Alaska and Newfoundland, through all mainland states south to Florida, Grand Cayman, Cuba, the West Indies and southern Mexico

LIFECYCLE

The northern flicker, which is a woodpecker, pecks on the sides of trees for food, but it mainly searches leaf litter and dead bark looking for its favorite prey — ants.

HABITAT

▲ **THIS HOLE WILL DO**
A male flicker checks out the status of his cactus nest.

The northern flicker thrives in a variety of habitats that offer open ground. From pastures to city parks to deserts, the flicker resides anywhere it can find ants, the staple of its diet. The flicker also visits farmland and orchards for fruits and berries that might be available. Roosting holes are most commonly found in trees, but barns, chimneys, and cacti will do. Nests have even been found in fence posts and haystacks.

Out in the open, the northern flicker must always be on the alert for predators, especially hawks and falcons, that prey on it. Black snakes regularly eat both the flicker's eggs and even its young.

With at least six subspecies, the flicker is widespread across the entire U.S. In the eastern states, it is the only brown-backed woodpecker. Subspecies keep to fairly distinct regions, but their ranges on occasion do overlap. Some flickers living in southern regions remain there throughout the year.

CONSERVATION

In general, populations of the northern flicker across North America are stable. However, habitat loss is a main cause of any decrease in woodpecker numbers. The European starling is the flicker's worst enemy in Colorado, competing for food and nest holes. Since woodpeckers damage trees and utility poles with their drilling, humans often target the birds.

BREEDING

At the start of the breeding season, the birds perform courtship displays including drumming, bowing and chasing in order to attract a mate. A flicker usually remains paired for life, but renews its bond each year through these rituals. After selecting a site, both birds excavate a hole that takes up to three weeks to construct. The number of eggs a flicker will lay is dependent on how many she observes in her initial clutch. If a predator robs an egg or two during egg laying, the flicker will lay replacements. The male and female share incubation duties, and an average of 5–7 chicks hatch after about 12 days. Both sexes feed the chicks until they fledge about one month later.

FOOD & FEEDING

FOUR-SEASON DINING

1 Spring...
A mated pair digs deep in a decaying branch for wood-boring insects. One gobbles a big fat grub stuck to its tongue.

2 Summer...
As the male searches for food for his nestlings, he discovers a nest of ants — a favorite food — hidden under some leaf litter.

▲ **THE WINNER TAKES ALL**

The strongest nestling climbs the nest's wall first; therefore, it is fed before its weaker sibllings.

BEHAVIOR

When the northern flicker migrates to its breeding ground, the area resonates with sound. The flicker's characteristic call, *wick, wick, wick,* sounds like "wake-up, wake-up, wake-up." The call announces the flicker's arrival, and the male and female mate.

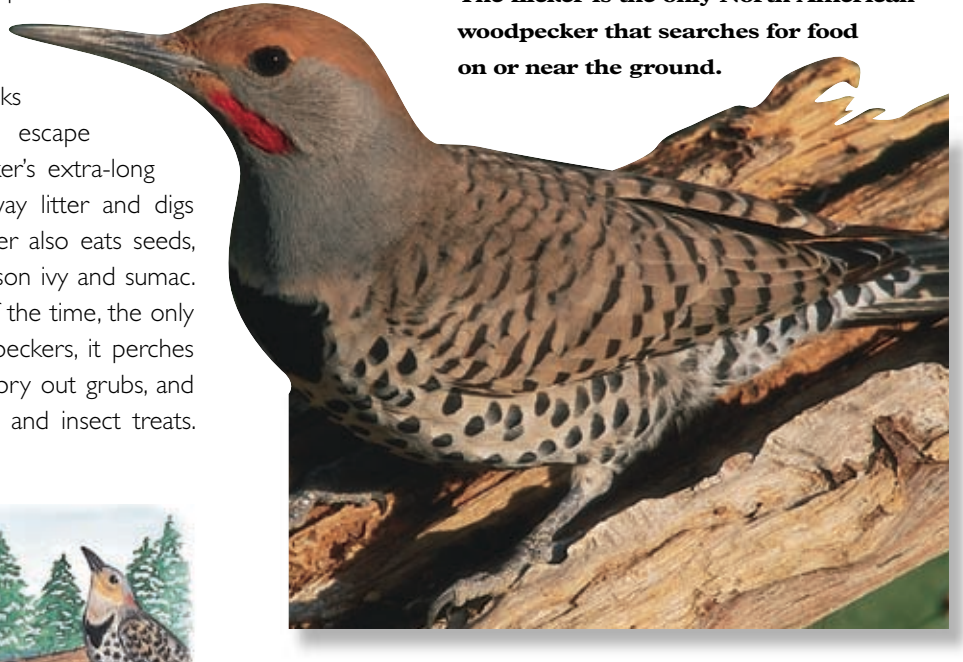
The male flicker frequently drums, especially on metal, a noise that can be annoying to many humans. But overall, the bird does not tap as much as other woodpeckers do for communication. Instead a loud *klee-yer* call is used for long-distance beckoning, especially by highly vocal fledglings.

In short flight, the flicker rapidly beats its wings to rise, then slows to dip about every 3', stalling motionlessly for a brief moment before continuing the pattern. When flickers that live in the northern regions migrate, they follow fixed courses, traveling in large flocks.

About 45% of a northern flicker's diet consists of ants of all shapes and sizes. Termites, beetles, caterpillars, crickets and spiders make up the rest of the flicker's animal diet. It finds most insects on the ground, even searching on sidewalks for the protein-rich morsels. It's hard to escape from the gluey surface of the northern flicker's extra-long tongue. Hopping along, the bird sweeps away litter and digs into crevices and holes with its bill. The flicker also eats seeds, nuts, fruits and berries, including those of poison ivy and sumac. The flicker feeds on the ground up to 75% of the time, the only woodpecker to do so. But, like other woodpeckers, it perches on the sides of trees to glean for insects or pry out grubs, and flits between trees in search of various fruit and insect treats.

▼ **ALL ALONE**

The flicker is the only North American woodpecker that searches for food on or near the ground.



3 Autumn...

Since their young have fledged, the mated pair feeds together again. Fallen cherries provide a sweet treat.

4 Winter

When snow has fallen, and insects and fruit are scarce, the pair takes advantage of nuts and seeds put out by humans.

DID YOU KNOW?

- **Since the flicker is such an indeterminate egg-layer, humans have removed eggs to see just how many a female flicker will lay. The record is 71 eggs in 73 days.**
- **Scientists have seen a male flicker treat his female partner as a rival when a fake black mustache was fastened on her face. As soon as it was removed, he accepted her back at the nest.**

PROFILE NORTHERN FLICKER

The flicker is named for its flight pattern: it "flicks" up and down, revealing brilliant yellow underwings that glitter in the sunlight.

FEMALE

The female is missing the distinguishing mustache (malar stripe) found on the male. In the yellow-shafted subspecies *(Colaptes auratus luteus, below)*, the mustache is black, and both sexes of juveniles exhibit this feature. The female loses it when she matures.

BILL & TONGUE

The flicker's tongue can flick out almost 3" beyond the tip of the bill. The bird can also flick its bill, digging quickly in ant nests before capturing the insects on its sticky tongue. The bill's chisel-like shape enables it to excavate nest holes in trees.

FEET

The flicker hops on the ground and perches on branches, but unlike perching birds, it doesn't need to wrap its claws completely around a twig. With two toes forward and two toes projecting back, the foot originally designed for clinging to sides of trees allows the flicker to perch at almost any angle.

VITAL STATISTICS

WEIGHT	Up to 6 oz.
LENGTH	Up to 14"
WINGSPAN	Up to 21"
SEXUAL MATURITY	About 1 year
BREEDING SEASON	Feb.–June, varies between regions
NUMBER OF EGGS	3–12, usually 6–8
FLEDGING PERIOD	25–28 days
INCUBATION PERIOD	11–12 days
BREEDING INTERVAL	Usually 1 year
TYPICAL DIET	Mainly ants, but also other insects, fruits and berries
LIFESPAN	About 12 years

RELATED SPECIES

● The family *Picidae* has over 200 species and is found almost everywhere, with about 20 species breeding in North America. The northern flicker, *Colaptes auratus,* has many subspecies. The male yellow-shafted flicker *(C. a. luteus)* has the typical black mustache. The male red-shafted flicker *(C.a. cafer)* has a red mustache. Interbreeding can produce offspring with either black or red mustaches.

CREATURE COMPARISONS

Measuring almost 20" in length, the great slaty woodpecker (*Mulleripicus pulverulentus*) is 40% longer than the northern flicker, and at 19 oz. weighs three times as much. It is the largest Old World woodpecker. The great slaty is slate-gray (hence its name) and has a long neck and tail, perfect for long days spent hammering and drilling on the sides of trees in Southeast Asia. This sharply contrasts with the varied colors of the flicker's plumage and its shorter neck, adapted for life spent mainly on the ground in North America foraging for ants and other insects.

Northern flicker

Great slaty woodpecker

Northern Gannet

• ORDER •
Pelecaniformes

• FAMILY •
Sulidae

• GENUS & SPECIES •
Sula bassana

KEY FEATURES

- Glides over the ocean for hours on end, "riding" the rising currents of air deflected by the waves
- Hits the sea at 60 mph when diving after shoals of fish
- Stores its catch in a throat pouch until it's ready to be swallowed
- Before it can fly, the single young leaves its nest and starts to swim south for the winter

WHERE IN THE WORLD?

Confined to the northern Atlantic, breeding on the coasts of Iceland, Norway, France, Britain, Ireland and northeast Canada; winters at sea, south as far as the coasts of northern Africa and the southeastern U.S.

LIFECYCLE

The northern gannet spends much of its life in dashing flight at sea. But at its breeding colonies on land, it occupies its time in ritualized displays with its mate and neighbors.

CONSERVATION

In the last century, the northern gannet was killed for food, but legal protection ended this practice and it recovered. A recent threat is overfishing of the fish stocks on which it feeds.

HABITAT

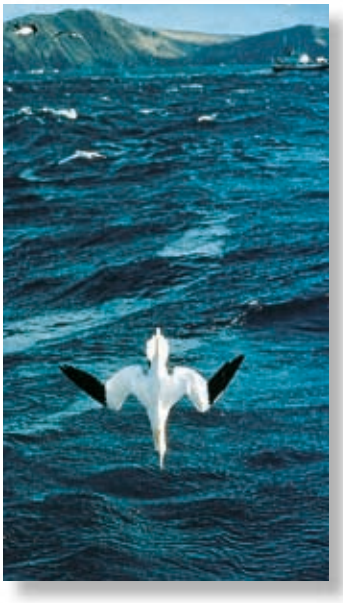
◀ **WHERE THE WIND BLOWS**
Air rising against cliffs helps the heavy gannet take off on its 6' wings.

The gannet wanders over open seas, often up to 90 miles from the coast, coming to land only to breed. It nests on offshore islands with steep cliffs in colonies known as *gannetries*. From afar, a gannet island seems to be covered in snow because of the white birds and their *guano* (droppings).

Island-nesting has great advantages: the gannet is safe from predatory mammals and can fly in any direction in search of fish. It tracks seasonal movements of fish shoals, moving south to warmer parts of the Atlantic in autumn and returning in spring.

FOOD & FEEDING

▼ **DIVE BOMBER**
The gannet often plunges nearly 100' to catch fish.



The gannet travels great distances to find rich feeding grounds. It spots shoals of fish while flying high over the sea, probably by the iridescent "oil slicks" shimmering on the surface that rise from the shoals. Then, arrowlike, the gannet dives vertically with its wings partly closed and plunges deep with a huge splash.

The gannet's weight and diving speed thrusts it about 12' below the surface, but it can paddle down to 50' in pursuit of fish. It can even catch strong-swimming fish, such as mackerel. Small prey is swallowed at the surface before the gannet flies up to dive again and again.

DID YOU KNOW?

- **Almost three-quarters of all northern gannets, about 200,000 pairs, breed off the coasts of Britain and Ireland.**
- **Male gannets often have yellow stripes on the toes; females may have blue.**
- **The gannet can swallow four large mackerel one after another and may become too heavy to fly up from the sea's surface.**
- **It takes 4–5 years for a juvenile to gain adult plumage, passing through ever-whiter stages.**

BEHAVIOR

The gannet nests in huge colonies, and all the birds look almost identical; there's little difference between sexes. It therefore uses a ritualized "language" of postures and calls to find its mate and keep neighbors at a distance.

A male claims ownership of his nest by calling loudly every time he returns to the colony and by displaying to neighboring males. He jabs the air with his bill, bows with wings raised, gapes menacingly and grapples bill-to-bill with rivals. Pairs communicate in gentler displays, such as bill fencing.

BREEDING

◀ Mess of a nest
Seaweed, feathers and *guano* make up the nest.

▼ Early birds
At dawn, the colony is already active.

At the start of the breeding season, the male brings nest material to his mate, which she binds together with droppings. They incubate their egg in alternating 30–36-hour sessions for 43 days.

The downy offspring is fed by both parents for 13 weeks. Too fat to fly and its wings not fully grown, it jumps into the sea to head south for winter by swimming and drifting with the current. It survives on fat reserves until it can fly and fish for itself.

▼ Bill rattling
When a bird returns to the nest, it engages its mate in friendly "fencing."

SIGN LANGUAGE

1 Finding the way…
A gannet colony is crowded, with thousands of similar-looking nests all only 3' apart; an incoming bird uses landmarks to find its nest.

2 Token of esteem…
A male arrives with seaweed for his mate to add to the nest. The birds pair for life and use the same nest each year.

3 Good to see you…
Shaking their heads up and down and from side to side, as if in slow motion, the birds strengthen their bond.

4 See you soon
One bird points to the sky to warn its mate that it's about to leave. If both birds left, their egg or chick would be at great risk.

PROFILE NORTHERN GANNET

The northern gannet is equipped for life as a specialized fish-eater and flies great distances on its long wings to track down prey.

JUVENILE

The juvenile's plumage is dark brown, maybe to signal to aggressive adult males that it isn't a rival. In noisy disputes, adults often attack each other, even their own mates, on occasion.

BILL

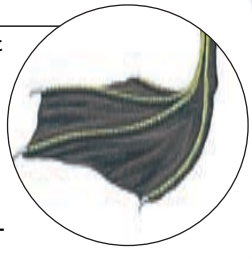
Tiny serrations along the cutting edges of the mandibles act like the teeth of a fine saw, slicing into the skin of squirming fish to hold them securely.

THROAT POUCH

Large fish are held in an expandable throat pouch until they're ready to be fully swallowed. As many as ten fish have been found in the throat pouches of some gannets.

FEET

All four toes of each foot are webbed, providing power to drive through the water in pursuit of fish. During incubation, the gannet wraps its feet around its egg, like a blanket, to keep it warm.



CREATURE COMPARISONS

Smaller than its relative the northern gannet, the masked booby (*Sula dactylatra*) or the blue-faced booby, ranges over all tropical oceans and nests on the flat, open ground of tropical islands. The booby is lighter than the northern gannet, which lets this long-winged bird take off from islands where there's often very little wind to provide lift. Both species have a mainly brilliant white plumage, but the northern gannet has creamy-yellow feathers on its head. The masked booby also has black trailing edges on its wings and tail, whereas the gannet is black on its wing tips alone.

Northern gannet

Masked booby

VITAL STATISTICS

WEIGHT	5–8 lbs.
LENGTH	3–3.3'
WINGSPAN	5.5–6'
SEXUAL MATURITY	4–5 years
BREEDING SEASON	April–September
NUMBER OF EGGS	1
INCUBATION PERIOD	43 days
FLEDGING PERIOD	91 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Fish: mainly shoaling species, such as herring and mackerel
LIFESPAN	15 years

RELATED SPECIES

● There are 2 other species of gannet in the genus *Sula*: the Australian gannet, *S. serrator,* and the Cape, or African, gannet, *S. capensis*. Both fish the same way as the northern gannet, but in temperate oceans in the Southern Hemisphere. *Sula* also has 6 booby species: the blue-footed, red-footed, brown, masked, Peruvian and Abbott's boobies. These birds take the place of gannets in tropical seas.

Northern Goshawk

• ORDER •
Falconiformes

• FAMILY •
Accipitridae

• GENUS & SPECIES •
Accipiter gentilis

KEY FEATURES

- Highly aggressive, it quickly kills its prey with the vicelike grip of its powerful talons
- Fiercely defends its nest from intruders, even attacking humans who venture too close
- Extremely acute vision allows it to quickly find and capture prey
- There are about eight subspecies of goshawk

WHERE IN THE WORLD?

Found in North America, from Alaska and Canada south through most of the United States and parts of Mexico; also found in parts of Asia, Africa and throughout most of Europe

LIFECYCLE

The northern goshawk leads a mainly solitary life, often surveying hundreds of acres and feeding on a wide variety of prey, from grouse to grasshoppers.

HABITAT

The northern goshawk is widely distributed throughout the temperate regions of the world, including North America, Europe and parts of Asia and Africa. This hawk mostly inhabits mature woods with remote stands of tall timber, particularly coniferous forests, but also deciduous and mixed forests. Found from sea level in lowlands to the subalpine woods of mountainous regions throughout its range, the northern goshawk prefers dense forests adjacent to large clearings, where it can hunt a wide variety of prey.

▼ **OPEN HOUSE**
The goshawk prefers forests close to open fields for hunting food.

CONSERVATION

The northern goshawk is not globally threatened, but is declining in many parts of its range. Habitat destruction and deforestation have caused significant declines, particularly in western Europe. Like all raptors, the goshawk is vulnerable to pollution, especially from pesticides and heavy metals that cause thinning of its eggshells and a decrease in its prey. The goshawk's nest sometimes is robbed to provide birds for the sport of falconry. It is protected by law in the U.S. and is listed on Appendix II of CITES (Convention on International Trade in Endangered Species).

FOOD & HUNTING

Highly aggressive, the northern goshawk feeds on a wide variety of prey. Its diet mainly consists of small and medium-sized birds and mammals, including hares, rabbits, squirrels, chipmunks, weasles, ducks, grouse, quail, owls, small hawks and woodpeckers; it also eats insects, such as grasshoppers and caterpillars. Hunting from a hidden perch or surveying a large clearing while in flight, the northern goshawk swoops down on unsuspecting prey and catches it on the ground; it may also skillfully dart and twist through the dense forest at speeds up to 38 mph in pursuit of birds. Once its victim is caught, the northern goshawk takes it to a clearing, devouring it on the ground. Like most hawks, the northern goshawk performs a mantling display when feeding in order to guard its hard-earned meal from other birds of prey that might try to steal it. The bird spreads its wings over its prey to create a canopy while puffing up its feathers and making threat calls.

▶ **ON THE MANTLE**
The goshawk protects its food from thieves with a mantling display.

HIDDEN PERCH

1 Perching...
From a hidden perch high in a tree, a northern goshawk looks out over an adjacent clearing and surveys it for prey.

BEHAVIOR

The northern goshawk is solitary except during the breeding season. Although it is active all day, it usually hunts during the early morning and evening. During the hottest parts of the day, the northern goshawk roosts in a tall tree where it watches over its territory. Like all raptors, the goshawk is highly territorial and defends an area as large as 5,000 acres in some parts of its range. The northern goshawk is mainly sedentary, but some populations in the northern parts of its range migrate as far south as Mexico in October for the winter months; these populations return to the northern breeding grounds in March.

▲ **SOARING HIGH**
The goshawk majestically soars through the air.

2 Swooping…
Spotting a snowshoe hare (*Lepus americanus*), the northern goshawk swoops down from its perch toward its victim.

3 Seizing…
Seeing the goshawk, the hare attempts to escape by racing away; however, it is no match for the hawk's powerful talons.

4 Holding
With the vicelike grip of its sharp talons, the goshawk firmly holds onto the struggling hare.

DID YOU KNOW?

- **The goshawk is very bold when hungry and has been known to seize chickens in the presence of humans; it has even attacked wooden duck decoys that were placed in a marsh by hunters.**
- **When hunting or angry, the goshawk's eyes turn dark crimson; the eyes of an angry female were such a fiery blood red that an observer thought she was seriously injured.**
- **The female frequently pulls and loosens the bottom of the nest; this provides sufficient aeration to prevent the growth of mold and maggots.**

BREEDING

Like most birds of prey, the northern goshawk is monogamous and mates for life. After wintering alone, the female returns to the nesting site from the previous year and calls to attract her mate with high-pitched screams. Both sexes perform flight displays, which include soaring over the nest site. The nest, made of sticks lined with twigs and leaves, is repaired, or a new one is built. After mating, the female lays 1–5 eggs (usually 3–4) and does most of the incubating, turning the eggs every half hour. The male hunts and brings her food during this time. After 35–38 days, the eggs hatch and the chicks are covered in grayish-white down. Both sexes vigorously defend the nest from intruders, including humans, and attack anything that ventures too close. The young hawks fledge in 34–45 days, with the males fledging about one week before the females; however, they do not permanently leave the nest for 70–90 days. Sexual maturity occurs between 2–3 years of age, but sometimes female goshawks mate at 1 year.

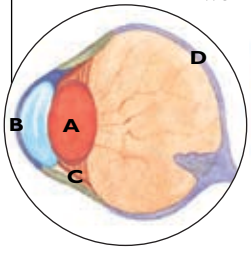
▲ **PARENTAL CARE**
Well known for its attacks on intruders, the northern goshawk protects and cares for its young.

PROFILE NORTHERN GOSHAWK

With its short, rounded wings and long, narrow tail, the goshawk twists and darts at incredible speeds through the forest in pursuit of prey.

EYES

Similar to mammals, the hawk's eyes have a lens (A), cornea (B), iris (C) and retina (D). The long distance from lens to retina gives the hawk excellent vision, allowing it to see a very detailed and colorful world.



BILL

The sharp, hooked bill rips into prey. The nostrils are covered by an area of bare skin called the *cere*.

WINGS

The short, rounded wings allow the goshawk to make sharp turns and dodge obstacles, such as tree branches, as it weaves skillfully through the trees.

PLUMAGE

All subspecies of goshawk have barred plumage that allows them to blend with their surroundings while they

WHITE MORPH

Found in Russia from Siberia to Kamchatka, the subspecies *A. g. albidus* may be light gray with barring on its chest, or white with only faint barring.

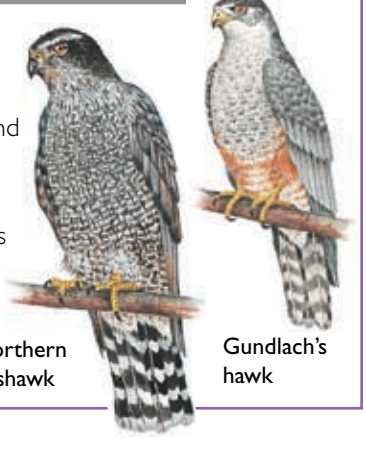
Subspecies shown: northern goshawk, *Accipiter gentilis actricapillus*

VITAL STATISTICS

WEIGHT	Male 1–2.5 lbs.; female 1.75–3.5 lbs.
LENGTH	19–27"
WINGSPAN	38–50"
SEXUAL MATURITY	2–3 years
BREEDING SEASON	April–June
NUMBER OF EGGS	1–5; usually 3–4
INCUBATION PERIOD	35–38 days
FLEDGING PERIOD	34–45 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Mostly small birds, mammals and reptiles
LIFESPAN	Up to 19 years in captivity

CREATURE COMPARISONS

Found only in Cuba, the Gundlach's hawk (*Accipiter gundlachi*) is a close relative of the northern goshawk. Unlike the goshawk, which inhabits the mature coniferous and deciduous forests of lowlands and mountainous regions, the Gundlach's hawk occurs in the tropical, evergreen and marshy forests along the coastline. The Gundlach's hawk is dark gray above with a gray breast and rufous barring on its belly and thighs, compared to the goshawk, which has a blue-gray back and white and gray underparts; both species have black caps on their heads. At 16.5–20" in length, the Gundlach's hawk is smaller than the northern goshawk.



Northern goshawk

Gundlach's hawk

RELATED SPECIES

The northern goshawk is the largest member of the 50 species in the genus *Accipiter*; close relatives include the African goshawk, *A. tachiro*, the Chinese goshawk, *A. soloensis* and the Cooper's hawk, *A. cooperii*. The family *Accipitridae* contains 237 species in 64 genera of hawk and eagle. There are about 289 species of hawk, eagle, falcon and vulture in the order *Falconiformes*.

Northern Harrier

• ORDER •
Falconiformes

• FAMILY •
Accipitridae

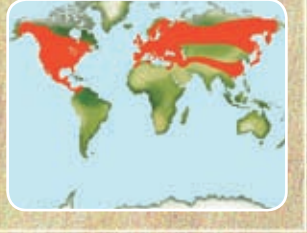
• GENUS & SPECIES •
Circus cyaneus

KEY FEATURES

- An elegant bird of prey that hunts at a leisurely pace, flying low over open country in search of small birds and mammals
- In courtship aerobatics, the male tumbles in display or drops food to the female in a midair pass
- Once severely persecuted in Britain, communal winter roosts are now widespread again

WHERE IN THE WORLD?

Breeds throughout North America, Europe and Siberia; winters in southern U.S. south to South America; in Europe from southern Asia and southern Europe to northern Africa



LIFECYCLE

A methodical hunter, the northern harrier turns into a stunt flier as it launches into a spectacular sky dance to impress its mate.

HABITAT

A bird of wide open spaces, the northern harrier is widespread across the U.S. and Canada. It prefers to breed in marsh and wetland edges; it was in this habitat that the bird was given its old name of marsh hawk. In Europe and Asia, where it is called the hen harrier, it breeds in large expanses of heather, gorse (a thorny bush) and boggy hollows, but also in the moutains up to 8,000'. During the winter, the bird migrates to warmer areas where it prefers fields, pastures and coastal marshes.

▼ **HARRIER HAUNTS**
The northern harrier prefers covered areas.

FOOD & HUNTING

Unlike most birds of prey, the northern harrier relies on slowness rather than speed when hunting. Its wings and tail are large in relation to its slim body, enabling it to fly at speeds of less than 12 mph as it scans the ground from a height of 10–13'. The bird adjusts its speed according to its target and terrain. It is at its slowest when hunting voles on rough ground, but the harrier reaches speeds of 25 mph when skimming over ploughed fields or short grass in search of birds. The northern harrier also relies on its acute sense of hearing to locate prey. It has a facial disk of feathers which helps to channel the faintest of squeaks into its large ears.

Once it has located a prey item, the northern harrier suddenly pounces feet first on the intended victim. It may kill only once in every 15 attempts.

DINING OUT IN EUROPE

1 Scouting mission…
A male harrier hunts low over a Scottish moor, scanning the ground and listening carefully for prey.

3 In for the kill…
The northern harrier pounces on the unsuspecting grouse, stabbing the bird lethally with his talons.

DID YOU KNOW?

- **The northern harrier spends about 40% of daylight hours on the wing and covers about 100 miles every day.**
- **Harrier breeding pairs often dive-bomb people who venture too close to their nests. They may also strike with their talons.**

BREEDING

▲ **INCUBATION STATION**
The harrier's nest is built out of sticks, heather, gorse and grass.

Aerial courtship displays by the northern harrier end in a sky dance, in which the male climbs to a height of 1,600' before tumbling down. He may plunge and rise more than 20 times before landing. Northern harrier pairs also execute "food passes." The male bird drops the food, and the female rolls onto her back, catching it in an outstretched foot.

Each female lays between three and six eggs, which she incubates for about a month. Once the chicks hatch, she feeds them on morsels of meat brought to her by the male. The young harriers fledge a month after they are born.

▶ **FEED ME!**
Chicks rely on parents for food for over a month.

2 Weakened defense…
He spots a red grouse feeding in the heather below, and swoops swiftly to the attack.

4 Filling feast
The prey is slowly plucked and eaten at the site where it was captured.

BEHAVIOR

During the winter, northern harriers in Europe and Africa will often gather at traditional communal roosts. The groups average about 30 birds, but more than 200 birds sometimes assemble at these sites. The birds circle the roost together at dusk before settling down for the night.

Roosts are located on the ground in boggy or flooded areas. This offers protection from foxes and other enemies. The bird sleeps on a "bed" of trampled grass or heather.

Communal roosting may provide the harrier with a food-finding system. A hungry harrier can recognize a better-fed individual and will follow it to a more productive hunting area the following morning.

Away from its roost, the northern harrier is generally solitary, but it may travel in small groups on autumn migration.

The northern harrier's vocal range is limited to cackles and wails. It is silent outside the breeding season, except when disturbed at its roost.

▲ **SHOCK TACTICS**
Young northern harriers screech noisily and flap their wings when startled.

CONSERVATION

Like all birds of prey in the U.S., the northern harrier is protected by law. It is legally protected in Britain as well but, in some European countries, the bird is still shot, especially during its migration. This can hurt local populations.

PROFILE NORTHERN HARRIER

The northern harrier's light build and long wings give it buoyant, energy-efficient flight, enabling it to soar for long periods as it hunts.

MALE

The male is distinguished from the female by his gray plumage. In flight, he reveals black primaries and a dark band along the trailing edges of his wing undersides.

CERE

The cere, a waxy, fleshy covering at the base of the bill, is yellow in the adult but greenish in the juvenile.

FEMALE

The female harrier has brown plumage with a streaked breast and white rump.

TAIL

The long tail aids maneuverability when the bird is hunting. Banding on the female's tail accounts for her common name: "ringtail."

FEET

Short toes and needle-sharp talons at the end of long legs pin prey to the ground.

VITAL STATISTICS

WEIGHT	Male 12 oz.; female 18 oz.
LENGTH	17–23"
WINGSPAN	38–48"
SEXUAL MATURITY	2–3 years
BREEDING SEASON	April–June
NUMBER OF EGGS	3–6
INCUBATION PERIOD	29–31 days
FLEDGING PERIOD	32–42 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Small birds and rodents
LIFESPAN	Up to 16 years; usually less than 12 years

CREATURE COMPARISONS

The marsh harrier (*Circus aeruginosus*), which is widely distributed in Europe, Africa and Asia, is a relative of the northern harrier. The male marsh harrier is mainly dark chestnut-brown with gray wings and tail, while the female is chocolate-brown with a yellowish-cream head, throat and forewing. Like the northern harrier, the marsh harrier hunts by flying low over the ground, but does so at a greater speed. Its wingbeats are heavier, too.

Male northern harrier

Male marsh harrier

RELATED SPECIES

● **Harriers, as a group, are found virtually throughout the world, but expert opinion on the number of species ranges from 9–13. Montagu's harrier, *Circus pygargus* (below), of Europe, looks much like the northern harrier.**

Northern Mockingbird

• ORDER •
Passeriformes

• FAMILY •
Mimidae

• GENUS & SPECIES •
Mimus polyglottos

KEY FEATURES

- Mimics about 30 different species of bird and a variety of other sounds, from whistles to barks
- Boldly defends a wide territory but reduces its area size in winter
- Eats fruits and insects; devours a large number of harmful crop pests

WHERE IN THE WORLD?

Widely distributed throughout North America, from Alberta and Quebec in Canada south to Mexico and the Bahamas

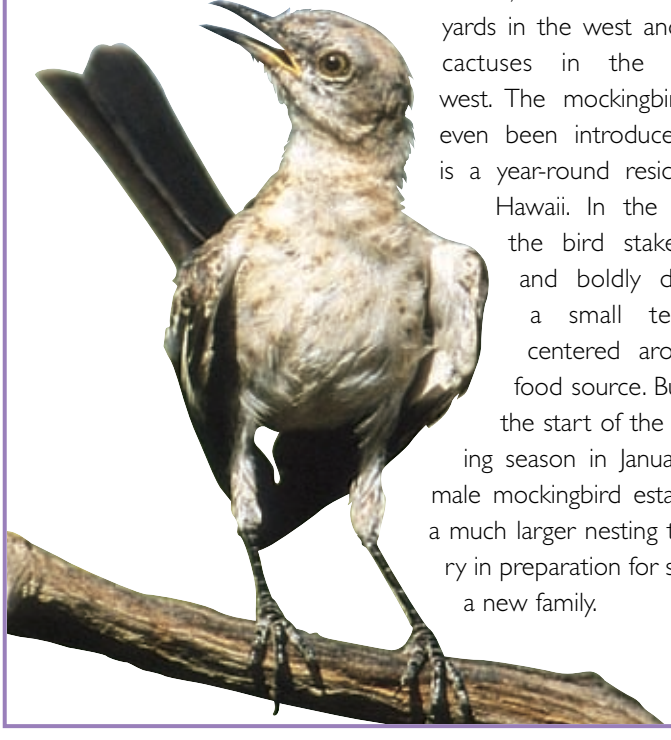
LIFECYCLE

The northern mockingbird, a master mocker, deceives hunters and birdwatchers with its song imitations, and battles intruders in mock fights and pecking matches.

HABITAT

▲ **OUT OF THE WAY**
The cup-shaped tree nest conceals the newborns.

▼ **NAME THAT TUNE**
A juvenile tries out a new imitation at its tree perch.



Found throughout North America, northern mockingbirds in the northernmost areas migrate south for the winter. But in the rest of its range, the mockingbird sets up permanent residence in a variety of open habitats. From lawns and farms to gardens and pastures, the northern mockingbird is found wherever there is an attractive mix of trees, shrubs and grasses. This blend of vegetation provides food and protection for the mockingbird. Year-round homes include streamside thickets and schoolyards in the north, orchards and vineyards in the west and even cactuses in the southwest. The mockingbird has even been introduced and is a year-round resident in Hawaii. In the winter, the bird stakes out and boldly defends a small territory centered around a food source. But with the start of the breeding season in January, the male mockingbird establishes a much larger nesting territory in preparation for starting a new family.

BREEDING

The male signals the start of the breeding season with a loud, brash call. When a female enters its territory, the two birds watch each other and communicate with a loud series of calls. Once a pair bonds, the frequency of their songs decrease. The birds work quickly to construct a strong, cup-shaped nest of twigs, grasses and rootlets about 3–10' above ground. The female lays up to six eggs and begins incubating after laying the last one. The hatchlings are fed by both parents for about 12 days and then fly off to establish a territory of their own. More than one brood can be raised during the breeding season.

▶ **A HUNGRY TRIO**
With mouths open, young hatchlings resemble bright yellow flowers.

BEHAVIOR

The mockingbird has an uncanny ability to mimic at least 30 other birds' songs. The imitations are incredibly precise. For example, the red-winged blackbird can't tell for sure if a song is from a fellow blackbird, indicating that the territory is already claimed. This mimicking helps keep other species out of the mockingbird's territory. When establishing its domain, the mockingbird loudly repeats a note at least three times, then switches to another phrase or imitation. The mockingbird's repertoire is not limited to bird songs. It can imitate the tinkling of a piano, squeaky hinges and even a dog's bark. When its songs don't warn off trespassers, its aggressiveness is a quick deterrent. Dogs, cats and squirrels are savagely pecked. Mockingbirds can be harsh with other birds as well; it assumes a threatening posture, with tail cocked and fanned, against robins, starlings and woodpeckers that dare try to rob from its area.

COMBAT ZONES

1 Backyard guard...
The mockingbird maintains its breeding territory with an ever-changing song. It scans for intruders from its treetop perch.

2 Battle-scarred...
The bird considers the suburban garden as its domain. It swoops down for attack and pecks madly at the unwelcome resident dog.

DID YOU KNOW?

- **Chosen for its singing abilities or territorial allegiance, the mockingbird is the state bird for Arkansas, Florida, Texas, Mississippi and Tennessee.**
- **In the Pueblo culture, it is believed that the mockingbird grants the gift of speech to humans.**

FOOD & FEEDING

▲ **A BITTERSWEET FEAST Berries and fruits are the staples of the northern mockingbird's diet.**

The northern mockingbird eats a variety of fruits and insects. Domestic fruits such as grapes, oranges, blackberries and figs account for a portion of the bird's diet, but wild fruits such as holly, smilax, elderberry, mulberry and fruit of the prickly pear cactus account for about 45% of the total food eaten. Almost half of its daily diet is insects, including harmful crop pests such as boll weevils, cucumber beetles and chinch bugs. Grasshoppers, caterpillars, spiders, sow bugs and snails round out the high-protein portion of the mockingbird's meal. The bird pounces on bugs from its perch with a swift descent, often catching an insect in midair above a tangle of wildflowers. The mockingbird also takes advantage of food such as bread, raisins or suet (hard beef fat) left out by humans. This easy snack is welcome, especially during the cooler winter months, when food is scarce in northern regions where birds remain year-round.

3 Rite of spring...
Boundary disputes occur between March and August when males confront each other at the edge of the breeding territory.

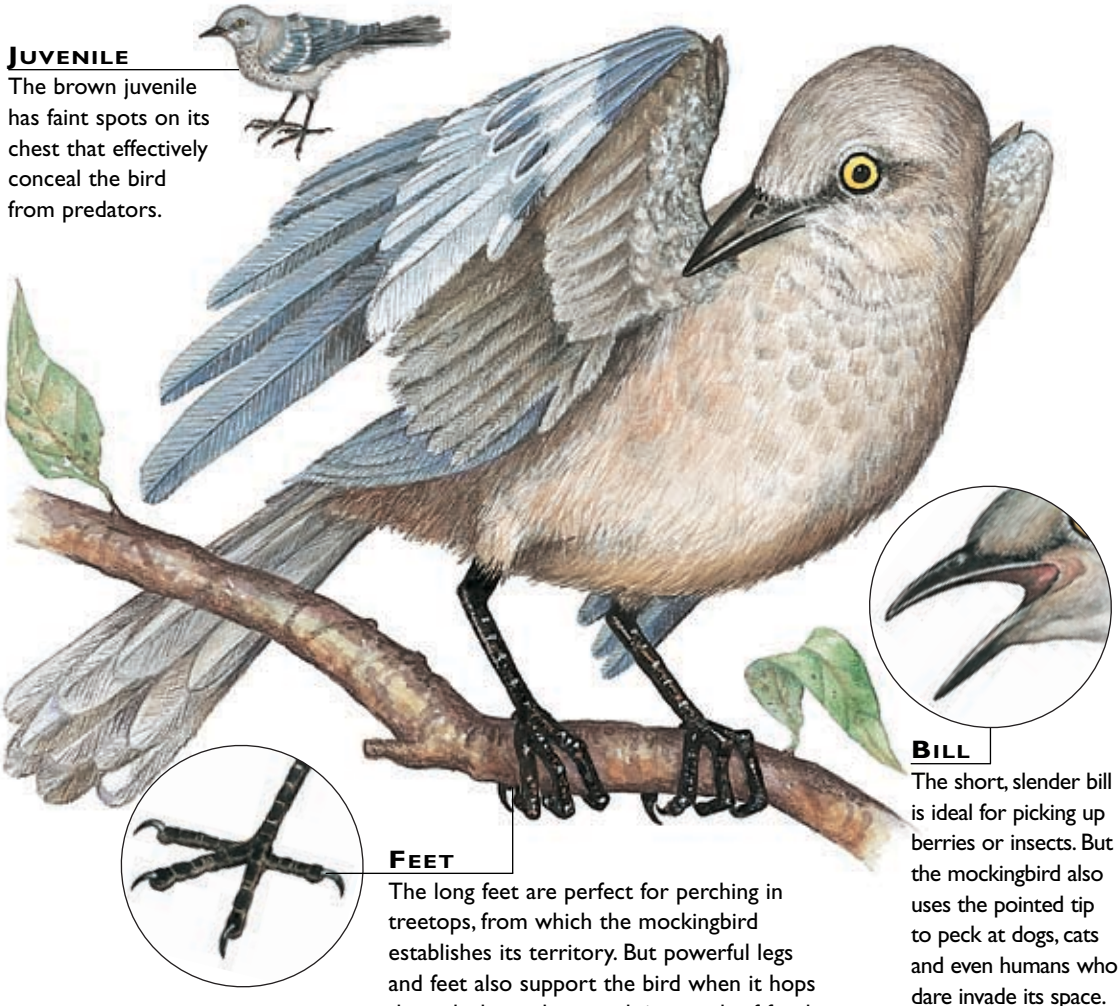
4 Boxing ring
They look like boxers at the start of a match, but only hop along a disputed border until the intruder retreats in defeat.

CONSERVATION

The northern mockingbird's affinity for crops of sweet fruits and berries may put it in jeopardy. One grape grower killed 1,100 mockingbirds to keep them from eating portions of his valuable crop. But the northern mockingbird has adapted well to urbanization of its natural habitat, and populations remain strong. Habitats modified by open tree and shrub plantings simulate the natural forest-edge conditions preferred by the mockingbird and have led to its spread across the United States. The push northward has been slowed by destruction of similar woody habitats.

PROFILE NORTHERN MOCKINGBIRD

Despite its dull plumage, the northern mockingbird attracts attention with its mimicking medleys and daredevil territorial defense tactics.



JUVENILE

The brown juvenile has faint spots on its chest that effectively conceal the bird from predators.

BILL

The short, slender bill is ideal for picking up berries or insects. But the mockingbird also uses the pointed tip to peck at dogs, cats and even humans who dare invade its space.

FEET

The long feet are perfect for perching in treetops, from which the mockingbird establishes its territory. But powerful legs and feet also support the bird when it hops through the undergrowth in search of food.

VITAL STATISTICS

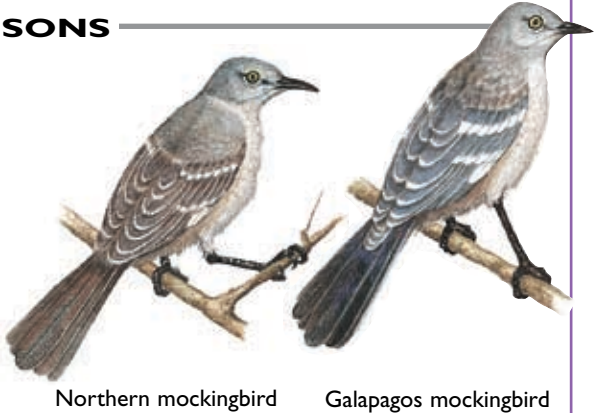
WEIGHT	1.5–2 oz.
LENGTH	9–11"
WINGSPAN	13–15"
BREEDING SEASON	March–August
NUMBER OF EGGS	3–6, usually 4–5
INCUBATION PERIOD	12–14 days
FLEDGING PERIOD	10–12 days
BREEDING INTERVAL	2–3 broods per season
TYPICAL DIET	Berries, seeds and insects
LIFESPAN	In captivity, up to 15.5 years; in the wild, about 12 years

RELATED SPECIES

● **A member of the family *Mimidae*, the northern mockingbird joins about 13 other species of mockingbird in this group. The blue and white mockingbird, *Melanotis hypoleucos*, is a vibrant, colorful contrast to the typical brown or gray of most mockingbirds. Approximately 17 species of catbirds and tremblers are relatives included in the *Mimidae* family of singers and mimics.**

CREATURE COMPARISONS

The 10" long Galapagos mockingbird *(Nesomir* is comparable in size to the northern mocking Galapagos mockingbird, as its name suggests, is only on the Galapagos Islands of Santa Fe, Isab Fernandina and Darwin. There, they form famil flocks, in contrast to the less gregarious northe mockingbird. Both species eat insects, seeds an berries. But the Galapagos also scavenges for other fare, including sea lion placentas and the and even chicks of other birds.



Northern mockingbird Galapagos mockingbird

Northern Pintail

• ORDER •
Anseriformes

• FAMILY •
Anatidae

• GENUS & SPECIES •
Anas acuta

KEY FEATURES

- Most widely distributed duck in North America; one of the most numerous ducks in the world
- Averages over 100 miles per day on long migratory flights that often exceed 2,000 miles
- Named for its "pintail," the elongated tail feathers that can measure up to 4" long in males

WHERE IN THE WORLD?

Found throughout the Northern Hemisphere; breeds across Canada, the U.S., Europe and Asia; also winters in South America, Africa, and India

LIFECYCLE

Female and male pintails resemble each other when the male molts; when his new handsome plumage grows in, he migrates south a month ahead of the female.

HABITAT

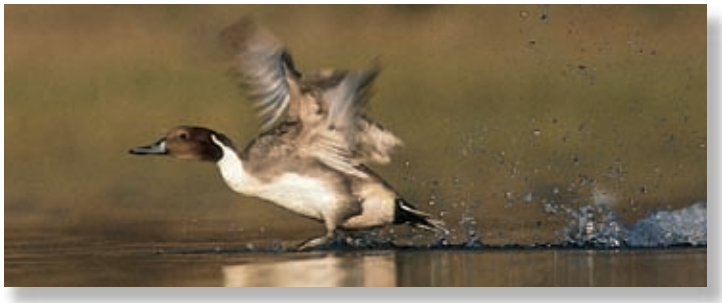
From the tundra to the tropics, the northern pintail is widespread and numerous. The pintail's two basic requirements for any home are water, shallow enough for feeding, and low vegetation on the shores. It is most abundant on prairie and tundra habitats that offer open vistas with quiet and shallow marshes, rivers or lakes. Freshwater is preferred over brackish. In Alaska, thousands of small ponds are home to one or more pairs. Pintails usually remain on ponds near the coasts, but in India, large numbers are found on inland lakes. On the sea, the birds form flocks of over 1,000, which split up into small parties that mingle with other ducks.

▼ **MOVING DAY**
Millions of pintails migrate each spring and fall.

CONSERVATION

The pintail is not endangered; over 6 million pintail breed in the U.S. alone. But hunting and drainage are contributing to a slow decline of many ducks. The pintail is a popular target for hunters; in fact, it is among the top three, along with mallards and teal. The draining of marshes and shallow lakes is continuing at an alarming rate, reducing breeding and nesting grounds.

BEHAVIOR



▲ **AQUATIC RUNWAY**
The pintail has large wings for strong, fast flight.

From mid-July to early September, the male pintail, or drake, molts, trading his handsome plumage for a plainer set of feathers called eclipse plumage. The pintail molts all of its flight feathers simultaneously, rendering it flightless. To compensate, the male assumes the overall coloration of the camouflaged female. During this vulnerable flightless period, a pintail will only dive fully underwater in an attempt to escape danger. The males molt first into their winter plumage and begin their long migratory journey south; the females follow a month later. The pintail accurately retraces the same migratory flyways in the fall that it followed in the spring. Flight speeds reach over 50 mph, but the young have less endurance and require more frequent stops than the adults. Only those pintails in parts of the western U.S. and Europe remain in the same place throughout the winter.

▼ **PERFECT PLUMAGE**
The pintail drake's tastefully colored feathers form an elegant profile.

FOOD & FEEDING

The northern pintail is an opportunistic feeder, using a variety of techniques to exploit all that its shallow, aquatic habitat has to offer. The pintail's flexible neck, serrated bill and webbed feet enable it to skillfully swim across shallow waters and surface-feed on seeds, grasses, insects and tadpoles. But the long neck offers an additional payoff: the pintail can feed in relatively deep waters by up-ending. Powerful, paddling legs help the duck keep its balance, while it reaches up to 12" below the surface. Spending up to 6 seconds underwater, the pintail searches for snails, mollusks, crabs and seeds along the muddy bottom and often uproots pondweed and sedge plants.

FLEXIBLE FEEDERS

1 Dabbling...
The pintail is a dabbling (surface-feeding) duck. A female sieves aquatic plant matter with the help of serrations on her bill.

2 Head-dipping...
The pintail can also extend its neck into the shallow waters to reach various submerged plants, found just below the surface.

3 Up-ending...
To reach the tubers of aquatic plants, the female submerges the front of her body, while her tail remains visible above the surface.

4 Grazing
The pintail's feet are set farther forward than those of diving ducks, so it can wander comfortably over nearby pasture.

BREEDING

The most common male courtship display is a call known as "burping" — a geee sound that changes to a soft, flutelike whistle. Males burp, then perform a "head-up-tail-up" display, with their long tails pointing straight up. Once she has chosen a mate, the female builds a down-lined hollow in the ground among low plants. She lays one egg per day, but does not start her lone incubation until the full clutch of 7–9 eggs is laid. Often the male stays with her to help guard the exposed nest and to accompany her to the water with the chicks. Female pintails are fearless in the defense of their young, attempting to combat much larger predators. But less than half of the chicks survive to breed the following year because of natural predators and hunters.

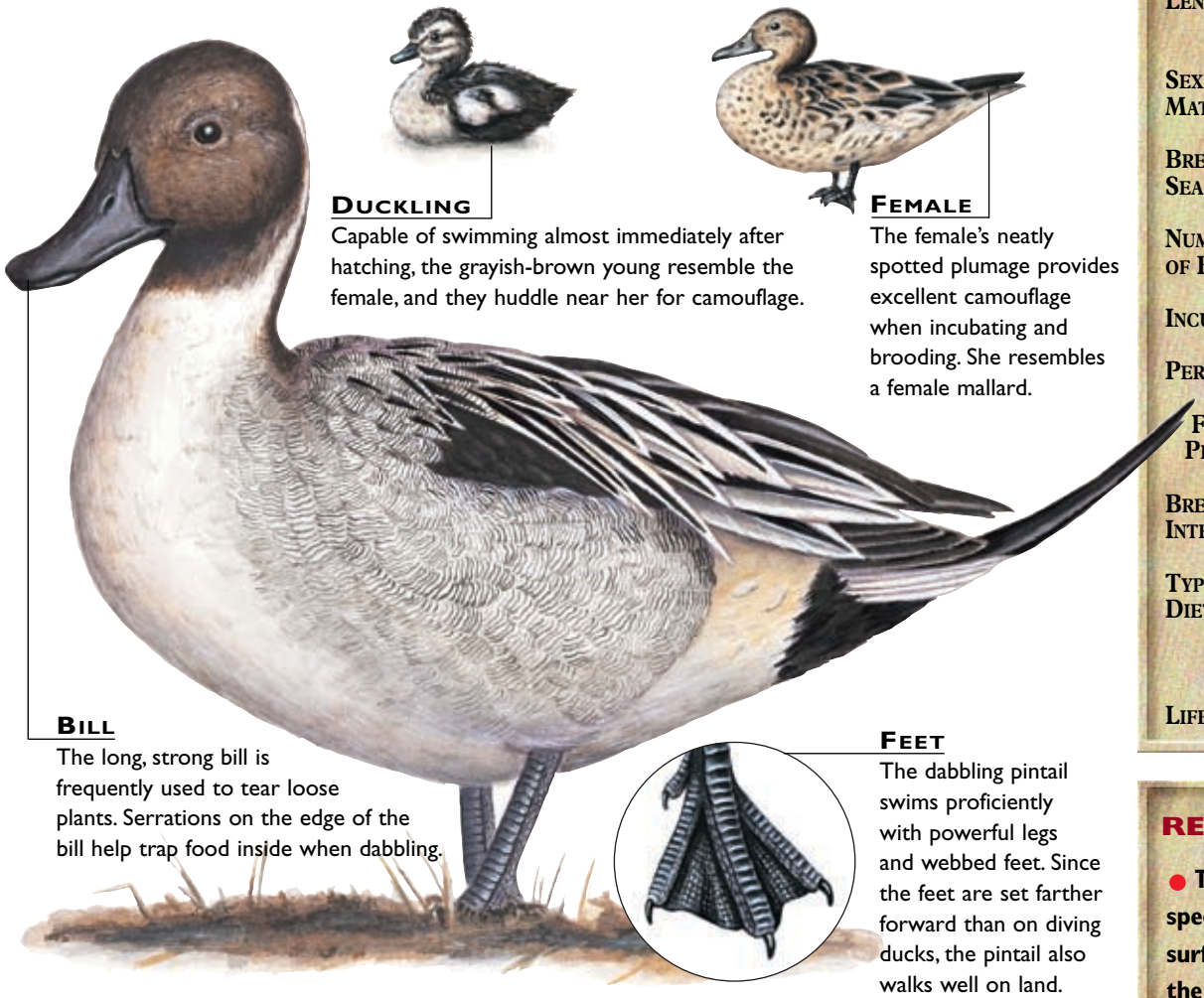
▶ **DOWNY SOFT**
All chicks hatch together after an incubation of about 23 days.

DID YOU KNOW?

- **The northern pintails in Europe migrate as far south as the Sudan and are depicted in ancient Egyptian paintings.**
- **When foraging for seeds in the water, the pintail may accidentally ingest spent lead shots from hunters; many pintail succumb to lead poisoning each year.**

PROFILE NORTHERN PINTAIL

The pintail's slim neck and streamlined body make an elegant profile; when swimming or flying, its distinctive tail feathers are easily identified.



DUCKLING

Capable of swimming almost immediately after hatching, the grayish-brown young resemble the female, and they huddle near her for camouflage.

FEMALE

The female's neatly spotted plumage provides excellent camouflage when incubating and brooding. She resembles a female mallard.

BILL

The long, strong bill is frequently used to tear loose plants. Serrations on the edge of the bill help trap food inside when dabbling.

FEET

The dabbling pintail swims proficiently with powerful legs and webbed feet. Since the feet are set farther forward than on diving ducks, the pintail also walks well on land.

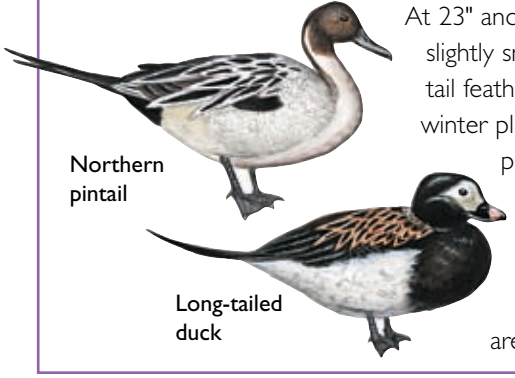
VITAL STATISTICS

WEIGHT	1–3 lbs.; male averages 2.3 lbs., female averages 1.9 lbs.
LENGTH	Male 20–29"; female 17–25"
SEXUAL MATURITY	1 year
BREEDING SEASON	April–July
NUMBER OF EGGS	7–9
INCUBATION PERIOD	22–24 days
FLEDGING PERIOD	5–7 weeks
BREEDING INTERVAL	1 year
TYPICAL DIET	Grasses, seeds, tubers, tadpoles, insects and mollusks
LIFESPAN	Up to 27 years

RELATED SPECIES

- **The pintail is 1 of 36 species of dabbling, or surface-feeding, ducks in the genus *Anas,* which also includes the mallard, *A. platyrhynchos,* teals and shovelers. Geese and swans join dabbling and diving ducks in the family *Anatidae;* all are considered true waterfowl. This family is 1 of 2 families comprising about 40 genera and over 140 species in the order *Anseriformes.***

CREATURE COMPARISONS



Northern pintail

Long-tailed duck

At 23" and 2 lbs., the long-tailed duck *(Clangula hyemalis)* is slightly smaller than the pintail. Only the male has the extended tail feathers. But both sexes have distinct summer, eclipse and winter plumages, which are among the most complex series of plumage patterns of any bird. Unlike the dabbling pintail, the long-tailed duck is a diver. It forages for food in deeper water than any other duck, diving up to 50' or more. The most numerous of all arctic breeding ducks, the long-tailed duck swallows shellfish whole; the shells are ground in its gizzard.

Northern Wheatear

• ORDER •
Passeriformes

• FAMILY •
Turdidae

• GENUS & SPECIES •
Oenanthe oenanthe

KEY FEATURES

- A ground-loving bird of moorland, alpine and open rocky areas, it sings from vantage points while remaining alert for food and predators
- Male performs a feather-fluffing, dancing display when intruders invade its territory
- Migrates long distances between breeding grounds and wintering areas

WHERE IN THE WORLD?

Breeds from Alaska, Canada and Greenland to Europe, the Middle East and northern Asia, including most of Siberia; all but a small population in Iraq overwinter in sub-Saharan Africa

LIFECYCLE

One of the first migratory birds to appear at its breeding grounds, the northern wheatear brings life, color and sound to bleak hills and alpine areas emerging from a long winter.

HABITAT

The northern wheatear breeds in temperate and subarctic regions. Almost all of these birds winter in hot, dry areas of tropical Africa. During the breeding season, it is often found on rocky slopes, scree and alpine meadows at altitudes of up to 10,000'.

Avoiding forests and woodlands, the wheatear prefers open country, and typically breeds in exposed areas rich in insect life, such as hillsides, stony slopes and walled fields where it finds plenty of nesting sites and vantage points. The wheatear is also at home on rocky coasts, bogs and Arctic tundra.

In its winter quarters in sub-Saharan Africa, the wheatear remains a lover of open ground, inhabiting short-grass savannah, farmland, barren rocky hills and plains recently cleared by fire.

▲ **WINDSWEPT ISOLATION**
Breeding birds favor remote, open regions.

DID YOU KNOW?

- **Nearly the entire population of wheatears winters south of the Sahara.**
- **During migrations, wheatears often cross vast tracts of ocean. Birds from Greenland may take over 30 hours to make the 1,450-mile crossing to Africa.**
- **The wheatear's name comes from the Anglo-Saxon words *hwit* and *oers*, which mean "white" and "rump."**

FOOD & FEEDING

The wheatear feeds mainly on insects, such as beetles, flies and other invertebrates, including snails, slugs and spiders. The bird pounds large insects, such as grasshoppers, against the ground to break off inedible legs and wings. In autumn, when food becomes scarce, the wheatear supplements its diet with berries.

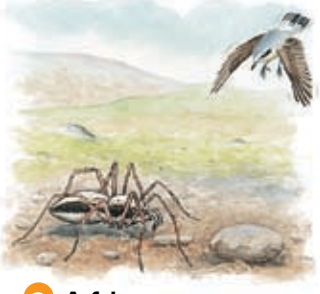
The bird uses two hunting strategies to locate and capture prey. Commonly, it perches on a low rock or bush, watching for any movement on the ground. It then darts down, sometimes hovering above its quarry, before pouncing.

The second method involves hopping over open ground before pausing and watching for prey. If nothing stirs, the bird repeats the process until successful.

◀ **INSECT ADDICT**
While eating, the wheatear looks for more.

HILLSIDE HUNTER

1 A fine view...
Perched on a rock, a wheatear scans the bare ground below for signs of prey. Its sharp eyesight can detect the smallest of movements.



2 A false move...
As a large wolf spider emerges from hiding, the wheatear swoops down instantly for a closer look.

3 Unequal race...
The spider scuttles for cover, but the bird easily outpaces it and catches it in its slim bill. Large prey offers a highly nutritious snack.

4 Dining at leisure
The bird carries its spoils back to its vantage point. Here, it can safely eat while keeping a close watch for predators.

BREEDING

▲ **SAFETY COLORING**
Brown spotted plumage helps hide the fledgling.

Living in open areas devoid of trees, the northern wheatear must build its nest in crevices in stone walls, rocky ground or in abandoned burrows in order to conceal it from predators, such as weasels and rats.

The nest foundation is an untidy mass of dried stems, rootlets and grass, occasionally decorated with a large feather. This holds a cup-shaped nest constructed of tightly woven grass stems, leaves, moss and lichen.

The pale blue eggs are incubated mainly by the female. Both parents feed the hatchlings, which grow swiftly. After fledging it is important that the young birds put on weight quickly, building themselves up for the long migration south.

▶ **FEEDING THE FAMILY**
Parent birds must hunt continually to feed young.

BEHAVIOR

Being a mostly solitary bird of open country, the northern wheatear is shy and wary — constantly alert to the threat of attack by birds of prey, such as falcons. When alarmed, it flies swiftly for cover uttering a harsh, penetrating *chack-chack* call to warn its mate of the danger.

The wheatear is territorial and returns to the same breeding site each year. If both partners survive the arduous migration, they are likely to pair up once again. Should only one partner survive, he or she waits for a new mate to arrive.

▲ **ON THE STAGE**
The male sings from a vantage point.

The male defends his territory from intruders with a vigorous, warbling call accompanied by a dancing display. With fluttering wings he leaps rapidly and erratically from side to side, ruffling his breast feathers and flicking his tail. He may even fly over his rival — appearing as a swirling mass of feathers. The rival may attempt to outdo the territory owner with an energetic and vocal display of his own.

CONSERVATION

The northern wheatear remains common in its range, but populations in Europe have declined in recent years. This is partly due to the increased use of pesticides, leaving little food for the bird during its breeding season. Forestation of upland areas also reduces the bird's favorite habitats. Like most migrants, many wheatears are targeted by "sport" hunters — particularly in Mediterranean countries — who shoot down songbirds and birds of prey as well as gamebirds.

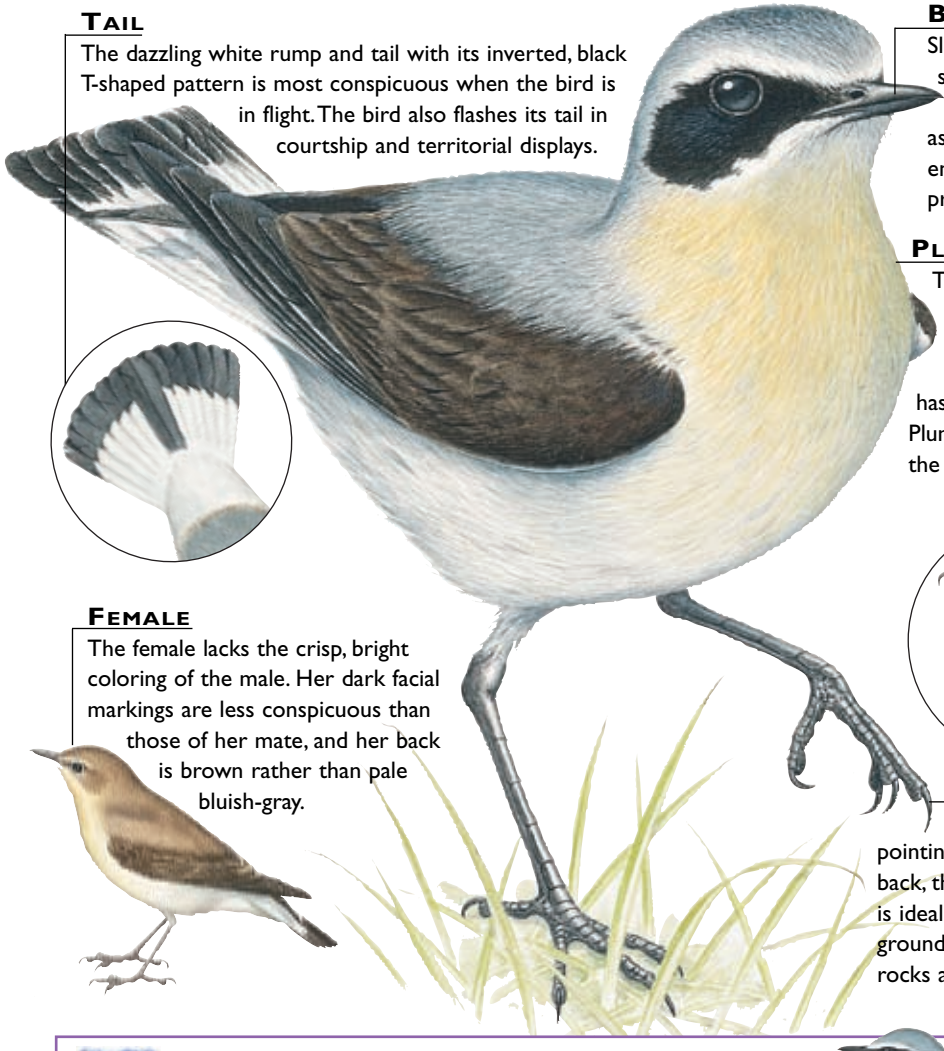
PROFILE NORTHERN WHEATEAR

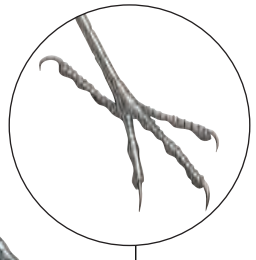
Jaunty and restless, the wheatear flits, hops or runs from perch to perch, flicking its wings and flaunting its strongly marked tail if threatened.

TAIL
The dazzling white rump and tail with its inverted, black T-shaped pattern is most conspicuous when the bird is in flight. The bird also flashes its tail in courtship and territorial displays.

BILL
Slim and sharp, the bill snaps up the tiniest creatures. It also acts as a pair of tweezers, enabling the bird to pry prey from crevices.

PLUMAGE
The throat and breast are pale yellow. Upperparts are darker, and the male has a bluish-gray back. Plumage dulls outside of the breeding season.





FEMALE
The female lacks the crisp, bright coloring of the male. Her dark facial markings are less conspicuous than those of her mate, and her back is brown rather than pale bluish-gray.

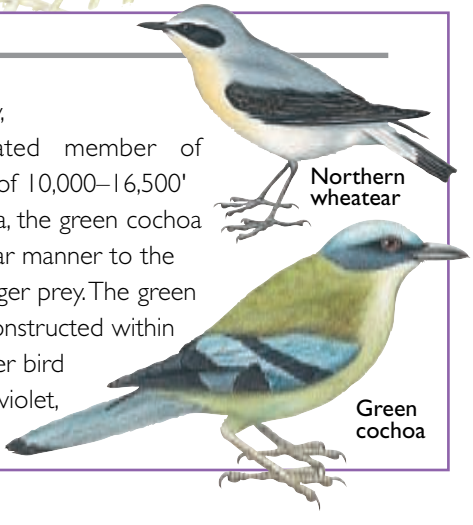
FEET
With three toes pointing forward and one back, the wheatear's foot is ideal for running on the ground or for gripping rocks and branches.

VITAL STATISTICS

WEIGHT	0.5–1 oz.
LENGTH	6"
WINGSPAN	10–12"
SEXUAL MATURITY	1 year
BREEDING SEASON	April–July
NUMBER OF EGGS	5–6
INCUBATION PERIOD	13 days
FLEDGING PERIOD	15 days
BREEDING INTERVAL	1 or 2 broods a year
TYPICAL DIET	Mainly insects; also spiders, mollusks, centipedes, woodlice; some berries
LIFESPAN	Up to 7 years

CREATURE COMPARISONS

Whereas the northern wheatear is a bird of open country, the green cochoa (*Cochoa viridis*), a closely related member of thrush family, inhabits mountain forests. Found at altitudes of 10,000–16,500' in the Himalayas and other mountains of-southeastern Asia, the green cochoa hunts in deep undergrowth for insects. It forages in a similar manner to the wheatear, but its more powerful bill enables it to tackle larger prey. The green cochoa's nest is more refined than that of the wheatear, constructed within tree foliage from mosses, leaves and plant fibers. A far larger bird than the wheatear, the male green cochoa's head is bluish-violet, while his wings and tail vary from gray to powder-blue.



RELATED SPECIES

- **The wheatear belongs to the genus *Oenanthe*, which also contains the desert wheatear, *O. deserti* (below). The genus is part of the family *Turdidae*, which is one of the largest families in the order *Passeriformes*.**

Oilbird

• ORDER •
Caprimulgiformes

• FAMILY •
Steatornithidae

• GENUS & SPECIES •
Steatornis caripensis

KEY FEATURES

- The world's only nocturnal, fruit-eating bird
- Spends its days in a pitch-black cave, only coming out after dusk to feed
- Emits high-pitched clicking sounds like a bat to navigate through the utter blackness of its cave
- One of the few birds with a keen sense of smell

WHERE IN THE WORLD?

Found in northern and central South America from western Guyana through Venezuela and Colombia to Ecuador, Peru and northwestern Bolivia; also found in Panama and Trinidad

LIFECYCLE

The oilbird is a creature of darkness, spending over half of its life in the ink-black depths of a mountain cave, emerging after dusk to feed in the lightless tropical forest.

HABITAT

▲ **CAVE BIRD**
Caves are a safe daytime haven from predators.

By night, the oilbird inhabits the tropical forest of Central and South America. As a fruit eater, it favors mature tropical forest that provides it with a year-round supply of food, and it has a particular fondness for laurel, palm and incense trees.

By day, most oilbirds exploit a very different habitat: deep caves found in the mountains of South America and Panama and on the coast of Trinidad. The oilbird may nest over 2,000' from the cave entrance — the only source of light. Most oilbirds roost in caves, but some populations in Venezuela also roost in palm trees.

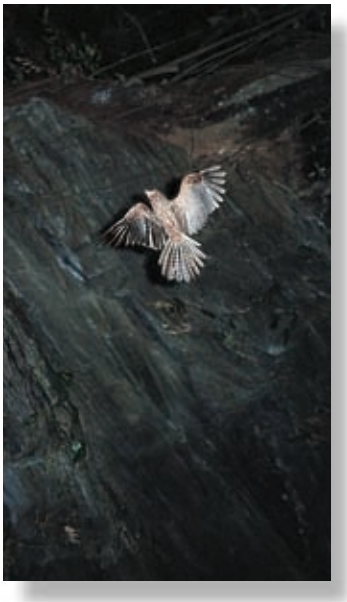
DID YOU KNOW?

- **The Spanish name for the oilbird is *guácharo*, which means "the one who wails."**
- **The oilbird is so-called because its nestlings are used by locals as an oil source.**
- **The oilbird is the only non-insectivorous member of the order *Caprimulgiformes*.**
- **The oilbird's echolocation can only detect objects larger than 8" wide.**

FOOD & FEEDING

In the tropics, night falls quickly and as the shadows lengthen, oilbirds stream out of their roosting caves like a host of bats. As they emerge, they break into small flocks to begin their night-long search for food.

The oilbird has a well-developed sense of smell; scent plays a key role in its search for aromatic fruit. Hovering on its long wings, the bird plucks oily fruit of palm and laurel trees with its hooked bill. Lacking a *crop* (a saclike part of the esophagus), it carries food in its stomach to be digested during the day in its cave.



▲ **EATING OUT**
The oilbird emerges from its cave at night to feed.

NIGHT BIRDS

1 Colonial life…
The oilbird roosts colonially in deep caves, taking wing at night to search the neighboring tropical forests for juicy fruit.

2 Steering by echo…
In the cave's darkness, the oilbird produces clicking sounds that bounce off the walls and give it a picture of its surroundings.

3 Led by its nose…
Travelling up to 15 miles over the forest, the oilbird uses its keen sense of smell to locate a tree laden with ripe fruit.

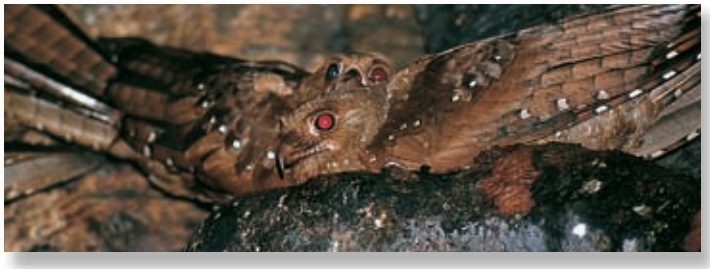
4 Struck oil
Swooping down, the oilbird hovers skillfully as it eats its fill, picking off the oily fruit of a palm tree with its sharply hooked bill.

BEHAVIOR

The oilbird is highly social; a large cave may have hundreds of roosting birds. Despite the numbers, the cave is often eerily quiet by day. If a roost is disturbed by an intruder, the silence is shattered by loud, shrieking, alarm calls.

The oilbird navigates its cave using *echolocation*, a kind of sonar similar to, but cruder than, a bat's. Producing clicking sounds as it flies, the returning echoes build up a picture of the surroundings. These sonar clicks are of a lower frequency than those of bats and are audible to humans.

When flying at night, the oilbird relies entirely on its large, light-sensitive eyes to find its way. Its flight above the trees is light, swift and undulating.



▶ **HEAD TO HEAD**
Oilbirds are social birds that pair for life. They often preen each other's head to strengthen bonds.

▶ **THE EYES HAVE IT**
Outside its cave, the oilbird relies on keen vision.

BREEDING

In the seasonless tropics, oilbirds breed year-round. Pairs mate for life and use the same nest every year to raise their young. Two to four eggs are laid, and both parents incubate them for 32–35 days.

Young are fed on a diet of fruit regurgitated by their parents three to four times a night. This diet quickly makes the chicks fat, so that by 70 days, when feathers first appear, they weigh about half as much as their parents. As they master the art of flying in the darkness of their cave, the young birds steadily lose weight. Young are fledged by the time they are 90–120 days old.

▼ **NATURAL BIRTHPLACE**
Nests are made from regurgitated food and droppings.

CONSERVATION

Not yet endangered, the oilbird is in decline due to ongoing destruction of its tropical forest habitat — and this poses a serious threat to the bird's future. Although the tradition of collecting nestlings for oil production is less common today, it persists in remote areas where protection is difficult to enforce.

PROFILE OILBIRD

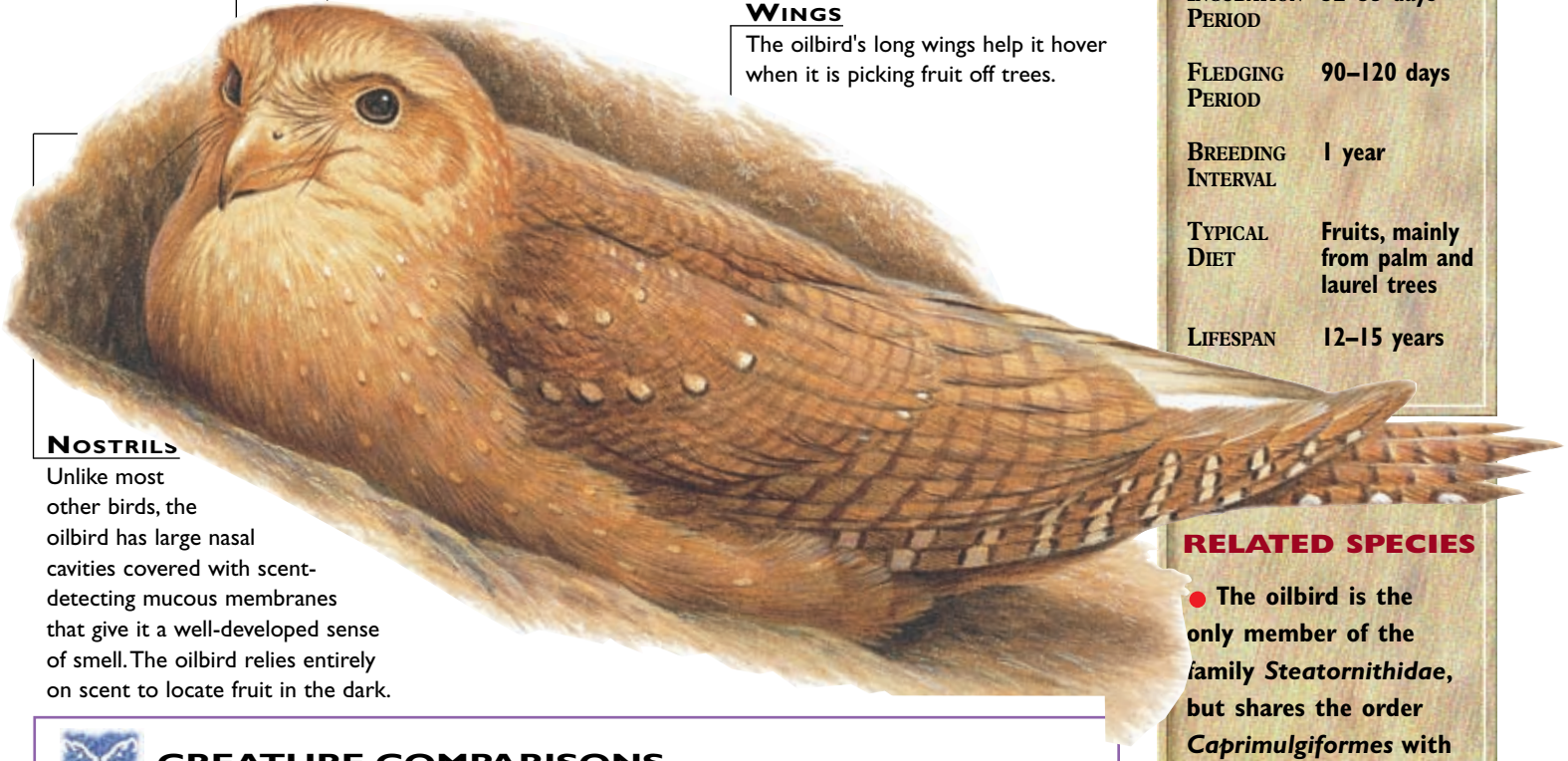
Supertuned senses of hearing, sight and smell help the oilbird find aromatic fruit in the forest at night and locate its nest deep in a cave.

EARS
Acute hearing analyzes the pulses of sound that it sends out when navigating the pitch blackness of its roosting cave.

EYES
Large, light-sensitive eyes give good vision in low light, enabling the oilbird to fly safely through the forest at night in search of food.

BILL
The eaglelike hooked upper mandible is adapted to plucking fruit from trees rather than tearing flesh. The stiff feathers around the bill provide the oilbird with a sense of touch.

WINGS
The oilbird's long wings help it hover when it is picking fruit off trees.



NOSTRILS
Unlike most other birds, the oilbird has large nasal cavities covered with scent-detecting mucous membranes that give it a well-developed sense of smell. The oilbird relies entirely on scent to locate fruit in the dark.

VITAL STATISTICS

WEIGHT	13–17 oz.
LENGTH	1.5'
WINGSPAN	3–4'
SEXUAL MATURITY	1 year
BREEDING SEASON	Year-round; a peak from December–June
NUMBER OF EGGS	2–4
INCUBATION PERIOD	32–35 days
FLEDGING PERIOD	90–120 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Fruits, mainly from palm and laurel trees
LIFESPAN	12–15 years

RELATED SPECIES

- The oilbird is the only member of the family *Steatornithidae*, but shares the order *Caprimulgiformes* with nocturnal birds, including frogmouths of Southeast Asia and Australia, poto-os of the West Indies and South and Central America, frogmouths of Australia and Papua New Guinea and the several nightjar species of Eurasia and North America.

CREATURE COMPARISONS

Despite being half the size of the oilbird, the Eurasian nightjar, *Caprimulgus europaeus*, shares the same body shape and long, sickle-shaped wings. Both feed at night. The oilbird spends its days in a deep cave; the nightjar relies on its camouflage and perches, branchlike, along a tree limb. The hook-billed oilbird feeds on fruit, but the nightjar opens its tiny bill wide to catch moths and other insects on the wing, aided by stiff feathers that help funnel prey into its mouth. Both birds are strong, agile fliers, but while the oilbird can find food in its tropical habitat year-round, the nightjar flies south to Africa when the weather cools and insect prey disappear.

Eurasian nightjar

Oilbird

Osprey

• ORDER •
Accipitriformes

• FAMILY •
Pandionidae

• GENUS & SPECIES •
Pandion haliaetus

KEY FEATURES

- Remarkably powerful for its size, it can seize and fly off with prey almost as heavy as itself
- Spiny-soled feet, tipped with razor-sharp talons, enable it to grip the most slippery of prey
- Most widespread of all birds of prey, occurring on every continent except Antarctica

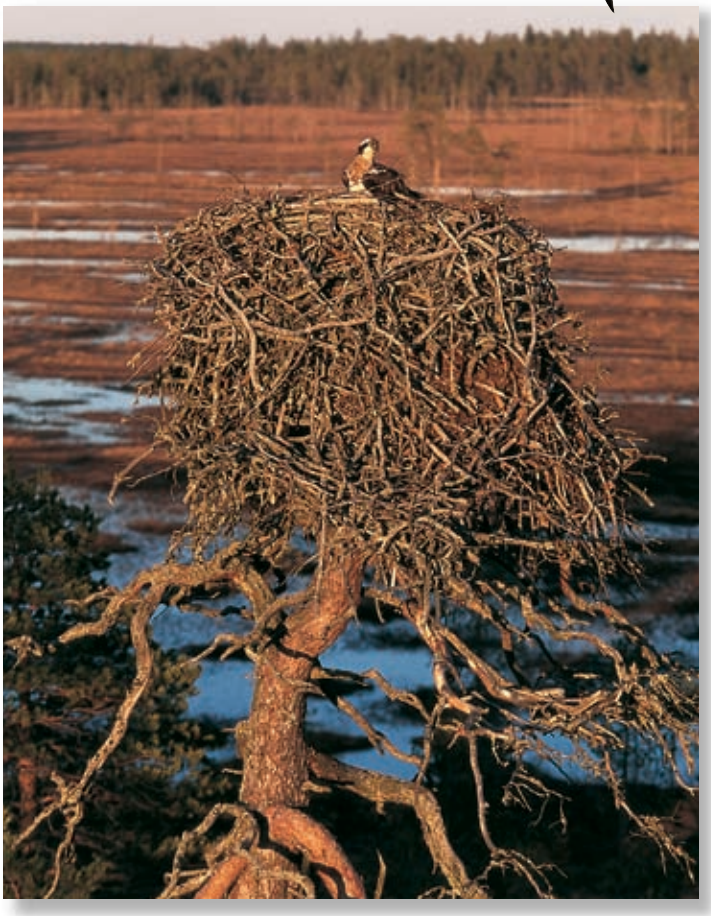
WHERE IN THE WORLD?

Breeds throughout much of Europe and Asia, North America, Southeast Asia and Australasia; winters in South America, Africa and India

LIFECYCLE

The osprey, also known as the fish hawk, is an adaptable, eagle-sized bird that preys almost exclusively on fish in nearly every fresh- and saltwater habitat in the world.

HABITAT



▲ **WATERSIDE BIRD**
The osprey exploits any habitat where it can fish.

The osprey's range is limited only by the availability of its specialized diet. It can live wherever it has year-round access to clear, unpolluted waters — salty or fresh — that contain plentiful supplies of small- to medium-sized surface-feeding fish.

Favored saltwater habitats include rocky, sandy or forested coastlines, remote oceanic islands, salt marshes and tropical mangrove swamps. Inland, it's found near lakes, rivers and marshes. In all habitats, the osprey seeks tall trees to perch and nest in, but will also use electricity poles, harbor buoys, bridges and abandoned buildings.

FOOD & HUNTING

BEHAVIOR

The osprey flourishes in a wide range of climates, but northern populations migrate south in winter as waters become cold or frozen, driving fish to greater depths. Individual ospreys migrate singly, but often in the company of other birds of prey, such as red-tailed hawks and kestrels. At this time, loose colonies of as many as 30 birds sometimes gather on estuaries or along rich stretches of coastline.

▲ **SITTING PRETTY**
Between dives, the osprey dries, preening its feathers.

The osprey devotes much time to keeping its plumage in good condition, removing any sticky fish scales and reapplying oil from the preen gland above its tail to keep its feathers waterproofed.

CONSERVATION

Although still widespread and numerous, many populations of osprey are declining due to pollution and overfishing. A large number of ospreys are also shot each year on migration.

When hunting, the osprey patrols up and down a stretch of water, flying with deep, relaxed wingbeats as it searches for a fish below. It may hover clumsily over the same spot before closing its wings and plunging for the kill.

It feeds on fish, including trout, salmon and carp from fish farms and stocked lakes, but also takes carrion, small birds and mammals.

◀ SHARP IMPLEMENT
Once a fish is caught, the osprey returns to a perch and rips it apart with its bill.

DID YOU KNOW?

- **Sparrows occasionally make their homes within the sprawling osprey's nest.**
- **The osprey has such large feet that sometimes it can snatch two small fish from the water in a single dive.**
- **Less than half of an osprey's dives capture a fish. Strong winds and murky water can affect the accuracy of its strike and reduce its success.**

PERFECT TIMING

1 Search...
Flapping slowly 65–100' above a lake, its wings held in a M-shape, an osprey searches the water for prey.

2 Stoop...
Spotting a fish below the water's surface, the bird draws in its wings and plunges at a 45° angle.

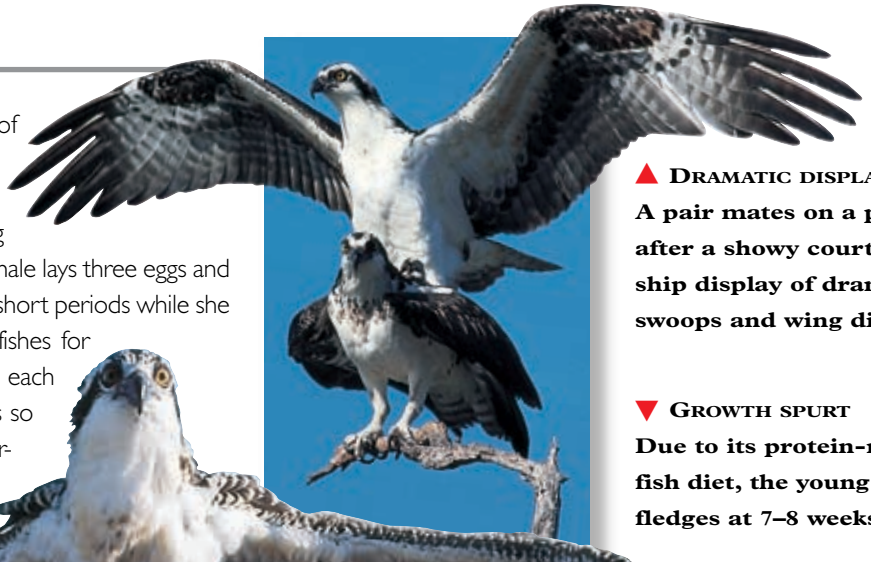
3 Snatch...
Judging its final attack with superb accuracy, the osprey dives feetfirst to snatch the fish from the water.

4 Success
Struggling into the air with its load, the bird shakes water from its wings and flies to its perch.

BREEDING

Breeding seasons depend on the latitude of the osprey's nest site: January in subtropical regions; May and June in northern areas.

Ospreys mate for life, each pair refurbishing the same substantial nest year after year. The female lays three eggs and incubates them alone; the male relieves her for short periods while she hunts. Once the first chick hatches, the male fishes for the family, bringing up to seven fish to the nest each day. Before delivering them, he eats their heads so the fish can't damage eggs or young by flounder-ing around. After six weeks, the female helps the male feed the chicks until they fledge.



▲ DRAMATIC DISPLAYS
A pair mates on a perch after a showy court-ship display of dramatic swoops and wing displays.

▼ GROWTH SPURT
Due to its protein-rich fish diet, the young osprey fledges at 7–8 weeks.

PROFILE OSPREY

Sharp eyes, narrow wings and dexterous, powerfully taloned feet equip the osprey to find, capture and kill the fish on which it feeds.

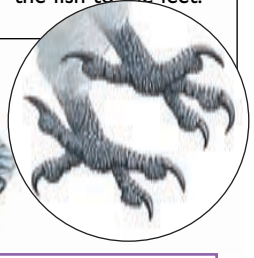
FEMALE
Larger than the male, the female also has a more prominent band of brown feathers across the breast.

BILL
Sharply hooked for piercing and ripping open the tough and scaly skin of fish.

PLUMAGE
Denser and more oily than the plumage of most birds of prey, the osprey's feathers shrug off water with ease.

WINGS
For a bird of prey with such a wide wingspan, the wings are unusually narrow. But wider wings would trap too much water in the feathers, making it harder for the osprey to get airborne after a dive to catch prey.

FEET
Outer toe on each foot rotates backward to help the bird grasp prey firmly. Spiny soles help hook the fish to the feet.



LEGS
Long legs increase the bird's reach, enabling it to catch fish without submerging its body in the water.

VITAL STATISTICS

WEIGHT	Male 3 lbs.; female 3.5 lbs.
LENGTH	About 2' for both sexes
WINGSPAN	5'
SEXUAL MATURITY	3 years
BREEDING SEASON	Varies with range
NUMBER OF EGGS	2–5; usually 3
INCUBATION PERIOD	34–40 days
FLEDGING PERIOD	49–57 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Almost entirely freshwater and marine fish
LIFESPAN	5–15 years

CREATURE COMPARISONS

Larger than the osprey, with a wingspan of 6–8' and up to 7 lbs., the African fish eagle (*Haliaeetus vocifer*) is also an accomplished predator. Having spotted a flash of silver from its waterside perch, the eagle flies over the water and deftly snatches its victim with a single foot, barely missing a wingbeat as it does. Only when catching very large fish does the eagle partly submerge itself. Where its range overlaps with the osprey's, the eagle isn't above a little aerial piracy and will often bully its smaller relative into giving up its catch.

African fish eagle

Osprey

RELATED SPECIES

● **The unique structure of the osprey's feet led to it being classified in its own family: *Pandionidae*. In the 220 species of *Accipitriformes*, there are several fish eaters, including the African fish eagle, *Haliaeetus vocifer*** (below).

Ostrich

• ORDER •
Struthioniformes

• FAMILY •
Struthionidae

• GENUS & SPECIES •
Struthio camelus

KEY FEATURES

- Lives on open plains where its "watchtower" vision helps it spot predators; its group-based lifestyle also gives the protection essential for exposed plains dwellers
- Gapes its bill and spreads its wings to dissipate body heat
- Gleans all of its water needs from plant food — except during the driest months

WHERE IN THE WORLD?

In a strip across Africa between 10° and 20° north of the equator — East Africa south down the Rift Valley to Tanzania; also inhabits South Africa, Namibia, southern Angola and Botswana

LIFECYCLE

The ostrich may be flightless, but it can run extremely fast — which is how this huge, nomadic bird escapes from predators as it roams the open grasslands in search of food.

HABITAT

▲ **WALK TALL**
The ostrich's great height suits it to plains life.

The ostrich lives on the short-grass savannahs of Africa and in semidesert regions. It wanders far in search of food, moving to desert areas when vegetation springs up after seasonal rains.

The ostrich avoids long grass, where predators may lie in wait and shuns thick woodland for the same reason. It favors undulating land, which allows it to feed inconspicuously and where it can run away at the first sign of danger. Any areas where humans have altered the landscape in any way are avoided.

CONSERVATION

Traditionally, the ostrich was hunted for meat, eggs and hide, as well as feathers. A more recent demand for its meat has prompted growth in commercial farming; this has relieved hunting pressure on wild birds, whose status is stable. Today, the ostrich has to compete with domestic grazing stock on its native grasslands, but it prospers in reserves. Attempts are being made to reestablish it in its former range.

BREEDING

The male performs a courtship dance in front of a female and prepares several nests for her. After mating, the female selects a nest and lays her first egg, which is 6" long. As the first to be mated, she becomes the dominant female of the group. She lays an egg every two days, to a total of up to 11 eggs.

The male also mates with several other females. They all lay clutches in the same nest; there may be 20 to 30 eggs when the dominant female is ready to begin her 42- to 46-day incubation. If there are too many eggs to brood, the female rolls a few from the nest. The whole clutch may hatch in one or two days. Chicks are first guarded by both the male and female but later join other broods to form a crêche, reaching full size in 18 months.

COURTING COUPLES

1 Let courtship begin…
The male approaches the female with straight neck, erect, fluffed tail and drooping wings.

2 Swooning and swaying…
When close, he drops down with wings outspread. He sways his neck, while raising his wings alternately.

BEHAVIOR

The ostrich normally lives in small groups (five to ten birds), although larger flocks assemble around water in the dry season or where food is abundant.

▶ **ALL TOGETHER NOW…**
Large flocks gather around water in the dry season, but spend most of their time in smaller family groups.

Groups stride across the short grass plains, frequently picking food from the ground. When not feeding, the ostrich spends its time resting, dust bathing and preening.

With its excellent hearing and height, the ostrich is often the first animal on the plains to spot a predator; its fleeing flocks often alert other animals to danger. The ostrich can reach speeds of 39 mph and outpaces most enemies. Rarely, it kicks powerfully in self-defense.

3 Back beat...
As the display gets frenzied, his neck writhes violently and his head thumps on his broad back.

4 Check mate
When the female is ready, they walk together. She lies down and the male mounts her.

FOOD & FEEDING

The ostrich feeds in a small group, stooping for plant material (mainly herbs, grasses, seeds and flowers) and occasionally insects and small lizards. It swallows several items together, which can be seen travelling down the neck as a small lump or *bolus*.

In dry areas, the ostrich browses on succulent plants, which may provide all its water needs, although it will drink regularly when water is available. It also swallows small stones and grit to help break down and digest plant matter. In captivity, an ostrich may swallow all manner of strange objects as substitutes for this digestive grit: one zoo bird met an untimely end after attempting to digest a 3' length of rope.

▼ DRINK UP!
Ostriches are especially on guard for predators at waterholes.

DID YOU KNOW?

- **When threatened, an incubating ostrich will lay her neck and head flat on the ground. This may have given rise to the legend that a threatened ostrich buries its head in the sand.**
- **A man weighing 250 lbs. can stand on an ostrich egg without breaking it.**
- **Egyptian vultures have been seen cracking open ostrich eggs by dropping large stones on them.**

PROFILE OSTRICH

The ostrich's powerful legs equip it to roam the open plains with ease, while other special features help it cope with the relentless heat and dust.

BILL

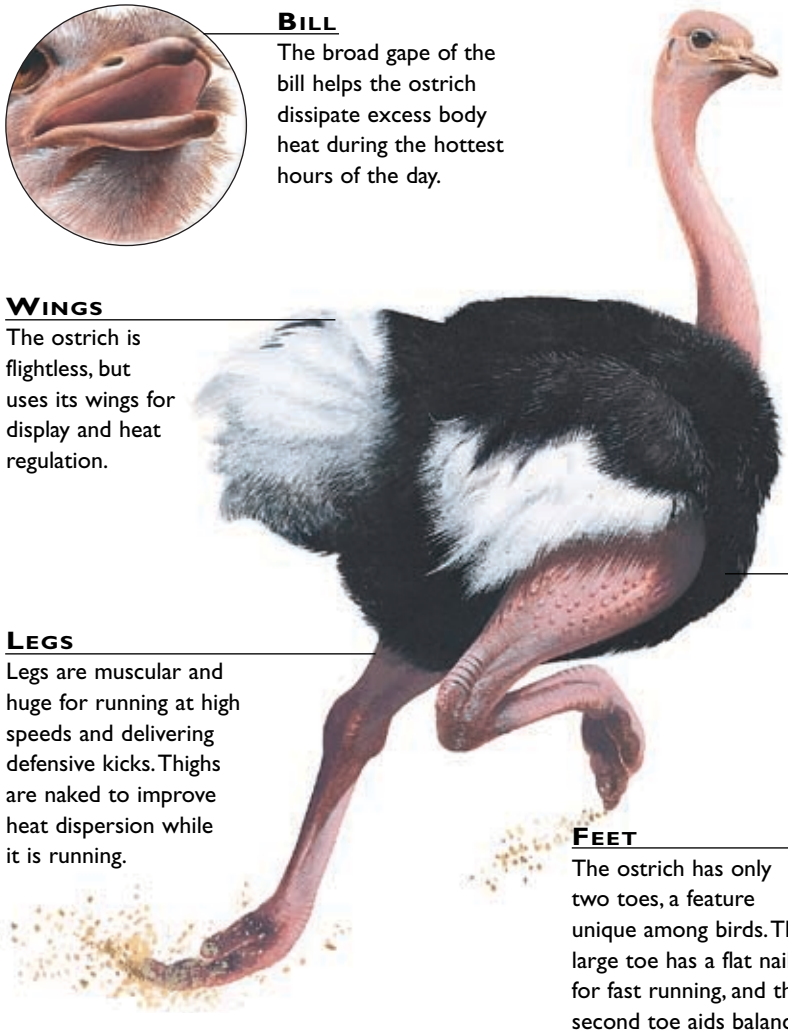
The broad gape of the bill helps the ostrich dissipate excess body heat during the hottest hours of the day.

EYES

Huge eyes scan the savannah for danger. Long lashes protect eyes from dust storms or debris kicked up while running.

WINGS

The ostrich is flightless, but uses its wings for display and heat regulation.



STERNUM

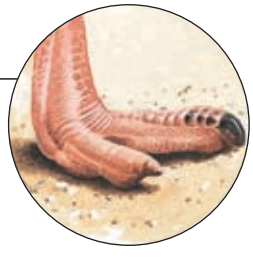
The flattened sternum (breastbone) lacks a keel, which serves as an anchor for flight muscles in other bird species.

LEGS

Legs are muscular and huge for running at high speeds and delivering defensive kicks. Thighs are naked to improve heat dispersion while it is running.

FEET

The ostrich has only two toes, a feature unique among birds. The large toe has a flat nail for fast running, and the second toe aids balance.

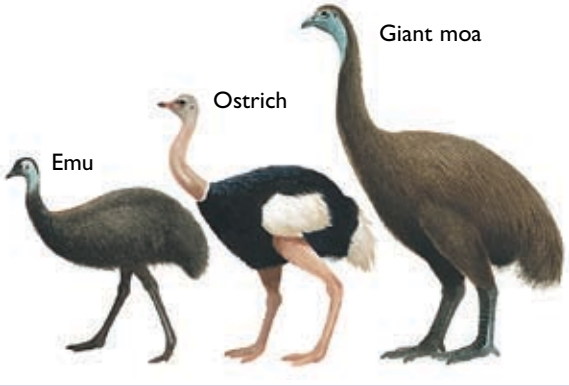


VITAL STATISTICS

WEIGHT	Female about 249 lbs.; male up to 339 lbs.
HEIGHT	6–8'
SEXUAL MATURITY	Female 2 years; male 3–4 years
MATING SEASON	Variable, often dependent on local climatic conditions
NUMBER OF EGGS	Each female lays 5–11 eggs
INCUBATION PERIOD	42–46 days
BREEDING INTERVAL	Unknown
TYPICAL DIET	Mostly plant material; some invertebrates
LIFESPAN	Up to 40 years

CREATURE COMPARISONS

At up to 8' tall, the male ostrich is the largest living bird. Its flightless relative, the Australian emu, stands almost 6' tall. Forest-dwelling birds called moas, which were even taller and heavier than ostriches, roamed New Zealand as recently as 300 years ago. Of the 12 moa species, the largest was the giant moa, which stood 10' tall or more.



RELATED SPECIES

● **The ostrich is the only member of the family *Struthionidae*. Other flightless birds around the world are the rheas of South America, the kiwis of New Zealand and the cassowaries** (below) **and emus of Australia.**

OVENBIRD

• ORDER •
Passeriformes

• FAMILY •
Parulidae

• GENUS & SPECIES •
Seiurus aurocapillus

KEY FEATURES

- Easily identified by its unusual walking gait and carriage; its tail tilts upward and wings droop slightly
- Takes its name from the shape of its nest, which looks like an old-fashioned Dutch oven
- To lure predators away from its nest, the female ovenbird will flutter away with wings and tail dragging as if mortally wounded

WHERE IN THE WORLD?

Found across North America, north to Newfoundland and Alaska; west to the Rockies; south to the West Indies and Bahamas; abundant in Florida, South Carolina and Louisiana

LIFECYCLE

The ovenbird stays close to the forest floor where it finds food and keeps its unusual oven-shaped nest well hidden among the beds of fallen leaves.

HABITAT

The ovenbird frequents forests where its natural camouflage blends in best. Deciduous and mixed forests both suit the ovenbird, which breeds in the Canadian northwoods and in the northeastern U.S. During fall and winter, the ovenbird migrates to Mexico, Central America and as far south as Venezuela, but it is frequently spotted in winter in the far southern reaches of the U.S.

▲ **SERENE SCENE**
The ovenbird prefers forests with lots of shade and leaf litter.

FOOD & FEEDING

The ovenbird forages most of the day on the forest floor. It deliberately strides, with its high-stepping gait, across leaf litter and logs as it searches for tidbits. Throughout the day, the ovenbird is safely camouflaged in the cover of fallen leaves. The ovenbird turns over dead leaves to glean snails, earthworms, spiders and, on occasion, uncovers a small lizard or frog. In the fall and winter, it relies on fruit and other vegetation, since insects are scarce. The ovenbird's bill opens seeds with ease. The ovenbird also consumes grit, used in the bird's gizzard to help grind up food. The bird picks very little prey from live vegetation, but it occasionally will alight in trees to feast on tree snails or hatches of budworms found in spruce trees. The normally reclusive ovenbirds have even been seen at Everglades National Park feeding on table scraps left over from tourists.

▼ **GOBS OF GRUBS**
The inquisitive ovenbird leaves no leaf unturned and uncovers a mouthful of larval grubs.

DID YOU KNOW?

- **Female ovenbirds are so reluctant to leave their ground nest containing young that they end up getting stepped on rather than fleeing.**
- **During a 48-hour period, a noisy ovenbird sang 215 times, more than once every 13 minutes, day and night.**
- **The genus name, *Seirus*, comes from the Greek "seio," to move, and "oura," meaning tail. The species name, *aurocapillus*, comes from the Latin words, "*aurum*" and "*capillus*," meaning gold hair, referring to the ovenbird's golden-orange crown.**

CONSERVATION

Ovenbird populations have been in decline for more than two decades, mainly due to habitat loss. The bird can be almost absent in tracts of 250–2,000 acres. Radio towers and skyscrapers take a toll on migrating flocks.

BEHAVIOR

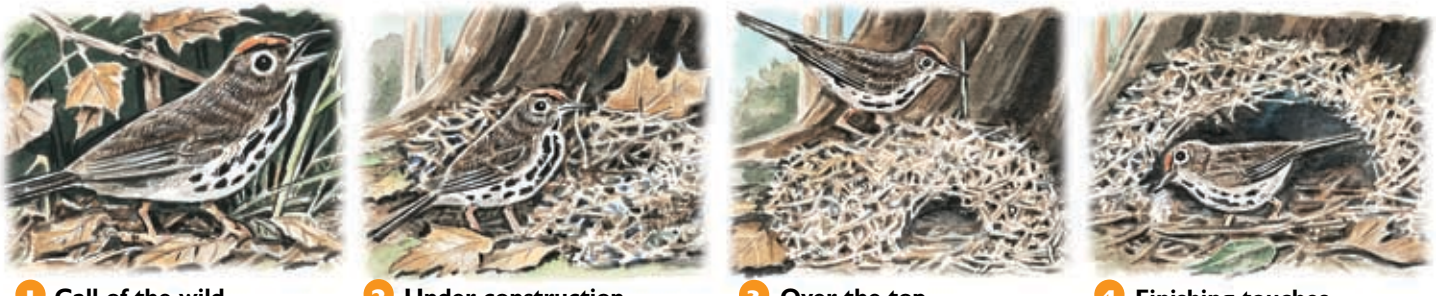
The call of the ovenbird, *tea-cher, tea-cher, tea-cher,* is a familiar sound during spring in the forests of the Northern U.S. and Canada. It also emits a warning *cheep* if it detects something approaching its nest. The ovenbird has a distinctive walk. With its tail up, wings drooped and head bobbing, it is easily distinguished from other warblers as it crosses the forest floor. Its coloring provides such effective camouflage that it can wait until the last moment to react to a threat. It migrates in flocks but is solitary outside the breeding season; some are permanent residents in the south.

SHADES OF BROWN
The bird's plumage blends with the forest floor.

BREEDING

In spring, the male ovenbird arrives at its breeding grounds about two weeks earlier than the female. Once she arrives, he puts on an impressive aerial display, on occasion flying 20' above her, circling and then making a downward flight. He then hops, struts and bows his head toward the female. If she accepts his attentions, they mate. The nest is made of leaves, stems, bits of moss and bark. Hidden on the ground, it's shaped like an old-fashioned Dutch oven (hence the bird's name) with a shallow dome over the top and an opening on the side. When the nesting female is approached she occasionally will act if she is hurt, fluttering away from the nest to attract attention to herself. The ovenbird lays 3–6 creamy-colored eggs with brown spots. It must beware of the cowbird, which pushes aside an ovenbird egg and lays one of its own as a replacement. When this happens, the ovenbird raises the chick as her own. The hungry nestlings are fed insects dozens of times per day and fledge in 8–11 days.

HOME SWEET DOME



1 Call of the wild...
An ovenbird male sings its familiar song from the safety of the forest floor.

2 Under construction...
A female ovenbird uses twigs and leaves to build her oven-shaped nest in the deep beds of leaf litter.

3 Over the top...
The female weaves the canopy covering the top of the nest, concealing it from predators.

4 Finishing touches
With the dome finished, the nest's lining is padded with plant stalks and even horse hair.

PROFILE OVENBIRD

The ovenbird's distinctive song echoes through the woodlands while its natural camouflage keeps it well hidden on the forest floor.

BILL
The short, strong and conical beak is a very efficient tool for opening the seeds that make up the bulk of the bird's diet.

FEET
With three toes pointing forward and one pointing backward, the ovenbird's foot is built for perching. Its grip automatically tightens if its weight shifts backward.

JUVENILE
The juvenile's olive-buff head will begin to show the adult's golden-orange hue within its first year. The bold, black spotting will align into neat rows as it matures.

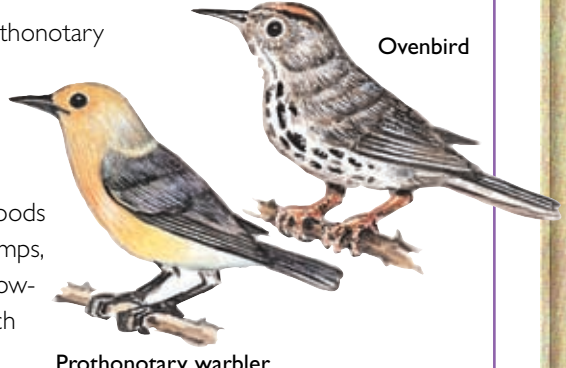
IN FLIGHT
The ovenbird spreads its wings and tail and flies 10–60' above the treetops to sing its song during the breeding season.

VITAL STATISTICS

WEIGHT	0.5–1 oz.
LENGTH	5.75"
WINGSPAN	9–11"
SEXUAL MATURITY	1 year
BREEDING SEASON	May–July
NUMBER OF EGGS	3–6, usually 4–5
INCUBATION PERIOD	11–14 days
FLEDGING PERIOD	8–11 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Seeds, snails, earthworms, insects, spiders, fruit, lizards and frogs
LIFESPAN	8 years

CREATURE COMPARISONS

Unlike most warblers, including the ovenbird, the Prothonotary warbler (*Protonotaria citrea*) is a cavity nester that makes its home in tree holes or other similar cavities. The Prothonotary warbler is also known as the golden swamp warbler because of its brilliant coloration and preference for damp, dark lowland woods as nesting sites. This warbler also favors wooded swamps, flooded bottomland forests and areas surrounding slow-moving water, in sharp contrast to the ovenbird, which nests mainly in dry, grassy areas.



RELATED SPECIES

● **The ovenbird is one of only three species in the genus *Seiurus*. The northern waterthrush, *S. noveboracensis*, has a similar gait to the ovenbird, but prefers streams and pools. The Louisiana waterthrush, *S. motacilla*, also tends to live near streams. The order *Passeriformes* includes 46 families of perching birds, such as broadbills, larks, warblers and honeyeaters.**

Oxpeckers

• ORDER •
Passeriformes

• FAMILY •
Sturnidae

• GENUS & SPECIES •
Buphagus erythrorhynchus, B. africanus

KEY FEATURES

- Make a living by feeding on the parasitic insects that infest big game and cattle
- Hitch a ride on their hosts, snapping up prey with a scissorlike bill
- Tolerated by their hosts because they perform a valuable service
- Nest cooperatively, with each breeding pair being supported by up to 3 to 4 individuals

WHERE IN THE WORLD?

Found from Sudan and Ethiopia in East Africa, across to the western coast of the continent, and south through Kenya, Uganda and Tanzania to South Africa

LIFECYCLE

Despite their name, oxpeckers do not limit their cleaning services to oxen. They can be found on many African mammals, nipping away at the parasites that infest their skins.

HABITAT

Oxpeckers are birds of the African savannah, where open, grassy plains are interspersed with light woodland and scattered shrubs. Their dependence on game animals means that they are common only in protected parks and reserves, where large herds live.

Because they nest in tree cavities, oxpeckers tend to be found in slightly wetter areas of savannah, where larger trees occur. As well as obtaining food from their host, oxpeckers drink from the same waterhole and simply fly down from the animal to the water, and back again once they have quenched their thirst.

▲ **MIDDAY AT THE OASIS**
The oxpecker frequents waterholes on savannah.

CONSERVATION

Where game herds are numerous, the oxpecker is not under threat. It is declining in areas where farmers remove ticks from livestock with chemicals.

FOOD & FEEDING

BREEDING

The oxpecker is a cooperative breeder. Each pair is assisted by up to four nonbreeding birds, which are usually offspring from previous broods. Breeding pairs mate on the ground or on the back of their mammal host.

The pair normally places its nest high in a tree hole, but it may also nest under the eaves of buildings or in thatched roofs, rock cavities and embankments. The nest is an untidy, cup-shaped pad of grass and straw, lined with animal hair plucked from a host, and set on a foundation of dried dung.

The oxpecker usually lays 2–3 eggs, although clutches of one or even five have been recorded. The pair shares the incubating duties during the day, but only the female incubates at night. After two weeks the eggs hatch, and the chicks emerge thinly covered in down. Both parents care for the young, and helpers assist in feeding the brood. The chicks leave the nest after about four weeks, but are fed by their helpers and parents for three more months.

► **FAMILY OUTING**
Dark juveniles may feed with adults.

The key to the oxpecker's feeding technique is its ability to hitch a ride on the backs of large grazing mammals. The oxpecker visits a wide range of hosts, including the rhinoceros, buffalo, giraffe, zebra and hippopotamus, as well as large antelope species.

Ticks and other blood-sucking parasites make up nearly all of the oxpecker's diet; ticks that are bloated with fresh blood provide the most nutrition. The oxpecker occasionally nibbles around the edges of old wounds, feeding on bits of loose skin, scar tissue and freshly flowing blood. It sometimes hunts on the wing, but is much less adept at this method of feeding.

DID YOU KNOW?

- **Oxpeckers may act as sentinels, giving their host early warning of approaching predators.**
- **Oxpeckers are also known as tickbirds.**
- **Elephants, waterbuck and hartebeest do not tolerate oxpeckers.**
- **Like other members of the starling family, oxpeckers have a range of calls, including shrill whistles and harsh chattering sounds.**
- **The red-billed oxpecker is absent from the western parts of the genus's range.**

A MOVABLE FEAST

1 Time to eat...
A flock of hungry oxpeckers heads out over the savannah in search of mammals that are in need of its pest-removing services.

2 Mane course...
Clambering about a giraffe's head, an oxpecker carefully probes the coat, looking for ticks and bloodsucking flies.

3 Necking...
Turning its bill sideways, flat against the animal, the oxpecker uses a scissorlike action to cut a tick free, before swallowing it whole.

4 The perfect host
Ticks are found even on the nostrils, ears and eyelids. Buffalo tolerate the oxpecker in these rather sensitive areas.

BEHAVIOR

During the day, the oxpecker travels in small groups, frequently uttering a sharp, hissing call as it flies about between the animals in a herd. At night, the oxpecker returns to a communal roost in a tree or a stand of reeds in a marsh. Sometimes a small party spends the night on its host's back, perhaps to keep warm during cool weather.

The distribution of the two species depends on their hosts. Both the red-billed and yellow-billed species favor less densely furred animals. Where they occur in the same area, the yellow-billed oxpecker seems to have first choice and is usually the species to be seen on sparsely haired mammals.

▼ **BACKPACKING**
Oxpeckers groom browsers such as kudu.

PROFILE OXPECKERS

Sharing the powerful feet and stiff, proplike tail of woodpeckers, oxpeckers can keep a secure grip on animals as they walk along.

BILL

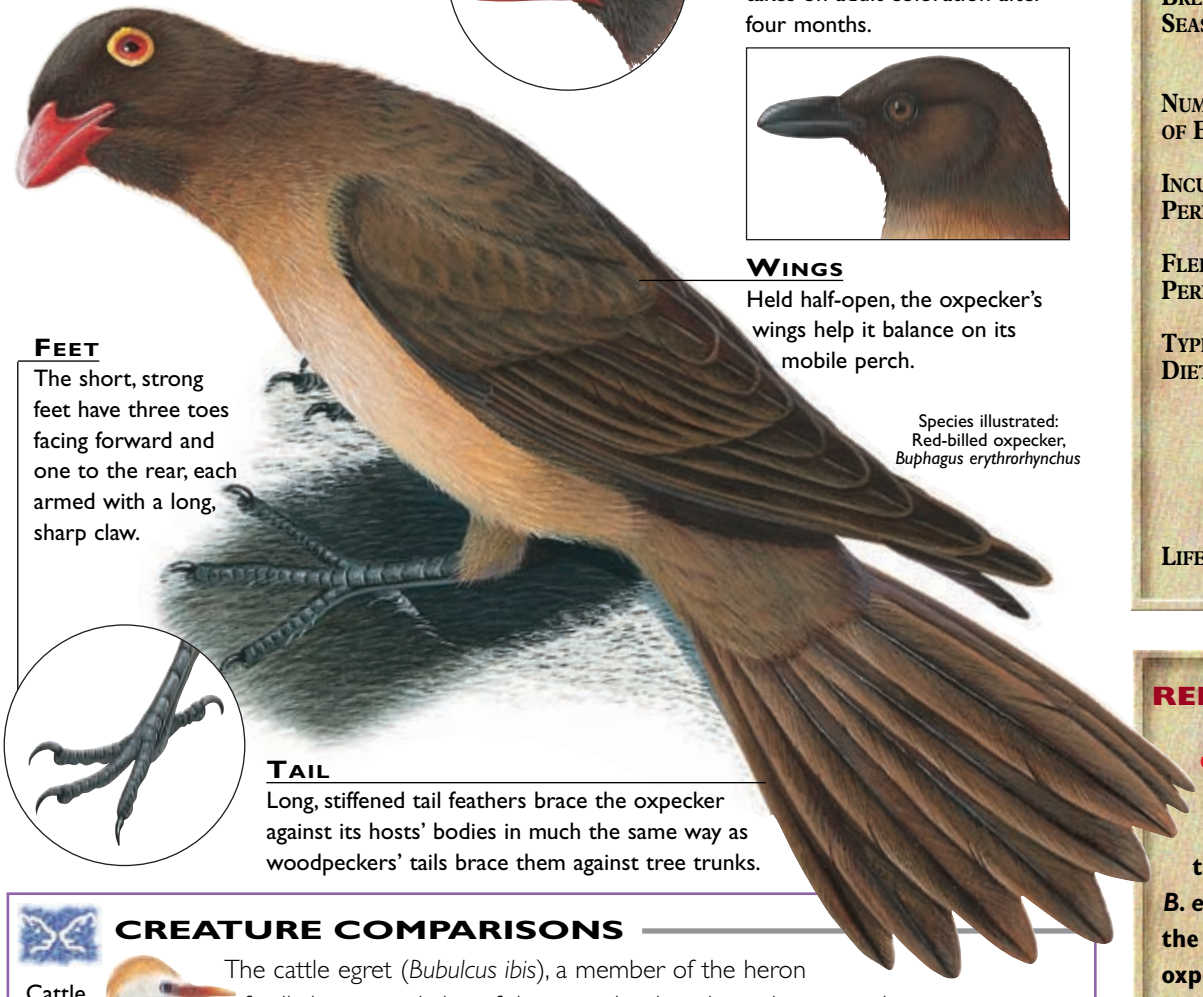
The stout bill is flattened on both sides. The oxpecker uses its bill to work through the fur of its host. The yellow-billed oxpecker has a yellow base on its bill.

JUVENILE

A young oxpecker is darker brown than its parents. Its bill is dark olive at first, but gradually takes on adult coloration after four months.

WINGS

Held half-open, the oxpecker's wings help it balance on its mobile perch.



Species illustrated: Red-billed oxpecker, *Buphagus erythrorhynchus*

FEET

The short, strong feet have three toes facing forward and one to the rear, each armed with a long, sharp claw.

TAIL

Long, stiffened tail feathers brace the oxpecker against its hosts' bodies in much the same way as woodpeckers' tails brace them against tree trunks.

VITAL STATISTICS

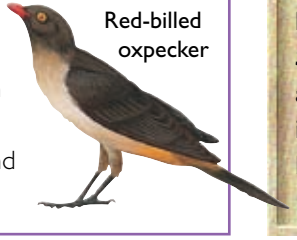
WEIGHT	1.75 oz.
LENGTH	8–9"
WINGSPAN	12"
SEXUAL MATURITY	1 year
BREEDING SEASON	Wet season: September–February
NUMBER OF EGGS	1–5, usually 2 or 3
INCUBATION PERIOD	12–14 days
FLEDGING PERIOD	26–30 days
TYPICAL DIET	Mainly ticks, bloodsucking flies and lice; some loose skin and blood from open wounds
LIFESPAN	Unknown

CREATURE COMPARISONS

Cattle egret

The cattle egret (*Bubulcus ibis*), a member of the heron family, is not a relative of the oxpecker but shares its savannah habitat. The two birds are often found alongside each other, associating with large grazing animals. However, the egret does not get its food directly off the animals' bodies. Instead, it walks alongside them snapping up grasshoppers, locusts and beetles flushed from the vegetation as the heavy grazers wander over the grassland. Unlike the oxpecker, the egret is an uninvited guest and gives nothing back to the grazers in return for its meals. Standing about 20" tall, the egret is much bigger than the oxpecker. Long legs enable it to walk quickly near feeding herds, and large feet offer stability.

Red-billed oxpecker



RELATED SPECIES

- **There are 2 species of oxpecker in the genus *Buphagus*: thered-billed oxpecker, *B. erythrorhynchus*, and the yellow-billed oxpecker, *B. africanus*. They are confined to sub-Saharan Africa, but the red-billed species is less common. Oxpeckers belong to the family *Sturnidae*, which contains about 105 other species, including the introduced European starling.**

Painted Bunting

• ORDER •
Passeriformes

• FAMILY •
Emberizidae

• GENUS & SPECIES •
Passerina ciris

KEY FEATURES

- Only the male sports the striking blue head and red underparts
- The male's song advertises his presence to adversaries and potential mating partners
- Fiercely territorial, the painted bunting will engage in midair fights to protect its space

WHERE IN THE WORLD?

Found in the southern U.S. and south into Mexico and Cuba; winters from the Gulf of Mexico area to Central America

LIFECYCLE

The beautiful painted bunting rarely emerges from the deep plant cover it prefers; when it is visible, it is often fighting for territory with another bunting.

HABITAT

Within its range in North and Central America, the painted bunting frequents woodland edges where food and water are plentiful. It can also be found in thickets beside streams, gardens and roads. This highly territorial bird values its privacy and prefers to remain close to the protective cover of vegetation.

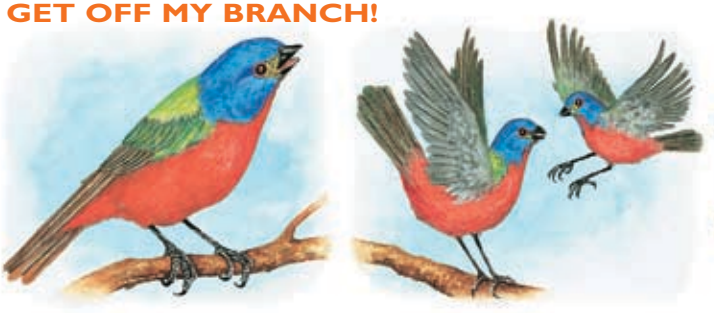
▲ **PRIVATE PERCH**
The shy painted bunting prefers to perch in trees or shrubs well hidden in thickets of vegetation.

◀ **BRANCH BEAUTY**
Bursting with glorious color, a perched female painted bunting decorates a tropical tree branch.

BEHAVIOR

Practically the only time the normally shy painted bunting is visible is during its particularly fierce territorial battles. Males will protect their territories from intruding males through vicious fights, which can begin in the air and eventually end up on the ground. A bunting may also warn intruders with a threat posture, standing erect with its tail and head held high, forming its distinctive blue head feathers into a small crest. Once a bird is victorious, he sings to advertise his dominance and proclaim the territory as his own. After the breeding season, adult and young birds gather in loose flocks and fly south to warmer climates.

GET OFF MY BRANCH!



1 Warning…
The male painted bunting perches in a branch high in a tree, singing his warning call as he holds his head erect with the bill open.

2 Serious posturing…
The highly territorial male stands up in a threatening posture, holding both his head and tail high as an intruding male flies nearby.

BREEDING

The male painted bunting arrives north first and establishes a well-defined territory, often occupying the same breeding area as the year before. Males perch at-prominent points and sing to establish territories. After chasing away potential suitors, the male sings a courtship song from his perch until a willing female appears. He then dives and chases her through the vegetation with such zeal that the pair sometimes ends up on the ground. After mating, the birds build a cup-shaped nest made of grasses, stalks and leaves in a bush or low tree, or in hanging Spanish moss about 25' off the ground. The male dutifully feeds the female as she incubates the clutch of 3–5 pale-blue eggs for about 12 days. After the young nestlings hatch, both parents feed the chicks until the fledglings leave the nest, about two weeks later. Adults may raise up to four broods each breeding season.

▶ **TWO'S COMPANY…**
Two bunting nestlings wait for their tardy sibling to hatch from its egg.

3 Intruder alert...
The intruding male swoops down and prepares to peck at the male on his perch; the other moves out of the way to avoid the attack.

4 Fierce battle
The males twist and turn, feet locked, as they peck at each other with their sharp beaks; they may tumble toward the ground.

CONSERVATION

Although considered common by the National Audubon Society, the bunting is threatened by the loss of its breeding habitat due to the development of swampy thickets and woodland edges. In addition, hundreds of the birds are captured in their tropical wintering grounds each year for the pet trade.

FOOD & FEEDING

Both in the trees and on the ground, the painted bunting feeds on a variety of seeds, which comprise the majority of its diet. The bird's stout, conical bill is well suited for crushing and husking seeds that are found scattered on the woodland floor. It also eats many insects, including caterpillars and flies. The painted bunting will forage most of the day and may also pluck various insects from the trees and surrounding bushes and shrubs to eat or to feed its nestlings.

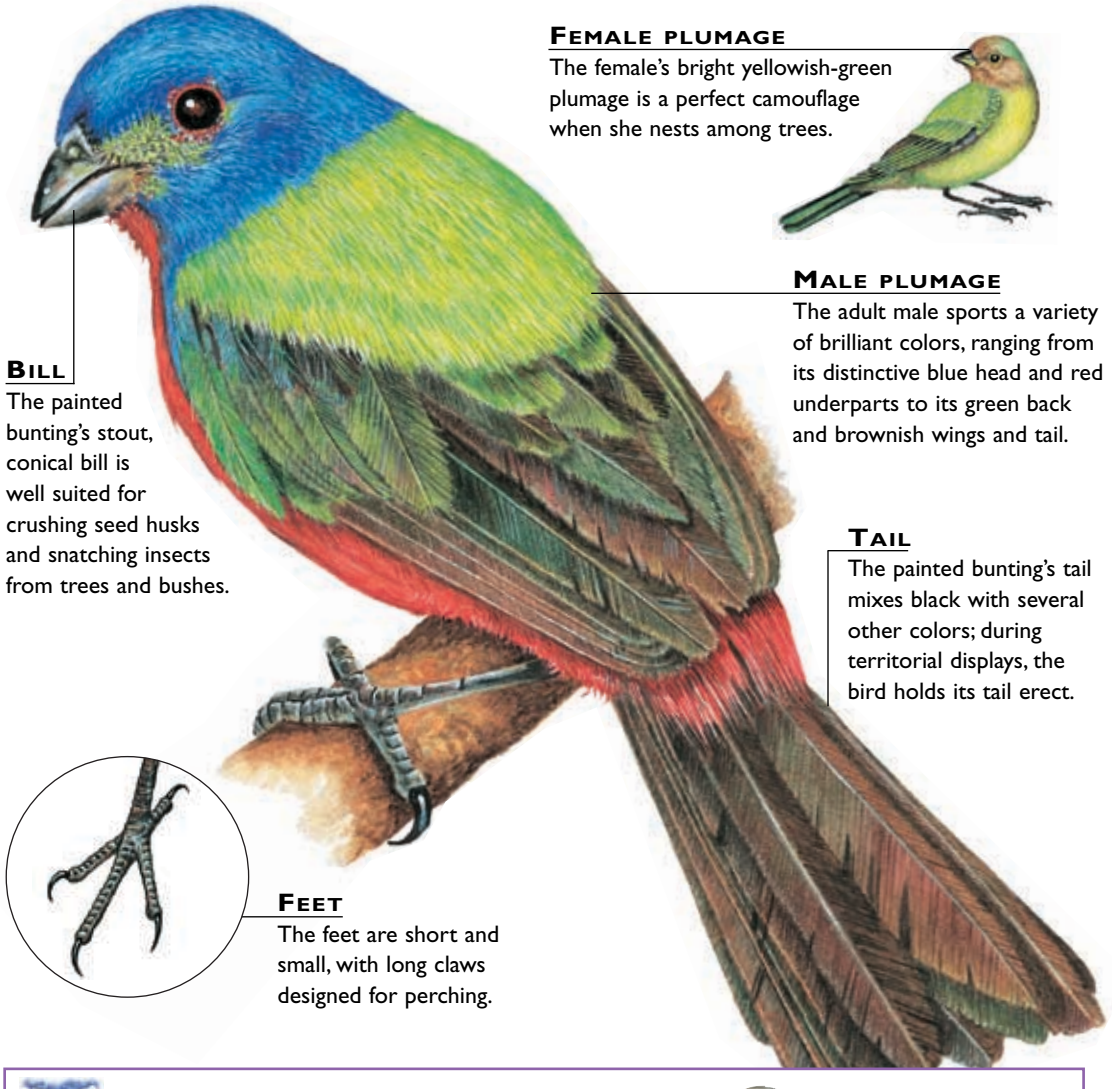
▼ **DOWN THE HATCH**
A female bunting takes turns feeding its two hungry hatchlings.

DID YOU KNOW?

- **According to Native American legend, the Great Spirit created the painted bunting from dabs of many colors left over after all the other birds were created.**
- **The beauty of the painted bunting has inspired many names. Spanish speakers call it *mariposa*, the butterfly, while in the southern U.S. it is called *nonpareil* (without equal) for its peerless beauty.**

PROFILE Painted Bunting

The painted bunting's electrifying colors are easy to spot as the bird flies in quick bursts, defending its territory.



Female plumage
The female's bright yellowish-green plumage is a perfect camouflage when she nests among trees.

Male plumage
The adult male sports a variety of brilliant colors, ranging from its distinctive blue head and red underparts to its green back and brownish wings and tail.

Bill
The painted bunting's stout, conical bill is well suited for crushing seed husks and snatching insects from trees and bushes.

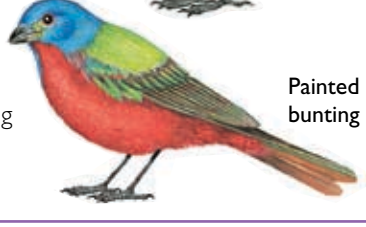
Tail
The painted bunting's tail mixes black with several other colors; during territorial displays, the bird holds its tail erect.

Feet
The feet are short and small, with long claws designed for perching.

Creature Comparisons

The snow bunting *(Plectrophenax nivalis)* breeds in the colder climates of Iceland, Scandinavia, Scotland, subarctic Asia and North America, while the painted bunting enjoys a much milder climate; it is found in southern North America and Central America. Larger than the painted bunting at 6.25", the snow bunting feeds on a similar diet of seeds and insects. It prefers open, stony country, tundra and mountains, and winters along the coasts. During breeding season, the male snow bunting is mainly pure white except for his black back, tail and primary feathers.

Snow bunting



Painted bunting

Vital Statistics

Weight	0.5 oz.
Length	5–5.5"
Wingspan	9–10"
Sexual Maturity	About 1 year
Breeding Season	March–July
Number of Eggs	3–5
Incubation Period	About 12 days
Fledging Period	2 weeks
Breeding Interval	Up to 4 broods per year
Typical Diet	Seeds, spiders and insects
Lifespan	Over 12 years

Related Species

- Among the 6 species in the genus *Passerina* are the indigo bunting, *P. cyanea,* and the lazuli bunting, *P. amoena.* The family *Emberizidae* contains 47 species, including the yellow warbler, *Dendroica petechia,* and the great-tailed grackle, *Quiscalus mexicanus.* The order *Passeriformes* contains a variety of birds, including larks, cardinals, crows and jays.

Palm Cockatoo

• ORDER •
Psittaciformes

• FAMILY •
Cacatuidae

• GENUS & SPECIES •
Probosciger aterrimus

KEY FEATURES

- Largest of all cockatoos — measures up to 27" in length
- Deftly cracks open nuts and the hard fruit of its favorite food, *Pandanus* palm, with its uniquely-shaped bill
- Cannot hiss like other cockatoos, but is adept at mimicking human language
- Captive birds live more than 30 years

WHERE IN THE WORLD?

Found in the tropical rainforest of New Guinea and in north Australia on the Cape York Peninsula; also on Misool, Yapen, West Papuan and Aru islands

LIFECYCLE

Unlike other cockatoos, the palm cockatoo does not congregate in large flocks; it roosts alone, feeds alone or in pairs and rarely forms groups of more than seven.

HABITAT

In Australia, the palm cockatoo makes its home in the eucalyptus forests of the Cape York Peninsula and the rainforests of the Aru Islands; in New Guinea, it populates the dense savannah woodlands in the northern and western sections of the island. Palm cockatoos inhabit wetter, warmer climates than most other cockatoo species and usually perch in leafless branches. Mating pairs maintain territories with several good nesting trees, which they check on periodically during the year.

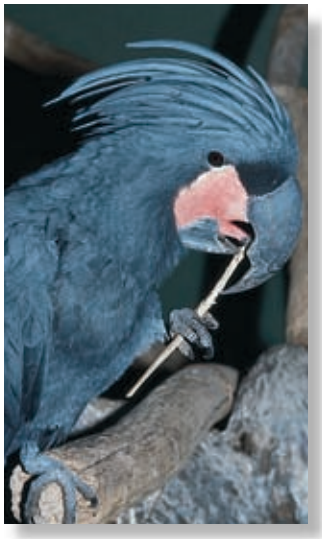
▶ **MAJESTIC PERCH**
The watchful cockatoo scans the humid rainforest that it calls home.

CONSERVATION

The population of palm cockatoos is diminishing. In New Guinea the bird's rainforest habitat has been reduced due to logging; people also hunt the birds for food and capture them so they can be sold in other countries as pets. In Australia the palm cockatoo is protected and listed in Appendix I of CITES, yet many of these popular birds are smuggled out of the country each year.

BREEDING

Young palm cockatoos demand constant and attentive care, so adults form strong pair bonds and share parenting duties. Since they pair for life and remain close together throughout the year, courtship rituals are kept to a minimum, with only courtship-feeding the rule. Together, the male and female regularly inspect their territory for potential nesting sites. The ideal home is a hollow spot in a tree, 10–25' above the ground. Once they choose a site, they'll use it year after year, constructing a nest by shredding twigs and dropping them into the hollow (*left*).



Both parents incubate the single egg for about 30 days. Then the chick begins the difficult and exhausting hatching process, which can take 3–4 days; it finally emerges without down. The chick will stay in the nest for between 100–110 days, longer than any other parrot species. It will be two more weeks before the young cockatoo is ready to make its first flight.

LOG CABIN

1 A suitable site...
Pairs mate for life; their first task as a mating pair is to find a safe, hollow tree in which to build their nest.

2 Making the bed...
The two birds work together to build a nest by gathering sticks and then shredding and dropping them inside to form a platform.

3 Baby makes three...
After a 30-day incubation, the female usually lays a single egg. Chicks remain in the safety of the nest for up to 110 days.

4 Dual parenting
A young cockatoo is demanding: both parents work to feed and care for their offspring until six weeks after it leaves the nest.

FOOD & FEEDING

The humid rainforests offers the cockatoo an abundance of nuts, fruits, seeds and grubs. The bird shells and eats nuts efficiently: first, it husks the nut, turning it with its tongue while working the shell off with its beak. Then it splits the nut in two, storing the halves in its lower mandible. With a cache stored, the bird can push pieces forward with its tongue, split them on the edge of its lower beak and throw them back, with a quick toss of its head, to be swallowed.

SKILLED CRAFTSMAN
The cockatoo sharpens its bill before feeding.

DID YOU KNOW?

- **Males sometimes exhibit a curious courtship behavior: they hold small sticks in their claws and drum on a hollow log.**
- **Cockatoos appear to be playful birds. They have been observed flying at one another, trying to knock each other from their perches.**

BEHAVIOR

Palm cockatoos roost separately, but call to each other after sunrise. After a brief foraging trip, a relatively small flock gathers in neutral territory. There they preen, display and interact socially. Long flights are usually necessary between roosting and feeding sites; the group disperses and often meets again at a convenient tree. At sunset, pairs leave the group and return to their own territories. After making a round of the nesting area, the two birds each roost separately. If predators or other birds intrude, a palm cockatoo stamps its feet and its facial patches blush a deep crimson.

PALM PEDICURE
A cockatoo uses its bill to clean its foot and claws.

LOW BOW
A cockatoo bends over during a social encounter.

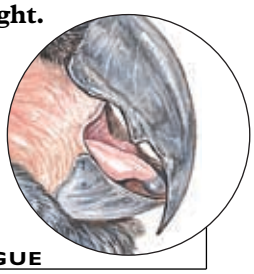
PROFILE Palm Cockatoo

With its broad tail and impressive, fanlike head crest, the palm cockatoo appears quite large, but it's in fact relatively lightweight.

Female
Males and females differ very little in appearance. The female has a slightly smaller upper mandible, only 2.9" as compared to 3.7" in males.

Facial patch
The patch of skin on the palm cockatoo's cheek ranges from beige to orange-pink to bright red, depending on the bird's environment and health; it flushes red when the cockatoo is stressed.

Plumage
The palm cockatoo is the only cockatoo with all dark plumage, described by many as black but often appearing a slate gray.



Tongue
The tongue manipulates seeds during the husking process. The cockatoo can't close its beak completely, so it always shows its black-tipped, red tongue.

Bill
The upper mandible is larger than the lower and has several notches for holding and grinding different-sized nuts and fruits. The lower mandible has a cavity for storing halves of split seeds.

Feet
The *zygodactyl* arrangement, with two toes pointing forward and two behind, allows a firm grip on branches as the cockatoo moves through the trees.

Vital Statistics

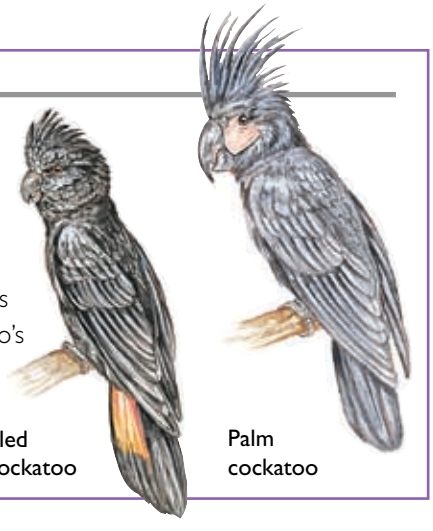
Weight	Male 1–2.5 lbs.; female 1–2 lbs.
Length	19–27"
Sexual Maturity	Unknown
Breeding Season	October–December
Number of Eggs	1–2
Incubation Period	30 days
Fledging Period	Up to 135 days
Breeding Interval	1 year
Typical Diet	Fruits, berries, seeds and grubs
Lifespan	Over 30 years, in captivity; unknown in the wild

Related Species

- **The palm cockatoo, often called the great black cockatoo, is the only species in its genus, *Probosciger,* but is 1 of 6 species of black cockatoo in 2 genera, including the glossy black cockatoo, *Calyptorhynchus lathami.* These birds join 14 species of white/gray cockatoo and 1 species of cockatiel in the family *Cacatuidae*. The cockatiel is the smallest in the family, weighing only 3 oz.**

Creature Comparisons

Unlike the palm cockatoo, the red-tailed black cockatoo *(Calyptorhynchus banksii)* has adapted to the drier conditions in the woodlands and shrublands of northern Australia and the open forests of the southeastern part of the continent. Measuring about 25" in length, the red-tailed black cockatoo is similar in size to the palm cockatoo. It lacks the palm cockatoo's head crest, but the male red-tailed cockatoo distinguishes itself with splashy red panels in its tail, hence its name; the female has orange and yellow spots and bars.



Red-tailed black cockatoo

Palm cockatoo

Paradise Whydah

• ORDER •
Passeriformes

• FAMILY •
Ploceidae

• GENUS & SPECIES •
Vidua paradisaea

KEY FEATURES

- Known as a brood parasite: lays its eggs in the nests of the green-winged pytilia
- Whydah chicks mimic the calls and actions of their foster siblings
- The male's elongated tail feathers make him more than twice the length of the female

WHERE IN THE WORLD?

Found over much of eastern and southern Africa, from Angola east through Zambia and Zimbabwe east to Mozambique

LIFECYCLE

The paradise whydah not only relies on the green-winged pytilia for hatching and feeding its chicks, but males mimic the pytilia's song when courting female whydahs.

HABITAT

The paradise whydah frequents open savannahs in eastern and southern Africa with scattered acacia trees or shrubs. The bird can be found at elevations from sea level to 7,000', but the largest concentrations are at altitudes below 5,000'. Since the whydah is dependent on its host, the green-winged pytilia, during breeding, the whydah seeks the same type of dry, open country woodlands and savannahs with thorny scrub that the pytilia prefers.

TREE HOUSE
The paradise whydah prefers the open woodlands and savannahs of eastern and southern Africa.

BREEDING

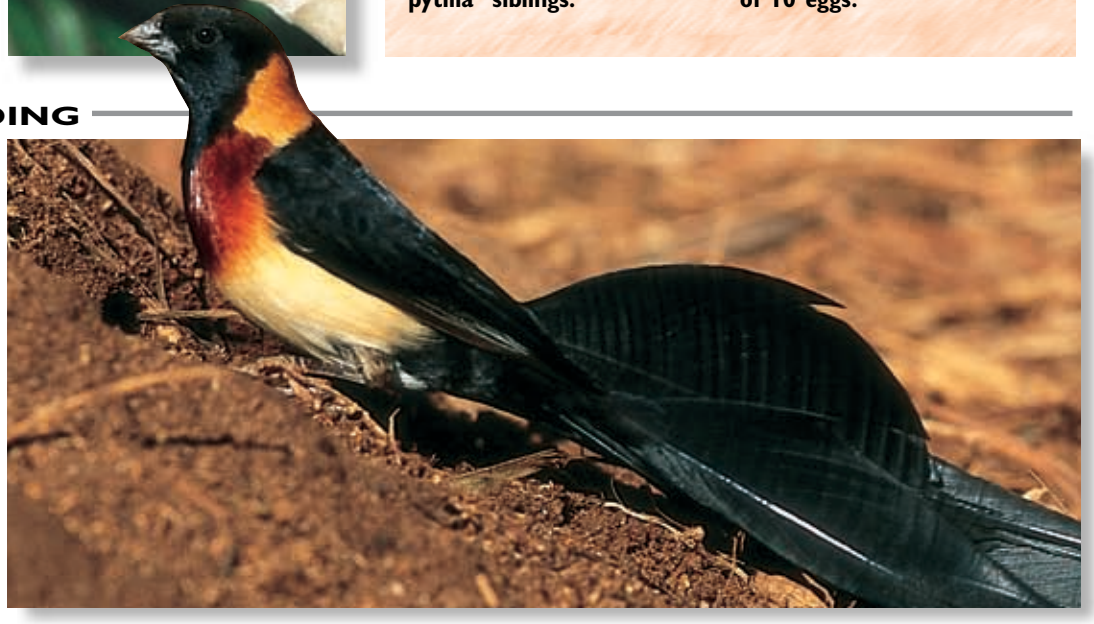
During the breeding season, the polygamous male flies with his impressively long tail feathers raised almost at a right angle to his body. The male hovers around a female, slowly beating his wings as if to hypnotize his potential mate. All whydahs are brood parasites and lay their eggs in the nests of other birds. The paradise whydah males shows the female the nest of a pytilia, and the female then lays 1–5 eggs in the pytilia's nest. Once the eggs hatch, after incubating for 12-13 days, the whydah's chicks mimic the calls of their fellow nestlings. The pytilias then take over the care of the young whydahs until they fledge about 16 days later.

DID YOU KNOW?

- **Adult paradise whydahs are 60% heavier than the green-winged pytilia.**
- **Paradise whydah chicks are actually more grayish and dark-skinned, with broader bills than their pytilia "siblings."**
- **Whydah eggs are only 0.1" larger than the green-winged pytilia's eggs.**
- **The paradise whydah parasitizes 92% of the nests of its host; there is a maximum combined clutch of 10 eggs.**

FOOD & FEEDING

The whydah wanders along the open savannah in search of insects and seeds, which the bird cracks open with its strong bill. While walking, the whydah often jumps backward with both feet together, scratching the ground to uncover a tasty snack. The bird feeds in small or mixed flocks of whydahs.



SCRATCH AND SNIFF
Scratching with its feet, the whydah unearths seeds.

PARASITIC NESTER

1 Unknowing host…
The green-winged pytilia, which builds its grass nest in a thorn bush, will soon return to an unexpected surprise.

2 A home of their own…
The female paradise whydah closely inspects the nest, which already contains one white pytilia egg, before laying her own eggs.

3 Then there were four…
The pytilia doesn't seem to mind the new additions, since they closely resemble her eggs in size, shape and color.

4 Mimic this, mimic that
Not even the parents can tell the difference between the chicks since the markings in the mouth openings are so similar.

BEHAVIOR

The mimicking behavior of the whydah begins at birth, when hungry whydah chicks mimic the vocalizations of their foster siblings. Adult males also mimic the song, chirps and warbling sounds of the green-winged pytilia, especially during the breeding season. The whydah has its own calls as well that begin with a long, introductory whistle. The male mixes its own song with the mimicked song during the mating ritual. During courtship, the territorial male will perform spectacular cruising flights high in the air, which end in a series of swooping plunges back to treetops where the females gather. Despite its small size, the whydah is a pugnacious bird that will chase other larger birds away if threatened. Small flocks that forage and perch together will eventually separate into pairs during the breeding season.

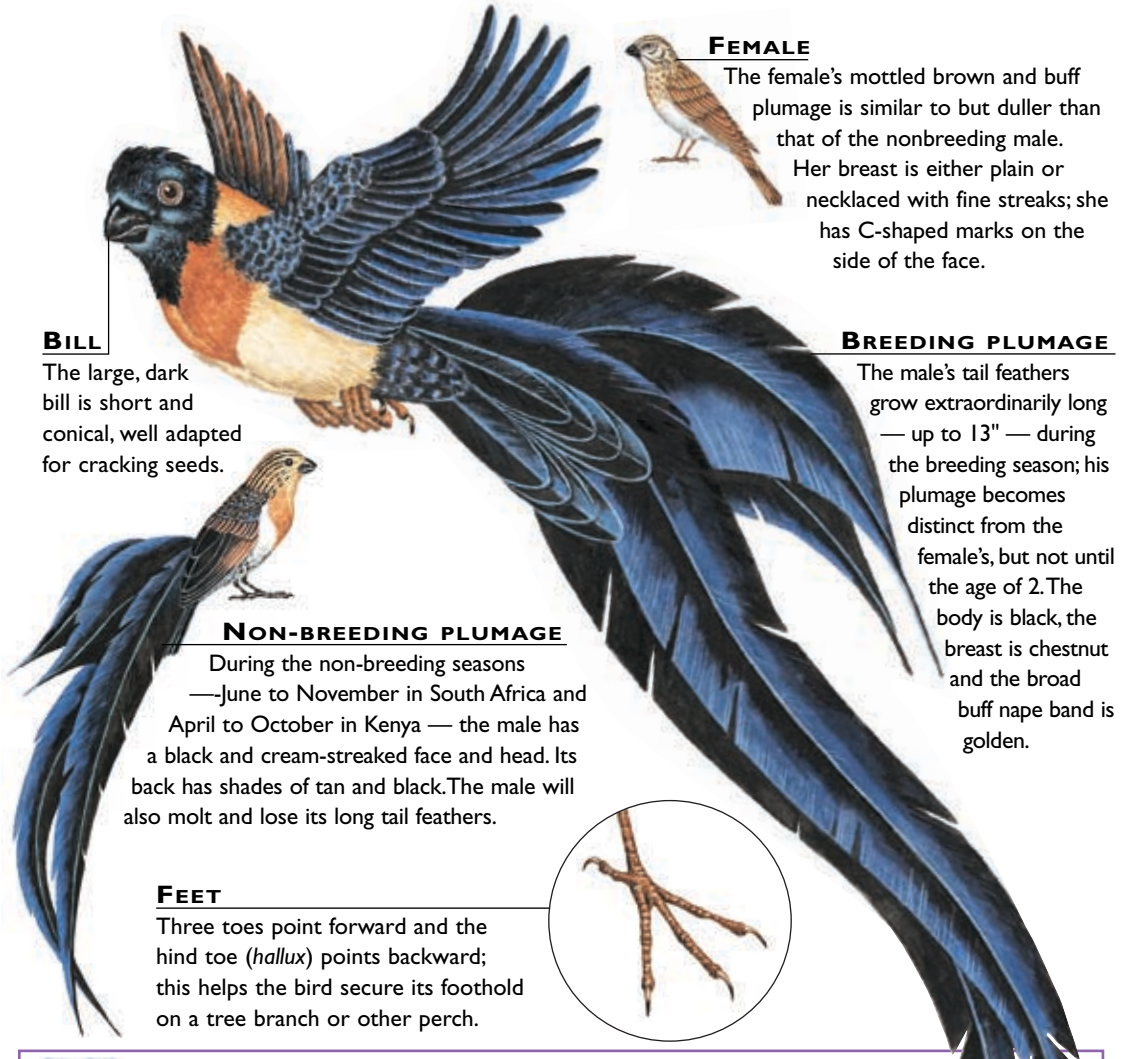
COPY CAT
The male paradise whydah mimics the green-winged pytilia with its calls.

CONSERVATION

The paradise whydah is fairly common and can be found in large numbers throughout its African range. A high rate of hatching success assures the whydah continued strong populations. As with any brood parasite, the success of its host, the green-winged pytilia, is essential to the paradise whydah's success. The green-winged pytilia is also fairly plentiful and not threatened at this time.

PROFILE PARADISE WHYDAH

During the breeding season, the male paradise whydah is unmistakable with his black plumage and spectacular sweeping tail.



FEMALE

The female's mottled brown and buff plumage is similar to but duller than that of the nonbreeding male. Her breast is either plain or necklaced with fine streaks; she has C-shaped marks on the side of the face.

BILL

The large, dark bill is short and conical, well adapted for cracking seeds.

BREEDING PLUMAGE

The male's tail feathers grow extraordinarily long — up to 13" — during the breeding season; his plumage becomes distinct from the female's, but not until the age of 2. The body is black, the breast is chestnut and the broad buff nape band is golden.

NON-BREEDING PLUMAGE

During the non-breeding seasons —June to November in South Africa and April to October in Kenya — the male has a black and cream-streaked face and head. Its back has shades of tan and black. The male will also molt and lose its long tail feathers.

FEET

Three toes point forward and the hind toe (*hallux*) points backward; this helps the bird secure its foothold on a tree branch or other perch.

VITAL STATISTICS

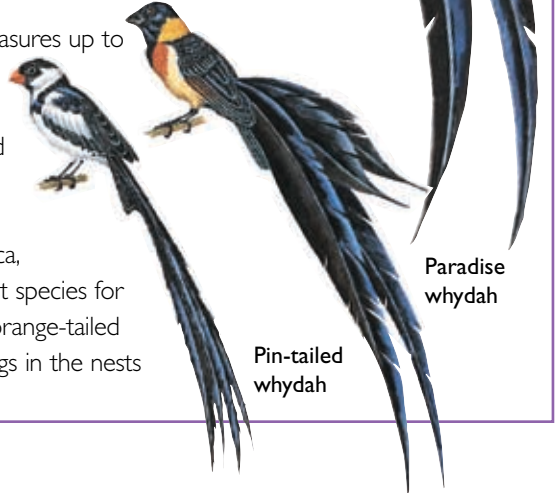
WEIGHT	Up to 0.75 oz.
LENGTH	
Head/Body	About 4–5"
Tail	Up to 13" in male; about 1" in female
SEXUAL MATURITY	1–2 years
BREEDING SEASON	Varies with location
NUMBER OF EGGS	1–5
INCUBATION PERIOD	12–13 days
FLEDGING PERIOD	About 21 days
BREEDING INTERVAL	Up to 5 clutches per breeding season
TYPICAL DIET	Seeds and insects
LIFESPAN	Unknown

RELATED SPECIES

● **The paradise whydah is one of nine species in the genus *Vidua*. The genus includes the straw-tailed whydah, *Vidua fischeri*, and the broad-tailed paradise whydah, *V. obtusa*. Within the family *Ploceidae*, there are 143 species of weaver, sparrow and snow finch in 18 genera. The family contains the village weaver, *Ploceus cucullatus*, and the house sparrow, *Passer domesticus*.**

CREATURE COMPARISONS

The male pin-tailed whydah (*Vidua macroura*) measures up to 12" in length, a bit smaller than the paradise whydah. The breeding male is black and white and has four long, central tail feathers. He is called "King-of-Six" for his ability to court six females at once. The pin-tailed whydah inhabits cultivated areas and gardens in most parts of southern Africa, Kenya and northern Tanzania. It relies on two host species for nesting, the common black-rumped waxbill and orange-tailed waxbill, unlike the paradise whydah, which lays eggs in the nests of only one host species.



Pel's Fishing Owl

• ORDER •
Strigiformes

• FAMILY •
Strigidae

• GENUS & SPECIES •
Scotopelia peli

KEY FEATURES

- Does not rely on sound to find prey, as most owls do
- Loose feathering on head gives it a distinctive fluffy appearance
- Unfeathered feet are equipped with sharp scales and talons to catch and hold fish
- Lacks the ear tufts found in most owl species

WHERE IN THE WORLD?

Found along large rivers and tree-lined streams of Africa, from Nigeria across the Congo Basin and central Africa to the Zambezi River and in Ethiopia south to South Africa

LIFECYCLE

The large, orange-colored Pel's fishing owl becomes especially noisy before breeding; mating pairs engage in distinctive duets that last for several minutes.

HABITAT

▲ TREE HOUSE
The fishing owl sleeps, roosts, nests and hunts in the serenity of the trees throughout its range.

Living along the edges of rivers and wetlands, the Pel's fishing owl resides throughout most of tropical Africa south of the Sahara Desert. It can be found in strips of riverine forests as well as the great tropical forests of the Congo River.

This owl thrives amid large, ancient trees, which provide numerous cavities for roosting and nesting as well as long branches extending over the water — a perfect fishing perch. Rarely seen, Pel's owl is secretive and can go undetected for long periods of time because it only comes out at night. The Pel's fishing owl spends the majority of its time in trees and rarely descends to the ground, which is why little is known about this mysterious owl's way of life.

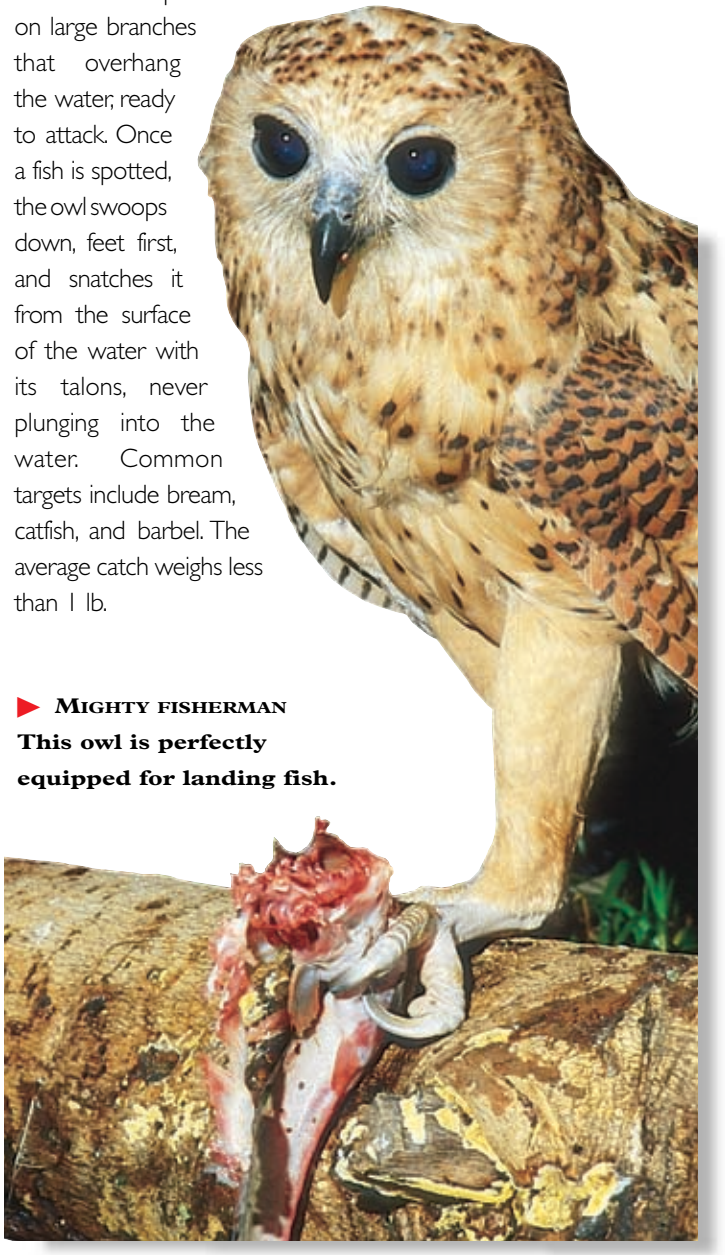
DID YOU KNOW?

- **First captured in 1850 in Ghana (then called the Gold Coast), the Pel's fishing owl was named for that country's governor, H.S. Pel.**
- **Murky waters force the owl to listen, not watch, for fish movement.**
- **Starvation accounts for most of the deaths of the Pel's fishing owl, particularly among inexperienced juvenile birds, which can't hunt well.**
- **The Pel's owl only eats live prey, and always consumes it head first; dead fish are ignored.**

FOOD & FEEDING

The Pel's fishing owl doesn't rely on the same hunting methods that most owls use. For example, in most owls facial disks around each eye funnel even the slightest sound into the ear openings, which are located just behind the eye. With less prominent disks, the Pel's owl relies more on sight than sound when hunting for its prey. Also, most owls are stealthy, silent fliers. The Pel's owl, with its specialized diet of fish, does not need noiseless flight, since fish cannot hear the owl approaching.

The Pel's owl perches on large branches that overhang the water, ready to attack. Once a fish is spotted, the owl swoops down, feet first, and snatches it from the surface of the water with its talons, never plunging into the water. Common targets include bream, catfish, and barbel. The average catch weighs less than 1 lb.



▶ MIGHTY FISHERMAN
This owl is perfectly equipped for landing fish.

BREEDING

The Pel's fishing owl heralds the breeding season with distinctive melodic duets designed to attract a mate. Once paired, mating begins in the summer to coincide with peak heights of nearby rivers. Chicks are reared as the water levels recede, when fishing conditions are most favorable. The Pel's fishing owl does not build a nest; the female usually lays her eggs in the hollow of a large tree.

The female incubates the eggs alone for about 35 days, but the male stays close and feeds her as well as the young once they hatch. Although the Pel's fishing owl lays two eggs, only one chick is reared. The first chick hatches up to five days before the second and bullies its younger sibling until it dies of starvation. The surviving chick fledges in about 70 days, but may stay with its parents longer.

During long periods of drought, a mated pair will sometimes let a year or more pass before breeding.

THE APPRENTICE
The young owl learns to hunt from its parents.

CONSERVATION

The Pel's fishing owl is rarely seen, and the size of its population is unknown, but experts do not yet consider it to be endangered. It is listed in Appendix II of CITES (Convention on International Trade in Endangered Species). However, the populations of rufous and vermiculated fishing owls, the other two African species, are endangered. Habitat destruction is the chief cause.

BEHAVIOR

Being mainly nocturnal, Pel's fishing owls roost alone or in pairs during the day and emerge around dusk to eat. They have such keen eyesight that they can see the ripples in the water made by fish. The Pel's owls are extremely territorial, utilizing distinct calls to warn off intruders and defend their turf.

DRIVEN TO DISTRACTION

1 Feeding…
A pair of Pel's fishing owls nests in an abandoned eagle's nest. The female incubates the eggs while the male hunts for their food.

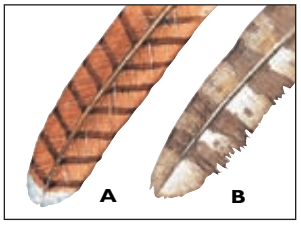
2 Chasing…
Vigorously defending his family, the male owl chases away an African fish eagle that has come to raid the nest.

3 Guarding…
Standing guard near the nest, the male fish owl catches a glimpse of a blotched genet venturing a little too close.

4 Distracting
The owl dives off the branch into the undergrowth, thrashing about as if injured. Falling for the display, the genet is lured from the nest.

PROFILE PEL'S FISHING OWL

One of the largest owls in the world, the uncommonly strong Pel's fishing owl can subdue a wiggling fish virtually equal to its own weight.

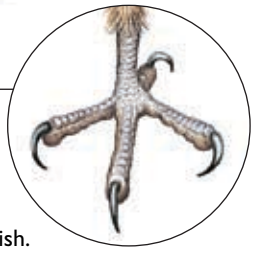


PRIMARY FEATHERS
Stiff wing feathers (A) lack the soft fringe on their leading edges (B) that enable most owls, such as the barn owl, to fly silently.

BILL
The strongly curved bill is large, with a broad base and, a sharp tip that is used for ripping and tearing prey.

PELLET
The owl has no crop for storage; food is swallowed whole and enters the stomach. All indigestible matter, such as feathers and bone, is then regurgitated as large pellets.

FEET
The foot is unfeathered with long, spiny toes and highly arched talons to grip slippery fish.



VITAL STATISTICS

WEIGHT	4–5 lbs.
LENGTH	20–24"
WINGSPAN	4.5–5'
SEXUAL MATURITY	Unknown
BREEDING SEASON	February–April
NUMBER OF EGGS	2, but only 1 hatchling is reared
INCUBATION PERIOD	About 35 days
FLEDGING PERIOD	About 70 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Mainly fish; also crabs, frogs and small mammals
LIFESPAN	Unknown

RELATED SPECIES

● The fishing owls are confined to Africa and Asia, and comprise 7 species in 2 genera. The genus *Scotopelia* contains all 3 African species: the Pel's fishing owl; the rufous fishing owl, *S. ussheri;* and the vermiculated fishing owl, *S. bouvieri*. The family *Strigidae* contains about 175 species of raptors that are found in virtually every place in the world.

CREATURE COMPARISONS

Most fishing owls have unfeathered legs and feet, but the Blakiston's fish owl *(Ketupa blakistoni)* is fully feathered to cope with the cold northerly climates of China and Russia. Inhabiting dense forests bordered by rivers, lakes or the sea, Blakiston's owl seeks out fast-flowing water that does not freeze in winter. Its plumage is dark brown with wavy horizontal barring, compared to the rufous-orange color of the Pel's fishing owl.

Pel's fishing owl

Blakiston's fish owl

Peregrine Falcon

• ORDER •
Falconiformes

• FAMILY •
Falconidae

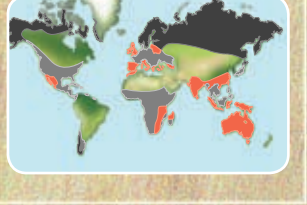
• GENUS & SPECIES •
Falco peregrinus

KEY FEATURES

- Hunts other birds in the air; possesses the agility and flying skills to catch even the most aerobatic species
- Specializes in spectacular diving attacks at speeds of more than 100 mph
- Kills victims by the devastating impact of its strike or dispatches its quarry on the ground with a bite to the back of the neck

WHERE IN THE WORLD?

Breeds in northern North America and Eurasia; overwinters farther south in the Americas, Africa south of the Sahara, parts of Europe, Southeast Asia and Australia; some populations reside year-round



LIFECYCLE

The peregrine falcon is renowned for its breathtaking dives on other birds, plummeting from high altitudes to burst without warning upon its hapless victims.

HABITAT

▲ **VANTAGE POINT**
High up on its cliffside aerie (nest site), a falcon surveys its domain.

▼ **FAR AND AWAY**
The widespread peregrine falcon adapts to a variety of habitats, but favors remote, open regions with high cliffs.

The peregrine falcon is the most widespread of all falcons, occurring on all continents except Antarctica.

The falcon lives in a wide variety of habitats, but avoids wetlands, such as marshes. It prefers open land bordered by high cliffs, especially along rocky coasts. It also breeds inland in gorges and disused quarries.

The bird can also be seen in large U.S. cities, where it sometimes nests on top of skyscrapers and preys on pigeons. The peregrine nests in trees in some of the Baltic countries and Australia and in church steeples or other tall buildings in parts of Europe.

BEHAVIOR

▲ **TAILING PREY**
The peregrine reaches its highest velocities in dives, but it also exhibits speed and power in flat pursuit.

The peregrine falcon is one of the world's fastest birds. On its dives, it angles its wings backward and pulls them close to its body to form an efficient aerodynamic profile. It may free-fall 1,000' or more, slicing through the sky at speeds near 100 mph. In level flight, the peregrine flies much more slowly and may even be outpaced by some species of duck.

Peregrines from tropical, subtropical and some island locations tend to be year-round residents, but individuals from the most northerly parts of their range migrate in the autumn to avoid the snows of winter. Those breeding in northern Canada, for example, may fly 4,800 miles to southern South America and back again each year — a round trip greater than that of any other falcon species.

DID YOU KNOW?

- **The name "peregrine" stems from a Latin word meaning "foreigner or wanderer." A peregrine on migration was recorded to cover 960 miles in 48 hours.**
- **The peregrine's eyes are larger and heavier than a human's. It can spot small birds on the ground while flying at heights of more than 1,000'.**

CONSERVATION

Peregrine populations declined from the 1950s to the 1970s as a result of the pesticide DDT. Many falcons died or laid eggs with thin shells after preying on seed-eating birds with deadly levels of DDT. Today, DDT is banned in many countries, and some populations are on the rise.

FOOD & HUNTING

The peregrine preys almost exclusively on birds and often catches them on the wing. Its diet depends on what's available within its range. Falcons in coastal locations, for example, prey mainly on seabirds around their cliffside nesting colonies.

The peregrine can use several hunting techniques. This hunter sometimes snatches a resting bird from an exposed perch in the treetops or seizes a victim on the wing using its incredible speed to outfly slower and less agile birds. Of all the techniques, however, the diving attack is the most dramatic.

The falcon typically flies at a great height while hunting. After spotting potential prey, it launches into a dive or "stoop." Once committed to its course, the falcon can't change direction, and a high proportion of dives fail as a result. But when the falcon gets it right, the strike is devastating. The victim is dealt a terrible, often lethal, blow without ever sensing its impending doom.

BOLT FROM THE BLUE

1 Patrol...
Patrolling high in the skies, the peregrine falcon glides and soars, searching for signs of low-flying prey far below.

2 Dive...
The falcon targets a duck. Angling its tapered wings sharply back, it plunges into a free-falling dive, reaching a speed of 100 mph.

3 Strike...
The falcon thrusts its sharp talons forward just before impact. The prey is struck with such devastating force that it is killed instantly.

4 Retrieve
The falcon brakes rapidly, turns and swoops again, snatching its victim up before its broken body tumbles to the ground.

BREEDING

Open sky is the stage for falcon courtship. Here, the bird plays out the full repertoire of its aerobatics in a showy display of looping, swooping and figure-eight flights as a prelude to mating. The male often passes prey to his mate in flight as a courtship offering.

The peregrine doesn't build a nest itself, but uses the old nest of another bird. The female lays three or four eggs and performs most of the incubation. When chicks hatch, the male continues hunting to provide food. At about four weeks, the chicks begin to show juvenal plumage and may take their first flight two weeks later. Parents continue to feed juveniles for up to two months, even after they've started to fly, often passing food to them on the wing.

Young sharpen flying skills by play-fighting in the air or by "dive-bombing" other birds. Eventually they leave the nest, driven away by their parents or in response to an instinctive urge to move on.

PROFILE Peregrine Falcon

The peregrine is a formidable predator of the skies, superbly equipped to seek and intercept other birds in flight, like a living air-to-air missile.

Bill
Hooked bill is used for tearing flesh. A notch helps deliver a clean bite to the back of a victim's neck, severing the spinal cord.

Female
Female is 15–20% larger than the male. She's more heavily spotted on the breast, and her flanks and tail bear heavier barring.

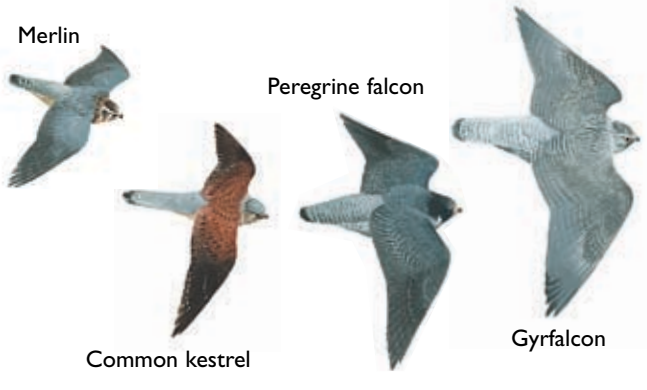
Wings
Long, pointed wings beat deeply in level flight. In a dive, they are angled back, close to the body.

Feet
Talons are sharp and curved. They're used in an aerial attack to deliver a glancing blow to prey, with the hindclaw possibly raking the flesh in passing.

Male plumage
Males in North America and Europe are a dark slate-gray above with a barred back and tail. Underparts are a pale pink-buff, with black spots on the breast. In other areas, males are a paler blue-gray or almost black above and white to buff below.

Creature Comparisons

The peregrine is one of many swift and deadly birds of prey in the family *Falconidae*. The merlin (a small falcon) often charges its prey in a low-level attack. The common kestrel, smaller than the peregrine, is the most numerous falcon. The gyrfalcon, largest of all falcons, is more heavily built than other species and has broader wings.



Vital Statistics

Weight	19–53 oz.; female larger than male
Length	17–20"
Wingspan	32–48"
Sexual Maturity	Usually 2–3 years
Breeding Season	February–August in northern parts of range
Number of Eggs	3–4
Incubation Period	29–32 days
Fledging Period	About 6 weeks
Breeding Interval	1 year
Typical Diet	Birds up to the size of a duck; small mammals
Lifespan	About 18 years

Related Species

● **The family *Falconidae* contains about 40 falcon species, including the peregrine falcon's close relative, Barbary falcon (or black shaheen), *Falco pelegrinoides*, and the endangered Mauritius kestrel, *Falco punctatus*** (below).

Pheasant Coucal

• ORDER •
Cuculiformes

• FAMILY •
Cuculidae

• GENUS & SPECIES •
Centropus phasianinus

KEY FEATURES

- Extremely vocal bird; named for its call, a low pitched *coo-coo-coo-coo-coocal*
- Builds a unique domed nest; female adds a layer of green twigs to insulate each egg
- Also known as the "swamp pheasant," due to its preference for swampy grasslands

WHERE IN THE WORLD?

Found in east and southeast New Guinea; also north, northwest and eastern Australia, Timor, Torres Strait islands and Yule island

LIFECYCLE

Despite its pheasantlike appearance, the pheasant coucal is closely related to the cuckoo and is quite vocal; in fact, one series of calls may contain 50 or more notes.

HABITAT

The pheasant coucal clambers about in the vegetation of gardens, thickets, grasslands and forest regrowth, often perching with its wings and tail spread. However, it spends most of its time on the ground, in thick undergrowth. The coucal inhabits areas of very dense vegetation, including long grass, coastal heathlands, margins of swamps, cane fields, lantana and pandanus thickets, mangroves, secondary forests and spinifex in sandstone country, through which it makes small tunnels; true to its name, the coucal runs through the tunnels like a pheasant.

▼ **HAPPY HIDEOUT**
Dense vegetation makes for the perfect coucal home.

DID YOU KNOW?

- **The pheasant coucal of northern Australia is the only member of the Australian cuckoo family that does not lay its eggs in the nest of another bird.**
- **Although the black nestlings are born with long, white, hairlike down, the chicks lose this odd-looking down within about a week.**

BREEDING

The pheasant coucal breeds from September through May, depending upon the region, but little is known about its courtship. Thecoucal builds a large, domed nest out of grass that is open at both ends and lined with fresh leaves. It starts outas a platform, where blades of grass and stems of other vegetation are drawn together to form a "roof" before the leafy nest lining is added. The nest is usually found in tussock grass near the ground. There, the female coucal usually lays 3–5 eggs, which are white with brown stains, and the 15–day incubation is performed by both sexes. The nestlings are black with long, white, hairlike down and have red mouths with black-tipped tongues. They are fed by both parents, and their eyes open at 7 days. They may then leave the nest if threatened, but the young may also be carried away from danger by one of its parents, which will take to the air holding a chick in its feet. Fledging occurs at 17 days, but the young birds aren't usually independent until 40 days.

FOOD & FEEDING

The pheasant coucal feeds mainly on insects and small vertebrates, when such creatures are available; the coucal especially favors grasshoppers, stinkbugs, mantids, stick insects and caterpillars. The coucal spends much of its time on the ground, foraging among the grass and leaves in the thick vegetation of its preferred habitat. However, the adaptable coucal has also been known to improvise and change its tastes to include such uncharacteristic prey as mangrove mud crabs, snails, frogs, lizards, nestling birds and even small mammals, including small rodents and bandicoots. Skulking in the pheasantlike posture it assumes during a hunt, the terrestrial coucal often finds food by carefully searching through the series of small intricate tunnels it has built in the undergrowth and running down its prey.

▶ **SPECIALIZED TOOL**
The pheasant coucal's slender bill makes insects easy prey.

NESTING NECESSITIES

1 Knitting the nest…
The pheasant coucal constructs its nest of grass and stems in tussock grass near the ground, carefully weaving material together.

2 Domestic dome…
The coucal bends the grass and stems to form a dome, which is open at both ends so parents can easily feed their hungry nestlings.

3 Coucal comforts…
The pheasant coucal lines the nest with fresh green leaves after each egg is laid to cushion the individual eggs and chicks.

4 Proud payoff
The 2-week-old chicks remain in the carefully constructed dome nest, awaiting a fresh meal from one of their parents.

BEHAVIOR

Though it physically resembles the usually quiet pheasant, the lyrical coucal is an extremely vocal bird, like its cuckoo relatives. When communicating, its most distinctive call is the one for which it is named, a low-pitched *coo-coo-coo-coo-coo-coo-coo-coo-coocal.* Its deep hooting call is also very distinctive; it is a slightly musical, rapid, booming series of *hooh* notes, falling and then rising in pitch, speeding up and then slowing down. One series of calls may contain 50 or more notes. The pheasant coucal is also known for its harsh scolding calls, as well as a hiss it makes in warning or in alarm.

Although it prefers to remain on the ground, perhaps due to its short and rather ineffectual wings, intrusion by predators will cause the bird to clamber to a vantage point in a taller tree, from which it may fly awkwardly away if the intruder persists. In the morning, the pheasant coucal often warms and dries its dew-covered body before feeding. In its sunning posture, the bird raises its back feathers and spreads its wings and tail.

▼ **GROUNDED**
The short-winged coucal rarely flies.

CONSERVATION

The pheasant coucal is not globally threatened. In fact, the bird is considered common near the coastal areas that it inhabits, such as in Australia and the Torres Strait islands. However, it is uncommon in semiarid areas and has become scarce in arid zones. The pheasant coucal has also become uncommon in the Pilbara Region in western Australia, where earlier it was believed to be moderately common.

PROFILE PHEASANT COUCAL

With its dark plumage and rather short wings, the pheasant coucal is an extremely poor flier whose terrestrial nature seems a natural adaptation.

BILL
The slender bill has an arched upper mandible, used to capture insects.

MALE EYE
The male's iris is red, unlike the female's, which is yellowish orange.

PLUMAGE
Mottled plumage helps conceal the coucal on the ground. The male and female look similar.

FEET
The coucal's feet are *zygodactyl*, with two toes directed backward and the other two forward, allowing it to perch easily.

TIMOR PHEASANT COUCAL
While its wings and tail share the same rufous-brown coloration, the Timor pheasant coucal, *C. p. mui,* (a subspecies), is otherwise covered in a white-to buff-plumage, making it much lighter than the pheasant coucal.

WINGS
The coucal's short wings make flight awkward and slow; the bird prefers to stay on the ground.

TAIL
The coucal's long tail is black and brown, with the same rufous pattern as its wings.

CREATURE COMPARISONS

The African black coucal *(Centropus grillii)* only measures up to 14" in length, considerably smaller than the pheasant coucal. Although both birds are predominantly black, the aptly named black coucal's plumage is covered with an oily sheen; its shiny feather shafts also create a flecked effect. While the African black coucal resides throughout central Africa, frequenting tall grass and reedbeds, the pheasant coucal covers most of New Guinea and the northern tip of Australia, remaining in its preferred habitat of dense vegetation.

African

Pheas.

VITAL STATISTICS

WEIGHT	8–11 oz.
LENGTH	21–31"
SEXUAL MATURITY	2–3 years
BREEDING SEASON	September–May; varies according to region
NUMBER OF EGGS	3–5
INCUBATION PERIOD	9–10 months
FLEDGING PERIOD	17 days
BREEDING INTERVAL	Female may lay several clutches in a season
TYPICAL DIET	Insects and small vertebrates
LIFESPAN	Unknown

RELATED SPECIES

- **The pheasant coucal is 1 of 28 species in the genus *Centropus,* which contains the bay coucal, *C. celebensis,* and the buff-headed coucal, *C. milo.* The coucals belong to the family *Cuculidae,* which also contains the parasitic nesting cuckoos, as well as the anis, couas, malkohas and roadrunners. Members of this family share similarities in the head, body, legs and feet.**

Pheasant-tailed Jacana

• ORDER •
Charadriiformes

• FAMILY •
Jacanidae

• GENUS & SPECIES •
Hydrophasianus chirurgus

KEY FEATURES

- Female mates with several males a year, leaving each of them with a clutch of eggs to rear while she goes in search of the next breeding partner
- Male guards eggs and chicks constantly, tucking them under his wings and carrying them when he goes out foraging or flees from predators

WHERE IN THE WORLD?

Found throughout India and locally in Southeast Asia, the Philippines, Taiwan and southern Borneo; also breeds as a summer visitor in China

LIFECYCLE

The male pheasant-tailed jacana is a model parent. Abandoned by his mate after she lays her eggs, he accepts sole responsibility for both incubation and rearing his young brood.

▶ **WALKING ON WATER**
The jacana strolls lightly over lily pads.

HABITAT

The jacana lives among freshwater lakes, swamps and rice fields, where there's a luxuriant growth of lilypads, lotus plants and other partially submerged vegetation. If flood or drought destroys its favored sites, the bird moves in search of another suitable habitat.

In summer, the jacana mostly occurs from sea level to altitudes of 5,000', but it has been seen at up to 12,500' in the Himalayas. Most birds descend to warmer, low-lying wetlands in winter.

BREEDING

The distinctive feature of jacana society is that the female mates with several males, which are left to incubate and rear their young. A single female may mate with as many as 10 males in a season, leaving them with up to four eggs each.

Each male constructs a simple nest, weaving a raft of grass or waterweed stems. This platform may be anchored to plant stems, rest on partially submerged vegetation or float freely.

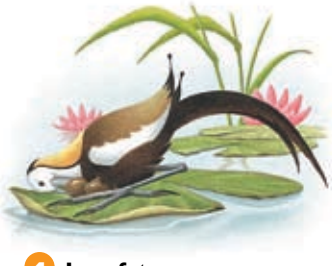
Once the chicks hatch, the male guards them constantly. He alerts them to danger with a call, at which they dive below water and remain motionless, with only their bills breaking the surface. When the father leaves the nest, he carries his young under his wings, with their long toes dangling near his belly.

THE GREAT ESCAPE

1 In fear...
Something disturbs the incubating male. Suspecting that his nest has been spotted by a predator, he moves his eggs to a safer place.

2 In reverse...
Tucking an egg between his bill and breast, he walks carefully backward, rolling his precious cargo over aquatic vegetation.

3 In water...
Anxious to complete the move quickly, the bird is undeterred by gaps between the lily pads, wades in and floats the egg across the water.



4 In safety
Having transferred the entire clutch, the male tucks the last of the eggs under his feathers and prepares to build a new nest.

DID YOU KNOW?

- **One of the local names for the pheasant-tailed jacana in India translates as "little white water princess."**
- **In its spring-summer breeding plumage, the jacana resembles a magpie from a distance.**
- **The jacana is generally silent, but has a loud, mewing call in the breeding season.**
- **The name jacana is the Portuguese version of an Amazonian Indian name applied to the wattled jacana of South America.**

BEHAVIOR

The pheasant-tailed jacana is stronger on the wing than other jacanas, enabling it to fly to warmer wintering areas where it often forms flocks of up to a hundred. At other times, the bird is usually seen singly or in pairs as it steps daintily, with jerking tail and high steps of its huge feet, across floating vegetation. Although its normal gait is slow and deliberate, the pheasant-tailed jacana is also capable of running at high speed when chasing off rival jacanas. It also swims well, even though it doesn't have webbed feet.

Although wary when predators are about, the jacana isn't normally a shy bird as far as humans are concerned and is often seen walking upon surface vegetation on village ponds only a few feet from noisy throngs of people washing and bathing.

▲ **RUNNING SCARED**
Rarely, the male picks up an egg in his bill and flies away from a predator; he returns later to rescue any remaining eggs.

◀ **SPREAD THE LOAD**
Long toes spread its body weight so it can stand on floating vegetation.

FOOD & FEEDING

The pheasant-tailed jacana feeds on both vegetation and live prey, the proportions depending upon local availability. Some experts claim that the jacana is largely vegetarian, but stomach contents have shown that mollusks form the bulk of the bird's diet.

The jacana obtains much of its food as it treads over lush aquatic vegetation picking up mollusks, amphibian and insect larvae and seeds. It may break leisurely foraging with a sudden dash to capture an insect or small fish. It also swims in search of food and may even up-end like a duck, submerging its head and cocking its long tail feathers to reach snails and succulent roots.

▼ **DABBLE AND DIP**
A strong swimmer, the jacana pushes into open water to forage for roots.

CONSERVATION

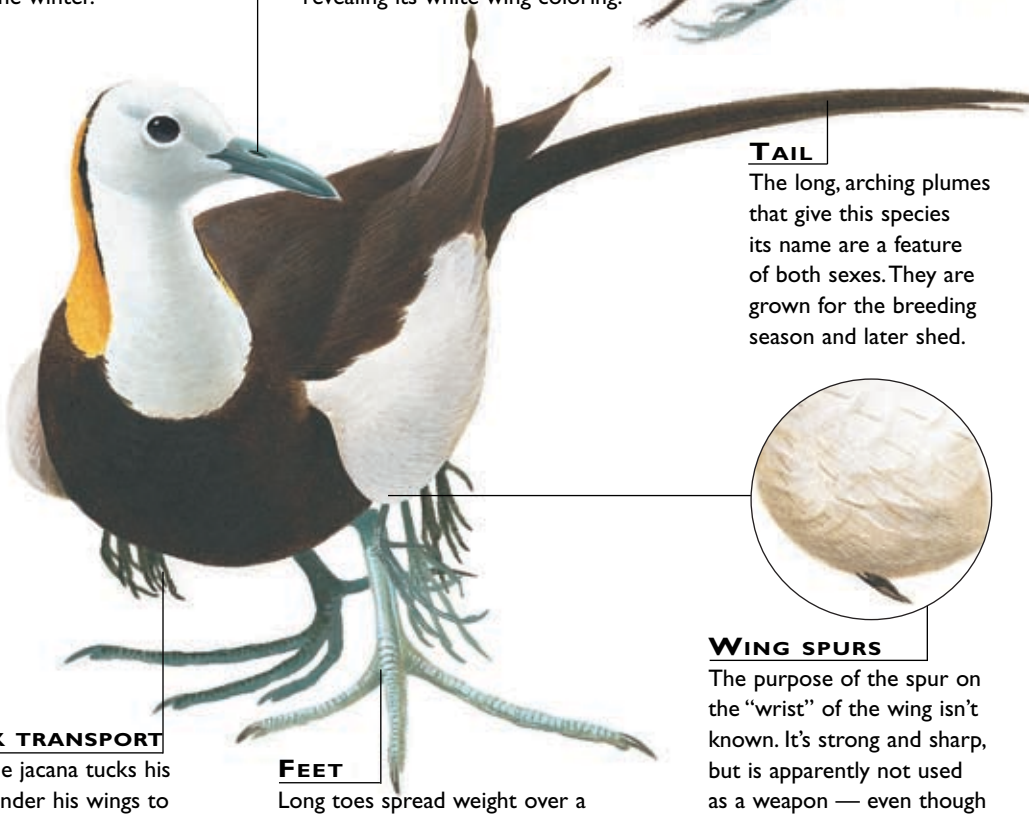
The pheasant-tailed jacana appears to be thriving throughout its extensive range. Success is boosted both by the wide dispersal and high number of its egg clutches and its adaptable diet. It can also nest and feed in areas close to humans. Periodic climactic extremes and the drainage of wetlands may adversely affect the species' numbers at a local level, but overall it isn't under threat.

PROFILE PHEASANT-TAILED JACANA

The female is very much the dominant bird in pheasant-tailed jacana society. Larger than the male, she grows an even more splendid tail.

BILL
Slate-blue during the summer, the bill changes to yellow with a brown tip in the winter.

FLIGHT
In flight, the pheasant-tailed jacana flaps its wings in a slow, deliberate manner, trailing its long legs and revealing its white wing coloring.



TAIL
The long, arching plumes that give this species its name are a feature of both sexes. They are grown for the breeding season and later shed.

WING SPURS
The purpose of the spur on the "wrist" of the wing isn't known. It's strong and sharp, but is apparently not used as a weapon — even though the jacana threatens rivals with open wings.

CHICK TRANSPORT
The male jacana tucks his chicks under his wings to carry them about, leaving their legs dangling free.

FEET
Long toes spread weight over a large area, allowing the bird to walk over lily pads without sinking.

VITAL STATISTICS

WEIGHT	4–6.5 oz.
LENGTH	23" including tail plumage
WINGSPAN	25–27"
SEXUAL MATURITY	2 years
MATING SEASON	Coincides with local rains
NUMBER OF EGGS	Usually 4 per clutch
INCUBATION PERIOD	About 26 days
FLEDGING PERIOD	50–60 days
NUMBER OF BROODS	1–3 per male; up to 10 per female
TYPICAL DIET	Mollusks, insects, seeds, roots
LIFESPAN	Not known

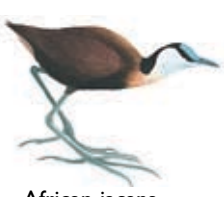
RELATED SPECIES

● The eight jacana species are found in the Americas, from southern U.S. to northern Argentina, and in Africa, Australia, India, Indonesia, Southeast Asia, New Guinea and the Philippines. Relatives include plovers, family *Charadriidae*, the painted snipe, *Rostratulidae* family, and oystercatchers, family *Haematopodidae*. The sandpipers, family *Scolopacidae*, are more distant relatives.

CREATURE COMPARISONS

Some of the pheasant-tailed jacana's relatives share its distinctive habits. The African jacana, or lily-trotter, also treads lightly over floating plants, as does the American purple gallinule.

The painted snipe of Africa, Asia and Australia (more closely related to jacanas than to true snipes) shares the female jacana's habit of taking several mates.



African jacana

American purple gallinule

Painted snipe

Pheasant-tailed jacana

Raggiana Bird of Paradise

• ORDER •
Passeriformes

• FAMILY •
Paradisaeidae

• GENUS & SPECIES •
Paradisaea raggiana

KEY FEATURES

- Bold plumage and a dazzling courtship display make it one of the wonders of the natural world
- Males dance in treetops, showing off bright-red, lacy plumes in cascades of shimmering color
- Female chooses the most impressive dancer for a mate, then raises her brood alone

WHERE IN THE WORLD?

In southern and eastern Papua New Guinea, from Milne Bay in the east, north to the Huon Peninsula, west almost to the border of Irian Jaya

LIFECYCLE

The courtship dance of the male Raggiana bird of paradise begins at dawn. Wild cries ring through the forest as it competes with other males for mates, shaking its plumes.

HABITAT

The bird of paradise favors lowland rainforest, but is also found in mountain forests up to about 4,950'. Although it rarely leaves the tree canopy, it may visit open land at the woodland edge. Some trees are used regularly as display areas (*leks*) where up to 10 male birds gather to show off their flamboyant plumes.

In the constantly warm, humid rainforests, the Raggiana can find a tree in fruit at any time of year. As a result, it requires a foraging area of less than 0.2 sq. mile and can survive even in wooded gullies where the surrounding area has been deforested.

▲ **ISLAND BEAUTY**
This bird of paradise is found only in the forests of eastern New Guinea.

▼ **BIRD-WATCHING**
The bird of paradise's colorful plumage lets its displays be seen among the thickest foliage.

FOOD & FEEDING

▲ **FOOD BILL**
Although its bill is best suited to eating fruit, the Raggiana is adept at snapping up insects.

Abundant fruits of forest trees form the main diet of the Raggiana. It also eats some insects found among the branches. As with other fruit-eating birds, young are raised almost exclusively on insects to give them the extra protein needed for growth. The female feeds them by regurgitating directly into their gaping mouths.

Plumed male Raggiana birds of paradise find most of their food close to their display trees. Females and young or molting males that don't possess plumes may form small flocks — sometimes in the company of other species — and forage over a wider area.

DID YOU KNOW?

- **Because native hunters removed the legs from the birds they killed, the first explorers believed that these birds were in fact wanderers from paradise, where they spent their whole lives in the air.**
- **The Raggiana bird of paradise is featured on the national crest of Papua New Guinea.**

BREEDING

▲ **SHOW-OFF**
The dominant male will mate with several females.

BEHAVIOR

The spectacular plumage of the male Raggiana exists for one purpose — to attract a mate. Every morning in the breeding season, a group of plumed males gathers at the display area. Each bird claims and defends a bare branch in the rainforest canopy on which to show off his plumage to the females.

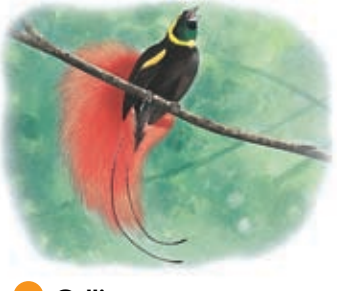
Dancing males announce their presence with a chorus of synchronized calls; their frenzy intensifies as females arrive to watch the show. The males' courtship dance includes a number of set routines, not always performed in the same order, but all intended to heighten the effect of the brightly colored plumage.

Younger males, yet to acquire their plumes, go through the motions of the dance at the edges of the main display area, but usually get a chance to mate only when adult males are scarce.

LORD OF THE DANCE

1 Clapping...
After some wing-fluttering, the Raggiana begins his main display by raising his wings and clapping them loudly over his back.

2 Quivering...
Leaning forward with head held down, the bird flicks his open wings to agitate the long flank plumes, forming a quivering cascade of color.



3 Calling...
Suddenly, he stands upright. Throwing back his head and calling loudly, he closes his wings, thrusts them down and hops sideways.

4 Bowing
Head bowed, the male points his plumes up, holding them still to show their undersides, while he awaits the female's verdict.

The female chooses her favorite dancer from the males; mating takes place after a further flurry of bobbing and prancing. There's usually one dominant ("alpha") male, who'll mate with the greatest number of females. This ability of one male to mate with many females and the ability of junior, unplumed males to breed when there's no alpha, let the species survive the era of plume-hunting.

After mating, the female builds a cup-shaped nest in the fork of a tree, up to 66' above the ground. She uses lengths of vine and dead leaves and lines the nest with soft palm leaf fibers. Eggs hatch after 20 days, and she continues to feed the chicks for more than a month after they fledge at about three weeks.

▶ **WAITING AND WATCHING**
The dull-colored female chooses a favorite male dancer, who continues to display until they mate.

CONSERVATION

The bird of paradise is common through its range and has withstood centuries of hunting by Papuan tribes, who value its plumes for their headdresses. It was once hunted for the Western fashion trade, but this was outlawed in the 1920s. Habitat destruction is a long-term threat.

PROFILE RAGGIANA BIRD OF PARADISE

A bird built for display, the male spends up to five months of every year in molt — shedding his old feathers and growing a fresh set of plumes.

BILL

Resembling that of its crowlike ancestors, the powerful bill is typical of many fruit-eating birds. In the male it's powder-blue inside and out.

FEMALE

The female is smaller than and very different from the fully plumed male. Her male chicks resemble her until they begin to acquire adult plumage.

WINGS

The short, rounded wings are used for display and are also strong enough to carry a plumed male through the air, although his undulating flight appears labored.

LEGS & FEET

Stout and strong, the legs give the displaying male a firm grip of his perch as he arches forward, seemingly beyond the point of balance. As with the bill, the legs and feet are very like those of a crow.

PLUMES

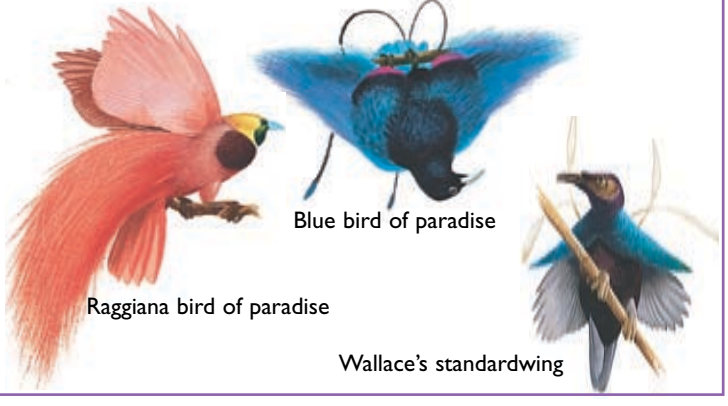
Lacy feathers up to 20" long grow from each side of the breast; their bases are usually hidden by the wings when the bird isn't displaying.

VITAL STATISTICS

WEIGHT	Male 11–12 oz.; female 6–7 oz.
LENGTH	Male 28" with plumes; female 11"
WINGSPAN	19–25"
SEXUAL MATURITY	Male 4–6 years; female 2 years
BREEDING SEASON	September –November
NUMBER OF EGGS	1 or 2
INCUBATION PERIOD	About 20 days
FLEDGING PERIOD	19–20 days
TYPICAL DIET	Mainly fruit; some insects
LIFESPAN	Probably up to 16 years

CREATURE COMPARISONS

The finery of the Raggiana bird of paradise is equaled by the blue bird of paradise, which displays upside down, flaring its wings and calling raucously. Wallace's standardwing, with 6" plumes from its wing edges, is one of the few birds of paradise that live outside New Guinea — on the Moluccan Islands.



RELATED SPECIES

● **Most of the 43 bird of paradise species live in Papua New Guinea, including the red bird of paradise** (below)**; a few are found in the Moluccan Islands and Australia.**

Rainbow Bee-eater

• ORDER •
Coraciiformes

• FAMILY •
Meropidae

• GENUS & SPECIES •
Merops ornatus

KEY FEATURES

- Removes stinger from bees and other stinging insects before swallowing them whole
- Reveals a brilliant display of colors during its frequent attacks against flying insects
- Bicycles its legs, while balancing on its bill, to dig dirt for its nesting tunnels

WHERE IN THE WORLD?

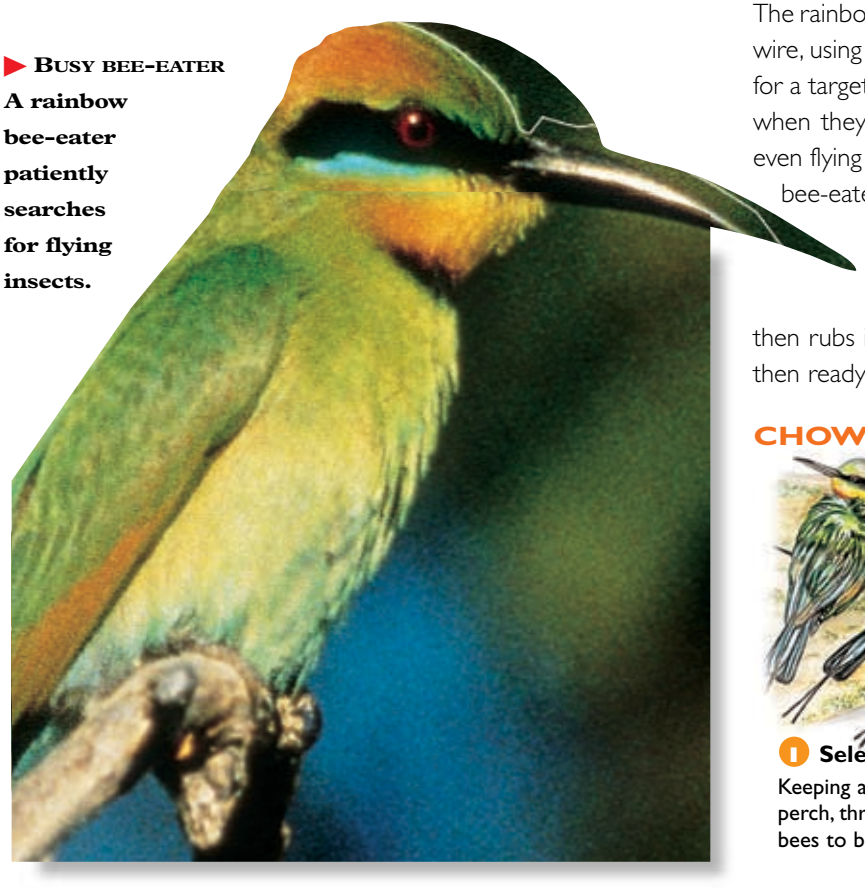
Throughout Australia, including the Northern Territory and New South Wales, but absent from Tasmania; also in New Guinea and Indonesia

LIFECYCLE

The colorful and agile rainbow bee-eater easily catches insects in midair, then meticulously removes the stingers from its prey before devouring them.

HABITAT

The rainbow bee-eater, also known as the rainbow bird, can be seen in almost any open Australian countryside where loose, pliable sand is available for it to dig nests. It invites attention across the continent with its bright colors and acrobatic flying. The bird frequents sand plains, savannah woodlands and roadsides, and it is not uncommon to see a rainbow bee-eater perched on a telephone wire or in a city park or garden. The rainbow bee-eater also needs to be near water, not only for drinking and bathing but because it supports vegetation, which attracts the flying insects that the bee-eater pursues. In July, Australia's winter, almost all rainbow bee-eaters migrate north. They noisily call as hundreds flock together and migrate up to 3,000 miles, as far north as New Guinea and Indonesia.



BUSY BEE-EATER
A rainbow bee-eater patiently searches for flying insects.

CONSERVATION

No species of bee-eater is endangered. Through habitat conservation and captive breeding, the rainbow bee-eater's numbers remain strong. Beekeepers sometimes destroy the birds to protect their stock. But, ironically, the rainbow bee-eater also assists beekeepers, since it eats numerous insect predators of honeybees, including bee-wolves and hornets.

BEHAVIOR

The rainbow bee-eater's lively colors flash as it performs its acrobatics; coppery flight feathers shine in the sunlight as the bee-eater soars, twists and turns during its swift pursuit of flying insects. But the rainbow bee-eater's presence is usually first revealed by its noisy calls, often emanating from roosts of 500 or more excited birds. The rainbow bee-eater gathers in large flocks during daily nomadic journeys for food and also during long winter migrations north.

FOOD & FEEDING

The rainbow bee-eater perches high in a treetop or on a telephone wire, using its tail for balance while surveying and waiting patiently for a target. Insects on the ground are safe from the bee-eater, but when they fly, the chase begins. Hornets, locusts, dragonflies and even flying termites fall prey to this bird. But bees are the rainbow bee-eater's favorites, especially honeybees, which form the bulk of the bird's diet. With an upward head flick, the bee-eater nabs the flying insect, and transports its live victim back to its perch. There it beats it to death, then rubs it against the perch to remove the stinger. The insect is then ready to be swallowed whole or given to a hungry nestling.

CHOW TIME

1 Selection...
Keeping a close watch from their perch, three bee-eaters wait for bees to buzz by.

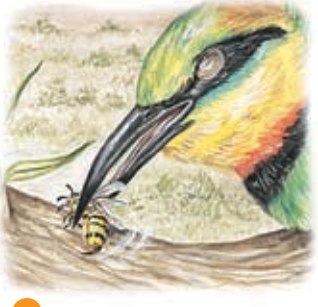
2 Collection...
One bird snatches a large wasp in its long, slender bill, which is ideal for catching flying insects.

▲ **PICNIC PERCH**

After graceful twists and turns during pursuit of a flying insect, the bee-eater settles down to eat.

3 Inspection…

At the perch, the wasp is quickly killed, but it's not yet ready to eat. First the stinger must be removed.



4 Ejection

The bee-eater rubs the wasp's tail against the perch, effectively eliminating the stinger.

DID YOU KNOW?

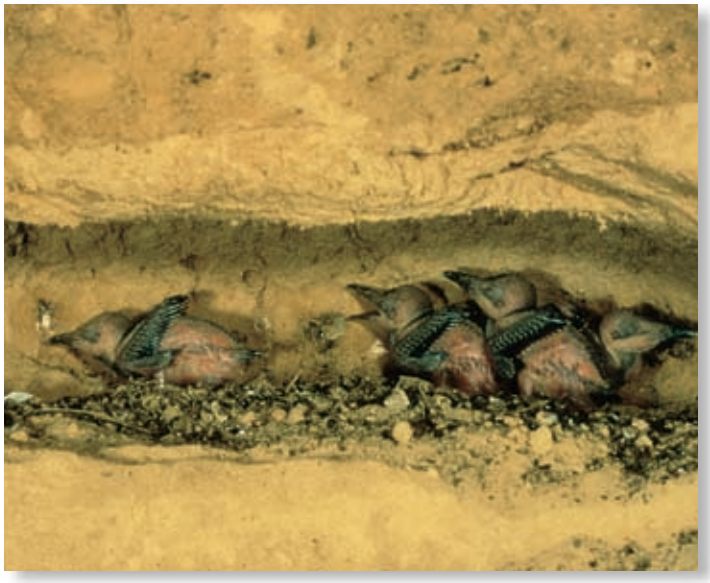
- **Bee-eaters regurgitate pellets that contain indigestible parts of insects; these reveal the birds' dietary preferences.**
- **At 26 days old, a nestling weighs 10% more than an adult. In preparation for its first flight, it loses weight over the next four days.**

BREEDING

A bee-eater mates for life, usually pairing up by the age of 1 year. The pair has no elaborate courtship ritual, but does practice nuptial feeding. This mutual food-giving strengthens the pair's bond. Sometimes the pair will postpone mating, and instead help another pair feed chicks. Approximately one in every seven pairs has an extra helper or two. The bee-eater expertly excavates its nest. It loosens the earth with its strong beak first, then balances on the tip of the bill and the bends of its wings, while bicycling its feet to kick dirt out of the tunnel. Up to 2 yards long, the tunnel's diameter of 2–3" is large enough to accommodate the crouching bee-eater and its nestlings. The female lays five eggs that hatch within 36 hours of one another. The nestlings are naked, blind and helpless at birth. The older chicks mature first, and sometimes are the only ones to receive food, as they win the race to the mouth of the tunnel — and survival.

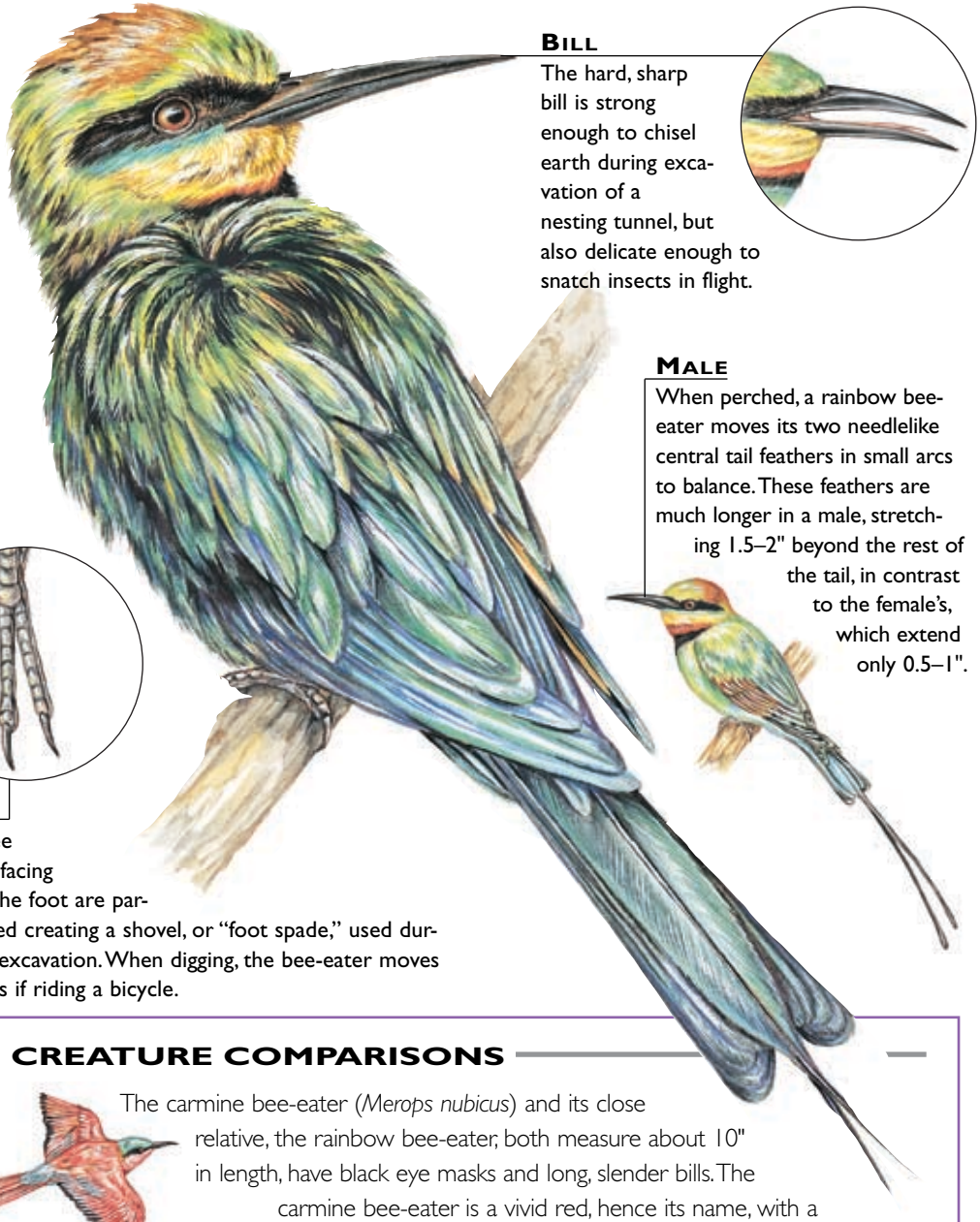
▼ **CONCEALMENT REVEALED**

A cutaway of a bee-eater's protective nesting tunnel reveals four chicks anxiously awaiting food.



PROFILE RAINBOW BEE-EATER

The rainbow bee-eater, with colored feathers that span the spectrum, scans its surroundings constantly for flying insect.



BILL

The hard, sharp bill is strong enough to chisel earth during excavation of a nesting tunnel, but also delicate enough to snatch insects in flight.

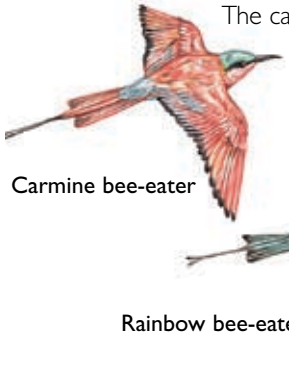
MALE

When perched, a rainbow bee-eater moves its two needlelike central tail feathers in small arcs to balance. These feathers are much longer in a male, stretching 1.5–2" beyond the rest of the tail, in contrast to the female's, which extend only 0.5–1".

FEET

The three forward-facing toes of the foot are partially fused creating a shovel, or "foot spade," used during nest excavation. When digging, the bee-eater moves its legs as if riding a bicycle.

CREATURE COMPARISONS



Carmine bee-eater

Rainbow bee-eater

The carmine bee-eater (*Merops nubicus*) and its close relative, the rainbow bee-eater, both measure about 10" in length, have black eye masks and long, slender bills. The carmine bee-eater is a vivid red, hence its name, with a blue-green crown, compared to the multicolored rainbow bee-eater, which has a golden-bronze crown. Both birds eat airborne insects and dig protective tunnels for their hideaway nests. The carmine bee-eater is a native of Africa; thousands of its tunnel openings dot the sand cliffs there, far from the rainbow bee-eater's nests throughout Australia.

VITAL STATISTICS

WEIGHT	0.7–1.2 oz.
LENGTH	7.5–10"
WINGSPAN	13–18"
SEXUAL MATURITY	About 1 year
BREEDING SEASON	Varies according to region
NUMBER OF EGGS	4–5
INCUBATION PERIOD	About 24 days
FLEDGING PERIOD	About 30 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Mainly bees, but also other flying insects
LIFESPAN	Unknown

RELATED SPECIES

- The order *Coraciiformes* includes bee-eaters, rollers, motmots, kookaburras and kingfishers. All have large heads with short necks and legs, ideal for nesting in holes. The 24 species of brightly colored bee-eaters in three genera all have black eye masks. In addition to the rainbow bee-eater, the genera contain the blue-cheeked bee-eater, *Merops persicus*, and blue-bearded bee-eater, *Nyctyornis athertoni*.

Rainbow Lorikeet

• ORDER •
Psittaciformes

• FAMILY •
Psittacidae

• GENUS & SPECIES •
Tricholglossus haematodus

KEY FEATURES

- Also called the rainbow lory, the bird displays a cornucopia of colorful plumage
- With a world population in excess of 5 million birds, it is one of the most common species through much of its range
- To supply its daily energy needs, the lorikeet must take nectar from about 5,000 flowers

WHERE IN THE WORLD?

Found from Bali to Lombok, through many of the islands of Indonesia, New Guinea and the Solomons, into eastern and southeastern coastal Australia

LIFECYCLE

With its bright and brassy plumage and friendly nature, the rainbow lorikeet is the most gaudy and gregarious bird in the South Pacific.

HABITAT

The rainbow lorikeet occurs in a wide variety of habitats, from human settlements to forest, coconut plantations, savannah, eucalyptus stands and mangroves. Although the lorikeet inhabits most types of lowland and wooded country within its range, including swamp forest and secondary growth, it tends to favor edges and disturbed vegetation rather than interior or closed-canopy formations. Lorikeets typically occur from sea level to more than 2000', but will occasionally ascend higher depending on the island's elevation.

▲ **SPLASH OF COLOR**
Lorikeets stand out in the forest branches.

BREEDING

Lorikeets tend to be nomadic and breed year-round, wherever and whenever trees and other plants are sufficiently in bloom to support the extra demands of rearing hungry families. Peak nesting tends to occur in the wet season, when the trees and shrubs come into flower. Breeding has been observed during most months in Indonesia, New Guinea and northern Australia. Because they do not have a well-defined breeding season, lorikeets pair for life: this way they are ready to breed anytime conditions are favorable. The courtship display includes some wing-fluttering to reveal the colorful underwing pattern, swinging upside down, head-bobbing, tail-fanning and bill-fencing. The monogomous, life-long breeding pair builds their nest in a deep, unlined hole in the limb or trunk of a large tree. The female lays 2–3 white eggs, and the white-downed young hatch in around 25 days, fledging in 7–8 weeks. While only the female incubates the eggs, both concerned parents take turns caring for the young.

▼ **HAPPY COUPLE**
Monogomous lorikeet breeding pairs stay together for life.

DID YOU KNOW?

- **Extremely energetic rainbow lorikeets that inhabit small groups of closely clustered islands may fly back and forth from one to the other daily in search of food.**
- **The rainbow lorikeet tongue is quite unlike that of other parrots, being furnished with a tuft of papillae, or extremely fine hairs; the lorikeet's genus name, *Trichoglossus*, means "hair-tongued."**

BEHAVIOR

Active, belligerent and noisy, the rainbow lorikeet is fast and furious in flight, where it often comes within a few feet of an observer. The lorikeet emits a sharp, rolling screech, repeated at regular intervals during flight. At rest, the lorikeet emits a soft twittering and loud, clear musical call. At dawn and the early part of the day, the birds feed on blossoms, often hanging upside down to reach them. During the hottest part of the day, they preen themselves and each other before settling down for a couple of hours. Later in the afternoon they feed again, chattering shrilly. Lorikeets wheel acrobatically as they come in to land at dusk. The birds are most often encountered in small, noisy groups, but communal roosts may involve many hundreds of birds. To bathe, lorikeets simply flap about in birdbaths or canopy foliage.

▲ **SPLISH SPLASH**
A lorikeet bathes itself during an afternoon break.

CONSERVATION

Rainbow lorikeet populations are extremely strong. In fact, with a world population in excess of 5 million birds, the lorikeet is the most common bird through much of its range. Although abundant throughout much of New Guinea and other South Pacific areas, the lorikeet is rare on Bali. However, this is possibly due to the fact that it is a recent colonizer there from Lombok and has not yet built up a strong flock.

FOOD & FEEDING

The lorikeet is a specialized feeder, chiefly eating nectar and pollen. In fact, 87% of the lorikeet's diet consists entirely of nectar — in one part of Australia, the lorikeet is found to enjoy about 43 different species of plants. However, the lorikeet also enjoys the fruit of the ficus and trema plants, as well as the pupae of the ponciana moth.

As it flies from one flower to the next, the lorikeet uses its brushlike tongue to collect pollen and nectar from flowers. The papillae on the tip of the tongue are arranged into a fringe around the tip, working like a paintbrush to gather the pollen and nectar. The lorikeet's gizzard is weak, since the bird ingests mainly nectar and pollen.

FLOWER SHOPPING

1 Out of town...
Rainbow lorikeets often have to fly long distances in search of pollinating flowers.

2 Feeding ground...
The lorikeet walks up a thin branch of bottlebrush toward a large, red flower at the tip.

3 Upside down...
Agile feet allow the lorikeet to hang upside down and feed from the bottlebrush flower.

4 All around
The lorikeet's unique tongue allows it to brush the flower to gather the pollen and nectar.

PROFILE RAINBOW LORIKEET

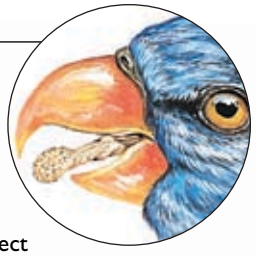
A brilliantly plumed, jewel-like bird, the lorikeet is easily recognized by its distinct coloration, heavy build and long tail.

IN FLIGHT

The lorikeet's tapering wings and pointed tail permit swift, agile flight; large, circling flocks utter piercing cries.

BILL & TONGUE

The bill is sharply hooked but not particularly powerful. Protrusions (papillae) on the tip of the tongue expand like the tentacles of a sea anemone to collect pollen and nectar.



PLUMAGE

The rainbow lorikeet's plumage truly befits its name. It is a stunning mixture of green, red, yellow, orange and blue.

FEET & LEGS

The lorikeet's strong feet and short legs enable the agile bird to hang upside down to reach otherwise inaccessible flowers.

VITAL STATISTICS

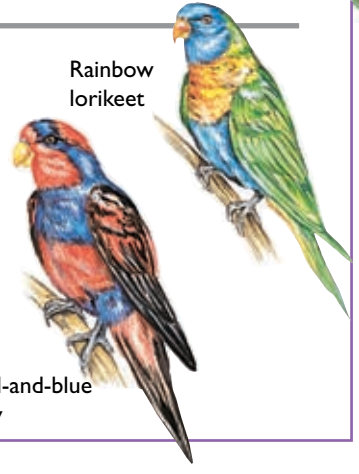
WEIGHT	2.6–5.5 oz.
LENGTH	9–12"
SEXUAL MATURITY	Unknown
BREEDING SEASON	Throughout the year
NUMBER OF EGGS	1–3
INCUBATION PERIOD	25 days
FLEDGING PERIOD	50–55 days
BREEDING INTERVAL	Less than 1 year
TYPICAL DIET	Nectar, pollen and insects
LIFESPAN	Average 15 years in captivity; unknown in wild

RELATED SPECIES

- Parrots and lories make up the family *Psittacidae*, 1 of 2 families in the order *Psittaciformes*, with the other family, *Cacatuidae*, containing the cockatoos. With 78 genera and 332 species, the family *Psittacidae* includes the world's only flightless parrot, the kakapo (*Strigops habroptilus*), and several neotropical parrots, such as the red-and-green macaw, *Ara chloroptera*.

CREATURE COMPARISONS

At 12", the red-and-blue lory (*Eos histrio*) is roughly the same size as the rainbow lorikeet. While its head and breast give it its colorful name, the red-and-blue lory is somewhat less colorful overall than the bright rainbow lorikeet. Preferring to live inside the forest, the red-and-blue lory can be seen visiting coconut plantations and other areas to feed from coconut, ficus and canarium trees, while the rainbow lorikeet tends to favor forest edges and vegetation. While the rainbow lorikeet spans through the islands of the South Pacific, the red-and-blue lory can be found on Miangas Island, north of Sulawesi.



Raven

• ORDER •
Passeriformes

• FAMILY •
Corvidae

• GENUS & SPECIES •
Corvus corax

KEY FEATURES

- The world's largest perching bird
- Eats carrion as well as small animals it is able to kill
- Superbly skilled in the air, performing simply dramatic aerobatic displays
- Adapts to a vast range of climates and habitats, from ice-cold Arctic lands and Himalayan peaks to searingly hot deserts

WHERE IN THE WORLD?

Across the Northern Hemisphere, from the Arctic (Alaska, northern Canada, Greenland, the far north of Scandinavia and eastern Siberia), south to the tropics (Honduras, Guatemala and Mexico)

LIFECYCLE

As if delighting in their mastery of the skies, groups of ravens often indulge in breathtaking aerobatics, swooping, rolling and tumbling through the air, seemingly just for fun.

HABITAT

The raven lives across vast swaths of the Northern Hemisphere, from the Arctic — where it's one of only a handful of birds to stay through the winter — as far south as tropical Central America. Very adaptable, it's at home in temperate grasslands, tundra, coniferous and deciduous forests, low-intensity farmland, mountains, steppes and deserts. It also inhabits coasts and oceanic islands. It can cope with almost any climate, from the blistering heat of Death Valley, California (air temperatures are among the highest on Earth), to the cold summits of Tibetan mountains.

◀ **ON TOP OF THE WORLD**
Ravens are often found in wild, mountain country.

DID YOU KNOW?

- **The raven plays a major part in legends and folklore of several peoples. The Anglo-Saxons thought King Arthur turned into one when he died; the Vikings regarded it as sacred.**
- **Ravens usually steer clear of the *eyrie* (nest) of the golden eagle: one of their few natural predators. Young ravens are most at risk to this hunter.**
- **A large, central Asian subspecies of raven was recorded at an altitude of 21,120' on Mt. Everest.**

BREEDING

▲ **STICK TOGETHER**
A resourceful but untidy nest-builder, the raven uses any material that it's able to carry.

FOOD & FEEDING

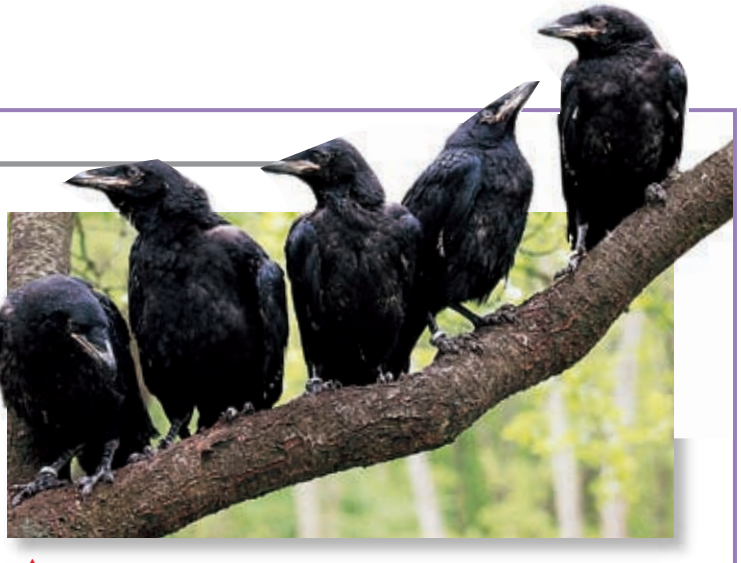
Greedily seizing any meal, the raven feeds on almost every type of carrion it can find. The bulk of its diet are mammal carcasses, from rabbits and hares to deer and elk, even stranded whales; livestock, especially sheep, are particularly important. During the winter in the U.S., deer that have starved to death or have been injured trying to cross the ice of frozen lakes provide a significant meal for raven in the area. Ravens also feed upon animals killed on roadways or left by predators.

If carrion is scarce, the raven can kill a range of small mammals and birds, targeting sick, wounded or young individuals and stabbing them to death with its bill. Whenever it can, it steals birds' eggs, hunts crabs, reptiles, mollusks, earthworms and slugs if available, and even feeds on bones and seeds.

▶ **CLEANING UP**
A raven gorging itself on the carcass of a hare. What it can't eat at one sitting, it may bury to eat later.

Each pair of ravens builds a nest on an inaccessible cliff ledge or at the top of a tall tree. Early breeders, they lay their eggs in February to take advantage of losses of young farm animals as well as the deaths of newborn deer and wild sheep.

The female alone incubates the clutch of 4–6 eggs for about three weeks, relying on her mate to provide her with food. But the demanding task of feeding the offspring calls for a dual effort and lasts for 5–7 weeks, when the young finally leave the nest *(right)*. If they haven't moved on by autumn, their parents chase them away from their territory.



▲ **FLOWER POWER**

The ruby-throat is attracted to nectar-rich blooms.

BLACK MAGIC

1 Fly-past...

With the breeding season, a male and female loop, glide and dive in display, using the sky as a stage.

2 Preen...

Courtship continues in a dead tree, where the pair preens each other to reinforce their lifelong bond.

3 Build...

Both carry nest material to a rocky crag. The female adds a final touch to their nest: a snug hair lining.

4 Feed

To satisfy their hungry chicks, both parents have to bring food, such as this baby hare.

BEHAVIOR

The raven is a master of the air, performing complex aerial maneuvers with grace — sometimes for no apparent reason other than the "enjoyment" of its own abilities. It circles, soars and nose-dives, and, in pairs or parties, often engages in tail-chasing dashes and "stunts," such as half-closing its wings to make itself stall and tumble downward. It can even flip over and fly upside down for short distances.

Along with other members of the crow family, the raven is regarded as among the most intelligent of birds. There are records of it approaching its nest site by a hidden route to avoid giving away its location.

▶ **QUICK THINKER**

In captivity, the raven learns to mimic the human voice or perform "tricks" for food rewards, such as throwing coins with its bill. It's also able to pass a variety of simple intelligence tests.

CONSERVATION

The raven has been driven from many lowland areas as a result of human persecution, usually by landowners or farmers, but is safe in the remote parts of its vast range.

PROFILE RAVEN

As large as a red-billed hawk, the raven turns into a ruthlessly efficient hunter if its usual diet of carrion is in short supply.

BILL
The heavy-duty bill, with sharp cutting edges, strikes lethal hammer blows at live prey and tear strips of flesh from carcasses.

SKULL
The raven has relatively small eyes for a bird of its size, but they're set in large eye sockets. The bill is longer than the skull itself.

PLUMAGE
The all-black, glossy plumage shows a shimmering iridescence in strong sunlight, rather like the effect created when oil is spilled onto water. The highlights are mainly purple, with hints of blue, bronze, red and green.

JUVENILE
Less glossy black than the adult and has a bluish-gray iris *(below)*, rather than dark

VITAL STATISTICS

WEIGHT	1–3 lbs.
LENGTH	Up to 2'
WINGSPAN	4–5'
SEXUAL MATURITY	2–6 years
BREEDING SEASON	February –June
NUMBER OF EGGS	2–7 (usually 4–6)
INCUBATION PERIOD	20–21 days
FLEDGING PERIOD	35–49 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Carrion and scraps; also a range of live prey, birds' eggs and seeds
LIFESPAN	13 years in wild; 30 in captivity

CREATURE COMPARISONS

At first sight, the raven, American crow (*Corvus brachyrhynchos*) and fish crow (*C. ossifragus*) look alike: large, glossy-black birds with broad wings and long tails. But the latter birds are two-thirds the raven's size. The raven's head, wings and tail project further, giving it a more elongated, cross-shaped silhouette.

Also note that the raven's tail forms a point at the end; the American and fish crows' are rounded. The American crow is found in woodlands and suburban areas; the fish crow prefers the coast and often lives in the cities.

American crow

Raven

Fish crow

RELATED SPECIES

● Of the 115 crow species in the family *Corvidae*, 42 are "typical crows." In the genus *Corvus*, these include the American, northwestern and fish crows, as well as 9 raven species. The remaining 73 species, split in 25 genera, include jays and the black-billed magpie (below).

Razorbill

• ORDER •
Charadriiformes

• FAMILY •
Alcidae

• GENUS & SPECIES •
Alca torda

KEY FEATURES

- Propels through air or water with equal flair; a master flier, swimmer and diver
- Spreads feet, wings and tail in an awkward posture when braking for quick stops on narrow cliff ledges

WHERE IN THE WORLD?

Found in the boreal and sub-Arctic waters of the Atlantic; breeds on cliffs and islands in Scotland, France, Norway, Canada and Maine

LIFECYCLE

A champion of action, the razorbill swims, dives and flies with expertise; on land, it spends a large part of its day socializing with other razorbills on jagged cliff edges.

HABITAT

For most of the year, the razorbill, a pelagic (ocean-going) bird, spends its time in the icy waters of the north Atlantic. In the spring it returns to steep cliffs on the mainland and offshore islands to breed. Thousands of razorbills join a multitude of puffins, petrels and other birds on the steep inclines. There's room for all, since each species prefers a different type of nesting site on the almost perpendicular slopes. Razorbills choose broad projections or sheltered crevices for their nests, in an attempt to avoid the dangers of sun, wind and predatory gulls. These midlevel ledges still provide access to the sea for chicks, which leave the nest before they can fly.

▼ **CLUB RAZORBILL**

Adult and immature razorbills lounge about on large, flat outcrops on high cliffs above the nesting sites.

DID YOU KNOW?

- **The razorbill remains submerged for about 22 seconds during a dive, but can stay underwater for a maximum of 52 seconds.**
- **To establish a strong bond, a pair of razorbills will occasionally copulate up to 80 times during the month before egg laying.**

FOOD & FEEDING

The razorbill can dive to 300' or more, but usually finds its food within depths of 9–75' in the boreal seas. Hoping to catch more than one fish per dive, the razorbill often dips its head into the water a few times to scout for prey before diving. With a flick of its feet, the razorbill up ends and dives, hunting mainly for sand eels — but gobies, sardines, anchovies and herrings also make tasty meals. When gathering food for its chick, the razorbill gathers up to 20 fish crosswise in its bill before heading back to the nest. The razorbill has also been seen robbing puffins of their catch, both in the air and during underwater chases.

BREEDING

After a winter at sea, razorbill pairs usually reunite. At congregating areas on the cliff, they strengthen their bond, nibbling bills and preening feathers. At sea, they "water dance," swimming around one another. Mating takes place just weeks before egg-laying, so the birds don't bother making a nest. The female simply lays her one egg directly on the rock crevice before settling to incubate for about 35 days, occasionally tucking a small stone below her to help keep the egg in place. The male relieves her at least twice a day to feed, socialize or roost idly at sea. He trades places with her after tickling her neck.

Within hours of birth, the hungry chick taps on the distinct white bar across its parents' bill to beg for food. Both parents feed the chick and shelter it for 2 weeks, until the young chick is ready to leave the nest, but not quite ready to fly. After sunset, it dives off the high cliff into the water, followed by its father, who accompanies the chick at sea, until it's able to fly. The chick will remain at sea until it is 2–3 years of age, when it will join adults as an observer at the cliff-side nesting sites.

SEA HUNT

1 A floating raft…
Turbulent waters make floating together difficult. The razorbills, at sea for the winter, search for food through the dark waves.

2 An expert dive…
One bird spots a potential snack and descends with a powerful dive, coordinating wings, feet and tail for expert maneuvering.

3 In hot pursuit…
The razorbill "flies" through the water with rapid wingbeats and, reaching a depth of 15', closes the gap between bird and prey.

4 A selfish snack
Without a chick to feed, the razorbill keeps the treat. It swallows the fish whole, while keeping an eye out for more.

▲ **NO BABYSITTER**
The parents trust that the boulder will hide their chick until they return with food.

BEHAVIOR

▲ **MEETING PLACE**
Razorbills are very sociable when breeding.

The ease and speed with which razorbills swim resembles that of penguins. But, unlike penguins, the razorbill can fly. Launching from its perilous nesting ledge, the bird flaps its wings slowly in a glide to sea level. Then, rapidly beating its pointed wings, the razorbill flies over the cool waters with tail and feet stretched behind for added lift. When returning to land, the razorbill often flies over the landing site a few times for inspection before touchdown. It sweeps upward slightly to decelerate and spreads its wings, tail and feet in an awkward-looking braking posture.

On land, razorbills spend their time at the nest or at areas nearby called clubs. They are highly social when breeding; birds from two or three nesting groups may associate at the gathering area.

CONSERVATION

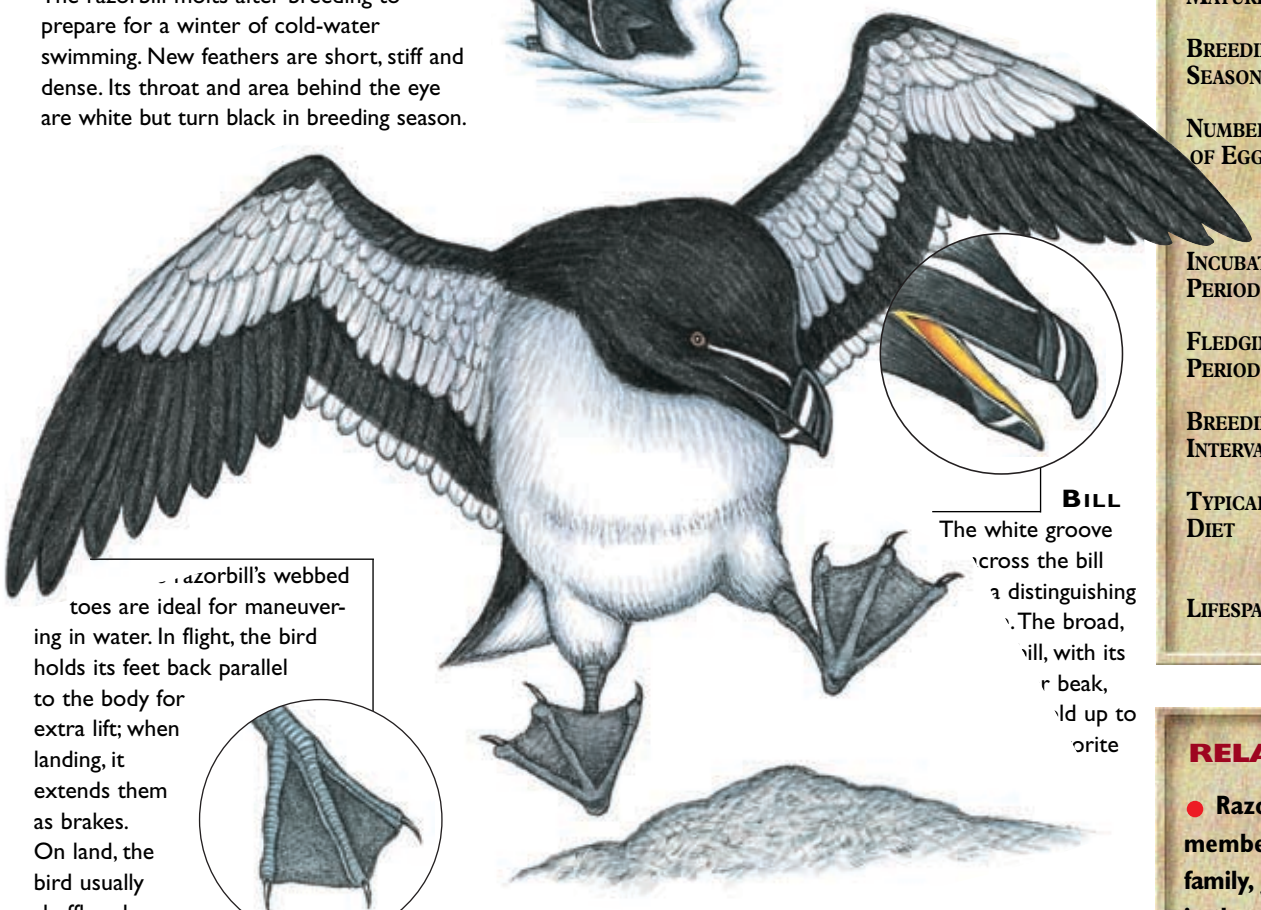
Inaccessibility prevents an accurate tally of the number of razorbills, though estimates reach as high as 2.5 million. The birds benefit from their remoteness, but oil spills and fishing nets have caused recent declines. Listed as threatened by the state of Maine, they are also protected on the Gannet Islands ecological preserve, the largest colony in eastern North America.

PROFILE RAZORBILL

With speed and skill, the razorbill cuts through the air or water with a sleek body designed for flying, swimming and even diving to depths of over 300'.

WINTER PLUMAGE

The razorbill molts after breeding to prepare for a winter of cold-water swimming. New feathers are short, stiff and dense. Its throat and area behind the eye are white but turn black in breeding season.



BILL

The white groove
cross the bill
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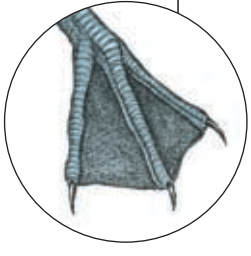
azorbill's webbed
toes are ideal for maneuvering in water. In flight, the bird holds its feet back parallel to the body for extra lift; when landing, it extends them as brakes. On land, the bird usually shuffles along

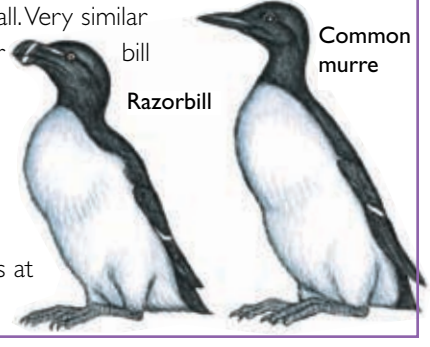


VITAL STATISTICS

WEIGHT	28 oz.
LENGTH	14–17"
WINGSPAN	24–27"
SEXUAL MATURITY	4–5 years
BREEDING SEASON	April–June
NUMBER OF EGGS	1
INCUBATION PERIOD	35–37 days
FLEDGING PERIOD	16–28 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Fish and aquatic vertebrates
LIFESPAN	20 years

CREATURE COMPARISONS

The common murre, or guillemot *(Uria aalge)*, is one of the largest members of the alcid family, weighing up to 32 oz. and measuring 16" tall. Very similar to the razorbill in appearance, the murre has a thinner, longer bill and shorter tail. Coloring also distinguishes the birds in the water or at their cliff-side nests. Murres are blackish-brown, whereas razorbills are a darker black. With ranges similar to the razorbill, the murre selects narrow rock ledges and lays slightly oblong eggs, which are shaped to roll in circles, so as not to roll off the small ledge. The razorbill picks wider ledges at the same cliffs and lays oval eggs that roll straighter.



RELATED SPECIES

● **Razorbills and murres, members of the *Alcidae* family, join terns and gulls in the order *Charadriiformes*. A relative of the puffin, the razorbill is closely related to the extinct flightless great auk. Because of its dense feathers and great skill in the water, the razorbill is often compared to the flightless penguins *(Sphenisciformes)* of the Antarctic, but they are in different orders.**

Red crossbill

• ORDER •
Passeriformes

• FAMILY •
Fringillidae

• GENUS & SPECIES •
Loxia curvirostra

KEY FEATURES

- Its extraordinary bill is-superbly adapted to removing seeds from pine cones
- Risks breeding in the depths of winter so that its young will hatch in a period of plenty
- Leads a nomadic life, roaming over large areas of forest
- Occasionally leaves northern forests in flocks to find food

WHERE IN THE WORLD?

Found mainly in a broad band across northern parts of Eurasia and North America, with smaller, scattered populations in southern Europe, northwestern Africa and central Asia

LIFECYCLE

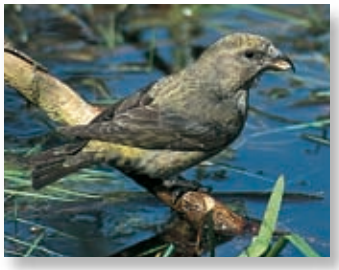
The red crossbill pays a heavy price for its reliance on a single source of food: in the years when the pine cone crop fails, it must fly great distances or face starvation.

HABITAT

The largest red crossbill populations are in coniferous forests that extend from Scandinavia east to Siberia and in northern North America. Known as boreal forest, this densely wooded area is snowbound for half of the year, but it has a vast number of cone-bearing spruce and fir trees.

Farther south, the red crossbill is found in coniferous forests on the slopes of the Alps, Pyrenees, High Atlas and Rocky mountains and the Himalayas.

▲▼ **NORDIC INVADER**
After mass migrations from the forests of Scandinavia in search of food, large colonies of red crossbills have expanded the species' range in southern Europe.



DID YOU KNOW?

- **Scientists in Russia have calculated that a brood of red crossbills is fed an average of 90,000 seeds by its parents before fledging.**
- **In autumn 1990, about 600,000 red crossbills appeared in eastern Britain, having fled Scandinavia and Russia in search of food.**

BEHAVIOR

The nutritional quality of tree cones varies from year to year and area to area. This, combined with the fact that cones ripen at different times in different places, means that no single stretch of forest can support red crossbills all year. Therefore, the bird must be constantly on the move. It travels in small flocks of up to 20, stopping wherever food is plentiful and then moving on when the supply is exhausted.

Every few years, when the cone crop fails, the red crossbill forms huge flocks that migrate southward in search of alternative food sources. Very large numbers of birds may die in these lean years.

FOOD & FEEDING

The red crossbill can appear parrotlike because it uses both its feet and its bill for climbing and feeding. Using this method to cling onto branches, the red crossbill can clamber foot-over-bill through the foliage and reach even the outermost cones.

While feeding, the red crossbill tends to hold cones steady with its feet while stripping them of seeds. Sometimes, it uses its bill to snip a cone from a stem before moving it to a new perch. The bird is often seen in small groups drinking from standing water on the forest floor: a diet of hard, dry seeds forces it to visit pools and streams several times a day to quench its thirst.

TWEEZERS IN THE TREE

1 A welcome site...
After flying for miles, the red crossbill selects an area where the trees are laden with cones.

2 Branching out...
Clambering along a bough, the bird size up a plump cone, looking for the best angle of attack.

CONSERVATION

Red crossbill numbers vary greatly from year to year depending on food availability, but these fluctuations have little or no long-term effect on the species' survival. In fact, as large areas in Britain, France, Belgium, Denmark and Germany have been turned over to conifer plantations over the course of the last 30 years, the red crossbill has extended its range.

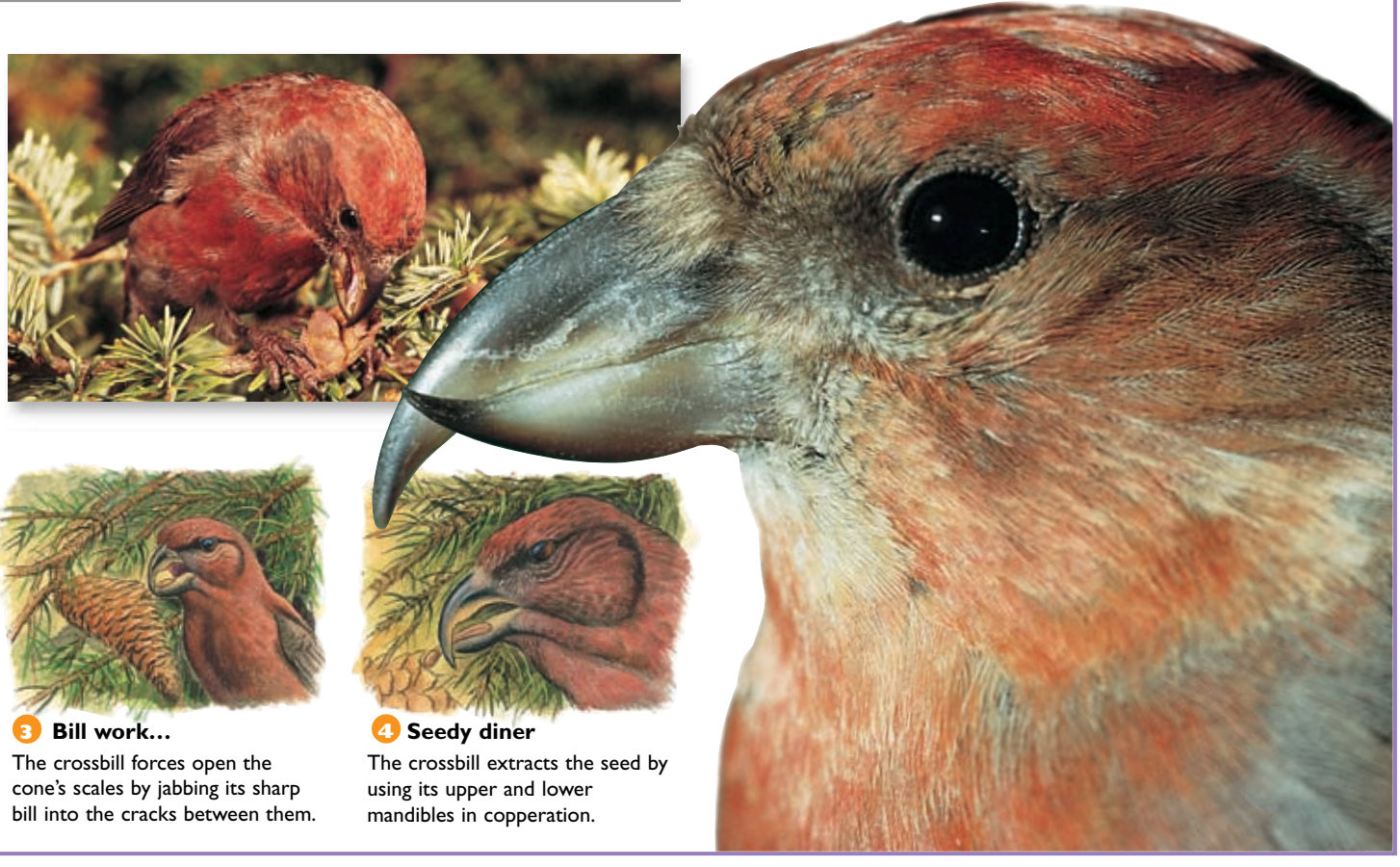
BREEDING

Unlike most small birds of the Northern Hemisphere, the red crossbill's breeding season starts early in the year. This is because the cone seeds that it eats are most plentiful in midwinter. The female incubates her eggs for about two weeks, often in freezing temperatures. Despite her efforts and the nest's lining of animal hair and grass, entire clutches may be destroyed by frost.

The young hatch just as pine cones are ripe and plentiful. They leave the nest after three to four weeks, but until their bills are fully formed, they are wholly dependent on their parents, both of which feed them a regular supply of regurgitaged conifer seed.

▲ **TOOLS OF THE TRADE**
It takes six weeks for chicks' bills to develop.

◀ **PINE PERCH**
The red crossbill travels and feeds in small flocks.



3 Bill work...
The crossbill forces open the cone's scales by jabbing its sharp bill into the cracks between them.

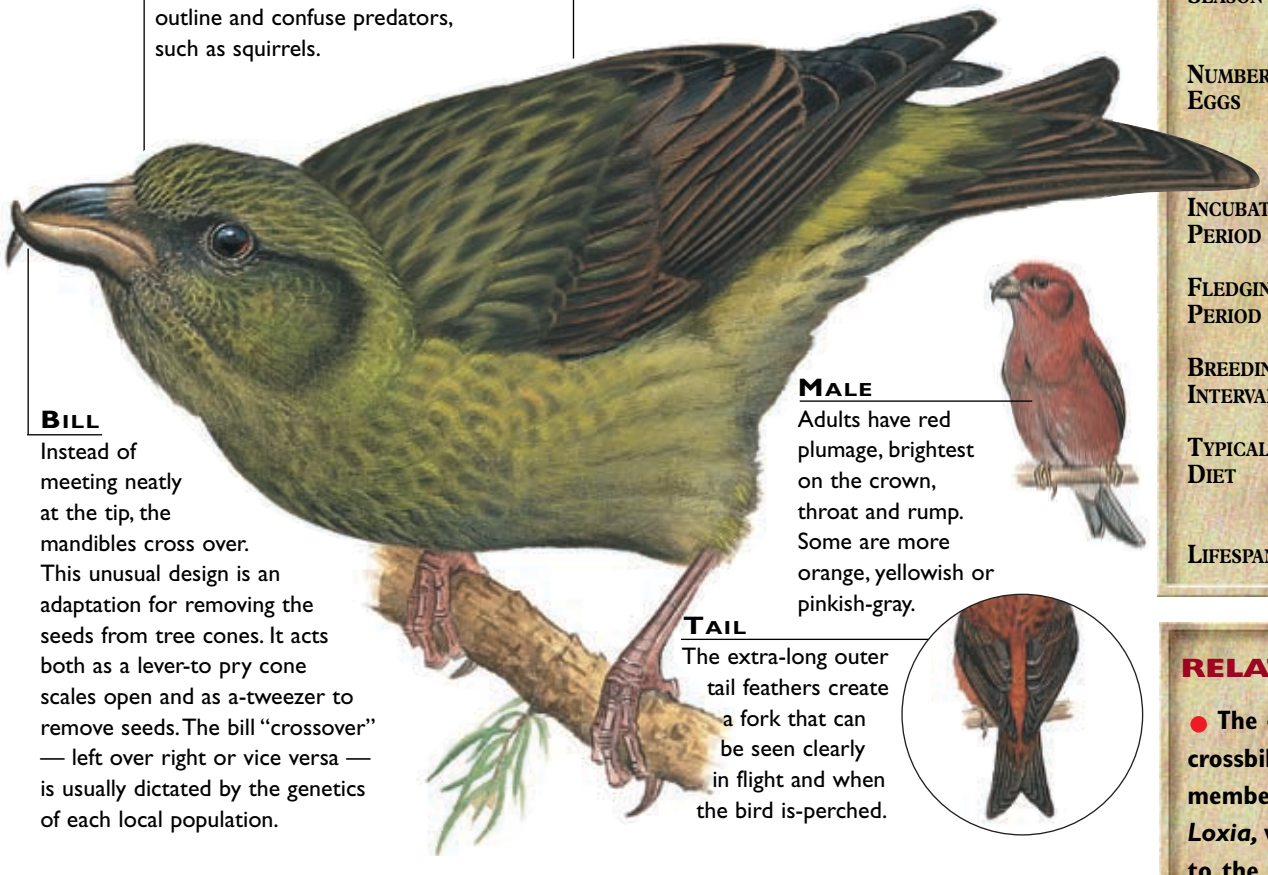
4 Seedy diner
The crossbill extracts the seed by using its upper and lower mandibles in copperation.

PROFILE RED CROSSBILL

The red crossbill's strange-looking bill is a vital tool that allows the bird to take advantage of the one abundant food supply in its harsh habitat.

JUVENILE
Dark-brown plumage with pale-cream streaks from head to tail break up the young bird's outline and confuse predators, such as squirrels.

FEMALE
The female has duller and less conspicuous plumage than the male, making her hard to spot on the nest.



BILL
Instead of meeting neatly at the tip, the mandibles cross over. This unusual design is an adaptation for removing the seeds from tree cones. It acts both as a lever-to pry cone scales open and as a-tweezer to remove seeds. The bill "crossover" — left over right or vice versa — is usually dictated by the genetics of each local population.

MALE
Adults have red plumage, brightest on the crown, throat and rump. Some are more orange, yellowish or pinkish-gray.

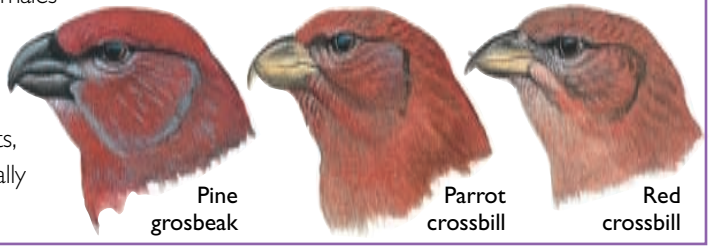
TAIL
The extra-long outer tail feathers create a fork that can be seen clearly in flight and when the bird is-perched.

VITAL STATISTICS

WEIGHT	1.2–1.75 oz.
LENGTH	6.5"
WINGSPAN	11–12.5"
SEXUAL MATURITY	6–12 months
BREEDING SEASON	Almost year-round, peaking January–May
NUMBER OF EGGS	2–5, usually 3–4
INCUBATION PERIOD	14–15 days
FLEDGING PERIOD	20–25 days
BREEDING INTERVAL	Usually 1 year
TYPICAL DIET	Seeds of coniferous trees
LIFESPAN	At least 7 years

CREATURE COMPARISONS

The red crossbill has much in common with two other species of finch found in coniferous forests: the pine grosbeak (*Pinicola enucleator*) and the parrot crossbill (*Loxia pytyopsittacus*). All three species are strongly built for birds of their size, with a bull neck and stocky body. The males all have bold reddish plumage, contrasting with the drab females and gray-brown juveniles. The parrot crossbill is-a specialized feeder with a bill design like the red crossbill's. The-pine grosbeak, which eats-shoots, leaves and berries, has a conventionally shaped but equally powerful bill.



Pine grosbeak | Parrot crossbill | Red crossbill

RELATED SPECIES

● **The 4 species of crossbill are the only members of the genus *Loxia*, which belongs to the finch family, *Fringillidae*. This family is divided into two subfamilies. *Fringillinae* contains the chaffinch, brambling and Canary Islands chaffinch. There are 120 or so species in the *Carduelinae* subfamily. All belong to the order *Passeriformes*, or perching birds.**

Red Junglefowl

• ORDER •
Galliformes

• FAMILY •
Phasianidae

• GENUS & SPECIES •
Gallus gallus

KEY FEATURES

- The ancestor of domestic chickens, this colorful pheasant is a wild and wary bird
- Lives under the rules of a group hierarchy established by ritual challenges and fighting
- Cross-breeding with domestic poultry is causing concern for the genetic purity of the species

WHERE IN THE WORLD?

Northeastern Pakistan and India east to southeastern China; south through the Malay Peninsula to islands of Sumatra, Java and Bali

LIFECYCLE

For a shy bird, the red junglefowl has a loud claim to fame — as ancestor of the chicken, it is considered to be the most important species of bird in human history.

HABITAT

▲ **HIDING PLACE**
A wary bird, the junglefowl never strays far from cover.

The red junglefowl is a bird of tropical and subtropical forests and woodlands, but prefers open woodland to dense jungle. It's most at home at the edges of bamboo groves and in mixed woods with patches of cultivated land, especially wheat fields and rice paddies, where it can find plenty of food.

Usually found at altitudes below 3,000', it lives up to 6,600' in the Himalayas.

CONSERVATION

The red junglefowl has been hunted for centuries, but continues to exist in good numbers throughout most of its range and is not considered threatened. As a pure species, however, it may not be as common because it is almost impossible to determine how many free-living birds are genuine junglefowl rather than look-alikes that have resulted from matings with poultry. Destruction of forests in many parts of its range is a further concern.

DID YOU KNOW?

- **The red junglefowl is fond of taking dust baths; it rubs itself in dry, sandy soil to remove parasites from its skin and feathers.**
- **The domestic chicken — descendant of the red junglefowl — is the most abundant bird in the world, with a population exceeding a staggering eight billion. This outnumbers humans by about two billion.**

BREEDING

During the breeding season, a male junglefowl assembles a harem of four or five hens, which he fiercely protects from rivals. He courts a female by dancing around her, hackles raised and fanning the wing nearest to her. After mating, the female builds a nest in some undergrowth from a scrape in the ground lined with dry leaves and grasses. She incubates her eggs for 18–20 days.

The chicks run about within hours of hatching; at about a week old they are able to flutter up to a safe roosting perch. At first their mother passes food to them with her bill; although they can soon feed themselves, they don't become independent until nearly 2 months old.

► **OATH OF SILENCE**
To avoid predators, hens never cluck while nesting.

RULING THE ROOST

1 Rule...
A male red junglefowl crows loudly to proclaim his territory and assert ownership of a harem of hens.

2 Raid...
A bachelor male attempts to take over the harem. The rivals square up to each other.

3 Ruckus...
Equal in size and splendor, neither cock is prepared to back down. They clash in a spur-slashing trial of strength.

4 Run for it
The harem owner has won. With his dominance confirmed, he chases off the beaten bachelor.

FOOD & FEEDING

The red junglefowl is not a fussy eater, consuming whatever it finds on its feeding forays. Seeds and grain form the bulk of its diet, but it also takes fruit, shoots, insects and other small creatures, such as spiders, worms, snails and occasionally reptiles. The junglefowl does most of its feeding in the early morning and late afternoon, when it also visits streams and ponds to drink.

Foraging in the same way as a chicken, the junglefowl scratches at the ground with its feet, scraping aside leaves and other debris to uncover edible morsels, such as seeds, fallen fruit and nuts. To get to succulent roots and tubers, it digs in the soil, and it takes berries, shoots and buds directly from plants.

The junglefowl must also consume large quantities of small stones to help its digestive system grind down tough seed cases.

TABLE FOR ONE
Up at dawn, the red junglefowl normally forages alone, although flocks occasionally gather to feed at prime sites.

BEHAVIOR

The red junglefowl has a complex social life. Although usually seen in small family parties, flocks of up to 50 birds may assemble outside the breeding season. Mature males split away from these flocks to form loose bachelor groups while they molt their breeding plumage.

Life in both groups is governed by a hierarchy known as the pecking order, in which each bird has its place according to its strength and character. Dominant birds are able to claim the best feeding and roosting sites. Various challenges, from ritual posturing to fierce combat, are used to determine rank, but comparative peace reigns once the pecking order is established. Although bold among its own kind, the junglefowl is ready to run for cover at the slightest disturbance. It can fly to escape predators, such as leopard cats, but it is usually reluctant to take to the skies.

TOP OF THE TREE
High social rank goes to the most impressive male.

PROFILE RED JUNGLEFOWL

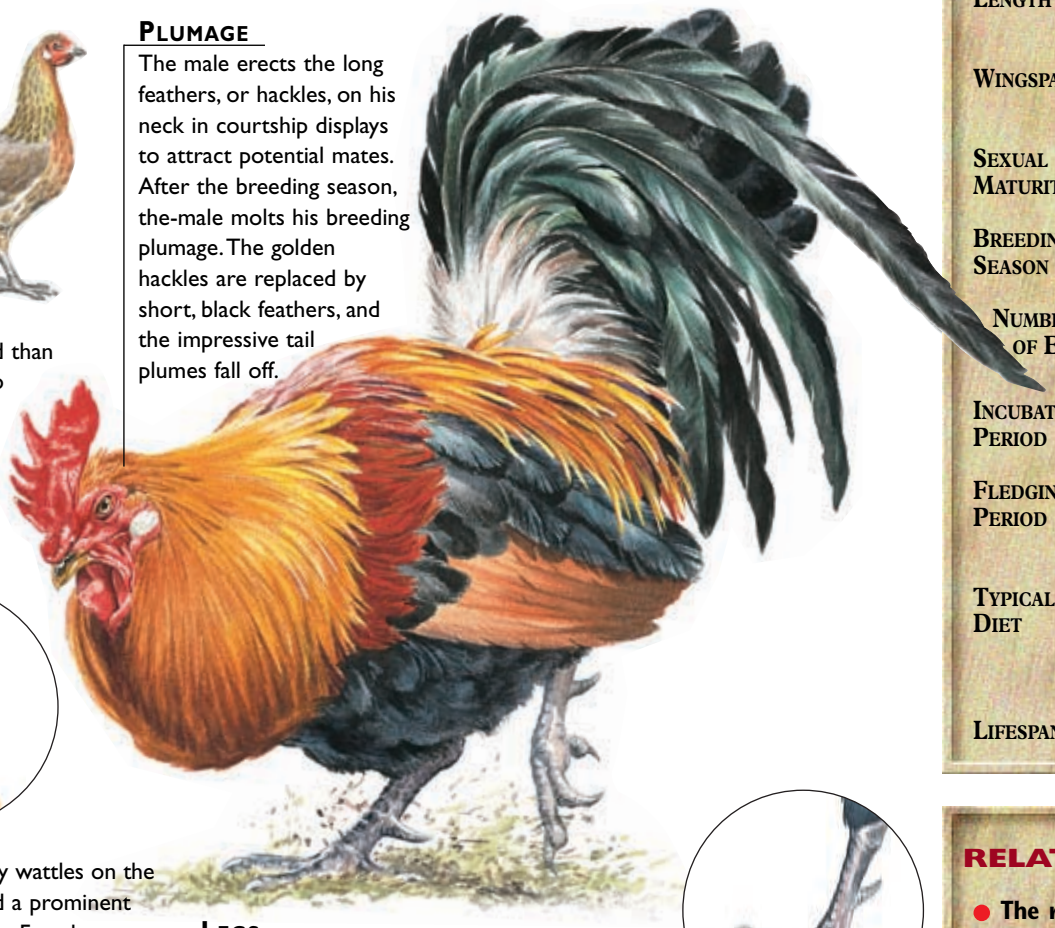
Adorned with rich colors and fanciful feathers, the male red junglefowl uses his magnificent plumage to entice females during breeding season.

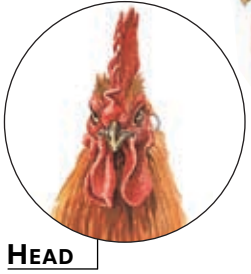
HEN

The hen's plumage is duller and more speckled than that of the male to help camouflage her while she is incubating eggs or brooding chicks.

PLUMAGE

The male erects the long feathers, or hackles, on his neck in courtship displays to attract potential mates. After the breeding season, the male molts his breeding plumage. The golden hackles are replaced by short, black feathers, and the impressive tail plumes fall off.





HEAD

The male has fleshy wattles on the sides of his bill and a prominent comb on his crown. Females are attracted to males with the biggest combs, which shrink in size after the breeding season.

LEGS

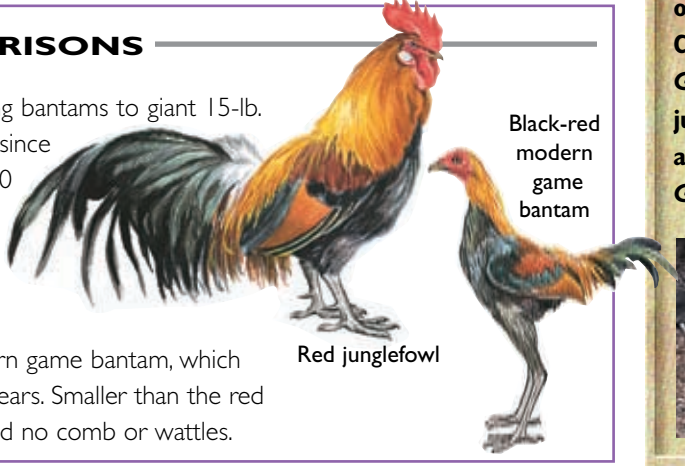
The junglefowl scratches the ground with its long, clawed toes when searching for food. A sharp spur on the back of each male's leg is used in fights.

VITAL STATISTICS

WEIGHT	Male 24–51 oz.; female 17–37 oz.
LENGTH	Male 26–30"; female 17–18"
WINGSPAN	Male 26–32"; female 14–25"
SEXUAL MATURITY	1 year
BREEDING SEASON	Dry season
NUMBER OF EGGS	4–9, but usually 5 or 6
INCUBATION PERIOD	18–20 days
FLEDGING PERIOD	Flies at 6–7 days; on its own at 45–60 days
TYPICAL DIET	Seeds, grain, shoots, roots, fruit and insects
LIFESPAN	3 years

CREATURE COMPARISONS

Some 150 breeds of poultry — from 8"-long bantams to giant 15-lb. Brahma cockerels — have been developed since the red junglefowl was domesticated in 3200 BC. Various types have been used for religious purposes, cock-fighting, meat, eggs and exhibition. Breed names include Scots dumpy, Sicilian buttercup, and marsh daisy. A popular show variety is the black-red modern game bantam, which despite its name, has existed for over 100 years. Smaller than the red junglefowl, it has long legs, a slender body and no comb or wattles.



Red junglefowl

Black-red modern game bantam

RELATED SPECIES

● **The red junglefowl is 1 of 48 species of pheasant in the family *Phasianidae*, which includes 3 other junglefowls: the Ceylon junglefowl, *Gallus lafayetii*, the gray junglefowl, *G.-sonneratii*, and the green junglefowl, *G.-varius* (below).**

Red Kite

• ORDER •
Falconiformes

• FAMILY •
Accipitridae

• GENUS & SPECIES •
Milvus milvus

KEY FEATURES

- Graceful aerobatics and a buoyant flight are its trademark
- Constantly adjusts the angle of its wings and deeply forked tail when airborne
- Consumes carrion in large quantities, often feeding at dumps
- An opportunist that frequently steals food from other large birds or takes over their old nests

WHERE IN THE WORLD?

Scarce, with a scattered range across Europe; about 90% of the birds breed in Germany, France and Spain, a small but growing number in Britain, a few in Morocco and on the Cape Verde Islands

LIFECYCLE

Able to soar and hang in the air without visible effort, the red kite looks for food from its aerial "perch." It feeds mainly on carrion or takes small prey by surprise.

HABITAT

▲ **HUMAN NATURE**
Kites use man-made habitats, like farmland.

The red kite, a bird of lightly wooded terrain, breeds and roosts in stands of trees and hunts over open areas. In the south of its range, it's found mainly in forested valleys and areas of traditional, mixed farming. In the north, it occurs on nonintensive farmland with small fields and hedges, interspersed with woods, rough pasture and moorland.

The kite's home range varies in area. In central Wales, some stay within 1–2 miles of their roosts and nests; others travel up to 9 miles or more for food.

In winter, the red kite uses a wider variety of habitats, including treeless agricultural land, scrub and wetlands. It often visits garbage dumps at this time of year. Demonstrating its opportunistic nature, the red kite also feeds at the roadside, on wildlife fatalities, as well as outside slaughterhouses. In medieval times, red kites occurred in large numbers in many of the cities of western Europe — until improved human cleanliness reduced the amount of food available.

DID YOU KNOW?

- **Kites flown by humans get their name from the bird.**
- **The isolated subspecies of red kite on the Cape Verde Islands is smaller and darker than red kites elsewhere.**
- **A pair of red kites often weaves pieces of plastic, rags or paper into their nest.**
- **Until the 16th century, red kites were a common sight in London.**

FOOD & HUNTING

The kite has a varied diet, which depends upon the food available at a particular time of year. In the breeding season, it takes a greater proportion of live prey: mammals up to the size of a hare and birds, including small species and the young of larger ones, such as crows. Garbage and carrion, especially dead sheep, become more important in winter. The red kite also steals food from herons and other predatory birds.

To locate food, the kite circles high above the ground or glides at treetop level, diving to catch live prey by surprise. It can catch birds and insects in the air, but only rarely engages in a chase, as it lacks the speed of falcons or hawks.

JUNK FOOD

1 Circle...
A red kite circles high overhead, scanning the ground below as it maneuvers with great skill.

2 Glide...
Once the kite spots a source of food, it begins to lose altitude by gliding slowly in wide circles.

3 Scavenge...
Joining others at a dump, it eagerly feeds on any scraps of animal matter that it can find.

4 Disturbed
In many places, kites are very shy and quickly take to the air at the first signs of disturbance.

BREEDING

In March and April, at the start of the breeding season, pairs perform display flights over their territory, circling at great height or chasing each other. Rival males may challenge each other by seizing the opponent's talons or cartwheeling down with their talons interlocked.

Pairs may build a nest or add to one that they've built during previous seasons. They may also take over the old nest of a buzzard or raven. After mating, the female usually lays two eggs, incubating them for about a month. The female broods the newly hatched chicks for two weeks, while her mate brings food. Later, when the chicks can feed themselves, the female also hunts for her offspring. Chicks fledge at about seven weeks old.

▲ **BITE-SIZED**
The female passes morsels of meat to her brood.

CONSERVATION

The long-term decline of the once-common red kite, which accelerated during the 19th century, resulted mainly from persecution by farmers and gamekeepers. It feeds largely on carrion, but is often blamed for the death of sheep and lambs. Now, with the cooperation of farmers and with legal protection, it's recovering in western Europe. A major conservation program also involves releasing juveniles from the healthy Spanish population into Britain.

BEHAVIOR

For much of the time, the red kite is solitary. Juveniles, in particular, may wander for one or more years, until they're able to breed. Kites sometimes gather to feed at garbage dumps or rest in communal roosts, especially in winter.

Most red kite populations breeding in northern and central Europe migrate south or southwest to spend the winter in regions fringing the northern Mediterranean. Birds from the southern part of the range remain in the same areas all year, and there is now an increasing tendency for northern birds to do likewise. Red kites may migrate in small groups, although usually they migrate singly among flocks of other birds of prey.

Unlike many birds of prey, home ranges of red kites often overlap. Neighboring pairs show little hostility to one another, defending only a restricted area around nest sites. The kite uses high-pitched, mewing calls to warn intruders, indicate alarm or simply to stay in contact with others — and is more vocal in breeding seasons.

▲ **HIGH AS A KITE**
The red kite's awe-inspiring and agile flight is, in fact, quite leisurely.

◀ **LONER**
The red kite's cries are often described as sounding plaintive, even distressed.

PROFILE RED KITE

The red kite is a multipurpose bird of prey, adapted to catch live prey as well as to make a living scavenging on scraps and carrion.

JUVENILE PLUMAGE

The juvenile has a darker head and paler, duller body plumage; its tail is less forked, with a pale patch at the base.

PLUMAGE

A warm, chestnut-colored plumage is covered with dark markings. Its head is pale gray or whitish. The tail is bright orange-brown above and pale gray with faint markings below; when viewed from this angle it appears almost translucent.

TAIL

The kite frequently twists and fans its long and deeply forked tail, moving it from side to side like a rudder.

WINGS

Long wings are adapted to lengthy periods in the air and provide a high degree of maneuverability.

FEET & LEGS

The kite's feet are spindly for a bird of prey its size. Its talons are only slightly curved, while its legs are feathered only about halfway down — it has no need for protective leg feathers or powerful feet since it feeds on small mammals and carrion.

VITAL STATISTICS

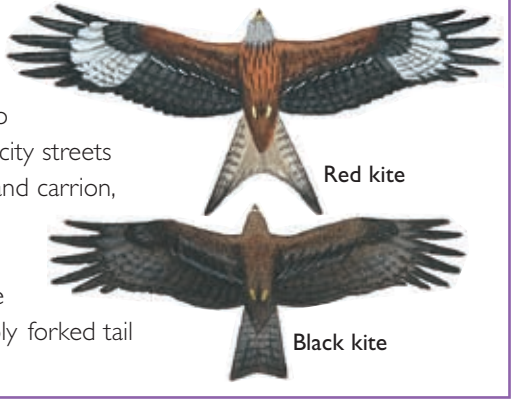
WEIGHT	Male 1.5–2 lbs.; female 2–2.5 lbs.
LENGTH	About 2'
WINGSPAN	5–6'
SEXUAL MATURITY	2–4 years
BREEDING SEASON	Late March –July
NUMBER OF EGGS	2–4
INCUBATION PERIOD	31–32 days
FLEDGING PERIOD	50–60 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Carrion, mammals, birds, reptiles, invertebrates
LIFESPAN	Up to 26 years

RELATED SPECIES

● **The 237 species in the large family *Accipitridae* include almost all birds of prey. Of these, 33 species are members of the kite subgroup and include the American swallow-tailed kite (*Elanoides forficatus*), the snail kite (*Rostrhamus sociabilis*), which feeds on aquatic snails, and the brahminy kite (*Haliastur indus*), a scavenger living near human habitation in India and Southeast Asia.**

CREATURE COMPARISONS

The red kite's closest relative, the black kite (*Milvus migrans*), is more abundant and widespread — found throughout the Old World. It has adapted to life alongside humans and is a common scavenger on city streets from Africa to eastern Asia. As well as human refuse and carrion, it eats large amounts of fish — unlike its red relative — and is often found near freshwater. The ranges of both birds overlap in parts of Europe, but the red kite is easily distinguished from the black kite by its deeply forked tail and the light patches near its wingtips.



Red-and-yellow Barbet

• ORDER •
Piciformes

• FAMILY •
Capitonidae

• GENUS & SPECIES •
Trachyphonus erythrocephalus

KEY FEATURES

- Alternating calls of pairs are so synchronized, sounds seem to be from one barbet
- Parents and immature helpers excavate the nest, share incubation and feed the nestlings
- Nests near termite mounds, but rarely eats the insects; in turn, termites don't bite the barbet

WHERE IN THE WORLD?

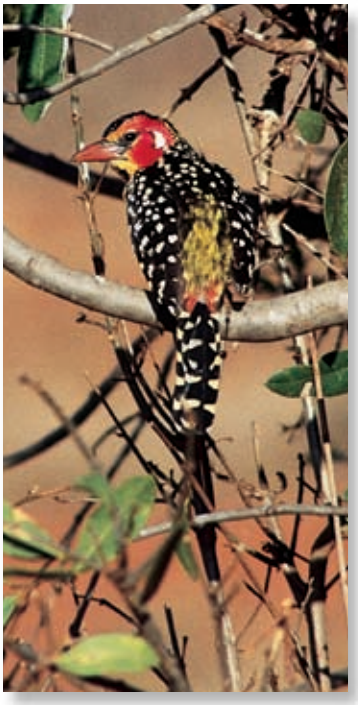
Found in eastern and southeastern Africa, from Sudan, Ethiopia and Somalia, south to Uganda, Kenya and central Tanzania

LIFECYCLE

Red-and-yellow barbets cooperate with family members to excavate and incubate a nest, forming a united front to staunchly defend their territory against uninvited company.

HABITAT

The red-and-yellow barbet prefers semiarid brush country and thornbush areas throughout its east African range. Anthills, termite mounds and stream beds from Ethiopia to Tanzania attract this African species; it is more likely to be seen on the ground than its forest barbet cousins, which rarely descend from treetops. The red-and-yellow barbet excavates its nest holes in mud or sandbanks, rotting trees or termite mounds. Nests near ant and termite colonies are protected by the biting insects, which do not attack the barbet. Reciprocally, the red-and-yellow barbet rarely eats its tiny neighbors.



DID YOU KNOW?

- **The species name *erythrocephalus* comes from the Greek words erythro and cephalos meaning "red head."**
- **A dueting pair occupies the topmost position in a tree or bush and forces away other singers that attempt to move upward or in between them.**

SITTING PRETTY
The colorful barbet has a good view of its territory.

BEHAVIOR

Remaining in family parties that do not migrate, the red-and-yellow barbet moves only in search of food. Boldly territorial, it may also be quite tame in areas where humans feed it. The alternating calls of the male and female produce a well-known duet, though the source of the sound often seems to be a single bird. The loud medley sounds much like the barbet's English name, "red 'n' yellow," over and over. Used as territorial and breeding calls, the different song notes rhythmically synchronize, and the duet sometimes becomes a chorus of the combined efforts of the entire family party.

STICKING TOGETHER

1 Feeding...
Nesting near a termite mound, a family party of barbets forages together for berries, locusts and beetles.

2 Squabbling...
Almost half as big and not as aggressive, a willow warbler is no match for the territorial red-and-yellow barbet.

3 Attracting...
Sensing the commotion, a snake, attracted to one of the other barbets, is preparing to strike, but…

4 Mobbing
…the barbet sounds an alarm call, rapidly bringing other birds together to mob the hastily retreating snake.

BREEDING

▲ **COURTSHIP CROWN**
The male's colorful crown feathers are raised during courtship postures.

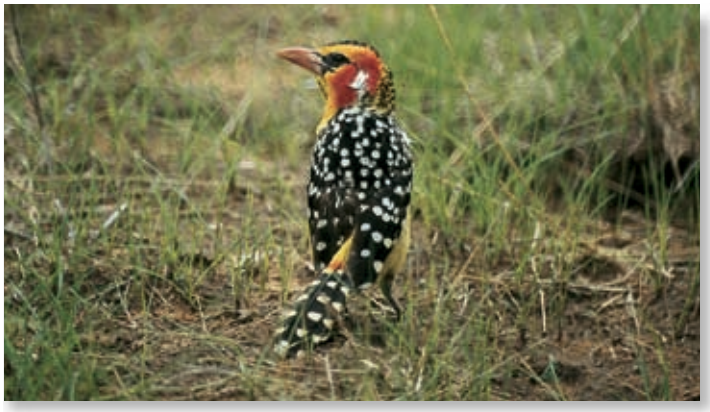
Nests are commonly made near large ant or termite mounds. While termites are aggressive territorial defenders against other potential predators, these insects do not attack the nesting birds; the reason is unknown. Both the mature adults and juvenile helpers, which have not yet reached sexual maturity, excavate the 16" nesting tunnel.

During courtship the male chases the female, strutting and posturing around her with his bristled crown feathers raised. Both parents and helpers incubate 4–5 eggs and feed the nestlings insects. The barbet breaks up large insects into pieces against a rock or crevice in a tree, which may be used again and again. With wings and legs removed, the insects are carried directly to the young, rather than being regurgitated and fed to the them as is the case with many birds.

FOOD & FEEDING

The omnivorous red-and-yellow barbet forages on open ground and in bushes in search of fruits, berries and buds. The most insectivorous of all barbets, it also hunts for locusts, beetles and small birds. It depends more on insects than other barbets because of its terrestrial, rather than tree-dwelling, adaptations. Insect wings and legs are regurgitated as pellets, similar to those of owls; however, the skins and seeds of grapes, berries and other fruits are passed in the feces.

▼ **SEARCHING FOR SWEETS**
The barbet looks for berries while foraging on the ground.



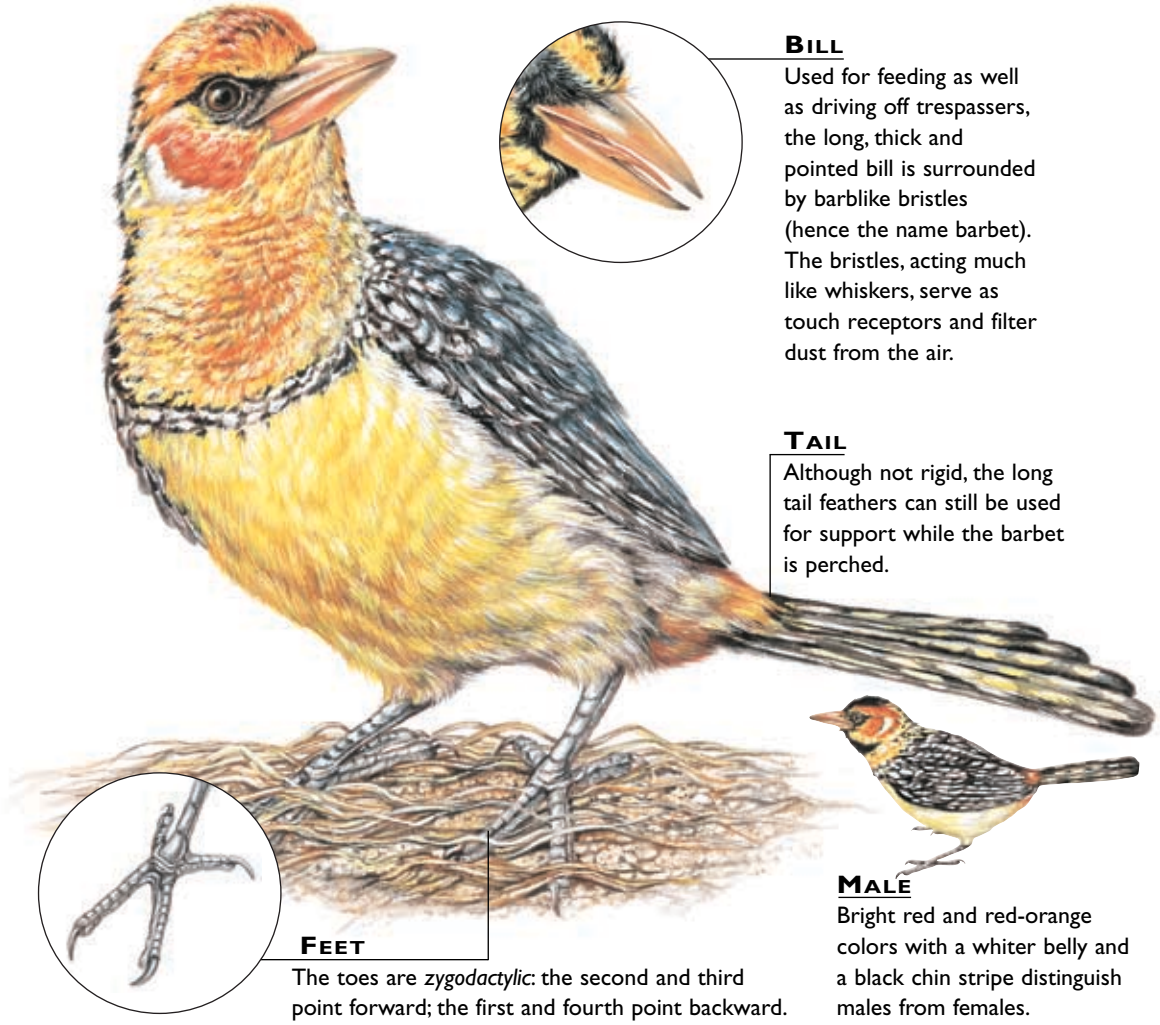
CONSERVATION

Fairly common and widespread, the red-and-yellow barbet is not endangered and is quite tame around humans that feed it. Some people take advantage of the barbet's friendly nature, and capture or kill the bird when it ventures near. Tribes, such as the Masai, use the barbets' feathers for ornamentation.

▼ **NO BOTHER**
Termites don't bite barbets, which often build their nests near termite mounds.

PROFILE RED-AND-YELLOW BARBET

Though it sings duets from the treetops, the red-and-yellow barbet is more likely to be seen feeding, nesting and quarreling on the ground.



BILL
Used for feeding as well as driving off trespassers, the long, thick and pointed bill is surrounded by barblike bristles (hence the name barbet). The bristles, acting much like whiskers, serve as touch receptors and filter dust from the air.

TAIL
Although not rigid, the long tail feathers can still be used for support while the barbet is perched.

MALE
Bright red and red-orange colors with a whiter belly and a black chin stripe distinguish males from females.

FEET
The toes are *zygodactylic*: the second and third point forward; the first and fourth point backward.

VITAL STATISTICS

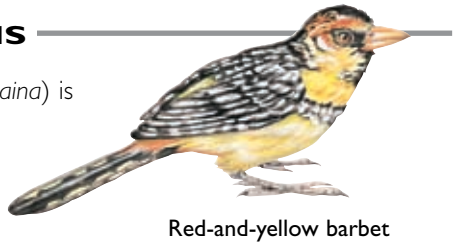
WEIGHT	2.5 oz.
LENGTH	9"
WINGSPAN	4"
SEXUAL MATURITY	1 year
MATING SEASON	Varies depending on region
NUMBER OF EGGS	2–6
INCUBATION PERIOD	2 weeks
FLEDGING PERIOD	3–5 weeks
BREEDING INTERVAL	1 year
TYPICAL DIET	Fruits, berries and insects such as locusts and beetles
LIFESPAN	Unknown

RELATED SPECIES

The order *Piciformes* contains six families and includes jacamars, puffbirds and toucans, which are all found only in Latin America. The barbets, honeyguides and woodpeckers are also found in Africa. Almost half of the 81 species of barbet live in Africa. The genus *Trachyphonus* includes the red-and-yellow barbet and D'Arnaud's barbet, *Trachyphonus darnaudii*.

CREATURE COMPARISONS

A close relative, the pied barbet (*Tricholaema leucomelaina*) is distinguished by a black-and-white striped head, red forehead and black neck, though it appears mainly black and white. At 7" it is smaller than the red-and-yellow barbet. At home in acacia woodlands from Zambezi south to the Cape Town area, it is occasionally found in pairs, but more often lives alone, searching for fruits, nectars and insects. Unlike its noisy cousin, the pied barbet rarely socializes. With no "helpers," pied barbet parents excavate, incubate and feed their nestlings alone.



Red-and-yellow barbet

Pied barbet

Red-billed Quelea

• ORDER •
Passeriformes

• FAMILY •
Ploceidae

• GENUS & SPECIES •
Quelea quelea

KEY FEATURES

- African relative of the sparrow, the quelea feeds and breeds in vast colonies over a million strong
- Descending on cultivated crops to feed, these huge flocks can devastate farmland
- Although vigorously persecuted as a pest, it has survived everything that people can throw at it

WHERE IN THE WORLD?

Ranges across open grassland south of the Sahara, through East Africa and into southern Africa; absent from North Africa and equatorial forests

LIFECYCLE

There is almost no such thing as a single red-billed quelea. The flock travels, feeds, roosts and breeds together in one of nature's most remarkable examples of community.

HABITAT

▲ **BIRDS OF A FEATHER...** **Sometimes called the "avian locust," the quelea flocks over arable land and watering holes.**

The quelea ranges in vast flocks over the grasslands and savannahs of sub-Saharan Africa. It's at home anywhere there are seeds to eat and trees to provide roosts. It can be found over a vast area of the continent. Although these conditions exclude the dense, equatorial forest belt and semidesert, such as found on the Horn of Africa, the quelea is flexible enough to thrive in humid swampland and dry, acacia-dotted savannah.

With large habitat areas being turned over to agriculture, the quelea is being forced to spend more time on arable land.

DID YOU KNOW?

- **One tree occupied by breeding queleas had 6,000 nests.**
- **The total population of the red-billed quelea is estimated at one billion.**
- **A feeding quelea's crop can become so distended, its contents can be identified through the stretched skin.**
- **One quelea flock had more than 80 million birds.**

BREEDING

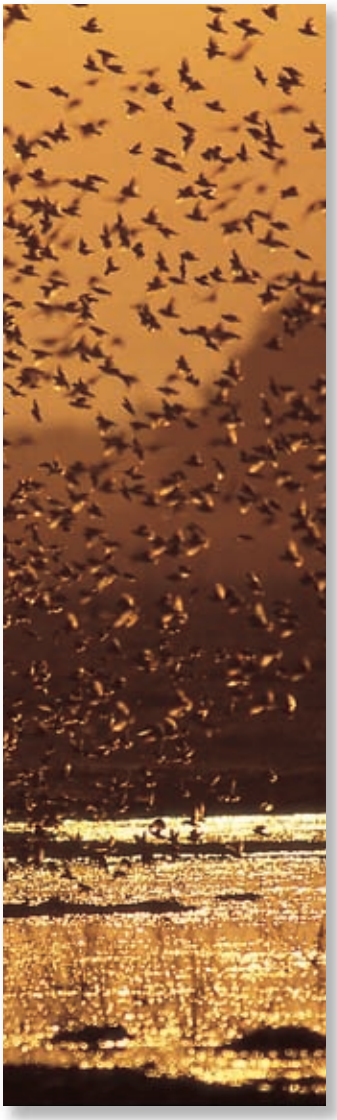
The red-billed quelea breeds in dense colonies. Thousands of pairs rear their young in trees thick with nests. With the onset of the breeding season, the male, in his bright mating plumage, begins building a roughly spherical nest. When half-constructed, he stops work and starts advertising his skills and charms. If a female likes the look of him and his nest, they mate, and he completes the structure.

Both parents feed the brood insects and succulent larvae — a diet that ensures a rich supply of protein and vitamins for the fast-developing young. At 2 weeks old, the young are fledged and ready to leave the nest; two weeks after that they are independent.

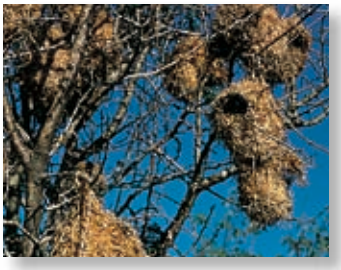
BEHAVIOR

Compulsively social, the quelea lives in flocks that can have tens of millions of individuals and darken the sky like a pall of smoke. Wheeling and swirling, the flock-moves together in perfect synchrony like a shoal of fish, billowing across the landscape with a roar of wingbeats. A flock feeding on the ground becomes a sea of tiny, feathered bodies.

Early in the morning, the flock sets out to find food, settling down to feed before it gets too hot. After a midday break in the shade, the birds feed again, and then retreat to roost in trees at dusk. A flock may travel 36 miles or more in a day, moving to new sites several times if food is not plentiful. The quelea does not always live in vast numbers everywhere. Where food is scarce, flocks are much smaller.



▶ **ONE IN A MILLION** **A tightly packed flock is a good defense against hawks and other aerial predators.**



◀▲ **SHOW HOUSE**
Nest-building is vital to the quelea's mating display.

CONSERVATION

Humans have attacked queleas with guns, poisons and even flamethrowers without significant results. However, widespread use of pesticides may be causing real damage.

FOOD & FEEDING

For thousands of years, these seed-eating birds have exploited the wild grasslands in much the same way as herds of grazing mammals. They descend on a verdant area in huge numbers, eat their fill and then move on. Today, much wild grassland has been cultivated for cereal crops, irresistible pickings for a quelea flock.

The quelea's stout bill is perfect for cracking husks. Worked by strong muscles, its mandible can easily crush tough grass seeds and make light work of softer, cultivated grasses. A visit from a flock of queleas can spell disaster for an African cereal farmer.

A FINE FEAST

1 Gathering for dinner…
A vast flock of red-billed queleas sweeps across the land. A tasty crop of ripe grain attracts them.

2 Places please…
Each of the million or more birds has a hearty appetite. It hops from stem to stem, stripping the seedheads.

3 Clean sweep…
Within a few hours, the crop is ravaged and worthless to the farmer. The flock swirls away.

4 Washing it down
Returning to their roost, the birds stop off for water, some swooping down to collect it on the wing.

PROFILE RED-BILLED QUELEA

The red-billed quelea looks innocent enough on its own, but in a flock a million strong, it is one of the most feared creatures in Africa.

BREEDING PLUMAGE

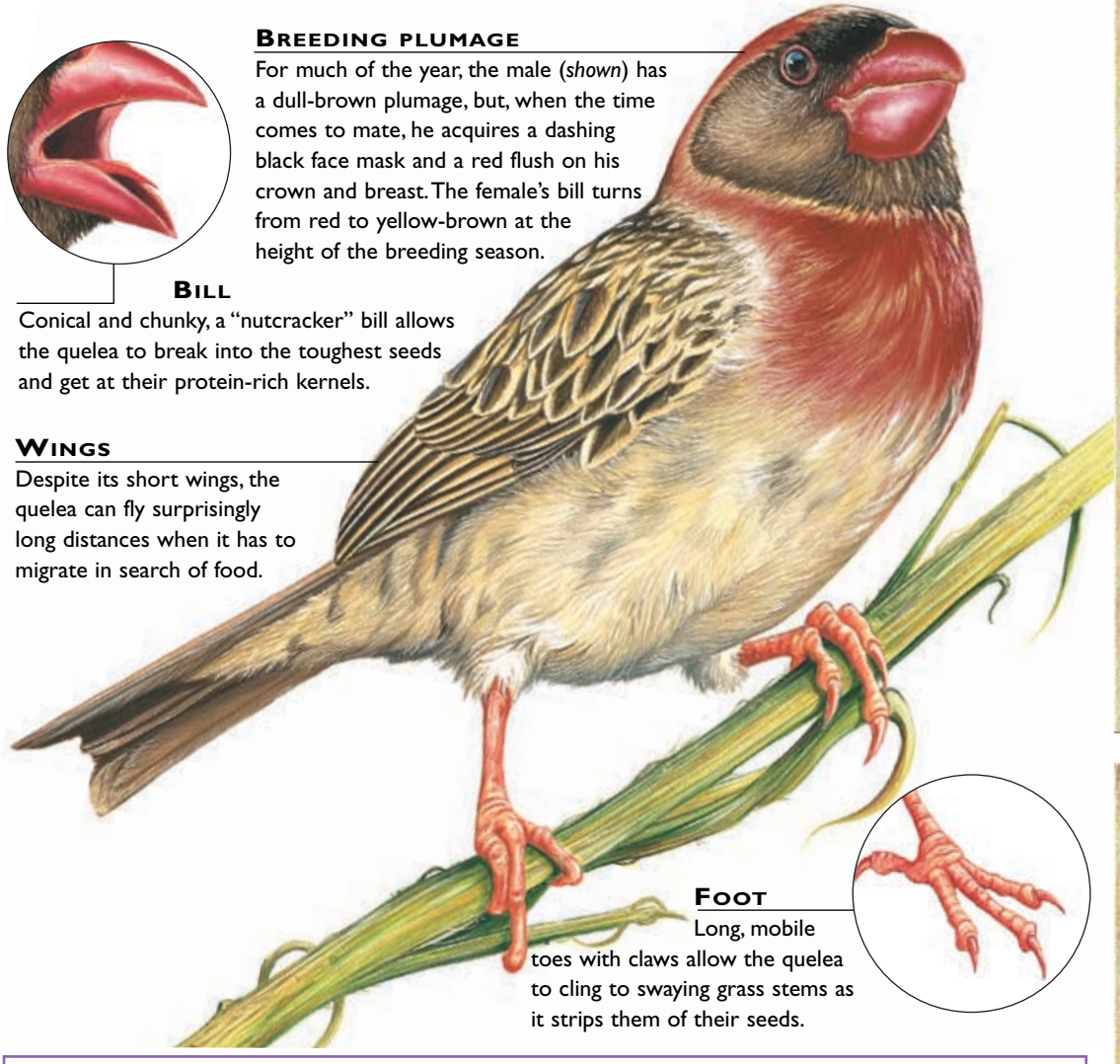
For much of the year, the male (*shown*) has a dull-brown plumage, but, when the time comes to mate, he acquires a dashing black face mask and a red flush on his crown and breast. The female's bill turns from red to yellow-brown at the height of the breeding season.

BILL

Conical and chunky, a "nutcracker" bill allows the quelea to break into the toughest seeds and get at their protein-rich kernels.

WINGS

Despite its short wings, the quelea can fly surprisingly long distances when it has to migrate in search of food.



FOOT

Long, mobile toes with claws allow the quelea to cling to swaying grass stems as it strips them of their seeds.

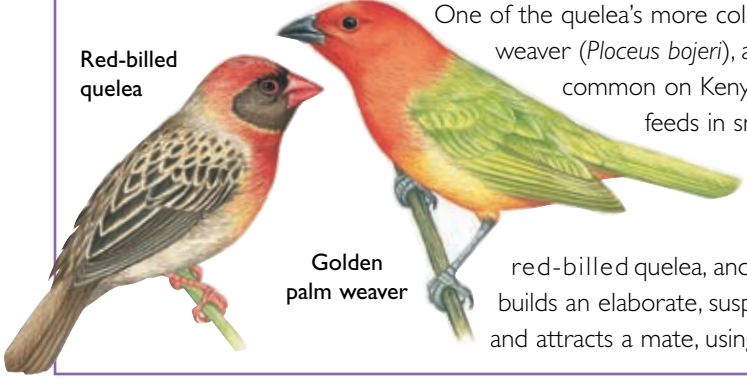
VITAL STATISTICS

WEIGHT	0.7 oz.
LENGTH	4.5–5"
SEXUAL MATURITY	1 year
BREEDING SEASON	Start of tropical rainy season
NUMBER OF EGGS	2–4
INCUBATION PERIOD	12 days
FLEDGING PERIOD	14 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Seeds and grain
LIFESPAN	About 3 years

RELATED SPECIES

● **The red-billed quelea is 1 of 94 species of true weaver bird, and 1 of 3 in its genus. True weavers, along with other types of weaver, whydahs, snow finches and sparrows, form 143 species in the *Ploceidae* family, including the village weaver, *Ploceus cucullatus*** (below).

CREATURE COMPARISONS



One of the quelea's more colorful relatives is the golden palm weaver (*Ploceus bojeri*), an elegant, sparrow-sized bird that is common on Kenya's Indian Ocean coastline. Here it feeds in small parties among the palm trees and shrubs near the shore, flitting through the foliage in search of berries and other fruit. Like the red-billed quelea, and most other weavers, the male builds an elaborate, suspended nest from woven grasses and attracts a mate, using a spectacular display of plumage.

Red-breasted Goose

• ORDER •
Anseriformes

• FAMILY •
Anatidae

• GENUS & SPECIES •
Branta ruficollis

KEY FEATURES

- Nests near larger birds of prey to protect its eggs from foxes and other predators
- Breeds on narrow stretch of land in the far reaches of harsh Siberia
- Thick-necked and short-billed, the red-breasted goose is smaller than most other geese

WHERE IN THE WORLD?

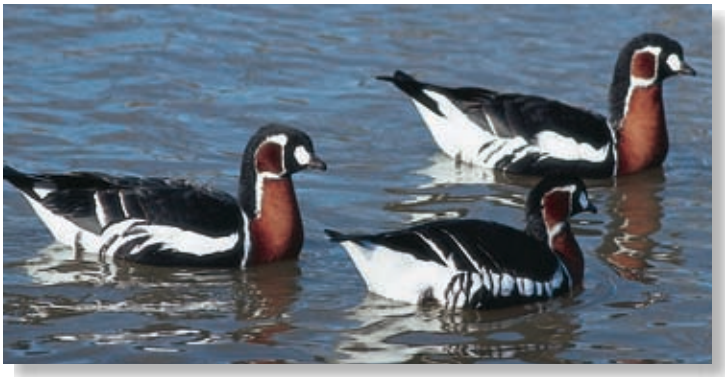
Found mainly on Siberia's Gyda and Taymyr peninsulas; winters around the Black Sea, especially in Romania, with scattered numbers in Greece and Iran

LIFECYCLE

The red-breasted goose occupies a narrow breeding ground on the tundra of Siberia, where it relies on birds of prey to help it guard against predators.

HABITAT

The restricted breeding grounds of the red-breasted goose consist mostly of moss- and lichen-covered tundra and brush tundra, mainly on the Gyda Peninsula and the western part of the Taymyr Peninsula in Siberia. During the nesting season, the birds seem to prefer the driest and highest areas of tundra and brush, staying close to the water. In the winter, they often occupy low-lying regions around lakes or reservoirs where herbs and grasses are easy to find.



▼ **PRETTY PADDLERS**
A graceful swimmer, the red-breasted goose winters on lakes or reservoirs.

CONSERVATION

There has been an alarming decline in the number of red-breasted geese during the last few decades, from an estimated 50,000 birds in the mid-1950s to a recent decline to 20,000. The decline of this species is related to the decline in birds of prey, especially the peregrine falcon, *Falco peregrinas*, due to the excessive use of pesticides in recent decades. The red-breasted goose nests very close to the nests of these birds as a defense mechanism against foxes. The decline in peregrine populations has led to a similar decline in goose numbers. The red-breasted goose remains vulnerable to illegal hunting, changes in land use and pollution; also, their breeding areas continue to be disrupted by oil and gas exploration.

BREEDING

Red-breasted geese breed during the summer months, usually during the first half of June. During this relatively mild season, snow on the tundra is starting to melt, and new grasses for nestlings to feed on are beginning to sprout. Courting behavior is highly ritualized, involving mutual head-dipping alternated with a very erect posture as the male and female face each other. The birds build a shallow nest of vegetation, lined with down, on steep river banks, low rocky crags or gullies, with cover such as dwarf birch, willow or tall dead grass. The nests are built near those of birds of prey, such as peregrine falcons. As the much larger and stronger birds protect their own nests, the falcons also help the defenseless geese protect their broods.

The normal clutch size is typically 6–7 eggs. Incubation is performed by the female alone, but the male remains nearby throughout the 23–25-day incubation period. Chicks typically begin hatching by the end of July and are flying by the end of August, suggesting a short fledging period.

RED-BREASTED RESOURCEFULNESS

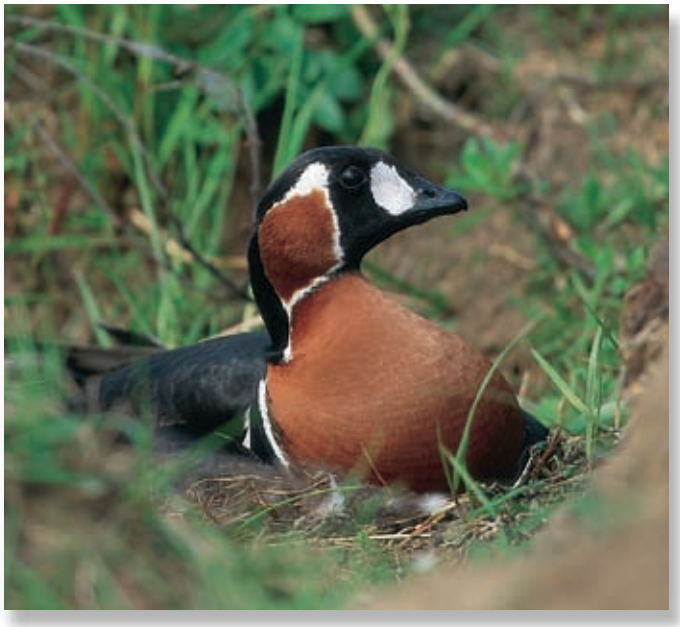
1 Safety in numbers…
The red-breasted goose builds its nest close to larger birds of prey, such as the rough-legged buzzard (*Buteo lagopus*).

2 Buzzard bombardier…
A nervous mother guards her precious nest as the rough-legged buzzard attacks an invading Arctic fox that is on the prowl.

FOOD & FEEDING

Essentially a vegetarian, the red-breasted goose's diet consists of the leaves, stems and green parts of grasses and aquatic plants. During its summer breeding season, the red-breasted goose enjoys cotton grass, which sprouts at about the time they begin nesting. They also eat sprouting wheat and wild garlic tubers. In their winter quarters, they fly to watering holes to drink and obtain sand for their gizzards; the sand acts as a grinding mechanism to aid digestion. The geese return to steppelike areas to eat grasses and herbs.

▶ **FORAGING FLOCK**
A flock of red-breasted geese forages for grass.



3 Goose stepping…
A new parent leads her unorganized parade of five curious chicks, which are eager to explore new territory around the nesting site.

4 Eye in the sky
A rough-legged buzzard flies patrol of its own nest as a hungry family of red-breasted geese forage for grass below.

DID YOU KNOW?

- **On October 10, 1998, the Ukraine issued a set of four colorful postage stamps depicting the red-breasted goose; the four stamps depict the various activities of the red-breasted goose.**
- **The beautiful goose is known by many other names. *Rothalsgans* is its German name, while in French it is known as *bernache á cou roux* and its Spanish name is *ganso de pecho rojo*.**

BEHAVIOR

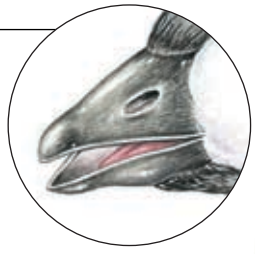
In spite of its small size, the red-breasted goose is highly vocal and relatively aggressive among its own kind. When provoked by other red-breasted geese, for instance, the red-breasted goose makes a formidable sight as it menacingly vibrates the feathers surrounding its neck and head.

▶ DAZZLING DISPLAY
The goose's glorious plumage makes it uniquely beautiful.

PROFILE RED-BREASTED GOOSE

With its brilliant copper-colored plumage, the red-breasted goose stands in sharp contrast to the stark, rugged Siberian landscape.

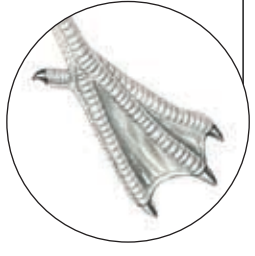
BILL
The small, delicate bill is well suited to the red-breasted goose's diet of small leaves and stems.



PLUMAGE
The red-breasted goose is named for the chestnut-red plumage on its foreneck, breast and head; these areas are finely bordered with white.

IN FLIGHT
During winter, the fast-flying goose makes daily flights to watering holes.

FEET
Webbed feet make the goose an unsteady walker but a graceful swimmer; it uses the webs like underwater flippers to propel it along.

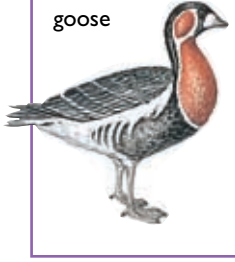


TAIL
Designed for spending much of its time sitting on the water, the red-breasted goose's black-and-white plumed tail can be used as a rudder when swimming.

CREATURE COMPARISONS

At 28", the emperor goose (*Anser conagicas*) is larger than the red-breasted goose. While both birds have distinct coloration, the emperor goose lacks the rich reddish-chestnut coloration of its relative; the emperor goose has a white head and back of the neck, with otherwise gray-to-black plumage. While the emperor goose is an Alaskan and eastern Siberian goose that winters in the Arctic seas, it is rarely found south of Alaska. The red-breasted goose is found almost entirely within the Taymyr Peninsula in the Siberian tundra and winters mostly around the Black Sea.

Red-breasted goose



Emperor goose

VITAL STATISTICS

WEIGHT	2.5–3.5 lbs.
LENGTH	20–22"
WINGSPAN	45–53"
SEXUAL MATURITY	3–4 years
BREEDING SEASON	Summer; begins in June and chicks fledge by August
NUMBER OF EGGS	3–7; usually 6 or 7
INCUBATION PERIOD	23–24 days
FLEDGING PERIOD	35–60 days
BREEDING INTERVAL	Yearly
TYPICAL DIET	Leaves, stems, green grasses
LIFESPAN	Unknown

RELATED SPECIES

- **The red-breasted goose is 1 of 5 species in the genus *Branta*. Distribution of this wide-reaching genus spans the globe, ranging from the Hawaiian goose, *Branta sandvicensis*, found in Maui, to the barnacle goose, *Branta leucopsis*, found in Greenland. There are about 147 species in the *Anatidae* family, which includes such birds as ducks, geese, mergansers and stifftails.**

Red-breasted Merganser

• ORDER •
Anseriformes

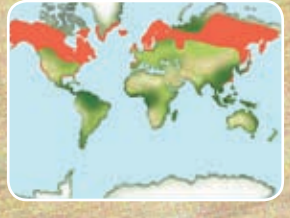
• FAMILY •
Anatidae

• GENUS & SPECIES •
Mergus serrator

KEY FEATURES

- Scans the water's surface for prey
- Females commonly gather their hatchlings to form one brood, which becomes the responsibility of the group
- During courtship, the male stretches his neck and sprints across the water before mating

WHERE IN THE WORLD?



Found in northern Europe, Asia and North America; winters on the Atlantic and Pacific coasts, the Gulf of Mexico and the Great Lakes

LIFECYCLE

Flocks of red-breasted mergansers descend upon the sea, in search of small fish and their eggs; nicknamed the fish duck, the merganser will eat almost nonstop.

HABITAT

During the breeding season, red-breasted mergansers can be found along the coast around inland lakes and streams in northern Europe, Canada, Greenland and Alaska. The duck's range extends into the tundra areas; as a ground nester, it does not need to have trees in its habitat. The merganser prefers areas with different types of cover, such as boulders, cavities and grassy habitats.

This migratory bird has the widest distribution of all mergansers in both the Old and New Worlds. The greatest southern migrations occur in October and November, when huge flocks form and head south to the marshes, lakes, ponds and streams on the Atlantic and Pacific coasts. The migration north from the coasts to the breeding grounds begins in March and ends in May. Red-breasted mergansers spend the summer in their breeding range across the North American, European and Asian continents.

▼ **FRIENDLY NEIGHBORS**
Red-breasted mergansers often share their coastal home with other birds, such as gulls.

SEEK AND DEVOUR

1 Reconnaissance mission…
An accomplished swimmer, the merganser uses its powerful feet to propel itself through the water in search of fish prey.

2 A view from below…
The merganser dips its head under the surface, swinging its crested head from side to side as it eagerly scans for fish.

3 Stick with the chase…
In one quick motion, the merganser plunges itself into the water in pursuit of its prey; the trout cannot escape this persistent hunter.

4 Gone with the fish
The duck's serrated bill holds the fish in place as it swims to the surface, holding the prize in its mouth and swallowing it whole.

BREEDING

A number of males (drakes) surround a female during courtship, vying for her interest — she will choose the most impressive suitor. The males perform extensive neck-stretching, followed by bobbing, vocalizations, drinking, preening and wing-flapping. The male also appears to skip over the water as he makes his approach to the female. Unlike other mergansers, the red-breasted species builds its nest on the ground, usually on small islands in freshwater lakes or near the sea, under some kind of cover — old logs, roots, even beach trash. If there is a shortage of nesting sites, more than one female may lay her eggs in the same nest. The female lays 7–12 olive to gray eggs; the chicks hatch, covered in gray down, in 26–28 days. The young are soon strong enough to run outside the nest and climb onto their mother's back. It is not uncommon for several females to raise and care for their chicks in one brood. After about 60 days, the red-breasted merganser chicks are on their own.

▶ **OPPOSING PLUMAGE**
The difference between the sexes is obvious.

FOOD & HUNTING

A notorious glutton, the red-breasted merganser eats incredible amounts of food. Fish are this diving duck's favorite meal, including trout, salmon, sand smelt, blenny, roach, gudgeon pike, rock bass, spotted shark, hake, herring and whiting. The bird also eats eels, crustaceans and water insects.

The merganser typically feeds by placing its head underwater and scanning for fish. Once it spots one, the duck immediately dives, grabs the fish and brings it to the surface, where it swallows its victim whole. The merganser will often take a drink of seawater after it has gulped down its prey. Flocks will frequently feed together, often launching their attack in unison, which usually creates quite a stir on the surface.

▲ **UNDERWATER SCAN**
Before diving, the merganser surveys for food.

CONSERVATION

The red-breasted merganser is not endangered. Since its meat is fairly inedible, the merganser is not sought after by hunters. But in Scotland and Ireland, where increasing numbers of the bird pose a threat to salmon and trout, there are bounties for dead mergansers.

DID YOU KNOW?

- **On land, the merganser often rests flat on its belly or stands at a 45° angle.**
- **The merganser's appetite for fish is so huge that the bird may need to regurgitate part of its meal before it can fly.**

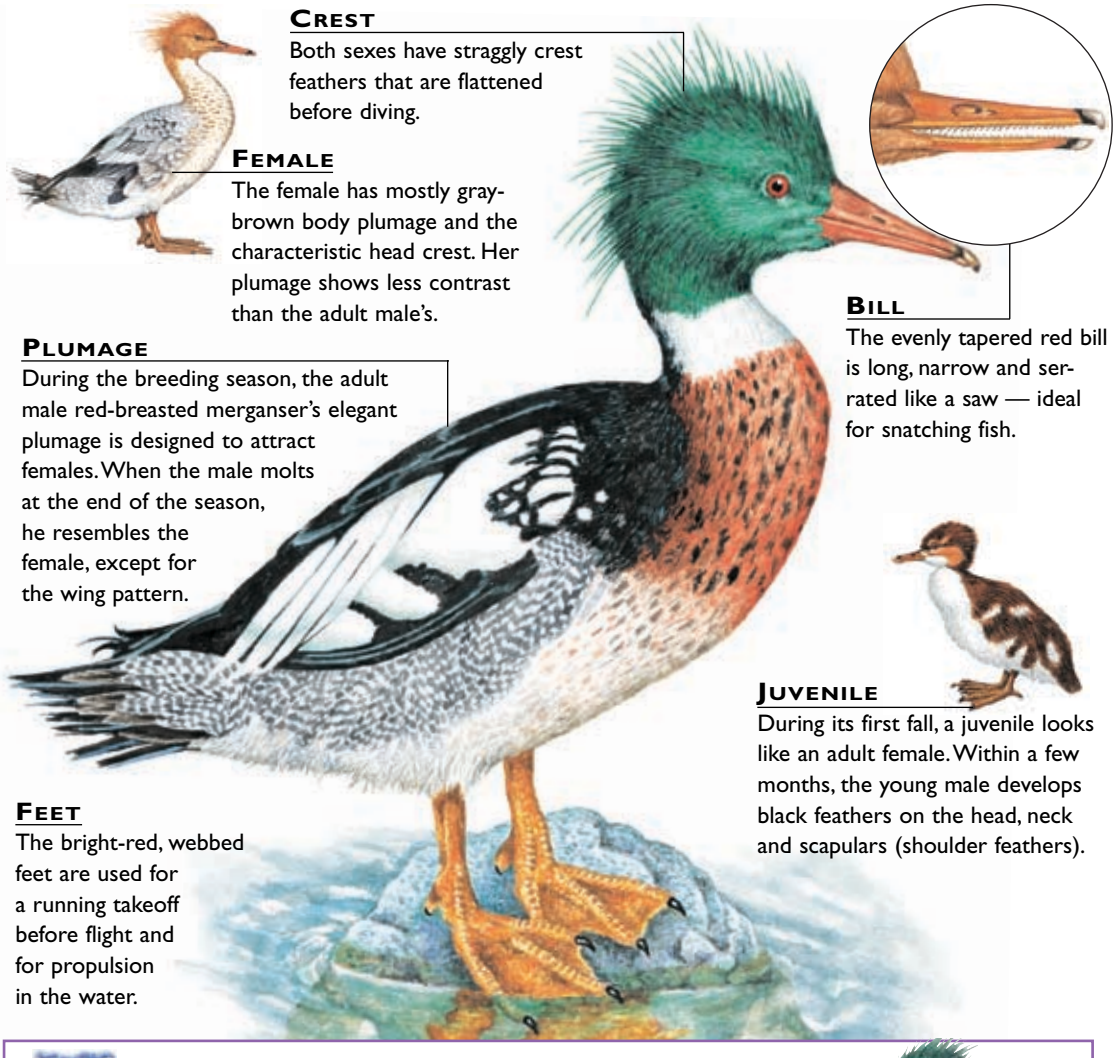
BEHAVIOR

The red-breasted merganser is most at home in the water or in the air. The duck flies close to the water, and its wings create a slight whistling sound. On land, the duck seems awkward as it walks and often stops to rest on its belly. These agile divers are fairly quiet birds, with the male uttering a rough *da-ah* and the female answering with a croaking *kha-kha-kha* during courtship.

▶ **NIBBLES AND TWISTS**
A meganser bends and twists its head to preen its feathers.

PROFILE RED-BREASTED MERGANSER

Both the male and female red-breasted merganser have a characteristic fuzzy crest that flattens when the large, sleek fish eater is about to dive.



CREST
Both sexes have straggly crest feathers that are flattened before diving.

FEMALE
The female has mostly gray-brown body plumage and the characteristic head crest. Her plumage shows less contrast than the adult male's.

PLUMAGE
During the breeding season, the adult male red-breasted merganser's elegant plumage is designed to attract females. When the male molts at the end of the season, he resembles the female, except for the wing pattern.

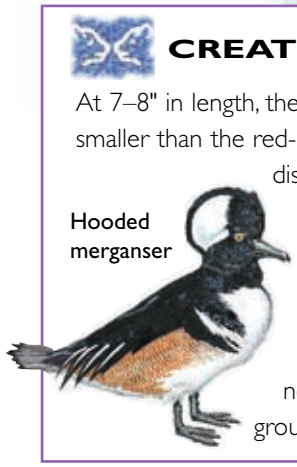
BILL
The evenly tapered red bill is long, narrow and serrated like a saw — ideal for snatching fish.

JUVENILE
During its first fall, a juvenile looks like an adult female. Within a few months, the young male develops black feathers on the head, neck and scapulars (shoulder feathers).

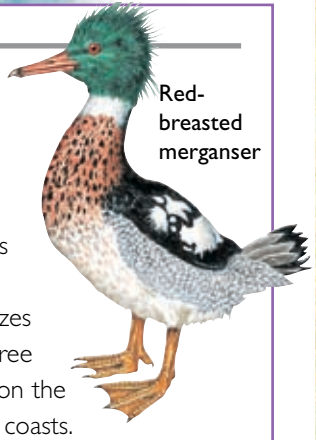
FEET
The bright-red, webbed feet are used for a running takeoff before flight and for propulsion in the water.

CREATURE COMPARISONS

At 7–8" in length, the hooded merganser *(Mergus cuccullatus)* is much smaller than the red-breasted merganser and not as common. It is easily distinguishable from its close relative by its hooded plumage, which the male displays during breeding season. In both species, male and female mergansers have a similar appearance outside the breeding season. Though both species have the same clutch sizes and incubation periods, the hooded merganser is a tree nester and the red-breasted merganser builds its nest on the ground. Both species winter along the Pacific and Atlantic coasts.



Hooded merganser



Red-breasted merganser

VITAL STATISTICS

WEIGHT	2.5 lbs.
LENGTH	19–26"
SEXUAL MATURITY	2 years
BREEDING SEASON	March–May or June–July, depending on the region
NUMBER OF EGGS	7–12
INCUBATION PERIOD	26–28 days
FLEDGING PERIOD	60 days
BIRTH INTERVAL	1 year
TYPICAL DIET	Mainly fish; also crustaceans, water insects, earthworms
LIFESPAN	Unknown

RELATED SPECIES

● The red-breasted merganser is 1 of 6 species in the genus *Mergus,* which includes the scaly-sided merganser, *M. squamatus.* There are a total of 41 genera and 147 species in the family *Anatidae,* which includes ducks, geese and swans ranging in size from the large, 6'-long trumpeter swan, *Cygnus buccinator,* to the small, 1'-long African pygmy goose, *Nettapus auratus.*

Red-headed Woodpecker

• ORDER •
Piciformes

• FAMILY •
Picidae

• GENUS & SPECIES •
Melanerpes erythrocephalus

KEY FEATURES

- Its brilliant red head makes this bird conspicuous no matter where it flies or lands
- Uses its hard, pointed bill to drill into trees in search of food and nesting sites
- Has a voracious appetite; almost anything is game for this active woodpecker
- Dwells in open country where dead trees are plentiful

WHERE IN THE WORLD?

Occurs in North America from Canada's Lake Winnepeg and southern Ontario south to the Gulf of Mexico and Florida; east of the Rocky Mountains and west of New England

LIFECYCLE

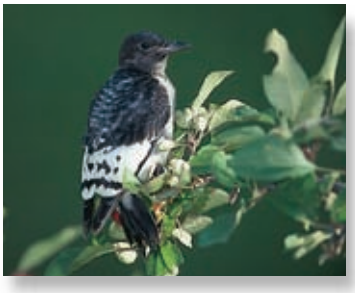
Migratory flocks of red-headed woodpeckers color the sky with a spectacular display of crimson; their bright heads are equally visible while drilling from their tree-side perches.

HABITAT

With a preference for open country, the red-headed woodpecker frequents mature lowland forests with plenty of dead trees for nesting and open undergrowth. Other habitats include various types of wooded savannahs, open woodland, pine forests, villages, suburbs, orchards and agricultural lands. Southern populations may choose clearings with tall stumps. In the post-breeding season, the woodpecker will flock to tall mature woodland. Northern populations will migrate south regularly from August to November, and winter in Kansas, Iowa, Ohio and New Jersey in search of new food sources. The woodpeckers return north in March.

▶ **GARDEN POST**
An adult uses its tail for support while perching.

▼ **YOUTHFUL YEARNING**
A drably-colored juvenile perches in a fruit tree.



CONSERVATION

Red-headed woodpecker numbers are plentiful in North America, and there is no immediate danger to the bird, other than destruction of its preferred woodland habitats.

FOOD & FEEDING

The omnivorous woodpecker forages in trees and on the ground, feeding on anything from small birds, bird eggs and mice to insects, fruits and seeds. Its wide range of prey also includes earthworms, crickets and wasps. After pecking away at dead tree bark, the bird uses its long tongue to extract insects, including beetle larvae. For larger animal prey, such as mice, the bird pounces on its victim and pecks it with its bill. Besides the nuts and acorns the woodpecker stores in winter, the bird also has caches of various fruits, including cherries, grapes and apples.

▲ **HOLD ON TIGHT**
An adult grasps a branch with its strong toes while hanging upside down to reach some berries.

BUSY FEEDER

1 Bird at work...
A woodpecker discovers a nest and chisels away until the hole is wide enough for the bird to look for any resident nestlings.

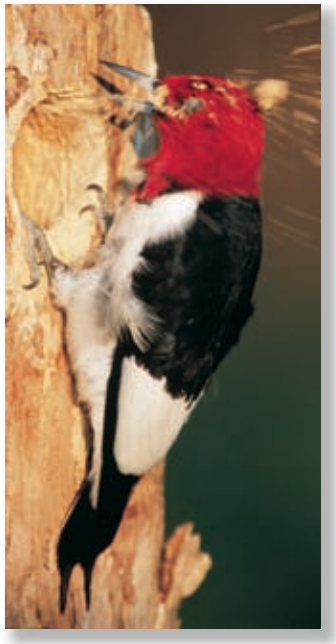
2 Reach and grab...
A young chick doesn't stand a chance as the woodpecker plucks it from its nest and flees the scene of the ambush.

3 Grasshoppers galore...
The unsuspecting grasshopper, a favorite food among woodpeckers, does not see the swooping bird that will make a meal of the insect.

4 Mission over
The woodpecker stores the grasshopper in a crevice along with dead beetles and other insects it has captured for future food sources.

BEHAVIOR

The red-headed woodpecker will use anything hollow, such as a tree trunk, as a drum to sound warnings to defend its territory. The bird repeatedly bangs away with its strong, sharply-pointed bill, pecking holes along the way. The woodpecker also emits rapid *churr* calls when it defends its range. The woodpecker is so aggressive that it will chase away most other bird species. During short-distance migrations, red-headed woodpeckers travel in flocks of several hundred birds, displaying a unique bobbing style of flight in which the bird appears to rise and fall several times.



BREEDING

During the breeding season, from April to August, the male red-headed woodpecker will excavate the nesting site, a cavity 8–24" deep, 5–80' above ground, usually in a cypress, oak or palmetto tree. Woodpeckers, which are not too finicky, will also use nest holes in buildings and other artificial structures, including common fence posts and even broken wagon wheels, as long as the entrance hole is about 1.75" in diameter. Drumming is part of the courtship ritual, and pairs will often perform mutual tapping, with one bird inside the hole of a tree and the other at the entrance. The male is monogamous; however, occasionally another female will join the pair to help care for the brood. The female will lay 4–7 white, glossy eggs on a layer of fine wood chips, and both sexes will incubate the eggs for 12–13 days.

The helpless chicks are naked and blind with extremely long necks — longer than their bodies, in fact. Both parents will feed and care for the hatchlings until they are ready to leave the nest, within 30 days, and after their juvenile plumage has developed. The pair will usually produce a second brood a short time later at a different location. If the eggs are taken or destroyed, the persistent pair will produce more.

FRESH FOOD
A parent brings a protein-rich insect meal to its hungry chicks.

DID YOU KNOW?

- **The red-headed woodpecker will suspend the wing-molting process when it is time to migrate and will continue it after arriving at its wintering grounds.**
- **One persistent female laid 32 eggs in a season before successfully raising a brood.**

FLYING CHIPS
A red-headed woodpecker chisels a nesting cavity in a tree with rapid drilling motions of its sharp, pointed bill.

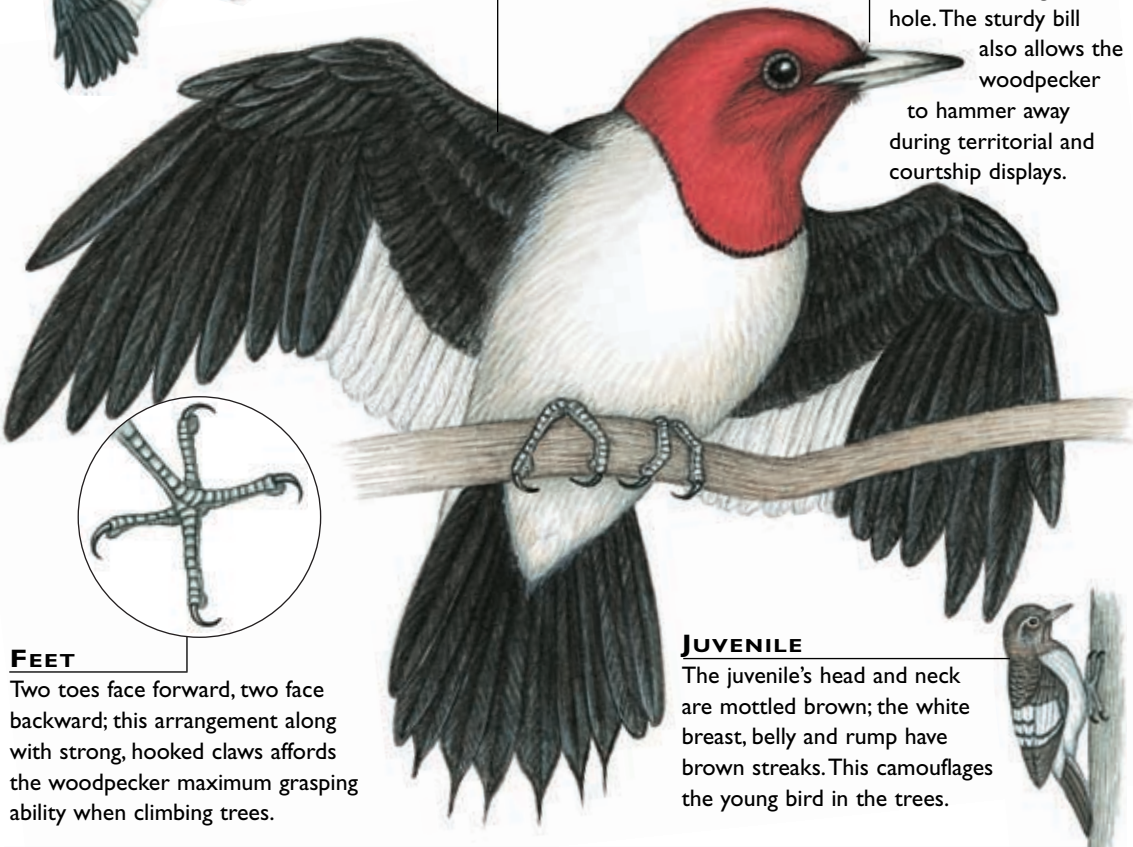
PROFILE RED-HEADED WOODPECKER

The handsome red-headed woodpecker flashes its signature crimson head as it flies to a handy perch on dead or fallen trees.

IN FLIGHT
The white in the woodpecker's wings is quite visible as it engages in its erratic up-and-down flight.

PLUMAGE
Both sexes sport a bright red head, neck and throat, hence their common name, with contrasting black-and-white plumage on the body.

BILL
The straight, hard, pointed bill is used like a chisel to drill into trees, whether in a search for food or when excavating a nest hole. The sturdy bill also allows the woodpecker to hammer away during territorial and courtship displays.



FEET
Two toes face forward, two face backward; this arrangement along with strong, hooked claws affords the woodpecker maximum grasping ability when climbing trees.

JUVENILE
The juvenile's head and neck are mottled brown; the white breast, belly and rump have brown streaks. This camouflages the young bird in the trees.

VITAL STATISTICS

WEIGHT	2–3.4 oz.
LENGTH	7.5–9"
WINGSPAN	16–18"
SEXUAL MATURITY	1 year
BREEDING SEASON	April–September
NUMBER OF EGGS	4–7
INCUBATION PERIOD	12–13 days
FLEDGING PERIOD	27–30 days
BREEDING INTERVAL	Usually 1 or 2 broods per season
TYPICAL DIET	Nuts, seeds, insects and fruit
LIFESPAN	Over 10 years

RELATED SPECIES

- The red-headed woodpecker is one of 22 species in the genus *Melanerpes*, including the golden-fronted woodpecker, *M. aurifrons*, with its "zebra-striped" coloration. There are about 200 species of woodpecker, wryneck and piculet in the family *Picidae*. The family includes the red-breasted sapsucker, *Sphyrapicus varius*, and the northern flicker, *Colaptes auratus*.

CREATURE COMPARISONS

The acorn woodpecker *(Melanerpes formicivorus)* at 9" is the same size as its red-headed cousin and prefers to live close to oak trees and woodlands in western North America south to Colombia. The sociable acorn woodpecker lives in groups of up to 12 birds that defend a shared territory and nest communally, while the red-headed woodpecker usually nests in separate pairs. In late summer, the acorn woodpecker bores holes into trees, fences and wooden buildings, storing an acorn in each hole, which serves as a future food site. The acorn woodpecker's plumage differs from the red-headed species; its head is only partially red, with black-and-white markings.

Red-headed woodpecker

Acorn woodpecker

Red-tailed Tropicbird

• ORDER •
Pelecaniformes

• FAMILY •
Phaethontidae

• GENUS & SPECIES •
Phaethon rubricauda

KEY FEATURES

- Plunges with dramatic, vertical dives of up to 160'; can catch a flying fish in midair
- Displays its remarkably long, red tail feathers during aerial courtship maneuvers
- Spends the majority of the year far from land; comes ashore only to breed

WHERE IN THE WORLD?

Found mainly in the tropical and subtropical Pacific and Indian Oceans; occasionally discovered in California, South Africa and Japan

LIFECYCLE

The flashy red-tailed tropicbird, with its long feathers streaming like a kite's tail, performs dazzling aerial courtship and daredevil diving displays.

HABITAT

The red-tailed tropicbird inhabits tropical and subtropical regions of the Indian and Pacific Oceans. It is very *pelagic* (ocean-going), spending most of its time soaring high above the sea. The tropicbird returns to land to breed on volcanic islands, ring-shaped islands *(atolls)* and coral reefs or sand banks.

HAWAIIAN VACATION
The red-tailed tropicbird soars high above the Pacific on its way to summer breeding grounds.

BEHAVIOR

THINK TWICE
The red-tailed tropicbird's defense posture startles most intruders.

The red-tailed tropicbird is usually silent at sea, whether flying high above or resting in the cool waters. But the tropicbird grows quite vocal on land. This territorial bird emits guttural screeches as part of its striking defense posture, used to threaten rivals and deter most predators. To make itself appear larger, the red-tailed tropicbird will raise its upper wing bones and hold its wing tips close together. It also ruffs its head feathers, while shaking its head from side to side, and spreads its long tail streamers upward. Birds as young as 40 days old are capable of this display. Unfortunately, many predators such as white-bellied sea eagles, silver gulls, ospreys and even ravens are often successful in getting past an adult bird to prey on the chicks or eggs. The tropicbirds also battle for scarce nesting sites, which must always be near a good takeoff point for flight. The red-tailed tropicbird can only shuffle about on the ground, and since it can't run to take off, it requires the right wind currents to become airborne. Once aloft, the red-tailed tropicbird soars effortlessly above the seas of the Tropics of Cancer and Capicorn, as well as areas even further north or south. Since good takeoff sites are often hard to find, the normally solitary tropicbird will occasionally crowd into a loose colony. But when on land, it will always establish a small territory and defend it from its neighbors. The birds peck and posture to keep others at bay.

DID YOU KNOW?

- **To cushion the blow it receives when plunging into the water, the tropicbird has air sacs under its skin at the front of its head and neck.**
- **If it rains while the red-tailed tropicbird is incubating, the bird pulls its head and neck close to its body and tilts them at an angle to encourage runoff.**

FOOD & HUNTING

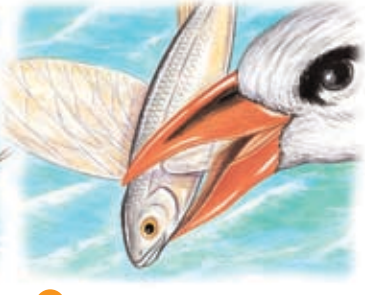
A tropicbird's feeding display is an incredible sight: The bird plunges over 100' through the air in pursuit of an 8" long flying fish. The flying fish uses its pectoral fins to sail above the surface at speeds up to 45 mph. The tropicbird tracks the glide path of these flying fish before zeroing in for the kill. It hunts for other fish as well, and is very fond of squid. When the tropicbird strikes, it remains underwater an average of 27 seconds during a dive. By the time it emerges, it usually has swallowed its catch.

FAST FOOD

1 Sky-high dive…
A feeding performance begins 80' above the surface as the tropicbird hovers over its prey, then plunges toward the sea.

2 Take five…
After a perfect dive, one tropicbird emerges in victory, takes a few seconds to swallow and continues the aquatic show.

3 Full speed ahead…
It spots a flying fish jumping and gliding in an attempt to escape an underwater predator. The tropicbird pursues and…



4 Well-fed
…catches the flying fish in midair before it has a chance to return to the water. It snaps its bill shut on its massive meal.

BREEDING

During courtship and mating aerial displays, the tropicbirds bark a distinctive *eek* and a cackling call, all while demonstrating their daredevil aerial maneuvers. Groups of up to 20 birds fly in circles, calling rapidly. From slow flight to hovering with rapid wing beats, the birds encircle possible nesting sites from five seconds to five minutes, before pairs actually descend to one. Once an egg is laid, these displays stop. The one egg is incubated by both sexes in shifts lasting up to 1 week. Born blind, the downy chick opens its eyes at 3 days old. The parent regurgitates food into the chick's mouth. The juvenile fledges at 3 months of age, and flies directly out to sea.

▼ MAKE IT SNAPPY
When its parents leave, a nestling will beg for food from any adult.

CONSERVATION

Populations of the red-tailed tropicbird are currently considered stable. The Pacific has the largest number of these birds; Hawaii alone is home to about 12,000 pairs. In 1997, El Niño raised the sea's surface temperature, decreasing the aquatic food supply. This contributed to a decrease in numbers on islands, such as Christmas Island.

PROFILE RED-TAILED TROPICBIRD

The colorful red-tailed tropicbird sails spectacularly above the sea in strong and graceful flight, only occasionally descending to land.

JUVENILE

Striped with black bars, the juvenile lacks the colorful red bill and tail streamers of the adult. It attains adult plumage in 2–3 years.

BILL

The long, pointed bill is used to snap up fish or squid from the sea and flying fish from the air. The bird can open its mouth wide to capture and swallow large fish, over 6" long.

FEET

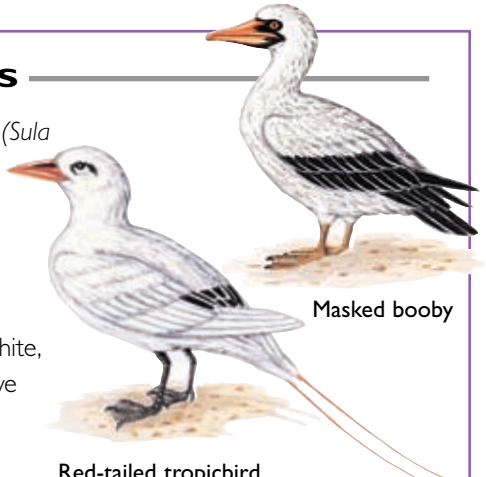
The small, webbed feet and short legs are better suited for digging and swimming than for walking. The bird can only shuffle about for short distances on land, with its belly scraping the ground.

TAIL

The tropicbird is a flying banner with its two long, red tail streamers. Up to 14" long, the feathers are displayed during courtship performances.

CREATURE COMPARISONS

Measuring up to 34" in length, the masked booby *(Sula dactylatra)* is much larger than the red-tailed tropicbird; it has a larger wingspan, up to 62" wide, and a streamlined body that tapers to a point at each end. This lets the booby make deeper underwater dives than the tropicbird and thus snag larger prey. Both birds are white, but the masked booby has more extensive black markings, including the wing edge and a face mask, hence its name.



Masked booby

Red-tailed tropicbird

VITAL STATISTICS

WEIGHT	21–29 oz.
LENGTH	
Head/Body	23–27"
Tail	Up to 14"
WINGSPAN	42–47"
SEXUAL MATURITY	Unknown
BREEDING SEASON	Varies according to region
NUMBER OF EGGS	1
INCUBATION PERIOD	41–48 days
FLEDGING PERIOD	68–91 days
BREEDING INTERVAL	Up to 1 year
TYPICAL DIET	Fish and squid
LIFESPAN	Up to 9 years

RELATED SPECIES

- **The *Phaethon* genus and *Phaethontidae* family include three species of tropicbird. The red-tailed tropicbird is shorter-winged and stouter than the other two species of tropicbirds, the red-billed, *P. aethereus*, and the white-tailed, *P. lepturus*. The order *Pelecaniformes* contains over 60 species, including anhingas, boobies and pelicans, the largest birds in the order.**

Red-winged Blackbird

• ORDER •
Passeriformes

• FAMILY •
Icteridae

• GENUS & SPECIES •
Agelaius phoeniceus

KEY FEATURES

- Only mature males display brilliant red shoulder epaulets
- One of the earliest migrants to the northern U.S. and Canada; marks its arrival with song
- Helps control insect populations but is also a crop pest: eats berries, fruits and grains

WHERE IN THE WORLD?

Breeds from the southern Yukon across Canada to Nova Scotia, south to Costa Rica; also in California, Cuba and the Bahamas

LIFECYCLE

The red-wing welcomes spring with its song; while its appetite for insects helps control pests, its preference for berries and grains makes it unwelcome at farms and orchards.

HABITAT

The red-winged blackbird thrives in areas near water, such as marshes, bogs and swamps, lakes and ponds or sluggish streams. It can often be seen perched in small trees and bushes. Males are the first to arrive at the breeding grounds in spring and early summer, and choose their territories based on the availability of safe nesting and roosting sites, as well as an abundance of food — marshes and hayfields are preferred.

In August, the birds move to more secluded areas; by the fall migration, males and females reappear briefly in the marshes and then move south in large flocks across the U.S. to find areas near open water.

▼ **A MIGRATING MASS**
Thousands of red-wings flock together during migrations south.

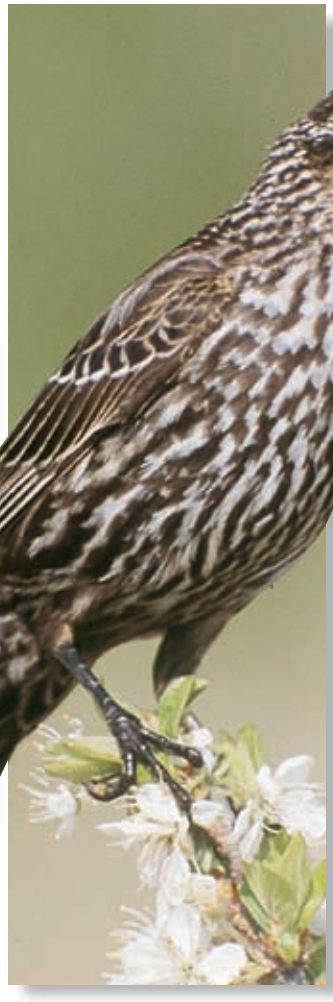
DID YOU KNOW?

- **In Arkansas, 30 roosting places accommodate an estimated 50 million red-winged blackbirds.**
- **The red-winged blackbird's flight speed has been recorded at up to 28 mph during migrations.**

CONSERVATION

The red-wing population is extremely strong; in Ohio it increased 300% over three years. But the red-winged blackbird is a chief culprit in crop destruction in the U.S., causing up to $100 million a year in damage. Most damage occurs when the young leave the nest, consuming berries and fruits along their way. With its exploding population, the red-wing will continue its mass consumption of crops unless population control measures are put into place. One method being tried is sterilization agents given through baited feed.

BEHAVIOR



▲ **CAPTIVE AUDIENCE**
A female perches and listens to a male's song.

Tremendously territorial, the redwing exhibits its most aggressive behavior during the spring. With his early arrival, the male esta-blishes his position through song and display. By early March, the red-wing utters its first call, *konkare*, proclaiming the arri-val of spring. Three visual displays are used to declare territory depending on the situation. The male sings from prominent perches within the chosen terri-tory; this display is accompanied by the *ookalee* call. The bird also shows its epaulets. The second display is a song flight as the bird reenters the territory, occa-sionally with his epaulets flared. The third display is the bill tilt, which takes place without sound when birds meet at territorial borders; the male also flares his epaulets. Most activity occurs in the morning and late afternoon. There is a lot of jockeying for sites, sometimes for weeks.

BREEDING

The mating ritual of the red-winged blackbird is a complex series of interactions in which the male impresses the female with his displays and song. From their perches, males bow and crouch, arching their wings until the bright-red and yellow wing patches catch the attention of the females. A rapid series of whimpering whistles from the male indicate that pair formation has started. The female builds the nest, made of woven materials such as grass and other leaves. Females incubate the eggs for about 12 days as the male remains nearby, guarding the territory. The newborn birds are naked and blind, requiring both parents for protection and feeding. At 10 days old, the young crawl out of the nest and perch in cover, such as stands of cattails, before they are able to fly. If they fall into the water, chances of survival are slim because of the nearby water snakes, bullfrogs and snapping turtles waiting to make a meal of the young birds. When the parents leave to start a new brood, the young form flocks with other juveniles and feed and roost together. The male red-wing averages three mates each breeding season.

A WORK OF ART

1 Weaving the base…
A female red-wing weaves thin strips of vegetation around lengths of bulrush as the male watches close by.

2 Strong foundation…
The female receives no help during the construction process but beautifully crafts the suspended nest with wet grass.

3 Intricate details…
She adds wet leaves and bark to form the cup, 3" in diameter, that will hold and protect the helpless hatchlings.

4 Finishing touches
After lining the nest with mud, the female adds a soft layer of fine grass that will cushion the 3–4 pale bluish-green eggs.

FOOD & FEEDING

The red-wing is an opportunistic omnivore, eating both plant and animal matter. The bird uses its bill to prospect for potential food sources, including crunchy arthropods, such as grasshoppers and crickets. Its taste for insects, particularly inchworms, moths, cutworms and wireworms, makes it beneficial to humans. However, its preference for berries and grains makes it a pest. The red-winged blackbird feeds during the day in open farm country and also snacks on breads and birdseed mixes at backyard feeders. Adult birds feed mostly insects to the young. When feeding with the flock, the red-wing walks deliberately on the ground or runs or hops to keep up with the other birds. In late summer and fall, thousands of red-wings mix with cowbirds and starlings to feed in the open fields on weed seeds.

◀ **PEST CONTROL**
A female red-wing catches a meal for her young.

PROFILE RED-WINGED BLACKBIRD

Only the male red-winged blackbird has red wings; its strikingly handsome plumage is designed to attract the drabber female.

FEMALE

The female resembles a large sparrow with her inconspicuous brown coloration. The hues blend with her surroundings during nest-building, incubation and brooding.

MALE'S EPAULETS

Symbols of age and experience, the male's bright red epaulets have a row of both yellow and white feathers that add to their brilliance during courtship and territorial displays.

MALE PLUMAGE

The male resembles a female until the second year, when he attains the glossy black feathers and full shoulder patches.

FEET

The red-winged blackbird has *ansiodactyl* feet, with three toes pointing forward and one behind, as in most perching birds.

VITAL STATISTICS

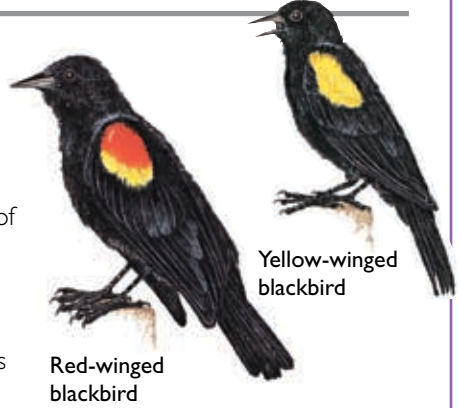
WEIGHT	Male up to 2.5 oz.; female up to 1.5 oz.
LENGTH	7–9.5"
WINGSPAN	12–14.5"
SEXUAL MATURITY	Male 2 years; female 1 year
BREEDING SEASON	March–July
NUMBER OF EGGS	3–5
INCUBATION PERIOD	11–12 days
FLEDGING PERIOD	21 days
BREEDING INTERVAL	Up to 3 broods per year
TYPICAL DIET	Insects, fruits, berries, grain and corn
LIFESPAN	Up to 15 years

RELATED SPECIES

● **The red-wing joins eight other species in the genus *Agelaius*, whose members inhabit the Western Hemisphere from Alaska to Patagonia. These birds are among 90 songbird species in 24 genera in the family *Icteridae*, including the brown-headed cowbird, *Molothrus ater*, and the bobolink, *Dolichonyx oryzivorus*, as well as blackbirds, grackles, orioles and meadowlarks.**

CREATURE COMPARISONS

The male yellow-winged blackbird (*Agelaius thilius*) is black, like the red-wing, but has yellow shoulders and underwing coverts. Like the red-wing, the yellow-winged blackbird marks the arrival of spring with song. It is the southern counterpart of the red-wing, found over the southerly parts of South America, from Bolivia and southern Brazil to Patagonia. The yellow-winged blackbird remains monogamous during its lifetime and is not territorial, unlike its close relative. Males often fly in flocks of 30–40, remaining apart from larger groups of females and the young outside of the breeding season.



Yellow-winged blackbird

Red-winged blackbird

Reddish Egret

• ORDER •
Ciconiiformes

• FAMILY •
Ardeidae

• GENUS & SPECIES •
Egretta rufescens

KEY FEATURES

- Occurs in two different color phases — a white phase and a dark phase
- Distinctive two-toned bill and shaggy neck distinguish it from other egrets
- Harpoons aquatic prey with its long, straight bill
- Unlike other herons, feeds by chasing its prey or raking the bottom to stir it up

WHERE IN THE WORLD?

Found in North, Central and South America mostly along the Gulf of Mexico and the Gulf of California: Florida, Texas, Mexico, Cuba, the West Indies, Colombia and northern Venezuela

LIFECYCLE

The reddish egret is a very social bird except when feeding; it prefers to eat alone and boldly defends its feeding territory from a variety of other birds.

HABITAT

Strictly a saltwater bird, the reddish egret typically occurs in shallow coastal waters, salt pans, open marine flats and along the shoreline; it is rarely seen far from the coast. Since this heron is entirely coastal, it usually seeks out islands and mangroves for nesting, where there is less danger from predators. The reddish egret mostly ranges from the Gulf of Mexico to the Bahamas and the Caribbean, as well as Mexico's Pacific Coast and the Gulf of California.

▲ **TIDAL FLATS**
The reddish egret relies on saltwater habitats, such as salt marshes along the coast.

DID YOU KNOW?

- **The white phase of the reddish egret has the same range as the dark phase; however, a higher percentage of white birds are found in the Bahamas, whereas a higher percentage of dark birds are found in Texas.**
- **Occasionally, two dark-phase egrets will produce a white-phase offspring, but two white-phase egrets always produce white offspring.**
- **Bird watchers love to watch the reddish egret feed — it often runs in zigzags to stir up prey, looking as though it is drunk and might topple headfirst into the water.**

BEHAVIOR

The reddish egret is *diurnal*, usually feeding during the day and roosting at night. Like most herons, it is highly social and can be found in large flocks with other herons, spoonbills and cormorants. By forming large groups, these birds reduce the number of threats from predators by increasing surveillance. While some populations fly south for the winter, the reddish egret is only an occasional migrator; most populations remain in the same place year-round.

▼ **MAJESTIC BEAUTY**
The reddish egret is truly a unique and beautiful bird, with its two-toned bill and shaggy plumes (*left*), as well as its unusual habit of actively chasing its prey (*below*).

BREEDING

In some parts of its range, such as Florida, the reddish egret breeds almost all year-round, with several peaks throughout the year; in other places, such as South America, it breeds only once, usually in the summer. Normally social and silent, the egret becomes aggressive and vocal during courtship; males chase each other while stabbing with their bills to defend territories and call to win a female's approval. A male walks back and forth in front of her while tossing his head and neck feathers. The pair nests either on islands, in low shrubs or on the ground, or in mangroves up to 15' high. Egrets nest in large colonies with other birds, especially other herons. The female lays 2–7 eggs (usually 3 to 4) and the sexes share incubation for 25–26 days. Chicks of white-phase adults have white down, whereas those of the dark phase have smoky-gray down with a cinnamon head and neck; mixed adults have mixed offspring. The chicks fledge at about 45 days, but don't reach sexual maturity until they are 2–3 years of age.

COLORFUL MARRIAGE

1 Mating…
A dark-phase male mates with a white-phase female high in a mangrove tree. The male spreads out his wings for balance.

2 Sitting…
The female sits on her eggs located in a nesting colony with several other species while her mate is out hunting for food.

3 Switching…
As the male prepares to take his turn incubating the eggs, the female perches off to the side. She will leave to hunt for herself.

4 Feeding
Weeks after hatching, chicks of both color phases clamber at the nest site to greet their mother as she arrives to feed them.

CONSERVATION

The reddish egret is not globally threatened. However, it was formerly more widespread in North America and has suffered in the United States; it is hunted there for its feathers. The bird had disappeared from Florida in the early 1900s but, through conservation efforts, the egret has returned. Habitat destruction has also reduced the bird's numbers.

FOOD & FEEDING

Although the reddish egret is gregarious, it is a solitary feeder and vigorously defends a feeding territory. It feeds mostly on small fish, but also consumes frogs, tadpoles and crustaceans. This egret prefers open tidal flats 6" or less in depth, but sometimes feeds in deeper water. As one of the most active feeders of the *Ardeidae* family, the reddish egret usually chases its prey by walking quickly or running. The reddish egret also feeds by hopping, opening its wings to frighten prey, and foot-raking, a process where it rakes the bottom with one foot to stir up prey.

▲ **GONE FISHIN'**
Most of the reddish egret's diet consists of small fish.

PROFILE REDDISH EGRET

With its long legs, slender neck and pointed bill, the reddish egret is well adapted to feeding on aquatic prey while wading in shallow water.

BILL
The two-toned bill is pink, with a dark tip; it is used as a harpoon to spear prey in shallow water.

WHITE PHASE
The white phase is often confused with other species of egrets. It is easily distinguishable, however, by its shaggy head and neck, two-toned bill and bluish-gray legs and feet.

JUVENILE
The juvenile blends into its environment with grayish-brown plumage. It has virtually no reddish tinge on its neck. The juvenile's bill is mostly black compared to the adult's two-toned bill.

DARK PHASE
The plumage of the dark phase is slaty gray with a rusty head and neck. Like the white phase, its head and neck are shaggy with long, thin plumes.

FEET
The unwebbed feet are designed for walking with three long, thin toes pointing forward and one backward; the middle toe is the longest and contains a comblike claw used for grooming.

VITAL STATISTICS

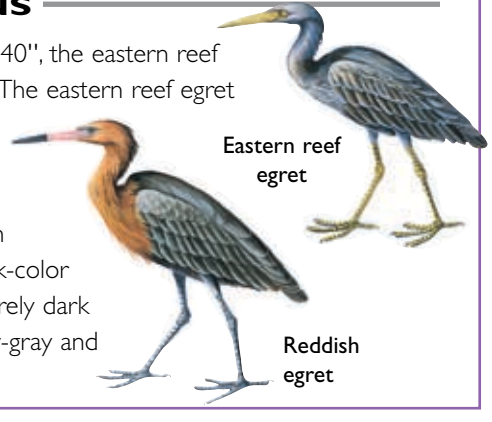
WEIGHT	1–2 lbs.
LENGTH	26–32"
WINGSPAN	About 46"
SEXUAL MATURITY	2–3 years
BREEDING SEASON	Varies with location
NUMBER OF EGGS	2–7; usually 3–4
INCUBATION PERIOD	25–26 days
FLEDGING PERIOD	About 45 days
BREEDING INTERVAL	1 year; occasionally 2 clutches per year
TYPICAL DIET	Mainly small fish; also frogs, crustaceans
LIFESPAN	12 years or more

RELATED SPECIES

● The reddish egret is 1 of 13 egrets in the genus *Egretta*. Other members include the great white egret, *E. alba*, the pied heron, *E. picata*, the little egret, *E. garzetta*, and the Chinese egret, *E. eulophotes*. The heron family *Ardeidae* contains 60 species in 17 genera of herons, egrets and bitterns. The cattle egret, *Bubulcus ibis*, is the most common egret and is found worldwide.

CREATURE COMPARISONS

Reaching only 26" long with a maximum wingspan of 40", the eastern reef egret (*Egretta sacra*) is smaller than the reddish egret. The eastern reef egret inhabits rocky shores and coral reefs from Asia to Japan, the Philippines, Australia and New Zealand, unlike the reddish egret, which is found in the shallow salt pans and marine flats of North, Central and South America. Although both species have a white and dark-color phase, the dark phase of the eastern reef egret is entirely dark gray with a solid-yellow bill; the reddish egret has slaty-gray and rust plumage and a pinkish bill with a black tip.



Reed Warbler

• ORDER •
Passeriformes

• FAMILY •
Sylviidae

• GENUS & SPECIES •
Acrocephalus scirpaceus

KEY FEATURES

- The male sings throughout the day attempting to attract a mate; once mated, it sings only at dawn and dusk
- If a cuckoo lays its egg in a warbler's nest, the warbler raises the young cuckoo as its own

WHERE IN THE WORLD?

From British Isles and southern Scandinavia, east across central Russia, and south to northwest Africa, across southern Russia to China

LIFECYCLE

The reed warbler brings lively song to reedbeds and marshes when it announces its spring arrival, a welcome sound to birdwatchers.

HABITAT

The reed warbler, as its name implies, is a common and widespread inhabitant of reedbeds. Throughout its range, from Britain to the Balkans, Russia to Sardinia, the reed warbler seeks out tall, broad-leaf grasses. Reeds are the tallest of all the grasses in northern climates; in the summer, during the breeding season, the reed warbler binds its cylindrical nest between the stiff stems, high above the water line for protection. The active bird also frequents clumps of sedges in marshes and swamps, willow thickets and other shrubs near brackish or freshwater. Wetland areas with plants such as meadowsweet and willowherb and even small trees, including blackthorn, hawthorn and willow, can also be called home. Occasionally, reed warbler pairs can even be spotted in a suburban garden, cultivated field or park. Every fall, the reed warbler travels 950–3,750 miles to tropical Africa, migrating as far south as northern Zambia.

Since reedbeds are harder to find in its dry, arid African wintering grounds, the reed warbler dwells in open grasslands, acacia scrub or wooded savannahs.

▼ **REED TO REED**
The reed warbler hops through the marshes and perches perfectly between reeds, loudly announcing its territory.

BREEDING

When the reed warbler returns north in the spring, the males arrive first. At daybreak the sound of their rhythmic songs fills the air, continuing throughout the day. Each male tries to find a mate, and some males may actually have two. Very territorial, the male stands guard near the nest, which is constructed solely by the female. She weaves the stems and leaves around the tall plants and forms a cylindrical cup.

The greenish-white eggs are smooth and glossy. The clutch is under threat from the the European cuckoo, which occasionally removes a warbler egg and replaces it with its own. The cuckoo's egg looks remarkably similar to the warbler's (*photo, right*), and the birds unwittingly incubate it as one of their own. But the cuckoo usually hatches first, and tips the young warbler chicks out of the nest. The warblers then continue to feed the cuckoo. In nests without cuckoos, both parents tend the young for about two weeks when the chicks mature and fledge.

SPRING FEVER

1 A fine tune…
A male reed warbler arrives at the breeding area before any females and awaits, singing his love song.

2 Love in bloom…
A pair has formed and the female warbler begins constructing a grass nest, knotting leaves to the stiff reed stems.

DID YOU KNOW?

- **The reed warbler's song, a rhythmic flow of notes, has been described as sounding like two pebbles being clinked together.**
- **The reed warbler's olive-brown coloring, conspicuously dull for a songbird, provides perfect camouflage in reedbeds.**

BEHAVIOR

3 Expert weavers...
Spiders' webs help cement the cup-shaped nest of leaves, flower heads and stems. Hair and feathers are used for a soft lining.

4 "Wide" receivers
The chicks open their mouths wide, begging for food. It takes both parents to provide enough food for all.

Each spring, the reed warbler's breeding call echoes throughout the marshes. Though other warblers physically resemble the reed warbler, each warbler has a distinct song. While incubating, this highly territorial bird faces a threat from the European cuckoo. The clever cuckoo waits until incubating parents have left their nest before removing a warbler's eggs and adding one of its own.

In fall, the warbler leaves Europe for Africa. Thousands of birds in flocks are viewed each year crossing the Mediterranean.

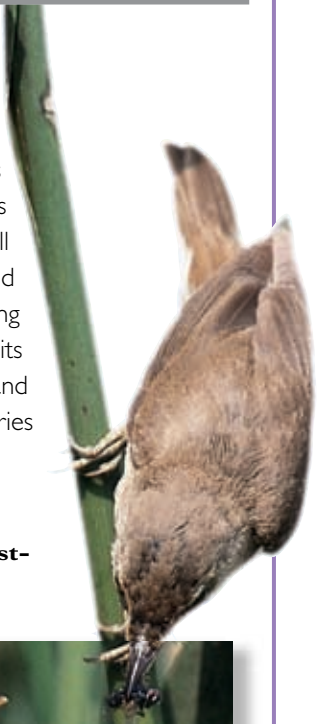
◀ **SAVVY STOWAWAY**
A cuckoo chick casts warbler nestlings aside and is raised by its unintentional foster parent.

CONSERVATION

The reed warbler is currently not in danger. As many as 1 million breeding pairs nest in Britain alone each year. Though the reed warbler often mistakenly raises a European cuckoo instead of its own young, this does not seem to have affected overall population strength. Its adaptability to not only reedbeds but marshes, swamps and even suburban parks and gardens has led to its widespread success.

FOOD & FEEDING

The reed warbler searches expertly among tall reeds, bushes and small trees for the basic marsh menu of insects. Hopping along among stems and leaves, the warbler grabs flies, moths and larvae. It occasionally takes flight and catches insects in the air. In the fall the bird supplements its diet with berries and builds up fat reserves for added energy during its long migration. Two-thirds of the way into its migratory travels, a warbler flying from England usually lands in Iberia to fatten up on berries before continuing its journey south.



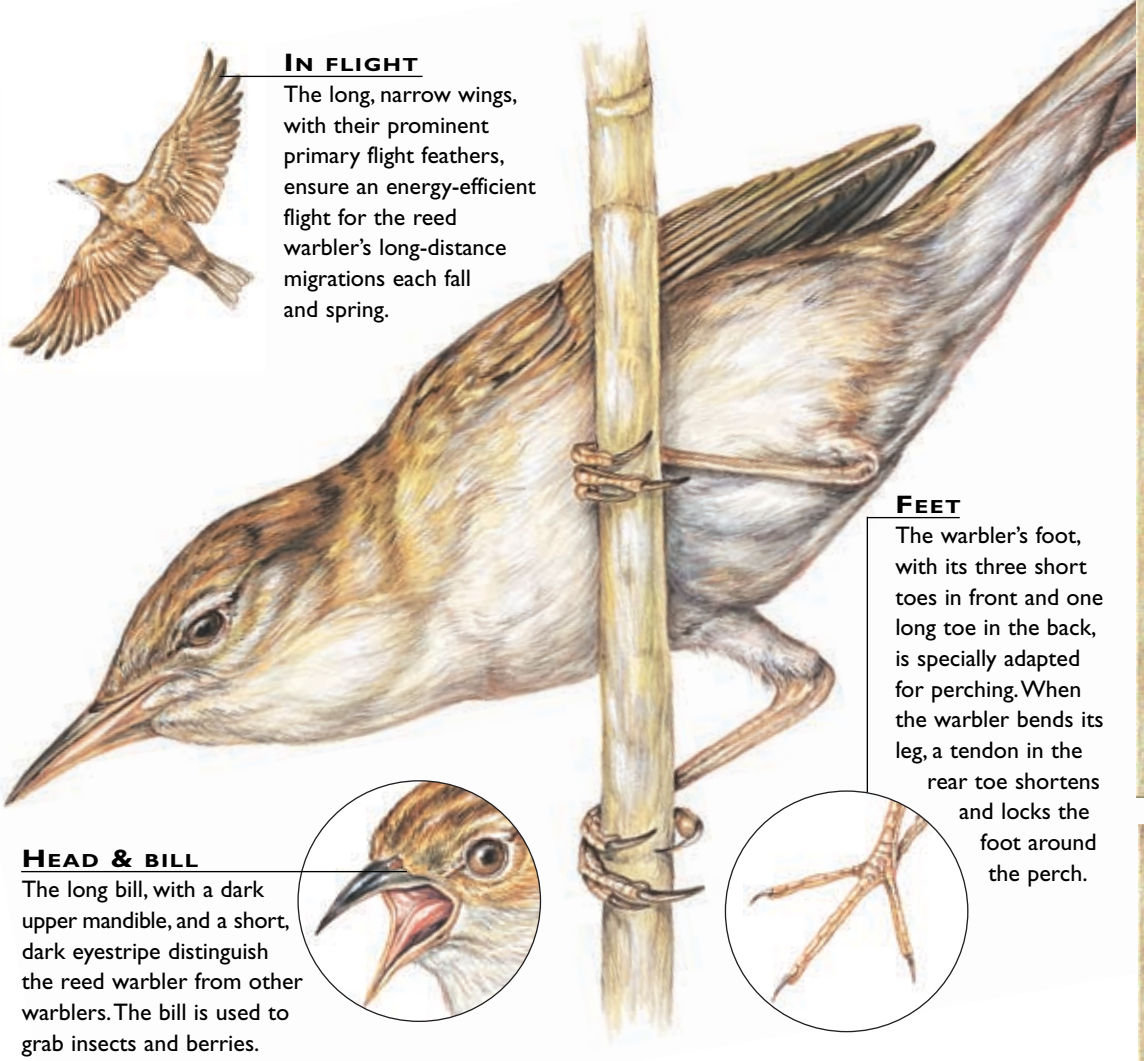
▼ **A REED'S NEEDS**
Insects provide the young warbler nestlings with vital protein for growth.

PROFILE REED WARBLER

The reed warbler is perfectly built for a life spent perching among reedbeds and undertaking long migrations.

IN FLIGHT

The long, narrow wings, with their prominent primary flight feathers, ensure an energy-efficient flight for the reed warbler's long-distance migrations each fall and spring.



FEET

The warbler's foot, with its three short toes in front and one long toe in the back, is specially adapted for perching. When the warbler bends its leg, a tendon in the rear toe shortens and locks the foot around the perch.

HEAD & BILL

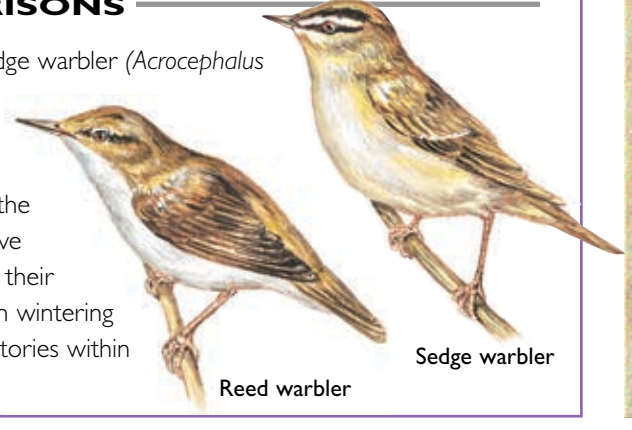
The long bill, with a dark upper mandible, and a short, dark eyestripe distinguish the reed warbler from other warblers. The bill is used to grab insects and berries.

VITAL STATISTICS

WEIGHT	0.3–0.6 oz.
LENGTH	Up to 5"
WINGSPAN	8"
SEXUAL MATURITY	1 year
BREEDING SEASON	April–July
NUMBER OF EGGS	3–6, usually 4
INCUBATION PERIOD	11–12 days
FLEDGING PERIOD	10–14 days
BREEDING INTERVAL	Up to 2 broods per year
TYPICAL DIET	Insects, including flies, moths and larvae; berries in autumn
LIFESPAN	12 years

CREATURE COMPARISONS

Measuring about 5" long, the olive-brown sedge warbler *(Acrocephalus schoenobaenus)* is similar in size and overall color to the reed warbler, but has darker streaking. The reed warbler is bulkier, with a wider wingspan than the sedge warbler, and the sedge warbler has a shorter bill. The birds have similar feeding and nesting habits throughout their common Eurasian breeding range and African wintering grounds. They defend mutually exclusive territories within the tall plants of reedbeds and marshes.



Sedge warbler

Reed warbler

RELATED SPECIES

- **The reed warbler is one of over 300 species of Old World warblers, American gnatcatchers and kingfishers in the *Sylviidae* family. These warblers are quite different from the over 100 species of New World wood warblers in the family *Parulidae*. The New World warblers have weaker voices but more colorful and fluffier plumage than the Old World warblers.**

Rockhopper Penguin

• ORDER •
Sphenisciformes

• FAMILY •
Spheniscidae

• GENUS & SPECIES •
Eudyptes chrysocome

KEY FEATURES

- Streamlined for swimming, it dives 300' or more beneath the surface to catch krill (shrimp) and squid
- Its dense coat of feathers can be flattened to form a watertight barrier against freezing Antarctic waters
- Colonies of thousands assemble to raise their young on remote oceanic islands

WHERE IN THE WORLD?

Lives in oceans near Antarctica; comes ashore on islands in the South Pacific and South Atlantic, including Falklands and Tristan da Cunha

LIFECYCLE

Perfectly adapted to life in freezing waters, the rockhopper penguin is also mobile on land, hopping over rocky ground to reach breeding sites far from the shore.

HABITAT

The hardy rockhopper penguin spends most of its life in the open sea and inshore waters surrounding Antarctica. Its distribution is determined by shifts in the Antarctic Convergence — a boundary that marks the meeting place between bitterly cold, but productive, polar waters and more temperate northerly waters.

The rockhopper comes ashore to breed and molt on rocky islands, preferring steep ground near vegetation.

▼ **NATURAL SHELTER**
Rocky outcrops and cliffs offer relief from the wind.

BEHAVIOR

From May to October, the rockhopper penguin is at sea, usually several hundred miles from its habitual nesting site. It feeds in flocks that may contain between 10–150 individuals. In shallow, inshore waters where predators such as the killer whale hunt, the penguin maximizes speed by *porpoising* — swimming at top speed under water, interspersed with brief leaps out of the water to breathe.

Between October and November, the bird is at its crowded nesting site. Once its young are fledged, it goes to sea for 1–2 months before returning to land to molt. When renewing its plumage, the rockhopper must remain on land: for a month it is unable to feed, and may lose almost half of its bodyweight.

▶ **ROCKHOPPING**
Rugged terrain requires a deft, feet-together hop.

FOOD & HUNTING

The rockhopper eats krill (shrimp) and other crustaceans, squid and fish. It makes dives that may exceed 300'. When the penguin finds a shoal of fish or swarm of crustaceans, it uses its high speed to chase down a meal.

Relying on sunlight to illuminate prey, the rockhopper feeds during daylight hours; its deepest dives are made around midday. The male penguin is slightly larger and heavier than his mate; this enables each sex to feed on a different stock of prey, reducing direct competition.

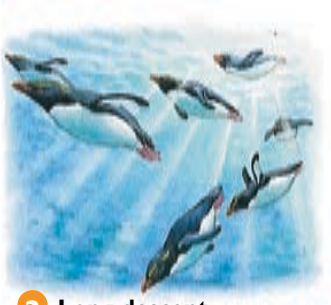
GONE FISHIN'

1 Gathering the gang…
Porpoising along at speeds over 5 mph, a group of penguins heads for a favorite feeding ground.

3 Today's special…
Shoaling squid come into view; a penguin accelerates sharply and lunges out with its bill agape.

BREEDING

◀ AQUATIC FLIER
A streamlined body and good underwater vision enable the rockhopper to prey on a variety of fish.



2 Long descent...
Two penguins embark on a dive, using flippers and feet to force their bodies down.

4 Tucking in
The penguin gulps down small prey, but brings larger items to the surface to subdue them.

The rockhopper penguin breeds in colonies containing hundreds of thousands of pairs. The courting male swings and bobs his plumed head. Each pair defends its nest site with determination, engaging in bill jousts with neighbors. Mating pairs are usually faithful, and many return to the same nest site year after year.

The female lays two eggs, which the parents take turns incubating: one guards the nest while the other feeds the family. Once hatched, all the chicks huddle closely together for warmth — and for security against gulls and skuas.

▶ UNITED WE STAND...
Mating pairs fend off both penguins and predators.

▲ SOUTHERN EXPOSURE
In such a barren land, the nest is a basic structure.

DID YOU KNOW?

- **Rockhoppers were once the center of a major oil industry on the Falkland Islands. In the late 1800s, millions of birds were boiled to render their bodyfat for oil extraction.**
- **Residents of remote Tristan da Cunha eat about 146 rockhopper eggs per person per year.**

CONSERVATION

The population on Campbell Island has fallen by 95% since the 1940s, due to a change in sea temperature. Rockhoppers are also threatened by fishing of krill, and in some places by egg-collecting. But there are still some 3 million pairs; the species is not in great danger.

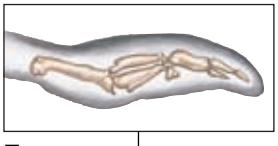
PROFILE ROCKHOPPER PENGUIN

Specially adapted circulation in its exposed feet and individually muscled feathers enable the rockhopper penguin to thrive close to the South Pole.

HEAD PLUMES
The rich yellow-and-black plumes characterize birds of the *Eudyptes* genus. In the rockhopper, the extent to which the plumes project or droop varies according to the subspecies. They reach their full glory on adults over two years old.

BILL
Composed of several horny plates, the rockhopper's short, stout bill is designed for seizing krill and squid.

FEATHERS
The rockhopper has a covering of short, stiff, lance-shaped feathers. Each quill has an additional row of downy filaments that create a dense warming layer beneath the sleek, waterproof exterior.



FLIPPERS
The long pectoral flippers are supported by heavy, bladelike bones in the forearm, wrist and hand. The penguin uses its flippers to propel itself through the water.

JUVENILE

Downy at first, the juvenile reaches full size just prior to its molt into adult plumage. At this stage, it may weigh more than its parents; every ounce is an advantage in its first winter.

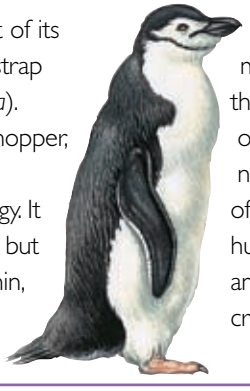
FEET
To compensate for heat loss in the feet, the rockhopper has a circulatory system that allows the temperature in its feet to drop to 42–48°F, while its core temperature remains at 102°F.

VITAL STATISTICS

WEIGHT	4–11 lbs.; maximum weight attained prior to molting
LENGTH	22–25"
SEXUAL MATURITY	4 years
BREEDING SEASON	Mainly November–March
NUMBER OF EGGS	2, although only 1 usually survives
INCUBATION PERIOD	28–38 days
FLEDGING PERIOD	About 70 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Crustaceans and fish
LIFESPAN	10–15 years

CREATURE COMPARISONS

The rockhopper shares part of its ocean habitat with the chinstrap penguin (*Pygoscelis antarctica*). Slightly larger than the rockhopper, the chinstrap has an almost identical shape and physiology. It lacks yellow-crested plumes, but has white markings on its chin, throat and cheeks.



Chinstrap

The chinstrap has a more southerly distribution than the rockhopper, nesting on mainland Antarctica, more northerly islands and the tip of South America. It gathers in huge breeding colonies and dives among areas of light pack ice for crustaceans and fish.

Rockhopper

RELATED SPECIES

● **The rockhopper penguin is part of genus *Eudyptes*, a group of 6 species with golden head plumes. The penguin family, *Spheniscidae*, contains 17 species in 6 genera. The gentoo penguin, *Pygoscelis papua* (below), shares its range with the rockhopper.**

ROSE-RINGED

• ORDER •
Psittaciformes

• FAMILY •
Psittacidae

• GENUS & SPECIES •
Psittacula krameri

KEY FEATURES

- Most widespread of all the parrots
- Roosts and feeds in hundreds-strong flocks, which can devastate fruit and cereal crops
- Thrives in cities and in countries far from its normal tropical range, including Britain
- Pairs mate for life and make their nest in a snug hole in a tree or wall

WHERE IN THE WORLD?

Found in southern Asia, from eastern Pakistan and India east to Burma (Myanmar), and in a band across Africa, from Senegal to Somalia; introduced to parts of Europe, Middle East, China and the U.S.

LIFECYCLE

The rose-ringed parakeet is bold and adaptable enough to profit from human activities. It flourishes in cities and has escaped from captivity to colonize new areas.

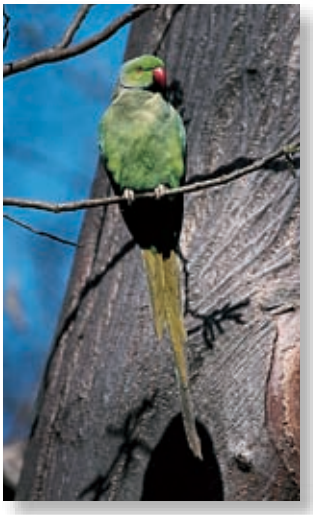
HABITAT

▲ **PLAINS LIVING**
Typical parakeet habitat is open woodland in Ethiopia.

The rose-ringed parakeet prefers lightly wooded country in the lowland plains of tropical Asia and Africa, but it occurs up to 6,600' in the Himalayas and the Ethiopian highlands. In rural India, the parakeet lives in areas of lush vegetation, breeding in deciduous forests. In much of its African range, however, the species is found in savannah woodland and arid, thorny scrub.

The rose-ringed parakeet lives near human habitation, since farmland, parks and gardens provide it with easy pickings. A huge parakeet population lives in the cities of northern India and Pakistan.

BEHAVIOR



▲ **SITTING PRETTY**
A long tail and opposing toes help the parakeet perch on thin branches.

It's unusual to see the rose-ringed parakeet alone or in a pair, except in the breeding season. For most of the year, the bird lives in flocks, which may be thousands-strong in parts of India. The parakeet squabbles frequently with its companions, but fights are rare, as they reserve their aggression for driving away predators, such as hawks. The parakeets all join in to mob their enemy, flapping their wings, pecking and screaming until it retreats.

The agile parakeet uses its bill like a third foot when climbing. It stretches its neck out and takes a hold on a suitable branch with its bill, before following with its feet. The parakeet uses a similar method when walking on a narrow perch.

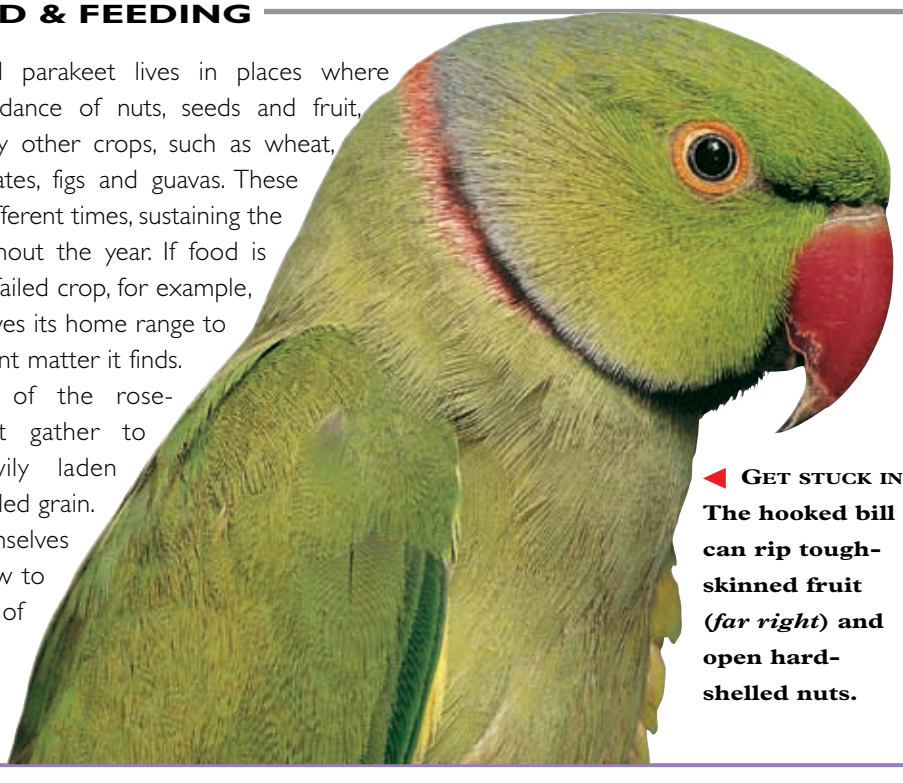
DID YOU KNOW?

- **The rose-ringed parakeet is sometimes called the ring-necked parakeet.**
- **The naturalized rose-ringed parakeet in Miami, Florida, is one of only a few birds that nest in winter. The male and female pair up in late December.**
- **The rose-ringed parakeet is not a popular cagebird due to its raucous calls and tendency to bite, but captive birds have been bred with striking yellow, blue, white, gray and even black-and-white plumages.**

FOOD & FEEDING

The rose-ringed parakeet lives in places where there's an abundance of nuts, seeds and fruit, supplemented by other crops, such as wheat, maize, coffee, dates, figs and guavas. These foods ripen at different times, sustaining the parakeet throughout the year. If food is scarce due to a failed crop, for example, the parakeet leaves its home range to eat whatever plant matter it finds.

Large flocks of the rose-ringed parakeet gather to feast on heavily laden fruit trees or spilled grain. The birds themselves have learned how to tear open sacks of grain or rice in farmyards and railway depots.



◀ **GET STUCK IN**
The hooked bill can rip tough-skinned fruit (*far right*) and open hard-shelled nuts.

PARROT FASHION

1 Opening movement…

An hour or so before sunset, a group of rose-ringed parakeets has gathered in the treetops. They call excitedly and preen each other.

2 Chorus…

As night approaches, different groups of parakeets take to the air, until hundreds of screeching birds are circling the area together.

3 Crescendo…

Still screaming, the expanded flock lands in some tall trees to roost. Sites like this are often used by successive generations.

4 Silent night

After jostling each other for the best perches, the parakeets begin to settle down for the night. The birds stay quiet until daybreak.

CONSERVATION

Far from being threatened, as is the case with many parrot species, the rose-ringed parakeet is itself a major pest for farmers as well as other wildlife in India, Pakistan and elsewhere. The parakeet has a habit of taking just a few bites from each fruit before discarding it and plucking another one, so the species can seriously damage fruit crops. In Europe, it often out-competes native birds for both food and nest sites.

BREEDING

▲ **GREENHOUSE**
Young birds lack collars, so they look more like the female than the male (*above*).

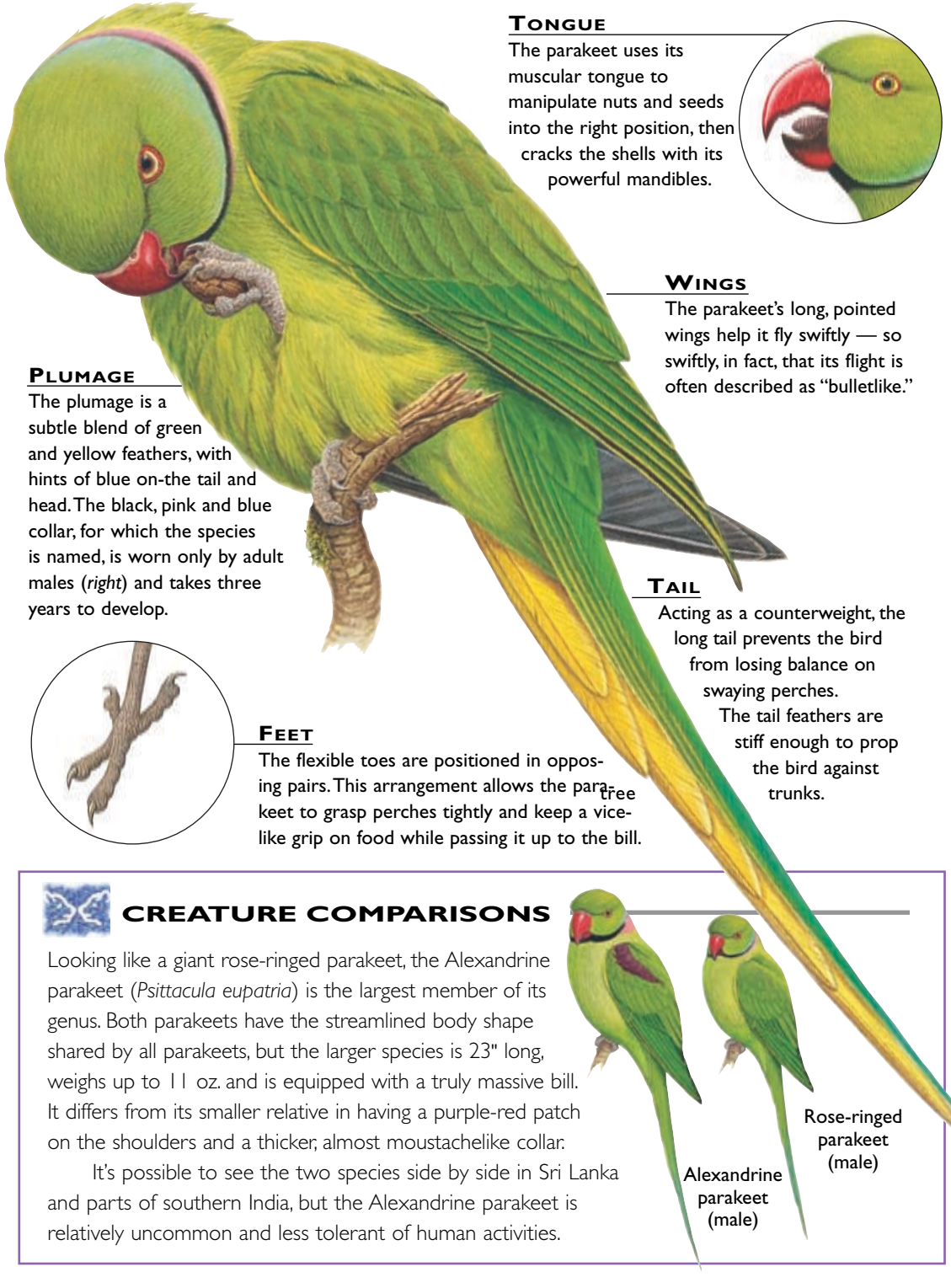
Pairs of rose-ringed parakeets stay together for life, but the male and female renew their pair bond every year. During the courtship display, the male approaches his mate while fanning his tail and repeatedly dilating, then contracting the pupils of his eyes. The male feeds the female beak to beak; she rolls her eyes and rubs bills with her partner.

The rose-ringed parakeet usually nests in an unlined tree hole about 10–33' above the ground. It often makes use of an old woodpecker hole, which the parakeet may first enlarge with its bill. In urban areas, breeding pairs sometimes nest in holes in walls and buildings, even in noisy areas, such as near a busy street market.

The female incubates the eggs for more than three weeks, while she is fed and guarded by her mate. The naked chicks hatch and their eyes open ten days later. Both parents feed the young for 7–8 weeks, regurgitating partly digested food into their bills.

PROFILE ROSE-RINGED PARAKEET

The rose-ringed parakeet has exquisite plumage with a graceful long tail that serves as an elegant balancing aid in trees and among crops.



TONGUE

The parakeet uses its muscular tongue to manipulate nuts and seeds into the right position, then cracks the shells with its powerful mandibles.

WINGS

The parakeet's long, pointed wings help it fly swiftly — so swiftly, in fact, that its flight is often described as "bulletlike."

PLUMAGE

The plumage is a subtle blend of green and yellow feathers, with hints of blue on the tail and head. The black, pink and blue collar, for which the species is named, is worn only by adult males (*right*) and takes three years to develop.

TAIL

Acting as a counterweight, the long tail prevents the bird from losing balance on swaying perches. The tail feathers are stiff enough to prop the bird against trunks.

FEET

The flexible toes are positioned in opposing pairs. This arrangement allows the parakeet to grasp perches tightly and keep a vicelike grip on food while passing it up to the bill.

CREATURE COMPARISONS

Looking like a giant rose-ringed parakeet, the Alexandrine parakeet (*Psittacula eupatria*) is the largest member of its genus. Both parakeets have the streamlined body shape shared by all parakeets, but the larger species is 23" long, weighs up to 11 oz. and is equipped with a truly massive bill. It differs from its smaller relative in having a purple-red patch on the shoulders and a thicker, almost moustachelike collar.

It's possible to see the two species side by side in Sri Lanka and parts of southern India, but the Alexandrine parakeet is relatively uncommon and less tolerant of human activities.

VITAL STATISTICS

WEIGHT	4-5 oz.
LENGTH	16-17", including 8–10" tail
WINGSPAN	19–20"
SEXUAL MATURITY	2–3 years
BREEDING SEASON	December–June in India; December–April in Africa
NUMBER OF EGGS	3–6
INCUBATION PERIOD	22–24 days
FLEDGING PERIOD	50–55 days
TYPICAL DIET	Fruit, seeds, nuts, nectar, buds; also raids crops and bird tables
LIFESPAN	15–25 years

RELATED SPECIES

● **True parakeets are split into 4 genera. *Psittacula* includes the rose-ringed parakeet and 11 other species; *Bolborhynchus* and *Brotogeris* have 5 and 7 species, respectively; the monk parakeet is sole member of *Myiopsitta*. Parakeets belong to the family *Psittacidae*, with about 350 species, including parrots, lovebirds and macaws. Almost a third of the species in *Psittacidae* are currently endangered.**

Ruby-throated Hummingbird

• ORDER •
Apodiformes

• FAMILY •
Trochilidae

• GENUS & SPECIES •
Archilochus colubris

KEY FEATURES

- A tiny bird with big performance, capable of astonishing feats of flight and endurance
- Able to hover and fly backward, sideways — and even upside down
- Brilliant colors sparkle like jewels in the sun as it sips nectar from flowers
- Beats its wings at an incredibly fast rate to produce the "hum"

WHERE IN THE WORLD?

Migratory: breeds east of the Rocky Mountains in U. S. and southern Canada and flies south to spend the winter in warmer habitats in Mexico and Central America, as far south as Panama

LIFECYCLE

The ruby-throated hummingbird is adapted to an energetic existence. In its busy, buzzing quest for nectar, it may visit as many as 2,000 flowers in a day.

HABITAT

▲ **HUMMING HOME**
Nectar-rich blooms attract the ruby-throat.

The ruby-throat is widespread across eastern North America, where it breeds. It is common in woodland glades of flowers, but also occurs in parks and gardens, especially where bottles of sugar water have been hung to form hummingbird feeding stations.

The ruby-throat pauses in the U.S. on migration to refuel with nectar wherever it finds suitable flowers. Tropical forest in Mexico and Central America is its favorite winter habitat.

CONSERVATION

In the 19th century, thousands of hummingbirds were killed for European fashion trade and decorative stuffed specimens. Today, cagebird trade is in decline, but several species (including the ruby-throat) are still experiencing a slump in numbers. The reason is unclear, but may be connected with destruction of the birds' tropical winter habitats.

BEHAVIOR

The hummingbird's ability to fly backward and hover in still air makes it unique among birds. It maintains control even when it rolls upside down in flight, which it does when fighting a rival. Male ruby-throats are aggressive to each other and will fearlessly attempt to chase off larger creatures, even eagles and humans.

The ruby-throat's migration, a trip of up to 3,360 miles, is a marvel of nature. Some birds take the land route; others island-hop through the Caribbean. Many, fuelled only by fat reserves, fly 480 miles nonstop across the Gulf of Mexico. Those that survive will have spent some 20 hours over water and made 4 million wing beats before their next sip of life-saving nectar.

FLOWER POWER

1 Countdown...
Like a helicopter revving rotor blades, the hummingbird whirs its wings in preparation for take-off while still grasping its perch.

2 Lift-off...
Unlike other perching birds, which jump before using their wings, the hummingbird simply releases its grip on the branch, rising smoothly.

FOOD & FEEDING

The ruby-throat feeds mainly on nectar, sweet fluid of flowers that attracts pollinating insects and birds. Hovering above a bloom, the bird dips its bill into the flower's throat and extends its tongue to sip. It also swoops into swarms of flies, catching them midair.

Because it burns energy so quickly, the bird must feed every few minutes during the day. It can survive the night only by allowing its body temperature to drop and its heartbeat to slow down, until it enters deep torpor (inactive state). The next morning, it wakes with the sun, warms up, then flies off for another busy day feeding.

◀ **MID-AIR REFUELLING**
The hummingbird feeds for only a few minutes at a time.

▶ **COLOR CODE**
The ruby-throat feeds from red or yellow flowers.

3 Hover…
By beating and swivelling its wings through a horizontal figure eight, the hummingbird achieves constant lift, allowing it to remain stationary.

4 Reverse
After feeding, the bird reverses by pivoting its wings so their uppersides face downward. It then flies away from the flower.

BREEDING

A male ruby-throat attracts a female by performing a display flight over his territory. Like a tiny pendulum, he swings back and forth in a wide arc, wings beating faster than normal. After mating, the male goes to find another partner and plays no further part in family life.

The female alone builds the nest and incubates two minuscule eggs. The nest, about 1.6" across, is a cup of plant down, bud scales and lichen, bound to a branch with spiders' webs. The female feeds her chicks small insects and regurgitated nectar by hovering over them and delicately putting her bill into theirs.

▼ **A DUTIFUL PARENT**
The female alone nurtures her chicks at the nest.

DID YOU KNOW?

- **The hummingbird keeps clean by bathing in dewdrops on leaves or by taking a quick shower in a nearby waterfall.**
- **The muscles that power the wings of the ruby-throat account for almost one-third its bodyweight.**
- **Proportionate to body size, a hummingbird's heart is one of the largest of any warm-blooded animal, beating an amazing 500–1,200 times per minute.**

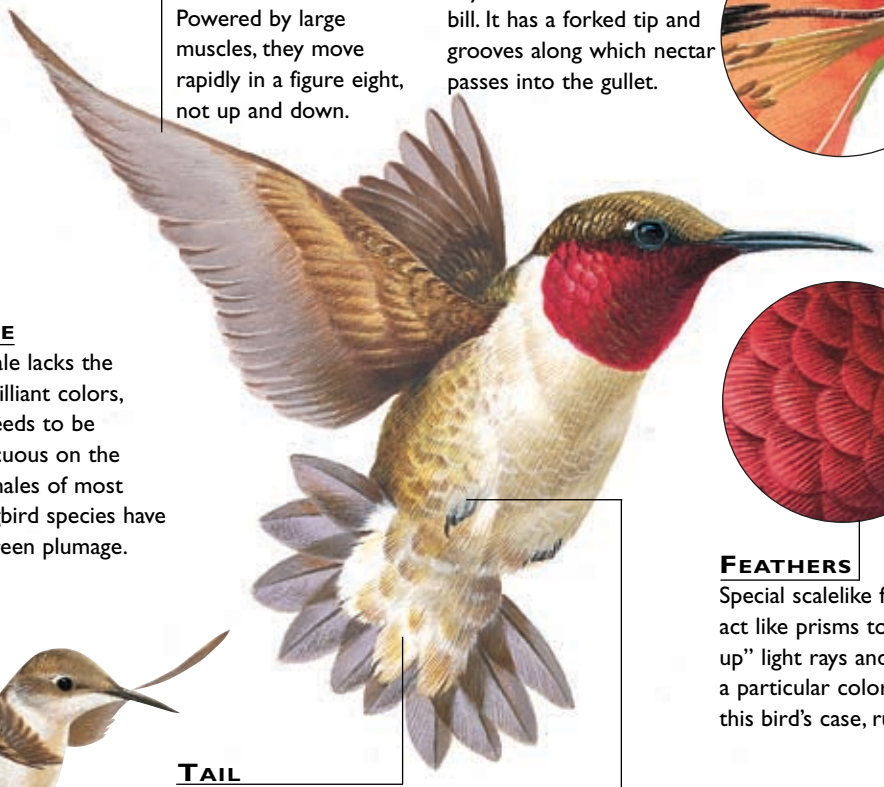
PROFILE

RUBY-THROATED HUMMINGBIRD

Hovering or accelerating vertically like a nectar-fueled rocket, the ruby-throat is a master of the air, aided by some unique features.

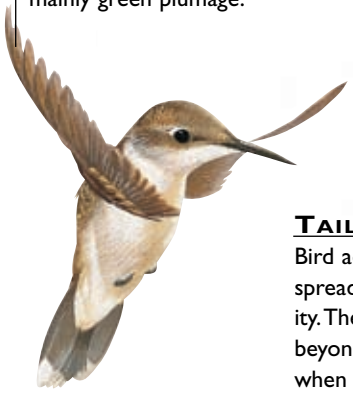
WINGS
Narrow, stiff wings can rotate in their sockets. Powered by large muscles, they move rapidly in a figure eight, not up and down.

TONGUE
Tongue can extend well beyond the end of the bill. It has a forked tip and grooves along which nectar passes into the gullet.



FEMALE
The female lacks the male's brilliant colors, as she needs to be inconspicuous on the nest. Females of most hummingbird species have mainly green plumage.

FEATHERS
Special scalelike feathers act like prisms to "break up" light rays and reflect a particular color — in this bird's case, ruby red.

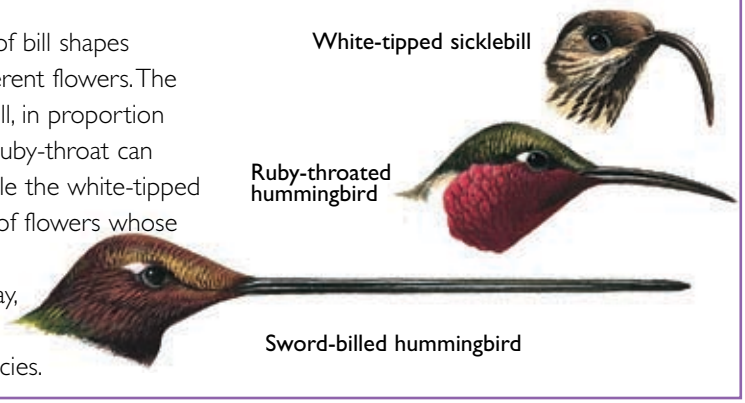


TAIL
Bird adjusts the angle and spread of its tail to aid agility. The tail barely extends beyond the folded wings when the bird is resting.

LEGS & FEET
Very small and weak and used only for perching. Claws are sharp, however, and are sometimes used in territorial fighting.

CREATURE COMPARISONS

Hummingbirds have a variety of bill shapes designed for feeding from different flowers. The sword-billed has the longest bill, in proportion to body size, of any bird. The ruby-throat can reach into smaller blooms, while the white-tipped sicklebill can reach the nectar of flowers whose petals have a curved neck. By feeding from flowers in this way, hummingbirds are important pollinators of many flower species.



VITAL STATISTICS

WEIGHT	0.19–0.24 oz.
LENGTH	3.6–3.8"
WINGSPAN	4–4.8"
SEXUAL MATURITY	1 year
MATING SEASON	Mainly May –June; from March in the south to July in the north
NUMBER OF EGGS	2
INCUBATION PERIOD	16 days
FLEDGING PERIOD	22–24 days
NUMBER OF BROODS	1–3 per year
TYPICAL DIET	Nectar, insects and spiders
LIFESPAN	5 years in wild

RELATED SPECIES

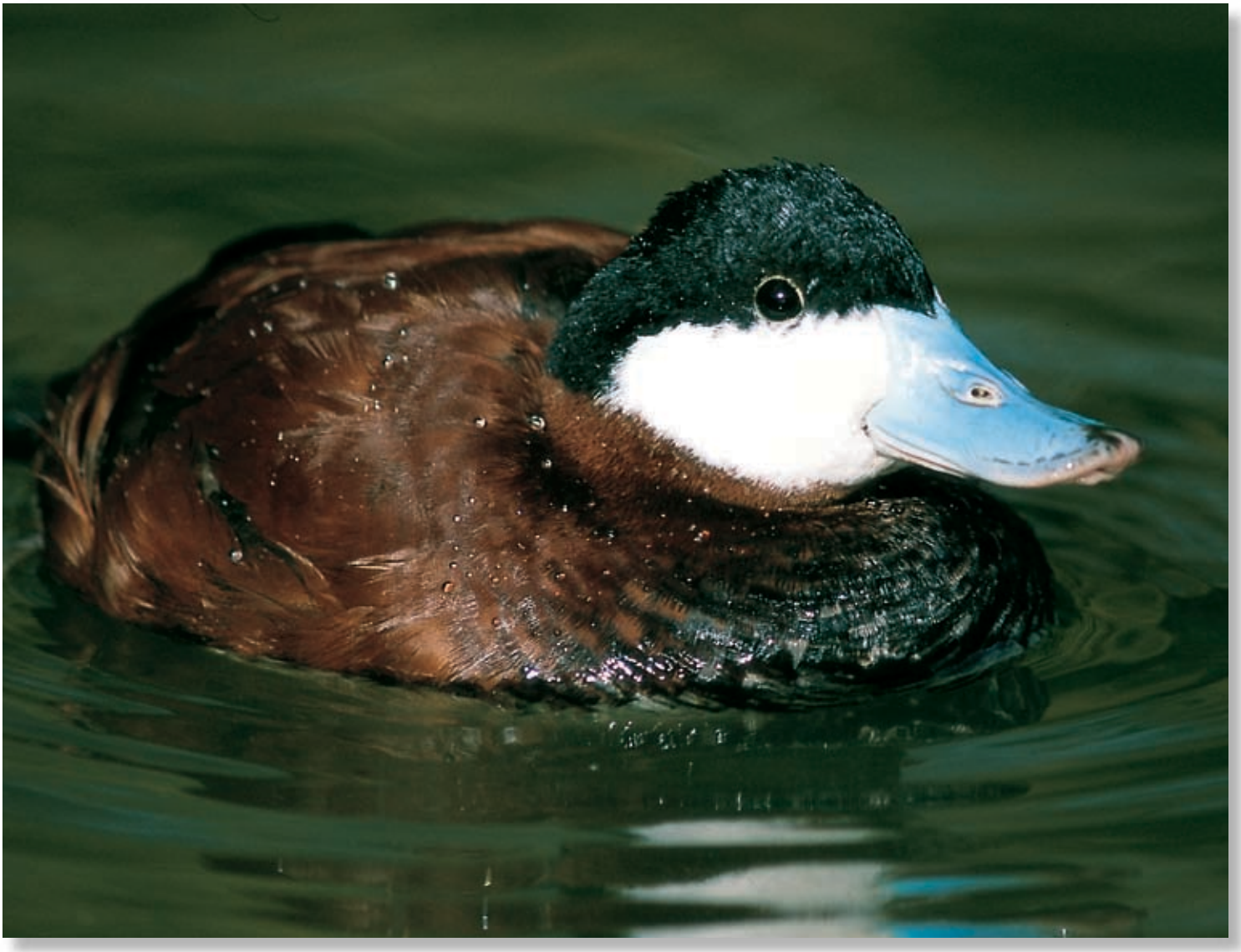
- **The ruby-throat is one of more than 300 species found in the Americas, from Alaska to Tierra del Fuego. These include what is probably the world's smallest bird, the 2"-long bee hummingbird** (below), **a rare species that is native to Cuba.**

Ruddy Duck

• ORDER •
Anseriformes

• FAMILY •
Anatidae

• GENUS & SPECIES •
Oxyura jamaicensis



KEY FEATURES

- Feeds by swimming along the bottom of lakes and pools while straining silt with its bill
- A skilled diver that can sink beneath the water surface like a stone and rise again like a cork
- During breeding season, males are aggressive and fight with bill and body for territories

WHERE IN THE WORLD?

One race occurs in much of North America; two other races are found along the coastal strip of western South America; introduced to Britain in the 1950s and spread to mainland Europe

LIFECYCLE

Although shy and secretive, especially during the breeding season, this North American duck has become an increasingly common sight in many wetlands and estuaries.

HABITAT

▲ **HOME SWEET HOME**
Thick reeds provide the duck with a safe refuge.

Being a specialized swimmer and diver, the ruddy duck's preferred habitats are marshes or shallow, freshwater lakes and ponds that are rich in floating and submerged aquatic plants. When nesting with a mate or brooding young, the ruddy duck prefers to skulk among thick vegetation and away from the shore. It avoids turbulent or flowing waters and exposed, rocky pools.

Every year, following the spring–summer breeding season, ruddy ducks in cool northern climates gather in large groups to migrate south for the winter. In Canada and the U.S., these groups can be many thousands strong. Migratory journeys of over 900 miles are not uncommon. The ruddy duck typically overwinters in large congregations on inland lakes, although it also makes use of the salt waters around estuary mouths and in sheltered coastal bays.

CONSERVATION

The ruddy duck's populations in Canada and the U.S. are stable. The species has adapted so readily to conditions in Europe that it-now poses a threat to the closely related white-headed duck (*Oxyura leucocephala*) — an endangered species native to Spain — that may eventually become extinct if it continues to breed with the ruddy duck. At present, ruddy ducks are separated from the other breed in Spain.

BEHAVIOR

Except when migrating, the ruddy duck seldom flies. When it does, it takes off with difficulty, keeps to a low altitude and skates across the water to an awkward stop when landing.

Drakes fight to defend territories, nipping and wrestling one another above and below water. If provoked, females are also aggressive, adopting a threat posture: body hunched, head thrust out, bill agape. If disturbed by a predator, the ruddy duck dives to escape.

▶ **UP, UP AND AWAY**
Ruddy ducks need a long runway to get airborne.

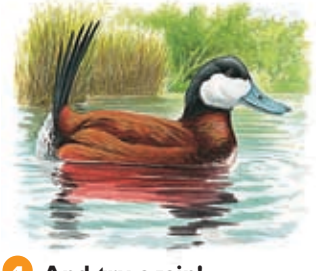
BREEDING

MAKING A SPLASH

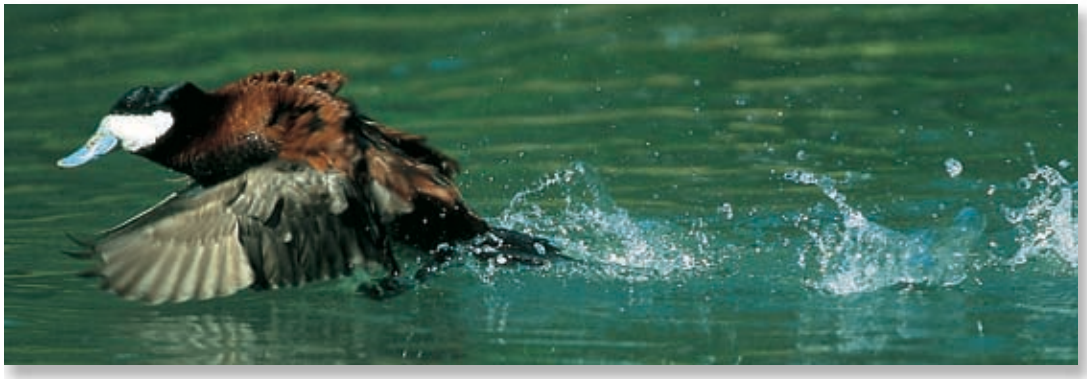
1 If at first...
The drake puffs up his chest and shows his tail feathers. Unimpressed, the female may even be hostile.

2 You don't succeed...
The drake paddles furiously with his tail submerged, chest lifted out of the water and bill tucked in.

3 Try, try...
The drake repeatedly thumps his bill against his puffed-up chest and blows clouds of bubbles.



4 And try again!
Finally won over, the female follows the drake, who cocks his tail to expose his bold white rump feathers.



DID YOU KNOW?

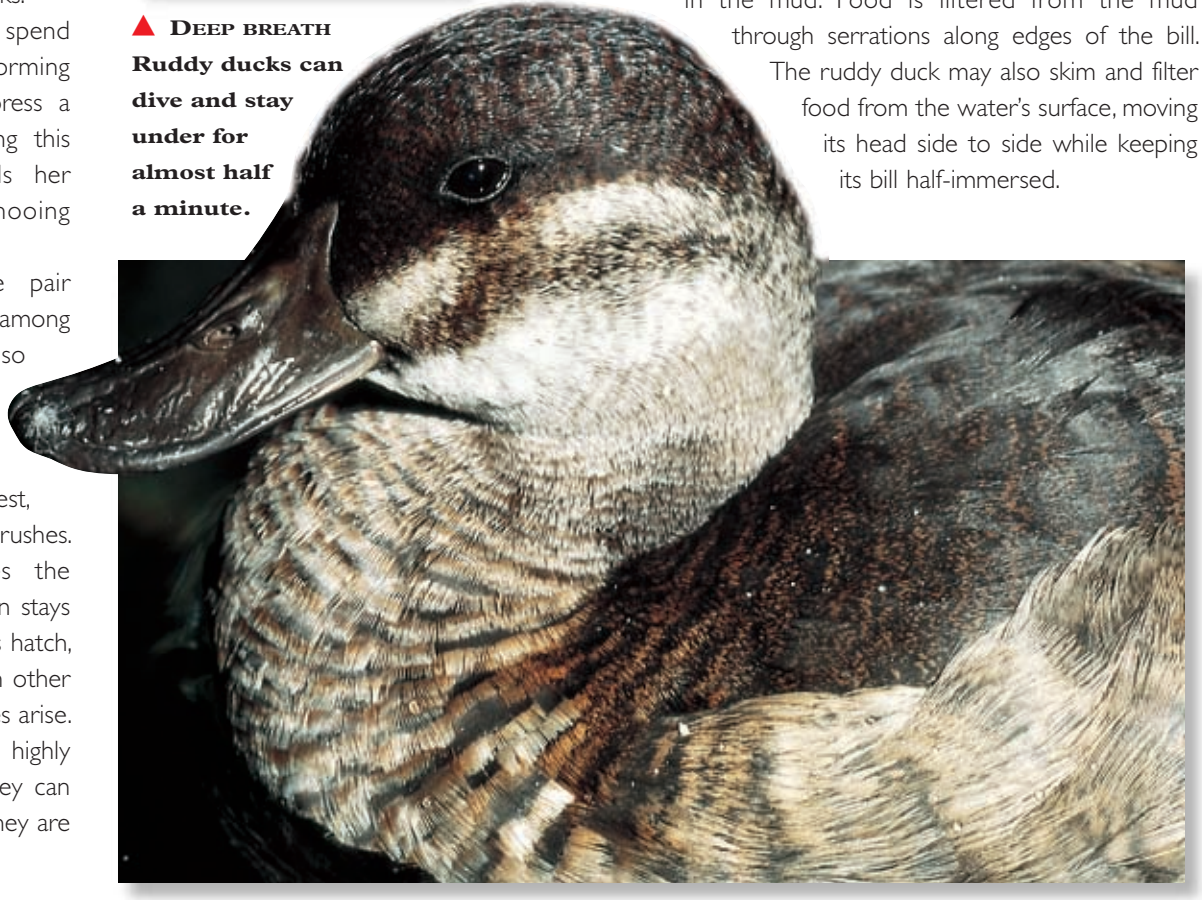
- **Ruddy ducks colonized Europe after escaping from an English wildfowl collection.**
- **They have nearly 100 colloquial names, including hickory-head and rubberneck.**

FOOD & FEEDING

During winter, the ruddy duck lives primarily on a vegetarian diet. It grazes on pondweeds and sedges as well as seeds, which it filters from mud on the pond floor. During the summer, it supplements its diet with freshwater snails and larvae of midges and other insects. Ruddy ducks also feed on small shellfish when in estuarine waters.

To feed, the ruddy duck dives and swims along the bottom, neck extended and head moving from side to side, its bill half-immersed in the mud. Food is filtered from the mud through serrations along edges of the bill. The ruddy duck may also skim and filter food from the water's surface, moving its head side to side while keeping its bill half-immersed.

▲ **DEEP BREATH**
Ruddy ducks can dive and stay under for almost half a minute.



In early spring, both sexes molt their winter plumage, ready for breeding. A female's new coat is reddish-brown; the drake sports rusty-red plumage with glossy black crown and white cheeks.

The drake may spend several hours performing lively displays to impress a potential mate. During this courtship, he patrols her immediate area, shooing away any rival suitors.

After mating, the pair finds a concealed site among reedbeds, 200' or so from dry land and about 100' from open water. Here, the female builds her nest, using dead reeds and rushes. She alone incubates the clutch. The drake often stays close by until the eggs hatch, but he may mate with other females if opportunities arise.

The ducklings are highly active; by the time they can fly, at 6 weeks or so, they are already independent.

PROFILE RUDDY DUCK

The ruddy duck's strong legs, waterproof plumage and stocky, naturally buoyant body enable it to swim and dive with masterful ease.

FLIGHT

The ruddy duck flies low on rapidly beating, whirring wings. It rarely leaves water other than to migrate.

TAIL

The long, stiffened tail feathers help the duck to steer underwater, by acting as a rudder. At the surface, the ruddy duck often holds its tail vertically.

BILL

The heavy, spatula-shaped bill is bright blue in the male (*left*) and steel-gray in the female and young.

FEMALE

The female, or *duck*, is fractionally smaller than the male, or *drake*. She is also much drabber, to camouflage her when sitting on the nest.

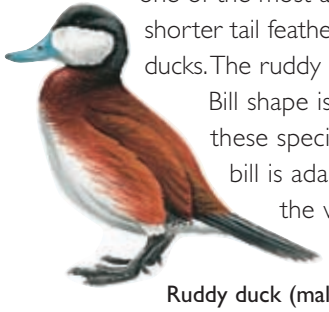
VITAL STATISTICS

WEIGHT	Male 19–28 oz.; female 10.5–23 oz.
LENGTH	14–17"
WINGSPAN	21–25"
SEXUAL MATURITY	1–2 years
BREEDING SEASON	Spring in North America and Europe; all year-round in South America
NUMBER OF EGGS	6–14
INCUBATION PERIOD	25–26 days
FLEDGING PERIOD	50–55 days
TYPICAL DIET	Insects, seeds and leaves of aquatic plants
LIFESPAN	About 8 years

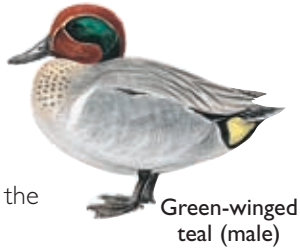
CREATURE COMPARISONS

The teal family includes many of the world's smallest ducks. The green-winged teal (*Anas crecca*), one of the most abundant and widespread teals, is smaller than the ruddy duck, with shorter tail feathers. The teal belongs to the tribe known as surface-feeding, or dabbling, ducks. The ruddy duck belongs to stiff-tailed, diving ducks.

Bill shape is the most important difference between these species. Green-winged teal's slender, flattened bill is adapted to grazing and nibbling plants along the water surface. Ruddy duck's broad, saw-edged bill filters insects and seeds from the muddy bottom.



Ruddy duck (male)



Green-winged teal (male)

RELATED SPECIES

● **The ruddy duck is 1 of 8 species in the stifftail tribe, *Oxyurini*. Stifftails are among 140 or so species in order *Anseriformes*, including pintail, *Anas acuta*** (below). ***Anseriforms*, which also include swans and geese, have short, strong legs, webbed feet and oily plumage.**

Ruddy Turnstone

• ORDER •
Charadriiformes

• FAMILY •
Scolopacidae

• GENUS & SPECIES •
Arenaria interpres

KEY FEATURES

- Named for its ability to turn over stones and shells with its bill to uncover its prey
- Breeding plumage resembles a complex calico pattern of black, white and chestnut hues
- Favors horseshoe crab eggs, which it digs out of sand on beaches along its migratory route

WHERE IN THE WORLD?

Found worldwide, north to the Arctic during the breeding season; winters as far south as Australia, Argentina and South Africa

LIFECYCLE

No nook or cranny is safe from the ravenous ruddy turnstone when it starts its nonstop foraging; it flips over obstacles in its path to find what delicacy may lie underneath.

HABITAT

The ruddy turnstone can be found around the world on marshes, beaches and even in the Arctic tundra during its summer breeding months. In the winter, the turnstone migrates to warmer climates and can be found in areas as distant as Australia, South Africa and South America, seeking out rocky slopes and stony coastal plains. Outside the breeding season, this migratory bird prefers chiefly coastal terrain, frequenting short-grass salt marshes as well as dykes, rocky shores and breakwaters. Sandy beaches with washed-up seaweed, sheltered inlets, estuaries, mangrove stands, exposed reefs and mudflats, preferably with beds of mussels or cockles, are also favored. The turnstone also frequents lakeshores where aquatic prey is abundant.

▼ **A BELIZE BREEZE**
A flock of turnstones sports winter plumage in its southern home.

BEHAVIOR

The ruddy turnstone alternates between sociable behavior during migration and the isolated behavior of pairs in the breeding season. Loose flocks of 10–100 turnstones fly south in the winter, feeding and roosting along tidal flats throughout the journey. These groups are particularly successful at locating prey through systematic foraging along the beach. The ruddy turnstone's flight action and movement are not as graceful as that of other small waders, and the bird can also be noisy and quarrelsome, showing its aggression to intruders by emitting chattering calls. This alarm call also serves to warn other birds of danger and may act as a form of singing during the mating season.

▶ **STAY OUT**
A ruddy turnstone makes a threatening display to keep intruders at bay.

CONSERVATION

The ruddy turnstone is not globally threatened and continues to occur in relatively large numbers throughout its worldwide range. An estimated 67,000 birds winter in Europe and 30,000–100,000 do so in the U.S.

BREEDING

After a brief courtship, ruddy turnstones form monogamous pair bonds that last at least through a breeding season. Beginning in May and through July, pairs build nests in wet and dry hummock sites that may be concealed in or under vegetation, or in open sites. In Finland and Sweden, turnstones nest in colonies with gulls and terns. The nest is a slight depression, lined with vegetation. Females lay 2–4 green eggs at one-day intervals, with both sexes incubating for 22–24 days. Chicks hatch with buff-gray to cinnamon upperparts, faintly striped and mottled gray or black; the face is also gray. Both parents care for chicks, and will perform displays to distract approaching predators. The female leaves the chicks after 1–2 weeks, and the male departs soon after the chicks fledge, about one more week later. By age 2, the young birds are mature and ready to breed.

▼ **LEFT ALONE**
An adult turnstone often leaves its eggs alone while distracting predators.

DID YOU KNOW?

- **A banded turnstone once flew 2,272 miles in 3.5 days — 649 miles a day.**
- **The first-year mortality rate for the ruddy turnstone is 42–55%.**
- **Turnstones will eat almost anything, including soap washed up on shore.**

FOOD & FEEDING

Part scavenger and part excavator, the ruddy turnstone feeds on a variety of food, ranging from fish to berries, depending on the season. The bird feeds mainly on adult and larval midges, as well as beetles and spiders, and some vegetable matter in warmer months. The winter diet includes insects, crustaceans, mollusks, small fish, large dead fish, mammals, scraps and bird eggs. The turnstone bends its legs as it flips objects over with quick, jerking movements, pecking at hiding prey or chasing it. Sometimes, several turnstones will join forces to push larger objects, such as a big dead fish, away from the tide. The bird also pushes mats of seaweed aside to reveal hidden prey.

BIRDS OF A DIFFERENT FEATHER

1 A time to breed...
Several ruddy turnstones in their full breeding plumage use their bills to probe along a beach.

2 A time to feed...
Horseshoe crab eggs provide nutrition for the turnstones during their migration north.

3 Winter tastes...
A turnstone, now in its duller winter plumage, flips over a rock to reveal sandhoppers — a tasty meal.

4 Riches from the sea
A ruddy turnstone pecks among seaweed and detritus lying on the dry sand to find food.

PROFILE RUDDY TURNSTONE

The attractive ruddy turnstone is a well-designed feeding machine; it uses its strong bill and legs to plow through mats of seaweed.

FEMALE

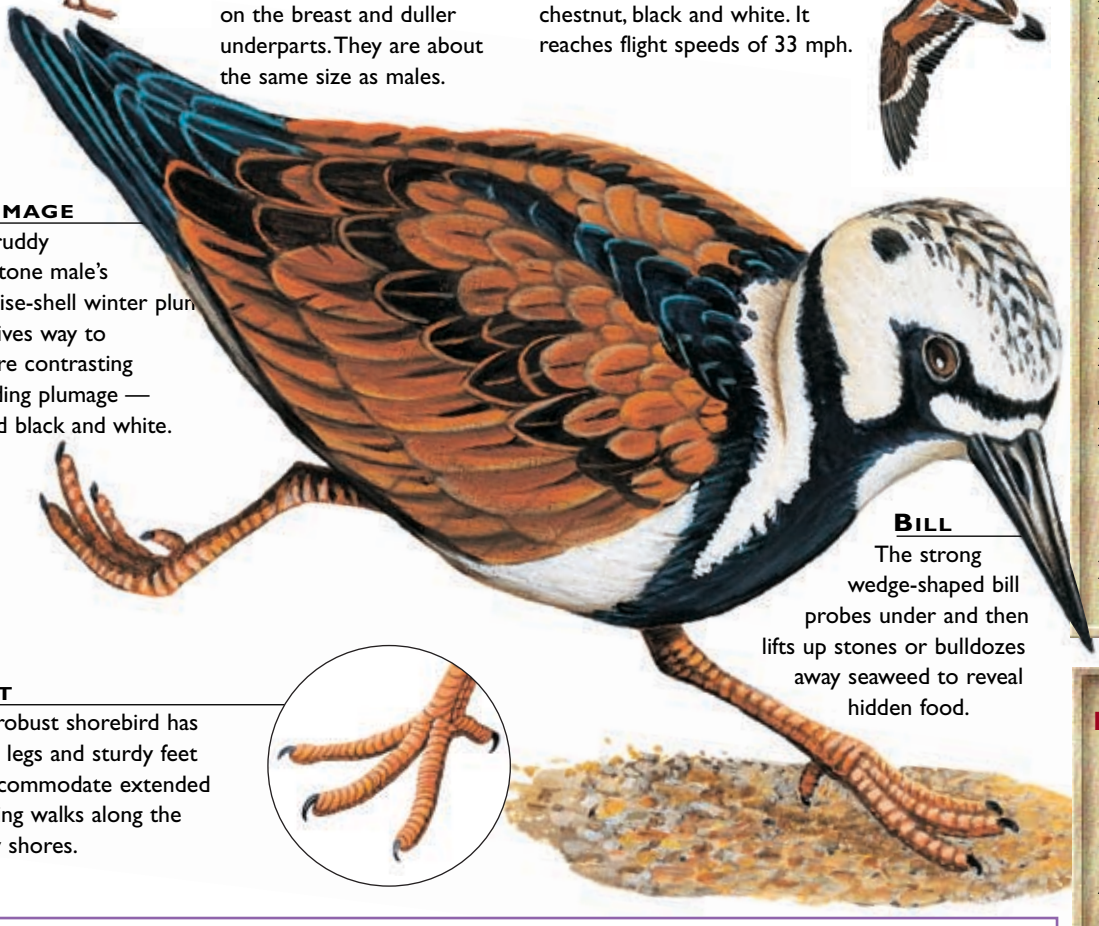
Females have more streaking on the crown, a brownish nape, pale flecks on the breast and duller underparts. They are about the same size as males.

IN FLIGHT

The ruddy turnstone forms a distinctive pattern in flight with a mixture of chestnut, black and white. It reaches flight speeds of 33 mph.

PLUMAGE

The ruddy turnstone male's tortoise-shell winter plumage gives way to a more contrasting breeding plumage — a bold black and white.



BILL

The strong wedge-shaped bill probes under and then lifts up stones or bulldozes away seaweed to reveal hidden food.

FEET

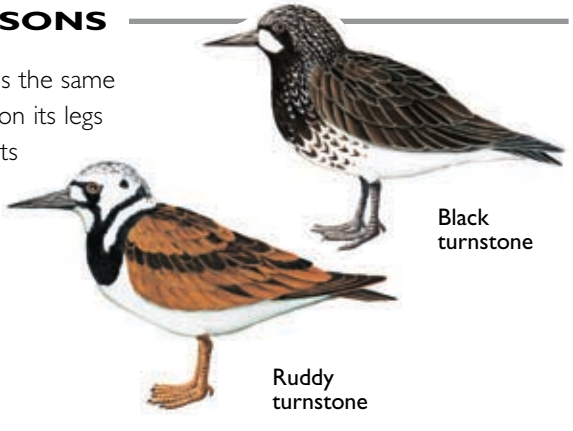
This robust shorebird has short legs and sturdy feet to accommodate extended foraging walks along the sandy shores.

VITAL STATISTICS

WEIGHT	3.5–5.5 oz.
LENGTH	7–9.5"
WINGSPAN	17–22"
SEXUAL MATURITY	2 years
BREEDING SEASON	May–July
NUMBER OF EGGS	2–4
INCUBATION PERIOD	22–24 days
FLEDGING PERIOD	19–21 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Insects, fish, crustaceans, mollusks, dead animal matter, vegetation
LIFESPAN	Up to 20 years in the wild

CREATURE COMPARISONS

The black turnstone *(Arenaria melanocephala)* is the same size as the ruddy turnstone. It has less orange on its legs than its ruddy relative and has more black on its white breast. The black turnstone's range is restricted to the North American Pacific rocky shores, while the ruddy turnstone can be found worldwide. Both species can be aggressive and are quick-stepping and rapid foragers; both male species acquire their breeding plumage in the summer.



Black turnstone

Ruddy turnstone

RELATED SPECIES

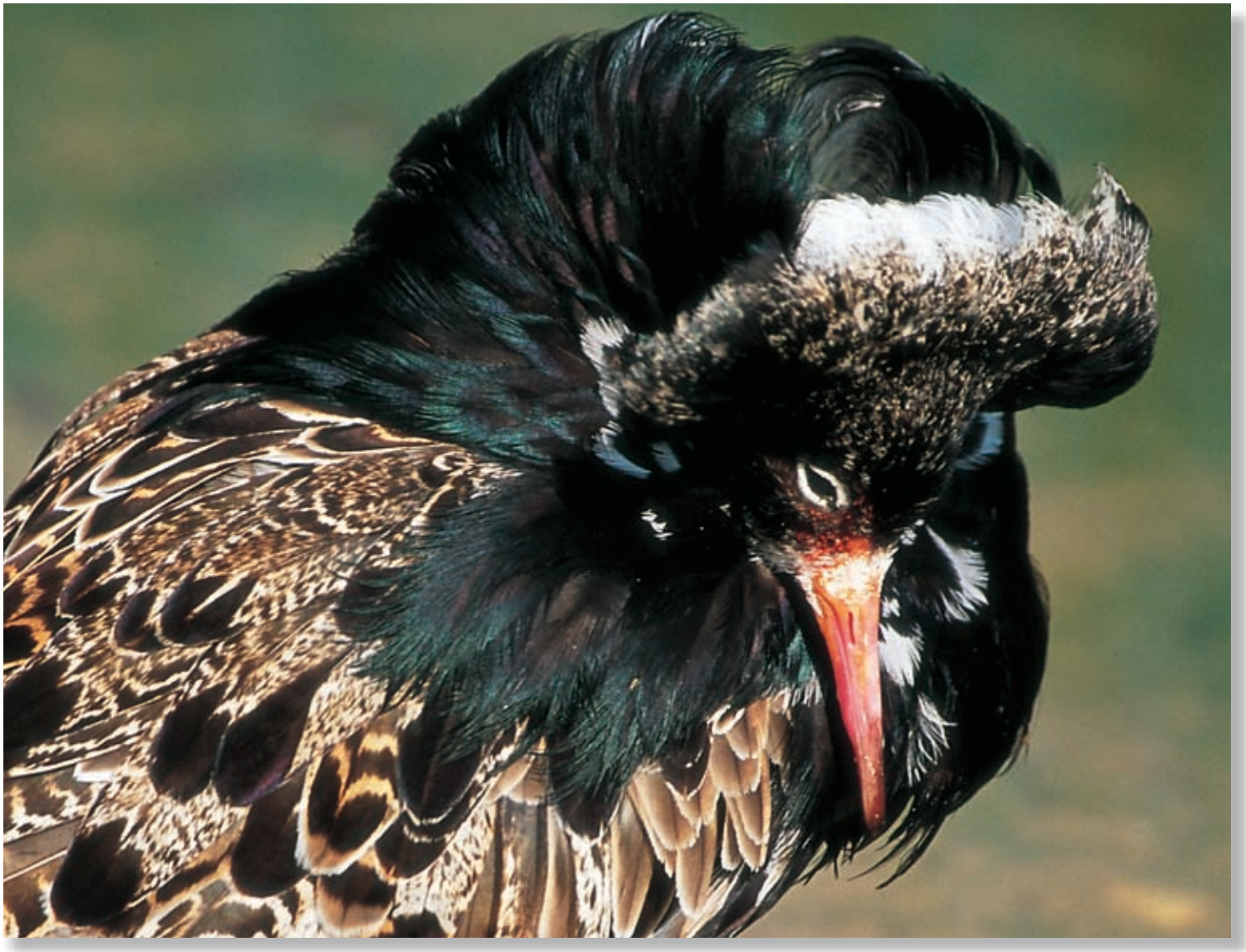
● **The ruddy turnstone is 1 of 2 species of turnstone in the genus *Arenaria;* the other is the black turnstone, *A. melanocephala.* The turnstones join 84 species of snipe, dowitcher, sandpiper, phalarope, godwit, curlew, shank and woodcock in the family *Scolopacidae.* The family includes the common sandpiper, *Gallinago gallinago,* and the solitary sandpiper, *Tringa solitaria.***

Ruff

• ORDER •
Charadriiformes

• FAMILY •
Scolopacidae

• GENUS & SPECIES •
Philomachus pugnax



KEY FEATURES

- For a few weeks in spring, each breeding male wears a uniquely patterned feather collar, or *ruff*
- Rival males compete for mating rights in mock battles at communal arenas known as *leks*
- Embarks on marathon migrations each year, from the Arctic tundra to southern Africa

WHERE IN THE WORLD?

Breeds from Scandinavia and the Baltic Sea east across the Siberian Arctic; winters in western Europe, the Mediterranean, Africa and southern Asia

LIFECYCLE

Lengthening days of spring herald the return of the ruff to its lek, where rival males clash for supremacy and females gather to pick partners from the flamboyant contestants.

HABITAT

▲ **LAND OF MIDNIGHT SUN**
Ruffs breed on Siberian tundra, where the summer is brief, but the sun never sets.

The ruff is a bird of open wetland habitats, but is less dependent on coasts and estuaries than other wading birds. In April and May, it flies north to nest in marshes of northern Europe and tundra of Siberia and Scandinavia, where summer brings an abundance of invertebrates.

In July, large flocks of adults return south to temperate Europe, southern Asia and Africa; their young follow a few weeks later. For up to eight months, they live on marshes, lake shores, damp meadows and rice paddies.

◀ **WINTER HOLIDAY**
To avoid the winter, the ruff flies south to warmer wetland habitats.

FOOD & FEEDING

A trail of tiny marks in soft mud may mean a hungry ruff — the bird feeds by walking briskly as it jabs the ground with its slender bill. The flexible tip is packed with sensitive nerve endings and can be opened while the rest of the bill stays shut, letting the ruff feel for food and suck it up without having to see it. At other times, the ruff swims into water to pick prey off the surface by sight. It also hunts insects, worms and snails, and occasionally a few seeds.

▼ **FAST AND FURIOUS**
A feeding ruff looks as if it's stitching the ground.

CONSERVATION

The ruff has rarely been targeted by hunters, and humans have also had little impact on the remote tundra where it breeds. Sadly, the picture is different over the rest of its range. In Europe, the wetland stopover sites where it once recuperated in long migrations have been drained to create farmland.

BEHAVIOR

Neither the Arctic tundra nor flat, low-lying marshes afford much cover for the ruff, so it's always alert for signs of danger. It forms feeding parties, often with other species of wading bird. As there are more eyes with which to spot predators, the whole flock is unlikely to be surprised: as soon as one bird detects potential danger, the entire group flies to safety. The female ruff, however, is vulnerable when incubating or tending very young chicks. If a predator nears her nest, she fakes injury, flailing a wing as if it's broken while zigzagging over the ground. She lures the enemy well away from the nest, before quickly taking off.

▶ **SITTING IT OUT**
A nesting female's first line of defense is to keep statue-still to avoid detection.

BREEDING

Instead of setting up their own territories at the start of the breeding season, male ruffs congregate at display arenas called *leks*. They mock-fight to claim small patches of the lek for themselves, puffing out their neck collars, erecting their ear tufts and fluttering their wings as they fend off rivals. Females gather at the lek, attracted by the colorful commotion, and watch as ringside spectators. The male that claims the most sought-after part of the lek — often at its center — attracts the most admirers and mates with as many as he can; other males are only able to mate a few times.

Males play no further part in the breeding cycle and, once the females have left the lek, spend their time feeding. Even females have a short breeding season. After making a simple nest (grass-lined hollow hidden deep in vegetation), their only major task is to incubate a clutch of four eggs for three weeks. Chicks can run and feed soon after hatching and leave the nest the same day. Their mother supervises them for several days, then they become entirely independent.

EVERY ONE UNIQUE
Breeding plumage of every male is as individual as a human fingerprint.

IN WAITING
White plumaged "satellite" males sometimes snatch a chance to breed.

BATTLE AT THE LEK

1 Dance...
A male ruff begins to dance at the lek, fluttering his wings and shaking his fully expanded ruff.

2 Leap...
He fights a rival for a better part of the lek, who responds by angrily kicking out with his legs.

3 Freeze...
All of a sudden, the two males "freeze" with their heads down. The newcomer's ruff and ear tufts...

4 My hero
...impress a female, who walks up and nibbles his ruff to show she wants to mate with him.

DID YOU KNOW?

- **The term "lek" comes from the Swedish word meaning "to play."**
- **A ruff's chicks leave the nest on the day they hatch, so it's classed as *nidifugous* (nest-leaving). Birds that stay in the nest until they fledge are *nidicolous* (nest-attached).**

PROFILE RUFF

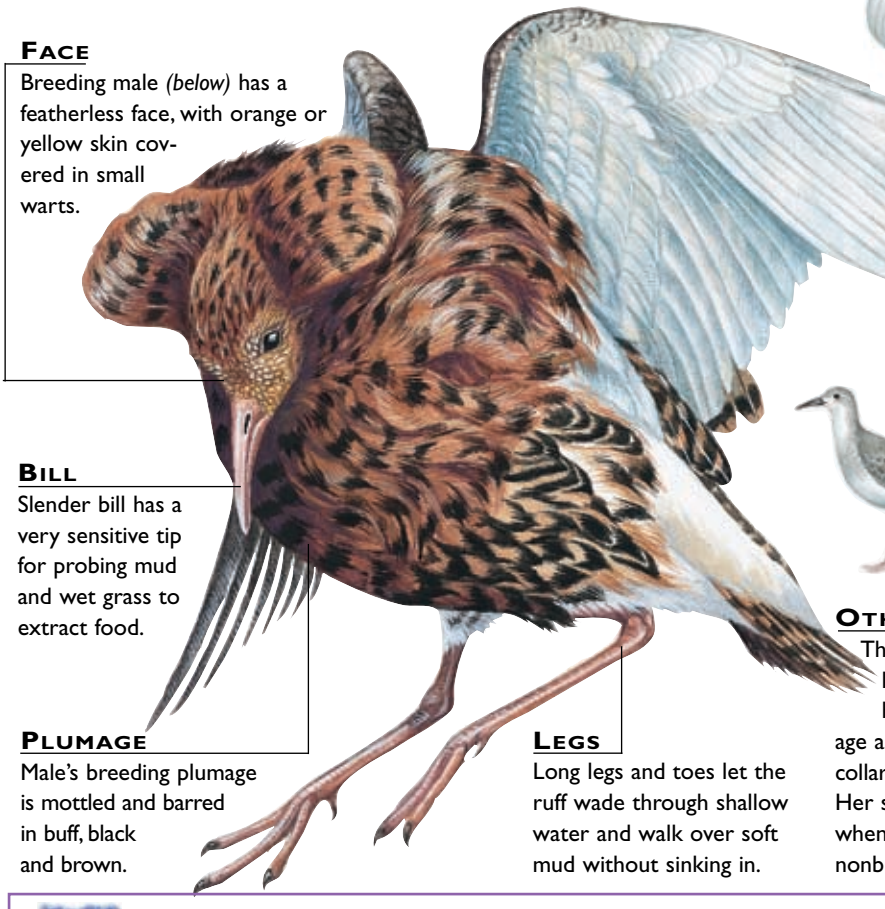
Many male birds are brighter than their mates, but the male ruff's spring finery is exceptional. He parades in front of drab females as if in fancy dress.

SATELLITE MALE

Some adult males inherit white ear tufts and ruffs *(right)*. In breeding seasons, these "satellite males" don't compete directly with other males at the lek. Instead, they each join forces with a dominant male, which helps the dominant bird attract females. But while he's fighting rivals, the satellite male slyly seizes his chance to mate unnoticed.

FACE

Breeding male *(below)* has a featherless face, with orange or yellow skin covered in small warts.



BILL

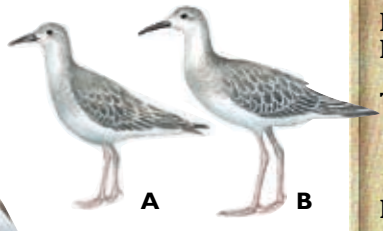
Slender bill has a very sensitive tip for probing mud and wet grass to extract food.

PLUMAGE

Male's breeding plumage is mottled and barred in buff, black and brown.

LEGS

Long legs and toes let the ruff wade through shallow water and walk over soft mud without sinking in.



OTHER PLUMAGES

The female **(A)**, also known as the *reeve*, has gray-brown plumage and lacks the tufts and collar of the spring male. Her small size identifies her when the male has his dull, nonbreeding plumage **(B)**.

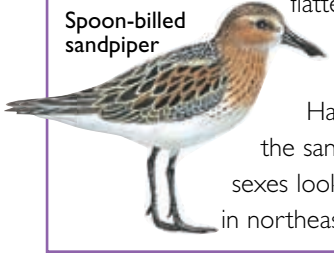
VITAL STATISTICS

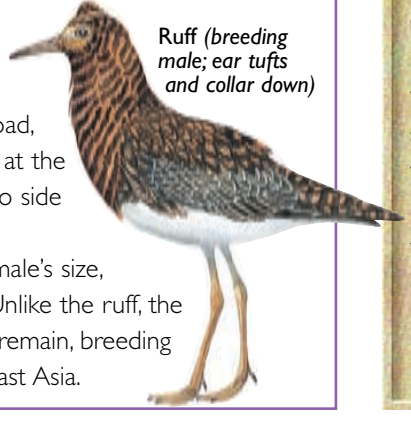
WEIGHT	Male 5–8 oz.; female 3–5 oz.
LENGTH	Male 1'; female 0.8'
WINGSPAN	1–1.6'
SEXUAL MATURITY	1–2 years
BREEDING SEASON	May–August
NUMBER OF EGGS	4 (rarely 3)
INCUBATION PERIOD	20–21 days
FLEDGING PERIOD	Independent a few days after hatching
BREEDING INTERVAL	1 year
TYPICAL DIET	Insects; snails, other mollusks; worms, seeds
LIFESPAN	Up to 10 years

CREATURE COMPARISONS

Nearly all wading birds, including the ruff, have long bills with narrow points, but the spoon-billed sandpiper (*Eurynorhynchus pygmeus*) is a striking exception to this rule. The sandpiper has a broad, flattened bill, which widens into a spatula shape at the tip. It feeds by sweeping this bill from side to side over soft mud.

Half as large as a male ruff, or two-thirds a female's size, the sandpiper has shorter legs and a slim profile. Unlike the ruff, the sexes look identical. Only 2,800 pairs are thought to remain, breeding in northeast Siberia and wintering in India and Southeast Asia.





RELATED SPECIES

● **The male ruff's breeding plumage placed the species in its own genus, *Philomachus*, one of 23 genera in the family *Scolopacidae*. With 85 species, this family has nearly half of the world's wading birds, including sandpipers, curlews, snipes, woodcocks, turnstones, phalaropes, godwits and the only wading birds other than the ruff to use leks: the great snipe and buff-breasted sandpiper.**

Rufous Hummingbird

• ORDER •
Apodiformes

• FAMILY •
Trochilidae

• GENUS & SPECIES •
Selasphorus rufus

KEY FEATURES

- Hovers above, below and beside flowers to reach sugary nectar
- Male is the only hummingbird with a solidly cinnamon-rufous back
- Collects nectar at a rate of 13 licks per second
- Enters a torpid state at night; lowers body temperature and decreases heart rate to conserve energy

WHERE IN THE WORLD?

Nests from south Alaska and south Yukon to east and central British Columbia, south through Montana, Idaho and California; winters in Mexico, south to Guerrero and northern Oaxaca

LIFECYCLE

A rufous hummingbird's world revolves around flowers: the bird hovers like a helicopter, moving in all directions around the bright blossoms.

HABITAT

▲ **SAVING ENERGY**
The hummingbird perches quietly in the forest.

Forests, forest edges, meadows, woodlands and even dense shrubland attract the rufous hummingbird. The bird ventures farther north than any other hummingbird, being found even in southern Alaska. It is widespread south through California during the breeding season, and winters in Mexico, enticed by the sweet nectar of the flowers that bloom in these western habitats. During its fall migration, the bird is often blown off course by fast-moving storms. An adult is usually able to find its way to its original destination, but a juvenile often finds itself farther east. Rufous hummingbirds have been sighted in all of the midwestern and eastern states, including Florida.

DID YOU KNOW?

- **Hummingbirds prefer a concentration of 1 part sugar to 5 parts water.**
- **The rufous holds the record for longest distance between banding and recovery for hummingbirds: over 1,700 miles.**
- **Hummingbirds are called *beija flor* (flower kissers) in Portuguese.**
- **Hummingbirds have the fewest total feathers of all birds and the largest relative heart size of all birds.**

FOOD & FEEDING

BEHAVIOR

Hummingbirds are well known for their finesse in flight. The rufous hummingbird moves its wings an average of 28 times per second during its expert hovering maneuvers. These quick movements require a lot of energy, and the bird's heart rate and temperature both increase. Unlike mammals, the hummingbird's temperature fluctuates, from 102–108°F. The bird often cools off by panting, but also spends almost 80% of its time perched, digesting its food to be used as energy for its next foraging trip. To conserve energy during the night, the bird often enters a state of torpor. Its temperature often matches the environment, dropping to around 70°F or even lower. Its heart rate decreases as well, down to 40 beats per minute from the usual 500– 1,300 beats.

The rufous hummingbird frequents funnel-shaped flowers — from manzanitas to madronas, columbines to currants. A hummingbird learns after one taste whether the plant is worth returning to: if the sugar concentration is right, the bird will revisit time and time again. Nearly all of the sugar consumed by a hummingbird is turned into energy: it takes less than an hour for the hummingbird to convert sugar to energy needed for flight.

A rufous hummingbird's favorite flowers are those that bloom abundantly without any surrounding twigs or leaves that would hinder the hummingbird's hovering movements. The bird is able to hover above, below or beside the flower while inserting its bill and extending its tongue deep into the petals. It quickly collects the nectar, at up to 13 licks per second. The rufous hummingbird also pollinates the flowers it visits, aiding in their reproduction. While eating, pollen sticks to the bird's head, bill and throat; when the hummingbird moves to the next flower, it transfers the pollen.

The rufous hummingbird also eats protein-rich insects. It often darts into swarms of midges, gnats or flies. These tiny treats also adhere to the hummingbird's sticky tongue while drinking nectar. This combination of nectar and insects is also regurgitated to the newly hatched young.

QUICK MEALS

1 Out...
A male darts out from its perch to seize a midge in midair. Its bill snaps shut on the tiny insect.

2 Up...
The bird hovers under a columbine and reaches up to insert its bill into the flower's nectar pot.

3 Down...
The bird whirrs its wings in a figure-eight pattern, about to extend its tongue deep into a snapdragon.

4 Around
To save energy, the hummingbird sips sap from a hole already made by a red-naped sapsucker.

CONSERVATION

The rufous hummingbird is currently not endangered. Though the bird is primarily a forest dweller, it has adapted to this habitat's gradual disappearance and thrives in parks and gardens throughout its range.

BREEDING

◀ **SWEET REWARD**
The rufous hummingbird migrates early to take advantage of early blooms on its northwest journey to breeding grounds.

Males arrive in the northernmost breeding grounds in May and establish territories before the females arrive. But the territories are for feeding, not for protection of the nest and young. Males perform an aerial display, which concludes with a humming sound made as air passes through the wing when the bird dives. But the males are so possessive of their bright blossoms that they limit contact with the females to copulation only. The female is on her own during incubation and brood rearing. The cup-shaped nest is made of plant down, mosses, bark and lichen, held together with spiders' silk. The two naked, blind chicks hatch after about 18 days. They open their eyes fully by the 12th day. At 20 days, the young are ready to leave the nest and become "mini hovercrafts."

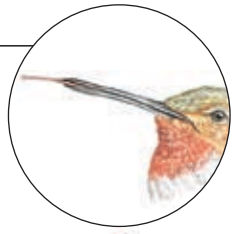
◀ **MORE, PLEASE**
A chick begs for more regurgitated food.

PROFILE Rufous Hummingbird

The hummingbird's feathers glisten like shiny pennies, reflecting light during the bird's acrobatic forward, backward and upside-down flights.

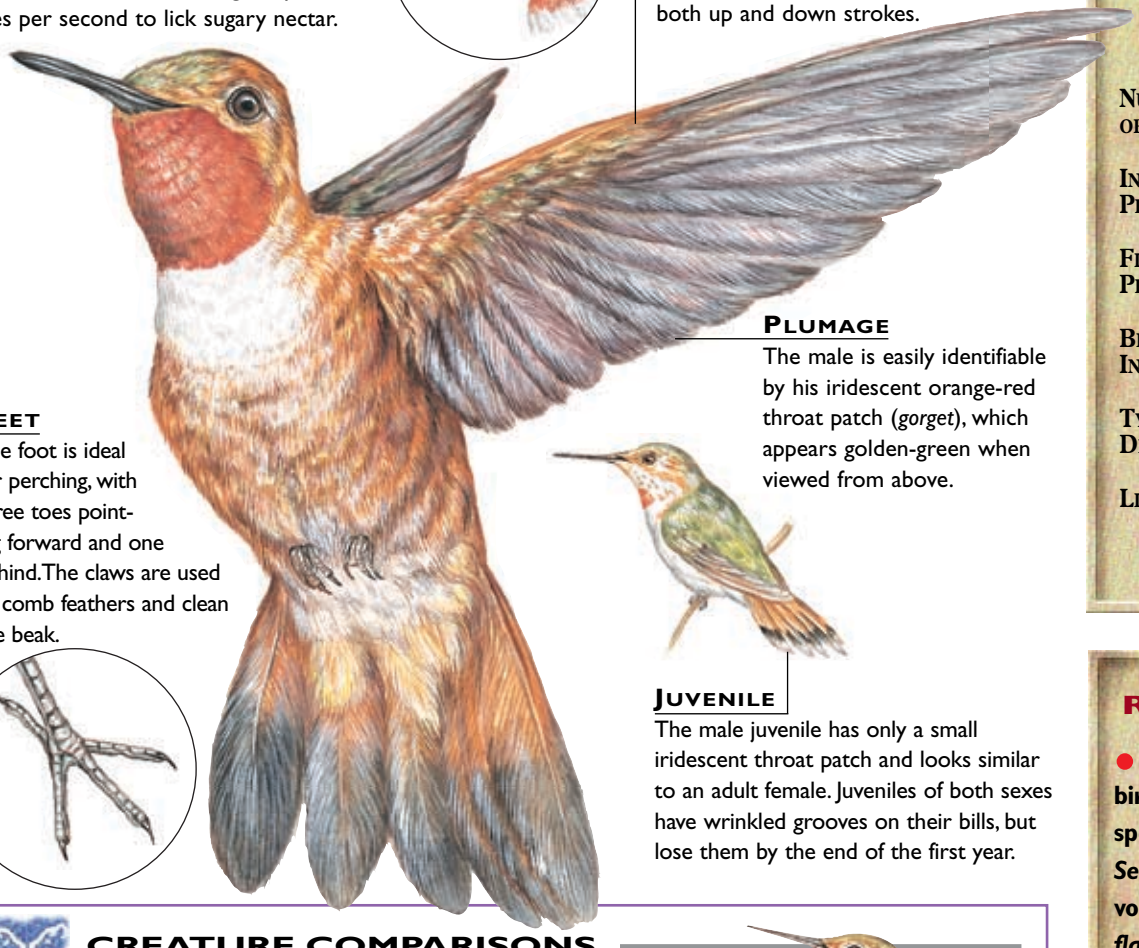
Bill & tongue

The tongue can extend 0.33" past the long bill. It is split in half at the tip, forming two fringed tubes. The hummingbird extends and retracts its tongue up to 13 times per second to lick sugary nectar.



Wings

The bird has a huge keel (the bony anchor for flight muscles), since the small wings are fanned so vigorously. The tip forms a figure eight, allowing power with both up and down strokes.

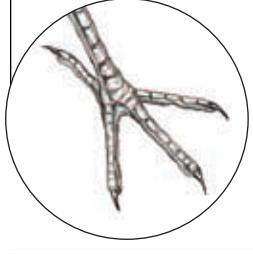


Plumage

The male is easily identifiable by his iridescent orange-red throat patch (*gorget*), which appears golden-green when viewed from above.

Feet

The foot is ideal for perching, with three toes pointing forward and one behind. The claws are used to comb feathers and clean the beak.



Juvenile

The male juvenile has only a small iridescent throat patch and looks similar to an adult female. Juveniles of both sexes have wrinkled grooves on their bills, but lose them by the end of the first year.

Vital Statistics

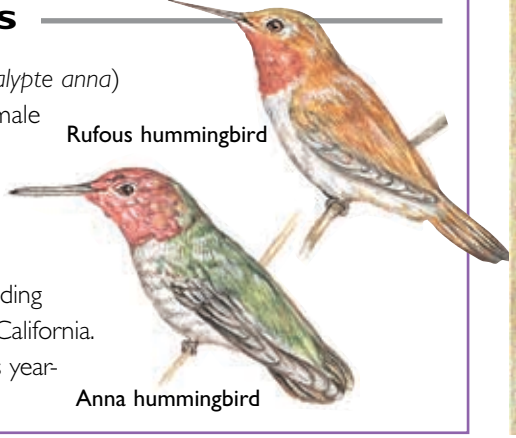
Weight	Average 0.1 oz.
Length	3.3–3.9"
Wingspan	About 4.25"
Sexual Maturity	About 1 year
Mating Season	May–June
Number of Eggs	2
Incubation Period	About 15–20 days
Fledging Period	20 days
Breeding Interval	Up to 1 year
Typical Diet	Nectar and insects
Lifespan	Up to 8 years

Related Species

● **The rufous hummingbird is joined by 7 other species in the genus *Selasphorus*, including the volcano hummingbird, *S. flammula*. They are members of the family *Trochilidae*, which contains more than 330 hummingbird species. The smallest, the bee hummingbird, *Mellisuga helenae*, measures 2.4", and the largest, the giant hummingbird, *Patagonia gigas*, measures 8.5".**

Creature Comparisons

Measuring up to 4" in length, the Anna hummingbird (*Calypte anna*) is about the same size as the rufous hummingbird. The male Anna hummingbird's green back is similar to the female rufous hummingbird's, but the Anna has a crimson helmet. The iridescent helmet glows and darkens under different lighting conditions, much like a soap bubble. The Anna hummingbird is typically found feeding on red gooseberry or bush monkey-flowers throughout California. The rufous hummingbird often passes through the Anna's year-round home range during its fall migrations to Mexico.



Sacred Ibis

• ORDER •
Ciconiiformes

• FAMILY •
Threskiornithidae

• GENUS & SPECIES •
Threskiornis aethiopicus

KEY FEATURES

- A chicken-sized bird that thrives in a variety of habitats, often nesting near humans
- Uses its long, curved bill to probe mud for invertebrates and to snap up larger prey, such as frogs
- Feeds and nests communally; it is sometimes found in large breeding colonies alongside other species of ibis, spoonbill and heron

WHERE IN THE WORLD?

Found in most of sub-Saharan Africa and in the marshes of southeastern Iraq; two subspecies also occur, one on Aldabra Island and the other in western Madagascar

LIFECYCLE

With its white plumage and black head and bill, the sacred ibis is a familiar sight across much of Africa. Its adaptability and varied diet ensure that it is common throughout its range.

HABITAT

Widespread in sub-Saharan Africa, the sacred ibis breeds around wetlands but is otherwise found wherever there is suitable food, including cultivated fields, and even sewage plants or garbage dumps near human dwellings.

The sacred ibis is migratory and often spends the dry season well over 100 miles from the lagoons and lake margins where it breeds.

▲ **WADING IN**
Estuaries and floodplains offer rich plant and animal life for ibises.

CONSERVATION

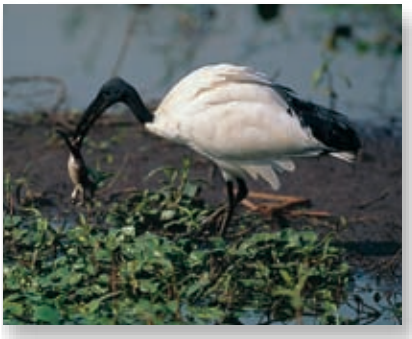
The sacred ibis was probably the first bird ever to be protected by law. About 2,400 years ago, the Greek writer Herodotus wrote a law that made killing a sacred ibis, even accidentally, punishable by death. Today the species as a whole is not globally threatened. The Aldabran subspecies was endangered until recently, but its numbers are now increasing because of legal protection and management of the island as a nature reserve.

FOOD & FEEDING

The sacred ibis has a wide, varied diet consisting mainly of insects, but it also eats crabs, snails, worms, fish, frogs, lizards and small mammals. The sacred ibis takes eggs and nestlings from other bird species; it also eats carrion and is often the first to arrive after a grassland fire to feast on burnt animal carcasses.

Feeding among slow-moving groups of anything between 3–300 birds, the sacred ibis picks food from the ground, probes soil and extracts insects from cracks in rocks or mud with its long, curved bill. As well as feeding on open land, the sacred ibis frequently forages in marshes and watering holes. Sometimes it scythes through the water like the closely related spoonbills, with its bill slightly open — ready to snap up anything it touches.

▼ **INTO THE IBIS**
Large prey is washed down with a drink.



BREEDING

Breeding usually starts during or just after the rainy season. Populations return to the same crowded colonies year after year, and pairs form quickly.

Once a pair has chosen a site, usually in the branches of a thorny tree, the female builds the nest from sticks and grass that the male collects. She lays 2–5 eggs.

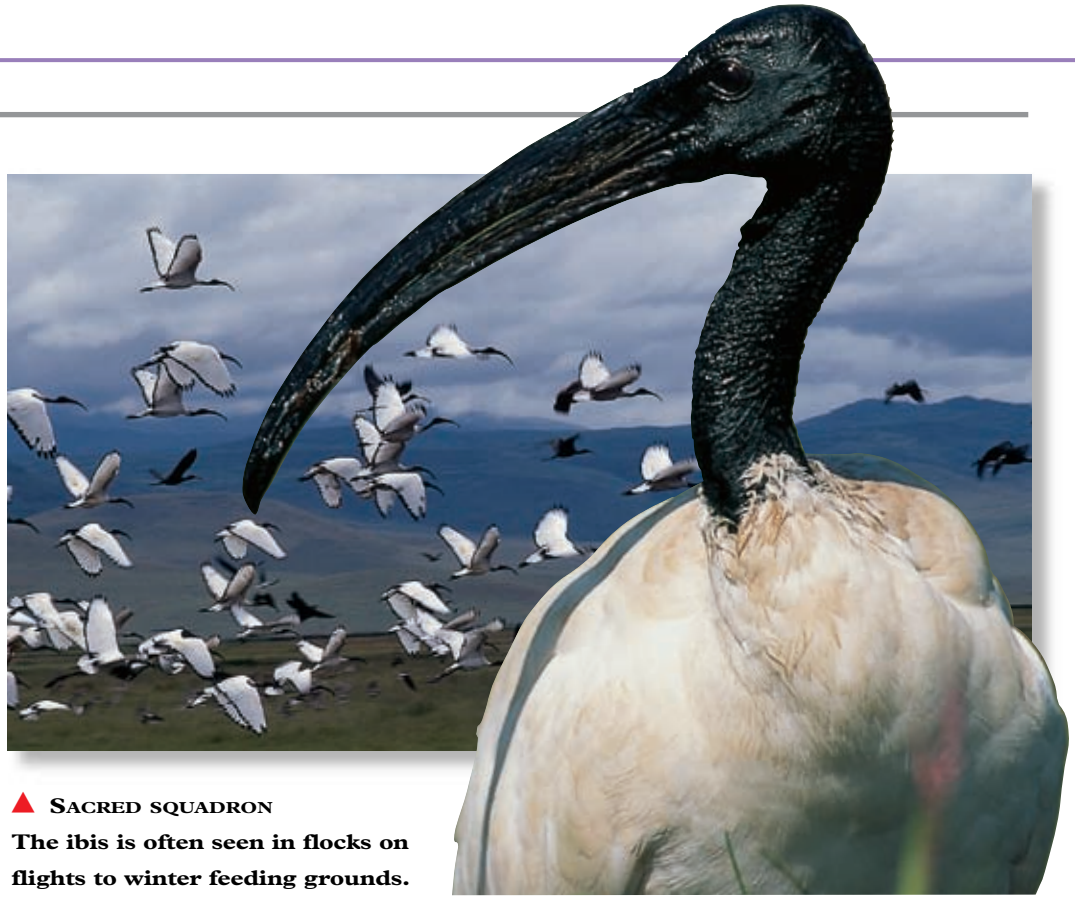
Both parents incubate the eggs and also share the feeding duties once the eggs have hatched. The chicks thrust their heads into the adults' open bills in order to stimulate adults to regurgitate food.

The survival rate for sacred ibis chicks is low, and it is very rare that more than one chick leaves the nest alive. Those that survive continue to be fed by their parents until they are fully fledged.

BEHAVIOR

A sociable bird, the sacred ibis usually travels and feeds in flocks of between 2–20 birds, although it may be found in larger concentrations feeding on abundant prey. Its breeding colonies can number up to 2,000 pairs, in trees often shared with other ibises, storks and herons.

The sacred ibis feeds mainly in the early morning and at dusk. It rests in trees during the day, often with its beak agape to keep cool. When it is not foraging or resting, the bird is usually preening or bathing in shallow water, stretching out its neck while vigorously beating the water with its wings.



▲ **SACRED SQUADRON**
The ibis is often seen in flocks on flights to winter feeding grounds.

BARBECUE FOR BIRDS

1 Foraging…
A flock probes a marsh for worms as a grassland fire approaches over the horizon.

2 Fire…
As the fire burns closer, the flock takes off and heads toward the advancing flames.

3 Scorched earth…
They land on the scorched ground and immediately start searching for the fire's victims.

4 Cooked meals
A tree trunk reveals lizards that tried in vain to hide from the flames. The ibises enjoy the meal.

◀ **A TALE OF TWO SITTERS**
Sacred ibis chicks are vulnerable at birth; they take up to six weeks before they are fully fledged.

DID YOU KNOW?

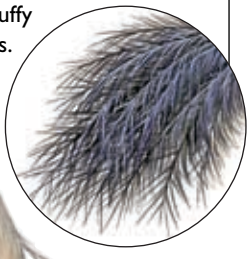
- **The Ancient Egyptians considered the sacred ibis to be the earthly symbol of Thoth, the god of writing and wisdom. Accordingly, live ibises were kept in temples and later buried with pharaohs. The mummified bodies of 1.5 million sacred ibises were discovered in Ancient Egyptian catacombs.**
- **The sacred ibis is now extinct in Egypt. In the beginning of the 19th century, it underwent a sudden and rapid decline; the last birds died out in the 1850s.**

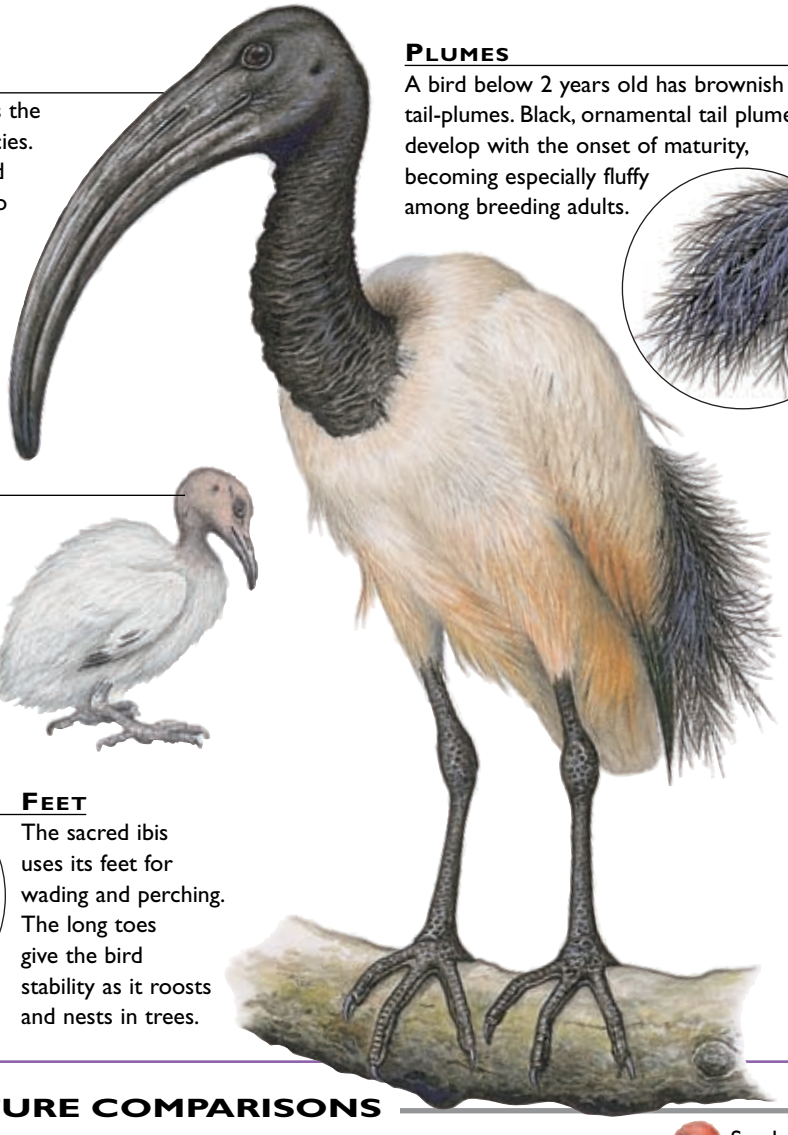
PROFILE SACRED IBIS

Long legs, a naked neck and a saberlike bill enable the sacred ibis to hunt in water and on land for many kinds of prey.

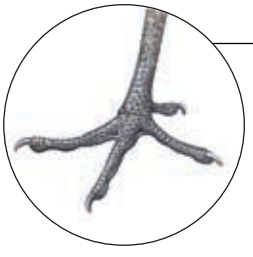
BILL
The heavy, curved bill is the thickest of any ibis species. The-nostrils are located at the base of the bill to prevent them from becoming blocked when the bird forages in mud.

PLUMES
A bird below 2 years old has brownish tail-plumes. Black, ornamental tail plumes develop with the onset of maturity, becoming especially fluffy among breeding adults.





CHICK
Upon hatching, the chick has visible claws on its wings and a relatively straight bill. As-it grows, feathers cover the-wing claws, and the bill slow-



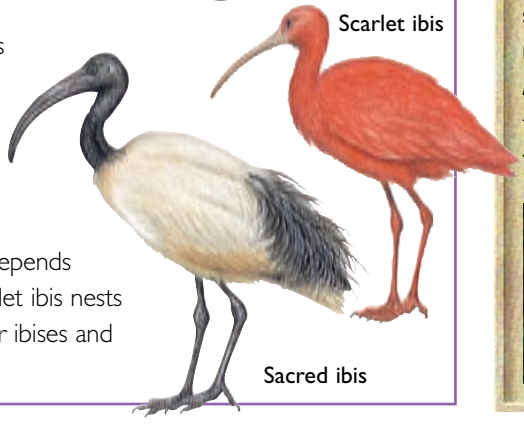
FEET
The sacred ibis uses its feet for wading and perching. The long toes give the bird stability as it roosts and nests in trees.

VITAL STATISTICS

WEIGHT	About 3 lbs.
LENGTH	26–35"
WINGSPAN	3.5–4'
SEXUAL MATURITY	Unknown
BREEDING SEASON	Rainy season; also during dry season in marshes
NUMBER OF EGGS	Up to 5; usually 2 or 3
INCUBATION PERIOD	About 28 days
FLEDGING PERIOD	35–40 days
TYPICAL DIET	Insects, worms, crustaceans, frogs, fish, lizards, small mammals, eggs, carrion
LIFESPAN	Up to 21 yrs.

CREATURE COMPARISONS

Smaller than the sacred ibis, the strikingly colored scarlet ibis (*Eudocimus ruber*) lives in northern South America. Unlike the sacred ibis, it is restricted to wetlands where it feeds in flocks, probing mud in search of crabs, worms and mollusks. The scarlet ibis gets its vivid coloration from its food — the red pigments are produced by algae eaten by the ibis's invertebrate prey. The brightness of the plumage depends on the abundance of the algae. Like the sacred ibis, the scarlet ibis nests communally in trees and often shares its colonies with other ibises and herons. Breeding colonies may contain up to 5,000 pairs.



RELATED SPECIES

● **The sacred ibis shares its family with 22 other ibis species, including the northern bald ibis, *Geronticus eremita*** (below)**, and 8 species of spoonbill. Its closest relatives are the Australian white ibis and the black-headed ibis from southeastern Asia.**

Sacred Kingfisher

• ORDER •
Coraciiformes

• FAMILY •
Alcedinidae

• GENUS & SPECIES •
Halcyon sancta

KEY FEATURES

- Striking colors make it easily distinguishable
- Nestlings look more like hedgehogs than birds
- Patiently surveys territory from various vantage points before making a quick strike
- Despite its name, the sacred kingfisher prefers insects to fish

WHERE IN THE WORLD?

Wooded areas of Australia and New Zealand, near water and in scrub country; also on islands, including Kermadec, New Guinea and Guadalcanal

LIFECYCLE

Territorial and aggressive, the sacred kingfisher chases away potential enemies by displaying its striking colors and singing a series of loud warnings from its perch.

HABITAT

▲ **WOODLAND WONDER**
The sacred kingfisher's bright blue and white plumage stands out among the green foliage.

The sacred kingfisher favors the woodlands of Australia and New Zealand, especially stands of eucalyptus near water. The bird is common in red-gum woods and mangroves, as well as along seashores and offshore islands. Sacred kingfishers also range throughout the acacia scrub in western Australia, melaleuca swampland in the north or anywhere they can find a tree hole, bank or termite mound for nesting. The bird winters in Sumatra, Borneo, New Guinea and surrounding islands, and prefers parkland, open country, gardens, savannahs and wooded roadsides, which offer a steady supply of food.

CONSERVATION

Sacred kingfisher populations are extremely strong. The sacred kingfisher lives in two-thirds of Australia, with 3–30 birds found per sq. mile. It is estimated that there are more than 10 million kingfishers living in Australia alone. There appears to be no threat to this number as long as the sacred kingfisher's habitat is preserved.

BREEDING

Sacred kingfisher pairs mate for life and live together year-round. They excavate nest holes, with sites varying between regions: in west Australia, the birds use tree holes; in the east, they use earth banks by streams; on the central New South Wales coast, they use tree *termitaria* (termite mounds). The female does most of the incubating of the 3–6 eggs. The young hatch blind and naked, with fleshy legs; their bodies, including the heels, are covered in horny papillae — small projections that later form colorful plumage. The young stand on their heels, using the papillae like the ridges on athletic shoes. The young fledge in about 24 days.

▶ **NEW HOME**
The sacred kingfisher never uses another bird's old nest — it excavates its own.

BEHAVIOR

The sacred kingfisher travels mainly in pairs and vigorously defends its territory. It uses loud, repetitious calls to chase away other birds, and spreads its wings, exposing its patterned undersides. The vocal bird sounds 12 loud staccato notes in a slightly descending scale. The cries change when nesting; then the bird emits a chuckling *ch-rr-k*. Migrations can reach up to 2,400 miles, with the majority of birds flying northward to winter near the north Australian coast and in Indonesia, Borneo, Sulawesi, New Guinea, the Bismark archipelago and the Solomon Islands. Sacred kingfishers move at night and cross the Torres Strait in great numbers from late September to late October. Most kingfisher species dig nesting burrows in a bank, but often there is a shortage of these sites. The birds then use natural holes in dead trees or dig into termite mounds in trees.

HOME SWEET HOME

1 Location, location…
A male and female kingfisher prepare to dig out a termite's mound found in the fork of a eucalyptus tree trunk.

2 All work and no play…
They take turns fixing up their future home. The male performs a daredevil feat by hanging upside down to chisel an entrance hole.

DID YOU KNOW?

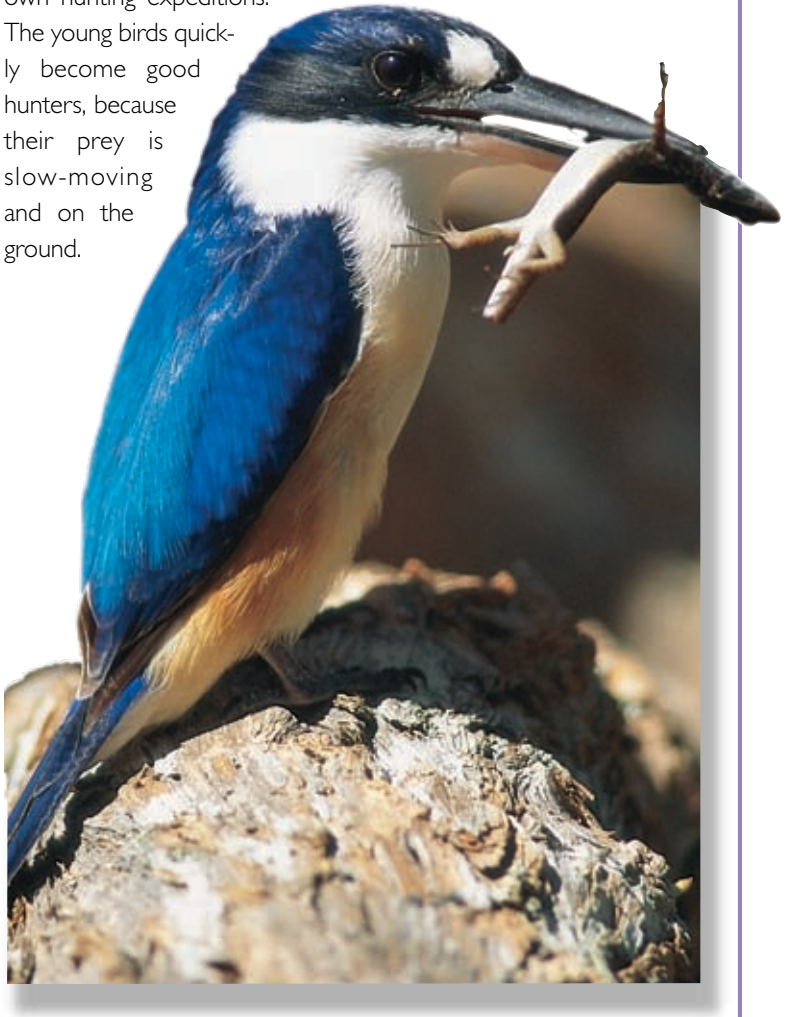
- **Kingfishers used one nest site in a tree in New Zealand for 17 years.**
- **According to Greek mythology, Alcyone found her husband drowned and then threw herself into the sea. For her devotion, the gods turned her into a kingfisher, hence the genus name Halcyon.**

FOOD & HUNTING

The sacred kingfisher is a patient hunter; it finds a strategic spot and scans an area for prey, preferring to perch low in the forest or in a mangrove swamp. It looks for insects, such as grasshoppers, dragonflies, cockchafers, beetles, grubs and caterpillars. The sacred kingfisher also hunts for spiders, freshwater fish, crayfish, frogs and lizards seized from saltwater shallows and rocks at low tide. It moves its head to scan for prey and periodically flicks its tail upward in anticipation. Once it identifies its meal, it dives down, scooping up the prey in its bill and returning to the perch, where the catch is beaten into submission and swallowed whole. Sacred kingfishers living near the sea dive into sand, mud and water for their meal. They also hover over foliage to snatch a snack. The parents bring protein-rich insects to their young; when nestlings fledge, they begin their own hunting expeditions. The young birds quickly become good hunters, because their prey is slow-moving and on the ground.

▼ **GOTCHA**

An unlucky lizard has lost its tail to no avail in its attempts to escape.



3 Her turn...

Adding the finishing touches, the female kicks the soil back toward the entrance. Termites try to seal the damaged parts of their home.

4 The reward

Holding a lizard in its bill, the male offers it to the female, who has made herself comfortable inside the finished nest.

PROFILE SACRED KINGFISHER

The sacred kingfisher uses its prominent bill to snap up prey from the water, but it prefers the easier task of snagging an insect on the ground.

JUVENILE

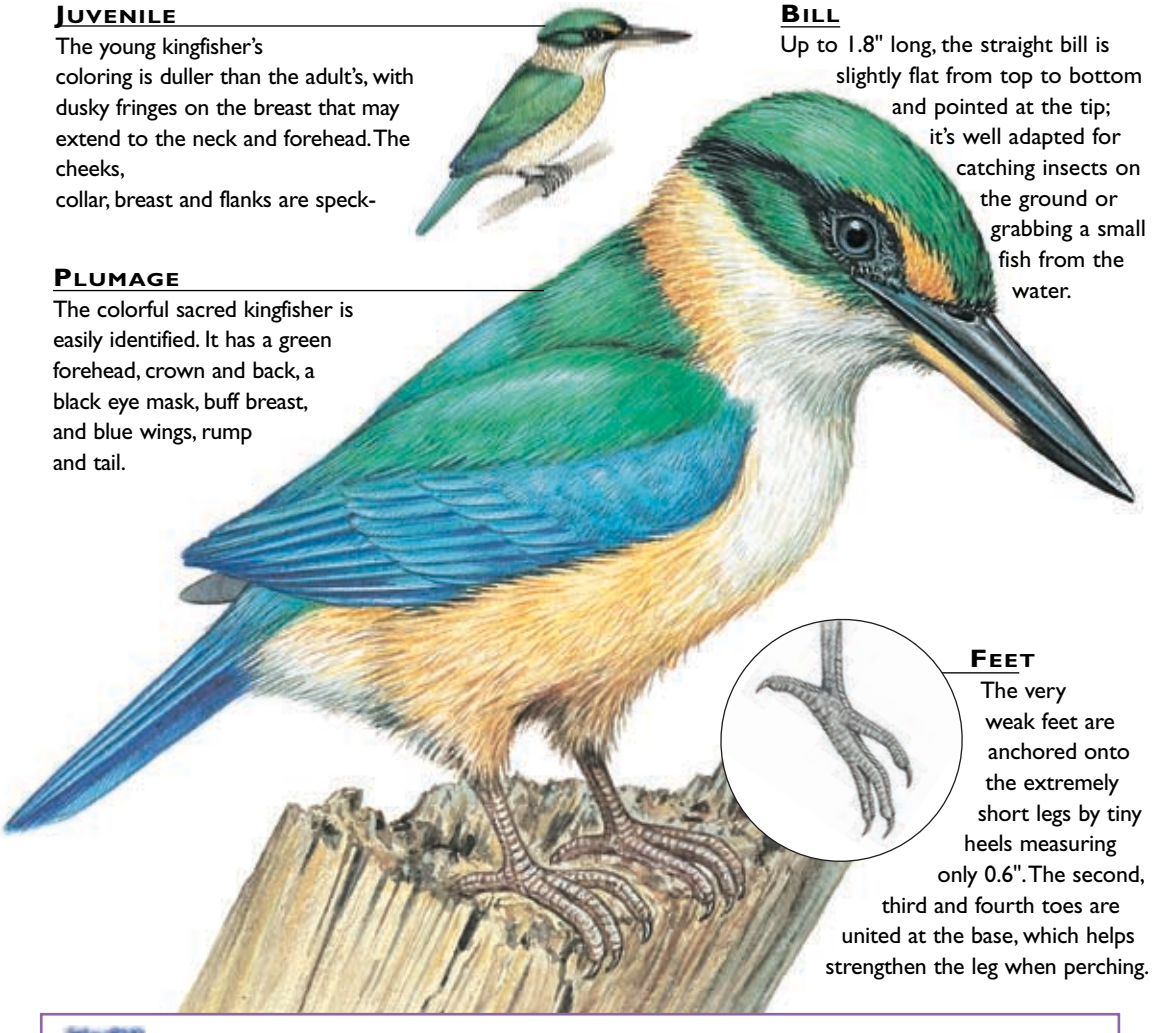
The young kingfisher's coloring is duller than the adult's, with dusky fringes on the breast that may extend to the neck and forehead. The cheeks, collar, breast and flanks are speck-

PLUMAGE

The colorful sacred kingfisher is easily identified. It has a green forehead, crown and back, a black eye mask, buff breast, and blue wings, rump and tail.

BILL

Up to 1.8" long, the straight bill is slightly flat from top to bottom and pointed at the tip; it's well adapted for catching insects on the ground or grabbing a small fish from the water.



FEET

The very weak feet are anchored onto the extremely short legs by tiny heels measuring only 0.6". The second, third and fourth toes are united at the base, which helps strengthen the leg when perching.

VITAL STATISTICS

WEIGHT	1–2 oz.
LENGTH	8.5"
WINGSPAN	11.5–13.5"
SEXUAL MATURITY	About 1 year
BREEDING SEASON	Varies according to region
NUMBER OF EGGS	3–6
INCUBATION PERIOD	18 days
FLEDGING PERIOD	24 days
BREEDING INTERVAL	Up to 1 year
TYPICAL DIET	Insects, spiders, fish, frogs, birds and crabs
LIFESPAN	Unknown

RELATED SPECIES

- **The sacred kingfisher is one of 56 woodland species of kingfisher in the genus *Halcyon*, which join about 30 other species in the family *Alcedinidae*. One of the most widely known of the true fishing kingfishers is the belted kingfisher, *Megaceryle alcyon*, of North America. The order *Coraciiformes* includes kingfishers along with motmots, bee-eaters, rollers, hoopoes and hornbills.**

CREATURE COMPARISONS

The unmistakable markings of the yellow-billed kingfisher *(Halcyon tortoro)* include a yellow bill and legs and a rich rufous head and breast with a large black patch on the nape. Slightly smaller than the sacred kingfisher, the yellow-billed kingfisher is common throughout lowland New Guinea. Unlike its relative, the 8" long yellow-billed kingfisher does not migrate. When hunting for prey, it sways from side to side on its perch and lands on the ground with a "thump."

Sacred kingfisher

Yellow-billed kingfisher

Saddle-bill Stork

• ORDER •
Ciconiiformes

• FAMILY •
Ciconiidae

• GENUS & SPECIES •
Ephippiorhynchus senegalensis

KEY FEATURES

- Tallest and most strikingly colored of Africa's storks; broad wings allow it to soar above the plains
- Wades through marshes and shallow water, snapping up fish and other aquatic prey with its long, sharp bill
- Builds vast nests high in the canopies of tall trees or deep within wetlands, out of the reach of predators

WHERE IN THE WORLD?

Ranges throughout tropical Africa, from southern fringes of the Sahara to northern Namibia, Botswana and northeastern South Africa

LIFECYCLE

Whether wading through swamps hunting aquatic animals, or soaring above the plains looking for new feeding sites, the saddle-bill stork is one of Africa's most striking birds.

HABITAT

The saddle-bill stork feeds in freshwater areas where there is sufficiently tall woodland nearby in which to roost and nest. Although it is normally wary of humans, storks that live in national parks often become acclimatized to vehicles and lose their natural shyness.

The saddle-bill stork does not make migrations. An established pair remains in its territory throughout the year unless severe drought or very heavy flooding forces them to seek out new feeding grounds.

▲ **SWAMP CREATURE**
Wetlands offer the stork an abundant food supply.

CONSERVATION

Although the stork is widespread, its territorial behavior and the scattered nature of its habitat make it scarce. Though numbers appear to be stable,-regional populations could easily become threatened by habitat loss or capture of young birds for sale to zoos or private collections.

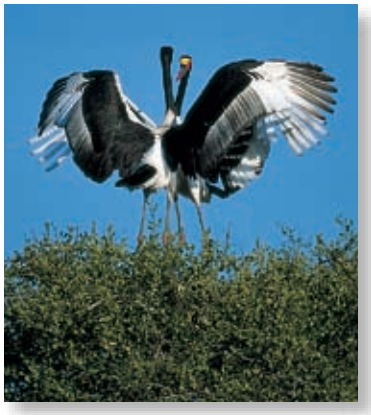
BREEDING

A pair of saddle-bill storks mates towards the close of the rainy season. The nest, located up to 100' high in the crown of a tall tree, may be 6.5' in diameter. It is constructed from sticks lined with reeds and mud. The stork may occasionally nest deep within a swamp, in a place inaccessible to dry-land predators.

The parent birds take turns incubating the eggs and share the duty of feeding the chicks. Food for hungry chicks becomes easier to find in the dry season because the wetlands shrink, forcing prey into ever decreasing areas.

Even after they have fledged, the juveniles continue to demand food from their parents, and they only slowly become independent.

▼ **SAME AGAIN**
Pairs renew their bond each year before mating.



FOOD & HUNTING

BEHAVIOR

A breeding pair of saddle-bill storks forms a bond that may last for life. The pair is territorial, especially during the breeding season, and drives off intruders vigorously. Rarely vocal, the stork often clatters its bill during threat displays and other ritual actions. These displays involve the bird's standing erect with wings outspread while striding aggressively towards the intruder. A pair also performs elaborate courtship displays.

Not an overly sociable bird, the saddle-bill stork usually feeds and roosts in pairs or in small family groups containing the parents and any juvenile offspring. Most foraging takes place in daytime, the stork flying several miles from its roosting spot to feeding grounds.

STORK IN A SQUAWK
Few are unimpressed by the stork's threat display.

MARSH MARAUDER

The saddle-bill stork forages by wading slowly, probing with its huge bill. It often finds its prey by touch, snapping its bill shut on anything that moves.

The adaptable bill serves as a pincer to grasp small animals and as a sharp dagger to impale larger creatures. The stork also uses its long toes to stir up the muddy bottom and flush out prey, briefly pursuing any quarry that escapes an initial bill attack.

Fish are the mainstay of the stork's diet, and its bill can tackle specimens up to 12" long. Frogs, snakes, crustaceans, mammals and insects are also on the menu, and this bird may also scavenge for carrion.

1 Touch down…
A saddle-bill stork glides in to join other members of the family group at a favorite feeding site on the fringes of a marshy lake.

2 Close scrutiny…
The stork wades stealthily through the shallows, watching for any movement. It may use its bill to probe underwater.

3 Life at the sharp end…
Staring intently into the water, the bird spies a small frog crouching below and strikes with a sudden lunge of its menacing bill.

4 Down the hatch
The prey securely grasped, the stork stands erect, raises its bill and tosses the unlucky frog down into its throat.

DID YOU KNOW?

- **The saddle-bill stork snips off the spines and "whiskers" of catfish before swallowing them.**
- **Groups of saddle-bill storks may stay close to a herd of animals, such as hippopotamuses, for protection, while catching creatures disturbed by the large animals' movements.**
- **An abandoned saddle-bill stork's massive nest may be used by other large birds such as secretary birds.**

PROFILE SADDLE-BILL STORK

Long-necked and armed with a daggerlike bill, the saddle-bill stork is an-expert fisher, relying on its bill to locate and catch its prey.

FLIGHT

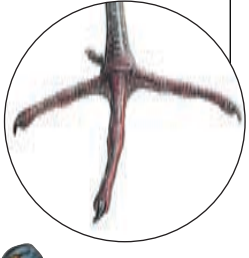
Like eagles and vultures, the stork possesses broad wings and specially adapted flight feathers that allow it to soar, using thermals (warm air currents) to gain height.

BILL

The gaudy, slightly upturned bill may be up to 13" long. The bird takes its name from the yellow "saddle" at the base of its bill.

FEET

The long, bright-pink toes spread the saddle-bill stork's weight as it strides across waterlogged vegetation and soft mud.



WATTLES

Both sexes may develop small, yellow or red fleshy wattles that dangle under the base of the bill almost like stirrups beneath the saddle.

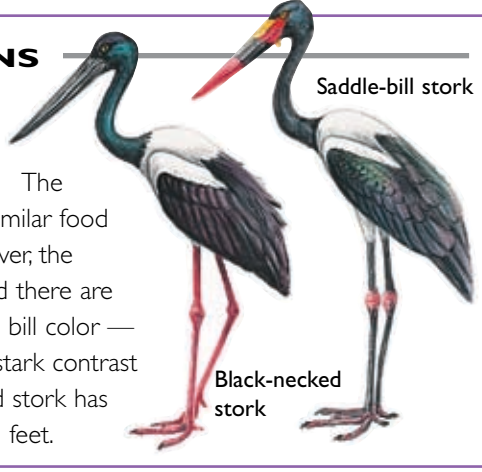
VITAL STATISTICS

WEIGHT	About 13 lbs.
LENGTH	4.75–5'; male larger than female
WINGSPAN	8–9'
SEXUAL MATURITY	2 years
BREEDING SEASON	Rainy season
NUMBER OF EGGS	1–5
INCUBATION PERIOD	30–35 days
FLEDGING PERIOD	70–100 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Fish, frogs, invertebrates and reptiles
LIFESPAN	36 years in captivity

RELATED SPECIES

- The saddle-bill stork is 1 of 17 species of stork in the family *Ciconiidae*. Of the other 5 families that make up the order *Ciconiiformes*, 2 contain just 1 species each: *Balaenicipitidae* and *Scopidae*. The remaining 3 families in the order are the *Threskiornithidae* containing 31 species; the *Ardeidae*, containing 60 species; and the *Phoenicopteridae*, containing 5 species.

CREATURE COMPARISONS



The black-necked stork (*Ephippiorhynchus asiaticus*) is the Indo-Pacific counterpart of the saddle-bill stork, found mainly in India, New Guinea and Australia. The two species are both birds of wetland habitats, with similar food preferences and nesting and breeding patterns. However, the Asian bird is slightly smaller than its African cousin, and there are other striking physical differences. The most obvious is bill color — the-saddle-bill stork's spectacular weapon provides a stark contrast to the black-necked stork's black bill. The black-necked stork has coral-red legs, while the saddle-bill has pink knees and feet.

Satin Bowerbird

• ORDER •
Passeriformes

• FAMILY •
Ptilonorhynchidae

• GENUS & SPECIES •
Ptilonorhynchus violaceus

KEY FEATURES

- Builds structures purely to attract mates
- Regarded by some ornithologists as one of the most advanced of all birds, it uses a tool and mixes "paint" to color the walls of its bower
- Makes a "dance floor" decorated with blue objects, including clothespins stolen from clotheslines

WHERE IN THE WORLD?

Found in a 150-mile wide coastal strip of Australia, from Victoria to southern Queensland; a separate population lives in northern Queensland

LIFECYCLE

Many birds have spectacular courting displays, but only the bowerbird builds and decorates an elaborate bower that serves as a dance hall and shop window for his trinkets.

HABITAT

The satin bowerbird is a bird of the forest, where it builds its bowers and nests. The main population lives in an area 150 miles wide and 1,200 miles long, from Victoria through New South Wales and up to southern Queensland.

Another population is in a 300-mile-long strip of northern Queensland. Bowerbirds in this population are smaller than their southern counterparts, but they're the same species; the 600-mile gap between the two ranges is the result of deforestation, followed by the spread of low-growing plants.

Found near sea level to around 3,500', the bird thrives in dense rainforest in northern parts of its range, but is also at home in more open woodlands farther south. The bowerbird will even visit gardens in the busy suburbs of Sydney, capital of New South Wales — and in winter, outside the breeding season, sizable flocks may visit open farmland.

▲ **WOODLAND HOME**
The female bowerbird's muted colors help her blend into the forest.

BREEDING

The bowerbird has evolved a unique courtship behavior that eliminates the need for flamboyant but cumbersome plumes worn by the closely related birds of paradise. Courtship centers on the elaborate display that the male puts on around his bower whenever a female arrives within range — a ritual that commonly takes place in the early morning from April through September.

When a female arrives, the brightly colored male begins an elaborate display dance, hopping stiff-legged around his collection of ornaments, often carrying one in his bill. Excitement increases, and his eyes bulge as the female enters the bower's avenue.

The female may appear uninterested, casually arranging a twig as the male cavorts. He flicks his wings and tail while "singing" in a voice compared to crashing of gears. If the female is impressed, she will crouch between the bower walls, where mating then takes place.

The female builds a nest to incubate her eggs and rear the chicks without the male's help. The saucer-shaped nest, built in a tree, is made with twigs and lined with leaves.

Immature males resemble their mothers in plumage and practice bower-building before acquiring full adult feathers. Their flimsy early efforts betray their inexperience.

▼ **CARING MOTHER**
The female makes a solitary nest in the trees to rear her chicks in.

▼ **COME INTO MY PARLOR**
The brightly colored male dances around his bower to entice a female to enter.

DID YOU KNOW?

- **Rival males steal trinkets from an unguarded bower and may demolish it if the owner doesn't return in time.**
- **The bowerbird is an accomplished mimic, whose repertoire has been known to include the mew of a cat.**
- **Early naturalists who discovered strange, decorated twig structures deep in the rainforest thought they were done by native people.**
- **The great gray bowerbird collects white or gray objects (bones and shells).**

BEHAVIOR

To attract his mate, the male bowerbird gathers sticks and assorted trinkets, with which he plies his skill as an architect, builder and decorator.

After carefully constructing a twig avenue on the forest floor, he chooses decorations, arranging them around the sunny northern entrance. He favors blue, but may use yellowish-green ornaments, like the female's plumage. If anything outside his color scheme (such as a white flower) falls onto the bower, he'll quickly remove it

The male bowerbird is one of the few birds known to use tools. He forms soft bark or other plant fiber into a "sponge" to absorb a mixture of saliva and bushfire charcoal, holding the sponge in his bill to daub the bower's inner walls. He also "paints" the twigs by rubbing them with the juice of pulped blueberries.

MASTER BUILDER

1 Plan...
The bower is aligned north-south, possibly to give the best, dazzle-free views from either end in early morning.

2 Build...
The bird takes two days to build the 5"-wide avenue of his bower, formed between two 12"-high, inward-arching walls made from twigs.

3 Decorate...
The bird constantly adds and rearranges feathers, flowers and man-made objects — usually blue to match his own color.

4 Paint
The bowerbird finishes the walls of the bower by painting them with berry juice or a dark paste he makes from bushfire charcoal.

FOOD & FEEDING

The bowerbird feeds mainly on a wide variety of fruits and berries, but will also snap up any insects that it finds, including beetles, moths and termites. The chicks, which need a high-protein diet for their rapid development, are fed chiefly on insects.

The bowerbird forages mainly in the forests where it breeds. Outside the nesting season, birds flock up to a hundred and search for figs and other fruit. When fruit is scarce, the bowerbird normally resorts to a diet of buds, flowers and even leaves.

▶ **INSECT ADDITIVES**
The bowerbird searches for grubs on the forest floor.

CONSERVATION

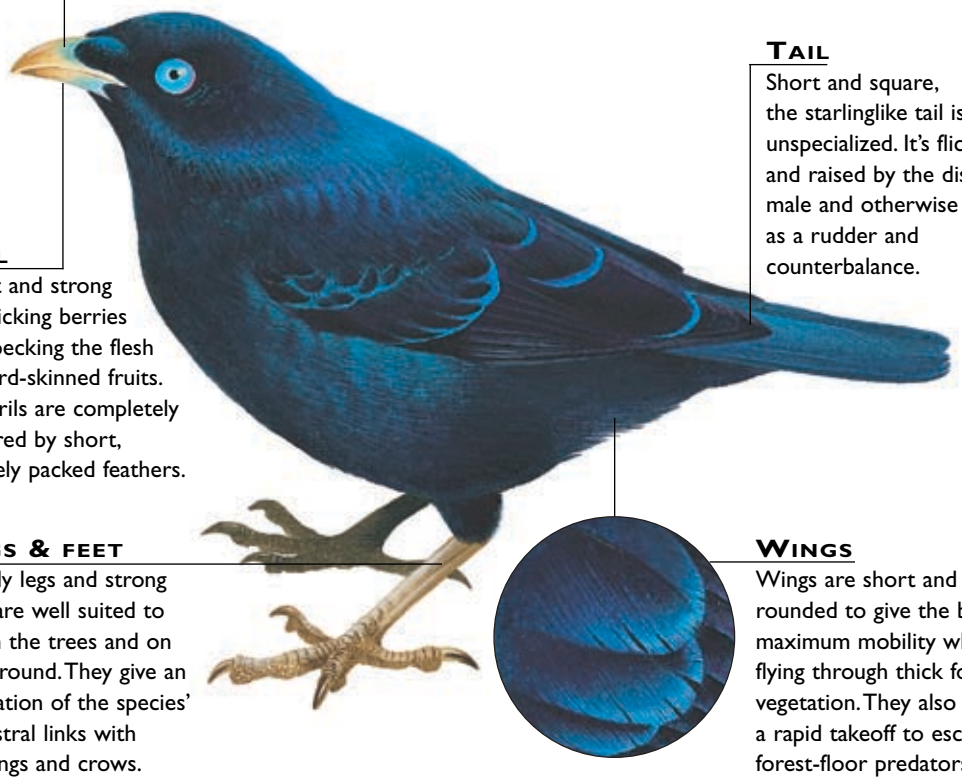
The satin bowerbird is fairly common in most of its range. Chief threats to its future are forest clearance and shooting by fruit growers, which has led to the extermination in some localized areas.

PROFILE SATIN BOWERBIRD

Attractive without being showy, the satin bowerbird gets its name from the sheen on the male's smart, blue-black plumage.

FEMALE

Soberly colored and lacking the gloss of the male, the female satin bowerbird has beautifully scalloped markings that help her blend with the forest background as she carries out her nesting duties.



BILL

Stout and strong for picking berries and pecking the flesh of hard-skinned fruits. Nostrils are completely covered by short, densely packed feathers.

TAIL

Short and square, the starlinglike tail is unspecialized. It's flicked and raised by the displaying male and otherwise acts as a rudder and counterbalance.

LEGS & FEET

Sturdy legs and strong feet are well suited to life in the trees and on the ground. They give an indication of the species' ancestral links with starlings and crows.

WINGS

Wings are short and rounded to give the bird maximum mobility when flying through thick forest vegetation. They also allow a rapid takeoff to escape forest-floor predators.

VITAL STATISTICS

WEIGHT	About 5 oz.
LENGTH	11–13.5".
WINGSPAN	18–20"
SEXUAL MATURITY	Female 2 years; male 4–6 years
BREEDING SEASON	September –February
NUMBER OF EGGS	1 or 2, sometimes 3
INCUBATION PERIOD	19–23 days
NUMBER OF BROODS	1
FLEDGING PERIOD	18–22 days
TYPICAL DIET	Mainly fruit and berries; some insects
LIFESPAN	Probably up to 15 years

RELATED SPECIES

● The bowerbird family has 18 species in New Guinea and Australia, but not all build bowers. Four species known as catbirds, because of their catlike calls, form a stable pair bond; the other 14 species don't. Bowerbirds lack the splendid plumes of closely related birds of paradise, but some, like the male regent bowerbird, are boldly colored. MacGregor's bowerbird has dun plumage and a flame-orange crest.

CREATURE COMPARISONS

The satin bowerbird's elaborate "bower" is overshadowed by the Vogelkop gardener bowerbird of New Guinea, which builds an astonishing courting place — a "hut" up to 5' wide with a moss "front garden" on which he arranges flowers and fruits. MacGregor's bowerbird builds a 2'-high twig "maypole" ringed by a circular "dance floor."

Scarlet Ibis

• ORDER •
Ciconiiformes

• FAMILY •
Threskiornithidae

• GENUS & SPECIES •
Eudocimus ruber

KEY FEATURES

- One of the most spectacular wading birds, displaying white or scarlet plumage
- The ibis can fly in excess of 25 mph while soaring to great heights
- Males and females have identical plumage, but the male is much larger and has a longer bill
- Legs, face and bill change colors during courtship

WHERE IN THE WORLD?

Found over the coastal plains of southeastern North America through Central America and the Greater Antilles; also in South America in Brazil, throughout the plains of Colombia and Venezuela

LIFECYCLE

The nomadic scarlet ibis feeds in flocks, relying on changing tides to reveal its food sources, but this social bird can be aggressive when defending its breeding territory.

HABITAT

▲ **COLONIAL ROOST**
Three ibises have prime perches on a coastal bush.

The scarlet ibis adapts to an array of coastal locations. Birds may be spotted in open marine lagoons, exposed tidal flats, gardens, residential yards, ball fields, golf courses, agricultural fields, garbage dumps and even the rice fields in the treeless plains (llanos). In North America, the bird nests as far north as Virginia and south through Florida to Louisiana; it also nests along the coasts of Mexico, Belize and Nicaragua. In South America, populations occur in the interior of Columbia and along the Atlantic coast from Guyana to Brazil. Though both white and red scarlet ibises can be found in North and South America, there tend to be more white individuals in the north and more red in the south.

DID YOU KNOW?

- **A tourist industry has developed in the Caroni Swamp of Trinidad where people observe the scarlet ibises flocking to their night roost.**
- **In Louisiana, 64% of all nests were lost during incubation because of high tides.**

BREEDING

Breeding colonies are large, dense and almost always located above some type of water, usually islands, mangrove swamps or gallery forests. Males arrive first to establish roosting sites; they participatein numerous displays, including shaking, flying, head-rubbing and bill- popping — snapping the bill shut with a quiet pop. But the courtship ritual can become violent: females often walk away bloodied, since the male is so aggressive in defending his individual space at the site. Females select and build the nests; the males provide sticks and other building materials. Nests are closely grouped in trees or on the ground; both parents guard the 2–5 cream to blue-green eggs. After about 21 days, the chicks hatch, and the newborn birds are completely dependent on their parents for food. The chicks' legs develop within two weeks, but they do not leave the nest completely until they are about 50 days old.

BEHAVIOR

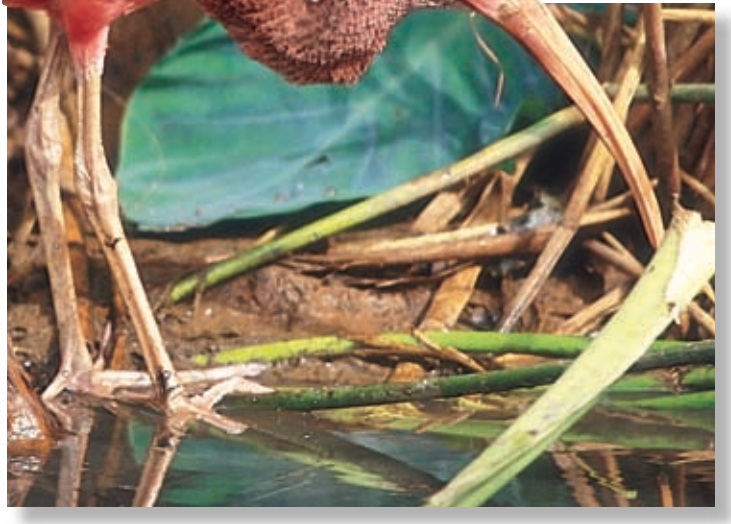
Though it is a gregarious bird, the scarlet ibis can become highly aggressive during territorial defense. Larger males usually win contests for food or space; fights may occur between males of the same or different bird species. The scarlet ibis flies by alternating rapid wing beats and gliding, usually in a V-formation; flight speeds often exceed 25 mph. Aerobatics are part of displays, where bachelors try to impress females, but are also part of the bird's regular feeding and roosting habits. For example, the bird often soars to great heights, then drops into a freefall before landing to roost. The bird's primary call is a honk coupled with a squealing sound during courtship.

FOOD & FEEDING

This abundant species feeds in large groups and frequents saltwater, but it can be found at freshwater locales as well. The scarlet ibis glides into a feeding site and uses its long bill to probe for food in shallow water, where it finds small fish, crustaceans, aquatic insects, worms, snails and fiddler crabs. Small prey is consumed immediately, while larger morsels are broken into bite-sized pieces. The bird will take flight if disturbed, sometimes performing aerial maneuvers until it is safe to return. Juveniles flock and feed separately from adults during the first and second years.

▲ **TWO-THIRDS DONE**
Two weeks of incubation completed; one more to go.

▼ **A PROBING PROFILE**
A juvenile wades, lifting vegetation in its search for aquatic food.



GO WITH THE FLOW

1 Communal feeding…
During low tide, a large flock of scarlet ibises use their long, thin bills to probe through a mud flat near a mangrove.

2 Tide begins to rise…
As the tide rises, and water floods the feeding grounds, the birds begin pursuing small fish that are visible on the water's surface.

3 Night is falling…
As the sun sets, the flock sets out together for a journey of several miles back to the colonial roosting site.

4 Home sweet home
The large flock descends into a mangrove forest, where the birds begin to jockey for prime roosting spots.

CONSERVATION

In many regions, scarlet ibis populations remain high. However, decreased numbers have been reported in the Florida Everglades and also areas of South America, where the bird is hunted for its feathers. The scarlet ibis is on the endangered species list in Brazil. In French Guiana, the bird's feathers are used to manufacture artificial flowers. Though hunting restrictions are in place in South America, they are rarely enforced. The United States government is making an effort to preserve the wetland habitats of the bird.

PROFILE SCARLET IBIS

Soaring scarlet ibis flocks are one of the great spectacles of nature; during mating, color changes in both sexes heighten the colorful display.

JUVENILE

Most of the juvenile's body is slate gray, but the face and bill are pink and the underside is white. Juveniles often flock separately and can take up to two years to reach full adult size and up to three years to grow adult plumage.

PLUMAGE

In adults, the basic plumage is either solid white, red or salmon-colored. Wing tips are always glossy blue-black. Northern breeding populations are usually white, while in South America, nesting ibises are usually red.

EYE

Acute vision helps the ibis hunt crabs and land animals. During courtship, the female shows the male the side of her face, particularly the eye, in a bowing display.

BILL

The long, thin, pink-red bill — perfect to probe for aquatic prey — darkens during breeding.

FEET

The legs and feet are pink-red, but change to bright red during courtship. The feet are only partially webbed at the base, an adaptation to wading and perching.

VITAL STATISTICS

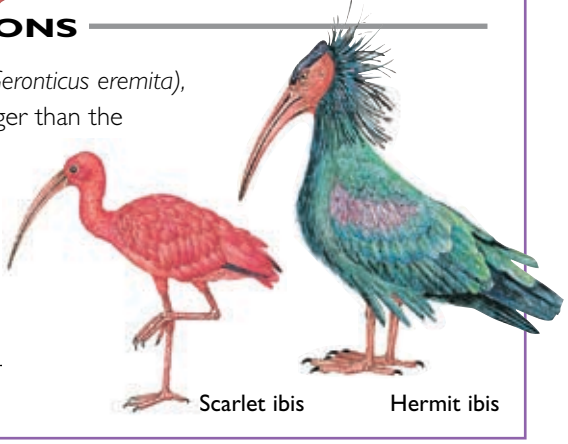
WEIGHT	About 30 oz.
LENGTH	23–27"; males larger than females
WINGSPAN	38"
SEXUAL MATURITY	3 years
BREEDING SEASON	March–September
NUMBER OF EGGS	2–5
INCUBATION PERIOD	21 days
FLEDGING PERIOD	50 days
BREEDING INTERVAL	Usually 1 year
TYPICAL DIET	Crayfish, snails, insects and fish
LIFESPAN	Unknown in wild; 7.5 years in captivity

RELATED SPECIES

● **The scarlet ibis is one of about 33 species of ibis and spoonbill in the family *Threskiornithidae*. Its relatives include the glossy ibis, *Plegadis falcinellus*, white-faced ibis, *P. chihi*, roseate spoonbill, *Ajaia ajaja*, and white spoonbill, *Platalea leucorodia*, which are all found in North America. The other species are found in Africa, Eurasia, Central and South America and Australia.**

CREATURE COMPARISONS

Measuring up to 31.5" in length, the hermit ibis *(Geronticus eremita)*, also known as the waldrapp ibis, is darker and larger than the scarlet ibis. Its bare, red head is covered by a ruff of feathers, which give the bird an unkempt appearance. The base plumage of the hermit ibis is dark metallic green tinged with purple, a sharp contrast to the white or red of the scarlet ibis. Unlike its aquatic cousin, the hermit ibis is mostly terrestrial and can be found in the m of Europe, Africa and into the Middle East.



Scarlet ibis Hermit ibis

Screamers

• ORDER •
Anseriformes

• FAMILY •
Anhimidae

• GENUS & SPECIES •
Anhima, Chauna spp.

KEY FEATURES

- Named for their noisy, high-pitched call, which can be heard over 1.5 miles away
- Gregarious screamers spend long periods perching conspicuously in trees like birds of prey, but feed on succulent aquatic plants like their waterfowl relatives
- Use unusual wing spurs during territorial and mating battles

WHERE IN THE WORLD?

Found in South America from Colombia south to Argentina; northern screamers are found only in Colombia and Venezuela; southern screamers in Bolivia, Brazil and Argentina

LIFECYCLE

Screamers attract attention: they perch conspicuously on treetops, utter a noisy, high-pitched call and congregate in large flocks, often numbering in the thousands.

HABITAT

Screamers are typically found in South American swamplands, but also frequent wooded zones where they perch on trees. Horned and southern screamers favor open plains and grassy meadows near water. The northern screamer prefers marshes with dense vegetation north of the equator (hence its common name), and lives well over 1,000 miles from the southern screamer. The horned screamer's range lies between the two others' and overlaps their ranges slightly.

▼ **SEE AND BE SEEN**
A treetop perch gives two southern screamers a great view of the marsh.

DID YOU KNOW?

- **Screamers are especially unpopular among hunters, since their alarm call immediately warns all other animals of human presence — making it difficult for hunters to take their intended prey by surprise.**
- **Both sexes produce a threatening *gruff* noise, which sounds like drumming or cracking. It appears that this sound may be produced not vocally but by the sudden collapse of subcutaneous air sacs that are found beneath the skin.**

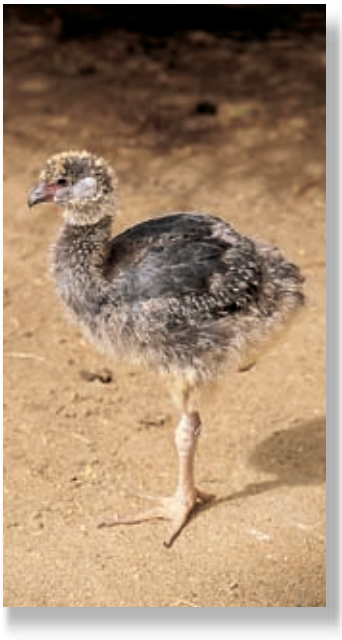
CONSERVATION

None of the three species of screamer is globally threatened, but habitat destruction is definitely the main threat to all species. Rainforest clearing, wetland drainage and water quality deterioration (due to the use of pesticides and insecticides) are all affecting numbers. Extensive work is required to help determine current numbers and conservation requirements.

BREEDING

Since they inhabit warm, tropical regions, screamers may breed at any time of the year. Pairs usually mate for life, and courtship during pair formation includes repeated calls, mutual preening and walking side by side. The horned screamer is the most territorial of the three species of screamer. The male uses his *moohooka* call to define the territorial borders and defend his position and mate. If an intruder is persistent, any of the species will engage in battle by pecking, kicking, flapping their wings and slashing with their wing spurs. Parts of the horny spur coverings have been found embedded in the breasts of other screamers.

The two parents are true partners. They both build the nest, which is made of weeds, reeds and sticks, and placed either in shallow water or on dry ground not far from water. After the female lays the 2–7 large, spotted eggs, the parents take turns incubating. After 40–47 days, the chicks hatch with thick, grayish-yellow down. They are able to leave the nest within a few days and accom-pany their parents during grazing, though the growing young also eat protein-rich insects to supplement their diet. They fledge within 8–10 weeks, but don't become fully independent until about 14 weeks of age. Juveniles will remain in large flocks, even during the breeding season, until they become sexually mature — usually not before 2 years of age.



▶ **SLIGHTLY SOUTHERN**
A southern screamer chick starts to develop its distinguishing neck ring.

A TEAM OF SCREAMERS

1 Four horned friends…
A small group of horned screamers, named for unique "horn" feathers, survey a marshy wetland, preparing to head out on a foraging trip.

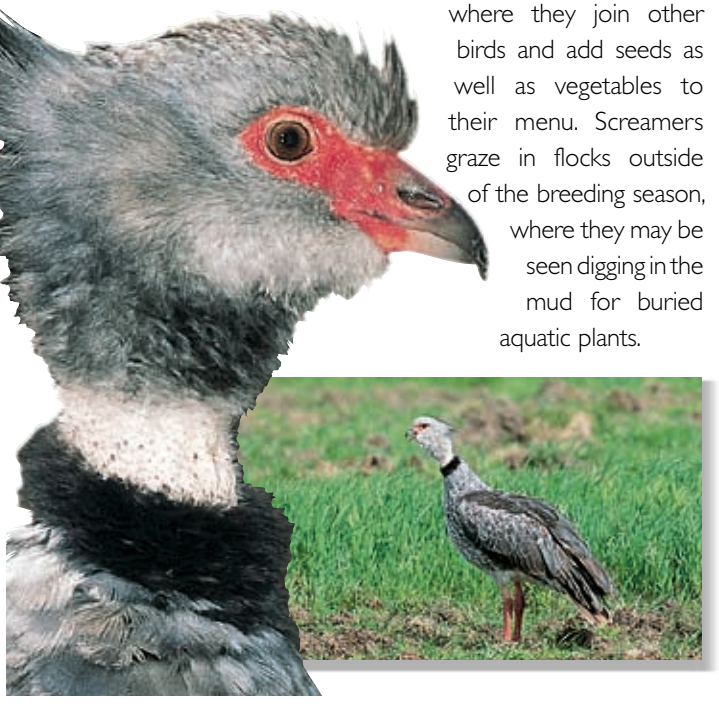
2 Ready to defend…
The wing's sharp spurs can be used for defense against predators when the birds are out in search of feeding grounds.

3 Hunt and peck together…
The screamers peck at the fleshy parts of the vegetation while treading across the wetland with their lightweight, unwebbed feet.

4 In all kinds of weather
The screamer eats leaves, stems and roots, always looking for the succulent parts, and remains a vegetarian throughout the year.

FOOD & FEEDING

All three species of screamer graze amid aquatic vegetation, but they have a preference for fleshy leaves, stems and roots. Though they often walk half-submerged in their swampland haunts, the birds also stride lightly across thick, floating vegetation in their quest for succulent plants. Occasionally they find their way to crop fields, where they join other birds and add seeds as well as vegetables to their menu. Screamers graze in flocks outside of the breeding season, where they may be seen digging in the mud for buried aquatic plants.



BEHAVIOR

Screamers are year-round residents of South American marshes, and their presence is hard to miss. All three species spend long periods of time perched on the tops of trees, their 3'-long bodies highly visible from near or far. This behavior may seem odd for an aquatic bird, but their long-toed, unwebbed feet are perfect for perching — whether to rest, escape predators or oversee a territory.

The screamers' noisy, high-pitched call, which often sounds like a trumpet, is the most obvious sign of the screamers' presence. The call is often repeated for hours on end and can be heard up to 1.5 miles away. One screamer's call generally starts a chorus, either in flight or at their nighttime roosting site, and the combined voices are often deafening. The birds are very gregarious: They sing together, graze in groups, and fly in large flocks that can number in the thousands.

SIDEKICKS
Two northern screamers stretch their legs and toes during a long foraging trip.

PROFILE SCREAMERS

Screamers have unwebbed feet, spurs on their wings and chickenlike heads and bills, but they are close relatives of ducks, geese and swans.

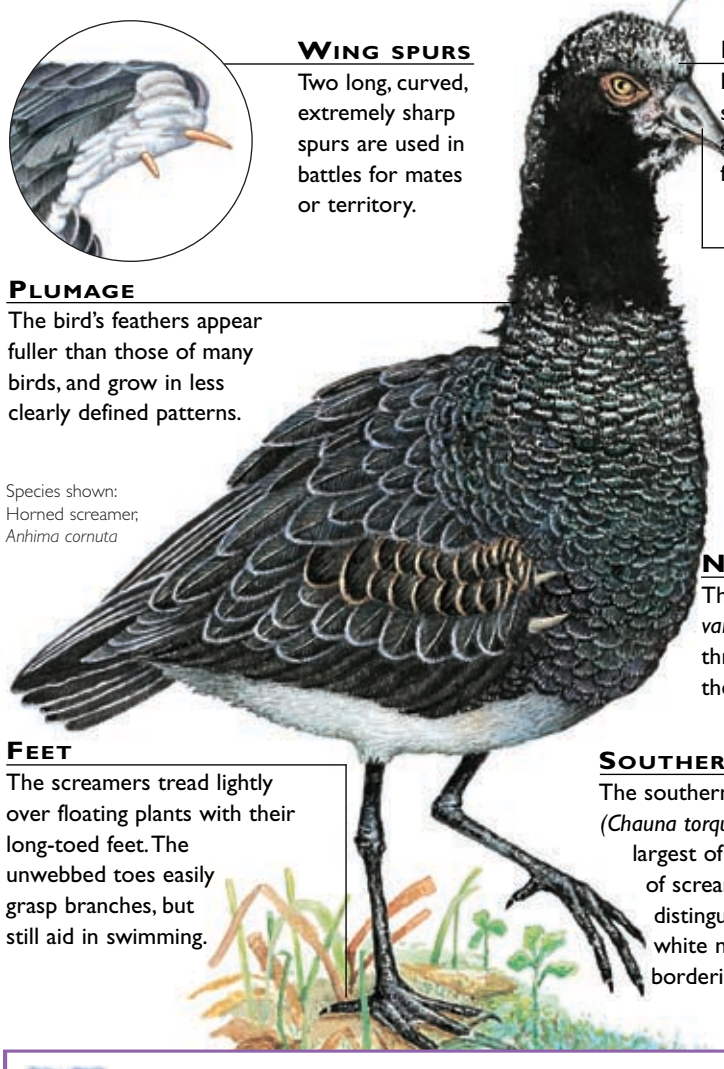
WING SPURS
Two long, curved, extremely sharp spurs are used in battles for mates or territory.

HEAD
Both sexes of horned screamer have a short tuft of upwardly turned feathers and a "horn" — a long, whitish feather, measuring 4–6" in length.

BILL
The chicken-like bill is adapted for feeding on aquatic plants.

PLUMAGE
The bird's feathers appear fuller than those of many birds, and grow in less clearly defined patterns.

Species shown:
Horned screamer, *Anhima cornuta*



NORTHERN SCREAMER
The northern screamer *(Chauna chavaria)* has a long, black neck and white throat and face, boldly contrasting with the other two species.

FEET
The screamers tread lightly over floating plants with their long-toed feet. The unwebbed toes easily grasp branches, but still aid in swimming.

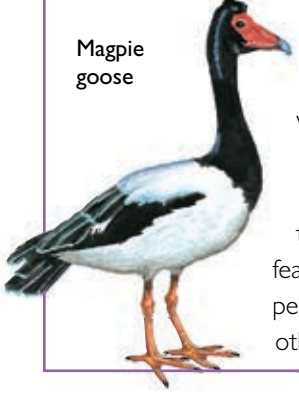
SOUTHERN SCREAMER
The southern screamer *(Chauna torquata)* is the largest of the three species of screamer and is distinguished by its thin, white neck ring with a bordering black band.

VITAL STATISTICS

WEIGHT	6.5–9.5 lbs.
LENGTH	32–36"
WINGSPAN	Over 5.5'
SEXUAL MATURITY	Usually more than 2 years
BREEDING SEASON	Year-round
NUMBER OF EGGS	2–7
INCUBATION PERIOD	40–47 days
FLEDGING PERIOD	8–10 weeks
BREEDING INTERVAL	Up to 1 year
TYPICAL DIET	Leaves, stems, flowers and roots of aquatic plants
LIFESPAN	Unknown

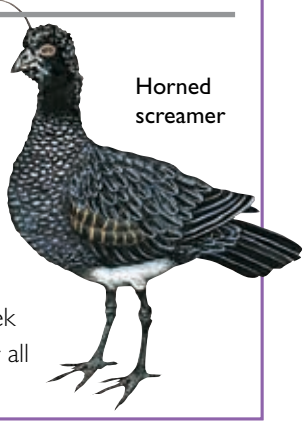
CREATURE COMPARISONS

Magpie goose



Measuring 32" in length, the magpie goose *(Anseranas semipalmata)* of Australia and New Guinea is slightly smaller than the horned screamer. With its long neck and bill, the magpie looks like its geese relatives, but it is a poor swimmer, and its partially webbed feet and perching habits are similar to the horned screamer's. Both birds molt their feathers gradually, so they do not go through a 4–8-week period of flightlessness — an interval of vulnerability for all other geese, ducks and swans.

Horned screamer



RELATED SPECIES

● **The *Anhimidae* family contains 3 species of screamer in 2 genera: *Anhima* and *Chauna*. The order *Anseriformes* also includes 147 species of duck, goose and swan. The screamers all have head adornments, but the male comb duck, *Sarkidiornis melanotos melanotos*, has a huge knob over his bill. Like screamers, the spur-winged goose, *Plectropterus gambensis*, has spurs on its wings.**

Secretary Bird

• ORDER •
Falconiformes

• FAMILY •
Sagittaridae

• GENUS & SPECIES •
Sagittarius serpentarius

KEY FEATURES

- The only bird of prey that hunts on foot, stalking through the long grass of the African savannah
- Uses its spindly, storklike legs for stamping on victims too big to be seized in the bill
- Adorned with an untidy, but distinctive crest of head feathers, which it raises when excited

WHERE IN THE WORLD?

Found on open savannah and plains over much of sub-Saharan Africa, southward to the Cape of South Africa; absent only from forested and mountainous areas of western central Africa

LIFECYCLE

Renowned as the snake catcher of the African savannah, the secretary bird actually feeds on a wider range of prey and hunts as it walks along rather than from the air.

HABITAT

Savannah grasslands and plains south of the Sahara are the secretary bird's habitat. It avoids densely vegetated areas, forests and rocky, broken country, preferring open areas with sparse cover where it can easily forage for prey. However, it requires some tree cover to nest and roost in safety.

The density of birds in any one area depends on food availability; populations vary widely in different parts of Africa. In the grasslands of the far south, for example, there may be just a single pair ranging over 20 sq. miles, while on the tropical savannah one pair per 8 sq. miles is more common.

▲ **FAMILY TREE**
The secretary bird is usually seen in pairs at its roost or nest site, but several birds may congregate to drink at a waterhole *(left)*.

DID YOU KNOW?

- **The secretary bird is considered so beneficial that farmers in southern Africa keep domesticated birds to control snakes and rats.**
- **With frequent food shortages in the secretary bird's habitat, it's common for only one chick from each brood to reach adulthood.**

FOOD & HUNTING

Any small animal up to the size of a young hare may fall prey to the secretary bird, but its staple food tends to be small ground mammals and large insects. It also eats young birds and reptiles, and is noted for catching snakes. It hunts prey on foot by strolling along, then suddenly speeding up and stamping its feet. This is thought to panic a hidden creature into making a sudden move, thereby revealing its presence to the hungry bird.

When prey is spotted, the bird dashes forward with wings outstretched. Most prey is taken in the bill, but it also stamps on larger prey to kill it, using its wings for balance. If the bird has trouble subduing larger prey, it may launch into the air with the victim, then drop it from the sky to stun or kill it.

The bird doesn't usually eat carrion, but groups have been known to gather near the fringes of forest fires. Here they feast on the roasted bodies of small animals caught in the blaze.

BEHAVIOR

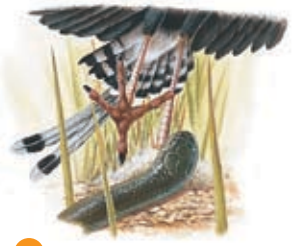
The secretary bird spends most of its time on the ground. It may walk more than 18 miles a day in search of food, pausing during the hottest periods in the shade of a tree. As its stalks the ground, it walks at about 3 mph — roughly the same pace as a human.

To advertise its territory, the bird takes to the sky almost every day. If one bird walks into the territory of another, serious battles break out. When a bird spots an intruder, it rushes up to it and tries to leap over it, striking down with its legs. The defender is usually victorious and returns to its mate. The birds then reinforce their bond with a display involving walking in circles with crests raised.

Courtship displays also consist of "circle-walking" and one or both birds soaring above their territory.

SNAKE IN THE GRASS

1 Stamping ground…
With a steady gait and darting head movement similar to a chicken's, the secretary bird watches for prey.



2 Target found…
Locating a snake in the grass, the bird pins it down with its broad feet.

3 Bird's eye view…
Flapping its wings to steady itself, the bird then strikes, killing its victim with its sharp, hooked bill.

4 Slipping down
If the prey is small enough, the secretary bird eats it whole, usually swallowing it head first.

▶ **GROUND WORK**
Much of the day is spent on the lookout for food.

BREEDING

Unusual among raptors (birds of prey), the female secretary bird is slightly smaller than the male. Adult birds seem to pair for life and use the same nest year to year. The nest is usually built 17–20' from the ground, often on top of a thorny tree, such as an acacia. Over the years, nests may grow to a mass of sticks over 7' across as more and more material is added. Unlike other raptors, the secretary bird doesn't carry sticks for the nest in its feet; instead it carries them in its bill. The central cup of the nest is lined with dry grass.

Two or three small, pointed white eggs are laid at two- or three-day intervals. About 45 days later, the young hatch separated by a similar interval.

▶ **LONE CHICK**
A chick stays in the nest until it's fully fledged at 65–80 days.

CONSERVATION

The secretary bird is in no danger, but is threatened in the north of its range where overgrazing by livestock and tree-logging for firewood reduced the landscape to near-desert conditions. Humans don't persecute the bird because of its reputation as a killer of snakes; it's protected over most of its range.

PROFILE SECRETARY BIRD

The secretary bird's long, scaly legs provide protection against venomous reptiles as it strides over Africa's grasslands in search of prey.

CREST
The crest of feathers on the head is erected during courtship and territorial displays. The bird was named after these feathers as they were said to resemble the quill pens that 19th-century secretaries commonly tucked behind their ears.

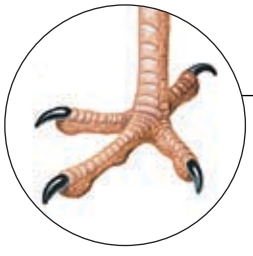
HEAD
As the bird becomes more mature, the color of its eyes change from gray to brown, and the skin on its face turns from a yellowish color to a deep red.

WINGS
Hunting on foot has left the secretary bird with relatively poor flying skills compared to other birds of prey. It takes off and lands rather clumsily, but, once aloft, it soars gracefully on broad, blunt wings while advertising its ownership of territory.

TAIL
The secretary bird's tail is more akin to a pheasant's than a bird of prey's. The tail is longer on the male and trails behind the bird in flight.

PLUMAGE
Depending on location, some birds have gray plumage on the chest and back; others are whitish.

LEGS
The lower parts of the long legs are featherless. Fully feathered legs would probably snag in the undergrowth as the bird strolls about.



FEET
The feet are used mainly for stamping on prey. Consequently, they can't grasp as powerfully as those of other raptors.

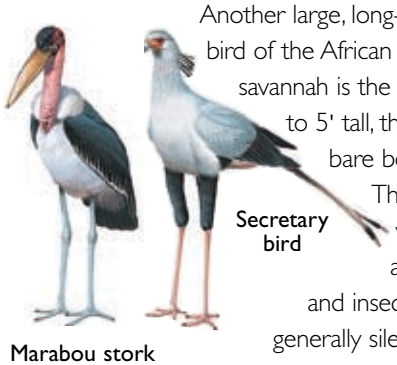
VITAL STATISTICS

WEIGHT	Up to 9 lbs.; males are heavier than females
LENGTH	4–5'
WINGSPAN	4'
SEXUAL MATURITY	2 years
BREEDING SEASON	All year (mainly spring and summer)
NUMBER OF EGGS	2 or 3
INCUBATION PERIOD	43–46 days
FLEDGING PERIOD	About 80 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Rodents, large insects, reptiles
LIFESPAN	10–12 years

RELATED SPECIES

● **The secretary bird is the only member of the family *Sagittaridae*; the name derives from the Latin word *sagittarius*, meaning archer, and refers to the way the bird, like an archer, stalks its prey on foot. This is the feature that distinguishes it from the other 279 species of the order *Falconiformes*, such as hawks and eagles, that hunt on the wing or swoop down from a perch.**

CREATURE COMPARISONS



Another large, long-legged bird of the African tropical savannah is the marabou stork. Growing to 5' tall, the adult stork is taller than the secretary bird. The stork's neck is bare because the bird feeds on carrion, and feathers would get soiled. The bill can crack small bones, and the stork may wield it against vultures to force its way to the front of the line at gatherings around a carcass. The stork's diet also includes rodents, reptiles and insects, including locusts. Both the secretary bird and the stork are generally silent, but during courtship displays they make deep, croaking grunts.

SHOEBILL

• ORDER •
Ciconiiformes

• FAMILY •
Balaenicipitidae

• GENUS & SPECIES •
Balaeniceps rex

KEY FEATURES

- Violently thrusts its massive bill through aquatic vegetation to reach fish and frogs
- On hot days, a parent cool eggs and chicks by sprinkling water on them
- Faces an uncertain future as its wetland habitat is gradually being lost to human settlement, warranting the attention of the IUCN (World Conservation Union)

WHERE IN THE WORLD?

Found in the papyrus swamps and wetlands in northeastern and Central Africa, from the Sudd swamps in southern Sudan, south through Uganda, into Zambia

LIFECYCLE

Although given to nesting in remote spots, the shoebill is one of the most distinctive birds of African wetlands. Its mighty bill is a specialized weapon for hunting in the water.

HABITAT

In northeastern Africa, the shoebill frequents the Sudd, a 52,000-sq. mile swamp. The bird is most often seen in flooded regions where the deep, sluggish waters carry large quantities of fish toward the great lakes of Victoria and Tanganyika.

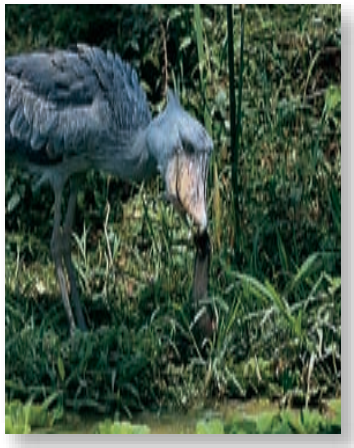
In Uganda, the shoebill is found on marshy lake margins thick with reeds, papyrus and grasses. The bird uses this vegetation for nesting material and to conceal its vast shadow from the fish below. It is often most numerous in areas where the water has a low oxygen level — lungfish, a favorite food, then must surface more often, making the shoebill's foraging a lot easier.

▼ **WATERBIRD**
The shoebill is found in marshes and swamps.

FOOD & HUNTING

Fish dominate the shoebill's diet; it also hunts frogs, lizards, turtles and snakes, as well as the odd waterbird or young crocodile.

Feeding starts by late morning. Shoebills may fish near each other, but do not hunt communally. Their method is spectacular but often unsuccessful, obliging the bird to move a few yards and try again.



CONSERVATION

The IUCN (World Conservation Union) has declared the shoebill a species of special concern because of its restricted range in Africa and poorly understood biology. The population is thought to be about 11,000, with roughly half occurring in the Sudd. This region is being drained, along with other wetlands, to create land for crop production. Cattle farmers are burning marshes, using the land for their stock. Fishermen disturb the bird during its breeding season, and juveniles are illegally collected for zoos.

BREEDING

The shoebill adapts its breeding behavior to suit the movements of floodwaters. By mating in the dry season, the shoebill ensures its young a supply of lungfish, which are trapped in dwindling pools.

The shoebill lays two or three chalky-white eggs on a bulky mound of aquatic plants trampled on floating marshy vegetation. The breeding pair continually adds fresh plant material to the nest, which may become so heavy that it sinks slowly into the marsh. Although breeding pairs may nest close to one another, they never form a social colony.

The parents dutifully tend their silvery-gray, downy hatchlings, supplying them with prechewed fish and dousing them with billfulls of cooling water on hot days. The chicks learn to handle fish and eat them head first. Each juvenile leaves the nest at 13 weeks, but still cannot fly and relies on its parents for another few weeks. Normally only one juvenile fledges from each brood.

▶ **JOB SHARE**
Both parents incubate the eggs and rear the young.

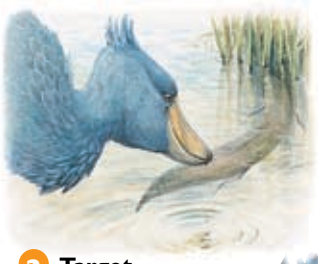
DID YOU KNOW?

- **The shoebill follows the sitatunga, an aquatic antelope; it stirs up lungfish, the bird's favorite food, as it walks.**
- **The shoebill shares with the storks the habit of defecating on its legs on hot days. This creates cooling by evaporation.**

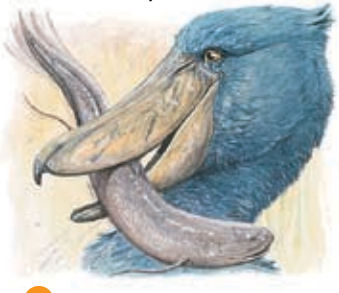
BEHAVIOR

FITTING THE BILL

1 Search…
When the shoebill hunts, it uses various tactics: periods spent standing motionless alternate with a stealthy stalk.



2 Target…
The bird attacks a catfish in a stand of reeds, toppling forward as it thrusts out its bill.



3 Control…
The messy hunter skillfully empties water and plant matter from its bill while keeping a firm grip on the prize.

4 Swallow
After a successful strike, the shoebill takes a drink and then moves to another undisturbed site.

The shoebill has a solitary, sedentary nature. Even breeding pairs seldom feed alongside each other; each one's territory may extend a few miles.

The shoebill is sometimes forced by droughts to seek new food sources. This heavy bird is, however, a reluctant flier because it depends on thermals (warm air currents) on which to soar. In flight it-draws its neck back, pelican-style, to bring the mighty bill closer to the body's center of gravity.

Usually quiet, the bird defends its nest with vigor, clapping its bill loudly and even leaping onto the back of an intruding shoebill.

◀ SOLO ACT
Even when breeding, the shoebill is independent.

PROFILE SHOEBILL

With stiltlike legs and splayed feet, the shoebill can wade in shallow water, or stand on floating vegetation, ready to strike with its extraordinary bill.

HEAD
The skull is large to support the massive bill. A small crest lies at the rear of the head, a feature it shares with pelicans.

NECK
The neck is fairly short and thick to help carry the oversized bill.

BILL
The distinctive bill reaches a length of about 8", enabling the bird to scoop up large mouthfuls of water and vegetation. The shoebill moves its mandibles from side to side to remove the vegetation, and often decapitates its prey before eating.

FEET
The long toes distribute the bird's weight, enabling it to walk over dense aquatic vegetation without floundering.

PLUMAGE
Blue-gray with darker flight feathers, the shoebill's plumage has a dull-green gloss on its upperparts. The belly is lighter, with some elongated feathers on the breast. Juveniles have similar plumage to the adults, but tend to be a darker gray with a brown tinge.

VITAL STATISTICS

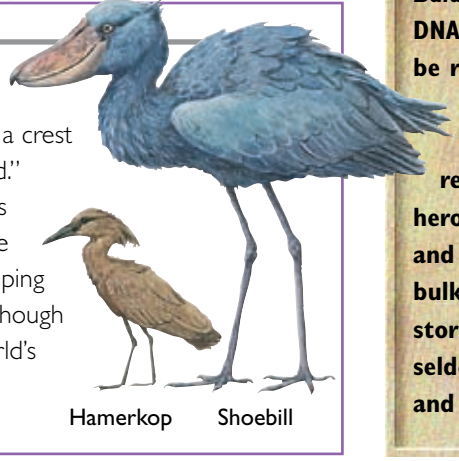
WEIGHT	11–13 lbs.
LENGTH	Up to 4'
WINGSPAN	6.5'
SEXUAL MATURITY	3–4 years
BREEDING SEASON	October–June
NUMBER OF EGGS	1–3, usually 2
INCUBATION PERIOD	30 days
FLEDGING PERIOD	95–105 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Fish, frogs, water snakes, turtles
LIFESPAN	Up to 35 years in captivity

RELATED SPECIES

● **The shoebill is the sole member of its genus, *Balaeniceps*, and the only species in its family, the *Balaenicipitidae*. Although DNA analysis shows it to be related to pelicans, it has been thought to be most closely related to storks and herons. With its long legs and neck, it resembles a bulky stork but, unlike storks or herons, it seldom perches in trees, and nests on the ground.**

CREATURE COMPARISONS

At 20" long, the hamerkop (*Scopus umbretta*) is dwarfed by the shoebill. It has pale-brown plumage, and the back of its head sports a crest that gives rise to its name, an Afrikaans word meaning "hammerhead." Like-the shoebill, the hamerkop is a waterbird. Its slender bill enables it to trap a varied diet from frogs to fish and small invertebrates. The hamerkop's bill has a tiny hook at the tip of the upper mandible, helping it pick up smaller victims and rinse them in water before eating. Although much smaller than the shoebill, the hamerkop builds one of the world's largest nests, creating a structure with an average depth of 5' and weighing up to 100 times more than the bird.



Hamerkop Shoebill

Short-toed Snake Eagle

• ORDER •
Falconiformes

• FAMILY •
Accipitridae

• GENUS & SPECIES •
Circaetus gallicus

KEY FEATURES

- Swallows snakes head first; tails can be seen protruding from the eagle's mouth
- Performs an elaborate sky dance during nuptial displays, which include snake-tossing
- Hovers above its prey for long periods before parachuting down to grasp the victim on the ground

WHERE IN THE WORLD?

Found in southwest and southeast Europe, including France, Italy and Spain; also in northwest Africa east to Iran, Iraq, India, western China and the Lesser Sundas islands in Indonesia

LIFECYCLE

The short-toed snake eagle is largely a specialist hunter, searching year-round for snakes, both big and small; the young learn at an early age to swallow snakes headfirst.

HABITAT

The short-toed snake eagle prefers warm, open habitats with scattered trees, meadows, forest and rocky slopes where it can nest and roost. Populations flourish not only in the Mediterranean region, including France, Spain, and Greece, but also in Algeria, Africa, China and India. Though generally uncommon in northern Europe, the eagle has ventured as far north as Denmark during the breeding season. In warmer climates, the eagle ranges in dry plains, hills and mountains; in cooler northern climates, the bird also inhabits heaths, damp grasslands and wetland margins adjacent to forests.

▲ **ROCKY RANGE**
Form Italy to Iran, Egypt to Estonia, the short-toed snake eagle prefers warm, rocky habitats.

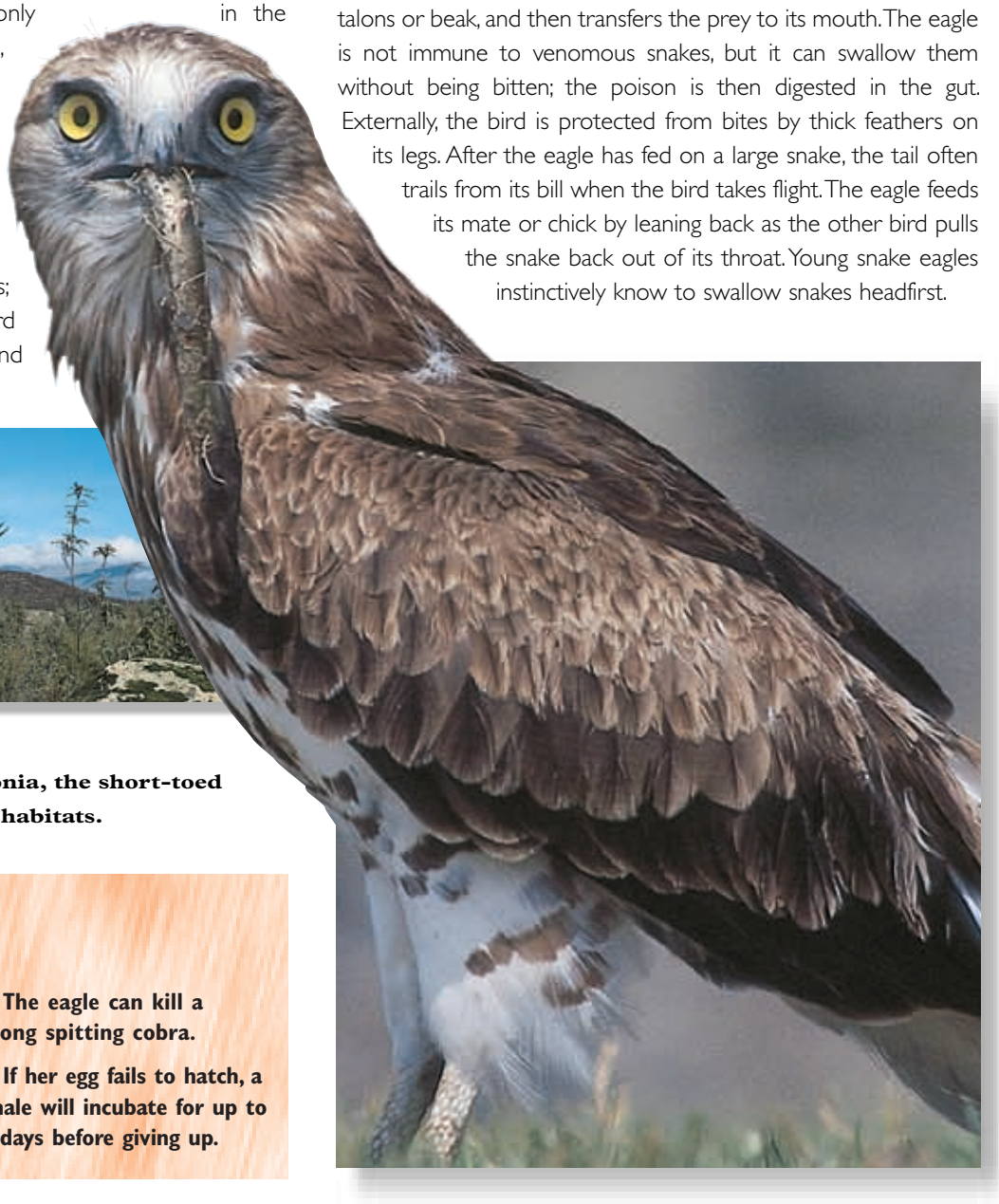
DID YOU KNOW?

- **The short-toed snake eagle has been known to attack prey from 1,500' away — thanks to its exceptional eyesight.**
- **The eagle can kill a 6'-long spitting cobra.**
- **If her egg fails to hatch, a female will incubate for up to 90 days before giving up.**

FOOD & HUNTING

The short-toed snake eagle is an expert snake hunter — 70–80% of its diet is made up of snakes. It also feeds on other reptiles, frogs, wounded birds or rodents, and small mammals. The snake eagle normally hunts at altitudes between 65–500', hovering with its face to the wind and then parachuting down on prey. The eagles may also use perches to locate prey, and they sometimes stalk it on the ground or in shallow water.

When hunting snakes, the eagle swoops to the ground, grabs the victim with its talons, smashes its head or tears it off with its talons or beak, and then transfers the prey to its mouth. The eagle is not immune to venomous snakes, but it can swallow them without being bitten; the poison is then digested in the gut. Externally, the bird is protected from bites by thick feathers on its legs. After the eagle has fed on a large snake, the tail often trails from its bill when the bird takes flight. The eagle feeds its mate or chick by leaning back as the other bird pulls the snake back out of its throat. Young snake eagles instinctively know to swallow snakes headfirst.



SNAKE SPECIALIST

1 Spotted...
A snake eagle hovers high up in the air, spotting a snake with its keen eyesight. Snakes comprise more than 70% of the eagle's diet.

2 Swoop and grab...
The eagle parachutes on outstretched wings and grabs the snake in its talons. The motion is swift and effective.

3 No escape...
Once in the eagle's powerful clutches, the snake is trapped. Using its sharp beak, the eagle will rip the head off the snake.

4 Meal in tow
The eagle flies off with the snake's tail hanging from the bird's partly opened bill. A waiting mate or chick will feed on the same snake.

BREEDING

A powerful flier, the eagle soars to great heights during the breeding season, when it performs breathtaking displays. The male bird begins the courtship dance with a steep climb into the air; it then repeatedly drops in gentle curves before rising again. During the display, the male often carries a snake or twig in its bill, which it drops and catches and then passes to the female. The birds then soar together, and conclude with loud *pieeou*, *pieeou* and gull-like *who-who-who* calls.

Pairs mate for life. Each year, the female builds a new nest of twigs and sticks in trees 10–25' above ground, always well hidden from below. The nest is relatively small compared to the size of the bird, with a deep cup lined with green grasses. The female lays one smooth, oval egg that is white and tinted blue. She incubates the eggs alone for 45–47 days, and the newborn chicks are downy-white with gray eyes that later turn a brilliant orange or yellow. Young eagles have very large heads even in the early downy stage. Feathers grow first on the back and head, an adaptation to the nest being exposed to the blazing sun. Both parents feed the chick, which fledges in 70–75 days. Some young fly to nearby branches at 60 days, but after fledging usually leave their parents' territory. The chick has the instinctive ability to swallow snake prey whole, like the adults. However, very young chicks are fed torn pieces of snakes or lizards.

▲ **PERCHING PROTECTOR**
A short-toed snake eagle stands guard over its growing chick, while they both await the female's return.

BEHAVIOR

The short-toed snake eagle is highly territorial and defends its space against intruders. In a threatening display flight, the bird glides with its head fully stretched out and emits a *u-ok-ok* call. This warning usually prevents intruders from crossing boundaries. After the breeding season, the bird migrates to winter quarters, traveling singly, in pairs or in small groups. European populations winter in the northern tropics of Africa; eastern populations winter in the Indian subcontinent and Southeast Asia.

CONSERVATION

The short-toed snake eagle is not globally threatened. Following a long-term decline due to hunting and habitat changes, most countries, including Spain and Russia, report population stability.

▶ **EYE SPY**
A snake eagle watches for snakes — or intruders.

PROFILE SHORT-TOED SNAKE EAGLE

The short-toed snake eagle stalks its prey from above before gliding to earth to grab its victim, usually a snake, with razor-sharp talons.

WINGS

The short-toed snake eagle soars on long wings. It glides over hilltops in updrafts and spends a great deal of time hovering or gently fanning its wings.

SKULL

The streamlined skull is dominated by a sharp and powerful bill. Large sockets contain the forward-facing eyes, which provide binocular vision.

FEET

With long curved claws and short, strong toes, the feet are well adapted for grasping and killing snakes rapidly.

PLUMAGE

An earthy-brown bird, the short-toed snake eagle has a contrasting dark crown, back and upper breast and white underparts, which may be barred.

VITAL STATISTICS

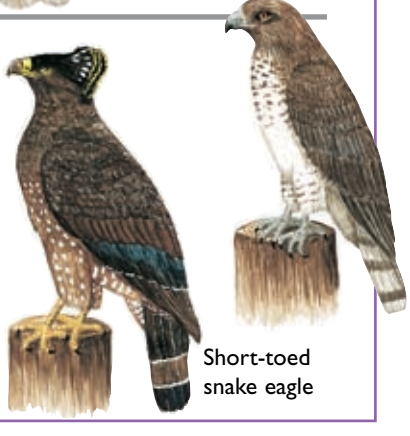
WEIGHT	2.5–5 lbs.
LENGTH	24–27.5"
WINGSPAN	5.5–6'
SEXUAL MATURITY	3–4 years
BREEDING SEASON	Varies with region
NUMBER OF EGGS	1
INCUBATION PERIOD	45–47 days
FLEDGING PERIOD	70–75 days
BREEDING INTERVAL	1–2 years
TYPICAL DIET	Snakes, lizards, frogs, birds and small mammals
LIFESPAN	17 years

RELATED SPECIES

● **The short-toed snake eagle is 1 of 15 species of snake eagles and serpent eagles in 5 genera: *Circaetus*, *Terathopius*, *Spilornis*, *Dryotriorchis* and *Eutriorchis*. The 6 species in *Circaetus* include the short-toed snake eagle, as well as the Beaudouin's snake eagle, *C. beaudouini*, and the black-breasted snake eagle, *C. pectoralis*. There are 64 genera and 237 species in the family *Accipitridae*.**

CREATURE COMPARISONS

Measuring up to 29", the crested serpent eagle (*Spilornis cheela*) is slightly larger than the short-toed snake eagle. The crested serpent eagle's distinguishing features include its large, black, fan-shaped crest, rounded wings and white-spotted underparts. Similar to the short-toed eagle in both diet and hunting habits, the crested serpent eagle has a more limited range. It inhabits China and India and prefers evergreen forests, but sometimes lives next to ponds or in hilly country. Both species perch and nest high in the trees and soar over their territory, scanning for prey.



Crested serpent eagle

Short-toed snake eagle

SKYLARK

• ORDER •
Passeriformes

• FAMILY •
Alaudidae

• GENUS & SPECIES •
Alauda arvensis

KEY FEATURES

- A well-camouflaged bird of farmland and open country
- Small in stature, but famous for its melodious, far-carrying song
- Sings while rising high into the sky and spiraling down to earth again
- Once very common, but threatened today by modern agriculture in many places

WHERE IN THE WORLD?

Native to Europe and northwestern Africa, and across northern Asia to China; northern populations migrate south in winter to the Mediterranean, the Middle East and central Asia

LIFECYCLE

The high, twittering song of the skylark evokes golden cornfields and summer days, inspiring naturalists and poets alike — but it can in fact be heard throughout the year.

HABITAT

One of the most common farmland birds, the skylark also thrives in most kinds of open, treeless landscape. The species occurs everywhere from salt marshes and sand dunes to steppes and moors, avoiding only woods, high mountains and semideserts.

Individuals in the north and east of the breeding range fly south in the winter. Skylarks in Scandinavia, for instance, leave for the fringes of the Mediterranean Sea in September, returning there to breed in early spring. The populations in southern Europe make more localized migrations to exploit seasonal food supplies.

▶ **COUNTRY RETREAT**
A ground-nesting bird, the skylark requires a habitat of seclusion.

CONSERVATION

The skylark has been hit hard by changing farming practices. Pesticides kill its prey, and herbicides kill seed-bearing plants. Now that cereal crops are often sown in the autumn for harvesting in early summer — enabling farmers to grow another in midsummer — skylarks are deprived of winter fields of stubble. These are an important source of seeds, and in spring the crops have already grown too tall for the bird to make its nest. As a result, numbers have fallen in northwestern Europe.

BEHAVIOR

The skylark's main predators are weasels and foxes, as well as European sparrowhawks and harriers. When it senses danger, the skylark runs to cover or freezes on the spot, flattening its body against the ground. If the threat persists, the skylark "explodes" into the air without warning and flies to safety.

In common with other species of the lark family, the skylark never bathes in streams or pools of water. The bird instead grooms by ruffling its plumage during showers of rain or by rolling about in dust and loose sand to remove parasites.

ON A HIGH NOTE

1 Ready for action…
A male skylark is about to perform a song flight and raises his crest in anticipation.

3 Point of view…
The lark climbs to a great height and hovers on the spot, all the while pouring out his sweet song.

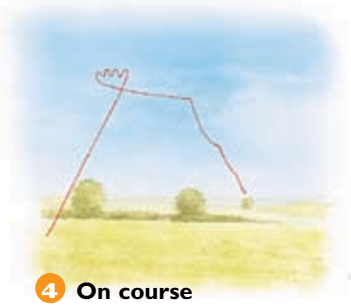
BREEDING

In late winter, the male skylark sings to proclaim territory and attract a mate. He devotes his energy to singing and chasing away rivals, and leaves the task of nest-building entirely to the female. She deposits her clutch of eggs in a shallow scrape in the soil and incubates them for two weeks. Both parents feed the chicks small insects.

▲ **SAFE AND SOUND**
Parents walk to the nest to avoid betraying its location.

Just over a week later, the flightless young leave the nest and embark on a dangerous stage. They spread out and continue to beg for meals from their parents, with only their camouflage for protection. After about ten days, the vulnerable youngsters make their first flights and become independent. The adult female immediately lays a new clutch in the same nest, and if conditions are right will later lay a third clutch.

2 Up, up and away…
About 30' up, the lark switches from a slow, fluttering flight to a swift, vertical ascent.



4 On course
Tracing patterns in the sky, the skylark plummets to the ground after about five minutes.

DID YOU KNOW?

- **A favorite of Europeans, the skylark has been introduced in many areas of the world, including New Zealand, British Columbia and the Hawaiian Islands.**
- **The skylark is an occasional mimic. It copies the songs of other larks and of waders, including the curlew and redshank.**
- **Birds from the east of the skylark's range are larger than those farther west; northerly breeders have longer wings to help them complete their migrations.**

FOOD & FEEDING

The skylark is quick to take advantage of whatever food is most abundant. It forages on foot for a wide range of invertebrates, from spiders and earthworms to flies, caterpillars and beetles. The soft leaves of clover and other low-growing plants provide a welcome treat. Occasionally, the skylark becomes a nuisance to farmers by eating the succulent seedlings of lettuces, peas and sugar beet.

Animal prey becomes scarce in autumn, and the skylark survives on spilled grain and the seeds of weeds, such as thistles, chickweed, sorrel and mustard. The skylark abandons its territories to gather in large flocks, often with buntings, finches and sparrows. Together, the small birds scour the land for seeds.

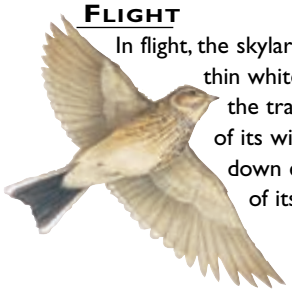
▼ **ON THE RUN**
When feeding, the skylark relies on its mobility.

PROFILE SKYLARK

With its streaky brown plumage and swift running speed, the skylark usually escapes notice until it takes to the air and bursts into song.

FLIGHT

In flight, the skylark reveals a thin white line along the trailing edges of its wings and down each side of its tail.



BILL

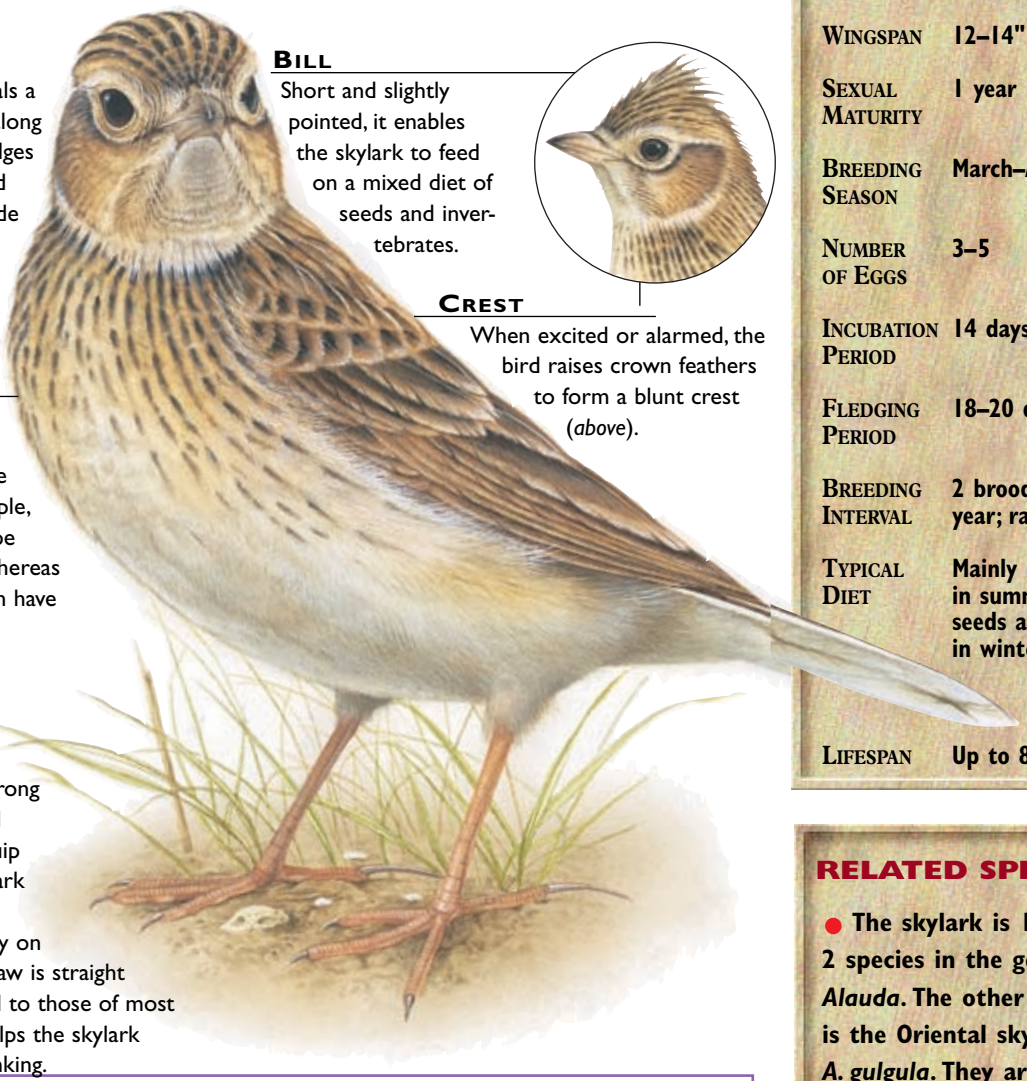
Short and slightly pointed, it enables the skylark to feed on a mixed diet of seeds and invertebrates.

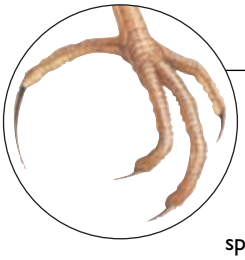
CREST

When excited or alarmed, the bird raises crown feathers to form a blunt crest (*above*).

PLUMAGE

Spots and streaks break up the skylark's outline. The species varies in color to match the color of the local soil: for example, individuals from northern Europe tend to be warm buff-brown, whereas those in dry, sandy regions often have paler, gray-buff plumage.





FEET

Long, strong legs and feet equip the skylark for a life spent-largely on foot. The-hindclaw is straight and greatly elongated compared to those of most songbirds, an adaptation that helps the skylark walk across soft soil without sinking.

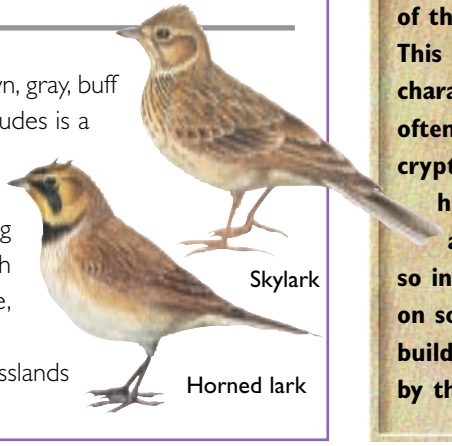
VITAL STATISTICS

WEIGHT	1–1.5 oz.
LENGTH	7–7.5"
WINGSPAN	12–14"
SEXUAL MATURITY	1 year
BREEDING SEASON	March–August
NUMBER OF EGGS	3–5
INCUBATION PERIOD	14 days
FLEDGING PERIOD	18–20 days
BREEDING INTERVAL	2 broods a year; rarely 3
TYPICAL DIET	Mainly insects in summer; seeds and grain in winter
LIFESPAN	Up to 8 years

CREATURE COMPARISONS

Nearly all species of lark have dull plumage in various shades of brown, gray, buff and white, but the horned lark (*Eremophila alpestris*) of northern latitudes is a striking exception. It has almost unmarked white underparts, more evenly toned upperparts and bold, black-and-yellow head pattern.

In summer, the horned lark is also adorned with a bizarre-looking pair of black feather tufts that sprout from just above and behind each eye — earning the bird its name. Despite its relatively showy plumage, however, the horned lark can be as elusive as the skylark. It scurries quietly among grasses and lichen-covered boulders of tundra and grasslands of North America, Europe and Asia.



RELATED SPECIES

● **The skylark is 1 of 2 species in the genus *Alauda*. The other species is the Oriental skylark, *A. gulgula*. They are part of the *Alaudidae* family. This family has certain characteristics: the birds often have streaked or cryptic plumage; the hindclaw is straight and long, especially so in species living on soft soil; and nest-building is usually done by the female.**

Slavonian Grebe

• ORDER •
Podicipediformes

• FAMILY •
Podicipedidae

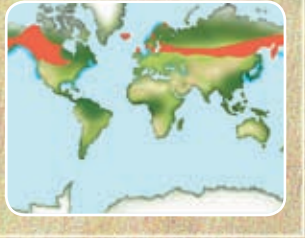
• GENUS & SPECIES •
Podiceps auritus

KEY FEATURES

- Short wings are used more for swimming underwater than flying through the air
- When alarmed, the grebe will dive as deep as 20' with its chick on its back
- Ear tufts give rise to its common name, the horned grebe
- Builds a floating nest anchored to reeds or bushes growing in ponds and lakes

WHERE IN THE WORLD?

Found throughout Europe, Asia, the east and west coasts of the U.S., Canada, Iceland and Northwest Mexico, as well as off the coasts of China and Japan; occasionally found in Bermuda



LIFECYCLE

A skilled swimmer with a varied aquatic diet, the Slavonian grebe seeks out watery areas where it doesn't compete with other grebes for food.

HABITAT

Freshwater ponds, small lakes and marshes are all home to the Slavonian grebe. It builds its nest on floating vegetation and stays near tall grasses during breeding. An expert swimmer, it patrols the water for insects, fish and crustaceans. Slavonian grebes tend to dwell on open lakes where they do not have to compete with other grebes for food. In winter, the Slavonian grebe migrates to open areas, including salt lakes in the American west, where it eats tiny brine shrimp. It also flocks to bays, and occasionally to the open sea, when migrating. The Slavonian grebe is the only grebe to breed in Iceland. Despite being a highly adaptable species, the Slavonian grebe needs a clean environment, since it is very susceptible to pollution.

▼ **MARSHY HOME**
The grebe prefers the seclusion of marshes, lakes and ponds.

FOOD & HUNTING

Slavonian grebes prefer water 5–25' deep, where they feed on small fish and other aquatic life. The grebe can grab an insect from the surface or dive for its food. It can stay underwater for up to 3 minutes, but its forays usually last about 30 seconds. Its partially webbed feet make it a powerful swimmer, and it is able to catch up with surprisingly large fish. Its favorites are carp, anchovies, silversides and shad. Shrimp, prawns and aquatic insects all are part of the grebe menu. The grebe's diet can change depending on the competition for food.

BREEDING

The male Slavonian grebe performs elaborate courtship displays common among grebes. These include ritualized postures and raising the tuft feathers on its head. Once paired, the male and female build a floating platform nest of plants anchored to reeds. The female lays 3–6 blue-white or olive-white eggs at two-day intervals. Both the male and female incubate. If the nest is threatened, the grebe will cover the nest with plant debris and slip away. Eggs will hatch after about 25 days. A chick can swim and dive feebly after hatching, and will ride on a parent's back or under its wing until it fledges at 50–60 days.

▶ **SOLITARY NEST**
The grebe builds a floating nest that is not well concealed.

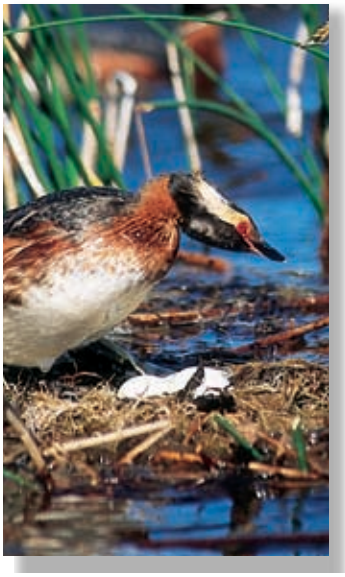
AGILE EATER

1 Dropping in...
A Slavonian grebe settles down to look for food among the bed of reeds in a small, secluded freshwater lake.

2 A quick snack...
It soon finds a dragonfly that comes out from its cover and strays too close. The grebe snaps it up off the surface of the water.

3 Taking the plunge...
The grebe is in its element underwater, where it uses its powerful webbed feet to propel it at speeds of about 3' per second.

4 Underwater attack
A small trout tries to swim away, but it is no match for the grebe, which uses its wings to execute a quick turn.



DID YOU KNOW?

- **Slavonian grebes dive so swiftly when frightened they were given the nicknames "hell-divers" and "water witches."**
- **Grebe breast feathers were once used in the millinery trade to decorate women's hats.**
- **In the early 1900s, President Theodore Roosevelt set aside two preserves in Oregon where grebes were previously slaughtered.**

CONSERVATION

At the turn of the 20th century, Slavonian grebes were hunted for their feathers and were extremely endangered. Laws protecting the grebe were passed and it has made a comeback, but it still faces threats. Fluctuating water levels limit breeding spots, and stocking lakes with rainbow trout reduces the aquatic insects available to grebes. Also, grebes are especially vulnerable to oil spills; of 34,717 birds killed in eight recent U.S. oil spills, about 12.5% were grebes.

BEHAVIOR

The Slavonian grebe is usually solitary but, when breeding, it can congregate in small groups of 4–6 pairs. It dives as deep as 20' below the surface to snag a meal and will swim laterally several hundred feet. It makes little noise, except in and around the nesting area, where it wails, squeaks, trills and whinnies. Researchers are puzzled by its highly unusual habit of eating its own body feathers; grebe chicks have even been found with their parent's feathers in their stomachs. While grebes migrate from their nesting grounds, they are poor fliers and travel by night. During the day, they stay close to shore and swim toward their migratory destination. Their takeoff is a clumsy run across the water; without tail feathers to act as a brake, they tend to land with a splash. When on land, they are very clumsy and move about with great difficulty. Grebes may be the most perfectly adapted to water of all birds.

▼ **DAUNTLESS DOMINANCE**
A male is ready to defend its claimed territory.

PROFILE SLAVONIAN GREBE

A ducklike bird, the Slavonian grebe is a swimmer, not a flier, and makes its home around marshes, lakes and the open seas.

PLUMAGE
Both sexes have golden-yellow crest tufts on their head, but the color is brighter in males.

WINTER PLUMAGE
Mostly dark above and white below, the grebe's black cap contrasts with its clear white cheeks and neck.

CHICK
The chick's head is covered in striped feathers, which help camouflage it from predators.

FEET
Splayed feet with partial webbing and rounded toes propel the grebe as it searches underwater for food.

VITAL STATISTICS

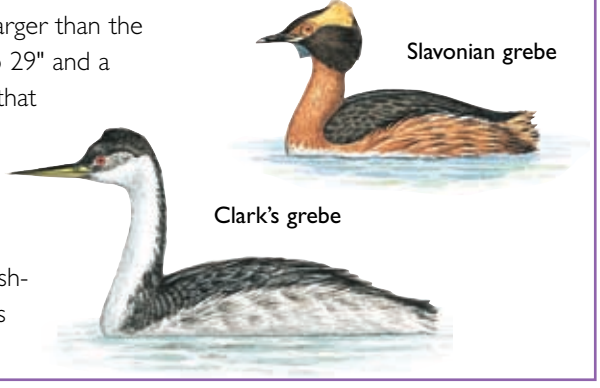
WEIGHT	Males usually 15–17 oz.; females lighter
LENGTH	12.5–15"
WINGSPAN	24"
SEXUAL MATURITY	About 2 years
BREEDING SEASON	April–June
NUMBER OF EGGS	3–6, usually 4–5
INCUBATION PERIOD	24–25 days
FLEDGING PERIOD	50–60 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Fish, crabs, shrimp and aquatic insects
LIFESPAN	Unknown

RELATED SPECIES

● **Worldwide, there are 20 species of grebes in 6 genera. The eared grebe *(Podiceps nigricollis)* and Slavonian grebe are close relatives, and both have distinctive ear tufts. The pied-billed grebe, *Podilymus podiceps,* is the most numerous in North and South America. The Western grebe, *Aechmophorus occidentalis,* and Clark's grebe, *A. clarkii,* were once thought to be the same bird.**

CREATURE COMPARISONS

The Clark's grebe *(Aechmophorus clarkii)* is larger than the Slavonian grebe, with a body length of up to 29" and a wingspan of 30–40", about 40% wider than that of the Slavonian grebe. The Clark's grebe's neck and bill are longer than those of the Slavonian grebe. Both grebes frequent the western part of North America and central Mexico, and their ranges overlap in both fresh- and saltwater habitats. The Clark's grebe eats more fish than any other species of grebe.



Smew

• ORDER •
Anseriformes

• FAMILY •
Anatidae

• GENUS & SPECIES •
Mergus albellus

KEY FEATURES

- The smallest duck to have a saw-edged bill — a useful tool for catching insects and small fish
- Nests in tree holes in the forests of the far north, flying farther south to spend the winter
- In late winter, small groups indulge in courtship displays and pair off before migrating north

WHERE IN THE WORLD?

Breeds in the far north of Europe and Asia; migrates south in winter to western and central Europe, Russia, Middle East and eastern China, Korea and Japan

LIFECYCLE

Gracing northern wetlands and waterways in summer, the smew takes advantage of the abundant supply of insect larvae to help feed its chicks before returning south in winter.

HABITAT

▲ **GREEN LIVING**
The smew nests in woodlands near water, often "recycling" woodpecker holes.

In summer, the smew takes up residence in the taiga — the forest zone that extends from northern Scandinavia and Siberia, across Russia, to the Pacific coast. The smew needs big, old trees with suitable nest holes, and its summer distribution closely matches that of the black woodpecker, whose abandoned holes are ideal. However, the smew also needs to be close to still or sluggish water in which it can feed. It favors drowned woodlands choked with dead trees, or backwaters cut off from the main flow of rivers.

In winter, the smew flies south to reservoirs, ponds and rivers, often well away from trees. Unlike many ducks, it can take off with just a short paddle across the water surface, allowing it to use surprisingly small ponds and minor streams. It remains there even in bad weather, provided some open water gives it access for diving under ice to feed. When the water freezes completely, it heads for coastal harbors, but rarely ventures far out to sea.

BREEDING

Following courtship displays in late winter, smews pair off and migrate north, arriving at their breeding grounds by early May. Each pair finds a nest site, usually another bird's abandoned home. Hardly any nest is built, just a shallow depression with a few wood chippings and a little down.

The female smew usually lays 7–9 eggs, although clutches numbering up to 11 have been recorded. She alone incubates the eggs. They hatch four weeks later, and the mother looks after her small, downy chicks for about another four weeks, feeding them mainly on insect larvae.

▼ **STEPPING OUT**
The young smew leaves the nest after a month.

FOOD & HUNTING

In winter, fish make up a large proportion of the smew's diet. Small groups swim together, periodically dipping underwater to locate prey. Then, almost magically, the entire group suddenly vanishes beneath the surface, without any apparent effort and with scarcely a splash. Flocks of up to 750 birds have occasionally been seen fishing together.

The smew dives almost vertically or at a slight angle, generally grabbing its prey at the bottom of its dive, then surfacing quickly to eat it. The smew tends to hunt for up to half an hour at a time, taking breaks to rest and preen.

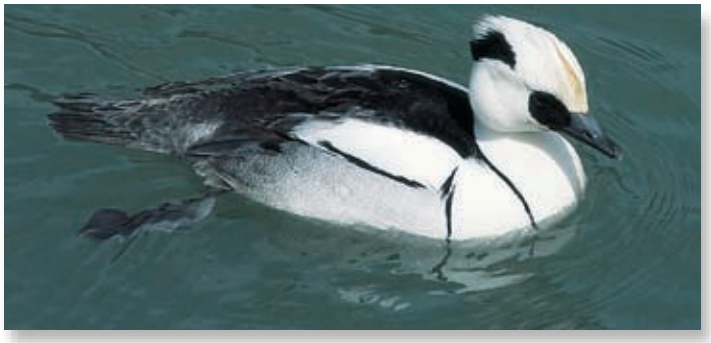
CONSERVATION

At least in Europe, the smew appears to be doing well. Its wintering population has increased recently, and the total population in the region around Europe is now more than 75,000. In parts of Russia, numbers have been reduced by predatory American minks that have escaped from fur farms. Concern also exists about the threat from pesticides and pollution. Rivers in industrial areas are often used as dumping grounds, and toxic chemicals gradually enter the food chain, accumulating in fish and invertebrates that make up the smew's prey base.

DID YOU KNOW?

- **The smew is also called the white nun.**
- **In winter, large numbers of smew gather in parts of southeastern Europe. Up to 65,000 gather on the Sea of Azov and on the Volga Delta.**
- **Migration journeys of 2,700 miles are not uncommon for those smews living in parts of northern Africa.**

BEHAVIOR



▲ **WHITE KNIGHT**
The male puts on a bold, active display for his mate.

In late winter, when his display plumage is fully developed, the male courts a female by raising his crown feathers and flicking his bill from side to side. Occasionally he paddles fiercely to thrust his body half out of the water, uttering a soft, rattling call.

After breeding, the male molts and takes on a dull plumage, like the female's, which offers better camouflage against predators.

LUCKY DIP

1 Gathering on ice…
Smews gather at a partly frozen reservoir to feed. They can take off from the tiniest patch of water.

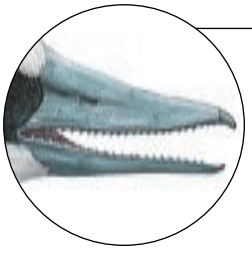
2 Ducking for food…
One bird dips its head below the surface. When it spots a shoal of fish, it-dives, and the others follow.

3 Catching the prey…
The smew can dive up to 10'. It propels itself with webbed feet, ready to grab fish in serrated jaws.

4 Up for grabs
Barely 15 seconds after diving, the smew returns to the surface to eat its catch.

PROFILE SMEW

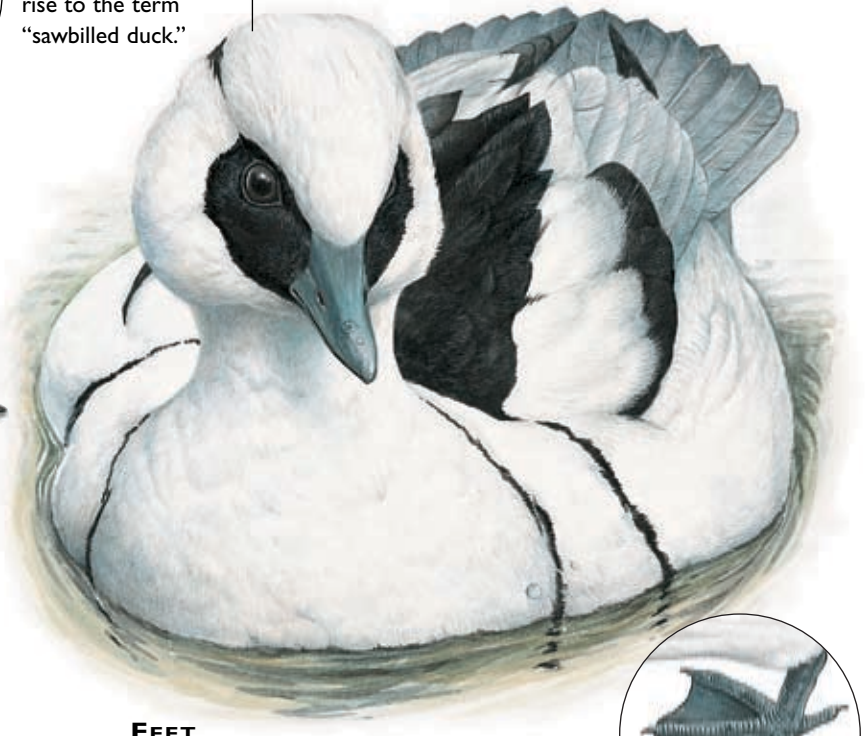
The smew's serrated bill and clawed, webbed feet enable it to lead a lifestyle of fishing in waters near its woodland nesting site.



BILL
The serrated edges allow the bird to grip fish and give rise to the term "sawbilled duck."

MALE
The male smew in breeding plumage is distinguished from other wildfowl by his striking white head and neck, and a black eye mask. His crest serves in breeding displays.

FEMALE
Characterized by white cheek flashes, the female (*above*) keeps the same ginger-red head plumage all year-round. The immature smew has similar plumage to the female.



FEET
The feet are gray. The three forward-facing toes are webbed, and the hindtoe is strongly clawed to help the bird grip branches.

VITAL STATISTICS

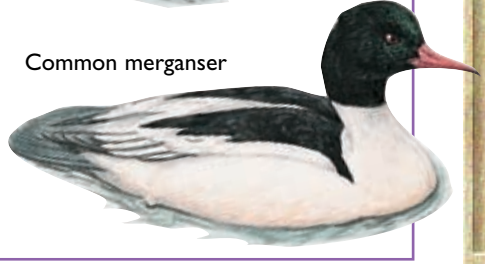
WEIGHT	18–32 oz.
LENGTH	14–18"
WINGSPAN	22–28"
SEXUAL MATURITY	2 years
BREEDING SEASON	Spring and early summer
NUMBER OF YOUNG	Usually 7–9
INCUBATION PERIOD	26–28 days
FLEDGING PERIOD	About 4 weeks
BREEDING INTERVAL	Once a year
LIFESPAN	Unknown: probably a few years

CREATURE COMPARISONS

Like the smew, the common merganser (*Mergus merganser*) is a sawbilled duck. It is about twice the size of the smew, and its bill is more pointed. It nests in tree holes and breeds in North America and northern Europe. The male common merganser has a glossy-green head and neck, while females and immature males have a ginger-red head and neck. The female has a small, white patch at the base of her bill, compared to the much larger white mask of the female smew. Outside of breeding season, the male smew is difficult to distinguish from the female and immatures.

Smew

Common merganser



RELATED SPECIES

- **The smew is one of 6 species of sawbill duck. The other 5 are the hooded merganser, *Mergus cucullatus*, the Brazilian merganser, *M. octosetaceus*, the red-breasted merganser, *M. serrator*, the Chinese merganser, *M. squamatus*, and the common merganser. Sawbills are all fish-eating birds and belong to the family *Anatidae*, which includes the many species of geese and swans.**

Snail Kite

• ORDER •
Falconiformes

• FAMILY •
Accipitridae

• GENUS & SPECIES •
Rostrhamus sociabilis

KEY FEATURES

- Feeds predominantly on a specific type of snail
- Unlike most raptors, the snail kite socializes with its own species as well as other birds
- One parent may abandon the other and leave it with the fledging chicks; the parent then starts the mating process with a new partner

WHERE IN THE WORLD?

In the U.S., found only in the Florida Everglades; also the West Indies, and in Central and South America, ranging from Mexico to Argentina

LIFECYCLE

As its name implies, the snail kite's life revolves around finding and catching a particular kind of snail — the apple snails in the genus *Pomacea*.

HABITAT

The snail kite's range is restricted due to the bird's specialized diet: it eats only *Pomacea* snails, also known as apple snails. These snails live in marine, freshwater and marshy areas across most of the Western Hemisphere. However, the snail kite is limited to warmer regions with shallow water, where the *Pomacea* snails come to the surface to breathe; the bird patrols these habitats in search of its prey. To ensure that it will have an adequate food source as well as ample nesting sites, the snail kite makes its home in freshwater canals and marshes; it seeks out broad expanses of tall grasses dotted with clumps of small trees and bushes, with an occasional island of larger trees.

▼ **GRASSY GRIP**
Snail kites prefer areas with tall grasses.

CONSERVATION

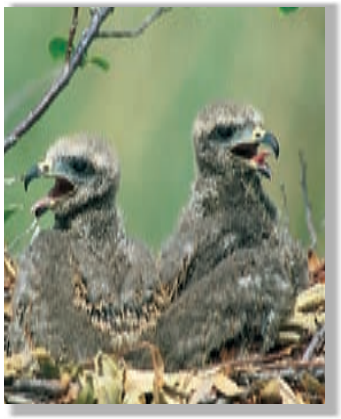
Although snail kite numbers throughout most of its range have remained relatively stable, the Florida Everglades populations have suffered greatly due to drainage and flood control. The bird is on the endangered species list for the Everglades and numbers only about 500. The U.S. Fish and Wildlife Service has instituted a Snail Kite Recovery Program, which includes annual surveys.

BREEDING

During courtship, snail kites fly to altitudes of up to 3,000' and then repeatedly dive in sudden short dips, wings folded, greeting each other with their harsh cries, *kor-ee-ee-a, kor-ee-ee-a*. Once a pair has formed, the two birds work together to build a nest. The nest is a carelessly built, flat structure of sticks about 1' in diameter and 3–15' above the water level, built either on dense marsh grass or bushes growing in the water. The female lays 3–4 dull-white eggs with brown blotches; both sexes share incubation for a total of about 30 days. The hatchlings are covered in buff down. In some kite nests, especially when food is plentiful, one parent abandons the young right before fledging; female snail kites are just as likely to leave as males. While the remaining parent continues to provide for the brood until it reaches independence, about a month later, the deserting bird is free to begin the breeding cycle again with a new partner. When food is scarce, neither parent deserts the nest, and both will struggle together to raise the hungry chicks.

FOOD & HUNTING

One of the most specialized feeders, the snail kite catches and shells large numbers of apple snails. In Venezuela it occasionally eats crabs (*below*). When hunting, the kite sits on a high perch or soars through the air, 5–30' above the water and marsh grass, with its long, curved bill pointed downward, watching for snails. After snatching a snail from the surface, the kite brings it back to its perch and uses its long, curved bill to dig beneath the hard outer cover of the snail. Next, it cuts the spinal muscle, which holds the snail in its shell, and finally removes the snail and swallows it whole or rips it into pieces. Capturing and learning how to remove the snail from its shell takes practice, and juveniles go through a great deal of trial and error (and presumably hunger) before finally mastering the process after a few weeks.



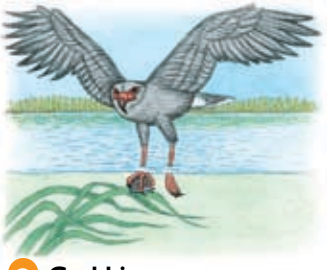
▲ **MORE SNAILS, PLEASE!** **Hungry hatchlings cry for food as they impatiently wait for their parents' return.**

DID YOU KNOW?

- **Even when researchers in the Everglades could not find snails with man-made equipment, such as bottom samplers that sift through mud and sand, the snail kites were able to find them with ease.**
- **On warm days, it takes the kite just seconds to find a snail, but on cool days, when they come to the surface less frequently, it may take 20 minutes.**

ESCARGOT ESCAPADE

1 Scanning...
The snail kite scans large areas of marsh for its prey by stationing itself on a perch or slowly gliding through the air.



2 Grabbing...
Once a snail is spotted, the kite swoops down to the water's surface and reaches with its long legs and claws to grab the snail.

3 Passing...
The kite then returns to its perch, passing the apple snail up to its beak so it won't risk losing its meal while landing.

4 Eating
Once back on its perch, the kite uses one foot to secure the snail's shell and its long, curved beak to remove the snail.

BEHAVIOR

The snail kite's behavior is as unique as its diet; it is highly influenced by the availability of apple snails. Most members of the *Accipitridae* family are solitary, but the snail kite is quite social. The extremely gregarious snail kites nest in colonies and are very tolerant, not only of their own kind but of other species of bird as well, especially the limpkin and boat-tailed grackle, both of which also eat apple snails. Although the snail kites will usually tolerate outsiders, there are times when they are defensive. If an exceptionally large number of apple snails shows up in the territory of one colony, the birds will aggressively chase away other birds, including other snail kites.

▲ **FEMALE LOOKOUT** **A snail kite perches on a small branch and searches for snails.**

◀ **SOUGHT-AFTER SNAIL** **The social kite shares its supply of apple snails *(left)* with other birds.**

PROFILE SNAIL KITE

One of the most specialized feeders, the snail kite has a beak and claws designed for tearing snails loose from their shells.

BEAK

The hooked edge of the upper beak is used to cut a snail's spinal muscle, releasing it from its shell.

FEMALE

The female has rusty black upperparts and a larger, buff-colored body streaked with dark lines. She also has a distinct white stripe over her eye.

VISION

Two *fovea* (small depressions in the bird's retina), one aimed forward and the other sideways, give the kite an unusually keen sense of distance and movement.

FEET

The bright orange-to-red feet and claws are longer than those of most raptors and are designed to reach down and grab snails out of the water during flight.

VITAL STATISTICS

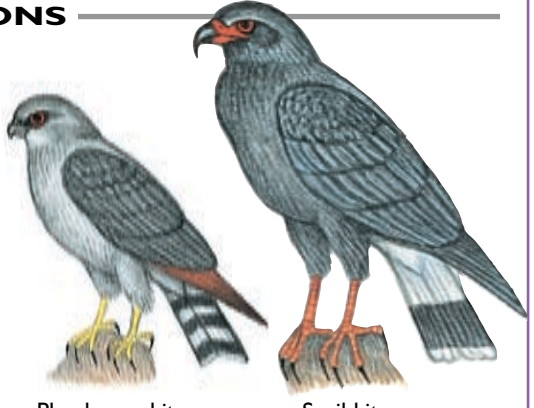
WEIGHT	12–21 oz.
LENGTH	16–19"
WINGSPAN	41–46"
SEXUAL MATURITY	About 10 months
BREEDING SEASON	February–July; varies with region
NUMBER OF EGGS	2–4
INCUBATION PERIOD	26–30 days
FLEDGING PERIOD	40–49 days
BREEDING INTERVAL	Up to 3 clutches per season
TYPICAL DIET	Snails of the genus *Pomacea*
LIFESPAN	Unknown

RELATED SPECIES

- The snail kite is 1 of 2 species in the genus *Rostrhamus;* the other is the slender-billed kite, *R. hamatus,* which is quite different from the snail kite. These two kites are among over 200 species in the family *Accipitridae,* which consists primarily of hawks, eagles and kites, including the zone-tailed hawk, *Buteo albonotatus.* These birds join falcons and osprey in the order *Falconiformes.*

CREATURE COMPARISONS

At 13–15", the plumbeous kite *(Ictinia plumbea)* is smaller than the snail kite. The plumbeous kite is ash gray with slate-black wings and mantle, and a white spotted tail, much lighter than its snail-eating relative. Ranging from east-central Mexico to northern Argentina and Paraguay, the plumbeous kite feeds primarily on insects, which it is able to snatch out of the air with its claws. It sometimes takes small snakes, lizards and frogs, a much broader menu than the snail kite's.



Plumbeous kite Snail kite

Snow Bunting

• ORDER •
Passeriformes

• FAMILY •
Emberizidae

• GENUS & SPECIES •
Plectrophenax nivalis

KEY FEATURES

- The hardy snow bunting nests farther north than any other perching bird
- Burrows in the snow to withstand temperatures as low as -58°F
- Flocks migrate south but will travel only as far as the snow line

WHERE IN THE WORLD?

Found in Iceland, Scandinavia, Scotland, arctic and subarctic Asia and North America; also on islands of the Arctic Ocean and the Bering Sea

LIFECYCLE

Despite its diminutive, sparrowlike form, the hardy snow bunting nests farther north than any other member of its order and can endure temperatures from -40°F to -58°F.

HABITAT

The snow bunting is aptly named; it rarely ventures far away from cold, snowy terrain. Its summer nests are at the very edge of the icy arctic frontier, and it winters no farther south than areas where snow falls in North America, Asia and Europe. The snow bunting prefers open country, where it feeds on the ground, but it will also seek out haystacks, barnyards and trash piles near lakeshores, as well as dunes, open beaches of seacoast and salt marshes. The snow bunting roosts on the ground, under a shelter of weeds or tufts of grass, or in snow. Snow buntings in North America usually travel no farther south than northern California; because they start so far north, their migration is as arduous as that of birds that winter farther south.

CONSERVATION

The snow bunting is not currently threatened, probably due to its often inaccessible arctic habitat. However, the small birds sometimes die in great numbers in nesting areas from May and June snowstorms, which cover its food supply.

BREEDING

The snow bunting mating season is from late May to July. Most males are monogamous, but polygamy has been recorded. About one-half of pairs raise two broods per year. After mating, the female builds her nest out of dead grass, moss and plant stalks lined with animal fur and bird feathers. She prefers to build her nest on the ground in rocky country, stony beaches, sea cliffs or grassy tundra.

The female lays 3–9 eggs, which are bluish or white and marked with brown and lilac spots and speckles. The female alone completes the 10–15 day incubation. After hatching, the young are fed invertebrates, such as mosquitoes, midges, crane flies, moths and spiders; the female provides most of the food. The young reach 90% of their adult weight after about 8 days, and leave the nest from 10–17 days after hatching. Although their arctic habitat and long migration results in a rugged life for the juvenile snow bunting, the hardy young birds are fully able to accompany their parents on the long journey southward.

▲ **FRIENDLY FLOCK**

Preferring to fly in relatively small flocks, snow buntings hunt for food and travel together.

BEHAVIOR

The snow bunting can often be seen in small flocks of 20–30 birds, especially when feeding or migrating; entire flocks quickly take to the air if one bird is spooked. The buntings often fly in great, sweeping circles and then return close to the spot from which they took flight. The bird usually stays on the ground, but occasionally perches on boulders. During exceptionally hard winters, the bunting seeks shelter by digging burrows in the snow. In North America, the arrival of snow buntings in large numbers during October and November is a sure sign that winter is coming, much as the robin is a sign of spring.

▶ **ROCKY RESTING SPOT**

A weary snow bunting takes time out to perch atop a rocky boulder to rest during its long and tiring migration south to relatively warmer areas.

MOM AT WORK

1 Unburied beetle…
When the last patches of thawing snow reveal the bunting's rocky habitat, insect prey such as beetles find it hard to hide.

2 Hunting expedition…
To feed her rapidly growing nestlings, the female hunts among the rocks for an insect dinner, which she clasps in her bill.

3 Dinner delivery…
To reach her hidden nest, the female hops down through the crevices and holes among the rocks and boulders in which it was built.

4 Home at last
Finally perched at the side of the nest after her hunting expedition, the female begins feeding one of the four hungry nestlings.

DID YOU KNOW?

- **Only residents on the arctic tundra see the black-and-white breeding plumage of the snow bunting. More familiar are the brown-and-white birds seen farther south.**
- **The snow bunting is one of two species of birds that often receives the nickname snowbird; the other is the dark-eyed junco.**
- **Another nickname for the bunting is "snowflake."**

FOOD & FEEDING

In early spring the snow bunting diet consists mainly of compressed seeds, while in summer and fall, the bird also eats spiders and insects, such as beetles, caterpillars and crane flies. Throughout the year, the bunting feasts on a variety of seeds, berries and shoots, preferring grasses, sedges and rushes. In winter, the bird searches for open patches in the snow. It scratches the ground, but will also hop while foraging. If the snow is too deep, the bunting will venture to rocky shorelines to feed on invertebrates such as sandhoppers, sea slaters and sand fleas. In the most severe winter conditions the bunting willingly approaches backyard birdfeeders. The bunting, which tends to feed in flocks, takes protein-rich midges, crane flies, moths and spiders back to the nest for its young.

▼ **SUMMER'S BOUNTY**
The bunting enjoys a variety of insect prey.

PROFILE SNOW BUNTING

Known as a harbinger of winter when it migrates south, the snow bunting's white wing patches make it resemble a large, flying snowflake.

FEMALE PLUMAGE

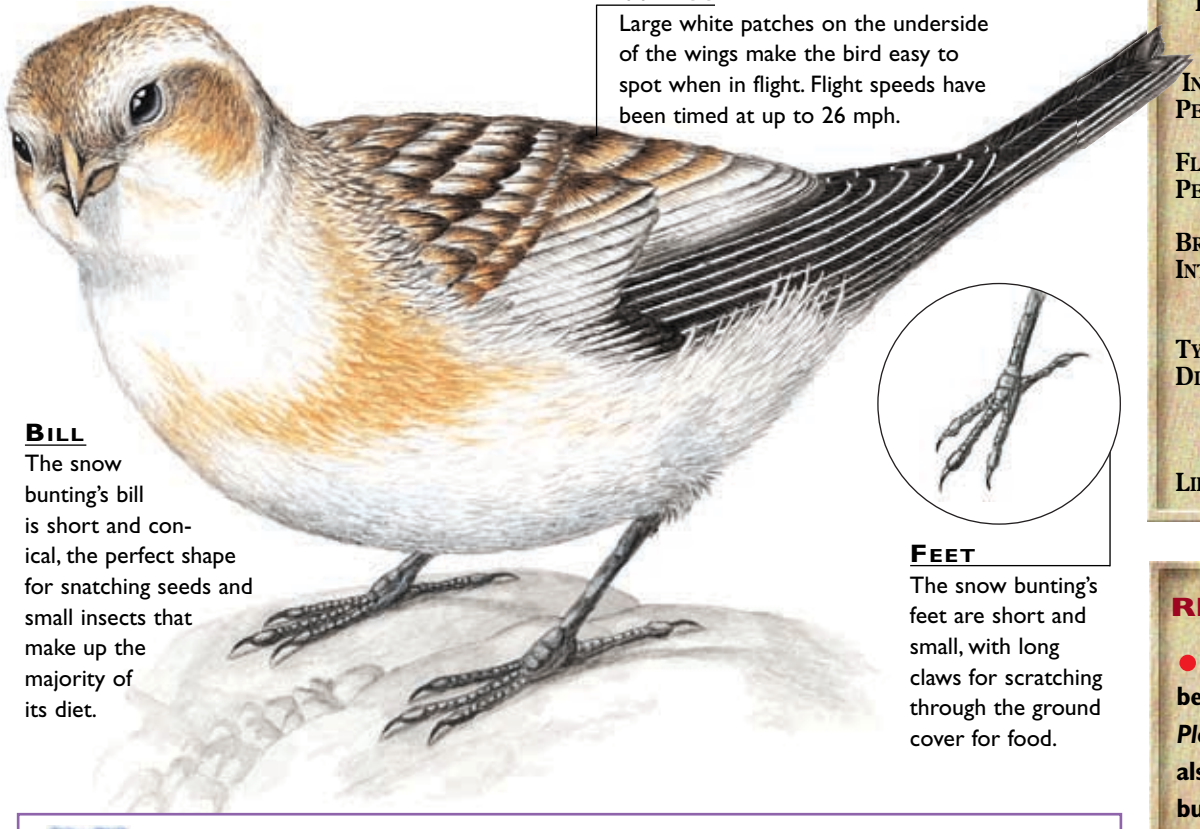
For camouflage, the female snow bunting has a gray-brown head and back in summer and is paler and duller in winter.

MALE SUMMER PLUMAGE

The male is white, with a black back, tail and wings. In winter, his plumage becomes mottled with brown (*below*).

WINGS

Large white patches on the underside of the wings make the bird easy to spot when in flight. Flight speeds have been timed at up to 26 mph.



BILL

The snow bunting's bill is short and conical, the perfect shape for snatching seeds and small insects that make up the majority of its diet.

FEET

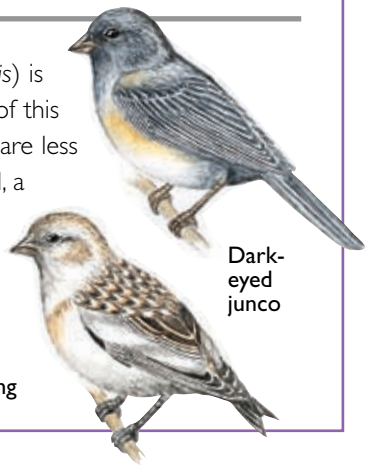
The snow bunting's feet are short and small, with long claws for scratching through the ground cover for food.

VITAL STATISTICS

WEIGHT	1.25 oz.
LENGTH	5–7"
WINGSPAN	12–13"
SEXUAL MATURITY	Unknown
BREEDING SEASON	May–July
NUMBER OF EGGS	3–9; usually 4–6
INCUBATION PERIOD	10–16 days
FLEDGING PERIOD	10–17 days
BREEDING INTERVAL	Up to 2 clutches per season
TYPICAL DIET	Seeds and insects; also spiders and sand fleas
LIFESPAN	Up to 9 years

CREATURE COMPARISONS

Measuring 6" long from bill to tail, the dark-eyed junco (*Junco hyemalis*) is about the same size as the snow bunting. There are four subspecies of this junco, with considerable variations in color. Females of all subspecies are less colorful than males; all forms have white outer tail feathers, a pale bill, a white belly and dark eyes. The junco, like the bunting, feeds largely on the ground, eating mainly seeds in the winter and adding berries and insects to its summer diet. While northernmost populations of the junco migrate to the southern U.S. in the winter and nest in mountain and boreal forests and edges, the bunting in the U.S. rarely strays farther south than northern California.



Dark-eyed junco

Snow bunting

RELATED SPECIES

● **The snow bunting belongs to the genus *Plectrophenax*. The genus also contains the McKay's bunting, *P. hyperboreus*, whose male in breeding plumage is the whitest of all North American songbirds. The lark bunting, *Calamospiza melanocorys*, offers a sharp contrast as a mainly black bird. The buntings join finches and sparrows in the family *Emberizidae*, which contains over 270 species.**

Snow Goose

• ORDER •
Anseriformes

• FAMILY •
Anatidae

• GENUS & SPECIES •
Anser caerulescens

KEY FEATURES

- Exists in two color forms, white and blue,-and two races:-the greater and the lesser snow goose
- One of the world's most abundant species of goose, with populations numbering in millions
- Annual migrations to wintering grounds are among the greatest of all wildlife spectacles

WHERE IN THE WORLD?

Breeds mostly inside thetfin Island and Greenland west across-Canada; migrates in winter to warmer parts of the-U.S.

LIFECYCLE

Vast flocks of snow geese breed on the Arctic tundra, exploiting the brief flush of plant growth. Each autumn they head south to spend the winter in the southern U.S.

HABITAT

▲ **PEACEFUL PASTURES**
Snow geese favor areas of vegetated wilderness that provide ample food and-shelter.

The snow goose breeds in the Arctic, usually on lowland grassy tundra and often close to lakes, pools or flooded plains. Some birds, including the greater race, which breeds in Greenland, nests on mountain slopes and ledges.

In its southern U.S. wintering quarters, the snow goose prefers farmland, grassland and wetlands (*right*), close to coasts. The tall, dense grasses and sedges provide cover and food, allowing the goose to build up its reserves of body fat before its arduous return to the north.

CONSERVATION

Both races of snow goose have increased considerably since the 1950s, due not only to restrictions on hunting but also to the-new feeding opportunities provided by fields of crops, some planted specially for the migrant geese.

BREEDING

The snow goose does not start to nest until June, when tundra topsoil thaws. Food is still scarce after the deep Arctic freeze, and so a breeding pair relies on protein and fat reserves built up while overwintering. It must produce several eggs and incubate them for a month, and if the two birds lack sufficient energy reserves, they may abandon the clutch or even die of starvation.

A newly hatched gosling faces the hazards of predation and bad weather. Furthermore, it must set off on its first southbound migration just a few weeks after it has learned to fly. Within the flocks, the young stays with its parents and siblings. This gives it the best chance of reaching its winter quarters safely.

A GOOSE'S YEAR

1 Sits...
A female incubates eggs in a shallow depression on the ground, lined with moss, grass and feathers from her breast.

2 Instructs...
Goslings learn where to find the best food by following their parents. The flock builds up body fat before migrating south for winter.

BEHAVIOR

Most wildfowl are gregarious, but the snow goose is particularly so. It spends the year in huge flocks, sometimes numbering tens of thousands, even when migrating. This social lifestyle has a number of advantages: it provides safety, helping the bird avoid being taken by predators, and it helps juveniles locate the best feeding sites and learn the correct migration routes. As they fly, the snow geese — among the noisiest of all wildfowl — maintain contact by uttering a continual chorus of barking and yelping calls.

Each autumn, the greater snow goose migrates south to winter on the Atlantic coast of the United States, from Maryland to North Carolina. The lesser snow goose heads for California, northern Mexico and southern states on the Gulf Coast. Some birds fly without stopping for 2,100 miles or more to the Gulf of Mexico, completing the journey in less than 60 hours. They fly at an average speed of 35 mph.

▶ **PACKED LUNCH**
Snow geese descend on crop fields to feed during long migrations.

FOOD & FEEDING

Almost entirely vegetarian, the snow goose obtains most of its food on marshy ground, rough grassland and arable farmland, by digging it out of the soil and mud or by grazing. During the brief Arctic summer, a breeding bird digs out the bulbous roots and succulent underground stems of aquatic plants.

In its winter quarters, the goose excavates and eats aquatic plants on brackish and saltwater coastal marshes. When large flocks feed in this way, they soon transform lush areas of marshland into a-muddy waste, pockmarked with holes made by their probing bills. Such-areas may take several years to recover completely, so the birds must find new feeding grounds the following year. Increasing numbers of snow geese devour crops such as cereals and waste grain, which has led to conflict with farmers.

▲ **PROBING BILL**
The snow goose may feed while on the water, foraging for juicy plants in the shallows.

3 Flocks…
In its southern overwintering grounds, a large flock of adults and juveniles eagerly takes advantage of spilled grain in-a stubble field.

4 Returns
When new shoots emerge in spring, the flock heads back to the Arctic.

DID YOU KNOW?

- **Snow geese are often kept in captivity in areas such as Britain. One population of over 60 birds inhabits the islands of Mull and Coll, off western Scotland.**
- **Many snow geese have a brown-stained head caused by the specks of iron oxide they pick up in the Arctic soil.**

PROFILE Snow Goose

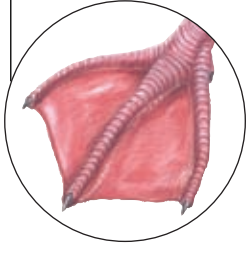
With its robust body, muscular neck and sharply serrated bill, the snow goose is well adapted to digging up a variety of plants and vegetables.

Wings

The snow goose has black wingtip feathers, which are highly resistant to wear and tear — an invaluable asset when the bird makes its long migrations.

Feet & Legs

The snow goose's broadly webbed feet provide it with a powerful swimming stroke. Its legs are more centrally positioned on its-body than in ducks, providing the goose with improved agility and balance when walking and-feeding on land and in shallow water.



Blue form

In addition to the white form is a blue form of snow goose (*below*). Its color results from silvery-gray feathers overlying brown feathers. The blue form is common in the lesser snow goose, but rare in the greater race. There are intermediate colors between the two-forms.

Bill

The cutting edges of the bill are lined with serrations that dig out and cut up roots and tubers. The black serrations form a distinctive "grin" on the pink bill.

Vital Statistics

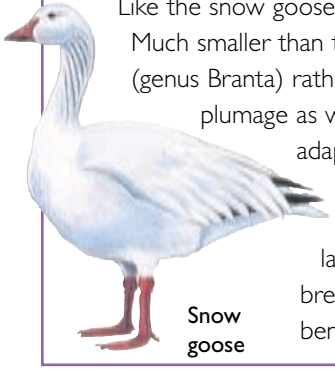
Weight	5.5–7 lbs.
Length	26–33"
Wingspan	4.3–5.5'
Sexual Maturity	2 years, but does-not usually breed until 3–4 years-old
Breeding Season	June–Sept.
Number of Eggs	2–10, but usually 4 or 5
Incubation Period	23–25 days
Fledging Period	40–50 days
Breeding Interval	1 year
Typical Diet	Wide variety of vegetation
Lifespan	Up to 17 years

Related Species

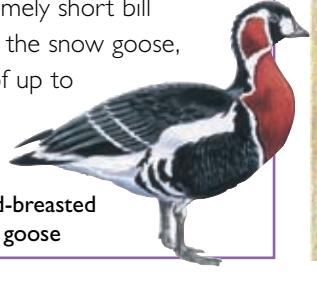
● **The lesser snow goose, *Anser caerulescens caerulescens*, and the greater snow goose, *A.-c.-atlanticus*, share the-genus *Anser* with 10 other species, including the-bar-headed goose, *A.-indicus* (below). Geese and swans are members of-the tribe *Anserini*.**

Creature Comparisons

Like the snow goose, the red-breasted goose (Branta ruficollis) breeds on the Arctic tundra. Much smaller than the snow goose, it belongs to the group of geese known as "black geese" (genus Branta) rather than to the "gray geese" (genus Anser). It is distinguished by its beautiful plumage as well as rounded head and short neck, and an extremely short bill adapted for grazing-short grass and vegetation. Unlike the snow goose, the red-breasted goose nests in small colonies of up to five pairs, often near peregrines, buzzards and large gulls. These birds drive Arctic foxes from the breeding colony, and the-red-breasted goose benefits from the association.



Snow goose



Red-breasted goose

Snowy Owl

• ORDER •
Strigiformes

• FAMILY •
Strigidae

• GENUS & SPECIES •
Nyctea scandiaca

KEY FEATURES

- Most northerly breeding owl; one of very few birds that live permanently in the High Arctic
- Biggest, most powerful flying bird of the far north
- Has adapted its diet to include carrion and is able to go without food for up to 40 days, but is forced to move south when prey is scarce

WHERE IN THE WORLD?

Found in a ring around the North Pole in the High Arctic; breeds in the tundra in the far north of Alaska, Canada, Greenland, Europe and Asia, but may migrate farther south

LIFECYCLE

The snowy owl's lifestyle in its harsh habitat is dominated by the search for food. Watching from a favorite perch, it may wait for hours — but is always alert and ready to strike.

HABITAT

▲ **STATUE IN THE SNOW**
Camouflaged against white, the owl chooses a tall perch in open ground.

The owl's range includes polar ice and frozen tundra north of the treeline, but it is nomadic and in the depths of winter may migrate south to Canadian prairies and the northern United States. Snowy owls have been sighted as far south as Virginia and northern Texas. When crossing open sea, owls may rest on icebergs or ice floes, and bad weather has even forced them to land on ships.

Wherever it settles, the owl favors areas of low, open ground where dry, rocky hillocks stand exposed from the snow. Perched on such ridges and mounds, it has a good view. Farther south in winter, it can often be found perched on a pole or fence post.

BEHAVIOR

The snowy owl is among the most silent of all owls. It calls when claiming territory in spring and near the nest in summer but is otherwise quiet. The territorial display call is a loud, deep, hollow hoot, which can carry 2 miles in clear Arctic air. If disturbed at the nest, it makes loud barks and quacks. Females also have loud wails.

Unless it's near the nest, the snowy owl is shy and difficult to get close to. It will often fly off at the approach of a human or large predator, even if the threat is still almost a mile away.

If an intruder approaches a female on a nest, she may distract it by rolling on the ground as if injured. She'll usually be aggressive, stretching her head, opening her wings or tearing grass from the ground and shaking it. Her mate will fly over the intruder,

▼ **WELL HIDDEN**
Snowy owls remain silent and are hard to spot.

DID YOU KNOW?

- **Because of its round face and yellow eyes, the snowy owl is known as the cat owl in some countries.**
- **Even before they hatch, owl chicks start to call to their mother.**
- **The snowy owl is reportedly able to swallow a small rabbit whole.**

CONSERVATION

Previously hunted and trapped in some parts of its range, the snowy owl is now protected from this threat. The species does face a growing threat in the form of increasing human encroachment on its remote habitat, which is likely to restrict its range and deplete its prey.

FOOD & HUNTING

The snowy owl hunts by day, even during dim daylight of the Arctic winter. It also feeds on carrion, such as a seal's carcass or Arctic fox.

Watching from its perch above the field, the snowy owl can spot prey over half a mile away. It flies low over the ground to reach its quarry, striking with talons extended. Most prey is small and is killed in the first attack, but a large animal is pecked on the head to kill it.

◀ **POWERFUL FLIER**
A snowy owl launches its airborne attack.

▼ **TASTY MORSEL**
Lemmings are one of its staple prey.

SILENT SWOOP

1 Patient wait…
From its rocky perch, the owl surveys the snowfield. It can sit motionless for hours until it spots a likely meal.

2 Silent approach…
Leaving its perch, the owl drops low over the terrain in stealthy flight. Its prey is unlikely to spot the white plumage against snowbound slopes.

3 Attack…
With sharp talons thrust forward, the snowy owl swoops on its victim. Small animals, such as lemmings, are killed instantly.

4 Feed
Small prey is normally swallowed whole, but a breeding snowy owl with chicks to feed will take the kill back to the nest.

BREEDING

◀ **SCRUFFY CHICKS**
Owlets are camouflaged and kept warm by their coats of gray down.

Because of its nomadic life, the owl doesn't form a pair bond with the same mate for more than one season. The nest is just a simple hollow, scraped out of frozen turf and mosses, usually on a ridge.

The female lays an egg every two to four days. She will lay more eggs in a year when food is plentiful. Each egg hatches a few days after the last, so the first chick is bigger than later ones. The female feeds it first; the other chicks eat only if there is enough food. This helps ensure the strongest chick survives. Hatchlings are covered in dark-gray down, which helps absorb heat and also makes the chicks less conspicuous to predators. After two months, the chicks are fully fledged.

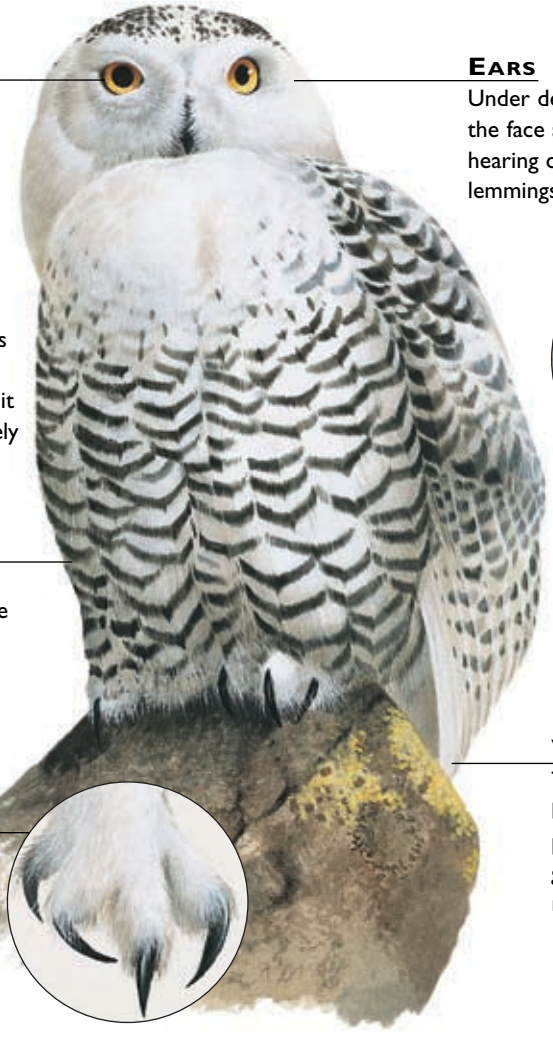
PROFILE SNOWY OWL

The snowy owl's dense plumage insulates it against the cold. In the female, barred feathers help camouflage her as she sits on her eggs.

EYES
Large, yellow eyes are set in the front of the face. This lets the owl see its prey with both eyes at once, so it can judge distance accurately for a killing strike.

PLUMAGE
Male and female have different markings. The male is almost pure white with a few small spots and wing barring. The female *(shown)* has heavy gray-brown bars across her body and wings.

CLAWS
Long, curved, needle-sharp claws are weapons for catching and killing prey. Feet feathers (denser than almost any other bird's) insulate against the Arctic cold.



EARS
Under dense, white feathers of the face are large ears. Sensitive hearing can pinpoint voles and lemmings under deep snow.

BILL
The bill is almost hidden in deep feathers. It looks small, but is large, hooked and sharp tipped, and is adapted for tearing flesh rather than killing prey.

WINGS
The snowy owl has long, broad wings, letting it fly powerfully close to the ground or accelerate rapidly after its prey.

VITAL STATISTICS

WEIGHT	4–6 lbs.
LENGTH	21–26"
WINGSPAN	4.7–5.4'
SEXUAL MATURITY	Probably 3–5 years
BREEDING SEASON	May to early September
NUMBER OF EGGS	Usually 5–7 but ranges from 2–16
INCUBATION PERIOD	30–33 days
FLEDGING PERIOD	60 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Lemmings, voles, rabbits, hares; various seabirds
LIFESPAN	8–10 years

CREATURE COMPARISONS

Most owls hunt at night or in twilight, but the snowy owl hunts by day — in the Arctic summer, when the sun never fully sets, it has little choice. Like the snowy owl, the Eurasian eagle owl (northern Europe) is powerfully built and preys on small rodents. It lives in more temperate conditions, hunting by night on the edges of woodlands and forests. Because its prey aren't subject to large fluctuations in numbers, the eagle owl is less migratory than the snowy owl and tends to stay in one region.

Eurasian eagle owl

Snowy owl

RELATED SPECIES

● There are about 175 species of true owl, family *Strigidae*, distributed all over the world, and 10 barn owls in the family *Tytonidae*. The snowy owl has no close relatives in *Strigidae*, but is thought to evolve from species similar to big eagle owls, which occupy a similar ecological food niche. The northern treeline marks the northern limit of the Eurasian eagle owl's range and the southern border of the snowy owl's range.

Snowy Sheathbill

• ORDER •
Charadriiformes

• FAMILY •
Chionidae

• GENUS & SPECIES •
Chionis alba

KEY FEATURES

- The ultimate refuse scavenger of the Antarctic; survives by eating anything remotely edible
- Lives by food-rich waters but does not swim or wade, so it has become expert at stealing food
- Usually found among penguins; times breeding with theirs to exploit feeding opportunities

WHERE IN THE WORLD?

Breeds on the Antarctic Peninsula and nearby islands, as far north as South Georgia; some birds overwinter in the Falkland Islands and South America

LIFECYCLE

The sturdy, robust sheathbill is a skilled thief, making its living by plundering food from penguin and seal colonies on gale-lashed shores in the southern Ocean.

HABITAT

▲ **PENGUIN PEST**
Sheathbills typically infiltrate the colonies of many types of penguins.

The snowy sheathbill breeds on the Antarctic Peninsula and islands in the South Atlantic, where resident wildlife must endure freezing weather for at least ten months of the year. With its super dense plumage, the sheathbill is well adapted to such hostile conditions. Nevertheless, many populations fly some 500 miles north after breeding to overwinter on the shores of the Falkland Islands or Patagonia in South America. They leave between March and July, returning in October and November (the southern spring).

Although it can be found on grassy inland bogs, the sheathbill usually keeps to the shore among penguin colonies. It may also be found on pack ice, especially when Weddell seals are pupping.

DID YOU KNOW?

- **The sheathbill is the only landbird that breeds on Antarctica's shores.**
- **Unafraid of humans, the sheathbill may enter buildings to look for food.**
- **After the Falklands War, sheathbills were "stowaways" on returning English ships.**
- **The sheathbill also steals food from nesting albatrosses and cormorants.**

BREEDING

The sheathbill normally pairs for life and breeds during the brief Antarctic summer. Pigeonlike head-bobbing forms an all-purpose display, used in disputes as well as courtship, and also as a greeting when a bird takes over incubation from its mate.

To ensure a good food supply, a pair almost always establishes its territory near, or among, a penguin colony. Living among the densely packed penguins also provides shelter. The sheathbill noisily chases off rivals, but fights rarely amount to much.

The sheathbills build a nest from a smelly jumble of feathers, seaweed, shells and debris, usually in a crevice, and the female lays two or three creamy-white eggs. By the time they hatch a month later, the penguin chicks are also emerging. The parents take turns stealing food from penguins to feed their own young. Many sheathbill chicks fall prey to skuas — or even to other sheathbills — and usually only one of the brood survives.

▼ **PROTECTIVE MOTHER**
A female often leaves chicks in a rock crevice.

CONSERVATION

The snowy sheathbill has a stable population of around 10,000 pairs, with the highest number on South Orkney Island. At one time, it was killed for food by whaling crews, but nowadays it benefits from humans in the Antarctic. Some island birds no longer migrate in winter, thanks to the extra food provided by garbage from scientific research stations.

BEHAVIOR

▲ **FLOOR MANAGER**
The sheathbill sticks mainly to the ground.

The sheathbill is notorious among locals. They know it as the "paddy," and it often follows them as they take out garbage. It also grabs food from scientists studying penguins, and pecks at their clothing to see if it is worth eating.

The sheathbill flies strongly if migrating, but it is reluctant to take to the air otherwise. It prefers to strut around, like a chicken, and breaks into a run when threatened. Every day it bathes and preens to condition its plumage. It often hops on one leg, keeping the other tucked into its feathers, to reduce heat loss. The bird is generally silent except when disputing territories.

FOOD & FEEDING

As a landbird in a region where the sea is the main source of food, the sheathbill has devised ways to obtain food from aquatic predators. Adélie and chinstrap penguins are the main objects of its unwanted attentions, as it runs nimbly between their nests, looking for unguarded eggs or small chicks. It even steals straight from the mouths of chicks as they are being fed by their parents. But only the older and more experienced sheathbills try this trick on the formidable king penguin.

Anything nutritious is a source of food, including feces (*right*), molted feathers, and invertebrates. Even blood, obtained by pecking at the wounds of seals, is a food source.

ON THE SCROUNGE

1 Cleaning contractors…
Sheathbills are often found near penguin colonies, where they eat droppings, eggs, chicks and food brought by adults.

2 Shore thing…
On spotting a penguin regurgitating food for its chick, the sheathbill tries to distract the adult; then, it steals the spilled dinner.

3 Waste recycling…
The afterbirth of a seal provides a feast for the sheathbill, which regularly forages near seal colonies during the pupping season.

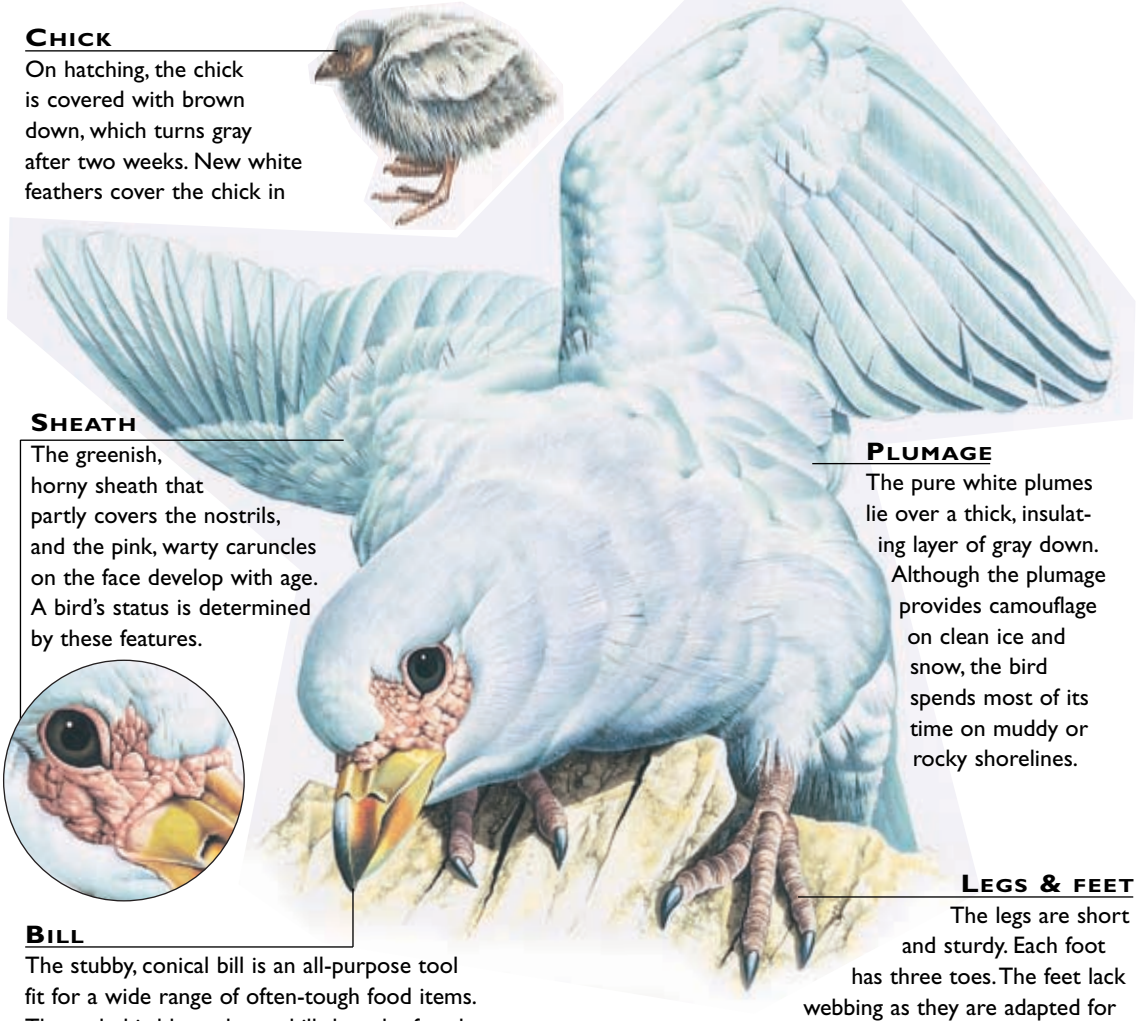
4 Milk thief
The bold sheathbill drinks the seal's milk by inserting its bill between the mother's nipple and the mouth of the pup.

PROFILE SNOWY SHEATHBILL

The sheathbill is essentially a wader that has adapted to spend most of its life on dry land. Luxuriantly thick plumage helps it brave bitter winters.

CHICK

On hatching, the chick is covered with brown down, which turns gray after two weeks. New white feathers cover the chick in



SHEATH

The greenish, horny sheath that partly covers the nostrils, and the pink, warty caruncles on the face develop with age. A bird's status is determined by these features.

BILL

The stubby, conical bill is an all-purpose tool fit for a wide range of often-tough food items. The male bird has a larger bill than the female.

PLUMAGE

The pure white plumes lie over a thick, insulating layer of gray down. Although the plumage provides camouflage on clean ice and snow, the bird spends most of its time on muddy or rocky shorelines.

LEGS & FEET

The legs are short and sturdy. Each foot has three toes. The feet lack webbing as they are adapted for walking and running, not swimming or diving.

VITAL STATISTICS

WEIGHT	16–27 oz.
LENGTH	13–16"
WINGSPAN	30–32"
SEXUAL MATURITY	3–5 years
BREEDING SEASON	December –March
NUMBER OF EGGS	Usually 2–3
INCUBATION PERIOD	28–32 days
FLEDGING PERIOD	50–60 days
TYPICAL DIET	Any animal matter, including carrion, feces, fish, eggs and chicks; also eats seaweed and human garbage
LIFESPAN	Unknown

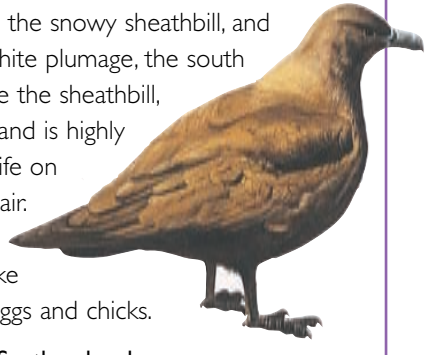
RELATED SPECIES

● **The genus *Chionis* also includes the black-faced sheathbill, *C. minor*. Both species have white plumage, but the black-faced sheathbill has a black bill and face. Sheathbills share the order *Charadriiformes* with several families. These include gulls (*Laridae*), terns (*Sternidae*), and the skuas (*Stercorariidae*), which pillage over the world's oceans.**

CREATURE COMPARISONS

The south polar skua (Catharacta maccormicki) is heavier than the snowy sheathbill, and has a wingspan of about 4'. Whereas the sheathbill has pure white plumage, the south polar skua varies in color from dark brown to pale gray. Like the sheathbill, it breeds in loose colonies along the coast of Antarctica, and is highly territorial. While the sheathbill steals food from wildlife on land, the south polar skua does the same in the air. It chases terns and other birds until they drop or disgorge their catches of fish. Like the sheathbill, the skua eats penguins' eggs and chicks.

Snowy sheathbill



South polar skua

Sooty Tern

• ORDER •
Charadriiformes

• FAMILY •
Laridae

• GENUS & SPECIES •
Sterna fuscata

KEY FEATURES

- Reaches sexual maturity at 6–8 years of age, later than any other member of the gull family
- Easily distinguished from other terns by its two-tone plumage: black above, white below
- Breeding cycle seems to follow the phases of the moon in the south Atlantic

WHERE IN THE WORLD?

Found in tropical and subtropical regions of the Indian, Pacific and Atlantic Oceans, including Africa, Australia and North America

LIFECYCLE

The sooty tern rides the air currents of the world's oceans, mating regardless of the season and taking the longest time to mature of any gull or tern.

HABITAT

Strong fliers, sooty terns travel in large flocks high above the ocean surface throughout the year. Thousands of birds fly in tight formations across the Pacific, Indian and Atlantic Oceans in search of surface fish and squid. Rarely settling on the sea itself, the sooty terns rest instead on tiny islands, sandbars and floating debris. All year-round, millions of sooty terns come ashore to breed on tropical and subtropical islands in all three oceans, including the Bahamas, the West Indies, Hawaii and the Galapagos Islands. Occasionally, cyclones and hurricanes force the birds to land far from their intended destinations. The sooty tern nests on any surface, whether sand, coral or rock, as long as fish and squid are nearby. The terns lay their eggs on the bare ground and carefully protect them from predators and the harsh heat.

▼ **NATURAL SHADE**
A sooty tern incubates its one egg on the sandy beach and attempts to shade it from the intense tropical heat.

FOOD & HUNTING

▲ **DOWN TORPEDO**
A parent returns from a long feeding excursion at sea with a squid for its anxiously awaiting chick.

The sooty tern, with its elegant black-and-white plumage, soars gracefully above the tropical seas. It looks for schools of large, predatory fish chasing smaller squid and fish, including the goatfish, mackerel scad and flying fish, which rush to the surface in an attempt to escape their aquatic predators. When the fish or squid surface, the sooty tern swoops down and plucks a meal from the water. Sometimes, the small fish even jump out of the water to avoid the predators, and the sooty tern easily picks them off in midair. The bird prefers not to swim or dive in pursuit of food, since its feathers are not entirely waterproof. Therefore, the sooty tern also feeds at dawn and dusk, when squid and deep-sea fish rise to the surface to feed. Then the tern easily snatches them from the surface.

DID YOU KNOW?

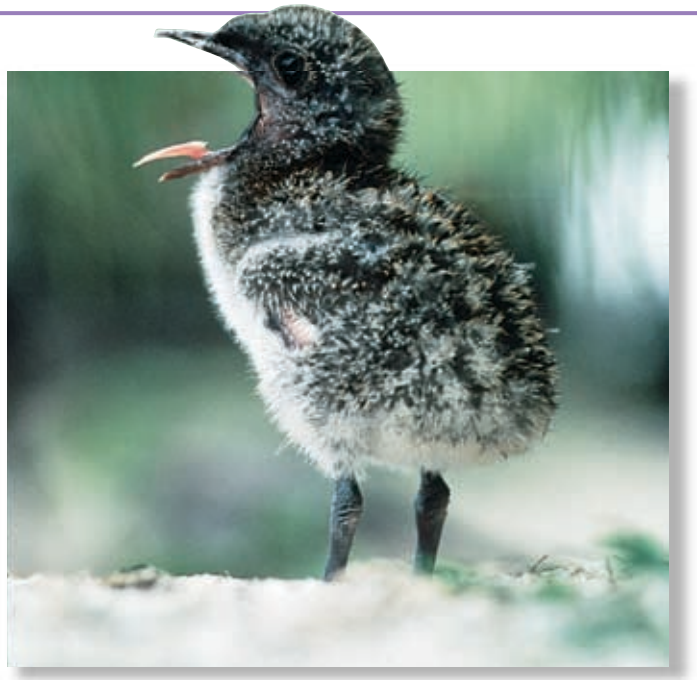
- **The sooty tern eats fish that are pursued by tuna. Fishermen follow terns to tuna schools.**
- **Distinct flocks have totally different breeding cycles. On Manana Island in the Pacific, a flock breeds in April, but 10 miles away on Moko Manu, in October.**

CONSERVATION

The sooty tern population probably exceeds 25 million pairs; it is not currently threatened. One of the most numerous seabirds, its highest numbers are in the South Pacific. However, some island colonies suffer losses from predators, especially cats and humans.

BREEDING

Throughout the breeding season, the sooty tern participates in "parades," common breeding displays that consist of the two mated birds circling each other. They droop their wings, arch their neck and take small running steps. The nest is no more than a shallow scrape or depression in the sand, soil, coral or rocks. The female lays one pale or buff egg with brown splotches. Both parents take turns incubating and relieve each other frequently, since the tropical heat is so intense. After hatching, the parents shade the chick with their wings, but the stints in the hot sun dehydrate the adults. They often fly off and dip their feet in the water to cool off. The young grow rapidly and fledge in two months. Most sooty terns take from 6–8 years to mature, the longest of any tern or gull. Though most breed yearly, those near the equator, including Ascension Island in the mid-Atlantic, breed every 9–10 months, seemingly following the phases of the moon.



A TERN'S TERMS

1 Overtime...
Sooty terns nest in large colonies beneath the hot tropical sun and try to shield each of their lone eggs from the intense heat.

2 Overhead...
Each parent goes out to sea in search of its own food, to keep its energy up, before returning to incubate the eggs.

3 Overheat...
A tern opens its wings to shield its chick from the hot midday sun. It sacrifices its own comfort for the well-being of its chick.

4 Overeat
As the chick grows, both parents leave to find food. One parent offers an entire squid to its ravenous chick.

BEHAVIOR

When other seabirds have settled for the night, the sooty tern's flight call, *ker-wacky-wack*, continues to carry far across the sea. Sailors say it sounds like "wide awake." The sooty tern often feeds at dusk when squid, a staple of its diet, surface at night. The breeding tern eats enough for two and brings back a bedtime snack for the young chick. The sooty terns nest close together even when more space is available. With neighbors so near, there is often pecking and bickering between adults, and even adults and the young of adjacent pairs. But the terns fiercely defend their colony with aerial attacks on intruders.

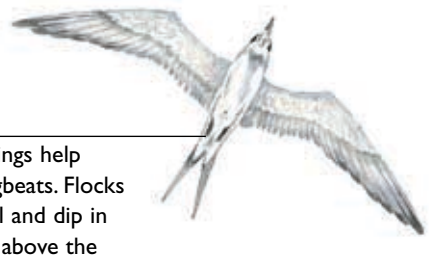
▶ **SHARP "V"**
During a mating display, a tern swings both wings to strike an impressive pose.

PROFILE SOOTY TERN

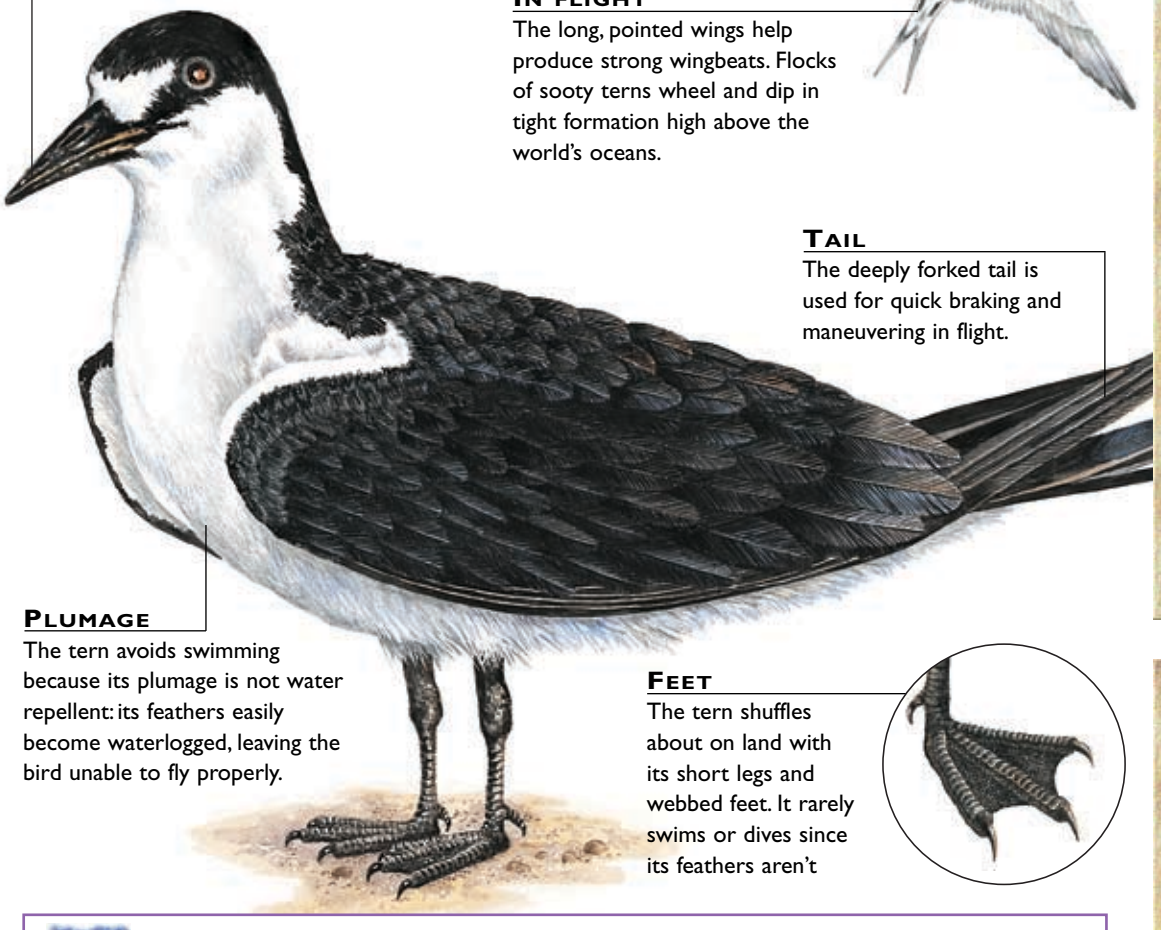
Strong and graceful in flight, the sooty tern is awkward on land and a reluctant swimmer — its plumage is not completely waterproof.

BILL
The sooty tern catches fish and squid from the ocean surface with its thin, strong, tapered bill. The tern points its bill downward as it searches for food.

IN FLIGHT
The long, pointed wings help produce strong wingbeats. Flocks of sooty terns wheel and dip in tight formation high above the world's oceans.



TAIL
The deeply forked tail is used for quick braking and maneuvering in flight.



PLUMAGE
The tern avoids swimming because its plumage is not water repellent: its feathers easily become waterlogged, leaving the bird unable to fly properly.

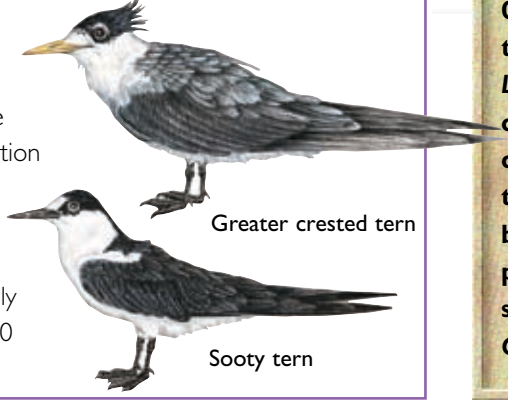
FEET
The tern shuffles about on land with its short legs and webbed feet. It rarely swims or dives since its feathers aren't

VITAL STATISTICS

WEIGHT	5–8.25 oz.
LENGTH	15–18"
WINGSPAN	34–35"
SEXUAL MATURITY	4–8 years
BREEDING SEASON	Varies according to region
NUMBER OF EGGS	1
INCUBATION PERIOD	28–30 days
FLEDGING PERIOD	56–63 days
BREEDING INTERVAL	9–12 months
TYPICAL DIET	Small fish and invertebrates, mainly squid
LIFESPAN	Up to 33 years

CREATURE COMPARISONS

Measuring up to 19" in length, the greater crested tern (Thalasseus bergii) is the third largest tern. With a wingspan of 41", it is slightly larger than its close relative, the sooty tern. The greater crested tern's white and gray coloration is interrupted by its long-crested black cap and yellow bill, whereas the sooty tern's white forehead stands out against its black upperparts and bill. Unlike the widespread sooty tern, the greater crested tern is found only in the Indian and Pacific Oceans, with approximately 500,000 pairs in Australia and about 50,000 pairs elsewhere.



RELATED SPECIES

● The sooty tern joins about 24 other species of tern in the genus *Sterna*. The genus *Hydroprogne* includes the Caspian tern, *H. caspia*, the largest tern. Over 35 total species of tern are members of the *Laridae* family. The family consists of about 82 species of gulls, kittiwakes, terns and noddies. These birds are joined by puffins, plovers, sandpipers and sheathbills in the order *Charadriiformes*.

Southern Giant Petrel

• ORDER •
Procellariiformes

• FAMILY •
Procellariidae

• GENUS & SPECIES •
Macronectes giganteus

KEY FEATURES

- Catches fish by impaling them on a specially adapted hooked beak
- Stomach oil serves as a food reserve; oil may be discharged as a foul-smelling defense mechanism
- Preys and scavenges upon birds and animals, on land and in the sea

WHERE IN THE WORLD?

Found in Antarctica and islands in the southern oceans, including Prince Edward, Marion, Crozet; also southern Chile and on oceans south of equator

LIFECYCLE

Skimming and gliding over the ocean waves, the southern giant petrel scans the surface of the Antarctic waters for easy surface prey, including squid, fish and carcasses.

HABITAT

▲ **SEASIDE STOP**
The southern giant petrel comes ashore to breed.

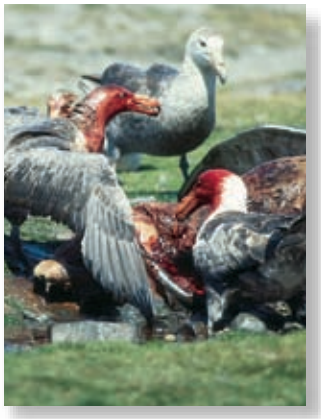
Open coastal plateaus and headlands serve as breeding grounds for this circumpolar resident that spends most of its life at sea. Grassy or bare ground is all that is needed for nesting. For the remainder of the year, the petrel is pelagic (ocean-going), from Antarctica to 20°S in the winter, where it feeds along the coasts.

DID YOU KNOW?

- **Experiments have shown that southern giant petrels cannot find nesting areas if the nostrils are plugged, indicating a high dependence on the sense of smell.**
- **The southern giant petrel's large intestine extends nearly 7.5'.**
- **It takes about 1.5 quarts of freshwater to flush the southern giant petrel's body of the salt accumulated from drinking 1 quart of seawater.**
- **The southern giant petrel is nicknamed "stinker" by mariners for the foul-smelling stomach oil it spits out during confrontations.**

FOOD & FEEDING

The southern giant petrel is a scavenger that typically feeds on scraps of partially devoured seal pups or seabirds left by whales. Using its strong, hooked bill, the petrel impales the flesh and tears it from the carcass. Flocks of petrels frequently follow fishing boats, waiting for galley waste thrown overboard or extra fish that are tossed back. Squid near the water's surface are a prime target during offshore feeding. Other prey includes jellyfish and similar soft-bodied invertebrates. Also a skilled predator, the petrel eats penguin chicks, gulls and shearwaters. The petrel can accumulate food in its crop (a storage area in the esophagus). During breeding season, it cruises back to feed its mate or young chick.



BY LAND OR BY SEA

1 Follow that boat...
Along with other birds, giant petrels track a fishing boat with full nets being hauled to the surface.

2 Dead in the water...
Dead or alive, the fish floating on the surface provide an easy feast for the ravenous petrel.

3 Mass feast...
A seal carcass is a prime feeding opportunity for a flock of petrels; another cruises toward the feast.

4 Scavenger at work
Reaching into the carcass, the giant petrel uses its hooked bill to tear through muscles and ligaments.

BEHAVIOR

When threatened, the giant petrel warns off potential attackers with calls; it also spits out a foul-smelling stomach oil. Nestlings use the oil-spitting behavior more frequently, since they are otherwise defenseless.

Adults will often fight for their share of scavenged food. The birds will assume an upright or forward threat posture, with tail cocked and fanned and head swinging, before moving in to attack. Vocalization is also an integral part of the petrel's life; the birds whinny during threat postures and bray during courtship. The southern giant petrel is able to recognize its mate through calls and visual signs. This bird spends most of its relatively long life on the wing and may return to land to breed only once every 2–3 years.

▲ **SIDEWAYS SOAR**
A petrel cruises on updrafts from the swelling sea.

CONSERVATION

Though the southern giant petrels are not currently threatened, their sensitivity to environmental disturbances and their own small numbers put them at risk. The total population consists of about 36,000 breeding pairs. Nesting success diminishes as the bird continues its search for new Antarctic bases, where human presence discourages the birds from nesting. Protective measures are already in place at some of the more established areas.

▼ **BATTLE IT OUT FOR THE GOODS**
If there isn't enough food to feed all of the southern giant petrels, there will be a fight.

BREEDING

Usually mated for life, the southern giant petrel breeds in colonies in secluded areas. The petrel reproduces more successfully when it retains the same nesting site and mate. Some colonies have been in the same place for at least 45 years, as successive generations return to the same site. During courtship, the head-raising display is initiated mainly by the females and is followed by a soft braying sound. The petrels face each other and rub their bills together. The southern giant petrel nests on flat ground, either among tussock grasses or ferns in a saucer-shaped depression. The female lays a single egg, which is incubated by both parents for up to 66 days. After hatching, the black, down-covered chick is fed regurgitated meals. It is ready to fly in 4 months and joins the parents during feeding expeditions. The juvenile will reach sexual maturity between 6–7 years of age. Harsh polar conditions take a toll on nesting success.

▼ **BALL OF FLUFF**
White morph chicks are covered with white down.

PROFILE SOUTHERN GIANT PETREL

The white variety (morph) of the southern giant petrel is found in only 15% of the population and is easily distinguished from the dark morph.

IN FLIGHT

With a wingspan of up to 6', the petrel unfolds its wings and seems to float into the air. The dark morph (*left*), with its dark gray-brown body and whitish head and neck, is easily distinguished from the white morph.

TAIL

The short and rounded tail, used for steering in flight, has 16 retrices (tail feathers), more than other petrels.

WHITE MORPH PLUMAGE

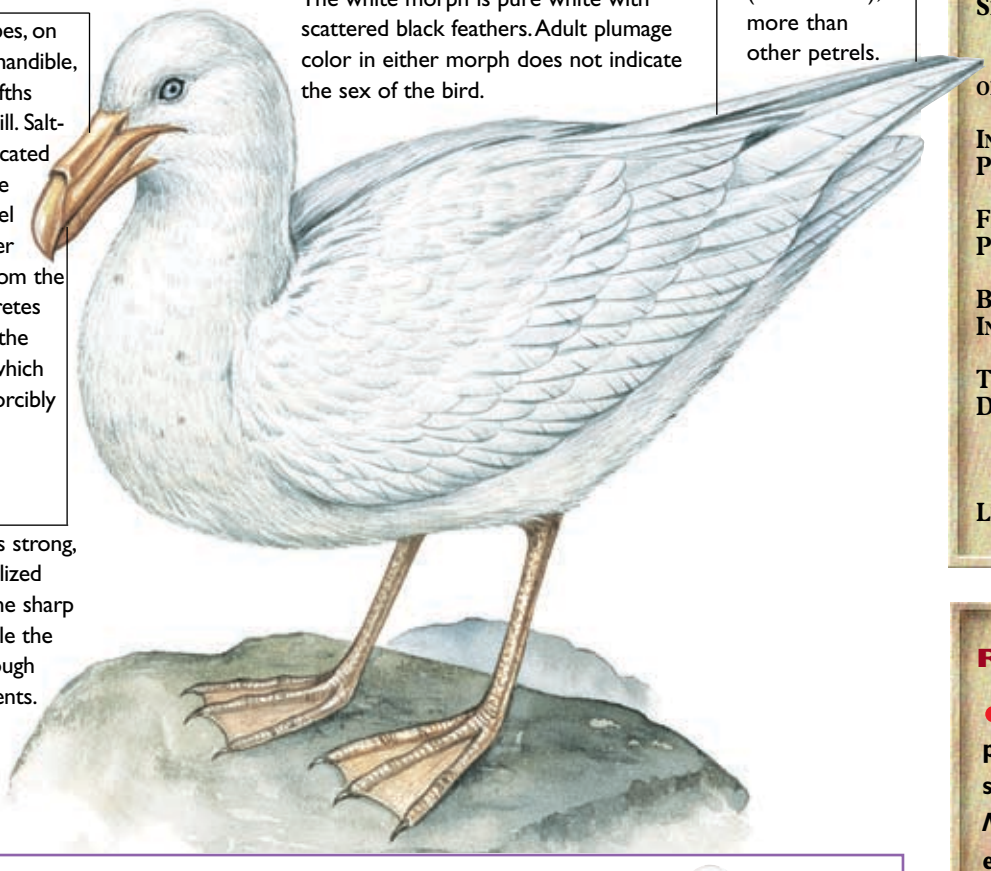
The white morph is pure white with scattered black feathers. Adult plumage color in either morph does not indicate the sex of the bird.

TUBENOSE

The large nasal tubes, on top of the upper mandible, extend for three-fifths the length of the bill. Salt-secreting glands, located internally above the eye, allow the petrel to process seawater by secreting salt from the body. The bird secretes collected salt into the nasal tubes, from which the salty liquid is forcibly sneezed.

BILL

The 4.5"-long bill is strong, hooked and specialized for tearing flesh. The sharp cutting edges enable the petrel to slice through muscles and ligaments.



VITAL STATISTICS

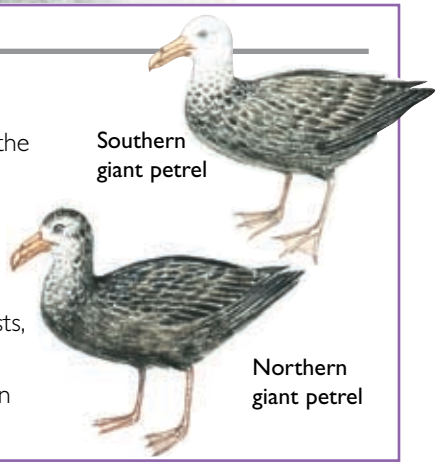
WEIGHT	Male 11 lbs.; female 8.5 lbs.
LENGTH	36–39"
WINGSPAN	6'
SEXUAL MATURITY	6–7 years
BREEDING SEASON	October–November
NUMBER OF EGGS	1
INCUBATION PERIOD	55–66 days
FLEDGING PERIOD	104–132 days
BREEDING INTERVAL	1–3 years
TYPICAL DIET	Penguin chicks, gulls, squid, fish and scraps of carrion
LIFESPAN	25 years

RELATED SPECIES

● The southern giant petrel is one of two species in the genus *Macronectes*. The southern and northern giants are among 70 species of "tubenoses" in the family *Procellariidae*. This family of medium to large seabirds includes prions, fulmar-petrels and shearwaters. The snow petrel, *Pagodroma nivea*, is all white, perfect camouflage in the packed ice it frequents.

CREATURE COMPARISONS

The northern giant petrel (*Macronectes halli*) and southern giant petrel are identical in size. But while the dark morph of the southern giant petrel closely resembles the northern giant petrel, there is no corresponding "pale" phase in the northern species. The northern petrel has more uniformly colored underparts than its relative and a pinkish, rather than green-tipped, bill. The northern giant petrel, as its name suggests, is found in sub-antarctic regions and seeks sheltered areas for breeding; the southern petrel breeds farther south in the open expanses of the antarctic.



Southern Ground Hornbill

• ORDER •
Coraciiformes

• FAMILY •
Bucorvidae

• GENUS & SPECIES •
Bucorvus leadbeateri

KEY FEATURES

- The bird breeds cooperatively; a mated pair accepts help from immature and other adults during nest-building, incubation and fledging
- Strides purposefully across the savannah, up to 7 miles a day
- Produces a distinctive, booming call heard across the lowlands of Africa's grassy plains

WHERE IN THE WORLD?

Found throughout African savannahs south of the equator; from southern Kenya through Rwanda, Burundi and southeast Zaire, south through Tanzania

LIFECYCLE

The southern ground hornbill practices cooperative behavior: it groups at feeding areas, assists at nursery sites and even bands together to hunt.

HABITAT

▲ **ZIMBABWE SAVANNAH**
The savannahs of Africa are home to the southern ground hornbill.

The southern ground hornbill makes its home in the stands of whistling-thorn acacia trees scattered throughout the grassy plains. While these trees provide shelter, the savannahs offer wide-open spaces for the hornbill to look for food.

The African savannah comes alive during the wet season. The grasses and trees turn a vibrant green, revived by the equatorial rainfall. When the plains flourish, the hornbill breeds, and parents and helpers are able to find sufficient food for the growing nestlings. But the rains eventually stop, and the grasses and leaves turn golden, forcing the hornbill to increase its territory. Foraging areas usually encompass up to 39 sq. miles.

DID YOU KNOW?

- **Dominated by its older sibling, the younger hatchling rarely survives. Scientists have started removing the second-hatched chicks and raising them in captivity.**
- **The southern ground hornbill is the largest bird species known to breed in cooperative groups — these groups may contain up to 11 breeding hornbills.**

BREEDING

Group cooperation is a part of breeding for the hornbill. From nest-building to fledging, both immature and adult helpers coordinate and assist a dominant mating pair with all of the necessary nesting duties. The hornbill nests in natural holes, but occasionally excavates its own. Though several males feed the dominant female during courtship, only the dominant male copulates with her. The female starts incubating with the first egg; the second egg isn't laid until 3–5 days later. Because of this time lapse, the older, larger hatchling is usually dominant and is the only one to survive.

FOOD & HUNTING

▲ **MIXED ASSORTMENT**
The southern ground hornbill is a carnivore; it hunts for anything it can overpower.

CLOSE FRIENDS AND RELATIONS

1 One plus two...
As a female southern ground hornbill assesses a potential nesting site, two males approach with lining materials.

2 Plus three...
She accepts the nest and lays two eggs. A female helper waits for her to finish adding wood chips for insulation before feeding her.

3 And more...
Each morning the dominant pair and all adult helpers call loudly from the nest before descending for their daily foraging trip.

4 Food for you and yours
The dominant male returns to his mate first with a billfull of food for her, which includes a lizard, mouse and small snake.

CONSERVATION

Since groups of hornbills usually raise only one young at a time, their numbers were declining even before the increased threat of habitat destruction. The spread of human populations and their homes has presented a peculiar threat to the hornbill. Hornbills often attack their own reflections, shattering window panes and destroying themselves. A hornbill specialist group was formed in 1983 to begin the process of stabilizing populations.

BEHAVIOR

The hornbill's loud call each morning alerts rivals as well as its prey. The bird produces a deep *hoo, hoo, hoo-hoo* from its roosting site, and it can be heard from almost 1 mile away. It descends from its perch in an acacia or ficus tree, producing a loud noise with each wingbeat. Around midday, the bird takes a break from the hunt and relaxes quietly, sunbathing on the ground with wings stretched, while group members preen each other.

The hornbill prefers walking and will cover more than 12 miles a day, patrolling its territory in search of food. It will fly across unsuitable habitats, such as bogs or marshes, if necessary.

▼ **A QUICK SNACK**
A female grabs a quick grub found on the ground.

The open savannah offers few hiding places, and the southern ground hornbill uses this open field to its advantage. It begins a new hunting expedition each day at dawn after its loud, booming call resounds across the land.

With no place to hide, potential prey must run. The hornbill charges on its long legs, outrunning hares, squirrels and snakes. A group of hornbills often bands together to hunt large or dangerous prey. A hornbill band may rob eagles of their prey or even of their young.

On its daily foraging trips, the hornbill scans the ground for termites, toads, snails and scorpions. At other times, the hornbill must dig deeper to reveal edible earthworms. Occasionally the bird will take flight and chase prey in the air, but it usually spends up to 70% of its day walking.

PROFILE SOUTHERN GROUND HORNBILL

Though it can fly, the southern ground hornbill spends most of its time walking fast and far across the savannahs of Africa.

MALE THROAT SAC
The male inflates his neck, face and throat skin to attract a female and to defend his territory. The blown-up sac also helps the bird blare its loud calls. The female has a violet-blue throat patch.

JUVENILE
The immature hornbill blends with its surroundings. The sooty-brown and pale gray-brown coloring indicate to other hornbills the juvenile's immature status.

FEET
The front surface of the long tarsus (heel) is covered with large scales that protect the foot and combat wear and tear. The bases of the toes are fused; the hornbill strides along on the tips of its toes.

VITAL STATISTICS

WEIGHT	Up to 9 lbs.
LENGTH	35–39"
SEXUAL MATURITY	4–6 years
BREEDING SEASON	During wet season; varies according to region
NUMBER OF EGGS	Usually 2, but up to 3
INCUBATION PERIOD	37–43 days
FLEDGING PERIOD	86 days
BREEDING INTERVAL	Usually 1 year
TYPICAL DIET	Insects and small vertebrates
LIFESPAN	Unknown

CREATURE COMPARISONS

Measuring up to 41" long and weighing up to 8 lbs., the great pied hornbill (Buceros bicornis) is similar in size to the southern ground hornbill. They both use preen gland oil, but the black and white great pied hornbill often appears yellow because the oil stains. The pied hornbill's diet consists of fruit, while the southern hornbill is primarily a carnivore. Unlike the southern hornbill, which has an open nest, the great pied hornbill seals its nest inside (by the female) and out (by the male) for added insulation and protection.

Great pied hornbill

Southern ground hornbill

RELATED SPECIES

- **The southern ground hornbill is part of the genus *Bucorvus*, which also includes the northern ground hornbill. The great pied hornbill, with its short legs, is part of the genus *Buceros*. But all hornbills have a straight bill with a boxy projection *(casque)* above it, which distinguish them from kingfishers, bee-eaters and rollers, also found in the order *Coraciiformes*.**

Southern Yellow-billed Hornbill

• ORDER •
Coraciiformes

• FAMILY •
Bucerotidae

• GENUS & SPECIES •
Tockus leucomelas

KEY FEATURES

- Male takes total responsibility for feeding female and chicks during the breeding period
- Female and young are sealed in their nest hole with a wall of dried mud to keep out predators
- Achieves far greater fledging success than other hole-nesting birds that don't seal the nest

WHERE IN THE WORLD?

From Angola through Namibia to Zambia, Botswana, Zimbabwe, Malawi, northern and eastern South Africa and southwestern Mozambique

LIFECYCLE

The southern yellow-billed hornbill goes to great lengths to safeguard its eggs and young, with male and female contributing equally to this family partnership.

HABITAT

▲ **BALANCING ACT**
A thornbush provides a perch for the southern yellow-billed hornbill.

The southern yellow-billed hornbill can thrive in several habitats. It finds a home on the savannah, among scattered trees and thornbushes. The bird also lives in open woodlands. In semiarid areas, it's usually found in waterside vegetation, but the hornbill avoids locations where the grass and undergrowth are especially tall and dense.

Although the southern yellow-billed hornbill doesn't migrate, it sometimes moves in dry seasons from the flat lowlands to moister, verdant hillsides. More local movements are sometimes prompted by the chance to take advantage of a good food source — such as bird feeders at game lodges. Under such circumstances, the bird will usually fly back to its usual territory to roost each night.

DID YOU KNOW?

- **The bird's strange nesting habits have earned it a place in African folklore, where it's often revered as a symbol of marital fidelity.**
- **Bill color may result from diet. Captive birds gain even brighter bills when fed pigment-rich food, such as egg yolk and tomatoes.**

CONSERVATION

The southern yellow-billed hornbill is widespread and common over most of its range. There's concern, however, about the long-term future of these and other hornbills as relentless land misuse steadily reduces their habitat.

FOOD & FEEDING

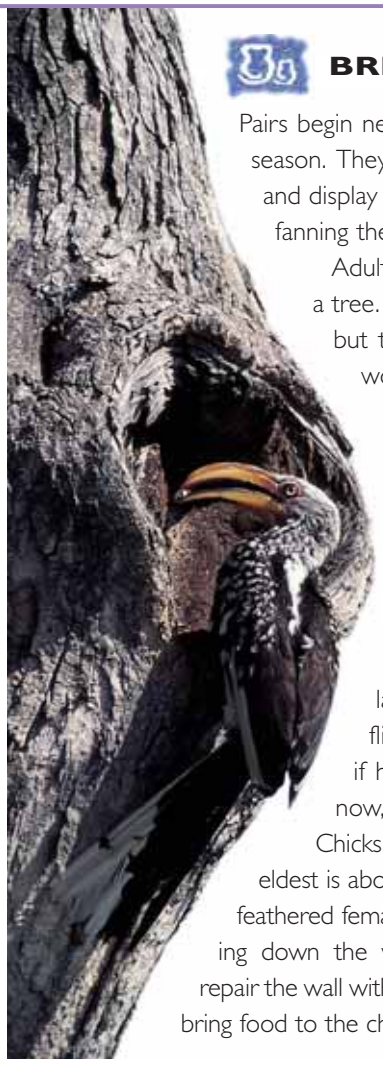
Insects, caught in the bill tip and tossed into the mouth with a flick of the head, form the bulk of the hornbill's diet. Beetles, termites, grasshoppers and caterpillars are staple items.

The southern yellow-billed hornbill is one of the least fussy of eaters and welcomes the opportunity to dine on rodents, small snakes, eggs, scorpions and ants. The bird balances its diet by eating seeds and fruits, including the nutritious nuts of the oil palm.

Most foraging is done on the ground, where prey is snapped up with little effort. The bird will also dig into soil and lift rocks with its bill in search of food. Safari tourist camps are often visited by groups of hornbills looking for scraps or handouts.

▲ **TERMITE DELIGHT**
The hornbill snaps up termites in its long bill.

▶ **SNAKE SNACK**
The hornbill readily attacks and devours small snakes.



BREEDING

Pairs begin nesting with the October rainy season. They become increasingly vocal and display to each other by bowing and fanning their wings above their backs.

Adults nest in a hole 16–40' up in a tree. Both sexes seal the entrance, but the female does most of the work from within. With mud brought by the male, she uses her bill to build a wall. She leaves a slit through which her mate delivers food and out of which she ejects remains of food and droppings.

The confined female first lays her eggs, then molts all flight and tail feathers at once; if her mate deserts her or dies now, the family is doomed.

Chicks hatch at intervals. When the eldest is about three weeks old, the newly feathered female escapes the nest by breaking down the wall. The parents and young repair the wall with their droppings. Both parents bring food to the chicks for the next six weeks.

COUNT ON ME
While the incubating female is walled up in the nest, she relies on her mate to bring her food.

AS SAFE AS FORT KNOX

1 Sealing in…
The female uses her bill as a trowel, walling up the entrance to her nest with mud provided by her mate.

2 Provisions…
The imprisoned female depends on the male for food, which he passes through the slit in the wall.

3 Confinement…
Secure in her nest, the female becomes flightless as she molts, throwing out most of the feathers.

4 Breaking out
After a confinement of about 50 days, the female chisels out to help her mate feed the chicks.

BEHAVIOR

The southern yellow-billed hornbill is a sedentary bird. Where conditions are particularly suitable, there may be as many as 6 breeding pairs in a half-mile square, each in its own territory.

Outside the breeding season, the species is usually in pairs or small family parties. They forage together and sleep communally in trees. Birds maintain contact with each other by making clucking calls, which become louder if they're alarmed by a predator.

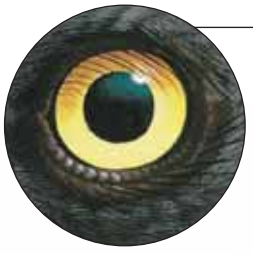
Mongooses and many birds of prey hunt the southern yellow-billed hornbill. Adults frequently fall victim to eagles, falcons and owls; the chicks, in their walled nest, are safe from most predators. In her breeding confinement, the female spends much of her time with one eye against the entrance slit, keeping watch.

TWO'S COMPANY
The bird is usually seen paired or in a small group.

PROFILE

SOUTHERN YELLOW-BILLED HORNBILL

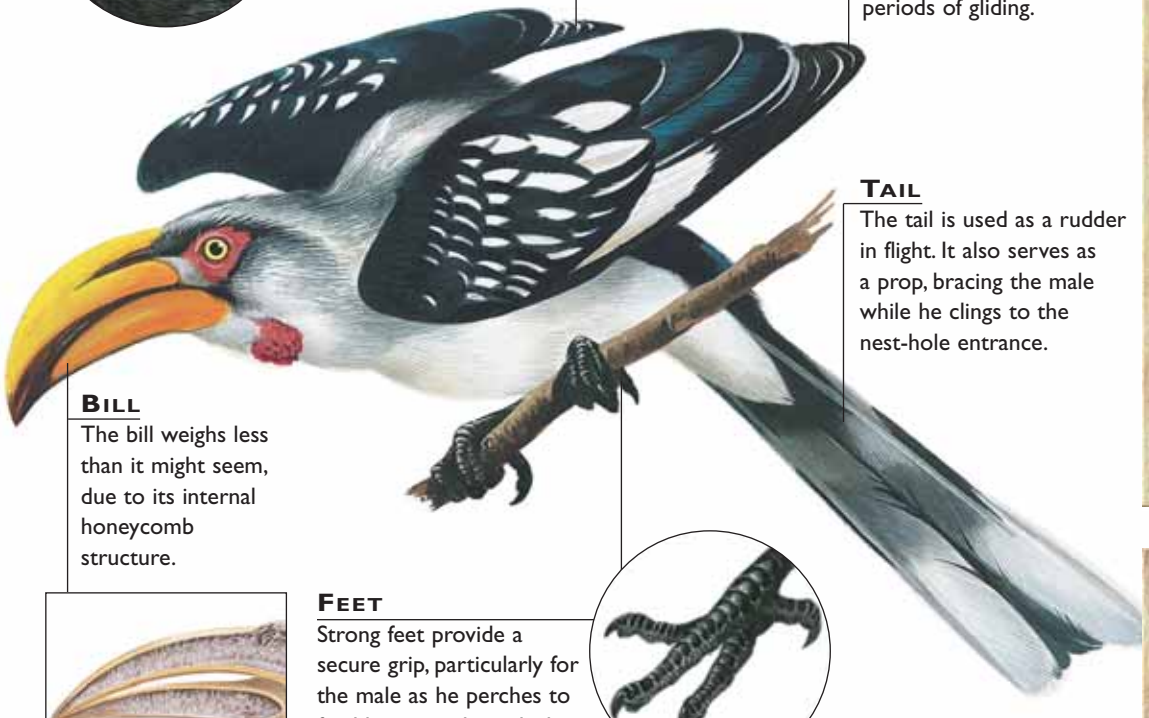
The huge bill, typical of the hornbill family, serves as a trowel for walling up the nest and as surprisingly delicate tweezers for picking up food.



EYES
The hornbill is rare among birds in having long lashes over its eyes — a feature it shares with the ostrich.

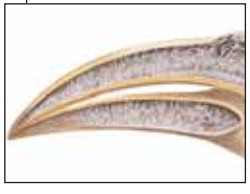
BODY
Stocky body has air sacs under the skin over the back and shoulder area, which may cushion the female from injury in her cramped nest.

WINGS
Wings are broad and rounded. A hornbill's distinctive flight action consists of slow, deliberate beats alternated with short periods of gliding.



TAIL
The tail is used as a rudder in flight. It also serves as a prop, bracing the male while he clings to the nest-hole entrance.

BILL
The bill weighs less than it might seem, due to its internal honeycomb structure.



FEET
Strong feet provide a secure grip, particularly for the male as he perches to feed his mate through the slit in the nest hole.

VITAL STATISTICS

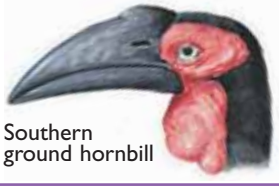
WEIGHT	5–8 oz.
LENGTH	16–18"
WINGSPAN	24–26"
SEXUAL MATURITY	1 year
BREEDING SEASON	Mainly October –February
NUMBER OF EGGS	2–6; usually 3 or 4
INCUBATION PERIOD	24 days
FLEDGING PERIOD	42–47 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Insects, eggs, rodents, small snakes, fruit and seeds
LIFESPAN	Probably 35–40 years

CREATURE COMPARISONS

Big, powerful curved bills for snapping up prey are a feature of the hornbill family. The southern yellow-billed hornbill eats mainly insects, plucked from the ground.

Southern yellow-billed hornbill

The southern ground hornbill's much larger bill is a formidable weapon, capable of dealing a death blow to animals as large as hares, squirrels and snakes.



Southern ground hornbill

The hornbills and their New World equivalents, the toucans, are unrelated, but have evolved similarly shaped bills because of their similar feeding habits.

Toco toucan

RELATED SPECIES

● **The 54 hornbill species are all found in the Old World, mostly in tropical regions. They include the 5'-long great pied hornbill** (below).

Spotted Nutcracker

• ORDER •
Passeriformes

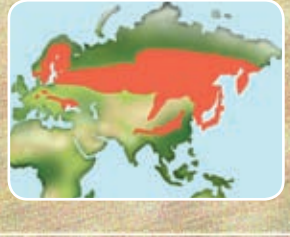
• FAMILY •
Corvidae

• GENUS & SPECIES •
Nucifraga caryocatactes

KEY FEATURES

- Buries nuts and seeds for the winter and recovers them by digging through deep snow drifts
- In times of famine, populations move to a new habitat in mass movements called invasions
- Nutcrackers favor high altitudes; some live in the Himalayas at above 13,000'

WHERE IN THE WORLD?



Found across northern Europe from Norway, Sweden and Finland, across Asia to Japan, south to Mongolia, China and Korea

LIFECYCLE

The spotted nutcracker copes with long, cold winters by carefully hoarding seeds and nuts; it cleverly finds its buried food caches even in snow more than 3' deep.

HABITAT

▲ **HERE TODAY**
Nutcrackers have been known to move en masse from an area.

▼ **HIGHER AND HIGHER**
Spotted nutcrackers prefer mixed forests at very high elevations.

Preferring colder climates and higher elevations, the spotted nutcracker inhabits Arolla pine forests from the northernmost reaches of Europe, through Asia and even in Siberia. Comfortable in mixed forests, spotted nutcrackers forage in open areas and have been spotted living in mountainous areas above 13,000'.

Scattered populations living in southern Europe are mainly the result of eruptive movements called invasions, which tend to occur about every seven years. Typically, invasions occur after many seasons of high seed production, leading to a dramatic increase in nutcracker numbers. If a season of low seed production follows, younger members of the overpopulated community will seek out any area with trees and available foraging, resulting in isolated flocks landing as far west as Britain.

FOOD & FEEDING

Subsisting mainly on seeds and nuts, the nutcracker gets its name from its unusual ability to crack open hard shells. Seeds are pried from cones and cracked open with the unusual interlocking protrusion found in the nutcracker's beak; small nuts are cracked the same way. But larger nuts are generally held in a claw or wedged into a rock or crevice and pecked open.

While stored seeds and nuts will carry the nutcracker through the winter, during the summer and autumn it supplements its diet with berries and insects. Spotted nutcrackers that invaded Britain in the 1960s reportedly fed on everything from cake to live rodents, behavior clearly motivated by extreme hunger.

DID YOU KNOW?

- **The spotted nutcracker will carefully disguise the areas that contain its stored seeds by covering them with bark, lichen, moss or other natural camouflage.**
- **Spotted nutcrackers' larders of buried seeds are one of the most important means by which Eurasian coniferous forests spread.**

BEHAVIOR

Generally a solitary bird, the nonmigratory spotted nutcracker is territorial and will defend its food supply with a vengeance year -round. During the autumn, a pair will hoard enough food items to last through the winter. They carry a load to their cache and bury the seeds, nuts and other edibles. Months later, the caches may be covered by several feet of snow, making the surroundings unrecognizable. The nutcracker must tunnel deep into the snow to find its stored food, but it has a better than 75% success rate.

CACHE AND CARRY

1 Fast food...
Using its foot as a brace, a spotted nutcracker pries a seed from an Arolla pinecone to be added to its growing stash.

2 Carryout...
The nutcracker places a hazelnut in its neck pouch for transport to one of its many caches of nuts and seeds.

3 Leftovers...
Carefully hiding the nuts and seeds, the nutcracker adds to its collection, which can exceed 20,000 seeds in a single year.

4 Checking the fridge
When food becomes scarce, the nutcracker returns to its larders, finding many under deep snow.

▲ **OFF MY CLOUD**
Nutcrackers are highly territorial and defend their limited food supplies throughout the year.

BREEDING

Despite their solitary habits, gatherings of up to 200 nutcrackers have been recorded during the early part of the breeding season, though these parties typically consist of about 10 birds. The gatherings apparently help young nutcrackers meet one another and select a mate. Territorial pairs will usually allow these gatherings in their territory, though other birds are not allowed to feed.

Spotted nutcrackers mate for life, and each season they take about 12 days to build a nest of twigs, lichen and brambles. Located 18–20' off the ground, nests tend to be wedged at the base of a branch. The female lays a clutch of 2–5 eggs, which are light blue with light-brown speckles. The eggs are incubated by both parents for 16–18 days; the nutcracker is the only member of the crow family that shares this duty. The young nutcrackers fledge at about 3 weeks old, but stay with their parents for 3 months or more.

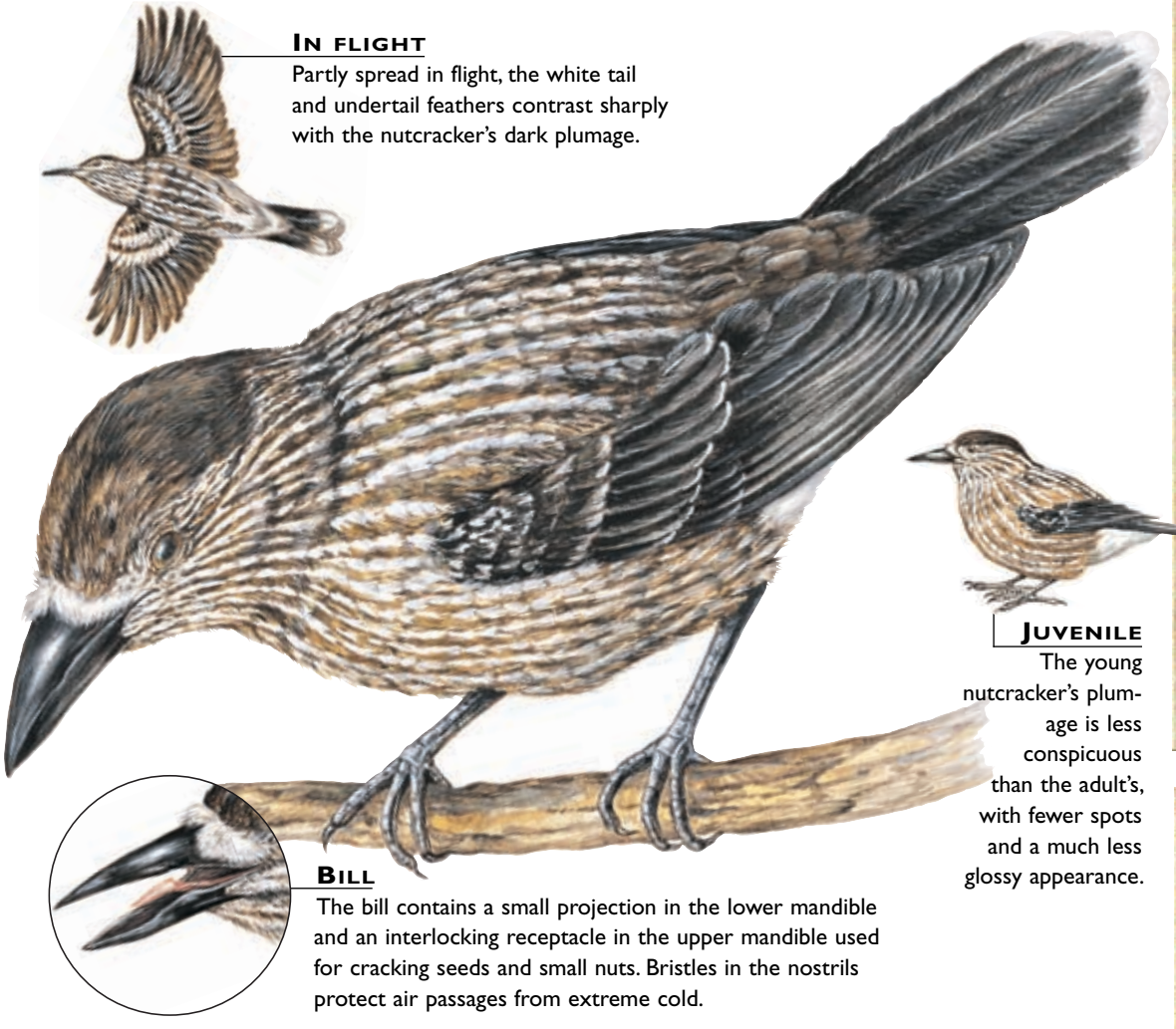
▼ **FILLING STATION**
Nutcracker nestlings are always hungry.

CONSERVATION

Because of the spotted nutcracker's ability to subsist on virtually anything and its willingness to migrate to new feeding areas, it is in no immediate danger. It does face some potential threats due to habitat destruction by the timber industry, but the unusually cold areas it prefers keep it relatively isolated and safe.

PROFILE SPOTTED NUTCRACKER

With bristles in its nostrils and a throat pouch for collecting food, the spotted nutcracker is well adapted to high elevations and cold Arolla pine forests.



IN FLIGHT
Partly spread in flight, the white tail and undertail feathers contrast sharply with the nutcracker's dark plumage.

JUVENILE
The young nutcracker's plumage is less conspicuous than the adult's, with fewer spots and a much less glossy appearance.

BILL
The bill contains a small projection in the lower mandible and an interlocking receptacle in the upper mandible used for cracking seeds and small nuts. Bristles in the nostrils protect air passages from extreme cold.

VITAL STATISTICS

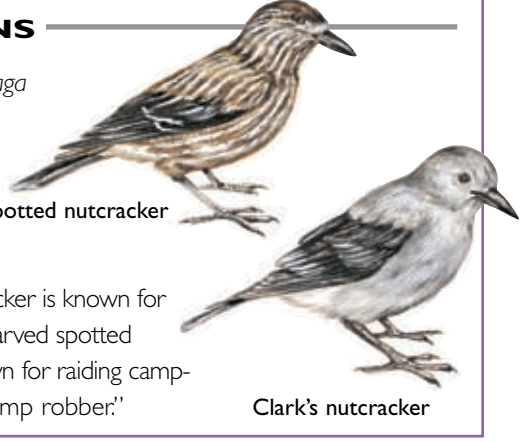
WEIGHT	4–7 oz.
WINGSPAN	18–20"
SEXUAL MATURITY	1 year
BREEDING SEASON	March–May, depending on region
NUMBER OF EGGS	2–5, usually 3–4
INCUBATION PERIOD	16–18 days
FLEDGING PERIOD	23 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Seeds of pine trees, nuts, including hazel nuts and acorns, insects and birds' eggs
LIFESPAN	Up to 8 years

RELATED SPECIES

● **The genus *Nucifraga* contains two species: the spotted nutcracker, native to Eurasia, and Clark's nutcracker, *N. columbiana*, of North America. While *N. columbiana* is one distinct species, there are eight subspecies of *N. caryocatactes*. All of the Eurasian subspecies share characteristics and habitats, and are indistinguishable in the field. Nutcrackers are related to jays and crows.**

CREATURE COMPARISONS

Smaller than its Eurasian cousin, Clark's nutcracker *(Nucifraga columbiana)* is strictly a North American bird. Named for its discoverer, Captain William Clark (of the Lewis and Clark expedition), Clark's nutcracker has a more uniform coloration than that of the spotted nutcracker, with pale smoky-gray and black-and-white highlights on the wings and tail. Noisy and aggressive, Clark's nutcracker is known for its peculiar taste for meat, an indulgence only the most starved spotted nutcracker would consider. Clark's nutcracker is also known for raiding campsites for food, for which it has earned the nickname "camp robber."



Spotted nutcracker

Clark's nutcracker

Stone Curlew

• ORDER •
Charadriiformes

• FAMILY •
Burhinidae

• GENUS & SPECIES •
Burhinus oedicnemus

KEY FEATURES

- A nocturnal bird, its loud, melodious calls are heard after sunset and throughout the night
- Coloration helps both the chick and adult blend in amazingly well with their heath homeland
- Enlarged heel joint, commonly mistaken for a knee, has led to its common name, "thick-knee"

WHERE IN THE WORLD?

Found in Europe and northern Africa; also in southwest Asia, including India, Myanmar and the Arabian Peninsula

LIFECYCLE

The stone curlew spends its life well hidden: egg, chick and adult are all effectively cloaked from most daytime intruders with camouflaging colors.

HABITAT

Open country — far from the noise of civilization — attracts the stone curlew. The bird is found across Europe and Southwest Asia in sandy or stony grasslands or heaths. The stone curlew prefers dry areas, unlike the other members of its family, *Burhinidae*. The stone curlew is also the only migratory bird in this family. In the northern reaches of its range, flocks form in October and migrate south to northern Africa, returning north again in March. Other stone curlews remain in their home year-round.

▼ **CRYPTIC CURLEW**
A motionless curlew blends with its surroundings.

CONSERVATION

Though the stone curlew is currently not endangered, its numbers have been affected by habitat destruction. Open heath areas, needed for nesting, are disappearing throughout Europe as housing developments replace them. The habitat disturbance caused by construction forces the stone curlew to leave surrounding areas as well, since the bird prefers to stay far away from any kind of human activity.

BREEDING

▲ **STAY DOWN**
Flattened chicks are difficult to detect.

The stone curlew mates for life, and pairs usually return each year to the same nesting territory. During courtship, the two birds stand together, their necks arched and bills pointed to the ground. They touch bills and bow, and then often run around excitedly. The nest is a mere scrape in the ground, near vegetation but not actually among the plants. Stones and rabbit droppings, used for padding, may be added to the hollow. The female lays two buff eggs; their dark-brown spots camouflage them well. Both parents incubate the eggs and care for the young, which look like fluffy bundles of feathers on stilts. The chicks walk at 2 days old and quickly learn how to find food themselves; they fledge by 5 weeks of age.

▼ **KEEP IT SIMPLE**
The curlew's nest is just a slight depression.

BEHAVIOR

The stone curlew is more often heard than seen. Its nighttime calls include a loud, melodious *curlee,* hence its common name. The stone curlew's muted colors and patterns provide excellent camouflage while it rests during the day. The bird often squats on its tarsi; its streaked-brown upperparts blend with the ground. It will often remain completely still when approached. But, depending on the threat and whether eggs or chicks are in danger, the bird will also stand, spread out its wings and erect its feathers.

A PLAN FOR DISTRACTION

1 Warning...
A female is incubating her eggs when the male sights approaching sheep and signals her with an alarm call and threat posture.

2 Confronting...
The male approaches one of the sheep in order to attract its attention, while the female secretly leaves the nest.

3 Diverting...
Both parents attempt to redirect the sheep's attention from the nest by performing an elaborate distraction display.

4 Departing
The startled sheep walks away. The male follows, continuing to intimidate the sheep; the female sneaks back to the nest.

FOOD & FEEDING

At sunset, the stone curlew rises from its daytime rest to begin an evening of searching, with its piercing, yellow eyes, for insects, worms, snails, lizards, frogs and rodents. The bird also eats young chicks, especially pheasants and partridges. The stone curlew strides purposefully along, almost trotting, and stops frequently to probe the soil with its short, straight bill. Its diet is similar to that of day-active (diurnal) birds but, with the other birds asleep, the stone curlew has little competition.

▲ **A PROBING PAIR**
Two stone curlews search the grassland floor for food, probing for worms and insects.

DID YOU KNOW?

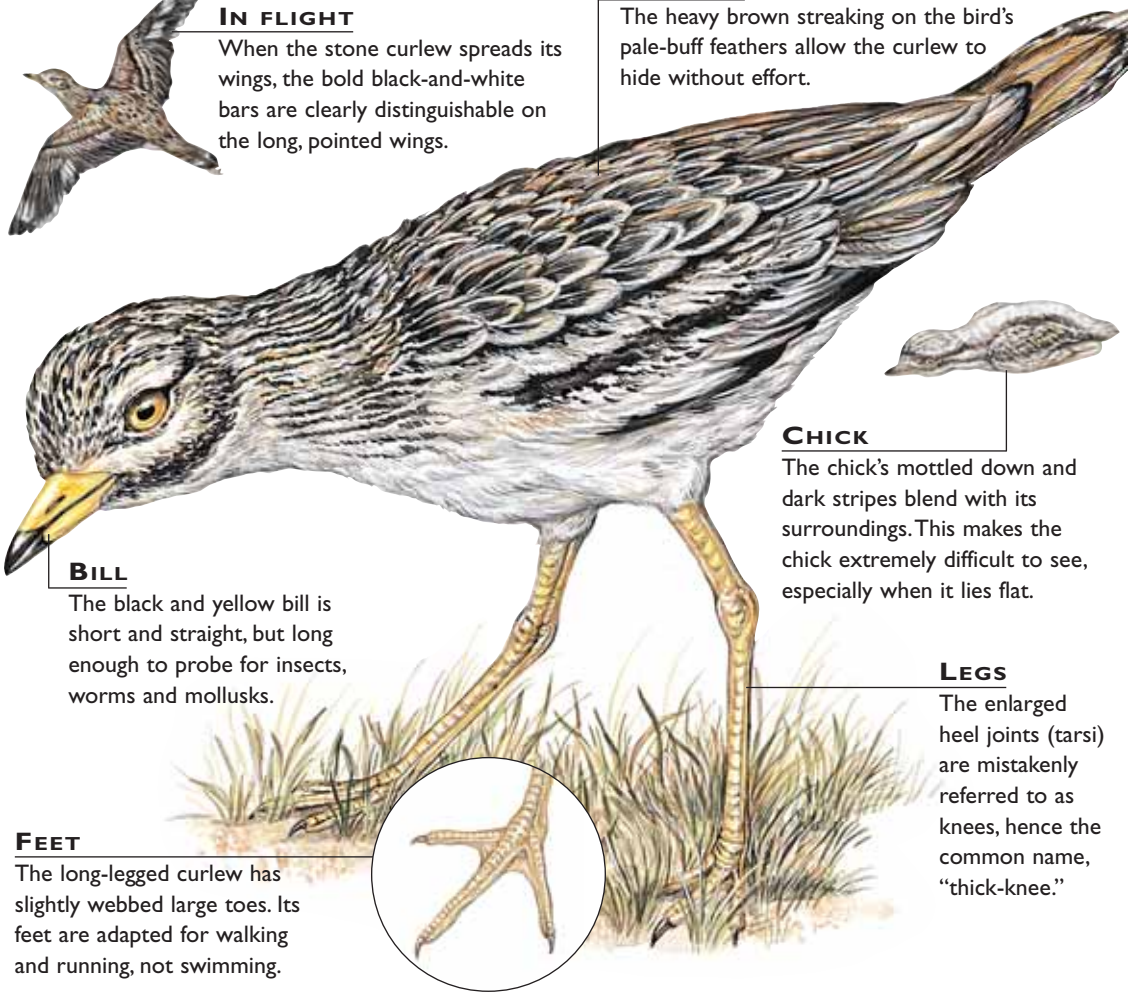
- **Stone curlew chicks will attain adult plumage within 3 months of birth.**
- **The stone curlew is very confident in its ability to stay unseen on the ground; even when touched by humans, it often remains perfectly motionless.**
- **If danger threatens before the chicks can run, the parents pick them up and carry them to a new hideaway.**

PROFILE STONE CURLEW

The stone curlew's nighttime feeding expeditions are aided by hawklike eyes, strong feet and fluid, silent flight.

IN FLIGHT
When the stone curlew spreads its wings, the bold black-and-white bars are clearly distinguishable on the long, pointed wings.

PLUMAGE
The heavy brown streaking on the bird's pale-buff feathers allow the curlew to hide without effort.



CHICK
The chick's mottled down and dark stripes blend with its surroundings. This makes the chick extremely difficult to see, especially when it lies flat.

BILL
The black and yellow bill is short and straight, but long enough to probe for insects, worms and mollusks.

LEGS
The enlarged heel joints (tarsi) are mistakenly referred to as knees, hence the common name, "thick-knee."

FEET
The long-legged curlew has slightly webbed large toes. Its feet are adapted for walking and running, not swimming.

VITAL STATISTICS

WEIGHT	13–16 oz.
LENGTH	16–17"
SEXUAL MATURITY	2–3 years
BREEDING SEASON	April–July
NUMBER OF EGGS	2
INCUBATION PERIOD	24–27 days
FLEDGING PERIOD	36–42 days
BREEDING INTERVAL	Sometimes 2 broods per year
TYPICAL DIET	Insects and occasionally small vertebrates
LIFESPAN	Up to 16 years

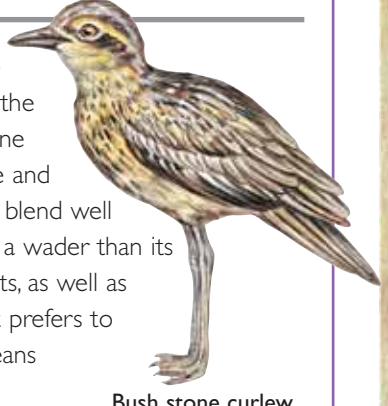
RELATED SPECIES

● The stone curlew is one of 7 species in the genus *Burhinus*. Other members include the spotted thick-knee, *B. capensis*, and dikkop, *B. vermiculatus*. The family *Burhinidae* includes both *Burhinus* and the genus *Esacus*, which contains the beach stone curlew, *E. magnirostris*. These birds join gulls, terns and auks in the order *Charadriiformes*, which contains over 300 species.

CREATURE COMPARISONS

Stone curlew

Measuring up to 23.5" long, the bush stone curlew (Burhinus grallarius), also called the bush thick-knee, is much larger than the stone curlew. Easily distinguished by its black eye stripe and streaking, the bush thick-knee's color patterns still blend well with its surroundings. The bush thick-knee is more of a wader than its cousin, and lives along reefs, beaches and coastal mud flats, as well as grassy woodland in Australia. Like the stone curlew, it prefers to feed at night, but eats mainly mollusks and crustaceans found near the waterline.



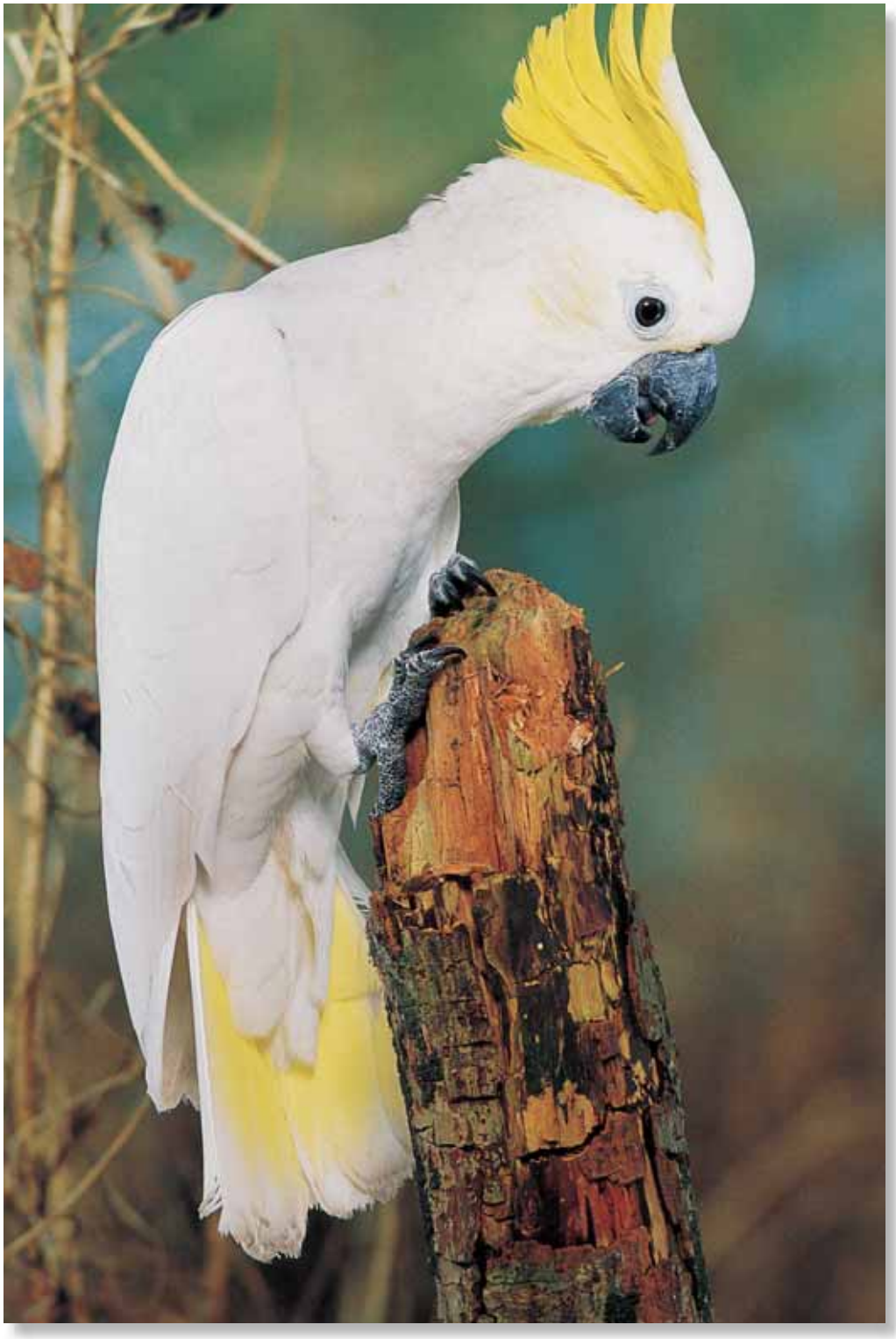
Bush stone curlew

Sulphur-crested Cockatoo

• ORDER •
Psittaciformes

• FAMILY •
Psittacidae

• GENUS & SPECIES •
Cacatua galerita



KEY FEATURES

- Easily distinguished by snow-white plumage and large erectile crest of yellow feathers
- Lives in noisy and conspicuous flocks, but is difficult to approach as some flock members stand on lookout duty and quickly warn others of approaching danger
- Has a huge appetite for seeds and grain and is regarded as a pest of commercial crops

WHERE IN THE WORLD?

In woodlands and clearings in northern, southeastern and eastern Australia; widespread in New Guinea, except for central highland areas, Tasmania and islands of southeastern Pacific

LIFECYCLE

The sulphur-crested cockatoo is a wary bird. It protects itself when feeding in a flock on the ground by posting lookouts in nearby trees to give early warning of danger.

HABITAT

The cockatoo occupies a wide range of habitats in Australia and New Guinea, occurring in highland forests to 4,950–7,920', in eucalyptus forests, coastal mangroves and in savannah woodland.

In Australia, the species has become particularly common and widespread on farmland and, recently, has increasingly begun to move into urban areas during the winter. Some cities in eastern Australia, such as Sydney and Canberra, even have large resident flocks of sulphur-crested cockatoos living in the suburbs.

▶ **ONE-UPMANSHIP**
The perching cockatoo is never far from trees.

▲ **LOCAL COLOR**
Flocks of sulphur-crested cockatoos rarely move far from their home patch and tend to stay in one locality year-round.

FOOD & FEEDING

Fruit, seeds, berries and nuts make up the main part of the sulphur-crested cockatoo's diet. These are taken from a variety of trees and bushes and from the ground. The cockatoo also supplements its diet with flowers, leaf buds, insects and larvae.

Large flocks feeding in agricultural areas can cause considerable damage to commercial crops and the cockatoo is regarded as a pest in cereal-growing districts of Australia. However, as the same flocks also consume enormous quantities of weed seeds, such as thistles, which are an invasive farmland pest, the cockatoo's feeding habits are also a benefit to farmers.

BREEDING

During the breeding season, the male performs a courtship ritual that involves strutting along a branch toward the female. With his crest raised, he bobs his head up and down and from side to side in a figure-eight pattern. If he does well, a session of mutual preening and bill-touching follows to cement the bond.

After mating, the female lays 2–3 white eggs. Hatching naked and blind five weeks later, young are fed by both parents. Young remain in the nest until they fledge at 10 weeks and fly out, dispersing to join a flock.

▶ **TREE HOUSE**
Tree holes, or hollow trees, provide an ideal nest site.

CONSERVATION

In parts of New Guinea, the sulphur-crested cockatoo is still hunted for its feathers. Elsewhere it's often kept as a pet and despite the illegal capture of wild specimens, the species is in no immediate danger.

BEHAVIOR

In the northern part of its range, the cockatoo forms pairs or small groups all year. In the south, it forms large flocks year-round, except in the breeding season.

At dawn, the sulphur-crested cockatoo leaves its roosting site, joining others screeching and shrieking to drink at a watering hole. Much of the day is spent feeding, but at the hottest time of day, the flock shelters in trees. Returning to the roosting site at dusk, individuals jostle and squawk noisily as they squabble over perching places.

▲ **UNDERCOVER**
Trees provide roosts and shade from heat.

◀ **FOOT AND MOUTH**
The cockatoo often brings food to its bill with its feet.

▼ **UP AND DOWN**
The cockatoo feeds in the trees and on the ground.

SAFETY IN NUMBERS

1 Departing…
Cockatoos spend the night in the safety of a roost. Squawking noisily, they set off at dawn, first to drink, then to feed.

2 Surveying…
The birds spend some time surveying the land, searching for open areas where they can feed in safety on the ground.

3 On guard…
While the main flock is feeding on the ground, several cockatoos keep a lookout from the tops of nearby trees. All is quiet until…

4 Beat it
…a dingo appears on the scene. The sentries call raucously to alert the feeding birds, which immediately take to the air.

DID YOU KNOW?

- **The sulphur-crested cockatoo's eye color can reveal its sex — dark brown in males, reddish-brown in females.**
- **The oldest captive bird in the world was a sulphur-crested cockatoo called "Cocky," who died in London at the age of 82.**
- **The cockatoo's common and Latin name, *Cacatua*, stem from the Malayan word *kakatoe*: an imitation of the bird's calls.**

▶ **CREST**
A sulphur-crested cockatoo uses its distinctive crest to reflect its mood. By raising its crest it may signal fear, aggression or sexual excitement.

PROFILE

SULPHUR-CRESTED COCKATOO

The sulphur-crested cockatoo, resplendent in its bright-yellow headdress, is equipped with a powerful, nut-cracking bill and highly dextrous feet.

FOOTHOLD

Shape of the feet lets the cockatoo manipulate food items with its toes. It also uses its feet to pick up and inspect unfamiliar objects.

BILL

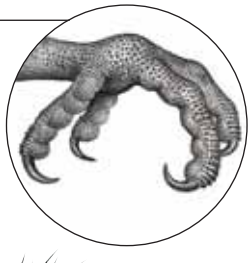
Bill is powerful for cracking tough nuts and sharply hooked for slicing fruit. It's also used like delicate tweezers, along with the fleshy, mobile tongue, to position food ready for crushing or swallowing.

WINGS

Wings are broad and powerful. The cockatoo flies with rapid bursts of shallow wing beats between alternate glides.

FEET

Two toes face forward and two backward. Each toe has a long, curved claw.



VITAL STATISTICS

WEIGHT	28–35 oz.
LENGTH	18–20"
WINGSPAN	28–32"
SEXUAL MATURITY	2–4 years
BREEDING SEASON	May–Sept. in north; Aug.–Jan. in south
NUMBER OF EGGS	2–3
INCUBATION PERIOD	36 days
FLEDGING PERIOD	10 weeks
BREEDING INTERVAL	1 year
TYPICAL DIET	Fruit, seeds, berries, nuts, insects, larvae
LIFESPAN	30–40 years in the wild

RELATED SPECIES

● **There are about 20 cockatoo species in the family *Psittacidae*, which also includes parrots and lories. Most cockatoos have a crest and are black or white with small splashes of other colors, but an exception is the galah, *Eolophus roseicapillus*** (below).

CREATURE COMPARISONS

Many parrots have a head crest, which, like the sulphur-crested cockatoo, they raise if excited. The cockatiel (*Nymphicus hollandicus*), which is smaller than the sulphur-crested cockatoo, has a fine, tapering crest. It's found over Australia's interior, usually near water.

A cockatoo with an impressive, back-swept crest is the palm cockatoo (*Probosciger aterrimus*) of New Guinea and Australia's extreme north. It also has the longest bill of all parrots. The bird is larger than the sulphur-crested cockatoo and is glossy black except for bare, reddish cheek patches, which turn deeper red when it becomes excited.

Cockatiel

Palm cockatoo

Sun Bittern

• ORDER •
Gruiformes

• FAMILY •
Eurypygidae

• GENUS & SPECIES •
Eurypyga helias

KEY FEATURES

- A heronlike wading bird that lives and feeds along tropical forest watercourses
- Camouflaged by its plumage until it reveals brilliant wing "eye spots" in a defensive display
- A specialist predator of fish and other aquatic life, it also hunts among the leaf litter

WHERE IN THE WORLD?

Found in lowland tropical forests in Central and South America, from southern Mexico to Bolivia and the Amazon Basin

LIFECYCLE

The sun bittern lives a sedate life skulking along Central and South American streams, but reacts in a flash to threats by "switching on" a spectacular plumage display.

HABITAT

▲ **OPEN ACCESS**
The sun bittern often strays into clearings.

The sun bittern is primarily a bird of lowland rainforests, although in Venezuela it occurs at altitudes of 6,600'. It always lives by watercourses — slow rivers in the lowlands, fast streams in the mountains — with boulders and fallen branches for perches.

The sun bittern selects nesting and roosting sites in open areas beneath a closed canopy, where it enjoys shelter from the sun, a clear view of predators and an arena for its breathtaking display.

FOOD & HUNTING

The sun bittern's diet includes a wide range of animal prey, most of it aquatic. The menu includes spiders, adult and larval flies, dragonflies, water beetles, cockroaches, snails, crabs, shrimps and worms. Other prey includes frogs, toads and small fish.

The sun bittern stalks slowly and silently along the water's edge or wades in the shallows. It often freezes, head tilted to one side and one leg raised. Once within striking distance of a potential meal, the bird whips its neck forward as quick as lightning to seize its victim with almost unerring accuracy.

In areas where the water is too deep for wading, the sun bittern hunts on the ground, snapping up frogs, spiders and lizards. Adults feed nestlings on freshly killed prey, recovering and presenting again any morsels dropped by their young.

ONCE BITTERN...

1 Shore patrol...
The sun bittern wades stealthily through the shallows, peering intently into the water for any sign of a potential meal.

2 The strike...
The bird startles a small fish from its riverbed niche. With a swift dart, the sun bittern dips its head into the water and traps its victim.

DID YOU KNOW?

- **The sun bittern occasionally washes food items in the river before eating them or presenting them to nestlings.**
- **A brooding sun bittern often sways its body like a snake and hisses to threaten intruders.**
- **Sun bittern fledglings practice the eye-spot display from the age of three weeks.**

BEHAVIOR

3 The catch...
Caught in the grip of the slender but powerful bill, the fish has no chance of escape. The sun bittern swallows its prize head first.

4 Second course
A freshwater crab meets its end in similar style. The bird swallows it whole; its digestive system can dissolve the shell.

BREEDING

The sun bittern's dramatic plumage plays a role in courtship rituals, which include gliding flights and loud hacking calls. The pair breeds early in the rainy season, when mud becomes available for nest-building. Both sexes construct the heap of moss, leaves, roots and grass, using the mud to secure it to a low bough. The female usually lays two eggs, which the pair incubates for up to 30 days.

The chicks hatch with a coat of down and remain in the nest for at least three weeks, fed and guarded by their parents.

▲ **SLOW STARTER**
Nestling development speeds up after 7–10 days.

◀ **HARD STARE**
The large, colorful wing patches resemble a pair of eyes and scare off predators.

The sun bittern is generally solitary except when sharing nest duties with its partner. It is ever wary as it stalks elegantly about its range. Rather than flee instantly from predators or nest thiefs, such as the ocelot, it adopts its defense display. Fanning out its wing and tail feathers, the bird angles them to present the dramatic markings on its wings. The overall impression is that of a huge animal with startling eyes; this is usually enough to frighten off most enemies. The bittern may sustain this posture for over a minute before suddenly folding its plumage and melting into the shadows on the forest floor.

CONSERVATION

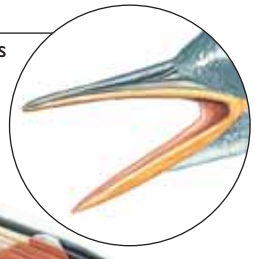
Although not common, the sun bittern is not listed as endangered. Like many tropical forest dwellers, however, it is vulnerable to the effects of deforestation. Where large swaths of trees are felled, soil is washed away. Streams often become more cloudy, making it harder for birds like the sun bittern to find food.

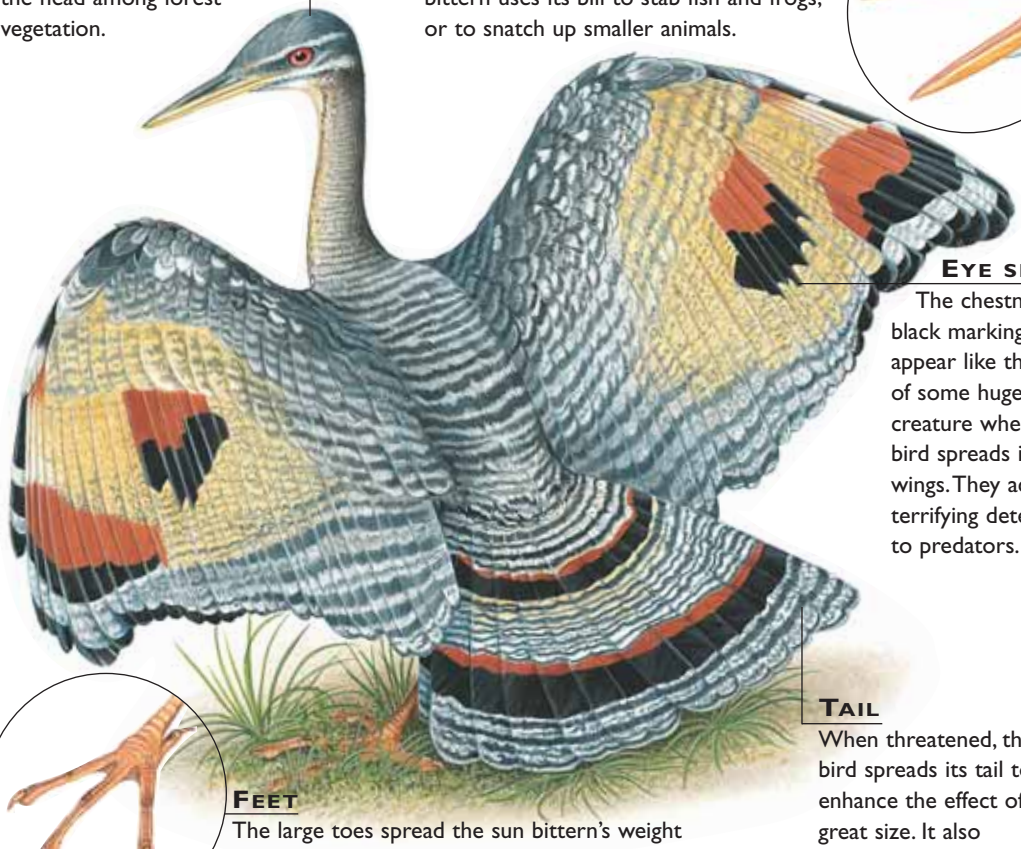
PROFILE SUN BITTERN

With its soft-feathered wings folded, the sun bittern looks a little like a heron, but its defensive display reveals a blaze of rich color and pattern.

HEAD
Stripes above and below each eye help camouflage the head among forest vegetation.

BILL
The upper part of the bill is black, whereas the lower mandible is orange. The sun bittern uses its bill to stab fish and frogs, or to snatch up smaller animals.





EYE SPOTS
The chestnut and black markings appear like the eyes of some huge creature when the bird spreads its wings. They act as a terrifying deterrent to predators.

TAIL
When threatened, the bird spreads its tail to enhance the effect of great size. It also exposes its markings during courtship.

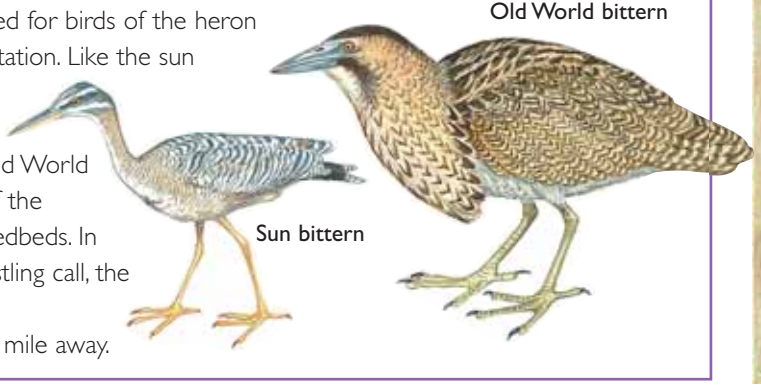
FEET
The large toes spread the sun bittern's weight when it walks on soft, muddy riverbeds. The short hindtoe helps the bird grip a branch when perched.

VITAL STATISTICS

WEIGHT	6–8.5 oz.
LENGTH	17.5–19"
WINGSPAN	24–28"
SEXUAL MATURITY	1–2 years
BREEDING SEASON	Start of the rainy season
NUMBER OF EGGS	2
INCUBATION PERIOD	29–30 days
FLEDGING PERIOD	21 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Small fish, frogs, insects and spiders
LIFESPAN	Unknown

CREATURE COMPARISONS

The name bittern is generally used for birds of the heron family that live in waterside vegetation. Like the sun bittern, these true bitterns use a combination of stealth and camouflage to catch prey. The Old World bittern (*Botaurus stellaris*), one of the largest, hunts fish and frogs in reedbeds. In contrast to the sun bittern's whistling call, the Old World bittern utters a powerful boom audible over 1 mile away.



RELATED SPECIES

● **The sun bittern is the sole species in its family; 3 subspecies are distinguished by small plumage differences. The sun bittern is unrelated to the Old World bittern and little bittern, *Ixobrychus minutus* (below), members of the heron family *Ardeidae*.**

Superb Lyrebird

• ORDER •
Passeriformes

• FAMILY •
Menuridae

• GENUS & SPECIES •
Menura novaehollandiae

KEY FEATURES

- Pheasant-sized, it's one of the largest and most remarkable of all perching birds
- The male is an outstanding singer and also has an unrivaled capacity for mimicking the sounds of other birds and animals
- The male's long, lacy, ornamental tail feathers form a spectacular veil that covers its body during courtship displays

WHERE IN THE WORLD?

Found in southeastern Australia (southeastern Queensland to southern Victoria); in 1934, the species was introduced to central and southeast Tasmania, where its numbers are slowly increasing

LIFECYCLE

The sweet-voiced lyrebird, named after the lyre (a harplike musical instrument with a shape resembling the erect arch of the male's tail) is among nature's showiest performers.

HABITAT

The lyrebird lives in a variety of habitats from sea level to above mountain snowlines in both tropical and subtropical regions of eastern Australia.

In the southeast of its range, the lyrebird inhabits wet and lush eucalyptus forests and rainforests, favoring damp, fern-filled gullies as its home base. Toward the northern limits of its range (along the New South Wales–Queensland border), it's found in rugged, open country where dead vegetation litters the ground and outcrops of granite punctuate the landscape. Superb lyrebirds sometimes venture into new forest plantations or gardens next to forests, as they are attracted to newly turned soil.

▲ **FERN GULLY**
Some lyrebirds live at the bottom of dark gullies.

BREEDING

During the breeding season, males defend display mounds that they build from soil. Perched on top, they sing and perform courtship displays to attract females. Each male usually mates with several females. After mating, however, a male takes no further interest in the females or the care of their young.

The female builds a large, domed nest from sticks, bark, ferns and moss. Sites are hidden in vegetation on the ground, a bank or even in a tree. The female incubates her single egg for much longer than most perching birds — about 42 days. This allows her to spend 3–6 hours off the nest each morning looking for food. Once the chick hatches, it's brooded by its mother for 10 days. The chick isn't fledged until it's 6 weeks old and is partly dependent on its mother for food for up to 8 months.

SHOWING OFF

1 Build...
A male rakes a mound of soil from which to advertise his presence to females. The mound is about 3–7' across and 6" high.

2 Display...
He builds several mounds and visits them in turn to pour out a torrent of song and to display, spreading his lacy tail up and over his head.

DID YOU KNOW?

- **Young lyrebirds learn their song from local adults; each group of males has a distinct "dialect" from the area in which it lives.**
- **Because the lyrebird's voice box is simpler than other songbirds', with only three muscles controlling the sounds it produces, its complex song may be the result of learning rather than its sound-producing apparatus.**

FOOD & FEEDING

The superb lyrebird spends much of the day searching for food. It rakes leaf litter of forest floors with its strong feet and long claws for insects, worms and other invertebrates, like a chicken scratching for farmyard food. As it strides, it sweeps one foot sideways to the right and then the other to the left, sending the surface material flying to the side.

The lyrebird's diet includes beetle and fly larvae, spiders and millipedes. Its powerful feet and claws are capable of upturning stones and other large objects, or ripping bark from rotting logs or fallen branches, to reveal prey that may lie in hiding beneath them.

◀ **DIG DEEP**
The lyrebird probes soil for worms and other prey.

3 Attract...
Three females approach, attracted by his performance. The male bends his tail forward, creating a veil that hides his head, body and wings.

4 Mate
After prancing on his mound and uttering a quieter song, the male chooses one of the females, making clicking calls, and mates.

▼ SCRATCH AND RAKE

Leaf litter on forest floors often hides invertebrate food, which the lyrebird reveals using its long legs.

BEHAVIOR

During the breeding season (autumn and winter), a mature male lyrebird defends a territory by singing and chasing intruding males. Several females may take up separate breeding territories near a male. After mating, a female devotes her time to rearing her young alone. By summer, the birds often live in loose feeding groups of females and males.

Lyrebirds are secretive. They are rarely seen; during the day they often hide in vegetation or in the trees, while at night they roost high in the forest canopy. Lyrebirds prefer to run rather than fly and often escape predators by running rapidly through the undergrowth; they may also flee by making flying bounds across the ground or rising into the trees.

The male bird's unmatched repertoire of songs and its ability to mimic make it stand out. The song is a loud medley of rich, mellow notes, rasps, clicks and superbly mimicked sounds. The lyrebird is capable of imitating up to 16 bird species and can even mimic humans. Females occasionally utter bursts of song, but they are weaker than those of males.

▲ SING A SONG

The lyrebird's song can be heard half a mile away.

CONSERVATION

Over much of its limited range, the superb lyrebird is fairly common and fully protected by law. The chief threat to this bird is the increasing clearance of wet forests that are its stronghold. Destruction of native forests has been implicated as a major factor in the decline of over half of Australia's species of songbirds. Ultimately, the survival of this and other bird species depends on reversing forest clearance, along with the establishment of even more reserves.

PROFILE SUPERB LYREBIRD

The male superb lyrebird flaunts his beautiful train of filmy, shimmering tail feathers and pours out his elaborate song to advertise for mates.

MALE'S TAIL

The tail, which is molted each year, is 20–24" long and consists of two broad, lyre-shaped outer feathers called *lyrates*. Twelve lacy feathers and two wirelike central feathers (*guard plumes*) make up the rest of the tail. The tail forms a spectacular train when the male erects it in courtship display. It takes young males 3–8 years to acquire these splendid plumes.

PLUMAGE

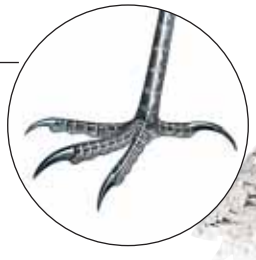
The bird has plain, rich-brown upperparts (with a coppery tinge to the wings) and gray-brown underparts. The male has a small red-brown patch on the throat, which is especially visible on younger birds.

FEMALE

The female is a smaller and less striking bird than the male. Its tail is much simpler, with shortish feathers that are a dull, grayish brown.

LEGS & FEET

Legs and feet are powerful with large, strong toes and long claws. They're adapted for walking or running on the ground and raking aside soil or leaf litter on the forest floor to find food. Males also use them for scratching up soil to form display mounds.



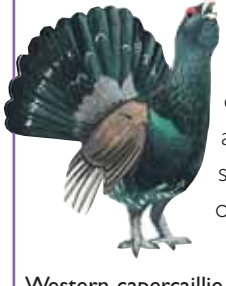
VITAL STATISTICS

WEIGHT	Male 1–2.5 lbs.; female 1–3 lbs.
LENGTH	2.5–3'
WINGSPAN	Unknown
SEXUAL MATURITY	Male 3–8 years; female 2 years
BREEDING SEASON	May–October
NUMBER OF EGGS	1
INCUBATION PERIOD	About 6 weeks
FLEDGING PERIOD	About 6 weeks
TYPICAL DIET	Insects and their larvae, worms and other invertebrates
LIFESPAN	Up to 20 years

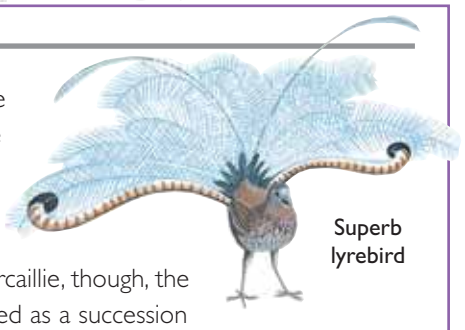
RELATED SPECIES

● **There are two superb lyrebird subspecies: the southeastern superb lyrebird, *Menura n. novaehollandiae*, and northern superb lyrebird, *M. n. edwardi* (occurs along northern margins of its range). Albert's lyrebird, *M. alberti*,** (below) **is also in the area.**

CREATURE COMPARISONS



Western capercaillie



Superb lyrebird

No relation of the superb lyrebird, the Western capercaillie (*Tetrao urogallus*), a member of the grouse family found in coniferous forests of northern Eurasia, also has a courtship display involving spreading of tail feathers and an extraordinary song. With the capercaillie, though, the song is hardly melodious; it's often described as a succession of accelerating "plops," followed by a loud pop and ending with a wheezing gurgle. The turkeylike Western capercaillie is stockier than the superb lyrebird, but like the lyrebird, has short, rounded and weak wings.

Swallow-tailed Gull

• ORDER •
Charadriiformes

• FAMILY •
Laridae

• GENUS & SPECIES •
Creagrus furcatus

KEY FEATURES

- Emits an eerie sound, a cross between a snore and a scream
- Like a bat, finds food through echolocation with the help of a clicking call
- White markings on its bill make the bird more visible at night to its young chicks

WHERE IN THE WORLD?

Breeds on Galapagos Islands; also inhabits Malpelo Island off Colombia and eastern South America from Panama to Peru

LIFECYCLE

The gull forms loose colonies during breeding seasons: close neighbors often synchronize egg laying. One bird's displays stimulate a chain reaction among other mating pairs.

HABITAT

The swallow-tailed gull is equally at home on cliffs, sand and rough lava deposits. Cliff ledges appear to be the gull's most successful breeding ground and nesting habitat. It frequents all of the Galapagos Islands, except Fernandina. After breeding in the Galapagos, the gulls fly east into Ecuador and Peru. Some occasionally travel into Panama.

▲ **DAYTIME GLIDE**
The swallow-tailed gull migrates from breeding grounds in the Galapagos to winter homes in Ecuador and Peru.

DID YOU KNOW?

- **During moments of anxiety, the swallow-tailed gull shows its tongue.**
- **On the Galapagos Islands, the birds' piercing alarm calls greet visitors.**
- **The Galapagos short-eared owl preys on swallow-tailed chicks, but as a protected area, the Galapagos Islands offer a relatively safe environment for the gull.**

BREEDING

The swallow-tailed gull breeds in loose colonies but sometimes seeks solitude on gravel beaches and cliff slopes on the Galapagos Islands. Courtship includes calls and the male offering the female pebbles for the nest and regurgitated fish or squid. Males choose the nesting site along the rocky cliffs and shores. As lifetime mates, both sexes are extremely loyal and territorial, with the female often flying alongside the male. The nest consists of up to about 300 small pebbles with a depression in the middle. Breeding pairs within small social groups often synchronize nest-building and egg-laying. A "leader" pair begins to build a nest and lay the single egg, and other gulls follow their example. Both parents incubate for about 35 days; the newly hatched chick weighs about 1.5 oz. and is gray and fluffy with black markings. The chick pecks at the white spot on its parent's bill when begging for food at night, and receives regurgitated food for its efforts.

AND BABY MAKES THREE

1 Maximum attention...
One parent leaves the cliffside nest in search of food while the other watches over the chick.

2 Nightly feed...
The parent joins two other gulls in their nightly search on the surface of the calm sea.

FOOD & HUNTING

With its long bill poised, the swallow-tailed gull searches for fish and squid near the water's surface after sunset, usually flying about 10–20 miles offshore. It may also snatch squid and fish in the wake of motor boats cruising near the Galapagos Islands. The gull has keen eyesight — the eye's oil droplets enhance the prey's coloration in the water. The gull also uses a variety of vocalizations to locate its food. The calls are similar to sounds used for echolocation, creating sounds that echo back to the ears and help to pinpoint swimming prey. Juveniles use the white spot on the adult's bill as a focal point when begging for food; the white is like a beacon in the night.

▶ **NIGHTTIME MEAL**
The swallow-tailed gull uses its long bill to snatch snacks from the sea.

3 Bullseye...
The swallow-tailed gull, using its keen eyesight, spots large squid propelling through the water.

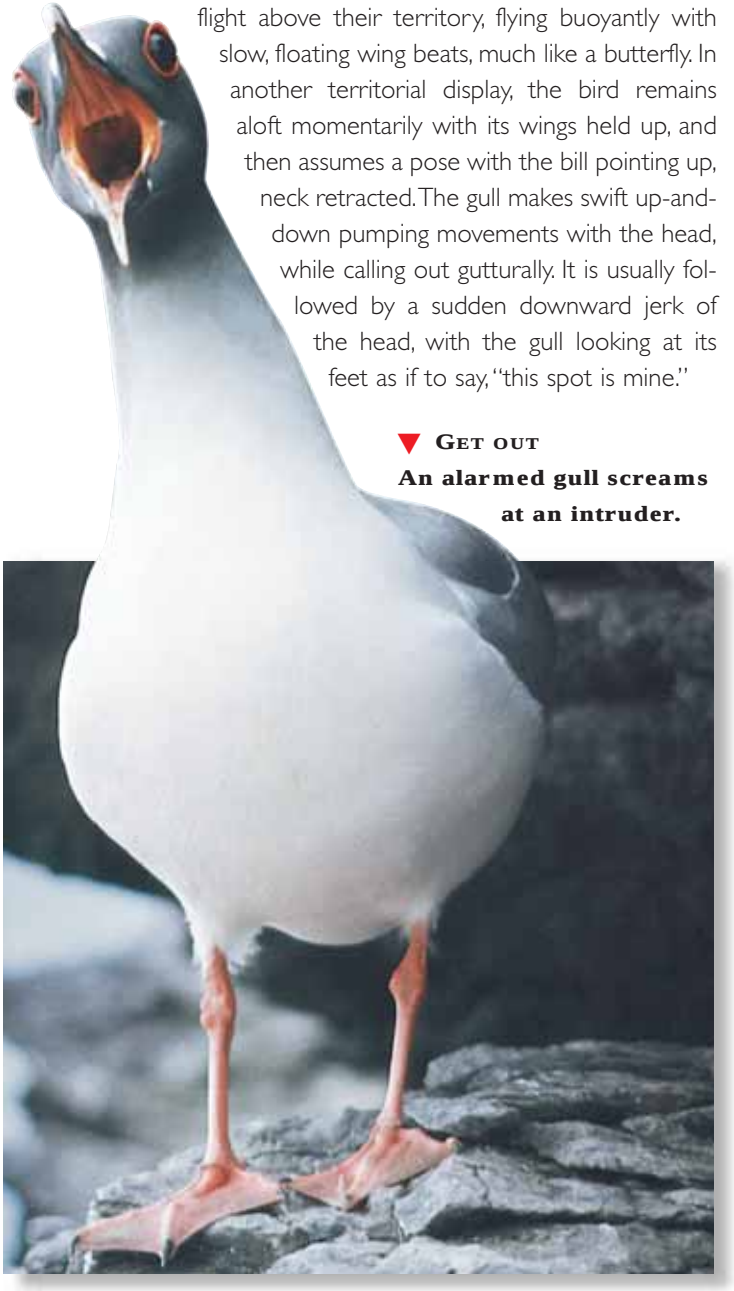
4 Back home
The swallow-tailed chick anxiously waits for its parent to finish regurgitating its meal.

CONSERVATION

With a total population of 10,000–15,000 pairs, the swallow-tailed gull is not endangered. However, there have been periodic food shortages that affect the swallow-tailed gull population, and sometimes survival rates of hatchlings are low because of predators, such as owls.

BEHAVIOR

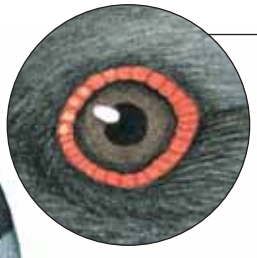
The gull defends strictly defined territories; consequently, as long as approaching birds remain on the right side of the boundary, they will be tolerated, even though they may be quite near. A variety of calls are used to announce and defend the territory; the swallow-tailed gull has a rather un-gull-like vocal repertoire, which includes snoring, rattling, screaming and whistling sounds. Territorial fights are infrequent and not very violent, but when trespassing occurs, the males will twist each others' bills. After an aggressive encounter, males often make a display flight above their territory, flying buoyantly with slow, floating wing beats, much like a butterfly. In another territorial display, the bird remains aloft momentarily with its wings held up, and then assumes a pose with the bill pointing up, neck retracted. The gull makes swift up-and-down pumping movements with the head, while calling out gutturally. It is usually followed by a sudden downward jerk of the head, with the gull looking at its feet as if to say, "this spot is mine."



▼ **GET OUT**
An alarmed gull screams at an intruder.

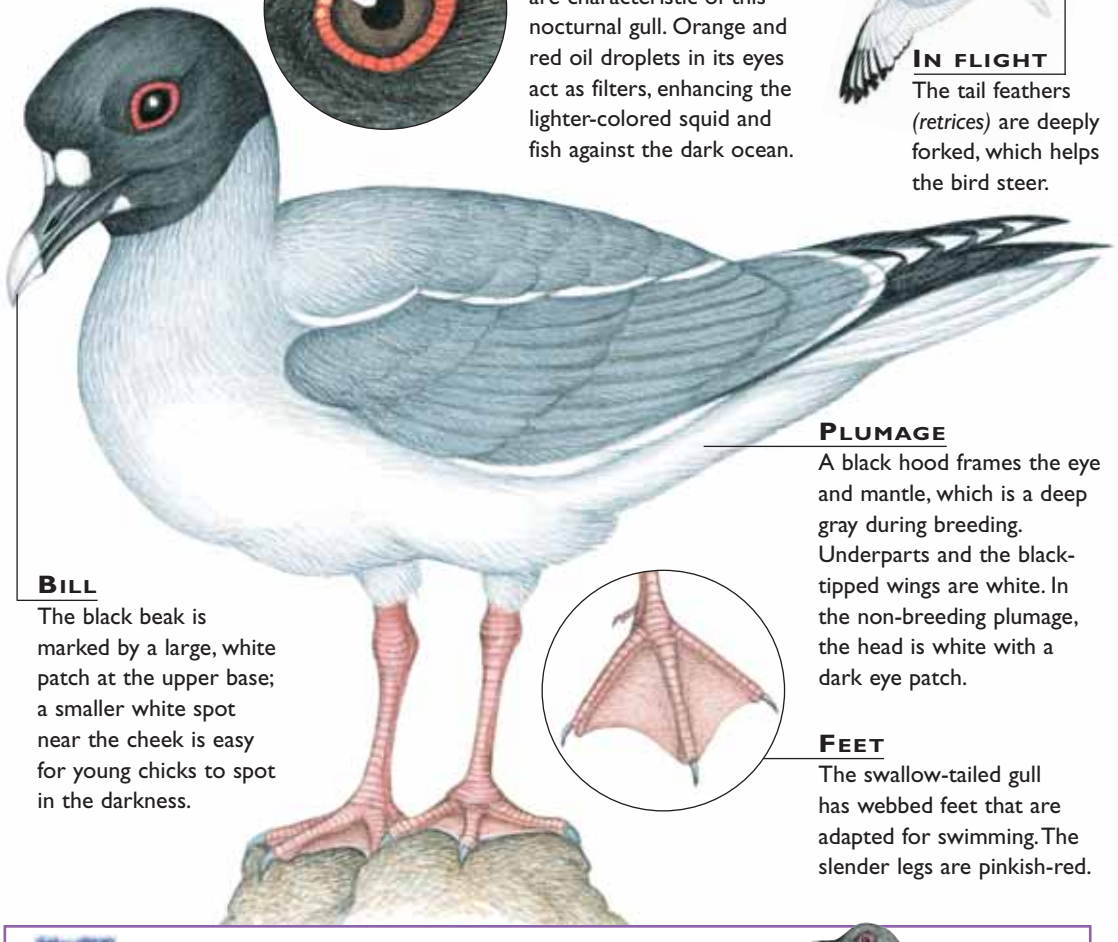
PROFILE SWALLOW-TAILED GULL

The swallow-tailed gull is most active at night, staring intently into the sea with its crimson-ringed eyes in search of squid and fish.



EYES
A dark-brown iris and a broad crimson eye ring are characteristic of this nocturnal gull. Orange and red oil droplets in its eyes act as filters, enhancing the lighter-colored squid and fish against the dark ocean.

IN FLIGHT
The tail feathers *(retrices)* are deeply forked, which helps the bird steer.



BILL
The black beak is marked by a large, white patch at the upper base; a smaller white spot near the cheek is easy for young chicks to spot in the darkness.

PLUMAGE
A black hood frames the eye and mantle, which is a deep gray during breeding. Underparts and the black-tipped wings are white. In the non-breeding plumage, the head is white with a dark eye patch.

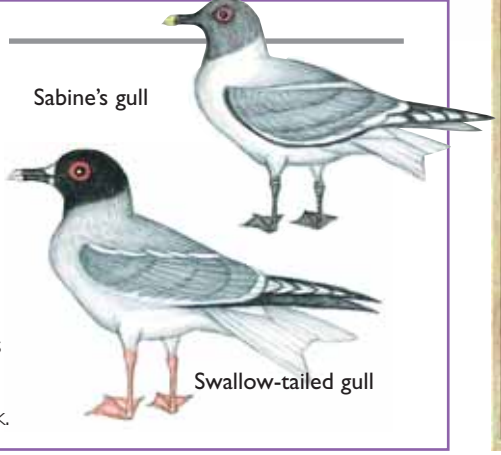
FEET
The swallow-tailed gull has webbed feet that are adapted for swimming. The slender legs are pinkish-red.

VITAL STATISTICS

LENGTH	22"
WINGSPAN	52"
SEXUAL MATURITY	1–2 years
BREEDING SEASON	Throughout the year; depends on region
NUMBER OF EGGS	1
INCUBATION PERIOD	34–35 days
FLEDGING PERIOD	58–65 days
BREEDING INTERVAL	Up to 10 months
TYPICAL DIET	Squid, fish
LIFESPAN	About 5–18 years

CREATURE COMPARISONS

At 13" Sabine's gull (*Larus sabini*) is about half the size of the swallow-tailed gull. Unlike its South American cousin, Sabine's gull breeds near the coasts of Alaska, northern Canada, Greenland, Russia and Siberia. Both gulls search for fish, which they snatch from the upper surface of the sea. The heads of both gull species remain white during nonbreeding seasons, but during breeding the Sabine's hood is mostly gray, while the swallow-tail's is almost black from the nape to the throat. The gulls' wings are similar, with alternating shades of white, gray and black.



RELATED SPECIES

● **The swallow-tailed gull is one of 43 species of gull in the world. It is the only species in its genus, *Creagrus*. Close relatives in the genus *Larus* include the Bonaparte's gull, *L. philadelphia*, and the California gull, *L. californicus*. The family *Laridae* includes both gulls and terns. Gulls and terns are closely related to the skuas, jaegers and skimmers in the order *Charadriiformes*.**

Tawny Frogmouth

• ORDER •
Caprimulgiformes

• FAMILY •
Podargidae

• GENUS & SPECIES •
Podargus strigoides

KEY FEATURES

- A nocturnal hunter and daytime rooster; thrives in a number of different habitats throughout its range
- Equipped with excellent camouflage that enables it to hunt or hide undetected by either prey or predator
- Feeds on a variety of food, ranging from insects and frogs to small mammals and even cultivated citrus fruits

WHERE IN THE WORLD?

Found throughout the mainland of Australia and Tasmania; also occurs on New Guinea and the Solomon Islands

LIFECYCLE

Seemingly oblivious to the march of human settlement across Australia, the tawny frogmouth remains one of the most widely distributed birds on the continent.

HABITAT

The tawny frogmouth is common throughout its range. It is most numerous in dense woodland and forest, where its mottled plumage blends with the backdrop of lichen-covered branches.

In eastern Australia, the vast eucalyptus forests west of the Great Dividing Range provide excellent cover. In northern parts of Australia and in New Guinea, the tawny frogmouth makes its home in dense tropical rainforests. In urban areas, it has become a regular inhabitant of gardens and parkland.

▼ **SHOWER TIME**
A tawny frogmouth takes a welcome rain bath.

BEHAVIOR

▲ **WOODEN PERFORMANCE**
The frogmouth freezes statue-still when alarmed.

A night hunter, the frogmouth roosts during the day on a branch or hides within a tree hole to avoid the midday heat.

Snakes and predatory birds are the frogmouth's major enemies, and the bird's most common defense is to adopt its spectacularly effective alarm posture. Stretching out its head, it flattens its wings against its body, narrows its eyes to a slit and remains motionless. In an instant the bird melts from view, seeming to fuse with the tree itself. Its patterned plumage, resembling intricately marbled tree bark, completes the effect. The frogmouth holds the posture until the danger has passed.

DID YOU KNOW?

- **The species owes its name to naturalists who witnessed it using its mouth like a frog to catch flying insects in midair.**
- **The frozen posture of the tawny frogmouth is so effective that it waits until an intruder is only about 3' away before flying off to safety.**

CONSERVATION

The tawny frogmouth is one species of Australian wildlife that hasn't suffered at the hands of human expansion. Its adaptability has ensured that numbers remain stable, but the use of insecticides in gardens, parklands and golf courses may put pressure on its urban populations.

FOOD & HUNTING

▲ Floor selection
In its woodland habitat, the frogmouth dines on an abundance of small mammals and amphibians.

Beetles, centipedes, frogs and mice are frogmouth favorites. It hunts mainly at night, swooping to catch prey on the ground or grabbing an insect in flight. The frogmouth returns to its perch to eat its prize.

The frogmouth is also adept at finding food in human settlements. It is not unusual to see the bird perched by the roadside, waiting to scavenge a roadkill. Likewise, it is a common sight near orchards and farms, where it feeds freely on citrus fruit.

NIGHT STRIKE

1 Watching…
An open forest setting is an ideal spot for the frogmouth to perch, stationary, on a branch.

2 Lift off…
Spotting a moth, the frogmouth leaves its perch and silently flies down toward its victim.

3 Opening time…
The frogmouth swoops closer to the moth, its wide, shallow mouth agape. It rarely misses its target.

4 Mouthful
With the moth safely in its bill, the frogmouth flies back to its perch to devour it.

BREEDING

The tawny frogmouth lives in pairs that nest and roost together all year-round. Mating can occur in any month, although there are localized peaks. Partners share the duties of rearing the young, but the male constructs the nest. This is a loose platform of sticks and leaves, usually sited on a forked branch or even in the discarded nest of another bird species. The bird adds spider's webs, lichen and its own feathers to disguise the nest.

The female lays two eggs, and takes on most of the 30-day incubation. Both parents feed the chicks, mainly small insects. After a month or so the fledged young are able to leave the nest. Their parents may mate again soon afterward.

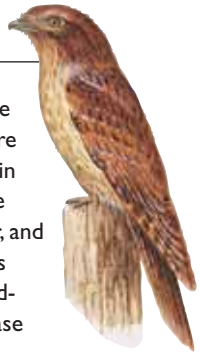
◀ Bodyguard
Vulnerable nestlings are sheltered by both parents.

PROFILE Tawny Frogmouth

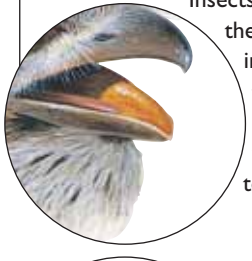
The tawny frogmouth is odd-looking, but its short-necked profile and patterned plumage are key elements in its superb disguise.

Bristles
Surrounding the beak are several long bristles that help disguise the frogmouth in its alarm posture.

Subspecies
The frogmouth varies in size and color depending on location. There are believed to be seven or more races of this species. Birds in the south of the range tend to be larger, and some females have a reddish phase (*above right*).



Mouth
The mouth often remains open when the bird is sitting camouflaged in a tree. Insects might then stray inside, only to be swept in by the frogmouth's tongue.



Wings
Small wings help the bird navigate between the branches at high speed.

Feet
Long, widely spread digits enable the bird to alight on the ground. The frogmouth uses its feet to carry prey back to its perch.

Tail
The long tail acts as a counterbalance when the bird roosts during the day.

Vital Statistics

Weight	2.5–4 oz.
Length	14–20"
Wingspan	18–24"
Sexual Maturity	1 year
Breeding Season	Varies across range
Number of Eggs	Usually 2
Incubation Period	30 days
Fledging Period	30 days
Breeding Interval	As short as 2 months, though usually annual
Typical Diet	Large insects, small mammals, fruit
Lifespan	Unknown

Related Species

- The tawny frogmouth is 1 of 3 species in genus *Podargus*. The Papuan frogmouth, *P. papuensis*, and the marbled frogmouth, *P. ocellatus*, are the others. Their order, *Caprimulgiformes*, includes the European nightjar, *Caprimulgus europaeus* (below).

Creature Comparisons

The common potoo (*Nyctibus griseus*) is found in the West Indies and from western Mexico to Uruguay. Roughly the same size as the frogmouth, the potoo has similar gray, streaked plumage. It, too, is found in wooded environments, relying on its plumage for camouflage. Its smaller bill has a sharper hook but the same protective bristles above it as the frogmouth's. Both birds catch insects on the wing, but the larger bill of the frogmouth enables it to take larger prey. Like the frogmouth, the potoo roosts during the day, perched motionless on a branch; unlike the frogmouth, it never lands on the ground. The potoo owes its name to its melancholy call: a descending *poh-o oh oh oh oh*.

Tawny frogmouth

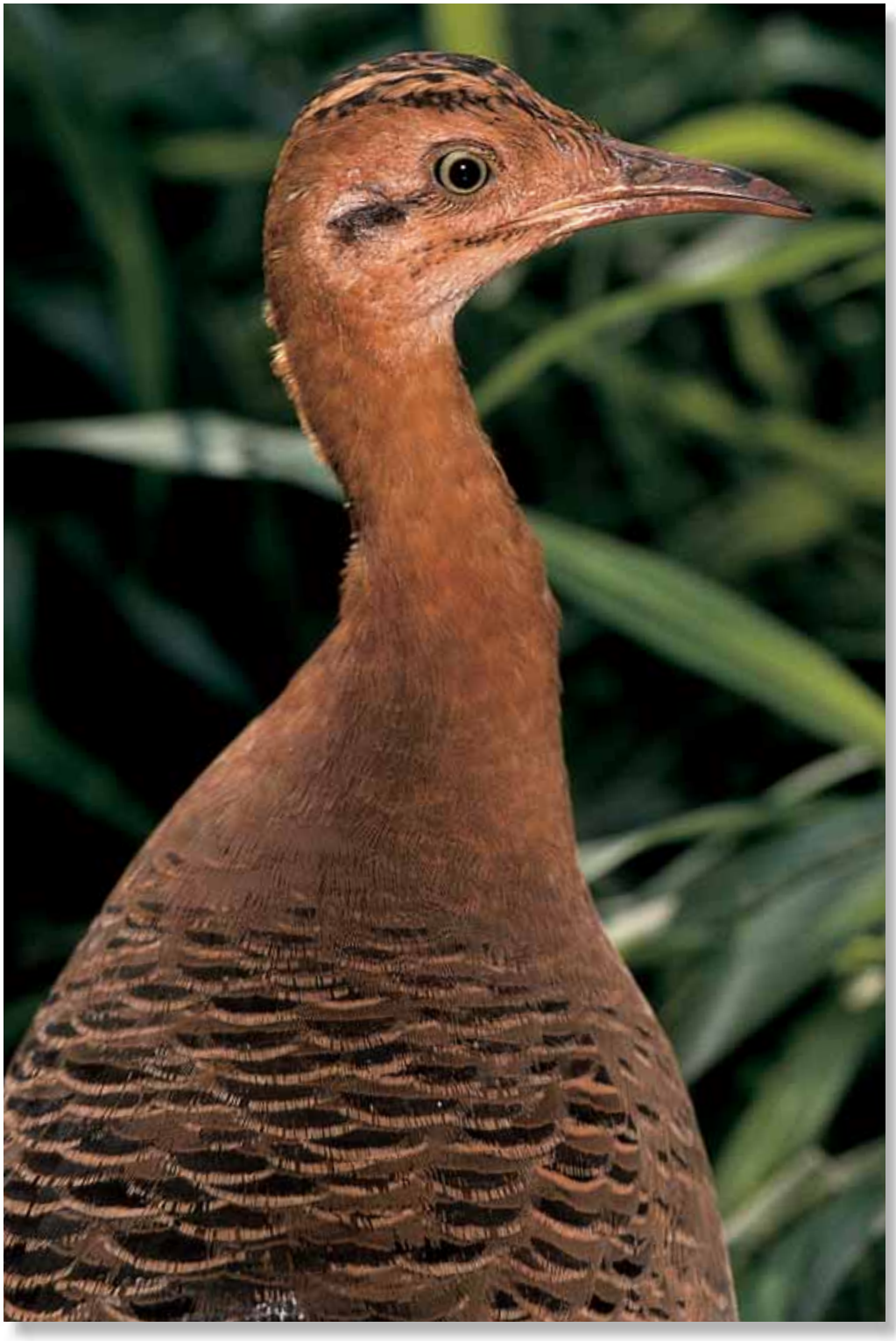
Common potoo

Tinamou

• ORDER •
Tinamiformes

• FAMILY •
Tinamidae

• GENUS •
Various



KEY FEATURES

- Ground-dwelling birds with a distinctive call; live in grasslands and forests in Central and South America
- Well camouflaged to hide from predators
- Male mates with several females before incubating all their eggs in one nest
- Glossy eggs are among the most brightly colored of all birds' eggs

WHERE IN THE WORLD?

Found throughout South and Central America, north as far as Mexico; absent from Tierra del Fuego and the Falkland Islands

LIFECYCLE

In many birds, the male leaves parental duties to the female. But in the tinamous, the male incubates the eggs while his mate wanders off to breed with other males.

HABITAT

As specialist ground dwellers, tinamous exploit almost every habitat in Central and South America. Each species has nesting and feeding habits that help reduce competition.

In the north of their range, the birds favor dense forest, while farther south they inhabit open grassland and savannah woodland. The Puna tinamou is found in the Andes at altitudes of up to 17,500'.

▲ **EARTHBOUND**
Tinamous spend almost all their lives on ground.

CONSERVATION

In the late 19th century, tinamous were hunted or exported as "South American partridges" before controls were introduced. In the early 20th century, tinamous were unsuccessfully introduced to Europe and the U.S. as gamebirds. There is little information on many species, but eight of them are classified as threatened. Certain species are restricted to one type of habitat. If this area is small, hunting or habitat destruction may eliminate the bird.

FOOD & FEEDING

An opportunistic feeder, the tinamou eats a wide variety of vegetation and animal matter. Feeding almost entirely on the ground, it eats mainly fruits and seeds, including cereal crops. Leaves, buds and shoots are especially important for species living in cold, bleak areas of grassland where other food is hard to find. Insects and other invertebrates are part of the diet of many tinamous.

The tinamou finds its food by walking slowly through the long grasses or deep forest undergrowth, picking up morsels or rummaging in soil or leaf litter with side-to-side movements of its bill. Its nostrils are located at the base of the bill to prevent them from becoming clogged with soil as it digs.

DID YOU KNOW?

- **The tinamou's predators include foxes, weasels, falcons and introduced mongooses.**
- **The ends of the tinamou's feather filaments are solidly joined rather than being hooked together as is the case with most other birds. Thus the tinamou's wings make a whistling sound when the bird is in flight.**
- **One of the tinamou's closest relatives is the rhea — a flightless bird that is up to 4.5' tall.**

BEHAVIOR

▲ **SONGS OF THE FOREST**
Calls are simple, high-pitched and melodious.

Forest species are solitary, skulking in dense undergrowth, but grassland tinamous, such as the spotted nothura, live in groups of 20–30 birds. In winter, up to 100 may gather, traveling widely to find food. The more birds in the flock, the more likely they are to locate food — and spot predators. Should an enemy approach, the birds utter harsh alarm calls to warn each other.

If surprised by a predator, the tinamou bursts from cover, flying swiftly to another hiding place. But it cannot sustain its flight for long and, if caught in open areas, may dart into any available burrow until the danger has passed. The solitary tinamou is one of many forest species that roost in trees to avoid danger.

▲ **Bigger bite**
Tinamous may eat mice and even small snakes.

ON THE ALERT

1 Tasty pickings…
While feeding, a crested tinamou remains alert, but relies on its dappled plumage to hide it.

2 Enemy approaching…
A pampas cat approaches. The tinamou freezes, trying to look more like a shrub than a bird.

3 On the run…
The cat is not fooled — it makes its move. The tinamou runs, calling to warn other birds of the danger.

4 Flight to freedom
As the cat pounces, the tinamou bursts into the air, leaving the startled cat behind.

BREEDING

Both male and female tinamous mate several times with different partners to ensure large numbers of healthy chicks.

The male scrapes out a rudimentary nest on the ground and lines it with dry leaves, grass or turf. He then attracts females with calls and mates with any that approach. Each female abandons her eggs after laying them, and then searches for other mates.

The male remains motionless while incubating the eggs, relying on his dull plumage to provide camouflage. When he leaves the nest to feed, he covers the eggs with leaves and feathers.

Tinamou chicks feed themselves within hours of hatching, but their father helps by dropping food nearby. They mature quickly and can make short, clumsy flights within a few days.

▼ **Nothing fancy**
Males court mates with a simple display.

PROFILE ELEGANT CRESTED TINAMOU

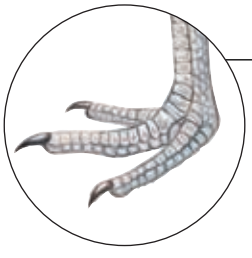
With its compact build and dappled brown plumage, the elegant crested tinamou is equipped for living on the ground in open grasslands.

CHICK

The chick is covered in a brown down to camouflage it against the ground. By the age of 6 weeks its flight feathers are fully grown.

PLUMAGE

Male and female have similar plumage. The tips-of certain feathers crumble into a fine powder, which the tinamou uses to waterproof its plumage. The bird is thought to be able to shed rump and back feathers if attacked.



FEET

Strong legs and feet enable the tinamou to run swiftly. It rarely perches in trees and has greatly reduced hindtoes — which may be absent in many species.

CREST

The long crest is erected when a predator is nearby and, coupled with a harsh trilling call, helps warn other tinamous of the danger.

EYES

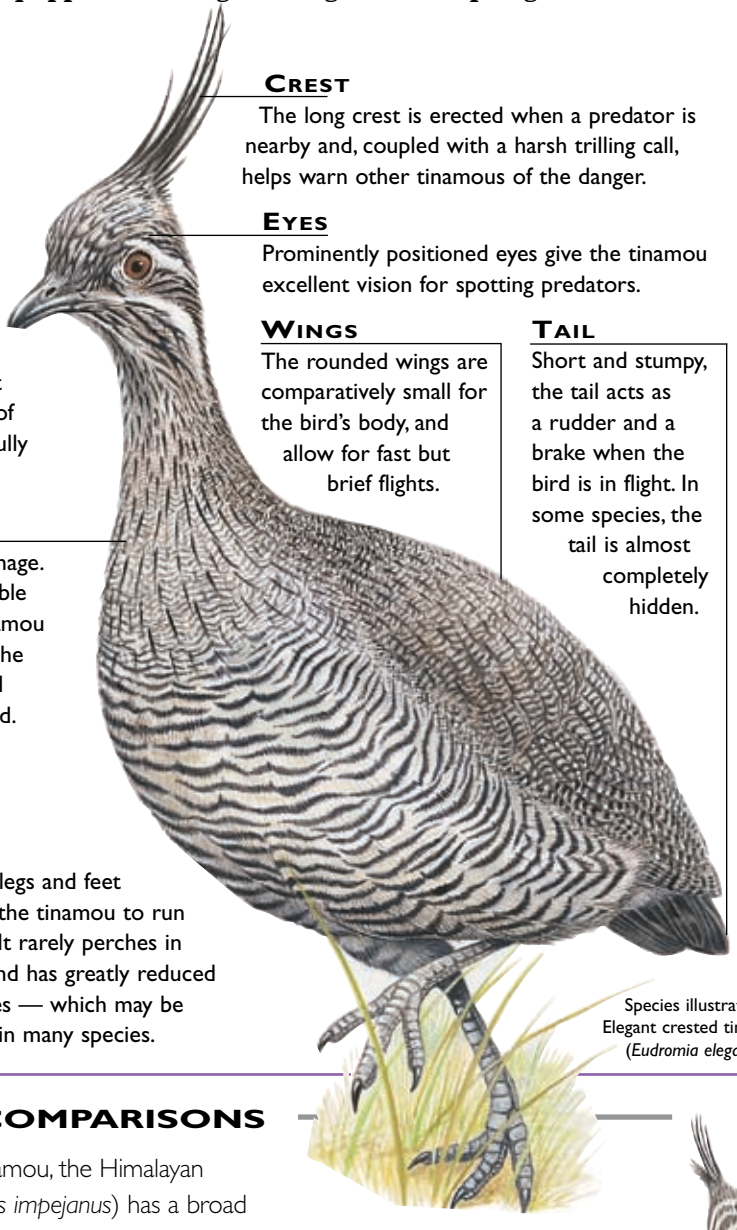
Prominently positioned eyes give the tinamou excellent vision for spotting predators.

WINGS

The rounded wings are comparatively small for the bird's body, and allow for fast but brief flights.

TAIL

Short and stumpy, the tail acts as a rudder and a brake when the bird is in flight. In some species, the tail is almost completely hidden.



Species illustrated: Elegant crested tinamou (*Eudromia elegans*)

VITAL STATISTICS

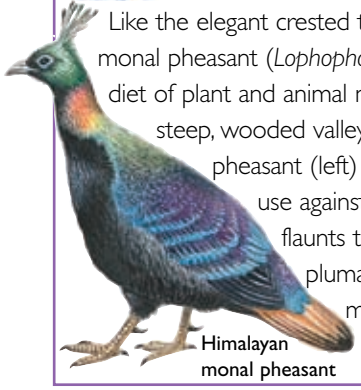
WEIGHT	5.5 oz.–4.5 lbs.; varies by species
LENGTH	5–20"; varies by species
WINGSPAN	10–28"
SEXUAL MATURITY	1 year
BREEDING SEASON	Seasonal in temperate areas
NUMBER OF EGGS	Up to 16
INCUBATION PERIOD	17–24 days
FLEDGING PERIOD	25–42 days
BREEDING INTERVAL	1 or 2 clutches a yr.
TYPICAL DIET	Plant matter, invertebrates
LIFESPAN	Unknown

RELATED SPECIES

● There are 45 species of tinamou divided into 2 subfamilies within the family *Tinamidae*. All are ground-dwelling and are found only within Central and South America. However, the subfamily *Tinaminae* contains forest dwellers, whereas the subfamily *Rhynchotinae* holds grassland species. Tinamous are in the order *Tinamiformes* — one of the oldest bird orders.

CREATURE COMPARISONS

Like the elegant crested tinamou, the Himalayan monal pheasant (*Lophophorus impejanus*) has a broad diet of plant and animal matter. But the pheasant forages in steep, wooded valleys, whereas the tinamou keeps to lowland grasslands. The male pheasant (left) has a spur on the back of each leg, which he is thought to use against rivals. His bright plumage includes a crest, which he flaunts to attract a mate. The female has much more subdued plumage. The dull-brown coloring hides her — and the male tinamou — from predators, as each incubates its egg clutches in deep undergrowth.



Himalayan monal pheasant

Elegant crested tinamou

Toco Toucan

• ORDER •
Piciformes

• FAMILY •
Ramphastidae

• GENUS & SPECIES •
Ramphastos toco

KEY FEATURES

- The largest toucan; known throughout the world as an exotic symbol of South American forests
- Its bill is a lightweight and dexterous tool for plucking and manipulating fruit and seeds
- Also uses bill to kill small animals and in playful bouts of bill-fencing and mutual preening

WHERE IN THE WORLD?

Found in South America, from Guyana south across much of southeastern Brazil to northern Argentina, and into westernmost Bolivia; its range excludes the heart of the Amazon rainforest

LIFECYCLE

Of all the South American toucans, the toco, with its bold bib and glaring eye, has the greatest liking for open woodland and is most likely to be seen near human settlement.

HABITAT

▲ **SHOW OFF**
The toco toucan is easy to spot, even in the treetops.

Many species of toucan seek refuge in the canopy of tropical forests, but the toco toucan prefers relatively open habitats and is absent from much of the Amazon rainforest, preferring savannah woodland, palm groves, riverside trees and forest edges.

This toucan is fond of coconut and sugar plantations and clearings, and is a familiar sight around villages and farms. It is however, entirely dependent on large trees, as it feeds, sleeps and nests high in the treetops. One of the main limitations on where the toucan can live is the availability of nest sites — the species uses tall, living trees with natural holes just large enough to accommodate it.

CONSERVATION

The toco toucan remains a widespread bird. Its dislike of dense forest has enabled it to escape the fate of many other toucans threatened by destruction of their rainforest home to make way for farmland and villages. The toco toucan is also able to adapt to man-made habitats, such as commercial plantations. But it soon vanishes from those areas where all the large trees have been felled.

DID YOU KNOW?

- **The toco toucan bathes high above ground by splashing its plumage in rainwater-filled hollows of a tree's branch or trunk.**
- **The garish colors and huge bill size of the toco toucan serve to intimidate small birds, so the toucan can raid their nests.**
- **Adult toco toucans make unusually restless parents. A toucan rarely sits on its eggs for more than an hour before letting its mate take over.**

FOOD & FEEDING

The toco toucan feasts on berries, seeds and fruits — especially figs — that cluster in treetops. Much of these develop on slender twigs that are too fragile for the bird's weight, but the toucan can use its long bill to reach out from a sturdy branch and grab a juicy prize. Although clumsy looking, the bill is dexterous enough to handle small morsels of food with finesse.

The toucan supplements its vegetarian diet by seizing spiders and insects, and on occasion, tree-living snakes and lizards. It often steals the eggs and young of other birds as well.

▲ **SWEET REWARD**
The toucan breaks up fruits too large to swallow.

BEHAVIOR

▲ **IF YOU'VE GOT IT, FLAUNT IT**
Flocks of toucans clamber about, and keep in touch by making toadlike croaks.

The toco toucan roosts on a large branch at night, twisting its head so that its bill nestles in the warm feathers on its back. At first light, the bird rouses and begins searching for food. The toucan stays among the topmost foliage, and moves by hopping from branch to branch rather than by flapping.

Small groups of toco toucans often indulge in "playful" antics: the birds jump around each other and stage mock push-and-shove contests with their bills. They also engage in bouts of mutual preening, where one bird stays still while a companion grooms its plumage. Toucans remove dust and sticky seeds by gently nibbling one another's feathers with the tips of their mandibles.

FRUIT RAIDERS

1 Search...
Three toco toucans fly to find a fruiting tree. They may be joined by other toucans, but feeding parties rarely exceed 12 birds.

2 Stretch...
One grasps a branch while craning to reach a berry. With a delicate tweezing action, it picks the delicacy from its stalk.

3 Swallow...
Using its feathery tongue, the toucan positions the berry in the end of its bill, then tosses back its head to tip the food back into its open mouth.

4 Spit
Although the toucan devours both the seeds and flesh of the berries, it regurgitates any hard seeds that it is unable to digest.

BREEDING

Having found a suitable cavity high up a tree trunk, the male and female toco toucan do little to prepare their nest. They just use decaying wood chips to make a bedding for the two to four eggs. While they incubate their eggs, the toucans regurgitate seeds, making the nest lining deeper.

In a little over two weeks, the blind and featherless nestlings hatch in the dark refuge of the nest. Young toucans develop slowly compared to most perching birds; about seven weeks pass before the brood emerges into the outside world.

▶ **EQUAL PARTNERS**
The parents take turns guarding the young and gathering food.

PROFILE Toco Toucan

Few people who see the toco toucan are likely to forget the sight of its giant bill and vibrant, eye-catching plumage.

Bill
The toucan's massive bill is not as heavy as it looks: it has a horny outer shell, but is mostly hollow inside. A honeycomb of bony fibers braces the bill for strength.

Wings & tail
Short, rounded wings help the toco toucan navigate adroitly through dense forests, while a long, broad tail acts as a balancing aid in the treetops.

Eye rings
A bright blue patch of bare skin surrounds the eye, giving the toucan a piercing "stare."

Tongue
The toco toucan's highly specialized tongue helps it move food along its bill. The almost featherlike, 6"-long tongue is deeply notched down each side.

Feet
The toucan has strong feet and toes to support its considerable bulk. Two toes point forward and two backward, giving the bird a vicelike grip on branches.

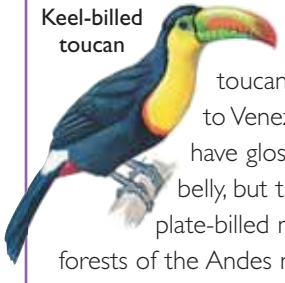
VITAL STATISTICS

Weight	17.5–10 oz.
Length	24–26.5"
Wingspan	19"
Breeding Season	Varies according to region
Number of Eggs	2–4
Incubation Period	16 days
Fledging Period	About 49 days
Breeding Interval	1 year
Typical Diet	Fruit, seeds, insects, spiders; steals eggs, nestlings from smaller birds. Occasionally hunts lizards and snakes
Lifespan	Unknown in wild

RELATED SPECIES

- The 35 toucan species split into 4 tribes in the family *Ramphastidae*: 8 species of "large" toucan; 4 medium-sized mountain species; 2 "small" toucan groups: 13 *toucanet* and 10 *aracari* species. All toucans are confined to American tropical forests and have huge bills relative to body size; they belong to the order *Piciformes*, which also includes New World barbets woodpeckers, and honeyguides.

CREATURE COMPARISONS



The toucan family has some of the most striking, colorful birds. The keel-billed toucan (*Ramphastos sulfuratus*) lives in rainforests from Mexico to Venezuela and is in the same genus as the toco toucan. Both have glossy, blue-black feathers on the upperparts, tail and belly, but their bills and "bibs" are very different in color. The plate-billed mountain toucan (*Andigena laminirostris*) occurs in forests of the Andes mountain range and has a lighter build than the genus *Ramphastos*. It's unique among the toucan family, with a yellow, hornlike plate on each side of its bill; the plate's function remains a mystery.

Torrent Duck

• ORDER •
Anseriformes

• FAMILY •
Anatidae

• GENUS & SPECIES •
Merganetta armata

KEY FEATURES

- Unusual among ducks in its preference for fast-flowing mountain streams with many waterfalls
- Simply built, long-tailed and short-legged; dives into the rapids to find insects on the riverbed
- One of the most attractive ducks, the male has a striking black-and-white head and orange bill

WHERE IN THE WORLD?

Resident in three separate areas of the Andes of western South America: Venezuela to southern Colombia; Ecuador to Peru; and south through Bolivia and Chile to Argentina

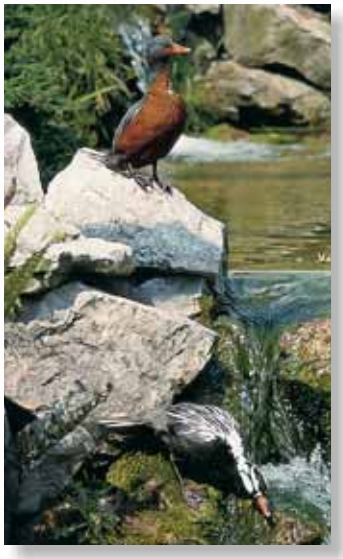
LIFECYCLE

The torrent duck lives up to its name as a fearless aquatic forager of the swirling eddies, tumbling cascades and rushing rapids that spill from the high Andes.

HABITAT

The torrent duck exploits a difficult aquatic environment. Unlike most ducks, which seek calm waters, the torrent duck thrives on shallow, white-water rivers and streams. High-speed currents quickly wash nutrients downstream, and the waters are often heavily cobbled with rocks and boulders. As a result, food is scarce and difficult to reach. By adapting to exploit this niche, however, this duck has few competitors for food resources.

The torrent duck favors rivers and streams with areas of calmer water where it can take a rest between its demanding bouts of feeding.



▲ **SLOW WITH THE FLOW**
A pair rests by a calm stretch of water.

FOOD & FEEDING

The diet of the torrent duck consists mainly of caddis-fly larvae, other aquatic insects, snails and a few fish. In the challenging mountain rapids, the duck uses various techniques to find food.

Foraging mainly by day, the torrent duck dives into rushing rivers to search for food among the rocks and sieve through the bottom debris. In shallow water, it stands and dips its head below the surface to snap up invertebrates. In calmer waters, it up-ends, reaching down with its long neck to explore the streambed. It also feeds at the foot of a waterfall, with water crashing over its body, or climbs onto slippery ledges behind the cascade to feed among plants growing on the rocks.

▶ **FAST FOOD**
These ducks scour rocks that hide aquatic larvae.

WHITE-WATER GRAFTING

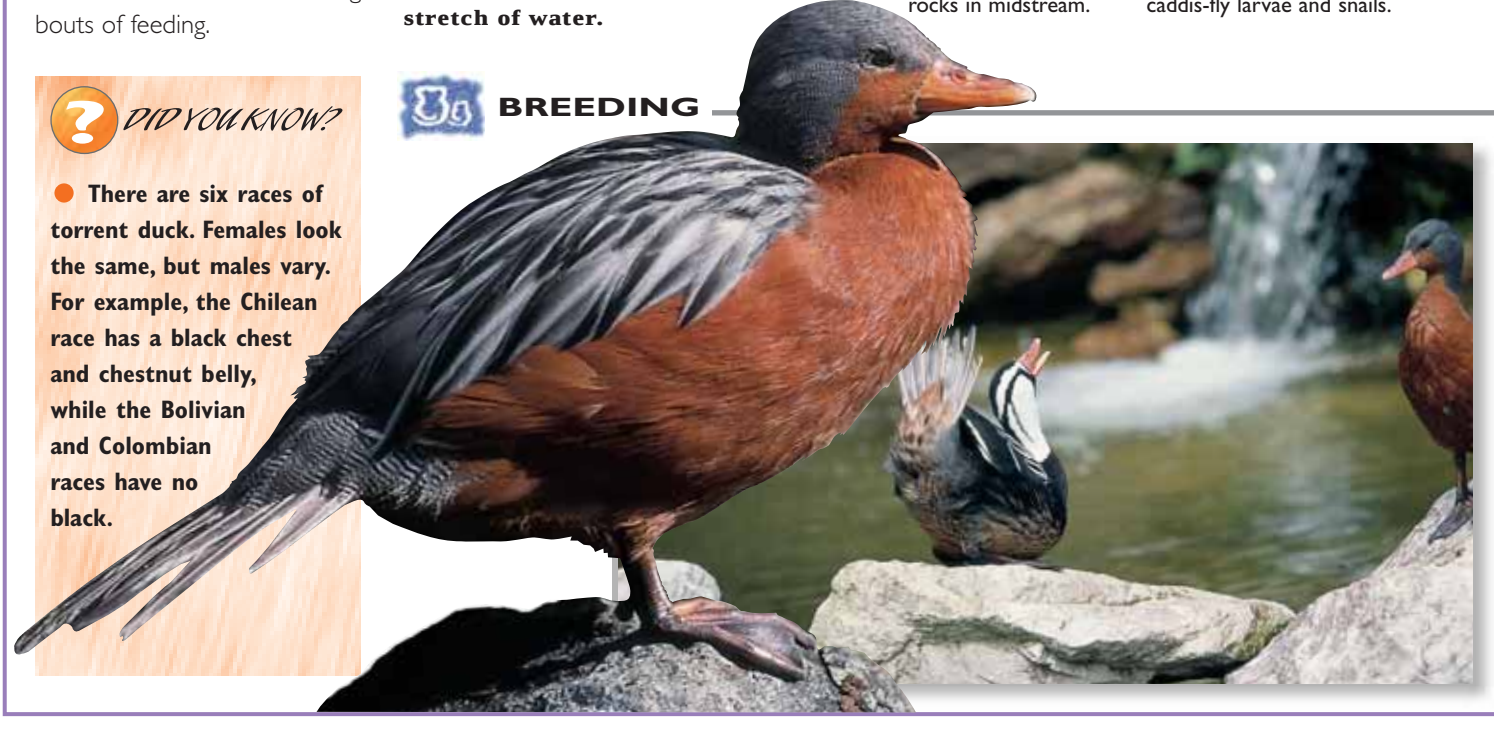
1 Hard at rest...
Swimming against rapids while feeding is hard work, so the duck takes regular rests on rocks in midstream.

2 Heading for a fall...
Back in the water, the torrent duck heads for a curtain of falling water. These places often hide many caddis-fly larvae and snails.

DID YOU KNOW?

● **There are six races of torrent duck. Females look the same, but males vary. For example, the Chilean race has a black chest and chestnut belly, while the Bolivian and Colombian races have no black.**

BREEDING



3 Taking a dive…

Ignoring the battering water and the racing current, the torrent duck dives under the waterfall and swims down to the streambed.

4 Hard case

It probes urgently among the stones. Finding a caddis-fly larva, it crushes its protective casing and quickly swallows it.

BEHAVIOR

The torrent duck is normally sedentary, found in pairs or small groups scattered along suitable stretches of river. Parties of males may also gather to display for females during breeding season.

At the higher altitudes in its range, the torrent duck may be driven from its territory by severe winter weather and moves to warmer areas at lower levels farther downstream. If it intrudes on another duck's territory, the newcomer may have to fight with the owner to gain a feeding site. Similarly, young birds may have to wander within their range, avoiding aggressive residents, before finding an unoccupied territory of their own.

▼ **HIGH-MINDED**

The torrent duck often swims with its body held very high — appearing to walk on the water.

The torrent duck is territorial throughout the year, which is uncommon in ducks. In keeping with such behavior, the male and female often pair for life, defending a stretch of river.

At the beginning of breeding season, both the male and female construct the nest with dry grass and line it with down and feathers. Nest sites vary from a cavity among rocks, on a cliff ledge or in thick streamside vegetation. Even the abandoned nest burrow of a ringed kingfisher may be used. The female incubates the clutch of eggs. After about six weeks, the chicks hatch; they are boldly striped with black-and-white spots. They leave the nest within hours and have the swimming skills to feed in calm waters, though their buoyant down prevents them from diving. Juveniles are unlikely to find their own territory until they're a year old.

◀ **SHOW TIME**

The male displays to a potential mate.

CONSERVATION

The torrent duck is not considered threatened, but is declining in many places, especially in the northern parts of its range. Its disappearance owes much to deforestation, which causes siltation — the lack of trees means that soil is washed away more easily. The increased runoff also causes flash floods, which destroy nesting sites.

PROFILE TORRENT DUCK

Powerful webbed feet, a streamlined body and stiff tail feathers equip the torrent duck to live in fast-flowing waters.

FEMALE

The female lacks the striking head pattern of the male. Her wings, neck and head are gray; her underparts, orange.

WING-SPUR

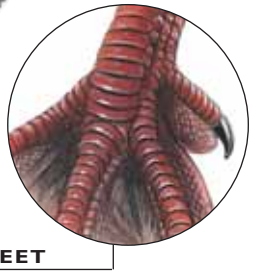
Both sexes have a small bony spur, like a thumb, at the outer joint of the wing. This spur is used as a weapon in territorial disputes.

PLUMAGE

The male (*below*) has a white head with black stripes over the crown and from the eye.

TAIL

The stiff tail feathers are pressed down against the riverbed to brace the bird when it is standing in fast-flowing water.



FEET

Very large webbed feet help propel the duck through fast currents and provide a sturdy base when it stands to feed in the shallows. A sharp hindclaw allows the bird to grip slippery rocks.

VITAL STATISTICS

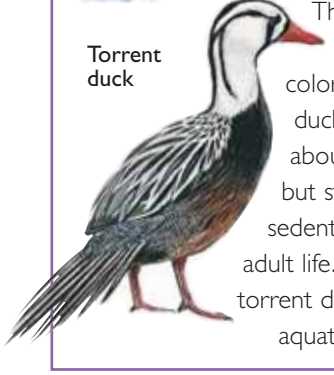
WEIGHT	11–15 oz.
LENGTH	17–18.5"
WINGSPAN	22"
SEXUAL MATURITY	1 year
BREEDING SEASON	Variable, usually between Nov. and June
NUMBER OF EGGS	3–4
INCUBATION PERIOD	43–44 days
FLEDGING PERIOD	Unknown
BREEDING INTERVAL	Probably 1 year
TYPICAL DIET	Aquatic insects and larvae, mollusks and small fish
LIFESPAN	Unknown

RELATED SPECIES

- **The torrent duck is the only species in the genus *Merganetta*. This genus is in the family *Anatidae*, which contains ducks, geese and swans. The 147 members of this diverse family are found worldwide, except on Antarctica, and range in size from the massive whooper swan, *Cygnus cygnus*, which weighs over 26 lbs., to the African pygmy goose, *Nettapus auritus*, weighing just 9–10 oz.**

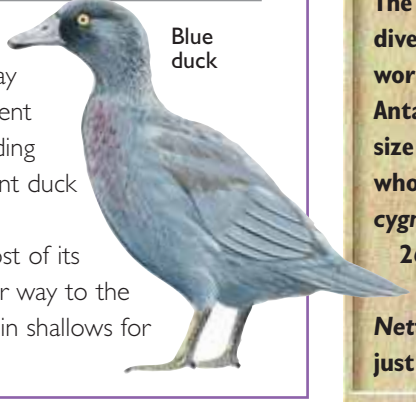
CREATURE COMPARISONS

Torrent duck



The blue duck (*Hymenolaimus malacorhynchus*), which takes its name from its uniformly blue-gray coloring, is found only in New Zealand. Like the torrent duck, it is an inhabitant of fast-flowing streams. Standing about 22" high, the blue duck is taller than the torrent duck but stockier than its relative. The blue duck is mainly sedentary, living along the same stretch of river for most of its adult life. Increasingly rare, the blue duck feeds in a similar way to the torrent duck, probing among rocks, diving and up-ending in shallows for aquatic invertebrates, including larvae.

Blue duck



Trumpeter Swan

• ORDER •
Anseriformes

• FAMILY •
Anatidae

• GENUS & SPECIES •
Olor buccinator

KEY FEATURES

- Floats gracefully in the water at rest, but swims and flies with extraordinary power
- Protects the nest that it uses year after year by establishing a milewide territory
- Trumpets loudly, hence its name, to defend its nest in spring and summer

WHERE IN THE WORLD?

Found in the U.S. and Canada, from parts of Alaska east to Saskatchewan, south to Montana and Wyoming; transplanted into refuges in Nevada

LIFECYCLE

The trumpeter swan is the picture of elegance when swimming or flying, but it becomes fiercely protective of its family flock throughout the breeding season.

HABITAT

Once almost extinct, the trumpeter swan now numbers more than 10,000 and inhabits marshy areas in the northwestern U.S., including Alaska and southwest Canada. The swans have grown especially numerous in undisturbed regions with extensive beds of sedges, bulrushes and cattails. Trumpeters overwinter in areas with lakes and streams that do not freeze over. Still, these safe areas are scarce due to development and hunting. In an attempt to reestablish the species, swan conservationists have transplanted the birds to several refuges capable of supporting breeding and wintering swan populations.

▼ SUITABLE SURROUNDINGS
Trumpeters migrate to winter grounds that have lakes with abundant aquatic plants.

DID YOU KNOW?

- **The female swan is called a pen and the male swan is called a cob — the young swan is a cygnet.**
- **The trumpeter swan's neck is twice the length of its body.**
- **The syrinx, or sound-producing organ of birds, is extremely large in the trumpeter swan. It generates the deep "trumpet" tones when the swan forcefully exhales.**

BEHAVIOR

◀ FLYING HIGH
During migration, trumpeter swans fly at great heights and speed.

Usually seen in a family flock of 3–5, the trumpeter swan may form larger social groups of 25–30 swans in the fall and winter. A mated pair selects a large, undisturbed home region in the spring that is usually defended until late summer, when cygnets (young) are half-grown. The pair can be quite territorial during breeding. Upon successfully driving other swans away, the male trumpets loudly, sounding much like a French horn.

Spending most of its time in the water and rarely feeding on land, the trumpeter often flies to an adjacent pond in search of food. Unable to spring directly from the water and fly, it uses its short legs to paddle clumsily along the surface for about 18' before taking flight. When threatened, it dives underwater and clings to vegetation. Then it resurfaces, just showing its head. The swans are flightless during molting, with nonbreeding swans molting first, then males. The females molt last. Waiting until the males molt, the females stay at the nest to guard the young, which cannot fly, against predators.

FOOD & FEEDING

A swift and powerful swimmer, the adult trumpeter swan spends up to eight hours weeding out the 20 lbs. of vegetation that it eats each day. In shallow water, the trumpeter swan gathers the stems and leaves of sage, white-water buttercups and pondweeds by delicately submerging its head and neck under the surface. The trumpeter even digs holes with its strong feet to expose tubers. In deeper water, the trumpeter swan tips its head down and its tail up, similar to a duck, to snap off parts of plants on the bottom of the marsh. Waterweeds are a favorite food, and the seeds of the yellow pond lily and water shield provide a tasty snack.

▶ AQUATIC AGILITY
While feeding, the trumpeter swan takes full advantage of its long, flexible neck.

BREEDING

Mates are chosen at 2–3 years of age, and pairs usually stay together for life. The courtship ritual includes slow synchronized swimming, blowing in the water and bill-dipping. On the fourth or fifth dip, the male crosses necks with the female to cement their bond. In April, both swans build the nest in water 1–3' deep. It will be used for several consecutive years. The uprooted marsh plants around the nest leave a large ring of open water for good visibility. The nesting pair does not tolerate other trumpeters in its territory, so nests are usually 0.5 mile apart.

The female incubates the off-white eggs, which are stained brown by nest materials, and covers the nest with debris before leaving to find food. In June, the newly hatched white or gray cygnets weigh 7–8 oz. each. Within their first days, cygnets go with their parents in search of food. By their tenth week, they weigh 19 lbs. and by October have had their first flying lessons.

A NEW FAMILY

1 Still newlyweds...
At 4 years of age, two young trumpeter swans have been a pair for two years, but the female will lay her first eggs this season.

2 Preparing the nursery...
The female swan tucks marsh grasses that the male has uprooted into the large nest, which measures over 6' in diameter.

3 A close watch...
After laying eggs for six days, the female keeps a close eye on them. Each egg measures 4.5" and weighs 12 oz.. The male patrols the area.

4 Family outing
The cygnets have hatched after a 33-day incubation. At 3 days old, they paddle in the water with their parents for the first time.

CONSERVATION

In 1932, the trumpeter swan was thought to be on the verge of extinction. After being overhunted for its feathers, which were used for pillow stuffing, and for its porous skin used for gloves, the trumpeters' numbers plummeted to under 100 in the Red Rock Lakes in Montana. In 1935, Congress set this area aside as a National Wildlife Refuge, hoping to save this species. In 1954, other trumpeters were discovered in Alaska, and since then populations have steadily increased. Strictly protected in Canada and the United States, the main challenge for the swan is to reestablish migratory routes and find wintering areas with abundant food supplies.

PROFILE TRUMPETER SWAN

North America's largest waterfowl, the trumpeter swan uses webbed feet for strong swimming and an 8' wingspan to reach air speeds of 80 mph.

CYGNET

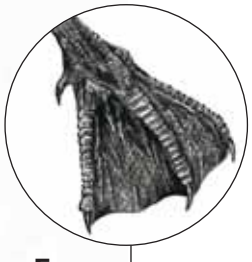
During the first year of life, the juvenile swan is grayish brown with pinkish feet and a flesh-colored bill. It develops white feathers during its second year.

BILL

The flattened bill has small, toothlike ridges called *lamellae* that are used like a strainer when feeding.

NECK

Known for its grace, the swan holds its long neck proudly erect when swimming, but in an elegant semicurve when simply idling at rest in the water.



FEET

The first three of the four toes are webbed, which assists during takeoff from the water's surface and makes the swan a powerful swimmer.

VITAL STATISTICS

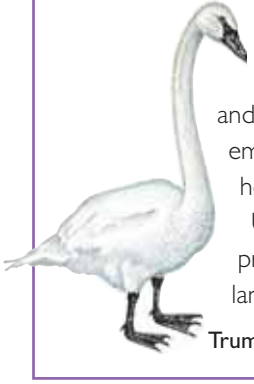
WEIGHT	Male up to 38 lbs.; female up to 25 lbs.
LENGTH	Male up to 62"; female up to 58"
SEXUAL MATURITY	4–6 years
BREEDING SEASON	April–July
NUMBER OF EGGS	1–9; usually 5
INCUBATION PERIOD	32–37 days
FLEDGING PERIOD	13–17 weeks
BREEDING INTERVAL	1 year
TYPICAL DIET	Marsh and aquatic plants
LIFESPAN	Up to 32 years in captivity

RELATED SPECIES

- **The family *Anatidae* consists of swans, geese and ducks, numbering more than 145 species worldwide. All three have common characteristics but also some differences. The seven species of swan are characterized by long necks; males and females have similar plumage. Male ducks have brighter plumage than females. Female geese have low voices; female swans have high voices.**

CREATURE COMPARISONS

The black-necked swan (*Cygnus melanocoryphus*) is a South American relative of the trumpeter swan. Smaller than the trumpeter, the black-necked swan weighs up to 15 lbs. As its name implies, it has a black head and neck, unlike the trumpeter, which has all-white plumage. It emits a soft, musical whistle, while the trumpeter blows loud horn notes. The black-necked swan lives in Brazil, Chile, Uruguay, Paraguay and Argentina. Unlike the trumpeter, it prefers open areas of water near the coasts. Rather clumsy on land, it searches in the water for aquatic plants and insects.



Trumpeter Swan

Black-necked swan

Tufted Duck

• ORDER •
Anseriformes

• FAMILY •
Anatidae

• GENUS & SPECIES •
Aythya fuligula

KEY FEATURES

- Common and widespread species as a result of a huge expansion that began only 150 years ago
- Dives for food in lakes, but is tame enough to take bread from humans in parks
- Named after its "ponytail" of feathers, its local name of magpie diver is equally descriptive

WHERE IN THE WORLD?

Occupies broad range from Iceland across western and northern Europe, through Siberia to Japan; winters in Africa and southeastern Asia

LIFECYCLE

Sociable and bold on park lakes, the tufted duck has taken full advantage of natural and man-made habitats to become one of Britain's most successful wildfowl species.

HABITAT

▲ **READY MADE**
Shallow ponds provide all life's necessities.

Chiefly a bird of freshwater habitats, the tufted duck does overwinter in sheltered estuaries and coastal bays. For the rest of the year, it favors lowland lakes and slow rivers.

Swift adaptation to new habitats is the key to the tufted duck's phenomenal recent success. It was one of the first species to take advantage of the many new habitats created in the 20th century through the flooding of gravel pits and the construction of reservoirs and ornamental ponds.

CONSERVATION

The tufted duck has expanded its range and population throughout Europe this century. Since it first bred in Britain in 1849, during a period of climatic warming, its spread has been helped by the increasing number of reservoirs and gravel pits, and by the abundance of the introduced zebra mussel. The tufted duck now has a permanent British population of about 18,000 breeding adults, while the number of overwintering birds is thought to exceed 90,000.

BREEDING

Communal courtship begins as soon as the male has acquired his new plumage in late autumn, but pair bonds are often formed in spring.

In winter, males display in groups. They become highly vocal, whistling as they swim back and forth, tossing and shaking their heads. Females will respond by growling, stretching their necks and ritually preening their wings.

Small islands are favored breeding sites; on some of them, there may be hundreds of nests spaced about 15' apart. The male plays no part in egg incubation or care of the young. Ducklings learn to dive within a few hours of hatching, but at first they feed mainly on surface insects.

FOOD & FEEDING

The tufted duck's principal prey is the zebra mussel, but it also takes other freshwater mollusks, shrimp, caddisfly and dragonfly larvae, water beetles and a few small fish. When it winters in coastal waters, marine mussels and cockles form the bulk of its diet. It also eats aquatic vegetation. The duck feeds by diving to depths of up to 46' and dabbling in the muddy or sandy bottom.

▼ **UP FOR A BREATHER**
A duck may make up to 100 dives in an hour.

▲ **EGGS-TREME**

One nest contained 22 eggs — probably the work of two females.

HAZARDOUS JOURNEY

1 Nesting…

A female builds her nest among thick reeds near the edge of a lake. She lays in mid- to late May.

2 Incubating…

Camouflaged by dull, brown plumage she incubates her clutch hidden from egg thieves.

3 Hatching…

The ducklings hatch three and a half weeks later, just in time for the early-summer glut of insects.

4 Leading

However, few ducklings escape the predators, such as gulls, that lurk around every corner.

DID YOU KNOW?

- **Females have adopted lost or deserted ducklings.**
- **The largest colonies of breeding tufted duck in the British Isles are on Lough Neagh in northern Ireland and Loch Leven in Scotland.**
- **The average life expectancy of an adult tufted duck is only about 19 months.**
- **Feeding dives lasting 40 seconds have been recorded, although most last about 15.**

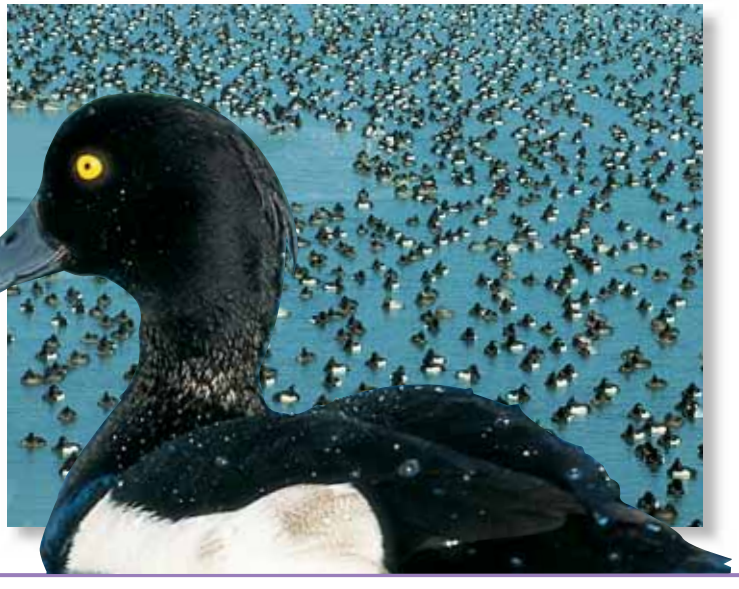
BEHAVIOR

The tufted duck may form flocks many thousands strong, although groups of 50 or so are more common. Outside the breeding season, flocks are often predominantly or wholly one sex, since males leave nesting areas ahead of females. Males gather in groups as they make the transition into dull eclipse plumage, a molt that begins in late May and includes 3–4 weeks during which they are flightless.

The tufted duck roosts at night, usually in a lake where it is safe from predators such as the fox and the weasel. Most populations in Britain do not migrate, but many birds from northern Europe winter on British lakes and rivers.

▼ **SAFETY IN NUMBERS**

The tufted duck roosts in a tight bunch.



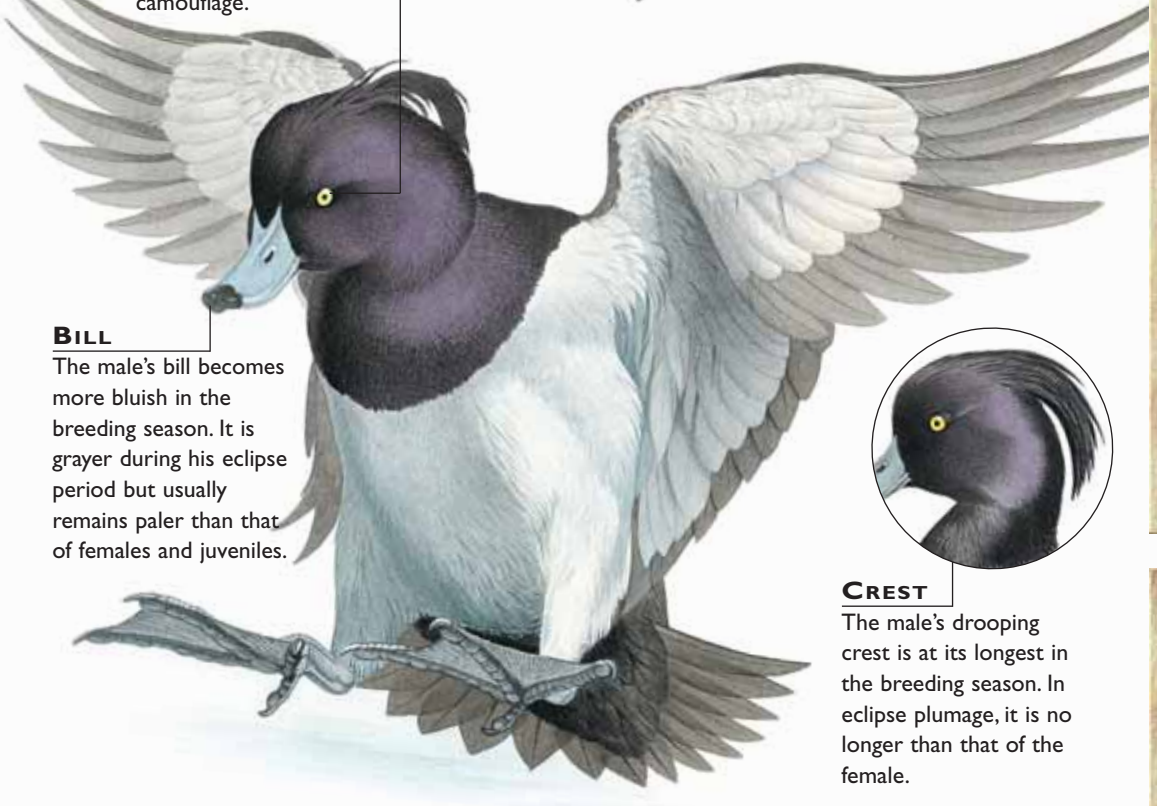
PROFILE TUFTED DUCK

The flamboyant crest and striking coloring of the male duck make it one of the most easily recognized birds, but they are not permanent features.

MALE PLUMAGE
The male (*below*) sports bold plumage in breeding season. He later enters a flightless eclipse phase while he molts, with dull plumage for camouflage.

EYES
The male's eyes change from their juvenile brown to bright yellow during his first winter.

WINGS
Narrow wings give fast, direct flight. The white wing features create a distinctive pattern.



BILL
The male's bill becomes more bluish in the breeding season. It is grayer during his eclipse period but usually remains paler than that of females and juveniles.

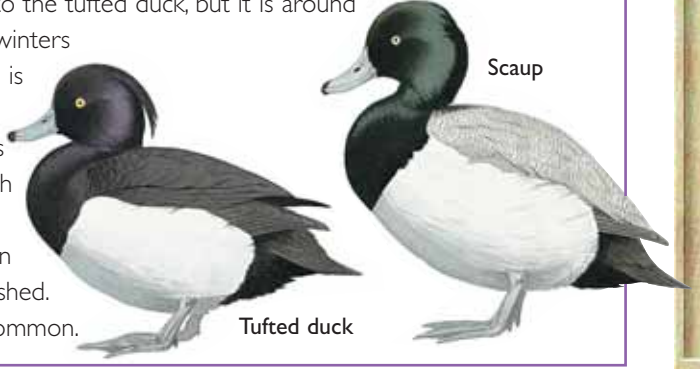
CREST
The male's drooping crest is at its longest in the breeding season. In eclipse plumage, it is no longer than that of the female.

VITAL STATISTICS

WEIGHT	Male 2–2.5 lbs.; female 1.8–2 lbs.
LENGTH	16–19"
WINGSPAN	27–30"
SEXUAL MATURITY	1–2 years
BREEDING SEASON	May–August
NUMBER OF EGGS	8–11
INCUBATION PERIOD	23–28 days
FLEDGING PERIOD	45–50 days
BREEDING INTERVAL	2 clutches a year in south; otherwise 1 year
TYPICAL DIET	Crustaceans, insects, plants
LIFESPAN	Up to 14 yrs.

CREATURE COMPARISONS

The scaup (*Aythya marila*) looks similar to the tufted duck, but it is around 10% larger and lacks a crest. The scaup winters on some of the same British waters and is commonly seen in winter off the east coast of the U.S.; the tufted duck prefers freshwater. Both dive and dabble beneath the surface to feed. They are hardest to distinguish when tufted duck males are in eclipse plumage and their crest is diminished. Hybrids of the two species are not uncommon.



RELATED SPECIES

- **Hybridization sometimes occurs between the 12 related species in the genus *Aythya*, which includes: the tufted duck; the ring-necked duck, *A. collaris*; the white-eyed duck, *A. australis*, an Australian species; the ferruginous duck, *A. nyroca*; and the pochard, *A. ferina* — a chestnut-headed duck often found with the tufted duck on British lakes and ponds.**

Tundra Swan

• ORDER •
Anseriformes

• FAMILY •
Anatidae

• GENUS & SPECIES •
Cygnus columbianus

KEY FEATURES

- Also known as the whistling swan, the tundra swan is distinguished by its spectacular all-white plumage, present in both sexes
- During migration, tundra swans fly in a single line or a V-formation in flocks of up to 500
- Dips its long neck underwater to feed on plants

WHERE IN THE WORLD?

From Alaska, the Bering Sea, the Arctic Ocean, east to Baffin Island and south to Quebec; winters along the coasts of North America, Asia and Europe

LIFECYCLE

The tundra swan often migrates in large flocks and even forms pairs on wintering grounds, but is solitary and highly territorial during breeding.

HABITAT

In spring, tundra swans flock to shallow pools, lakes and rivers in the Arctic tundra, mainly in Alaska and Canada, but its range extends west to St. Lawrence Island in the Bering Sea and east to Southampton Island and the northern parts of the Hudson Bay. This large swan winters on marshes, grasslands or agricultural fields, often in coastal regions between the Chesapeake Bay and Currituck Sound and on the Pacific coast, from southern Alaska to California. The tundra swan migrates long distances to winter in these temperate areas and may frequent even more southerly regions during very cold winters.

▲ **AQUATIC RUNWAY**
Tundra swans migrate south to marshes.

DID YOU KNOW?

- **Pilots have reported the swans at heights up to 6,000' between Minneapolis and Washington D.C.**
- **Lead poisoning caused the deaths of over 500 tundra swans in a North Carolina refuge in 1974.**
- **In a study of feather counts, the tundra swan had an amazing 25,216 contour feathers, due to its large body size.**

BREEDING

Paired swans arrive at northern breeding grounds from May to June. The swans establish their nesting territory with a great deal of calling and display: arched necks, outstretched wings, bowing and bobbing. The nest is an elaborate platform composed of moss, grass and sedge; females build the nest near rivers and estuaries and on elevated ground, for a better view. The female lays one creamy-white egg every other day; she begins incubating when the last of the 3–5 eggs is laid. After about a month, the cygnets hatch with pale silvery-gray down. Both parents guard the young for almost three months, and bring the cygnets food. The young grow rapidly, reaching a weight of 12 lbs. in just over two months. Adults molt at the breeding site while tending the young and lose all of their flight feathers. During this time they are unable to fly. By late September, the entire family is capable of flight as they head south; they remain together until the spring.

A FAMILY AFFAIR

1 Firm grasp...
A male (cob) bites a female's neck as the pair mates under the cold waters.

2 A warm touch...
The female (pen) incubates her eggs atop a mound of vegetation she built as a nest.

BEHAVIOR

The swan's high-pitched whistling, barklike call, *kow-wow*, is distinctive and helps establish a territory. The swan is highly territorial and solitary during breeding; only one or two pairs are found per sq. mile. Loud calling and displays with outstretched wings fend off most intruders. Flocks sharing a winter home can number in the thousands. A typical migratory route is often more than 2,000 miles, with flocks of up to 500 swans flying in a V or single line.

▲ **AN ICY HELLO**
Swans quickly establish breeding territories.

▶ **ALL TUCKED IN**
A tundra swan rests its long neck while floating.

FOOD & FEEDING

The tundra swan feeds by dipping its head and neck into the water, plucking aquatic vegetation with the scissorlike edge of its large bill. The swan also uses its coarse tongue and serrated bill to scoop and filter particles that float on the surface of the water. Salt glands allow the bird to digest saltwater plant life, excreting excess salt through the nostrils. Its long neck enables the swan to reach deep into the water; if the water is too deep for dipping, the swan reaches the bottom by up-ending. In winter, the tundra swan sometimes grazes on grain and waste potatoes on farmland; it also feeds on tubers, wild aquatic celery, wigeon grass, bulrushes and pondweeds. Tubers of arrowhead are a favorite. In brackish waters, including the Chesapeake Bay, the tundra swan strays from its herbivorous diet and eats mollusks, especially clams.

▼ **SUNLIT SEARCH**
A swan prepares to dip its head and long neck back into the water for a meal.

3 A time to molt…
Adults molt, losing all of their flight feathers, as they tend to their large cygnets on the slow-flowing waters.

4 Family trip
The adult pair and their three cygnets set out on the long journey south to warmer winter grounds.

CONSERVATION

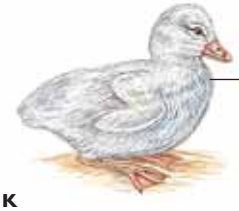
Not globally threatened, the tundra swan maintains sizable populations. The largest threat to this swan is illegal hunting and lead poisoning. Spent lead pellets left by hunters in the bottom of ponds accumulate rapidly; ingesting a single pellet is fatal to most waterfowl, including the tundra swan.

PROFILE TUNDRA SWAN

The tundra swan's plumage blends with its snowy habitat in spring; the bird's long neck and webbed feet enable it to feed on underwater plants.

BILL

The powerful black bill has serrated edges; it allows the swan to get a firm grip on aquatic vegetation when it dives. The swan places its chin and bill horizontally on the surface of the water and also filters water through the serrations, trapping food particles in the mouth.



CYGNET

The cygnet is pale grayish-white with a pink bill and pale orange feet. It will develop into a brownish-gray juvenile, and still retain its gray head and neck area until the end of its first year.

NECK

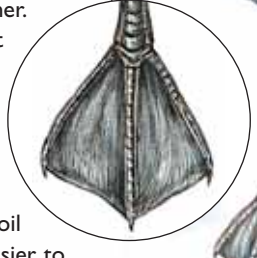
The extended neck is as long as the body. Muscular and extremely flexible, it enables the swan to reach deeply submerged vegetation.

PLUMAGE

Both sexes have all-white plumage, which is sometimes stained a rusty color from the minerals found in the marsh soils where they dig for food.

FEET

The tundra swan's large webbed feet make it a powerful swimmer. It has prominent toes, which it uses to rake the bottom for underwater vegetation, stirring up the soil and making it easier to pull up aquatic plants.



LEGS

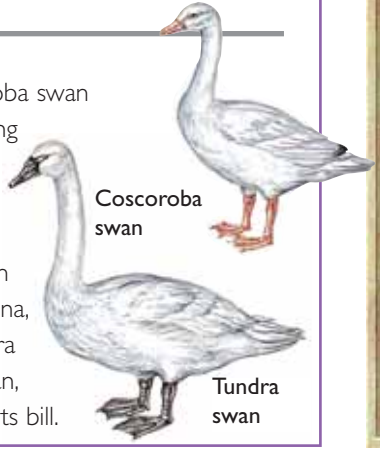
The strong legs are set far back on the body, producing an awkward gait on land, but providing powerful propulsion while swimming.

VITAL STATISTICS

WEIGHT	10–19 lbs.
LENGTH	47–59"
WINGSPAN	6–7'
SEXUAL MATURITY	3–4 years
BREEDING SEASON	May and June
NUMBER OF EGGS	3–5
INCUBATION PERIOD	29–35 days
FLEDGING PERIOD	60–75 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Leaves, roots and stems of aquatic plants
LIFESPAN	Up to 20 years

CREATURE COMPARISONS

Measuring up to 45" in length, and weighing up to 12 lbs., the Coscoroba swan (*Coscoroba coscoroba*) is smaller than the tundra swan. Its large feet, long legs and rounded wings are similar to its relative's, but the head is feathered in front of the eye, somewhat like a goose. While the Coscoroba swan lacks black coloring in its feet and beak, its six outermost primary feathers are black on the tips, a sharp contrast with its white plumage. A native to South American regions such as Argentina, Chile and Brazil, the Coscoroba breeds and winters far from the tundra swan, though its diet and nesting habits are similar. Like the tundra swan, the Coscoroba feeds by straining food through the fine serrations on its bill.



RELATED SPECIES

- **The tundra swan is 1 of 6 species of swan in the genus *Cygnus*, including the mute swan, *C. olor*, and the black swan, *C. atratus*. The seventh species of swan, the Coscoroba swan, is in its own genus, *Coscoroba*. The long-necked swans join the smaller ducks and geese in the family *Anatidae*, with over 140 species found worldwide except Antarctica.**

Turtle Dove

• ORDER •
Columbiformes

• FAMILY •
Columbidae

• GENUS & SPECIES •
Streptopelia turtur

KEY FEATURES

- Coos a sweet but mournful mating call that is widely recognized
- Produces "pigeon milk," a porridgelike substance made only by doves and pigeons to feed their young
- Does not need to raise its head to swallow

WHERE IN THE WORLD?

Found throughout Europe, the Canary Islands, Egypt, northwest Africa, the central Sahara and western Siberia south to Kazakhstan

LIFECYCLE

Known as a symbol of love because of its tender mating song and faithfulness, the turtle dove is also a creature of habit: its daily feeding routine runs like clockwork.

HABITAT

A common inhabitant of open woodlands, the turtle dove frequents meadows that offer a smorgasbord of tasty seeds and leaves. Trees and bushes are used for roosting and nesting, while scattered weeds and grasses provide excellent feeding sites. The dove avoids windy, wet and chilly climates, instead preferring balmy weather for breeding. It settles in temperate, steppe and semidesert regions for mating and migrates south to the Mediterranean and Africa for the winter. Whether in Europe, Asia or Africa, the dove's home always has a source of water nearby.

▼ **REGULAR ROOST**
The turtle dove roosts and nests in woodland trees.

DID YOU KNOW?

- **Doves are released at the Olympics to symbolize the hope of world peace, but in ancient times they were offered as a sacrifice.**
- **Prolactin, a hormone formed in the anterior lobe of the pituitary gland, stimulates secretion of milk in both doves and mammals.**

BREEDING

ALL IN THE FAMILY

1 Construction…
A turtle dove adds a grass lining to the flimsy straw and twig nest, which can be seen through from the ground below.

2 Inspection…
Before settling to incubate, the female dove examines the two white, smooth eggs, delicately placed in the nest.

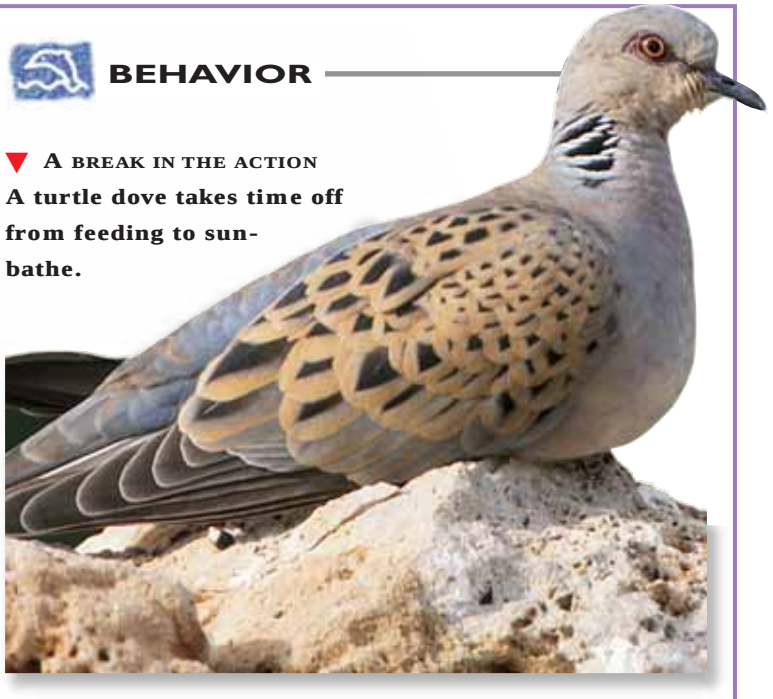
FOOD & FEEDING

During its two daily feeding periods, the turtle dove also finds freshwater to drink. Its ability to suck up the water and swallow in one action is unusual among birds. Most birds have to raise their head to swallow, which often exposes them to predators. The turtle dove's routine rarely changes. It wakes at dawn and hunts for a variety of tidbits, nibbling on staples of seeds, fruits and nuts, mainly on the ground. Each day at about midmorning the turtle dove retires to the nest to rest. In the afternoon it forages again, sampling leaves, cocoons of earthworms and the bird version of escargot: small tree snails.

▶ **SEED SEARCH**
With a fondness for weed seeds, a turtle dove finds food mainly on the ground.

BEHAVIOR

Pairs of doves mate for life. After remaining in small flocks during the winter, they return each year to breeding areas in May. The male finds a nesting site, and both doves build a simple, fragile nest located 3–8' above the ground in a tree or shrub. Varying their daily routine for a week, they spend early mornings and evenings shaping the nest. To begin his bowing display, an important part of courtship, the male stretches tall and then bows so low that his belly touches the branch or the ground. He repeats this movement up to six times in succession, at a rapid rate of less than 1 second per bow. One or two white oval eggs hatch within two weeks. Triggered by a hormone during incubation, the lining of both parents' crops enlarge up to 20 times their original thickness. The parents feed only "pigeon milk" to the young for 5 days and then add grain to the porridgelike mixture for about 18 more days.



A BREAK IN THE ACTION
A turtle dove takes time off from feeding to sunbathe.

3 Regurgitation…
One squab appears to be engulfed by its parent, but is actually scooping up its first meal, "pigeon milk," with its broad bill.

4 Aviation
Having spent almost 3 weeks in the nest, the two siblings are ready for their maiden flight. Their mother observes them closely.

Male turtle doves take the lead in the chorus of turtle dove singing. A sad, tender cry, *coorr-coorr,* is sung by territorial males to females and potential male trespassers as a way of announcing their presence. The male turtle dove changes its tune, emitting a rapid *croor-wa, croor-wa, croor-wa* during its impressive courtship displays. Females are not quite as vocally talented as the males. Their coos, uttered less frequently, are usually hoarser and not as melodic as their male counterparts.

A smooth and elegant flier, the turtle dove travels long distances with easy wingbeats, frequently gliding. It maneuvers with finesse through foliage, instantly changing speed and direction. It takes off with a swift flutter and lands with tail feathers spread open. In flight, the dove uses its agility and speed to escape its aerial predators, such as hawks and eagles, but it prefers ducking for cover. Emitting a distress call that sounds much like a panting gasp, the turtle dove will even try to enter a building to escape. Often, after successful evasion, the dove will shake its head to express its discomfort at the close call.

CONSERVATION

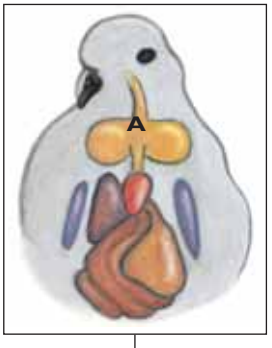
Even though they are hunted by a variety of predators, turtle doves are resilient birds, and their populations remain strong. However, the passenger pigeon is a prime example of how an abundant bird can quickly become extinct. Prized for its meat and an easy target, it was hunted into oblivion at the turn of the 20th century.

PROFILE TURTLE DOVE

The graceful turtle dove moves with agility in flight or on the ground and has one of the most specialized crops of all birds.

SUBSPECIES

Found only in Egypt, *S. t. rufescens* is one of four subspecies of the turtle dove. The darkest subspecies, this dove has rust-colored upperparts and lacks the typical gray crown.



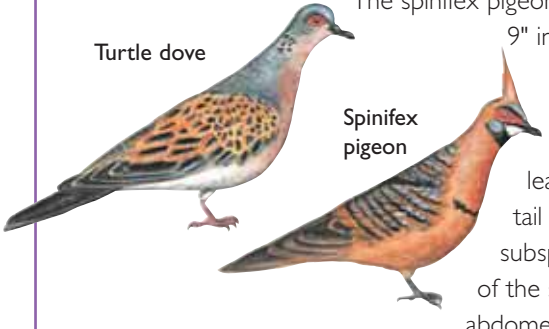
CROP

The crop (A) is an extension of the esophagus and stores hurriedly swallowed food. During the nesting season, the walls of the dove's two-chambered crop thicken and produce a thick milk substance that is fed to the hatchlings.

FEET

With three toes forward and one toe directed backward, the dove walks briskly in search of food or perches high in a tree.

CREATURE COMPARISONS



The spinifex pigeon (*Geophaps plumifera*), at 9" in length, is slightly smaller than its close relative, the turtle dove. It gets its name from its Australian habitat of spinifex grassland, made up of plants with stiff and sharp-pointed leaves and seeds. The spinifex has a red-brown back, tail and wings, and resembles the turtle dove's Egyptian subspecies, *S. t. rufescens*, in coloring. The two subspecies of the spinifex pigeon differ only by the color of their abdomen: red-brown in one, white in the other.

VITAL STATISTICS

WEIGHT	3.5–5.5 oz.
LENGTH	10–10.6"
WINGSPAN	18.5–21"
SEXUAL MATURITY	1 year
BREEDING SEASON	Early May
NUMBER OF EGGS	2
INCUBATION PERIOD	About 14 days
FLEDGING PERIOD	11–20 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Seeds, fruits and nuts
LIFESPAN	Up to 13 years

RELATED SPECIES

- **"Pigeon" is the common name for members of a family of birds, *Columbidae*. Smaller species with pointed tails are known as doves, and larger species with round or square tails are usually referred to as pigeons, though the names are often used interchangeably. One of nearly 300 species, the ringed turtle dove, *Streptopelia risoria*, belongs to the same genus as the turtle dove.**

Verreaux's Eagle

• ORDER •
Falconiformes

• FAMILY •
Accipitridae

• GENUS & SPECIES •
Aquila verreauxil

KEY FEATURES

- Hunts entirely while in flight, swooping down rapidly to surprise its unsuspecting prey
- Builds a massive nest out of sticks and grass on the exposed side of a sheer cliff
- The elder chick almost always kills its younger sibling
- Also known as black eagles, these birds of prey feed mainly on the small hyrax

WHERE IN THE WORLD?

Found in both Chad and Sudan; also throughout Israel, Egypt and southeastern Arabian peninsula; also in Ethiopia to Somalia, with main ranges from Kenya to South Africa

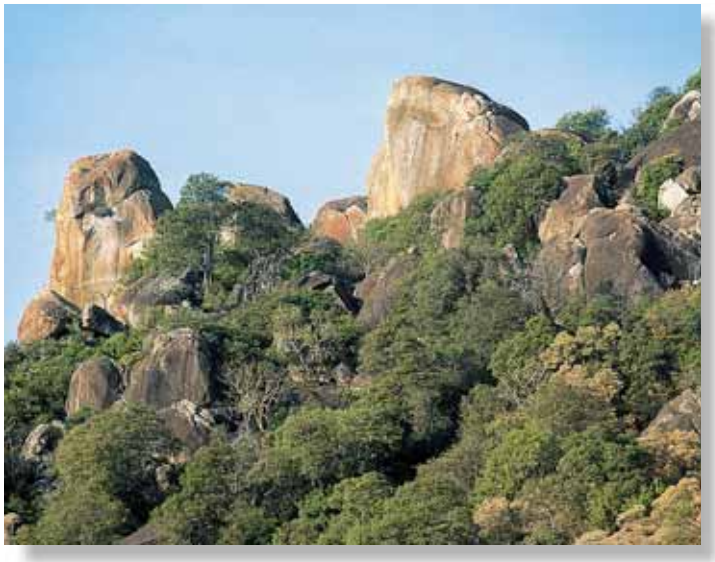
LIFECYCLE

A highly specialized hunter, Verreaux's eagle relies on the element of surprise when it strikes; the eagle often swoops down a cliff to grab its favorite victim — the rock hyrax.

HABITAT

Verreaux's eagle favors a rugged and extreme habitat; it ranges throughout the mountainous and desert terrain of most of sub-Saharan Africa. This eagle inhabits areas where its favorite meal, the hyrax, lives. Verreaux's eagle searches out its prey in river gorges, rocky outcrops, hills and mountains all the way from sea level to over 15,000', where the eagle builds large nests on exposed rocky cliffs.

▼ **HIGH ALTITUDE**
The eagle prefers mountainous terrain, overlooking its domain.



DID YOU KNOW?

- **The largest recorded Verreaux's eagle nest is 13' high.**
- **Verreaux's eagle has been known to attack creatures as large and powerful as leopards in defense of its nest.**
- **Verreaux's eagles have been the subject of an extremely long-term monitoring program which keeps track of their habits; it was established in 1964 in Matobo National Park, which is located in Zimbabwe.**

BREEDING

Male Verreaux's eagles mark the beginning of the breeding season with dramatic displays in which the bird plunges, climbs and swings. The female sometimes reciprocates with similar performances. These birds are monogamous and have been known to keep the same mate and nest for an entire lifetime.

▲ **PRECARIOUS PERCH**
Verreaux's eagle nests on cliff edges.

Breeding occurs at different times throughout the year, depending on the region. After mating the female lays two eggs 3–4 days apart in a nest made of sticks and grass, usually situated on the edge of a cliff. The first chick hatches in about 44 days and usually kills the younger chick. It makes its first flight 13–14 weeks later. Both parents feed the chick until it leaves the nest.

ELEMENT OF SURPRISE

1 View from above...
Flying high above a mountain, a Verreaux's eagle spots rock hyraxes that are sunning themselves on a rocky ledge.

2 Coming in...
An accomplished aerialist, the eagle swoops down and around the rock outcrop, zooming in the hyrax colony.

3 Too late...
The eagle turns the corner and banks sharply among the rocks, surprising the hyrax just as it is getting up on its feet in alarm.

4 A fine catch
Verreaux's eagle flies high into the air with its kill, making its way back to the nest where it will savor the meal.

BEHAVIOR

Usually silent, Verreaux's eagle may utter whistling calls during mating season. If threatened, the eagle emits a savage bark. The territorial bird often perches in conspicuous places and lets other eagles know to stay away from its territory with warning calls; it will drive away an invader that violates its airspace. Pairs live together for years and respect their neighbors' boundaries. As summer ends, eagle pairs begin repairing last year's nest and prepare for the new season.

HUNTING HYRAX
The magnificent Verreaux's eagle takes wing in search of the wily hyrax, which likes to hide in rocky outcrops.

CONSERVATION

This widely distributed African eagle is not considered globally threatened. In fact, it is quite common in habitats that contain plenty of hyraxes, especially South Africa. Verreaux's eagle populations are sparse on the Arabian Peninsula; these reduced numbers may be due to drought and hunting.

FOOD & HUNTING

The hyrax, a rock-dwelling mammal that resembles a cross between a rabbit and a guinea pig, accounts for at least 90% of the eagle's diet. The eagle needs to consume about one hyrax a day to survive. Scoping out its prey from above, the eagle spots its unsuspecting victim and quickly strikes. If the hyrax tries to scurry into a rock crevice, the eagle is often able to surprise the small mammal by plucking it from its hiding place with its feet.

Often hunting in pairs, the eagle also eats birds and other small mammals. The eagle uses its sharp claws to grab its victim and fly back to its nest, where it eats its kill or stores the food until it is ready to be eaten. Verreaux's eagle rips into the flesh of its prey and breaks it into pieces with its sharp beak before swallowing.

PROFILE VERREAUX'S EAGLE

Verreaux's eagle hunts for prey using its keen sense of vision; it spots its victim from high atop its perch before swooping in for the kill.

BILL
The eagle's bill is sharp and hooked, designed especially for tearing and pulling the flesh, skin or feathers of its unfortunate victim.

FEET
The feet have three toes pointing forward and one opposable hind-toe. The curved claws and the rough toe pads provide excellent grasping ability when hunting.

VISION
Like all birds of prey, the eagle's vision is highly developed, allowing it to detect prey while perching or when flying.

PLUMAGE
The bird is predominantly black except for its yellow feet and a white V on its back, which is exposed when the bird flies. Short, inner secondary flight feathers give the wing a leaf-shaped appearance.

VITAL STATISTICS

WEIGHT	Female 6.5–12 lbs.; male 6.5–9 lbs.
LENGTH	2.5–3'
SEXUAL MATURITY	Unknown
BREEDING SEASON	All year, depending on region
NUMBER OF EGGS	2
INCUBATION PERIOD	44 days
FLEDGING PERIOD	3–6 months
BREEDING INTERVAL	2–3 years
TYPICAL DIET	Hyraxes, small mammals, reptiles and birds
LIFESPAN	About 16 years

RELATED SPECIES

There are 64 genera and 237 species in the family *Accipitridae*, one of the largest bird families. The 11 species in this genus are viewed as the most highly evolved in the family *Accipitridae*. Some of the more diverse members of the *Aquila* genus are the greater spotted eagle, *Aquila clanga*, the Tawny eagle, *Aquila rapax* and the steppe eagle, *Aquila nipalensis*.

CREATURE COMPARISONS

Measuring about 2' in length and weighing 2.5 lbs., Wahlberg's eagle (*Aquila wahlbergi*) is smaller than Verreaux's eagle. Like its relative, Wahlberg's eagle usually lays two eggs, with the older hatchling killing the younger sibling. It spends most of its time on the wing searching out prey, but has a more varied diet than Verreaux's eagle; the Walberg's eagle eats squirrels, birds, snakes, frogs and small mongooses. The Wahlberg ranges in color from creamy white to dark brown, compared to the predominantly black Verreaux's eagle. Like its relative, it makes its home in Africa, frequenting the savannah regions extending from the east and west coasts in northern Natal, Botswana, Namibia, Zimbabwe and Mozambique.

Wahlberg's eagle

Verreaux's eagle

Victoria Crowned Pigeon

• ORDER •
Columbiformes

• FAMILY •
Columbidae

• GENUS & SPECIES •
Goura victoria

KEY FEATURES

- Male bows his head during courtship displays to show off his splendid crest
- One of the largest pigeons in the world, almost the size of an average turkey
- Adults produce crop milk to feed their young
- The male makes a unique, loud booming sound during the courtship ritual

WHERE IN THE WORLD?

Found in north New Guinea from the Siriwo River to Astrolobe Bay; also in Yapen and Biak Islands in Geelvink Bay as well as Japan (Jobi) Island and Bink Island, where it may have been introduced

LIFECYCLE

Traveling in small flocks, the colorful Victoria crowned pigeon makes a dazzling sight as the birds search their forest habitat for food that has fallen from the trees.

HABITAT

The Victoria crowned pigeon lives in the lush rainforests, which are rich in fruit trees for the birds to feed on. The pigeon also occupies muddy lowland flats in swamps and sago palm forests, as well as drier forest in the tropics of New Guinea. Some populations have been found in the Jimi Valley, at elevations between 1,500–2,300'. This sedentary bird nests close to rivers and swamps where vegetation is dense, and in virgin forests, far away from the crush of human civilization.

▼ **PIGEON PERCH**
A crowned pigeon perches in the trees of its lush rainforest home.

DID YOU KNOW?

- **Members of the genus *Goura* do not have a gallbladder and also lack an oil gland for preening.**
- **The bird is supposedly named for Queen Victoria, who had a penchant for wearing elaborate feathered headwear.**
- **The Victoria crowned pigeon apparently has no natural predators in the forest other than man, who hunts the colorfully plumed pigeon for its beautiful feathers and meat, which is considered quite a delicacy by some cultures.**

BREEDING

The loud, booming call of the male Victoria crowned pigeon resounds throughout the rainforest during the bird's fall breeding season. He also displays his feathery, colorful crest to the female by nodding his lowered head. Continuing with the elaborate courtship ritual, the male makes his unique call as he fans his tail up and down vigorously. The female pigeon responds by spreading her wings and raising them up as she runs alongside the male with slightly bent legs, hissing along the way. Before mating, the male and female crowned pigeon will preen each other carefully while perched on the fork of a tree branch. The breeding pair builds its nest up to 50' above the ground, usually in a rainforest tree. The nest is a neat, solid, compact mass of tightly woven palm leaves, sticks and stems, in which the female lays one large white egg. Both parents will take turns incubating the single egg for approximately 30 days. Once the lone chick hatches, the parents feed it crop milk; this nutritious food is produced by both sexes in the crop, which is an extension of the esophagus. The thick milk has the same consistency as cottage cheese. Fed on this milk, the young crowned pigeon grows fast. In fact, by 4 weeks the chick is ready to fly from the nest. However, the young bird is still fed by the protective parents until it is about 13 weeks old.

DYNAMIC DISPLAY

1 Breathtaking sight…
The male's call gets the female's attention as he lowers his head, offering a full view of his crest.

2 Beautiful pair…
The blue male and female are a stunning sight to behold as they preen each other.

3 Weaving together…
The breeding pair works together to build a tidy, compact nest of leaves and sticks.

4 Parent's pride
The pair takes turns incubating a single egg. The adult's feet grip the nest as it waits to be relieved.

FOOD & FEEDING

Feeding mainly on fallen fruits, berries and seeds, the crowned pigeon often forages on the forest floor in groups of 2–10. The pigeon scoops up fruits and berries and will crack the seeds with its sharp, hooked beak. Unlike other birds, pigeons immerse their bill in water and are then able to swallow without raising their heads.

▼ **DRESSED FOR DINNER**
Two pigeons forage in their colorful plumage.

CONSERVATION

Although not globally threatened, the Victoria crowned pigeon is considered vulnerable by CITES II because it continues to be threatened by agricultural logging, capture for the lucrative pet trade and hunting for its meat and colorful plumes. Despite being protected by law in New Guinea, the Victoria crowned pigeon has all but disappeared from large areas of forest.

BEHAVIOR

Little is known of the habits of the three species of crowned pigeons, other than what has been observed in zoos and among collectors of the birds. The Victoria crowned pigeon travels in small groups that spend most of their day searching for fallen fruits and berries; the pigeon remains near its food source and perches on branches. After preening its feathers, the pigeon bathes in pools of water among the fallen leaves of the forest. Virtually defenseless against hunters and feather collectors, the pigeon flies noisily up into the trees when alarmed or disturbed.

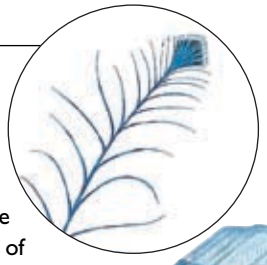
▶ **PRETTY PIGEON**
The crowned pigeon bathes and preens often.

PROFILE VICTORIA CROWNED PIGEON

The azure feathers of the Victoria crowned pigeon fan out along its head, making it one of the most spectacular tropical birds in the forest.

PLUMAGE
The pigeon's colorful plumage is gray-blue with a purplish-red breast; the wing is blue with a purple edge.

CREST FEATHERS
The white-tipped crest feathers are long, with slightly separated barbs at the ends, giving them a lacy appearance. Feathers are composed of mostly dead cells, like the hair of humans.



BILL
The pigeon uses its sharp, hooked bill to crack open seeds; the bird can also immerse its bill in water and swallow without raising its head.

IN FLIGHT
Though heavy, the crowned pigeon is a strong flier. It remains close to the ground, but will fly high up into the trees when alarmed.

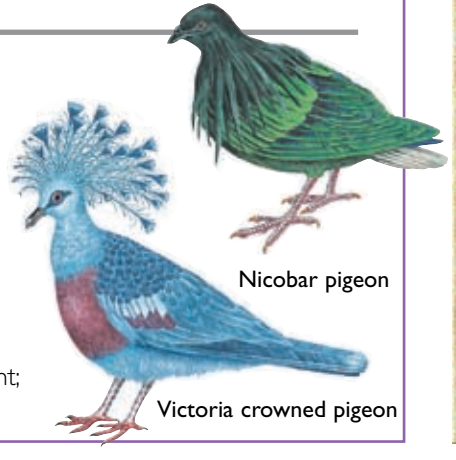
LEGS & FEET
Legs have a tough skin with a tiled effect. Three toes on the front and one in the back enable the bird to climb trees or grip perches.

VITAL STATISTICS

WEIGHT	Up to 6 lbs.
LENGTH	23–29"
SEXUAL MATURITY	17 months
BREEDING SEASON	August–September
NUMBER OF EGGS	1
INCUBATION PERIOD	30 days
FLEDGING PERIOD	28 days
BREEDING INTERVAL	About 1 year
TYPICAL DIET	Fruit, berries and seeds
LIFESPAN	Unknown

CREATURE COMPARISONS

The Nicobar pigeon (*Caloenas nicobarica*) is found on the Nicobar Islands, New Guinea, through Indonesia and the Philippines, a range that overlaps with the Victoria crowned pigeon's. In addition, the Nicobar pigeon shares other common traits with the Victoria crowned pigeon: it also feeds on seeds and fruits, nests high up in the trees and produces one egg. Resembling a vulture more than a pigeon, the smaller Nicobar pigeon has short plumage except on the neck where the feathers are long. Plumage is blackish-gray with a greenish tint; upperparts are dark green and the short tail is white.



Nicobar pigeon

Victoria crowned pigeon

RELATED SPECIES

● **There are 3 species in the genus *Goura*. In addition to the Victoria crowned pigeon, the genus also includes two other crowned species: the western or blue-crowned pigeon, *Goura cristata*, and Southern crowned pigeon, *Goura scheepmakeri*. There are 49 genera and 309 species in the family *Columbidae*, which also includes doves, such as the emerald dove, *Chalcophaps indica*.**

Village Weaver

• ORDER •
Passeriformes

• FAMILY •
Passeridae

• GENUS & SPECIES •
Ploceus cucullatus

KEY FEATURES

- A seed-eating bird of savannah and farmland
- Male weaves a spherical nest from strips of grass in order to attract a mate
- After inspecting a number of nests, the female breeds with the owner of the nest that meets her approval
- Outside of the breeding season, the male loses his bright coloration

WHERE IN THE WORLD?

Nonmigrant; lives in Africa, south of the Sahara Desert, often near cultivated land; common in tropics, and also found on the eastern side of the continent as far south as Cape Province

LIFECYCLE

During the breeding season, the nesting site of the village weaver is a scene of noisy activity, as brightly colored males hang beneath their nests competing for females.

HABITAT

▲ **STRANGE FRUIT**
Overhanging branches are popular nesting sites.

There are two subspecies of village weaver: one with a black hood, one without. Both live in open, semiwooded habitats from the fringes of the Sahara to the grasslands of South Africa. The bird needs a supply of palm leaves that it can strip and use to build its nest. The village weaver often lives on arable land, but avoids dense forests and arid areas. It often lives near rivers and streams, nesting on branches overhanging the water or among tall reeds.

CONSERVATION

The village weaver has not been seriously affected by human changes to Africa's landscapes, and is not endangered. In some places the clearing of forests for cultivation has actually helped the species to spread. The village weaver is occasionally trapped as a pest, and where it is very numerous its nests are sometimes destroyed. However, such measures have had little effect on its overall numbers.

BEHAVIOR

The weaver is a social bird, not only breeding in colonies but feeding in flocks. Flocking helps the weaver locate food that is often widely scattered and offers a measure of safety. Roosting and feeding sites are busy as birds squabble over partners and pickings.

Such a social lifestyle requires good communication, and the village weaver has a repertoire of at least 15 calls. Some are understood only by the same species, but a few can be recognized by other small birds. While on the move, the weaver keeps up a constant *chuck-chuck* that helps the flock stay together, and chirps excitedly to announce the discovery of food. It is particularly vocal during the breeding season, chattering to court partners or to deter rivals. But every so often, the colony suddenly falls silent.

▼ **SPLASH DOWN**
Regular bathing removes dust from plumage.

DID YOU KNOW?

- **The village weaver gets its name from its habit of nesting near settlements.**
- **Weavers sometimes nest in the same trees as wasps; this helps deter predators.**
- **The female rejects any egg that looks unlike the rest of her clutch. This is probably a defensive tactic against a cuckoo that lays its egg in weaver nests.**

BREEDING

The rains, which fall at different times of the year across its range, are the cue for the male to seek a clear branch and begin building a nest from strips of grass. The ball-shaped mass appears impenetrable, but there is an entrance to the chamber underneath.

Having attracted and mated with a female, the male takes little interest in the rest of the proceedings, and often begins building another nest elsewhere. The female incubates the eggs and rears the young alone. The eggs hatch after about two weeks, and roughly three weeks later the nestlings are independent.

▲ **BUSY BUILDER**
A male may weave three nests in breeding season.

BUILDING A SHOW HOME

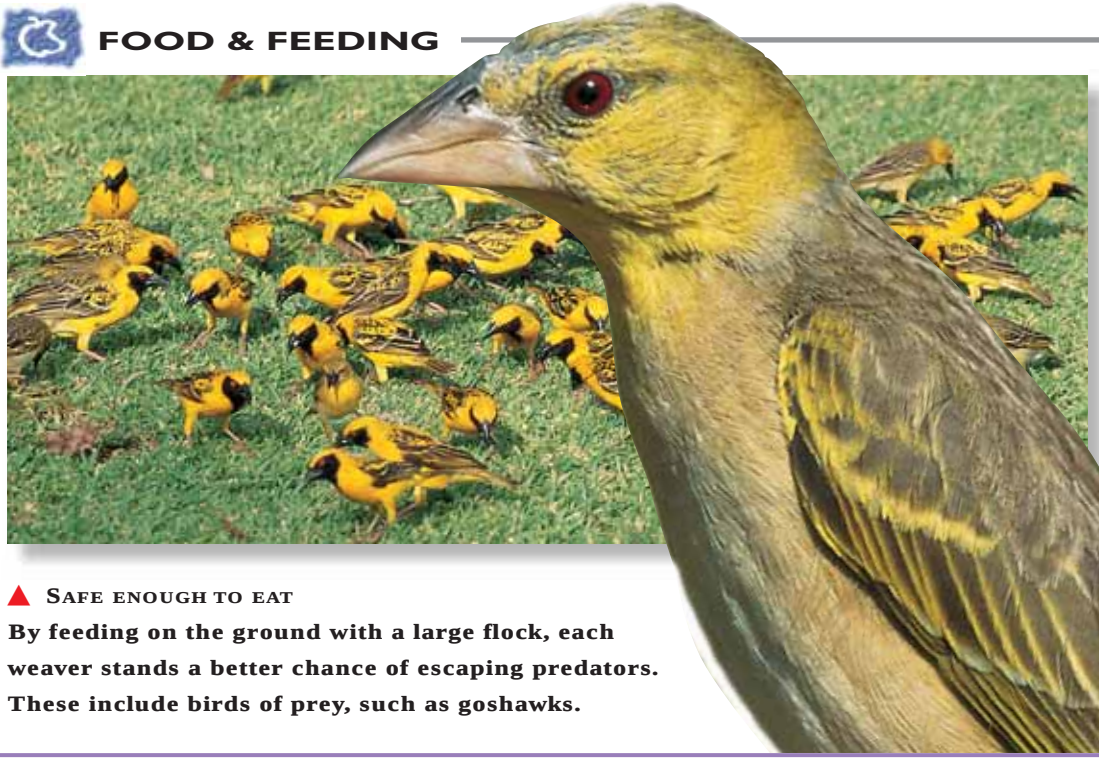
1 Collecting materials…
The male tears off pieces of green grass or palm leaves, and then carries them back to the nest tree.

2 Foundations…
The first strands are draped over a branch. The male coils them and pulls them tight.

3 Ready for viewing…
With his nest complete, the male carries out a courtship display to attract female visitors to the nest.

4 Inspection
Satisfied with the nest (shown in cross section), a female lines it and lays her eggs.

FOOD & FEEDING



▲ **SAFE ENOUGH TO EAT**
By feeding on the ground with a large flock, each weaver stands a better chance of escaping predators. These include birds of prey, such as goshawks.

The village weaver feeds mainly at or near ground level on the seeds of grasses and other low-growing plants. It may feed on seed crops, such as millet, but rarely to the extent of being a serious pest.

The village weaver also eats insects, especially during the breeding season, when nestlings need plenty of energy and protein. With its stout yet fine-tipped bill, the weaver can manipulate morsels easily, whether gathering insects for nestlings or cracking tough seed husks.

PROFILE VILLAGE WEAVER

The lightweight build, strong feet and pointed bill of the village weaver enable it to hang adroitly while threading the first grass strips of its nest.

FEMALE

The female has less showy plumage than the male. She molts, but remains the same color all year.

BILL

The robust bill ends in a fine point and is used to pick up seeds and insects and to tear up and weave strips of grass.

NON-BREEDING

Outside the breeding season, the male molts his bright-yellow underside and black head feathers.

LEGS & FEET

The weaver has three toes pointing forward and one pointing backward. In addition to perching, it uses its toes to grip grass when nest-building.

VITAL STATISTICS

WEIGHT	About 1.5 oz.
LENGTH	7"
WINGSPAN	10"
SEXUAL MATURITY	1 year
BREEDING SEASON	Varies by location, but often coincides with rainy season
NUMBER OF EGGS	2 or 3
INCUBATION PERIOD	13 days
FLEDGING PERIOD	18 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Seeds and insects
LIFESPAN	About 5 years

RELATED SPECIES

● **The village weaver is 1 of more than 100 species in the subfamily *Ploceinae*. Most live in Africa, but a handful lives in southern Asia. All true weavers build woven nests and breed in noisy colonies, and most are highly social. The weaver family also includes three other subfamilies. One of the species within a subfamily, the sociable weaver, makes nests that can be over 25' across.**

CREATURE COMPARISONS

Like the village weaver, the chestnut weaver (*Ploceus rubiginosus*) lives in Africa. There are two separate populations: one in the east, the other in the southwest. Both species have powerful feet that help them grip branches while they weave their intricate nests. Similarly, the male of both species takes on a more brilliant coloration during the breeding season: the male chestnut weaver becomes reddish, while the female remains a dull brown. Like the village weaver, the chestnut weaver is sociable, often gathering in large flocks of up to 500 individuals.

Chestnut weaver

Village weaver

WALLCREEPER

• ORDER •
Passeriformes

• FAMILY •
Tichodromadidae

• GENUS & SPECIES •
Tichodroma muraria

KEY FEATURES

- Its gray plumage appears drab until it opens its wings to reveal a bold red and white pattern
- Flicks its colorful wings while ascending steep rock faces to search for insects and spiders
- Leads a solitary life except for the breeding season; then both sexes feed and protect the young

WHERE IN THE WORLD?

Found in central and southern Europe, including Spain, France, Austria, Italy, Germany, Poland, Albania and Greece, east across Asia to Mongolia and western China

LIFECYCLE

The wallcreeper is an extremely elusive bird that dwells on steep mountain cliffs, where it hides its nest in a secure rock crevice, far out of reach from larger predators.

HABITAT

From rocky riverbeds to clay cliffs, boulder-strewn slopes to stone cathedrals, the wallcreeper calls a variety of precipitous places home — but the bird's favorite haunts are limestone hills and jagged cliffs. True to its name, the wallcreeper inhabits walls of all sorts, including those made by man, such as castles, tunnels and large bridges. In its natural habitat, the bird prefers steep, mountainous regions in the spring and summer months, choosing rock that is partially covered with plants. It descends to mountain villages in the winter, where it searches the walls of stone buildings and other crevices for food.

TRUE TO ITS NAME
An extremely agile wallcreeper clings to a steep rock face with its long, sharp toes.

DID YOU KNOW?

- **In France there is a winter tour designed specifically to find the wallcreeper in the Les Alpilles, after the birds descend from their breeding grounds in the high Alps. Les Alpilles is well known for its limestone hills, the wallcreeper's favorite.**
- **The principality of Andorra is a rather small country, only 182 sq. miles in area, located between France and Spain. In June 1981, a special wallcreeper stamp was issued as part of the country's Nature Protection series.**

FOOD & FEEDING

The wallcreeper expertly climbs up steep rock faces in its quest for insects and spiders. The bird carefully examines every crevice; it ascends the cliffs with short wing flicks, methodically investigating every crack. It ferrets out the invertebrates with its long, sleek bill and extracts them with its forked tongue. The wallcreeper then flits, butterflylike, down to the bottom of another face and begins again. In rainy weather, when the steep cliffs are slippery, the bird often forages along streams or among the pebbles and rocks at the base of the cliffs. It explores underneath every stone, but it is rarely seen in trees.

BEHAVIOR

The wallcreeper is almost constantly in motion. On steep rock faces, the bird characteristically flicks its wings half-open like a butterfly; mountaineers call the wallcreeper the butterfly bird. Juveniles begin this flicking habit as soon as they are able to fly. The wallcreeper flicks its wings faster when excited, but if an aerial predator approaches, the bird often freezes, hoping to blend with its gray plumage into the rocky background.

When moving from one precipice to another, the wallcreeper flies high across mountain valleys or over passes. On cliffs or buildings, the bird uses a hopping gait to traverse the steep surface. The wallcreeper prefers to live alone; it joins others only during the breeding season, and even then, pairs remain 0.5–1.25 miles apart from other pairs. Throughout the year, the birds defend feeding territories; disputes may be prolonged and include aerial fights, where the bird emits a *chuit dweeoo* call and other whistles.

FREQUENT FLYER
When not creeping, the bird prefers to fly.

ROCK CLIMBING

1 Starting point…
A wallcreeper flashes its brilliant, crimson-patterned wings as it flies toward a steep rock face.

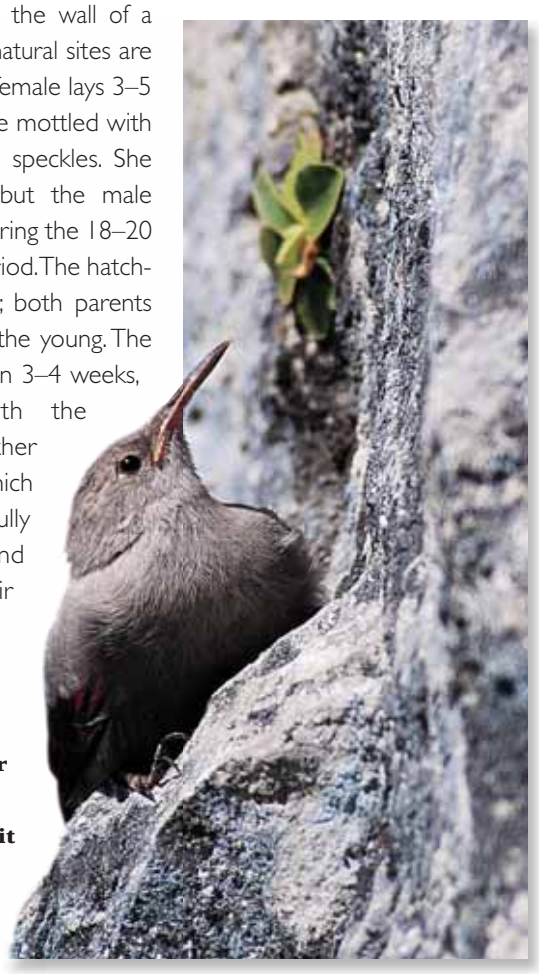
2 Hop along…
The agile bird hops between rocks, searching for a new nook with tasty insects.

3 In between…
The wallcreeper disappears into a rock crevice; its long, curved bill helps it delve deep after food.

4 Mission complete
The successful wallcreeper exits the crevice with a large caterpillar trapped in its bill.

BREEDING

At the start of the breeding season in the spring, the wallcreeper usually ascends to higher altitudes, seeking its favored limestone cliffs. The male executes display flights, designed to show off his dazzling red wings. He also "dances" for the female, circling her with his wings spread, tail moving up and down and head shaking back and forth. Once paired, the two build their cup-shaped nest made of grass, moss and rootlets in a crevice, boulder pile or behind a rock. It may also be placed in the wall of a building or pipe if natural sites are not available. The female lays 3–5 white eggs that are mottled with dark-red to black speckles. She incubates alone, but the male brings her food during the 18–20 day incubation period. The hatchlings grow quickly; both parents feed and protect the young. The chicks fledge within 3–4 weeks, but remain with the parents for another 5–6 days, after which time they are fully independent and search for their own rocky terrain.



HOLD TIGHT
The wallcreeper seeks out rocky crevices where it can conceal its nest of grass.

CONSERVATION

The wallcreeper is not globally threatened, though its wary nature makes it a hard bird to observe. Its ability to adapt to a variety of steep habitats — from cliffs in mountainous regions or seashores to the faces of gorges, quarries and even castles and cathedrals — contributes to its success, but it is uncommon throughout its range due to its solitary behavior.

PROFILE WALLCREEPER

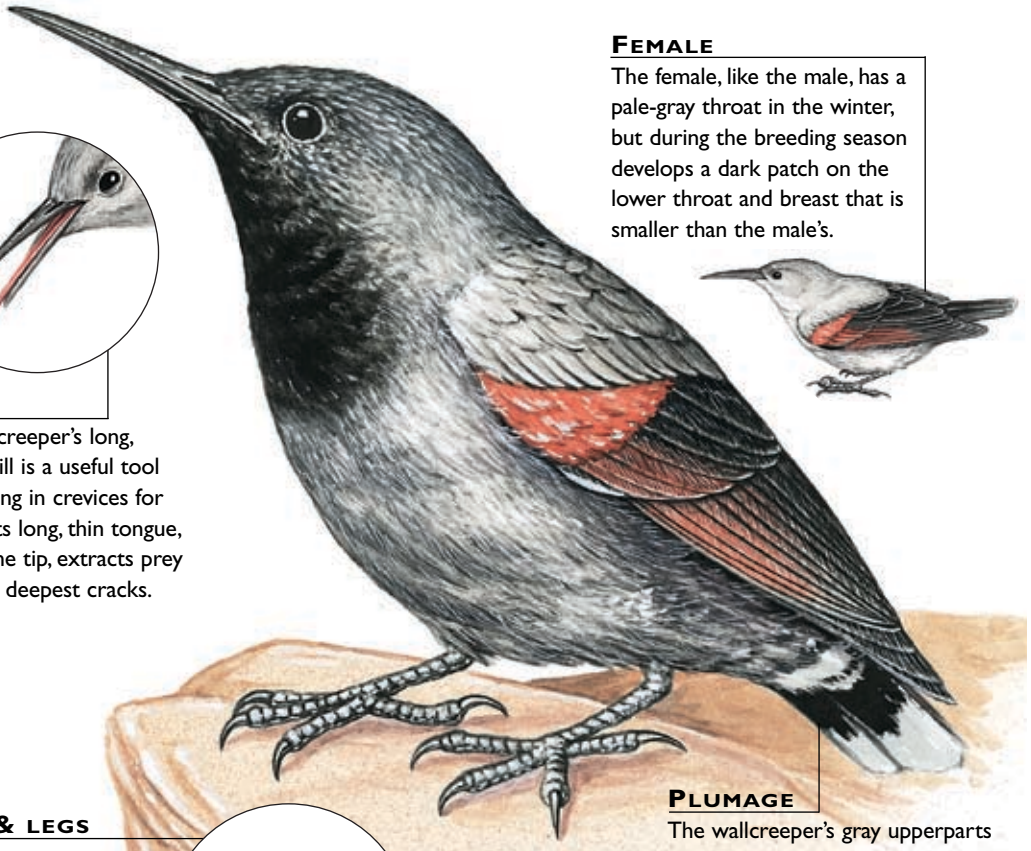
Aptly nicknamed the "rock flower" in China, the wallcreeper masterfully climbs rock walls while opening its wings to reveal beautiful red markings.

BILL

The wallcreeper's long, curved bill is a useful tool for probing in crevices for insects. Its long, thin tongue, split at the tip, extracts prey from the deepest cracks.

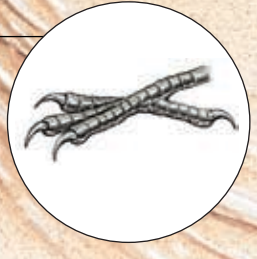
FEMALE

The female, like the male, has a pale-gray throat in the winter, but during the breeding season develops a dark patch on the lower throat and breast that is smaller than the male's.



FEET & LEGS

The wallcreeper climbs up vertical rock faces with its long toes and deeply curved claws.



PLUMAGE

The wallcreeper's gray upperparts camouflage the bird perfectly as it climbs up the face of rocks. When the wallcreeper spreads its wings, it exposes crimson bands and white spots. The male (*above*) has a large black bib on his throat and chest during the breeding season.

VITAL STATISTICS

WEIGHT	0.5–0.7 oz.
LENGTH	6.25–6.5"
SEXUAL MATURITY	About 1 year
BREEDING SEASON	April–July, depending on the region
NUMBER OF EGGS	3–5
INCUBATION PERIOD	18–20 days
FLEDGING PERIOD	3–4 weeks
BREEDING INTERVAL	1 year
TYPICAL DIET	Insects and their larvae; also spiders and centipedes
LIFESPAN	Unknown

RELATED SPECIES

● **The wallcreeper is the only species in its genus, *Tichodroma,* and its family, *Tichodromadidae*. There are two subspecies, *T. m. nepalensis,* found in Turkmenistan and eastern Iran east to China, and *T. m. muraria,* found in Europe east to northern and western Iran. The wallcreeper was once placed in the family *Sittidae,* but was then classified in the subfamily *Tichodrominae*.**

CREATURE COMPARISONS

The treecreeper (*Certia familiaris*) measures up to 5" and is smaller than the wallcreeper. The treecreeper's plumage is a rich pattern of dark and rufous brown mixed with white, whereas the wallcreeper's base plumage has shades of gray with bright red dominating the wings. The treecreeper climbs up trees in a spiral, searching for insects and spiders, using its stiffened tail feathers for balance. The wallcreeper ascends cliff faces in a similar quest for concealed invertebrates, but does not use its shorter tail for support. Both species are found throughout Europe and Asia.

Treecreeper

Wallcreeper

Wandering Albatross

• ORDER •
Procellariiformes

• FAMILY •
Diomedeidae

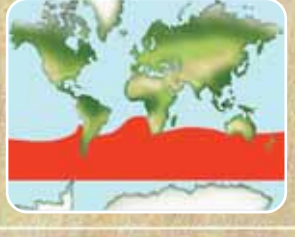
• GENUS & SPECIES •
Diomedea exulans

KEY FEATURES

- One of the largest of all flying birds, with a wingspan of 12'
- Travels great distances at sea — thousands of miles a year in search of food
- Flies by gliding rather than flapping its wings
- Chick stays in the nest for nearly a year and may spend years at sea before breeding for the first time

WHERE IN THE WORLD?

Throughout oceans of Southern Hemisphere; breeds on remote oceanic islands and island groups, which include Auckland Island, South Georgia, Prince Edward Island and the Crozet Islands



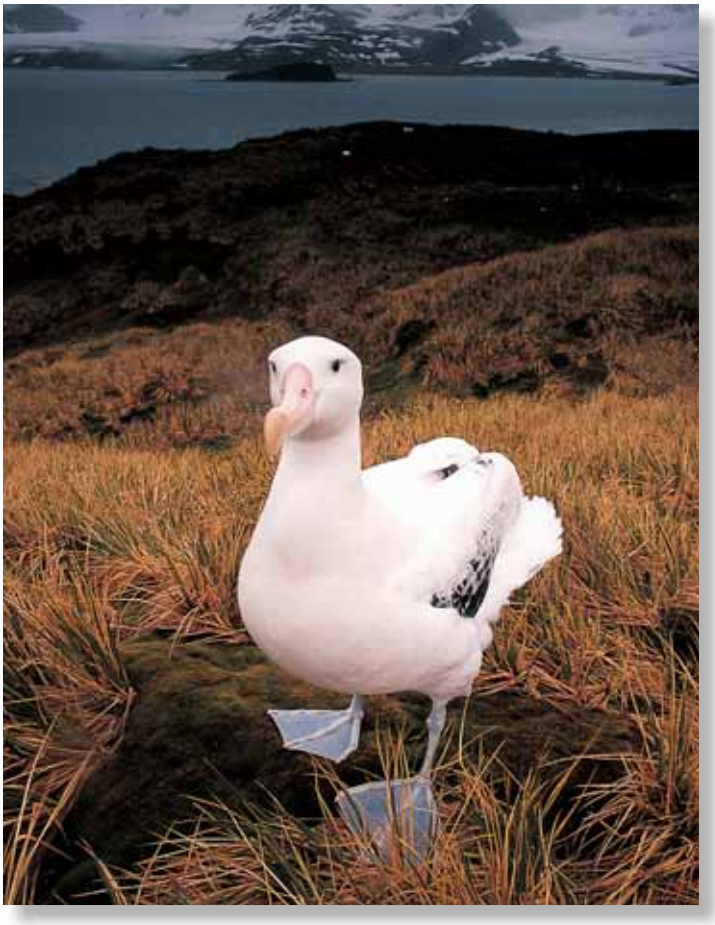
LIFECYCLE

The wandering albatross has no contenders to its mastery of the southern oceans' winds. Flying for days on end, it searches for food in one of the most hostile environments.

HABITAT

The wandering albatross lives up to its name, spending most of the year far out at sea. This nomadic bird can be found soaring over vast expanses of often turbulent southern oceans that surround Antarctica. Occasionally, it lands on the water in calm weather to feed. With the breeding season in early spring, the albatross returns to land. On its remote, bleak and wind-blown island nesting site, the bird usually occupies a slope with only a scant covering of tussock grass. The nest site needs to offer proper exposure to the prevailing wind in order to make takeoffs and landings easier.

▼ **IN FROM THE SEA**
The albatross may land on oceanic islands.

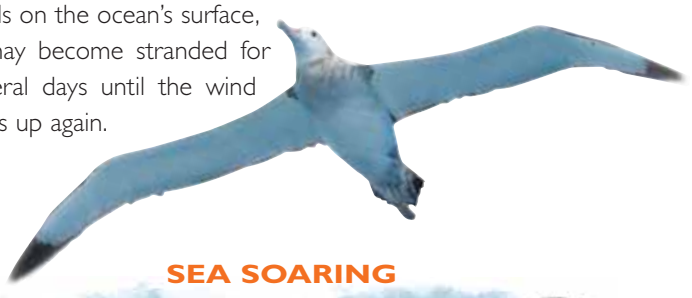


BEHAVIOR

To exploit the vast food resources of open southern oceans, the albatross needs to be very energy-efficient in flight. Its long, heavy wings aren't suitable for prolonged flapping. Instead, the bird takes advantage of variations in wind speed above the ocean's surface to glide continuously without having to flap its wings — a process known as "dynamic soaring" or "slope gliding."

▼ **BLOWING IN THE WIND**
Thermal currents help the bird cross the ocean.

The effective use of air currents comes at a cost. Because of its size and weight, the albatross needs a minimum wind speed of about 11 mph to get airborne. In calm weather, when the bird feeds on the ocean's surface, it may become stranded for several days until the wind picks up again.



SEA SOARING

1 Losing speed...
Losing speed and height at the end of its glide path, the albatross seeks an up-current that billows in the trough between two waves.

2 Gaining height...
To gain height, the albatross turns into the wind and is lifted rapidly and almost vertically over the crest of the next wave.

3 Blown along...
At the higher altitude, the wind is strong and blows the albatross along at good speed. It then glides downwind as far as it can.

4 Again and again
This rise-and-fall sequence is repeated in long spirals, allowing the albatross to travel great distances merely by gliding.

DID YOU KNOW?

- **It's believed that the word "albatross" is derived from a corruption of the Portuguese "alcatraz," meaning large seabird.**
- **The albatross pairs for life. Separation is likely to occur only if breeding attempts fail over a long period of time.**
- **The genus name *Diomedea* comes from Diomedes, the Greek hero of the Trojan War. In mythology, Diomedes's dead warrior comrades were reincarnated as seabirds.**

BREEDING

Mature males are the first to return from the sea to their breeding colonies. While awaiting the arrival of their mates, they repair their old nests. The nests are bow-llike structures on the ground of mud and grass. Birds that haven't mated before arrive fairly late in the breeding season to look for a mate. A courtship ritual then consists of a simple repertoire of displays, involving a series of ritual poses: "bill-circling," "sky-pointing" and "flank-touching."

Once the birds mate, they return to sea to feed and build body reserves. Both return to the nest just prior to the egg being laid and take turns incubating the egg until it hatches. One year after the egg was laid, the young albatross is fledged. Energy requirements for breeding on the cold islands are so high that breeding only takes place once every two years.

▲ **IT TAKES TWO**
On average, albatross mates relieve each other on the nest every week.

▶ **REMEMBER ME?**
Recognition displays reestablish pair bonds.

FOOD & FEEDING

Squid and octopus are the most important components of the albatross's diet, but flying fish, pilchards and crustaceans are also taken. Squid perform vertical migrations in the sea, coming close to the surface at night and returning to deeper water in the day. Consequently, the albatross is usually more active at night when squid are easier to catch. Often, the albatross feeds at the ocean's surface, but may plunge dive and up-end to reach prey.

Humans have accidentally helped the albatross's survival. This bird frequently follows ships, especially fishing fleets, feeding on the edible refuse discarded by fishermen and the fish offal that's dumped into the sea while the fish are processed. The wandering albatross's powerful bill also allows it to tear at any floating carrion that it finds.

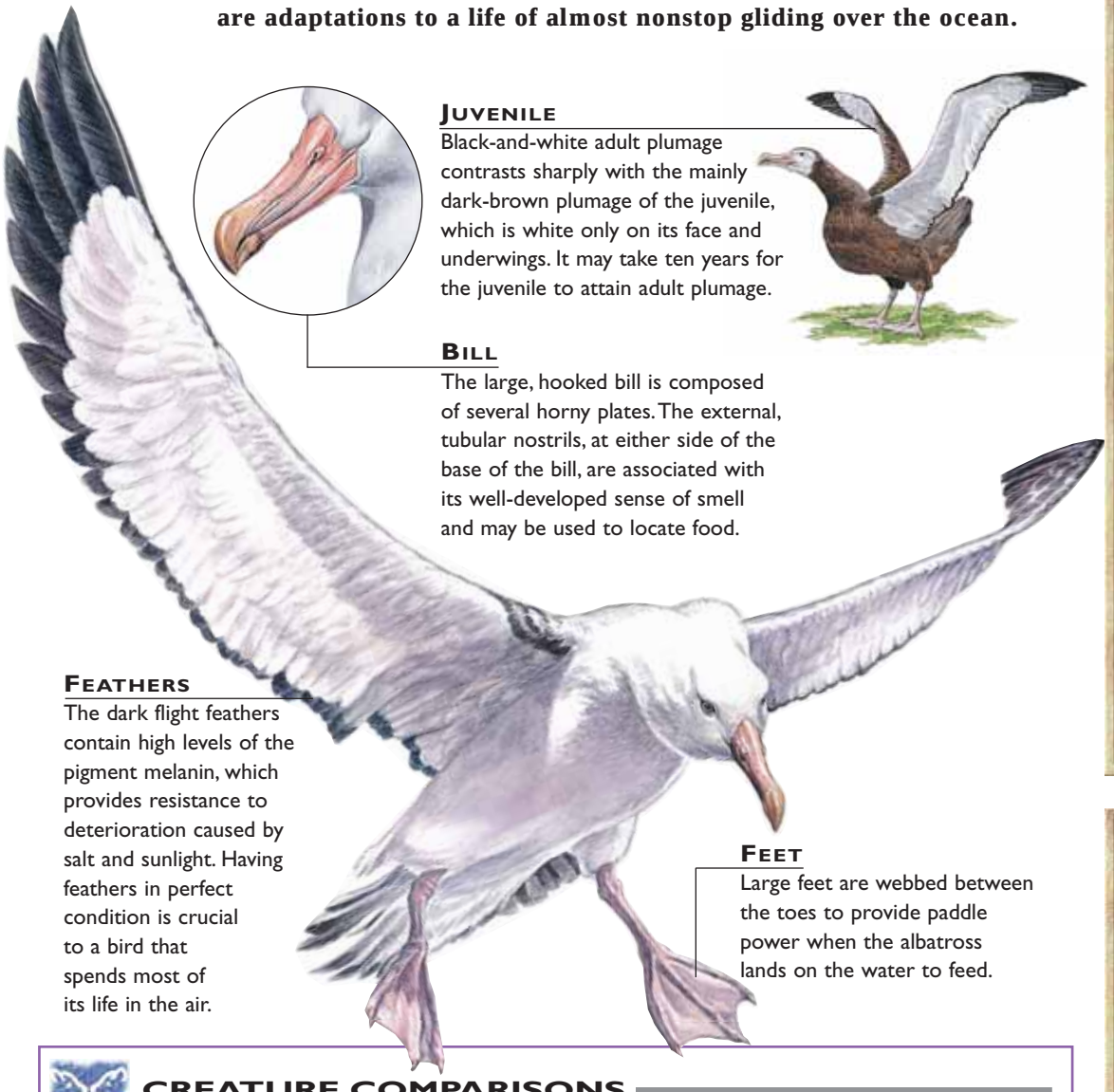
▼ **OPEN WIDE**
The chick is raised on a partly digested seafood mixed with a foul-smelling oil, which is regurgitated by the parents.

CONSERVATION

The wandering albatross isn't under any severe threat but has undergone a considerable decline in the past. The present world population is about 21,000 breeding pairs, with some 80,000 nonbreeding birds remaining out at sea. Many birds have been reportedly killed by long-line fishing, which involves paying out a huge line of fish and squid hook baits. Albatrosses fly down to snatch the baits, become hooked, then drown as the main line sinks.

PROFILE WANDERING ALBATROSS

The wandering albatross's long, narrow wings and streamlined body are adaptations to a life of almost nonstop gliding over the ocean.



JUVENILE

Black-and-white adult plumage contrasts sharply with the mainly dark-brown plumage of the juvenile, which is white only on its face and underwings. It may take ten years for the juvenile to attain adult plumage.

BILL

The large, hooked bill is composed of several horny plates. The external, tubular nostrils, at either side of the base of the bill, are associated with its well-developed sense of smell and may be used to locate food.

FEATHERS

The dark flight feathers contain high levels of the pigment melanin, which provides resistance to deterioration caused by salt and sunlight. Having feathers in perfect condition is crucial to a bird that spends most of its life in the air.

FEET

Large feet are webbed between the toes to provide paddle power when the albatross lands on the water to feed.

VITAL STATISTICS

WEIGHT	14–25 lbs.
LENGTH	3–5'
WINGSPAN	8–12'
SEXUAL MATURITY	3–4 years
MATING SEASON	Early spring
NUMBER OF EGGS	1
INCUBATION PERIOD	65–79 days
FLEDGING PERIOD	39–40 weeks
BREEDING INTERVAL	Once every 2 years; nesting usually begins in November
TYPICAL DIET	Squid, octopus, crustaceans, fish; ship refuse
LIFESPAN	30–40 years; maybe 60 years

RELATED SPECIES

● The 14 albatross species are divided into two genera: *Diomedea* (12 species) and *Phoebetria* (two species: sooty albatross and light-mantled sooty albatross). The wandering albatross and two other species — the royal and Amsterdam Island albatrosses — are often called the "great albatrosses." The final nine smaller species in *Diomedea* are often called "mollymawks."

CREATURE COMPARISONS

Waved and sooty albatrosses share with their larger relative the long, narrow wings of birds adapted to a life gliding over the oceans. Most albatross species are white with dark upperparts, wingtips, brow or tail; the waved albatross has a brown body and wings and yellowish tinge on its nape. The sooty albatross is almost completely chocolate-brown with a long, pointed tail.

Sooty albatross

Waved albatross

Wandering albatross

Water Rail

• ORDER •
Gruiformes

• FAMILY •
Rallidae

• GENUS & SPECIES •
Rallus aquaticus

KEY FEATURES

- Stays undercover in marshland grasses, and is rarely seen but often heard grunting as it feeds
- Prefers not to fly and eats plants or animals in the water or on land
- Leaves the nest within hours of birth, but follows its parents, which feed and protect it

WHERE IN THE WORLD?

Widespread in marshes across Asia and Europe, with a breeding range from Iceland to Japan, including Russia and the Mediterranean

LIFECYCLE

Even the avid birdwatcher often fails to spot the reclusive water rail, which leaves the nest immediately after birth to lead an undercover life in the marsh.

HABITAT

The water rail is far-reaching throughout Europe and Asia. Within its range, it will call any marsh, freshwater swamp or bog home. It regularly uses paths cut through the dense vegetation to connect feeding areas. During icy winters, some nonmigratory rails simply settle on the shores of channels, swamps, lakes and ponds. Those in Iceland take advantage of hot springs with warm streams that melt through the snow. Water rails that do migrate prefer spending their winters in the warm climates of the Mediterranean and southern Asia.

▼ **RESERVED RAIL**
A water rail offers a glimpse of itself before slipping back into cover.

FOOD & FEEDING

The water rail is an opportunistic feeder and rarely passes up an opportunity to eat any plant or animal found in its marshy habitat. The water rail probes for shrimp, small fish and snails in the water, but also forages along the banks for insects, worms, seeds and berries. Rarely seen during the warmer seasons, it can easily be spotted in the winter when it must venture out to reach food under unfrozen water surfaces.

THE RAIL-ROAD

1 Swimming...
A secretive water rail embarks from its tall, grassy hideaway to paddle along the marsh in search of aquatic food.

2 Striking...
Within minutes the rail, using its slender bill, launches a swift and precise attack on a frog that's caught off guard.

3 Jumping...
Upon detecting a dragonfly that has just settled on a bulrush, the water rail leaps from the water 3' into the air.

4 Stabbing
The rail takes a shortcut through the tall grasses and encounters the perfect prey — an unprotected nestling.

CONSERVATION

Water rail populations remain strong, but draining swamps and cleaning overgrown ponds have taken a toll. Only about 3,500 California black rails, a cousin of the water rail, still survive. Conservationists are lobbying to have this rail included on the federal list of endangered species. The water rail can fly weakly to avoid land predators, but many island rails are flightless and are extremely vulnerable to predators such as cats and rats.

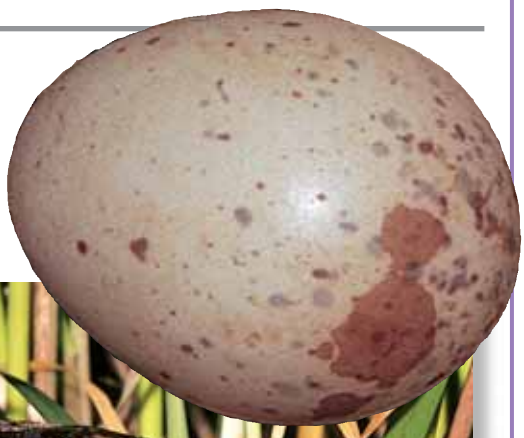
DID YOU KNOW?

- **The rail, which has an extremely slender body, probably inspired the expression "skinny as a rail."**
- **The water rail performs distraction displays, such as pretending to be hurt, to lure disturbing intruders away from its nest.**
- **The rail's wings have a small claw where the wing bends. The rail actually has 3 fingers in its wing and this claw is the equivalent of a human's thumb. The rail moves through dense-growing plants by hooking and pushing them to the side with its claw and wing.**

BREEDING

Either sex initiates courtship by rubbing bills or by preening, which helps establish mutual trust. The male often performs an unusual display: it flaps its tail, raises its wings and rests its bill against the female rail, then encircles her while showing off his feathers.

The large, cup-shaped nest is well hidden and rests at or near water level. Both parents share incubation; when the young start hatching, the parents pick off the eggshell. The chicks follow their parents within hours of hatching. This way, the parents don't have to return to the nest with food after foraging; they just feed the chicks where the food is found. Within a few weeks, the chicks can find food by themselves and take their first flying lessons by the time they're 2 months old.



ONE OF NINE
Chicks leave the nest hours after they hatch.

A LITTLE HELP FROM MOM WOULDN'T HURT
Water rail chicks hatch with their eyes open and a coat of soft, black down; the female picks off the eggshells.

BEHAVIOR

A shy, secretive bird that usually withdraws into the dense grasses for protection, the water rail is often heard but not seen as it grunts softly, sounding much like a pig, while looking for food.

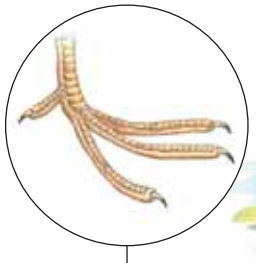
The water rail is a very wary bird; when it feels threatened, it will stand completely still or run for cover. It prefers not to fly, so it will only do so as a last resort.

MASTER OF THE MARSH
The rail can dart easily through the grass for cover.

PROFILE WATER RAIL

The slender water rail maneuvers expertly with its long legs through tangled marshland grasses and across mud flats.

BODY FORM
The narrow, compact body helps the rail run swiftly and skillfully through entangled marsh grasses and weeds.



FEET
Long, strong toes on the relatively large feet help the water rail walk on mud and grasses.

CHICK
The downy chick is black with a bluish sheen and leaves the nest as soon as it hatches.

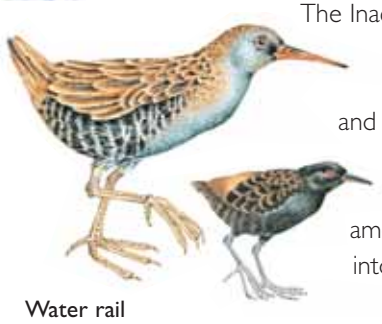
VITAL STATISTICS

WEIGHT	4.5–6.5 lbs.
LENGTH	11"
SEXUAL MATURITY	1 year
BREEDING SEASON	April–July
NUMBER OF EGGS	Average of 6–11
INCUBATION PERIOD	20–30 days
FLEDGING PERIOD	7–8 weeks
BREEDING INTERVAL	Up to two broods per year
TYPICAL DIET	Mollusks, insects, seeds and vegetation
LIFESPAN	6 years

RELATED SPECIES

● The genus *Rallus* includes the California clapper rail, *Rallus longirostris obsoletus,* as well as the water rail, *R. aquaticus*. There are over 120 species in the family *Rallidae*, which consists of rails, coots, crakes and gallinules. Coots, with their lobed feet, are the most aquatic birds in the group. Long bills distinguish rails from the stubbier-billed crakes.

CREATURE COMPARISONS



Water rail

Inaccessible Island rail

The Inaccessible Island rail is found only on Inaccessible Island, located in the Tristan da Cunha Islands in the south Atlantic Ocean. Measuring 5" in length, this rail is the smallest flightless bird and is much smaller than the water rail. Sometimes called the island hen, this primarily dark, reddish-brown and gray bird is plainer than the water rail. Both rails search for insects among tangled grasses. The Inaccessible Island rail weaves grasses into an unusual-looking nest; it has a roof formed from matted tussocks. It lays a much smaller clutch of only two eggs on the relatively predator-free Inaccessible Island.

Waved Albatross

• ORDER •
Procellariiformes

• FAMILY •
Diomedeidae

• GENUS & SPECIES •
Diomedea irrorata

KEY FEATURES

- Spends its entire life in tropical climates — the only albatross to do so
- Lives an average of 30–40 years; first breeds at 5–6 years of age and mates for life
- Unique among albatrosses, it builds no nest and lays its egg on the bare ground

WHERE IN THE WORLD?

Found on and in the waters off of Española, or Hood Island, in the Galapagos Islands; also occurs on Isla de la Plata off Ecuador

LIFECYCLE

Unlike any other albatross, the waved albatross is a year-round resident of the tropics; it logs thousands of miles flying in circles over the same warm waters.

HABITAT

This seabird is the only albatross species to live its life in the tropics. It is mainly *pelagic* (ocean-going), though it may approach the shores of Ecuador and Peru in search of certain foods. Most of the bird's life is spent on the open seas and near coastal waters until it is time to breed. During that period, albatross colonies nest on bare lava among boulders in open areas surrounded by bushes. The birds frequent Española (Hood) Island in the Galapagos and Isla de la Plata (La Plata Island) off Ecuador.

▲ **SAME PLACE, NEW YEAR**
About 12,000 pairs of waved albatrosses return to the same breeding ground each year.

FOOD & FEEDING

Squid is the main staple of the waved albatross's diet. The bird feeds mainly at night, when squid and other sea creatures come to the surface, but it will also feed during the day. Since the waved albatross has difficulty maneuvering in flight, it sits on the water and then seizes prey with its bill as its victim swims to the surface. The bird's diet also includes fish and crustaceans, and the bird often scavenges scraps tossed from ships, particularly animal fat. It may occasionally follow and attack boobies (another Galapagos bird) and steal their regurgitated food.

◀ **A 6' STRETCH**
The long-winged albatross glides to new feeding areas.

BREEDING

The waved albatross usually breeds for the first time at 5–6 years of age, with the male arriving first to the nesting colony. The birds mate for life; if they are pairing for the first time, they go through an elaborate courtship dance. During pair formation, the male and female face each other and go through a variety of displays; they may clap the lower bill up and down, touch sides and point their bills to the sky; one bird will even circle its bill around its partner's bill.

After mating, the female lays one large, white egg on bare rock, and both parents incubate for a total of about 65 days. When the brown chick hatches, the parents first feed it only stomach oil, produced during the digestion of the parents' food. The parent squirts a stream of the foul-smelling liquid into the chick's bill. Later, the parents feed the chick a mixture of partly digested fish and squid in addition to the oil. For about 4 weeks, the parents take turns protecting the chick and flying off in search of food. Then both parents leave the growing chick alone while hunting for food. Skuas and sheathbills often prey upon the chick during this time. After a long fledging period, about 167 days, the chick usually flies off to sea alone while the parents are away. The adults will return to the same nesting site each year, but will forego the elaborate courtship ritual in following years.

DID YOU KNOW?

- **The waved albatross is thought to be the most primitive species of albatross, due to its simple coloration and lack of a nest.**
- **Sailors consider it bad luck to kill an albatross.**
- **The waved albatross's egg weighs up to 11% of the female's bodyweight and takes a good deal of energy to lay. After laying the egg, the female immediately goes out to sea to feed, leaving the male to incubate first.**

CONSERVATION

With current populations estimated at 50,000–70,000, the waved albatross is not globally threatened. But it is considered vulnerable because of its high egg mortality rate. The birds are protected, but there are still some illegal egg collections. With its limited range, oil spills and chemical pollution are serious threats to the waved albatross.

▲ **ALL ALONE**
A brown, down-covered chick nervously waits for its parents to return with food.

BEHAVIOR

Also known as the Galapagos albatross, this bird floats in the air for hours at a time, mostly in search of food. It relies heavily on wind to stay aloft. During calm weather, it can be stranded in the water for hours until the air currents build. The albatross glides along with stiff wings using a technique known as "dynamic soaring," alternately rising and falling to take advantage of the wind. The waved albatross requires some kind of runway and a running start to take off. The bird may have problems landing, too, and occasionally crashes into objects.

Usually silent in flight, the waved albatross croaks, shrieks or gargles when competing for food. Courting birds make a rattling sound, formed by rapidly opening and shutting the bill.

SURFACE TO AIR

1 Partners...
A mated pair switches duties at the nesting site; one is about to incubate while the other prepares to take flight in search of food.

2 Running start...
Once in the air, the bird is a master glider, but taking off is a chore. It spreads its wings on its way down the runway.

3 Slow beginning...
The albatross runs in an ungainly fashion down the sloped makeshift runway, wings beating and legs pumping.

4 Art in the air
The albatross flies gracefully away to feed in the open sea, gliding up and down with the wind currents above the waves.

PROFILE Waved Albatross

The albatross soars on wings made for gliding, and its dark feathers resist abrasion by salt and sunlight better than lighter-colored feathers.

Bill
The long, hooked bill is made up of several horny plates.

In flight
Among the world's best fliers, the waved albatross rides the wind on long, narrow wings.

Nostrils
To find food or its nest, the albatross relies on an acute sense of smell — aided by the external tubular nostrils, which lie on each side of the bill.

Plumage
The waved albatross has a brown body and whitish head and neck. Juveniles are almost indistinguishable from adults.

Salt glands
Excess salt is filtered by salt glands, located internally above each eye. The salt solution is secreted through the tubular nostrils.

Feet
The waved albatross's large, webbed feet help propel the bird along the water's surface when swimming.

Legs
The albatross can stand and walk on land, but the bird sways awkwardly from side to side, a movement exaggerated in courtship.

Vital Statistics

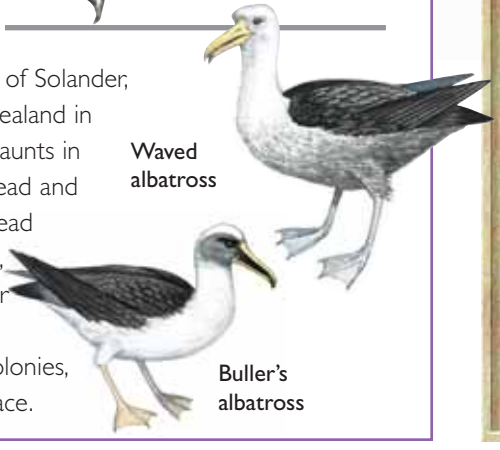
Weight	9 lbs.
Length	33–36"
Wingspan	6'
Sexual Maturity	All year
Breeding Season	April–June
Number of Eggs	1
Incubation Period	65 days
Fledging Period	167 days
Breeding Interval	1–2 years
Typical Diet	Squid, fish, crustaceans and scraps from ships
Lifespan	30–40 years

Related Species

● **The waved albatross is 1 of 12 species in the genus *Diomedea*. Included in the genus are the great albatrosses, which have the largest wingspans of any bird — over 11'. In this group are the wandering albatross, *D. exulans*; the royal albatross, *D. epomophora* and the Amsterdam albatross, *D. amsterdamensis*. The genus *Diomedea* is 1 of 2 genera in the family *Diomedeidae*; the other is *Phoebetria*.**

Creature Comparisons

Buller's albatross (*Diomedea bulleri*) is found on the islands of Solander, Snares, Three Kings and Chatham off Australia and New Zealand in areas of bushy vegetation, far from the waved albatross's haunts in the Galapagos Islands. The bird's head is gray and its forehead and cap are white, in contrast to the brown body and white head of the waved albatross. Its key identifiable feature is a thick, black bar under its wings. Buller's albatross is slightly smaller than its relative, measuring 31" long and weighing up to 7 lbs. Like the waved albatross, Buller's albatross breeds in colonies, follows ships for scraps and eats fish from the water's surface.



Weka

• ORDER •
Gruiformes

• FAMILY •
Rallidae

• GENUS & SPECIES •
Gallirallus australis

KEY FEATURES

- The flightless weka runs and swims to escape predators, including cats and dogs
- Forms a monogamous pair and often establishes a permanent territory
- Emits a repeated shrill whistle that can be heard at dawn and dusk

WHERE IN THE WORLD?

Found only in New Zealand; on the larger North, South and Stewart Islands; also D'Urville, Kapiti Island, and the Marlborough Sounds

LIFECYCLE

Always on the prowl, the weka seizes any opportunity to snatch a tasty morsel, then scurries away; its feeding area can range from mountains to seashores.

HABITAT

▲ **SOUTH ISLAND STROLL**
A weka family forages together along the wetlands.

The flightless weka occurs from sea level up to 5,000', inhabiting forest boundaries, woodland, scrub and grassland, including subalpine tussock grassland. It is found on beaches, particularly those with rotting seaweed, as well as tidal creeks and bays, at the margins of estuaries and on freshwater wetlands. Not disturbed by human neighbors, the weka frequents modified habitats such as lawns, pastures and plantations. It prefers drier areas of low vegetation and avoids forests with no suitably dense understory. In higher elevations, weka have been spotted in hills, mountains and rocky seashore cliffs.

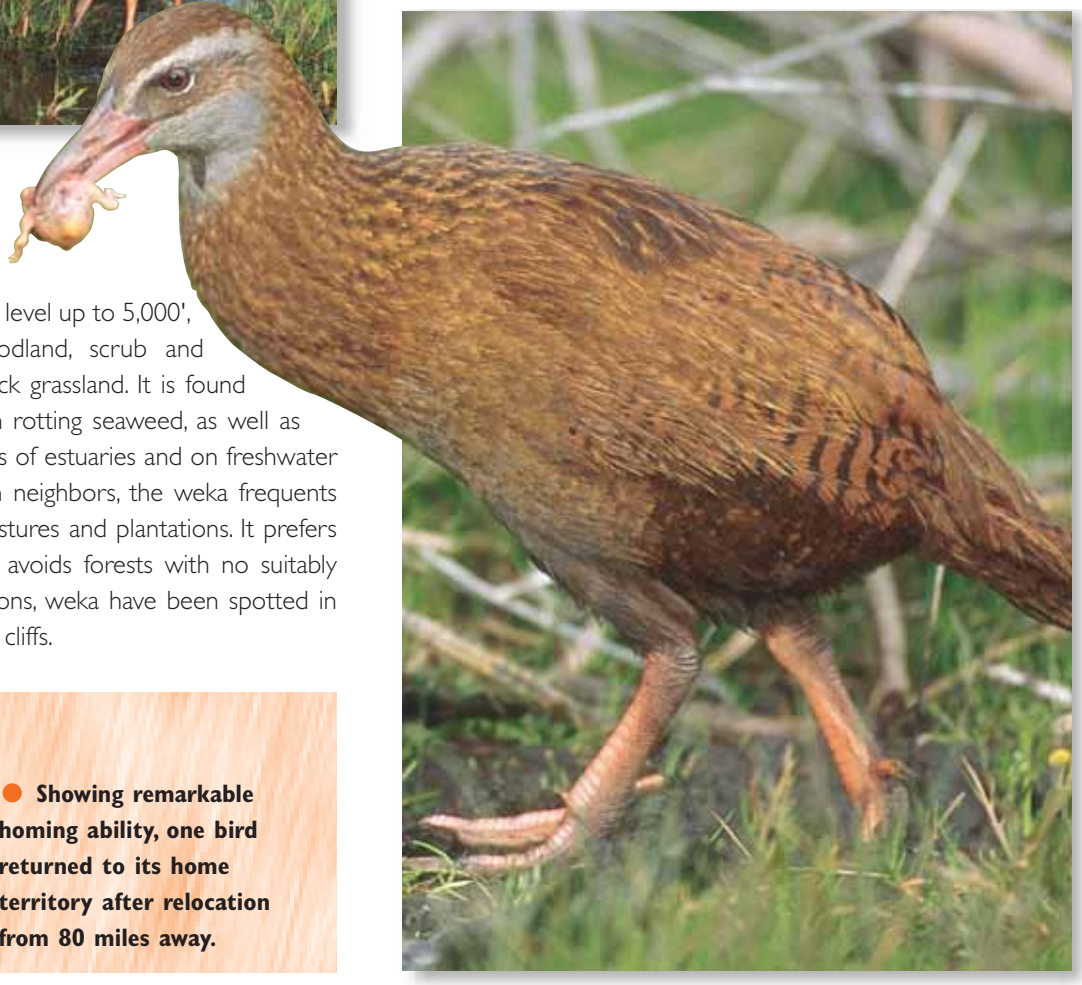
DID YOU KNOW?

- **Many flightless weka are accidentally killed while walking across New Zealand roads where weka populations are high.**
- **Showing remarkable homing ability, one bird returned to its home territory after relocation from 80 miles away.**

FOOD & FEEDING

An opportunistic feeder, the weka forages mainly for native fruits, invertebrates and small vertebrates, including marine life, lizards, frogs, mollusks, rats and mice. The bird feeds both night and day, covering up to 1 mile on the ground while using its bill to uncover anything from bird eggs to fungus. The weka also searches debris piles on the beaches for seaweed and scavenges at camp sites, flicking through the litter with its sturdy bill. This omnivorous hunter will eat chickens, young rabbits and bird eggs, using its bill to spear and carry the prize away. For larger victims, the weka hammers away with its bill while holding down the object with its feet. The bird also follows pigs to search the animal's rooting sites and scavenges carcasses along the way.

▼ **NEST ROBBER**
A weka grabs a young, naked hatchling and carries it away.



SCAVENGER AT WORK

1 Beach patrol...
The weka carefully surveys the beach for rotting seaweed, an epicurian delight.

2 Exposed...
Perseverance pays off when the weka uncovers a dead fish underneath the seaweed.

3 Egg hunt...
The presence of this kelp gull indicates a nest — and probably up to three tasty eggs.

4 A thief on the run
Wasting no time, the weka spears the egg and flees, leaving the adult gull no choice but to watch.

BEHAVIOR

Weka are more often heard than seen, calling year-round and often setting off a chain reaction among other weka that join in. The main call is a shrill, far-carrying cry, normally heard in the early evening, often given by a pair in a practice called duetting. This call is often described as a high-pitched *wee-eek*, *wee-ee-eek*, hence the bird's common name, and is used to announce each weka's territory. Aggressive encounters evoke a deep, resonant booming, *doon-doon-doon*. Weka are usually shy and retiring, though some, especially those on the islands, are quite bold, even taking food from human hands. Adult weka remain in their territories while juveniles will disperse up to 5.5 miles from their place of birth. The flightless bird is quite an accomplished swimmer, often crossing more than 0.5 mile of river, lake or sea.

SUDDEN STRETCH
Flightless, the weka uses its legs more than its wings.

CONSERVATION

Weka populations range from rare to common depending on the region and food availability. Maori and early European settlers used weka for food, oil and feathers. By the 1900s, weka populations declined dramatically and became extinct in most of North Island and eastern South Island. Several factors may have contributed to this decline, including conversion of forests to farmland, the use of poison baits and predators, such as cats and dogs. The North Island weka is listed as threatened because of its declining distribution. The Royal Forest and Bird Protection Society and Otorohanga Kiwi House have begun a successful captive-breeding program.

BREEDING

The sedentary weka often maintains a permanent territory. Pair bonds are usually for life. Because of the secretive nature of the weka, not much is known about certain courtship behavior, but it is assumed that courtship includes feeding and mutual preening, common in rails. The nest is constructed on dry ground located under tussocks, logs, stumps or rocks, in tree hollows and even outbuildings. The bowl-shaped nest, built by both sexes or the male only, is made of grasses, twigs, moss, feathers, wool, hair and leaves. The male incubates the 2–6 creamy-white or pinkish eggs at night, and the female does so during the day. After about 27 days, hatching occurs over several days; the first and strongest chicks receive the most food. The chicks are able to leave the nest after only three days, but the parents care for them for 40–108 days. Weka may breed cooperatively, with chicks being fed by another adult or by juveniles of a previous brood.

BABY STEPS
Weka chicks are able to walk days after hatching.

PROFILE WEKA

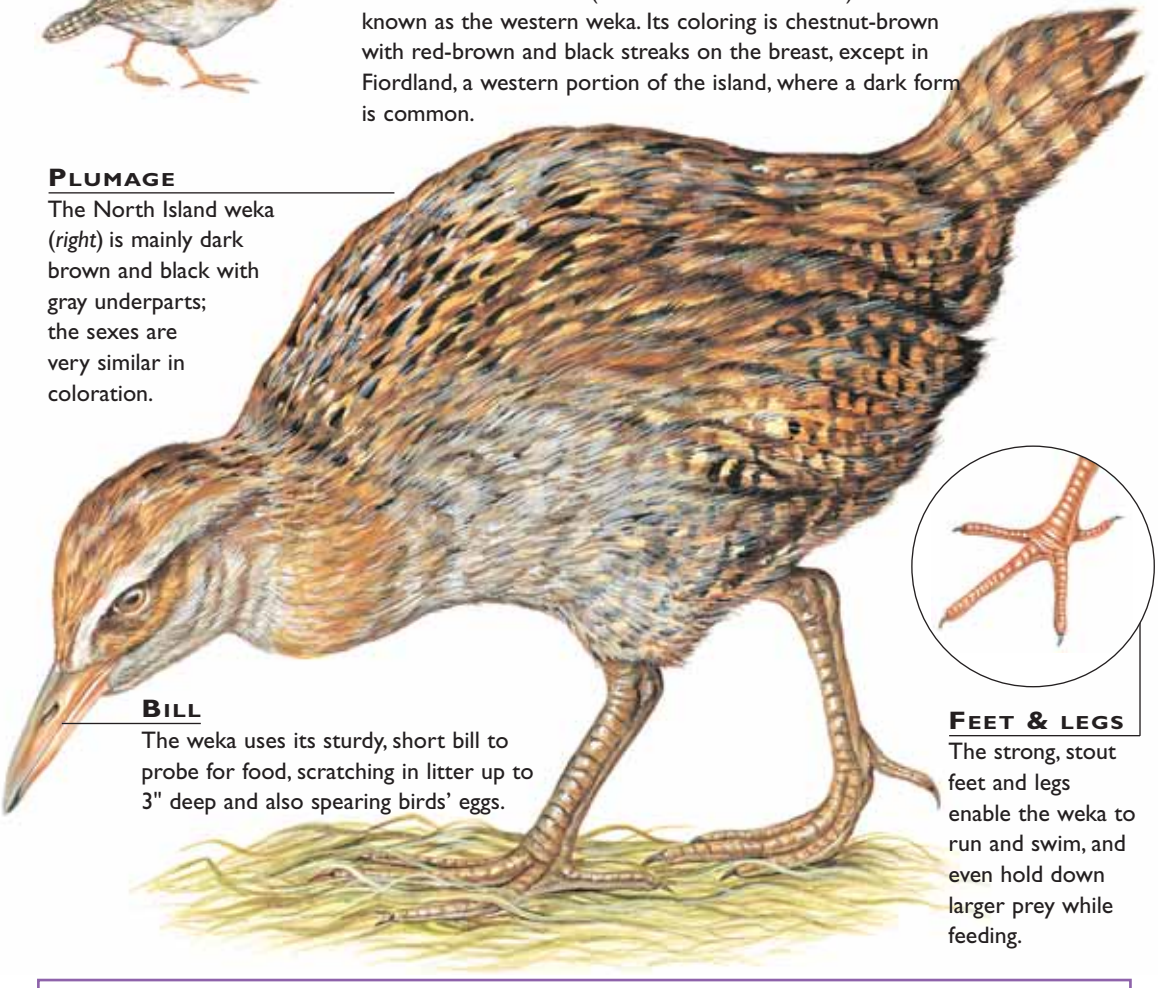
The flightless weka runs swiftly to avoid predators and walks up to 1 mile in search of food, using its bill to uncover hidden treats.

SOUTH ISLAND SUBSPECIES

The South Island weka (*Gallirallus australis australis*) is also known as the western weka. Its coloring is chestnut-brown with red-brown and black streaks on the breast, except in Fiordland, a western portion of the island, where a dark form is common.

PLUMAGE

The North Island weka (*right*) is mainly dark brown and black with gray underparts; the sexes are very similar in coloration.



BILL

The weka uses its sturdy, short bill to probe for food, scratching in litter up to 3" deep and also spearing birds' eggs.

FEET & LEGS

The strong, stout feet and legs enable the weka to run and swim, and even hold down larger prey while feeding.

VITAL STATISTICS

WEIGHT	Male up to 2.2 lbs.; female up to 1.5 lbs.
LENGTH	21"
WINGSPAN	Up to 24"
SEXUAL MATURITY	5–12 months
BREEDING SEASON	August–March
NUMBER OF EGGS	2–6
INCUBATION PERIOD	26–28 days
NESTING PERIOD	2–3 days
BREEDING INTERVAL	Up to 4 broods a year
TYPICAL DIET	Fruit, seeds, roots, fungi, insects, eggs, vertebrates
LIFESPAN	Up to 15 years

RELATED SPECIES

- **The weka is one of 10 species in the genus *Gallirallus*, which includes the flightless New Caledonian rail, *G. lafresnayanus*, and the Guam rail, *G. owstoni*, which can fly only 10' at a time. A total of 133 species of rail, gallinule and coot belong to the weka's family, *Rallidae*. The family's smallest member is the 5"-long black rail, *Laterallus jamaicensis*; the largest is the takahe, *Porphyrio mantelli*.**

CREATURE COMPARISONS

The New Guinea flightless rail (*Megacrex inepta*) lives in mangrove forests, wet thickets, swamp forests and riverine bamboo thickets in the lowlands of New Guinea. More often heard than seen, the rail's voice is shrill and reminiscent of the squeal of a baby pig. This smaller relative of the weka reaches up to 15" in length. Its heavy legs are longer than the weka's, but its tail is shorter. Like the weka, it runs swiftly to avoid predators, and also flicks its wings upward while moving around.

New Guinea flightless rail

Weka

Western Capercaillie

• ORDER •
Galliformes

• FAMILY •
Tetraonida

• GENUS & SPECIES •
Tetrao urogallus

KEY FEATURES

- Resembling a turkey in flight, this game bird weighs up to 17 lbs.
- The courtship song of the male is one of the most distinctive among birds
- Spends most of its life on the ground amid pines and other conifers

WHERE IN THE WORLD?

Found in northern Europe from Scandinavia and eastern Europe to Lake Baikal in Russia; reintroduced into Scotland

LIFECYCLE

Male capercaillies gather in forest clearings to prepare for a courtship competition, complete with a "wedding" melody; the winner will mate with the most females.

HABITAT

The capercaillie frequents pine and other coniferous forests, especially Scots pine. During nesting, the females seek out boggy areas, where they search for insects to feed their brood. Leks, or courtship territories, require fairly open vegetation. In addition to northern Europe, capercaillies can be found in central Europe plains and the mountainous Balkans. The original populations in Ireland and Scotland were exterminated in the late 1700s when the forests were destroyed. The capercaillie was reestablished in the 1800s when several birds were brought to Scotland from Sweden.

▼ **WINTER PERCH**
A capercaillie searches for cones from his ever-green perch.

CONSERVATION

The number of capercaillies continues to decrease because of hunting and destruction of habitat, especially courtship areas. The current population is estimated at less than 10,000 pairs. In Slovenia, it is on the Red List of endangered birds.

BEHAVIOR

▲ **FEATHER DUSTER**
Dust bathing helps remove excess oil from feathers.

Lekking, the preparation of an area used for courtship and mating, is a key activity of the capercaillie. The oldest and most aggressive males have the highest social rank; they establish the largest territories within the lek and mate with the most females, up to 90% of those in the territory. The mating call of this game bird has been compared to the sound of a rattle followed by a loud pop and ending with a grinding noise. The highly territorial male will protect the lek against other animals and even humans. The capercaillie's flight is typical of game birds: rapid wingbeats, followed by a glide. Takeoff is noisy but flight becomes silent and swift. In the summer, capercaillies travel alone, but by winter, males form large flocks.

DID YOU KNOW?

- **The name 'capercaillie' is derived from the Gaelic for cock of the woods.**
- **Fences pose a great hazard to the capercaillie; it often flies into them.**
- **In a small forest in the Scottish Highlands, territorial male capercaillies vigorously attacked humans, sheep and a horse in a nearby field, using their wings and beaks.**

BREEDING

Capercaillies perform one of the most elaborate courtship rituals of any animal. Males gather together at a lekking site, each with his own territorial portion, to perform for the females. The males stretch their necks, point their bills to the sky and fan their tails; each bird then rustles its wings and jumps high into the air, up to 3'. The courtship song, often called the "wedding- feast" melody, is made up of a variety of sounds, ranging from a noise like fighting cats to a popping cork. Fighting among males often leads to death. For this reason, males do not mate until 3 years of age, when they have attained full adult size and plumage. After mating, hens lay 7–11 pale yellow, speckled eggs in the nest, usually a hollow spot scraped into the ground or among heather. The eggs are covered with pine needles and the female incubates for up to 29 days. The female protects and feeds the nestlings; she will feign injury and lure predators away from the nest and the growing chicks. The young are independent by 3 months of age.

THE MATING GAME

1 Let the games begin…
Females perch at a strategic location to view males competing for their affections.

2 Strutting his stuff…
One male wastes no time as he quickly leaps into the air, singing loudly and puffing out his feathers.

3 Attention-getter…
As he continues to fan his tail, the efforts of the male pay off when two females begin to approach.

4 Success
The two crouched females, impressed by the male's display, call to him and wait for his arrival.

FOOD & FEEDING

Adapting its diet to the season, the capercaillie eats pine needles andcones in the winter and fall, feeding primarily in the trees; ground growth, such as grasses and heather, along with insects, are mainstays in the spring and summer. The capercaillie forages during the day, with peak periods in the early morning and late afternoon; young forage more often than adults. During the spring and summer, the bird walks along, pecking along the ground. But in the winter, with snow covering the ground, the bird prefers foraging in trees, often moving to a new forest just to find the pine needles and cones necessary for subsistence during the cold months.

SUMMER SEARCH
A female forages for leaves in a low-lying bush.

PROFILE Western Capercaillie

The male capercaillie is the largest member of the grouse family, easily recognizable by his distinctive olive-green breast and fanned tail.

Tail
The fan-shaped tail will be fully spread and raised vertically during courtship ceremonies.

Female
The female is less colorful than the male. She has a reddish-brown patch on her breast, and her tail is rounded but narrower than the male's.

Juvenile
The juvenile resembles the female but its reddish-brown patch is smaller.

Eye wrinkle
The male capercaillie has a large bright-red skin patch over the eye.

Male plumage
The male's base color is dark blackish-gray, speckled with white flecks.

Feet
The strong, sturdy feet are adapted for walking and moving through the trees. Feathers reach almost to the toes for warmth.

Bill
The short, white bill is curved and strong for pulling grasses or prying pine cones open.

Vital Statistics

Weight	8–17 lbs.
Length	24–35"
Wingspan	Over 4'
Sexual Maturity	1–3 years
Breeding Season	March–May
Number of Eggs	5–15
Incubation Period	24–29 days
Fledging Period	Unknown
Breeding Interval	1 year
Typical Diet	Grass, flowers, berries, fruits, seeds, pine needles; also insects
Lifespan	Up to 13.5 years

Related Species

● The western capercaillie is one of 18 species of chickenlike birds in the family *Tetraonidae,* and is the largest member of the family. Ten species live in North America, including 5 species of grouse, 3 species of ptarmigan and 2 species of prairie chicken. The white-tailed ptarmigan, *Lagopus leucurus,* is a truly alpine bird, and lives only on the highest slopes of the Cascade and Rocky Mountain ranges.

Creature Comparisons

The blue grouse *(Dendragapus obscurus)* measures up to 19" long and is smaller than the western capercaillie. The blue grouse's upperparts are mostly slate-blue, hence its name. The skin over the blue grouse's eye is yellow, while the capercaillie has a prominent red marking. Both species have a similar diet; they eat pine needles, plants, berries and seeds. But the blue grouse is found from Alaska south to New Mexico, while the capercaillie resides in northern Europe.

Blue grouse

Western capercaillie

Western Tanager

• ORDER •
Passeriformes

• FAMILY •
Thraupidae

• GENUS & SPECIES •
Piranga ludoviciana

KEY FEATURES

- A bright, colorful bird; the male is more vivid, with a bold red head and facial feathers
- Catches flying insects in midair after scanning the forest canopy for prey
- Emits a song similar to that of a robin, but more hoarse and lower pitched

WHERE IN THE WORLD?

Found in North America from Alaska to California, from Texas to New Mexico; winters in Mexico, Central and South America

LIFECYCLE

Fluttering through its wooded habitat, the western tanager is an accomplished forager, deftly catching insects in midflight; it frequents a wide variety of forests.

HABITAT

The western tanager's habitat varies according to season, but for the most part it inhabits open coniferous forests and mixed deciduous forests of mature aspen trees and alder groves. Beginning in April, populations arrive into the U.S. and Canada from as far south as South America. The western tanager seeks the cover of mature forests of Douglas fir, pine, spruce and aspen in mountains up to 10,000'. In the winter, when returning south to Mexico, Central and South America, the bird prefers pine and oak woodlands, low scrubby forest near coffee plantations and open areas with many scattered trees. During migration, small groups of about 30 tanagers roost in open habitats, such as parks and gardens.

▼ **UNDERCOVER AGENT**
A female tanager blends well with its forest habitat.

CONSERVATION

The western tanager is currently not threatened. Its widespread range, during both breeding and nonbreeding seasons, contributes to its success. All tanagers are protected by law and may not be kept in captivity without a permit.

BREEDING

Not much is known about the western tanager's mating displays, other than that the male and female will fly together. The monogamous pairs stay together throughout the May–July breeding season. The female builds her nest on a horizontal tree branch, usually an oak or aspen, 10–65' above ground. The cup nest is made of grasses, twigs and small pieces of bark, lined with hair and vegetation. The female lays 3–5 pale blue eggs with irregular brown spots. She incubates alone for 13 days, and is joined by the male when the nestlings hatch. Both parents feed the chicks wasps, bees (after removing the sting) and other insects and larvae. Fledging normally occurs in about 14–16 days.

HUNGRY BABIES

1 Begging...
A female tanager sits on the side of her nest preparing a meal for two hungry chicks, which are eagerly begging for food.

2 Helping father...
Both parents feed the chicks until they are ready to leave the nest. The male tanager captures a bee in its bill and will remove the sting.

FOOD & FEEDING

The western tanager forages in the forest canopy, taking to the air to search for insects such as flying ants and termites, as well as wasps and bees. Ants are another tanager favorite. The bird also eats nut weevils, wood borers, caterpillars, cicadas, termites and grasshoppers. The patient western tanager often remains motionless when it forages, only moving its head from side to side while scanning the air from its perch for flying prey. The bird also carefully searches through foliage or jumps on a collection of leaves, searching in a leisurely fashion for the food within.

The tanager's diet is not limited to insects, though: it also plucks nectar from flowers or snatches dried fruit or sliced oranges from bird feeders. Lederberries, cherries, hawthorn apples and other fruits are seasonal favorites that help round out the tanager's varied diet.

▶ **THE EARLY BIRD...**
The tanager's stout bill makes easy prey out of worms and insects.

BEHAVIOR

The solitary tanagers spend most of the day fluttering back and forth within the forest canopy, foraging for food. The western tanager is not territorial, and it will not drive out intruders. The bird gathers with 30 or more tanagers during migrations; during the breeding season, tanagers live in pairs. This songbird's call has been compared to that of a robin, but it is more hoarse with a lower pitch. In addition to its *pit-ic* call, the male western tanager produces an early-morning *tu-weep*. In flight, the western tanager maintains a steady path with rapid wingbeats. Solitary but not shy, the tanager will take food from feeders and also bathe in birdbaths.

▼ **TIME OUT**
The solitary tanager enjoys a quiet moment.

3 Mother too...
The male lands at the side of the nest, carrying the large bee in its bill, as the female flies off to search for more food for the chicks.

4 One to go
The male places the bee into the mouth of one of the chicks; the other must wait until the mother returns with more food.

DID YOU KNOW?

- **A tanager was once observed flying 30' straight up into the air before diving in a direct line back to its perch.**
- **"The Western Tanager" is the title of the Los Angeles Audubon Society newsletter.**
- **The western tanager was first named the Louisiana tanager, since Lewis and Clark first discovered it in the western portion of the Louisiana Territory.**

PROFILE Western Tanager

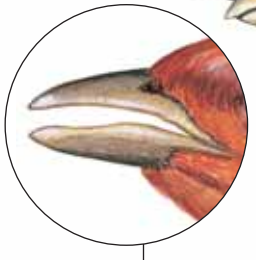
The multicolored western tanager glows in sunlight when catching insects in flight and contrasts with forest foliage when pecking at berries.

Female plumage

The female is greenish-yellow above and yellow below, and blends into the forest foliage. She looks like a northern oriole, but has a stouter and paler bill.

Wings

The tanager's strong wings allow it to fly in a straight line with rapid wing beats while it hunts for its prey in flight.



Bill

The short, stout bill is perfectly shaped for grabbing insects in flight or picking fruit.

Male plumage

The male has a red head and face, which fades outside the breeding season. The male's body and back are yellow, and its wings and tail are black.

Feet

Three toes in the back and one in the front are perfect for perching in trees.

Vital Statistics

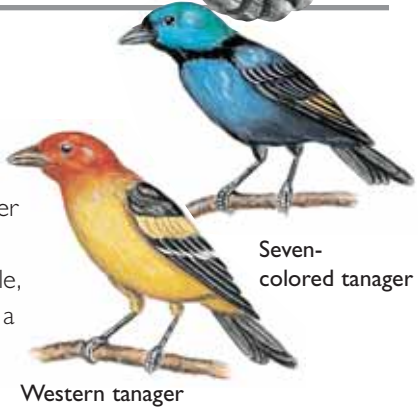
Weight	0.8–1.3 oz.
Length	6.25–7.5"
Wingspan	11–12"
Sexual Maturity	About 1 year
Breeding Season	May–July
Number of Eggs	3–5
Incubation Period	13 days
Fledging Period	About 14–16 days
Breeding Interval	1 year
Typical Diet	Bees, wasps, insects, fruits and berries
Lifespan	Over 15 years in captivity

Related Species

- The western tanager is 1 of 9 species in the genus *Piranga,* which also includes the hepatic tanager, *P. flava,* scarlet tanager, *P. olivacea* and the summer tanager, *P. rubra.* The family *Traupidae* is limited to the Western Hemisphere, but only 6 of the 236 species inhabit North America. The blue-gray tanager, *Thraupis virens,* became established in Florida after escaping from captivity.

Creature Comparisons

Slightly smaller than the western tanager, the seven-colored tanager (*Tanager fastuosa*) measures up to 5" in length. It is found in the forests of northeastern Brazil in the highest branches of large trees, from lowlands to heights of 2,700'. Unlike the solitary western tanager, the seven-colored tanager associates with a variety of other birds. The South American bird is named for its plumage, a mixture of blue, green, purple, yellow, orange, black and cyan (a blue-green mix). Its song is a repetitive *it-it-it-it*. Considered a prize ornamental cage bird, seven-colored tanager populations are threatened.



Seven-colored tanager

Western tanager

WHIMBREL

• ORDER •
Charadriiformes

• FAMILY •
Scolopacidae

• GENUS & SPECIES •
Numenius phaeopus

KEY FEATURES

- Relies more on its keen eyesight than its sensitive bill when searching for food
- Prefers mudflats, rocky shores and beach habitats, where it will forage for food in one area much longer than other wading birds
- Chicks search for their own food from birth, but must still be brooded for warmth by the parents

WHERE IN THE WORLD?

Found in northern Europe, Asia and North America; winters from southwest Europe and Africa, through the Middle East to west India and also in Australia, Central and South America

LIFECYCLE

Usually traveling in small flocks, whimbrels are gregarious birds that keep up their search for food even when other wading birds have moved on.

HABITAT

The whimbrel lives on tidal flats, coastal wetlands and grasslands. In winter, the whimbrel occupies exposed reefs, muddy, rocky or sandy beaches, tidal mudflats and mangrove swamps. Whimbrel communities will roost in mangrove swamps on the ground or perch high in mangrove trees. This medium-sized bird is also comfortable in subarctic and subalpine moorland, birch forest and tundra, open forest and river valleys. During migration, the whimbrel roosts in shallow water at night; by day it will feed off inland grassland. In the spring, it prefers heathland and farmland.

DISTINCT PROFILE
The whimbrel's bill is the perfect feeding tool in all types of habitats.

BREEDING

Male whimbrels arrive first at breeding grounds and establish territories. Following the males' aerial courtship displays and elaborate vocalizations, the female makes her choice. The nest is a simple depression, filled with fragments of vegetation, in an exposed location. Both male and female whimbrels incubate the clutch, which usually consists of no more than four eggs. Chicks are colored warm buff with brown and are able to walk and pick up food items within a few hours of hatching. The chicks are responsible for finding all of their own food, but the parents will brood the young for about 35–40 days after they hatch in order to keep them warm, since the young are unable to keep their body temperature constant for very long. The broods of different parents and even different species may come together to form large groups, called crèches; often one or both parents leave the young in the care of another bird. These crèches of waders serve as defense against predators, since a group can more easily detect and mob predators. However, mortality rates both with or without a crèche may reach 30% for a number of reasons, including lack of food and warmth, and attacks by predators, such as Arctic foxes, buzzards, owls and gulls.

FIRST ONE OUT
While the other chicks keep pecking, one breaks free.

DID YOU KNOW?

- **Whimbrels periodically molt the lining of their gizzard. These linings, which look like small yellowish bags, have been found in great numbers on the roosting sites of northward-migrating whimbrels and are believed to prevent the buildup of stomach parasites.**
- **Whimbrel eggs are pear-shaped (pyriform) so that the pointed ends of the 3–4 eggs fit together in the center of the nest scrape. Even if the eggs roll, they roll in circles and never far away from the incubating bird. This is true of all birds in the family *Scolopacidae*.**

CONSERVATION

Because of its extremely extensive breeding range, the whimbrel is probably the most abundant curlew. With eastern Atlantic flyway populations alone estimated at 600,000–700,000 birds, the whimbrel is not globally threatened. During the late 1970s there was a natural decline in populations, but they are now increasing.

BEHAVIOR

The whimbrel is a persistent forager, often seen probing when other birds have retired for the evening. When the whimbrel flies to a new area, it rises to great heights and then descends in circles as it nears the ground.

While migrating, whimbrels will often roost communally with other wading birds. High-tide tree roosts offer a perfect view of prey and predators. The mass roost offers safety from predators; the whimbrel issues harsh alarm calls if a threat is approaching. Other vocalizations begin when whimbrels organize for migration. Flight groups of up to 100 birds will stay in the V-formation during long journeys, which can cover more than 1,000 miles.

MASS WATCH
Whimbrels rely on their keen eyesight to spot the movements of prey and predators.

FOOD & FEEDING

The whimbrel's downward-curving bill is highly specialized, serving as a probing and pecking tool as the bird searches for food. The wading whimbrel will use its long, thin bill to poke into burrows for crabs, a favored delicacy. Once it captures prey in the bill, the bird manipulates it with its tongue to bring it further back into its mouth. The whimbrel's long bill removes long and soft-bodied prey, such as worms and mollusks, intact and tears larger victims, which include reptiles and birds, into bite-sized pieces.

The whimbrel generally forages in small groups or individually, along the coast or inland during migration. Inland birds eat insects (such as beetles and cranefly larvae), spiders, snails and slugs. During the breeding season in the spring, the whimbrel will also eat the berries, seeds and leaves that become plentiful.

VERSATILE FEEDERS

1 Berry nice...
A small group of whimbrels walks purposefully across the vast tundra plain in search of bushes bearing berries.

2 Peck away...
The bird uses its long bill to peck at a variety of berries, including cranberries, cowberries and crowberries.

3 Time for seafood...
Whimbrels probe along coastal areas in the sand, using their long downward-curving bills to dig into small crevices.

4 Delicacy within reach
Extracting a small crab from its burrow, this bird uses its strong bill to rip its prey into bite-sized pieces.

PROFILE WHIMBREL

The whimbrel stands out among curlews with a prominent dark stripe on its sides and crown; strong wings enable it to make long migratory flights.

IN FLIGHT

The whimbrel's wings are strong and the tail is short, in comparison to the rest of the body. The black-brown top of the head is divided down the center by a pale vertical band.

EYE

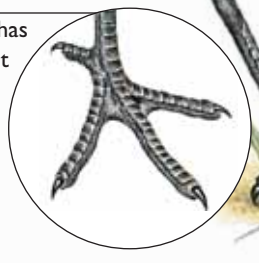
The whimbrel's eye has a high density of cones, which gives it sharp vision in daylight and helps in color discrimination. The whimbrel always keeps a watchful eye on its surroundings.

PLUMAGE

The whimbrel's belly and undertail coverts are white, a sharp contrast with the camouflaging patterns of the brown upperparts.

FEET

The whimbrel has three long front toes and a small hindtoe for perching; long legs help it wade during high tides.



BILL & TONGUE

The long bill is more sensitive on the tip and adapted to probing mudflats for small invertebrates. The bill is also used for preening, nest-building and defense. The tongue moves food to the back of the long bill.

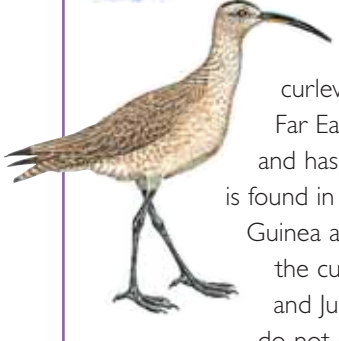
VITAL STATISTICS

WEIGHT	About 1 lb.
LENGTH	14–18"
WINGSPAN	32"
SEXUAL MATURITY	1–2 years
BREEDING SEASON	May–June
NUMBER OF EGGS	4
INCUBATION PERIOD	27–28 days
FLEDGING PERIOD	35–42 days
BIRTH INTERVAL	1 year
TYPICAL DIET	Aquatic invertebrates, sandhoppers, insects, crabs, mollusks and fruit
LIFESPAN	Over 11 years

RELATED SPECIES

- The whimbrel is one of 8 species in the genus *Numenius;* close relatives include the long-billed curlew, *N. americanus,* and the bristle-thighed curlew, *N. tahitiensis.* There are 24 genera and 86 species in the *Scolopacidae* family, which includes wading birds such as snipes, dowitchers, sandpipers, phalaropes, turnstones, woodcocks, curlews, godwits and shanks.

CREATURE COMPARISONS



Whimbrel

The Far Eastern curlew (*Numenius madagascariensis*) is larger than the whimbrel and is the largest of all curlews at 26". Both birds have similar coloration, though the Far Eastern curlew lacks the whimbrel's bold head markings, and has buff rather than white underparts. The Far Eastern curlew is found in Mongolia, Siberia, Central China, the Philippines, New Guinea and New Zealand. A long-distance migrant like its cousin, the curlew nests in small colonies of 2–3 pairs between May and June. The curlew matures later than the whimbrel; juveniles do not reach sexual maturity until 3–4 years of age.

Far Eastern curlew

Whippoorwill

• ORDER •
Caprimulgiformes

• FAMILY •
Caprimulgidae

• GENUS & SPECIES •
Caprimulgus vociferus

KEY FEATURES

- Patterned plumage provides the perfect camouflage during the day
- Feeds exclusively on insects, which it catches in flight with its wide mouth
- Best distinguished by its call, a loud "*whip-poor-will*," leading to its common name

WHERE IN THE WORLD?

Found in North America from southeast Canada through the central and eastern U.S.; also the southwest U.S. to Mexico and Costa Rica

LIFECYCLE

With swift and agile flight, the voracious whippoorwill hunts nocturnal insects, such as moths, and rapidly catches and eats its fast-moving prey in flight.

HABITAT

▲ **FOREST FLOOR**
The whippoorwill is most often found perching on the ground.

Throughout its range from Canada to Central America, the whippoorwill is widely distributed and is most common in the country, where it prefers the ungrazed woodlots and woodlands usually associated with farms. Its rural habitat also includes the dense deciduous and coniferous forests along mountains and canyons in the southern U.S. The whippoorwill commonly perches on the ground or lengthwise on the branch of a tree, where it uses its concealing plumage to become part of the scenery in order to avoid predators.

DID YOU KNOW?

- **The whippoorwill's reproductive cycle coincides with the lunar cycle; young are born under full moons. This enables the adults to forage easily to feed nestlings.**
- **The whippoorwill calls at a rate of one call per second; the record for the most consecutive number of calls is 1,088 counted by ornithologists in the field.**

BREEDING

Breeding begins in May and lasts until August. During this time, the male whip-poor-will uses his call to locate a mate and to challenge any rivals. The male also performs several courtship displays. He quietly approaches the female while bobbing his head and purring as he circles her; he may also show her the large white patches in his tail. Once the female has accepted his advances, the pair mates.

The female lays two eggs on the open floor in the woods. Since her plumage blends so perfectly with the dead leaves on the ground, she uses no other means of concealment and incubates her eggs for 17–20 days, usually without ever being discovered. The male abandons the female after mating, so she is on her own during incubation and must provide all the food for the nestlings. When the female leaves to hunt, the nestlings sit on the ground and also blend well. The young leave the nest about 20 days after hatching.

▲ **NO NEST**
Eggs are laid on the ground with no cover.

▼ **HIDING PLACE**
The chick's downy feathers are quickly replaced with the streaked plumage.

FOOD & FEEDING

The whippoorwill emerges after dark to feed on flying insects. Flying close to the ground with its mouth wide open, the whippoorwill uses its acute vision to forage for prey. It catches large numbers of insects quickly and efficiently, feeding mostly on large moths. Other prey includes beetles, grasshoppers, caterpillars, crickets and mosquitoes.

INSECT PURSUIT

1 Scanning…
Perched on a dead branch, the whippoorwill begins its nightly feeding rounds, scanning the area for prey.

2 Flying…
The whippoorwill leaves its perch and flies low, just above the ground, in the clearing of a mixed woodland.

3 Pursuing…
Spotting a large moth, the whippoorwill swiftly pursues it, with its mouth wide open, flying just below the top of the grass.

4 Devouring
With swift flight, the whippoorwill closes in fast and snaps up the moth in one swift gulp, swallowing it whole.

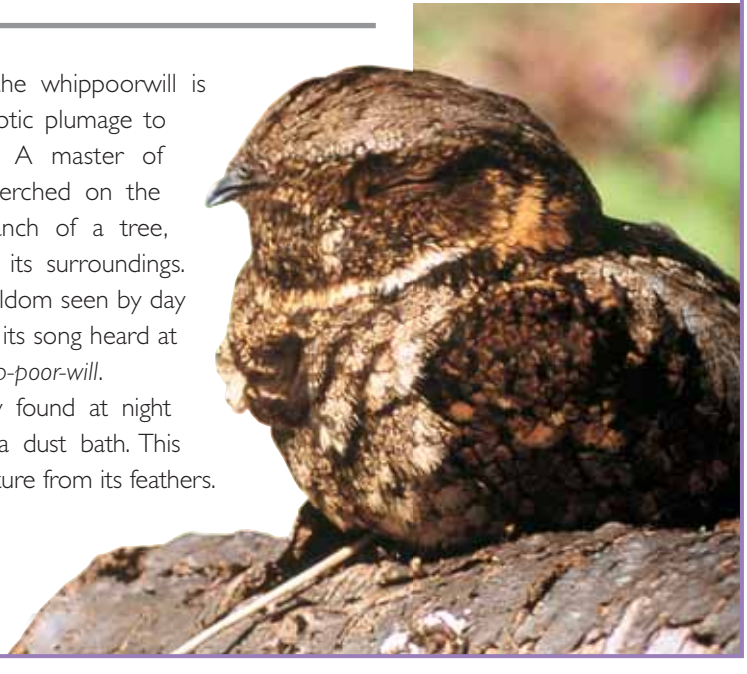
CONSERVATION

The whippoorwill is not globally threatened, but its numbers are declining due to habitat destruction: the forests throughout its range are being cleared for human development. The whipoorwill is listed on Canada's Blue List and, like all members of the *Caprimulgidae* family, it is protected by United States law, and a permit is required to keep it in captivity.

BEHAVIOR

Like all members of its family, the whippoorwill is nocturnal and relies upon its cryptic plumage to remain hidden during the day. A master of camouflage, it spends the day perched on the ground or lengthwise on a branch of a tree, blending almost completely with its surroundings. This bird hides so well that it is seldom seen by day and is more commonly known by its song heard at night: a loud, rapidly repeated, *whip-poor-will*.

The whippoorwill is frequently found at night along the sides of roads taking a dust bath. This ritual removes excess oil and moisture from its feathers.



NO WORRIES
The whippoorwill's plumage helps it hide from danger.

PROFILE WHIPPOORWILL

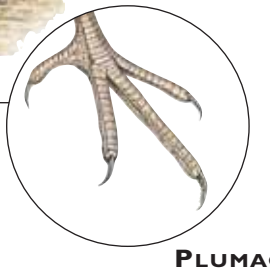
With its long, pointed wings, the whippoorwill darts through the air to chase insects with the speed and skill of a bat.

FEMALE

The female looks very similar to the male, but she lacks the broad white areas on the tail, and her throat band is buff instead of white.

BRISTLES

Surrounding the mouth are modified feathers or bristles. They aid in feeding by widening the mouth area and acting as a funnel to help scoop insects out of the air.



FEET

The legs are small and weak, with small toes and claws. The middle toe is longer with a *pectinated* (comblike) claw used to comb and clean the bill area after hunting.

BILL

Despite its small size, the bill has a large gape, or mouth opening, for catching insects in flight.

PLUMAGE

With its streaked plumage, the whippoorwill blends easily into the scenery in its forest home.

VITAL STATISTICS

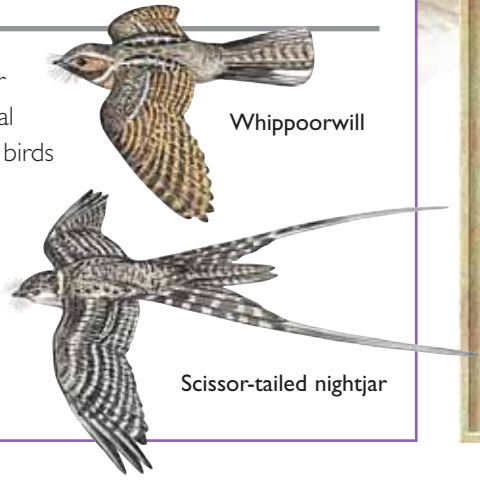
WEIGHT	1.5–2.5 oz.
LENGTH	9–10"
WINGSPAN	16–19.5"
SEXUAL MATURITY	1 year
BREEDING SEASON	May–August
NUMBER OF EGGS	2
INCUBATION PERIOD	17–20 days
FLEDGING PERIOD	About 20 days
BIRTH INTERVAL	1 year; sometimes 2 broods per year
TYPICAL DIET	Insects, especially moths
LIFESPAN	Unknown

RELATED SPECIES

● The whippoorwill belongs to the nightjar family, *Caprimulgidae*, which contains about 72 species in 16 genera. All of the members look very similar, with camouflaging plumage. The genus *Caprimulgus* is the largest in the family with 45 species, including the chuck-will's-widow, *C. carolinensis*, the dusky nightjar, *C. pectoralis* and the European nightjar, *C. europaeus*.

CREATURE COMPARISONS

A close relative of the whippoorwill, the scissor-tailed nightjar (*Hydropsalis brasiliana*) is native to the tropical and subtropical zones of South America from Peru south to Argentina. Both birds have camouflaging plumage, but the nightjar lacks the white wing stripe visible from below when in flight. The scissor-tailed nightjar also has very long, forked tail feathers that reach up to 6" in length, compared to the short, round tail of the whippoorwill. At a maximum length of 20", including the tail, the nightjar is much larger than its cousin, but the tail accounts for almost two-thirds of the nightjar's total length.



White-fronted Bee-eater

• ORDER •
Coraciiformes

• FAMILY •
Meropidae

• GENUS & SPECIES •
Merops bullockoides

KEY FEATURES

- Beautiful bird with a social life that is similar to humans'
- Family groups live together, help each other with domestic chores and visit friendly neighbors
- Several families form a clan and cooperate to protect their hunting territory
- Plucks bees out of the air and removes the sting before eating

WHERE IN THE WORLD?

Found in central and southern Africa — from Gabon and Angola in the west to Kenya in the east and south to eastern areas of South Africa

LIFECYCLE

Sociable but quarrelsome, the white-fronted bee-eater lives in crowded communities (clans). It spends much time assisting neighbors or squabbling with rival clans.

HABITAT

The bee-eater needs high perches to scout for insects, open country to hunt them and sheer, sandy riverbanks to nest in. It finds all of these in savannah where there are scattered trees, rivers, dry water courses and gullys. It can also be found along the edges of woodland, sometimes foraging as much as four miles from the nesting colony.

▼ **HIGH-RISE HOUSING**
Over the years, favorite breeding sites become riddled with nest tunnels.

◀ **VIEW TO A KILL**
Bee-eaters use a communal feeding ground and guard the area from high perches.

DID YOU KNOW?

- **Bee-eaters pair for life, but the male may try to mate with a stray female while jealously guarding his partner from other males.**
- **Pellets of insect remains, regurgitated in the nest by the parents, form a soft base for the eggs and chicks.**
- **The female occasionally lays her eggs in a neighbor's nest if it is left unguarded. Likewise, a parasitic bird, the greater honeyguide, lays its eggs in the nest of a bee-eater. In both cases, the nest's rightful occupant then incubates and rears the "impostor" chicks.**

BEHAVIOR

BREEDING

The white-fronted bee-eater prepares for parenthood several months before it actually mates. At the end of the rainy season, when the ground is still soft, the bird digs a new nesting tunnel—usually about 3' long—in a sandy riverbank. The nest is then abandoned until the breeding season begins.

The male courts his mate with gifts of food, presenting large insects bill-to-bill. She is also offered morsels by "helpers": usually her own male offspring from the previous brood.

Incubation begins as soon as the first egg is laid. This means that the first-hatched chick will be up to four days older than the youngest. In a season when food is in short supply, this head start gives the eldest chick the best chance of survival.

CASTLE IN THE SAND

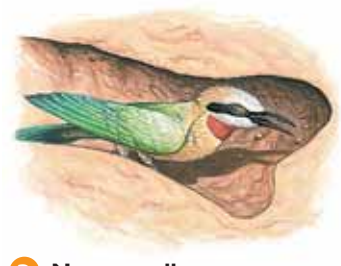
1 Shifting sand...
Clinging to a riverbank and closing its eyes to keep out flying sand, the bee-eater uses it stabbing beak to begin digging.

2 Digging dirt...
The bird scrabbles with its feet in a bicycling motion to scoop out loose earth—sometimes showering a family member waiting to help.

Teamwork is a way of life for the bee-eater. The family unit is the basis of a two-tier system of cooperative society. The unit comprises a breeding pair and one or two helpers (usually offspring that have remained with their parents from the previous year). All domestic tasks, from digging nest tunnels to incubating eggs and feeding chicks, are shared by the mated pair and their helpers. They also roost together, either in their nest or closely huddled on a tree branch.

Family units link up with one to five other groups to form the second tier of teamworking — the clan. Clan members pay social visits to each other's nests and each clan flies together to and from its feeding grounds, which it defends against rival clans nesting in the vicinity.

◀ **YOUR TURN NEXT**
Clan members commute to and from their feeding grounds together.



3 No egg rolls...
To prevent eggs from rolling out of the hole, the bird-eater switches from uphill to downhill excavation near the end of the tunnel.

4 Sitting it out
Members of the family take turns helping the breeding pair excavate the tunnel and also assist in incubating the eggs.

FOOD & HUNTING

As its name suggests, the bee-eater's favorite food is bees. Many other insects are taken, including wasps, grasshoppers, moths and dragonflies.

The bee-eater catches all its prey in flight. A special technique makes bees and wasps safe to eat. Holding the insect in the tip of its bill, it rubs the bee's tail-end against a branch, causing venom to be discharged or the sting to fall off. It's an acquired skill; young bee-eaters are stung during their first attempts. The birds have a degree of immunity, however, and live to try again.

▲ **BALANCED DIET**
The bee-eater takes moths as readily as it does bees.

▲ **PLUCKED FROM THIN AIR**
The long beak snaps up prey with a lightning strike.

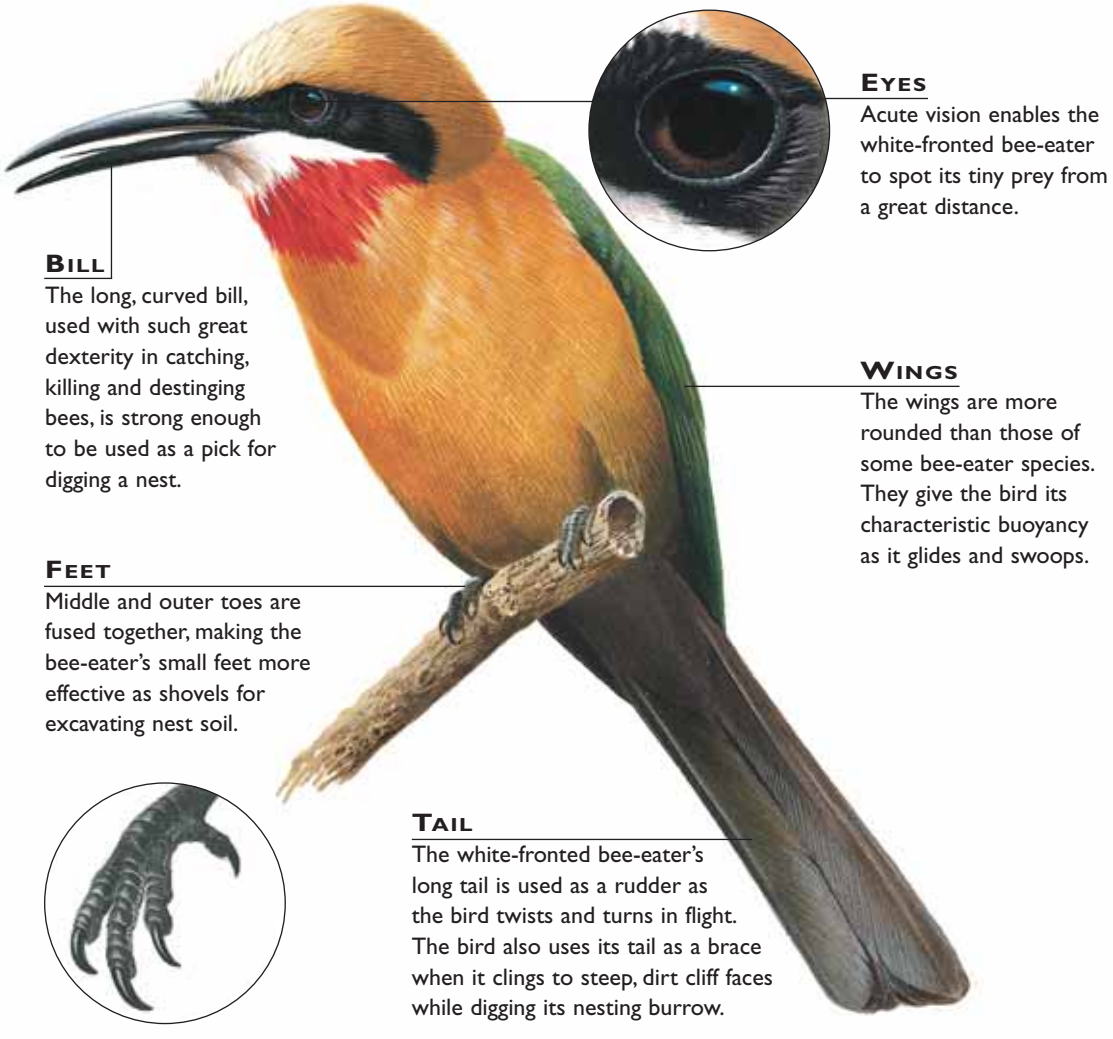
CONSERVATION

There appears to be no threat to survival of white-fronted bee-eaters — or any bee-eater species, most of which have large and thriving populations. Bee-eaters are sometimes persecuted by beekeepers, but their predation of domestic bees is probably balanced by the fact they also kill many of the other insects that also prey upon the bees.

PROFILE

WHITE-FRONTED BEE-EATER

The white-fronted bee-eater is graceful in its aerial pursuit of insects and robust enough to dig deep into a riverbank to make its nest.



EYES
Acute vision enables the white-fronted bee-eater to spot its tiny prey from a great distance.

BILL
The long, curved bill, used with such great dexterity in catching, killing and destinging bees, is strong enough to be used as a pick for digging a nest.

WINGS
The wings are more rounded than those of some bee-eater species. They give the bird its characteristic buoyancy as it glides and swoops.

FEET
Middle and outer toes are fused together, making the bee-eater's small feet more effective as shovels for excavating nest soil.

TAIL
The white-fronted bee-eater's long tail is used as a rudder as the bird twists and turns in flight. The bird also uses its tail as a brace when it clings to steep, dirt cliff faces while digging its nesting burrow.

VITAL STATISTICS

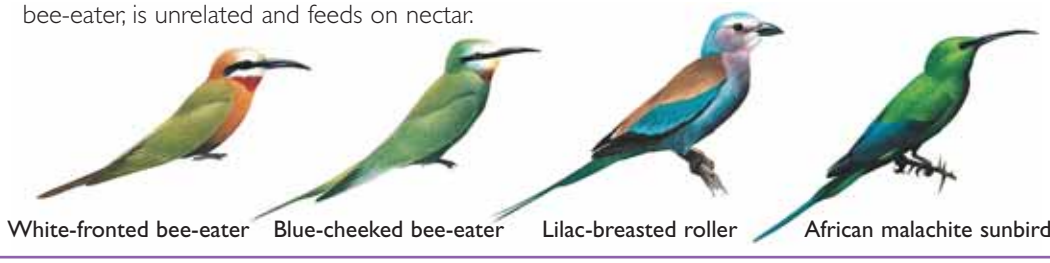
WEIGHT	1–1.5 oz.
LENGTH	8.5–9.5"
WINGSPAN	12–14"
SEXUAL MATURITY	1 year
BREEDING SEASON	Year-round near equator; August–November elsewhere
NUMBER OF EGGS	Usually 3 or 4
INCUBATION PERIOD	19–21 days
FLEDGING PERIOD	About 28 days
TYPICAL DIET	Bees, wasps and other flying insects
LIFESPAN	Avg. 5–6 years, but may live to 12 years

RELATED SPECIES

● **All 24 bee-eater species are colorful birds. Of the 18 species found in Africa, 14 live there and nowhere else, including the little bee-eater, *Merops pusillus*** (below)**. Five other species are found in parts of Eurasia, and a single species lives in Australia.**

CREATURE COMPARISONS

Several bee-eater species, including the migratory blue-cheeked bee-eater, have sharply pointed wings and long tail streamers. The larger lilac-breasted roller is more distantly related to the bee-eaters and eats grasshoppers and lizards. The African malachite sunbird, although shaped like a bee-eater, is unrelated and feeds on nectar.



White-fronted bee-eater | Blue-cheeked bee-eater | Lilac-breasted roller | African malachite sunbird

White Stork

• ORDER •
Ciconiiformes

• FAMILY •
Ciconiidae

• GENUS & SPECIES •
Ciconia ciconia

KEY FEATURES

- A tall, stately relative of the vultures
- Strides across grassland and marshes; stabs frogs and other small animals with its daggerlike bill
- Often builds nest on roofs and chimneys
- Migrates in flocks thousands strong, covering great distances with energy-saving, soaring flight

WHERE IN THE WORLD?

Breeds across Europe, from France east to Russia, south to Spain; in North Africa, parts of central Asia, South Africa; winters in Africa, Iran and India

LIFECYCLE

Celebrated in the folklore of many countries and honored by local traditions, the white stork has for centuries been a welcome guest in many European villages and towns.

HABITAT

▲ **REEDY HIDING PLACE**
If safely concealed, the stork stands on one leg to relax.

In summer, the white stork lives in open country. It searches grasslands, meadows and fields of crops or ploughed soil for food and often rests in damp and waterlogged areas that offer cover, such as vegetation around drainage ditches, canals, shallow pools and marshes. It nests and roosts on trees, cliffs, buildings and other man-made structures, such as telegraph poles, water towers and church spires.

In its wintering areas, the white stork frequents cultivated fields and grassland in arid, lowland plains.

CONSERVATION

The white stork has long lived in relative harmony with humans, who welcome its return to its traditional nest sites each spring — some communities even fix nesting platforms to towers and roofs to make "their" storks stay. However, the white stork has declined recently because of intensive farming, overgrazing in its winter range, hunting and an increase in fatal collisions with power lines.

BEHAVIOR

The white stork's spectacular migrations to and from its winter quarters have been observed since biblical times; these journeys are difficult to miss, as the stork travels in huge flocks of up to 11,000 birds. The flock soars on thermals — spirals of warm air that rise up from ground heated by the sun. There are no thermals over sea, so storks mass together in larger numbers at certain locations to cross stretches of water at their narrowest points: crossing places include the Strait of Gibraltar and the Bosporus — the narrow channel that separates Asia and Europe.

◀ **UP, UP AND AWAY**
Migrating storks use the lift created by currents of air rising over cliffs.

FOOD & FEEDING

A great opportunist, the white stork eats whatever small prey it comes across. Much of its diet consists of earthworms and large insects, especially beetles, locusts, and grasshoppers; in parts of Africa, it is known as "grasshopper bird." It also hunts snakes, lizards, frogs, toads and mammals, such as voles, mice, hamsters and moles.

The white stork devours most prey whole; it stabs larger victims to death with its pointed bill, before slashing their bodies to devour them piece by piece. When prey is abundant, the stork feeds rapidly: one individual caught and ate 44 mice, two hamsters and a frog, all in one hour.

▲ **SPRING-LOADED**
The white stork hunts with neck hunched up, poised to lash out.

TOWER OF STRENGTH

1 Depart...
Many storks nest on man-made sites. An adult flies off to find food, leaving its mate to guard chicks.

2 Hunt...
It reaches a nearby hunting ground; spots a frog and quickly seizes it in its powerful bill.

3 Return...
As the stork returns to its nest, its mate flies off to go on a hunting trip of its own.

4 Feed
The stork passes the frog it has caught to a chick, and stays on guard duty until its mate returns.

BREEDING

▲ **HIGH SOCIETY**
Storks may nest alongside other birds, such as cattle egrets.

By end of February, the first white storks have begun to arrive at the species'southernmost breeding grounds; they may not reach northern and eastern parts of their range until early April.

The male is faithful to his old nest rather than a mate; he arrives alone, ready to court the first female that appears. However, some pairs stay together for several seasons.

After an energetic display involving head-bowing, neck-stretching and bill-clattering, the female lays an average of four eggs. Both sexes take turns incubating a clutch for over a month. The downy chicks are fed by parents on regurgitated food for about nine weeks. After three more weeks, the chicks are fully independent.

DID YOU KNOW?

- **The white stork reaches speeds of 27 mph during its long migrations.**
- **Domestic chickens, ducks and cats have all fallen prey to the white stork — it was even seen devouring a dead baby goat.**
- **Some small birds, such as sparrows and starlings, use the bulky nest of the white stork as a strong, secure site on which to build their own nest.**

PROFILE WHITE STORK

The white stork's plumage and graceful stride belie that it's a deadly predator that kills with lightning strikes of its bill.

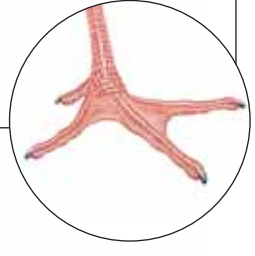
SKULL
The stork's skull is dominated by large eye sockets and, above all, by the heavy upper and lower mandibles of the massive bill.

WINGS
The long, broad wings conserve energy during the stork's migrations by allowing it to glide effortlessly on rising currents of heated air.

LEGS
Strong, stiltlike legs are adapted for striding through knee-deep grass and wading in shallow water. They also help the stork to make quick progress when searching for prey.

PLUMAGE
The white stork wears mainly white plumage with bold contrasting black flight feathers.

FEET
Three forward-pointing toes are webbed at base to support stork's weight on soft ground; hindtoe is slightly raised to add extra "spring" to its stride.



VITAL STATISTICS

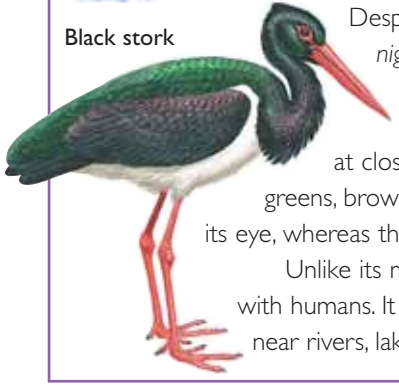
WEIGHT	Male 5.5–9.5 lbs.; female 5–9 lbs.
LENGTH	3.3–3.8'
WINGSPAN	3.8–5.5'
SEXUAL MATURITY	4 years
BREEDING SEASON	April–July
NUMBER OF EGGS	1–7; usually 3–5
INCUBATION PERIOD	33–34 days
FLEDGING PERIOD	58–64 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Range of small prey: insects, worms, frogs, snakes, lizards, mammals, birds
LIFESPAN	Up to 35 years

RELATED SPECIES

● The white stork is one of 19 species in the family *Ciconiidae*, which includes the wood stork *Mycteria americana* (below), the only stork native to North America. Storks belong to the order *Ciconiiformes;* relatives in this order include herons and ibises.

CREATURE COMPARISONS

Black stork



Despite its name, the black stork (*Ciconia nigra*) is a more colorful bird than the marginally larger white stork. Its head, neck and upperparts appear black from a distance; at close range their true colors are a blend of glossy greens, browns and purples. The black stork has a red ring around its eye, whereas the white stork's eye ring is black.

Unlike its more familiar relative, the black stork avoids contact with humans. It nests in trees in undisturbed open woodland near rivers, lakes and swamps, over a wide range from Spain to China.

White stork

Wild Turkey

• ORDER •
Galliformes

• FAMILY •
Meleagrididae

• GENUS & SPECIES •
Meleagris gallopavo

KEY FEATURES

- Heavy bird that spends most of its time on the ground, but is a surprisingly powerful flier
- Roosts in trees at night, but the female nests among undergrowth during breeding season
- Courting male displays iridescent plumage and bold skin colors to attract females

WHERE IN THE WORLD?

Formerly widespread across North America, but now restricted to scattered areas of the United States and parts of northern Mexico

LIFECYCLE

Despite its cumbersome appearance, the wild turkey flies powerfully each evening to its roosting site in the trees. In the morning, it descends again for another day's foraging.

HABITAT

The wild turkey lives in open woodland and forest with scattered clearings. It needs the trees for nighttime roosting, and open clearings and fields for feeding sites.

The wild turkey prefers oak and pine trees, such as those found in the temperate deciduous forests of the eastern states. The oak and hickory forests of the central states and the subtropical forests of Florida also yield suitable habitats. In the southwestern United States, the wild turkey even roosts on powerlines and windmills and, providing it's not disturbed, is found in urban areas.

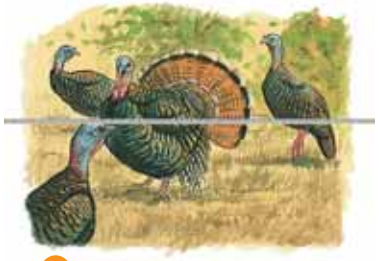
▲ **LIVING SPACE**
Seeds and invertebrate prey are found in grassland.

BREEDING

A courting male puts on lavish displays for potential mates. Nesting begins in February in southern states, and in April farther north. The female builds a nest that is a simple scrape in the ground, usually concealed under a bush, or against a tree trunk or log. More than one female may share the nest.

After four weeks, the well-developed, downy chicks hatch and are soon running around the nest area with their mother. But as many as half the poults (young) are killed by predators, disease, accidents or cold weather. Those that survive stay with their mother for another eight months or so.

IT'S SHOWTIME!



1 Adoring fans...
To attract a mate in the vicinity, the male drops his wings, fans his tail feathers and struts about, gobbling loudly.

3 Mating...
The male's impressive display has won him a partner. Immediately after mating, however, he departs to seek another receptive mate.

FOOD & FEEDING

The wild turkey eats virtually everything that it can fit in its bill. The young turkey relies on insects during its first eight weeks; invertebrates make up 80% of its diet. The adult eats a range of fruits, seeds, tender shoots, buds, and insects.

In autumn, the turkey eats as much as it can, building up fat reserves for the winter. Large flocks gather and gorge themselves on chestnuts, acorns, pecans, and other nuts. Fallen grain and maize gleaned from fields are another food source at this time of year. Along with its food, the turkey swallows grit. This aids digestion by grinding up tough seeds and nuts in its gizzard (a muscular part of its stomach).

▲ **GRUBBING FOR GRUBS**
The wild turkey scrapes the soil to expose insects.

DID YOU KNOW?

- **The domestic turkey can produce offspring from an unfertilized egg, and it is thought the wild turkey can do the same. Known as *parthenogenesis*, the process usually results in male chicks.**
- **The wild turkey once came close to being the United States national bird. In fact, Benjamin Franklin preferred the turkey to the carrion-eating bald eagle — the species that eventually won the accolade.**

2 Head-up display…
The male's head remains upright and quivers slightly, while the folds of skin around its throat puff out and become white in patches.

4 Nesting
The female nests only if she has sufficient fat reserves. She produces a creamy-yellow egg every 25 hours and lays 8–15 in total.

▲ **FAMILY GATHERING**
After three weeks, the poults are able to fly with their mother up to a nighttime roosting site in the trees.

CONSERVATION

Overhunting caused wild turkey population to fall from 10 million to 300,000 in the 1940s. Captive-breeding and reintroduction programs have restored numbers to about 1.8 million.

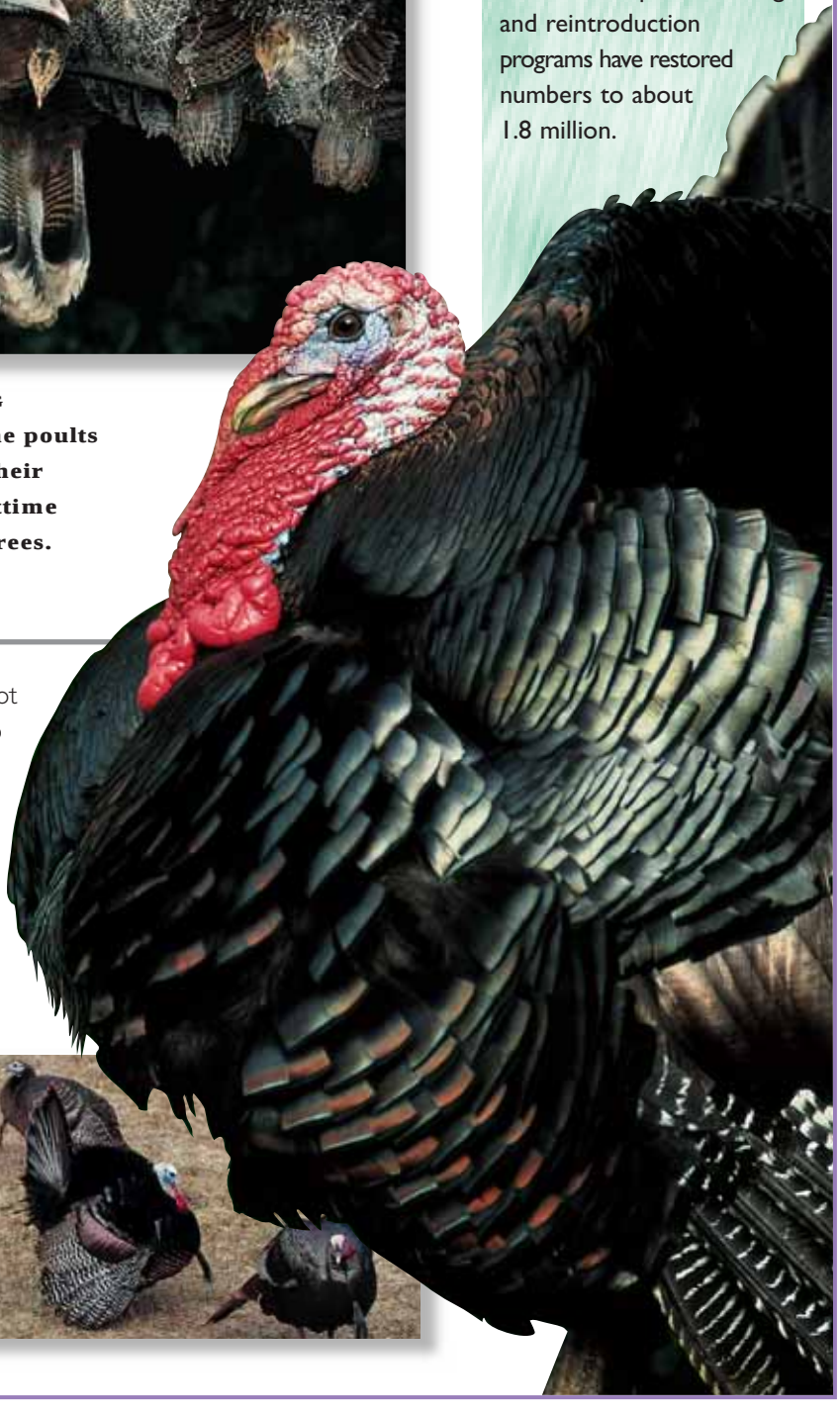
BEHAVIOR

The wild turkey has tiny wings relative to its weight, so a lot of its daily activity is ground-based. If threatened, it runs to safety, flying only as a last resort. Nevertheless, it is a powerful flier and can reach 60 mph in short bursts.

Throughout the summer, females and their offspring form large, noisy brood flocks up to a 100 or so strong, often gathering in meadows and clearings where insect prey is abundant. Within such flocks, the birds participate in ritualized displays and fights to maintain a hierarchy or "pecking order."

Young males leave brood flocks before the breeding season to form bachelor groups, but are unlikely to breed in their first year.

▶ **TALKING TURKEY**
Wild turkeys use nearly 30 different calls.



PROFILE WILD TURKEY

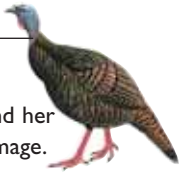
The courting male ruffles his splendid body feathers, fans his luxuriant tail and gobbles loudly in an attempt to dazzle his female audience.

SNOOD

The turkey's featherless head is decorated with bright red and blue warty skin. A fleshy protuberance called a snood hangs from the forehead.

FEMALE

Smaller than the male, the female has more feathers around her neck, and duller plumage.



PLUMAGE

The male's metallic dark-brown plumage is iridescent; in certain light it seems to contain the colors of the rainbow.

BEARD

The beard is a tuft of long, bristly feathers that grow from the male's breast. Unlike the rest of the plumage, the beard is not shed annually.

TAIL

The male usually holds his black-tipped tail feathers neatly behind; he displays them only during courtship.

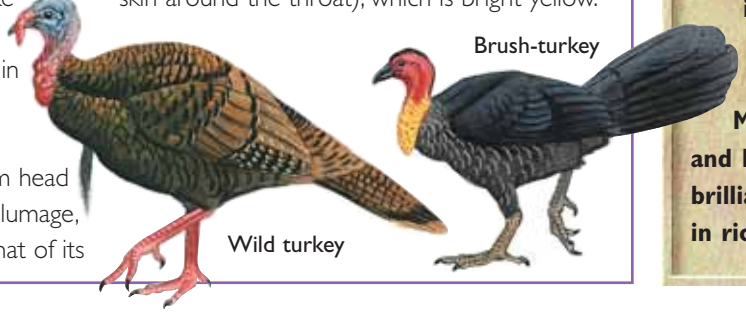
VITAL STATISTICS

WEIGHT	Male 18–22 lbs.; female 10 lbs.
LENGTH	Male 50"; female 36"
HEIGHT	Up to 45"
SEXUAL MATURITY	Male 1 year; female 10 months
BREEDING SEASON	February–August
NUMBER OF EGGS	8–15
INCUBATION PERIOD	28 days
FLEDGING PERIOD	2–3 weeks
BREEDING INTERVAL	1 year
TYPICAL DIET	Fruits, seeds, vegetation, nuts, grain, maize, acorns, insects
LIFESPAN	5–7 years

CREATURE COMPARISONS

The brush-turkey (*Alectura lathami*) belongs to the family Megapodiidae. A ground feeder, like the wild turkey, it uses its powerful feet to rake up seeds and insects and to give it a sure grip when roosting in the trees. It's found in the rainforest, thick scrub and cultivated areas of eastern Australia.

The brush-turkey, about 28" from head to tail, is smaller than the wild turkey. Its plumage, with shades of black, is less striking than that of its American cousin. The red-headed brush-turkey lacks a snood, but does have a wattle (folds of skin around the throat), which is bright yellow.



RELATED SPECIES

● Chickens, turkeys and gamebirds are classed in the order *Galliformes*. The wild or common turkey and the ocellated turkey, *Meleagris ocellata*, are the only members of the family *Meleagrididae*. The ocellated turkey lives in the semiforested lowlands of the Yucatan Peninsula in Mexico, Guatemala and Honduras and has brilliant metallic plumage in rich colors.

Willow Ptarmigan

• ORDER •
Galliformes

• FAMILY •
Tetraonidae

• GENUS & SPECIES •
Lagopus lagopus

KEY FEATURES

- In tune with the seasons, it alters its diet to survive harsh winters and has three plumages a year to blend with changing surroundings
- Freezes on the spot when danger approaches, only "exploding" from cover at the last moment
- Chicks run and feed within minutes of hatching

WHERE IN THE WORLD?

In a broad band across the northern hemisphere, from Alaska and British Columbia east through northern Europe and Russia to Siberia

LIFECYCLE

The willow ptarmigan hides from danger by flattening itself against the ground and staying motionless. It shoots off like a rocket if danger persists and resumes feeding when all is clear.

HABITAT

▲ **MIDNIGHT SUN**
In the north of the ptarmigan's range, summer daylight lasts 24 hours.

The willow ptarmigan lives in tundra, moorland and Alpine meadows, where the vegetation rarely grows above its eye level. Plants here are ground-hugging herbs, mosses and grasses. The willow ptarmigan favors areas scattered with stunted willow and birch trees and berry-bearing shrubs; these provide vital food sources in fall and winter.

The willow ptarmigan lives in open, rather featureless terrain, but tends to inhabit areas that have a few elevated sites, such as ice ridges or rocks. The male uses these as "stages" when displaying to females. In very harsh winters, the ptarmigan moves to sheltered valleys or thickets close to rivers.

◀ **WHITE-OUT**
In winter, when the tundra is buried under snow, ptarmigans turn all white.

VANISHING ACT

1 Freeze...
While feeding on tender shoots, an ever-alert willow ptarmigan sees a red fox. It crouches down in the low vegetation and waits...

2 Hold tight...
...until it's safe to move. Staying still amid the grasses, it evades the notice of the hungry fox, which locates prey by sight and sound.

3 Lift-off...
Timing the final escape takes nerve. When the fox is almost in pouncing range, the ptarmigan suddenly explodes into the air...

4 Away
...startling the predator. While the fox gathers its wits, the ptarmigan powers away to safety with rapidly beating wings.

DID YOU KNOW?

- **Incubating females are so sure of their "invisibility" that humans can walk up and touch them.**
- **The male's throaty call sounds very like "go back, go back, go back."**

FOOD & FEEDING

BEHAVIOR

The northern tundra zone abounds with predators (the Arctic fox, weasle, snowy owl and gyrfalcon). The ptarmigan has three plumages and melts into the changing Arctic landscapes, escaping their attention.

The ptarmigan matches summer ground cover with brown and black-and-white flecked feathers *(right)*. Its white winter plumage provides camouflage and insulation. Between these extremes, it is brown with a liberal "dusting" of white to mimic partial snow cover.

CONSERVATION

Although common across its range, the willow ptarmigan has population explosions of 300–500%, followed by crashes, often in 10-year cycles. These may be the result of changes in soil fertility and, therefore, plant growth.

◀ **TIME OF PLENTY**
Spring brings a profusion of food *(red grouse form)*.

Food is hard to come by in northern winters, but the ptarmigan survives on a monotonous diet of buds and twigs of dwarf willow and birch trees. In spring, the menu broadens to include green shoots, seeds, berries and a few insects and other invertebrates.

The quality of the willow ptarmigan's winter diet is so poor, though, that the female's body can't cope with the demands of producing eggs in early spring. Instead, the female has to wait until the food supply improves toward summer and she has put on sufficient weight, before she can nest.

BREEDING

Each pair of ptarmigan stays together through the breeding season, with males defending a territory with loud, croaking calls. The female sits on her nest, a shallow hollow in the ground lined with grass, relying on excellent camouflage to remain hidden. The male helps brood and defend the eggs, which hatch after 20 days.

Chicks develop rapidly, leaving the nest soon after hatching. They can run and feed themselves in minutes, but their parents need to warn them of danger in their first three months.

▼ **QUICK ON THEIR FEET**
Chicks hatch with open eyes, strong legs and down.

PROFILE WILLOW PTARMIGAN

Like a heavyweight "survival jacket," the willow ptarmigan's plumage provides protection in northern winters and camouflage against predators.

HEAD

Small, fleshy "combs" over the male's eyes, a feature almost entirely hidden in the female, become larger and turn a deeper shade of red in breeding displays. Sometimes, the combs swell so much that they almost meet over the bird's head.

WINTER PLUMAGE

The isolated British population of willow ptarmigan, known as red grouse *(as shown here)*, don't molt into all-white plumage for winter; they keep their red-brown feathers *(right)* all year. On mainland Europe and in North America, grouse turn white to mimic snowy conditions.

FEET

Legs and feet are feathered to sustain subzero temperatures. In winter, feathers on the toes grow thicker and longer to help the bird walk over snow, like snowshoes. The claws also grow long for this reason.

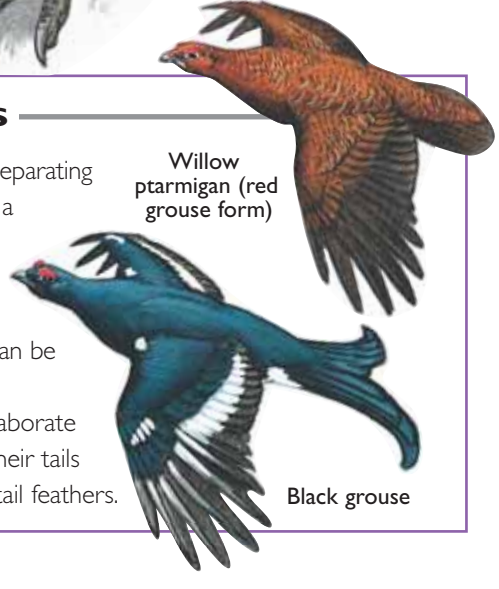
VITAL STATISTICS

WEIGHT	1–1.5 lbs.
LENGTH	1–1.5'
WINGSPAN	2'
SEXUAL MATURITY	1 year
BREEDING SEASON	Summer in the north
NUMBER OF EGGS	2–15, usually 8–11
INCUBATION PERIOD	22 days
FLEDGING PERIOD	Chicks develop rapidly, flying short distances within 2 weeks
TYPICAL DIET	Buds and twigs of willow and birch (winter); seeds, shoots, fruits and insects (spring and summer)
LIFESPAN	2 years

CREATURE COMPARISONS

The black grouse (*Tetrao tetrix*) inhabits transitional areas separating boreal (northern) forest from moorland or tundra; there's a marked difference between male and female, unlike the willow ptarmigan. Known as a blackcock, the male black grouse is spectacular in its glossy, velvet-black plumage and sports a lyre-shaped tail. The dull, speckled-brown female can be mistaken for a willow ptarmigan, but its plumage is darker.

At a lek (display mound), blackcocks perform elaborate rituals for the females' attention. Cocking and spreading their tails and drooping their wings, they expose pure white undertail feathers.



RELATED SPECIES

● **The 17 grouse species in the family *Tetraonidae* are related to pheasants, partridges and quails. Grouse are a northern hemisphere group, with 7 species in Eurasia, 8 in North America and 2 species, the willow and rock ptarmigan** (below), **occurring in both regions.**

Winter Wren

• ORDER •
Passeriformes

• FAMILY •
Troglodytidae

• GENUS & SPECIES •
Troglodytes troglodytes

KEY FEATURES

- One of the smallest birds in the United States, barely heavier than a wine-bottle cork
- Usually hard to see, remaining in dense cover where it forages exclusively on insects
- Vocal throughout the year, it has one of the loudest songs of all birds relative to its size

WHERE IN THE WORLD?

Across North America in winter to southern states; also in Iceland and most of Europe, parts of Asia to Kamchatka in Russia and south to North Africa

LIFECYCLE

Smaller than most birds, the winter wren loses body heat rapidly, yet can survive the winter by scurrying among the undergrowth searching every nook and cranny for insects.

HABITAT

▲ **ROUGH AND READY**
The winter wren forages and nests in thick cover.

The winter wren's habitat ranges from parks or farmland to wooded ravines and remote island sea cliffs. It survives where it can roost or nest in safety, such as on riverbanks or among vegetation, and where it can find insects in low cover.

The largest numbers occur in broad-leaved woodland with heavy understory. The only habitats that the wren avoids are large areas of bare rock, snow, sand, mud and water. The isolation of wrens on offshore islands has evolved several distinctive island races.

BEHAVIOR

Because it spends most of its time slipping restlessly through dense cover, the winter wren is hard to spot. But it is not usually timid, and when washing itself in a bird bath allows humans to approach. The wren is especially noticeable when it pops up to sing on a moss-covered stump, puffing out its breast and trembling its wings, to deliver its astonishingly loud song.

The male winter wren sings throughout the year, except for a brief break in late summer to early autumn, when molting. Analysis has revealed that each burst of wren song contains over 100 separate notes. The male delivers his song at great speed, always ending the performance with a loud trill.

WHISTLING WITH INTENT

1 Vocal hero…
A male pours out his song from a perch to proclaim ownership of territory to other males and interested females.

2 Chases…
As an intruding male arrives, the resident bird takes to the air swiftly. Amid a swirling aerial chase, he chases off the intruder.

DID YOU KNOW?

- **The winter wren's scientific name, *Troglodytes*, comes from the Greek word meaning "cave dweller," and refers to the wren's domed nest, which has a cavelike entrance.**
- **Sixty-one individuals have been recorded roosting in a single nest box during a harsh winter.**
- **Old country nicknames for the wren include stumpy toddy, titty todger and jenny wren.**

FOOD & FEEDING

3 Toleration...
During autumn, when there are many young birds around, the adult male relaxes his guard and may allow others to feed nearby.

4 Heart warming
In severe winters, wrens put aside territorial differences and huddle together, using each other's bodyheat to stay warm.

The winter wren forages for a wide range of insects but seems to have a preference for beetles. This diminutive bird also snaps up ants and their eggs, aphids, caterpillars various types of flies and grasshoppers. The wren also eats spiders, and may feed on millipedes, centipedes, woodlice and small snails. Occasionally, the winter wren has been observed eating tadpoles and even small fish.

When searching for prey, the wren moves quickly and jerkily, flying fast between feeding areas. Foraging close to the ground, it peers under leaves and probes bark crevices in search of prey. Its tiny, compact body enables it to slip behind ivy stems or through shrubs and brambles.

In winter, insects become scarce, and the winter wren may move into marshy areas where prey can still be found. It has become skilled at locating the semidormant pupae of moths and other insects, and may even eat seeds for energy.

◀ **Strike it lucky**
A slender bill extracts insects from crevices.

BREEDING

The male wren is most vocal in early spring, when his song will attract females. Although some males take one mate each season, many will mate with two or more females.

Using dead grass or leaves, moss and bracken, the male builds several nests. He hides each one well — among ivy or other creepers, in a hedge or even in the old nest of another bird. When a female shows interest, he takes her to one of his nests. If it meets with her approval, she adds a lining of feathers and lays her eggs. The male plays no role in rearing the young.

▲ **Home removals**
The mother cleans the nest of fledglings' fecal sacs so that the smell does not alert predators.

▼ **Open-and-shut case**
The young winter wrens feed on insects brought by their mother until they fledge at 3 weeks old.

CONSERVATION

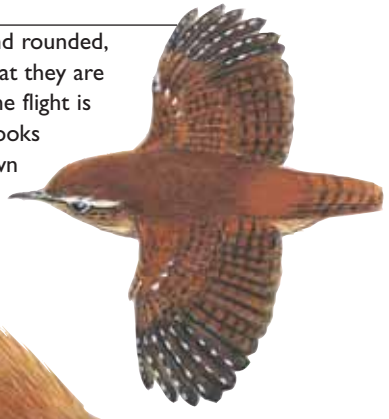
Common across most of its range, large numbers of wrens may be lost in extreme cold weather — up to 70% of Britain's wrens have died during particularly severe winters.

PROFILE WINTER WREN

With its wide, gripping feet and lightweight body, the winter wren can descend easily to the ground and probe for insects using its slender bill.

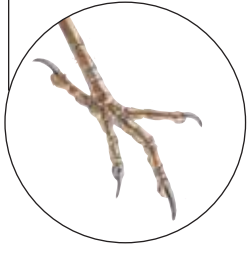
TAIL
Short and barred, the tail is often cocked at a jaunty angle when the bird is not in flight.

WING
The wings are short and rounded, and whirr so rapidly that they are visible only as a blur. The flight is fast, and the tiny bird looks rather like an overgrown bee or other insect.



PLUMAGE
Both sexes have fawn underparts with rich brown upperparts and wings. Heavily marked by black bars, the wren has a pale buff "eyebrow."

FEET
With a sharp claw on each digit, the feet provide grip as the bird hops, mouselike, on the ground or between branches.



BILL
The wren's bill is slender and pointed, and its upper mandible is slightly down-curved. It is ideally adapted for exploring tiny crevices for small insects and spiders.

VITAL STATISTICS

WEIGHT	0.28–0.45 oz.
LENGTH	3.6–4"
WINGSPAN	5.2–6.8"
SEXUAL MATURITY	1 year
BREEDING SEASON	April–August
NUMBER OF EGGS	3–9, usually 5–7
INCUBATION PERIOD	12–20 days, usually 15–17
FLEDGING PERIOD	14–19 days
BREEDING INTERVAL	1 year (up to 2 broods per season)
TYPICAL DIET	Insects, spiders
LIFESPAN	Up to 6 years

RELATED SPECIES

- The winter wren is 1 of 5 species in its genus. The others are the house wren, *Troglodytes aedon*, clarion wren, *T. tanneri*, tepui wren, *T. rufulus*, and mountain wren, *T. solstitialis*. They belong to the family *Troglodytidae*, which contains about 60 species. Only the winter wren represents the family outside the New World. Australasian wrens are part of the *Maluridae* family.

CREATURE COMPARISONS

Found in Australia, the splendid fairy-wren (*Malurus splendens*) is in a different family, the *Maluridae*. It feeds on insects in scrubland, woodland fringes and orchards. Growing to about 5.5", the splendid fairy-wren is slightly larger than the Shetland wren (*Troglodytes troglodytes zetlandicus*), a large subspecies of the winter wren. This island race is heavily barred and paler than the subspecies found in the U.S. It's appearance cannot compete with the breeding plumage of the male splendid fairy-wren. He is all blue, with pale cheeks and a white-tipped crest divided by black eye stripes.

Splendid fairy-wren

Shetland wren

Wompoo Fruit Dove

• ORDER •
Columbiformes

• FAMILY •
Columbidae

• GENUS & SPECIES •
Ptilinopus magnificus

KEY FEATURES

- Fruit-eating dove that has adapted to most forest environments throughout its range
- Also known as the magnificent fruit dove, due to its colorful plumage
- Hangs upside down on a tree branch when foraging for hard-to-reach fruit

WHERE IN THE WORLD?

Found in Australia in New South Wales, Queensland and Victoria; also New Guinea and adjacent islands

LIFECYCLE

The fruit dove nests on exposed branches in trees, finding relatively open areas in the forest; the single egg is incubated by the male during the day and the female at night.

HABITAT

The wompoo fruit dove inhabits a variety of forest types, including primary and well-developed secondary rainforest, gallery forest and monsoon forest. In New Guinea, it occurs from near sea level up to 4,500', but is more common at lower elevations. The fruit dove is also found in New South Wales in eucalyptus forests and farmland during the winter months. This species is able to cross open country and adapt to habitat other than rainforest, such as both lowland and hill forests.

▼ **FOREST HOME**
The wompoo fruit dove prefers the thick rainforests of eastern Australia.

BEHAVIOR

In the eastern part of Australia, wompoo fruit dove populations are sedentary; others move based on the availability of ripening fruit. Despite its colorful plumage, the bird sometimes can be difficult to see when it feeds high in the trees. It makes its presence known by a *wompoo* call that sounds like a loud, monotonous *woo* note, hence its name. When the bird is feeding, it makes a low-pitched *pack-pack-pack* sound and a guttural *bahroo* noise. Flight muscles are large and powerful in these agile fliers, enabling the bird to cross large bodies of water to find food, as it flies from island to island. The bird bathes in the rain or puddles and takes dust baths. The fruit dove uses its bill to remove foreign bodies such as parasites and to rehook the zipperlike portions of a feather *(barbicles)* that have come loose on the flight feathers.

▶ **VOCAL CHORDS**
The wompoo fruit dove is very vocal, whether feeding or at rest.

BREEDING

The fruit dove breeds mainly from the middle of the dry season to early wet season in both Papua New Guinea and eastern Australia, with some breeding occurring year-round. These monogamous birds form pairs, defend territories and build nests. The nest is a large platform made of twigs and vines placed on a fork or palm frond, 12–20' high. The female lays one white egg, which is incubated by both sexes for at least 21 days. If the brood-ingparent is disturbed, it usually pretends to fall from the nest, then flies clumsily away in a distraction display. Both sexes prepare crop milk for their young prior to hatching. The chick stimulates the parent by placing its bill into its parent's bill. Although the chick is ready to fledge in 13–14 days, it feeds on crop milk long after fledging; the time it reaches sexual maturity is still unknown.

EGG PROTECTION

1 Guarding the young…
The wompoo fruit dove sits on its nest in a fork near the branch of a fig tree. Parents take turns incubating the single egg.

2 Danger approaches…
A New Guinea quoll clambers up the tree trunk as the wompoo fruit dove stands in front of the nest exposing its egg.

DID YOU KNOW?

- **To compensate for wear and damage caused by feather mites, the wompoo fruit dove grows new feathers each year after the breeding season.**
- **Pigeons and doves are among the most powerful and agile fliers; their flight muscles are relatively larger than those of most other bird groups.**

3 Dramatic drop...
The dove falls from the nest with wings partially folded, causing the quoll to freeze midway up the trunk and to look down at the bird.

4 Distracted
The dove flies low and erratically through the trees in a distraction display. The quoll climbs down to pursue the dove.

CONSERVATION

The fruit dove is not globally threatened and remains widespread and common in most of its range. However, the southernmost species *(Ptilinopus magnificus magnificus)* has declined severely due to habitat loss and overhunting.

FOOD & FEEDING

The dove eats a wide variety of fruits — more than 50 plant species according to one study. It prefers fruit from the fig family, as well as laurels and palms. In Australia, the favored food is the fruit of white cedar. As the dove forages, it feeds at all levels of the forest from understory to the canopy, mostly in lower canopy and midlevel. It feeds singly, in pairs or small flocks. The wompoo fruit dove ventures onto a branch, hanging upside down on the thinnest twigs to reach its favorite fruit. Using the hard tip of its beak, the dove plucks fruit and then swallows it whole. The gizzard walls consist of hard nodules and ridges, which rub the fleshy pulp and skin off the fruit; undigested stones pass into the intestines and are later expelled whole. This fruit-eating bird has a shorter intestine than birds that eat only seeds. Like all doves, the fruit dove needs water to moisten and help digest its food. It sucks water up through a pumping action, rather than raising its head to swallow like other birds.

SPECIAL BEAK
The fruit dove's beak is adapted for eating fruits; the hard tip allows it to easily pluck its food from the trees.

PROFILE Wompoo Fruit Dove

With its rainbow of colors, the wompoo fruit dove makes an impressive sight as it soars through the trees of the forest.

Eye
Normally a dull brown, the dove's eye becomes bright red during the breeding season.

Bill
The base of the bill is soft, with a horny sheath to protect the nostrils; however, the tip is hard and used for eating fruit.

Squab
The squab (chick) has a naked head at birth; as fruit becomes a larger part of its diet, it develops feathers.

Plumage
The wompoo fruit dove blends easily into the tropical settings found in rainforests. It has mostly green upperparts, a grayish-white head, purple breast and yellow belly.

Feet & legs
Legs are relatively short; the strong feet grip branches forcefully even while the dove hangs upside down. With powerful muscles and a large functional hindtoe, the dove can maintain its perching position for extended periods of time.

Vital Statistics

Weight	8.5–17.5 oz.
Length	11.5–18"
Wingspan	Unknown
Sexual Maturity	Unknown
Breeding Season	Year-round
Number of Eggs	1
Incubation Period	At least 21 days
Fledging Period	About 13–14 days
Breeding Interval	1 year
Typical Diet	Fruits and berries
Lifespan	Unknown

Related Species

The wompoo fruit dove is 1 of 51 species in the genus *Ptilinopus,* including the pink-spotted fruit dove, *P. perlatus,* the ornate fruit dove, *P. ornatus,* and the superb fruit dove, *P. superbus.* The family *Columbidae* contains 309 species in 42 genera of pigeons and doves. The order *Columbiformes* includes about 325 species in 2 families of sandgrouse, pigeons and doves.

Creature Comparisons

Considerably smaller than the wompoo fruit dove, the many-colored fruit dove (*Ptilinopus perousii*) weighs 2.5–3 oz. and measures up to 9". The many-colored fruit dove is pale yellowish-white above with a crimson band across the upper back, crimson forehead and crown, and a prominent breast patch with purple-pink spots; its Australian cousin is bright green with a gray head, purple throat and yellow bands on its wings. Found in Upolu, Samoa, Fiji and other adjacent islands in the Pacific Ocean, the many-colored fruit dove also eats fruit, primarily from the banyan tree, and inhabits the forest canopy.

Wood Duck

• ORDER •
Anseriformes

• FAMILY •
Anatidae

• GENUS & SPECIES •
Aix sponsa

KEY FEATURES

- A true North American bird, the wood duck occurs naturally on no other continent
- Striking colors of the drake (male) make it one of the most beautiful of all birds
- Nests in tree holes and man-made tree boxes, unlike most ducks

WHERE IN THE WORLD?

Occurs only in North America, in mainland U.S. and southern Canada; northern populations fly south to winter in Mexico; small population in Cuba

LIFECYCLE

Of all North American waterfowl, the wood duck is the most adept at living in thickly forested wetlands, thriving in a habitat that provides nest sites, food and cover.

HABITAT

▲ **A WOODED HIGH-RISE**
The wood duck nests in trees as high as 50'.

The wood duck flourishes in freshwater, preferring bodies that are slow-moving and shallow. It frequents areas sheltered by dense stands of trees and shrubs, with just enough sunlight breaking through to support an abundant food supply. The wood duck can adapt to almost every type of freshwater wetland — rivers, streams, lakes, ponds, swamps and even the numerous shallow, wooded ponds created by beavers. Flocks navigate deftly through the thick branches of lowland hardwoods. These sites are sometimes close to human habitation, and conservationists build nest houses for the ducks. Occasionally, wood ducks even try to nest in structures such as barns or chimneys.

◀ **WATERY HOME**
The wood duck is a dabbling duck, at home in the water.

DID YOU KNOW?

- **The wood duck's love for acorns earned it the name the "acorn duck."**
- **The female lays 10–16 eggs, the largest number of any North American bird.**
- **Native Americans revered wood ducks — their image adorns ceremonial items.**
- **The wood duck can run over 7 mph, faster than any other duck species.**

FOOD & FEEDING

Wood ducks are omnivorous, consuming a wide variety of plants and animals, with acorns being their preferred food. Small fish and insects are an especially important source of protein to breeding females and ducklings. Wood ducks do not establish or defend feeding territories. They feed in small groups and cover sizable areas while searching for food. Although wood ducks feed most often in and under the water, they often forage for insects, fruits and grains on dry land. During the nesting period, the drake, having already eaten, will watch for danger while his mate feeds.

CONSERVATION

The wood duck population in North America is a strong 7–8 million birds, but this has not always been the case. Hunted dangerously close to extinction in the 1800s, it has made a remarkable comeback after being the only duck singled out for total protection under the Migrating Bird Treaty Act of 1918. Hunting is still regulated, but habitat loss is now a threat.

AN UP-ENDING STORY

1 Searching…
The wood duck feeds most often in shallow waters, dabbling and probing for acorns, seeds, plants and insects.

2 Tipping up…
When foods are too deep to reach, the duck dives by leaping up and forward and propelling into a tight arc with its feet.

3 Tug of war…
With its hooked and narrow bill, the wood duck uproots tubers of aquatic plants, such as duck potato and water lilies.

4 Torn to pieces
Because its bill is not adapted for crushing, items too large to be swallowed whole will have to be nibbled and torn.

BREEDING

▼ **PERFECT DUO**

Wood ducks form a strong, monogamous bond.

BEHAVIOR

A bird of quiet ponds and dark forests, the wood duck is shy and secretive, seeking refuge in the trees. An acrobatic flyer, it is just as agile in the water or even on land. The duck is a strong swimmer, spending much of its time dabbling on the water's surface. It also is one of the fastest ducks on land and will consistently outrace other species, such as mallards. The migration patterns of the wood duck are unique: it is the only species of North American waterfowl with a northern population (about two-thirds) that migrates and a significant southerly portion (about one-third) that doesn't.

▼ **ON THE MOVE**

The wood duck drake takes off from the water almost vertically to fly swift and direct during migrations.

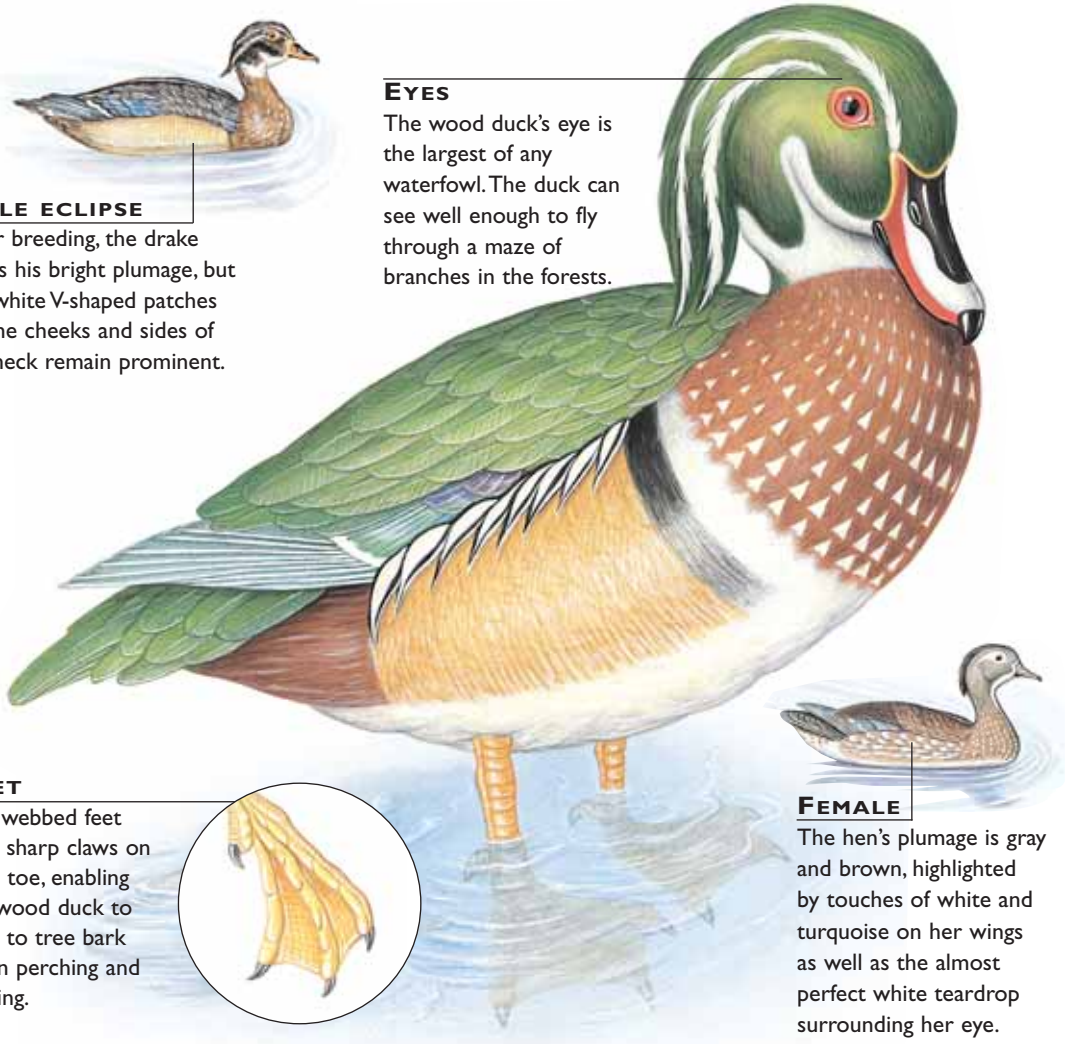
At least 6–7 months before the spring nesting season, large flocks of drakes gather for ritualized displays and vocalizations meant to impress females. The female will choose a mate and, once paired, they begin to search for a nest site. The final decision on a particular nest is made by the female alone. Rarely does a drake enter a nest hole, but he does stand guard in a nearby tree. The female incubates the eggs, covering them with downy feathers that she pulls or sheds from her breast. The eggs hatch in about 30 days and, within just a few hours, the ducklings are capable of leaving the nest. The female scouts the surroundings, and when all is clear, she summons her brood from the nest. Hearing her soft call, the ducklings scramble out of the nest hole; one by one, they jump down to join her, using their tiny wings as parachutes to soften their fall.

PROFILE WOOD DUCK

The striking, myriad colors in the plumage of the wood duck drake provide perfect camouflage in the shadowed forests and sunlit wetlands.

MALE ECLIPSE
After breeding, the drake sheds his bright plumage, but the white V-shaped patches on the cheeks and sides of the neck remain prominent.

EYES
The wood duck's eye is the largest of any waterfowl. The duck can see well enough to fly through a maze of branches in the forests.



FEET
The webbed feet have sharp claws on each toe, enabling the wood duck to cling to tree bark when perching and nesting.

FEMALE
The hen's plumage is gray and brown, highlighted by touches of white and turquoise on her wings as well as the almost perfect white teardrop surrounding her eye.

VITAL STATISTICS

WEIGHT	1.5 lbs.
LENGTH	About 18"
WINGSPAN	2.5'
SEXUAL MATURITY	1 year
BREEDING SEASON	Spring in the north; spring and fall in the south
NUMBER OF EGGS	10–16
INCUBATION PERIOD	28–33 days
FLEDGING PERIOD	8–10 weeks
BREEDING INTERVAL	Up to 1 year
TYPICAL DIET	Nuts, seeds, frogs, fish, insects and aquatic plants
LIFESPAN	2–6 years

CREATURE COMPARISONS

Like the wood duck, the African pygmy goose (*Nettapus auritus*) is a woodland duck that nests in tree holes. At 13" long, this perching duck is one of the smallest ducks in the world and is found exclusively in Africa. Like the wood duck drake, the African pygmy goose drake has ornate coloring, with extensive iridescent colors of dark green and bright orange, a white face and a white collar. The female African pygmy goose is brownish with a plain, dusky head.

Wood duck

African pygmy goose

RELATED SPECIES

- **The wood duck is one of only two species in the genus *Aix*. The other is the mandarin duck, *A. galericulata*, a native of Asia. These two cousins belong to the *Cairinini* tribe, which contains 9 genera and 13 species of perching ducks and geese, including the muscovy duck, *Cairina moschata*, of Central and South America. All exhibit perching and tree-hole nesting traits.**

Wood Pigeon

• ORDER •
Columbiformes

• FAMILY •
Columbidae

• GENUS & SPECIES •
Columba palumbus

KEY FEATURES

- The largest pigeon in Europe, and widely regarded as a pest in the countryside due to grain-feasting exploits
- Shy and wary because of persecution in rural areas, it has become surprisingly tame in city parks
- Breeds mainly during the spring in cities, but rural pairs delay nesting to coincide with the late-summer grain harvest

WHERE IN THE WORLD?

Throughout Britain and sub-Arctic Europe, west to the Azores in the Atlantic Ocean and east, through northwest Africa and the Middle East, as far as northern India

LIFECYCLE

Tree-felling spells disaster for many birds, but the adaptable wood pigeon has flourished on the cultivated land that has largely replaced its ancestral forests.

HABITAT

The wood pigeon is a common sight in cities and lightly wooded farmland. Although it was originally a forest species, only a few still inhabit heavily timbered areas where oak, beech and other deciduous trees are a good food source.

Elsewhere, the wood pigeon roosts and breeds in broad-leaved copses or conifer plantations, spending the rest of its time on arable land where food is abundant.

▲ **BRANCHING OUT**
Despite the bird's name, only a few live in woods.

FOOD & FEEDING

The population size of the wood pigeon had a huge increase in number when farmers unwittingly helped it through the lean months by growing cold-weather crops for their livestock.

Although it still eats acorns, beechmast and wild berries, the wood pigeon finds a more reliable and longer-lasting winter food supply in cultivated plants, such as clover, kale and turnips.

In the spring, the wood pigeon raids fields of peas and beans, while in late summer it feasts on ripening cereals. Large flocks also glean spilled grain from stubble after harvest time.

When feeding in trees, the wood pigeon is agile for a bird of its size, often hanging upside down from thin twigs to reach blossoms and nuts at the tips of branches. Wild figs are among its favorite foods in the Middle East and southern Asia.

THE GREAT GRAIN ROBBERY

1 Surveys...
Wood pigeons once relied on trees for food, but now they sit in them to survey fields of cereals in the surrounding farmland.

BREEDING

The wood pigeon does not have a clearly defined breeding season, and nests have been found in every month. In towns, most eggs are laid in April and May, but the rural peak is from July to September to coincide with the grain crop.

Nests are thin platforms of twigs, usually in trees or bushes, sometimes on the ground, and often on buildings in towns.

The wood pigeon lays only two eggs in a clutch, but may raise three broods a year. Both sexes incubate the eggs and feed their young. For their first few days the nestlings, known as squabs, drink "pigeon's milk," a protein-rich liquid produced in each adult's crop. The squabs then receive regurgitated seeds from their parents and are independent after a month.

▼ **MILKY WAY**
"Milk" from the adult's crop nourishes young.

CONSERVATION

The wood pigeon does major damage to European crops and costs farmers millions of dollars each year. It has been a pest since the middle of the 19th century, when fodder production for livestock became widespread, enabling more birds to survive the harsh winter. A shotgun is the tool farmers use to control these birds, but it has had little effect on their numbers, which in Britain peak at around 10 million each autumn.

2 Plunders…
After making sure there are no foxes or cats nearby, they fly down into a wheat field to plunder the grain, which is ready to harvest.

3 Scoffs…
Ears of wheat are quickly destroyed as the birds hurry through their meal, aware that at any moment a farmer may appear.

4 Bulging appetite
If undisturbed, the wood pigeon continues to feed until its crop (a storage area in the throat) becomes bloated with grain.

DID YOU KNOW?

- **Old country names for the wood pigeon include quisty and queest, from the Latin *questus*, meaning to lament. The names were inspired by the bird's mournfully plaintive cooing.**
- **Pigeons are one of the few birds capable of sucking water into their mouth. Most birds drink by sipping and then raising their bill.**
- **The wood pigeon was once known as the ring dove; "pigeon" and "dove" are interchangeable names.**

BEHAVIOR

How the wood pigeon responds to human… depends on its local environment. The bird is highly vigilant in rural areas, where it is shot at and has many of its nests destroyed in an attempt to reduce its grain-robbing. A long history of persecution has taught it to be forever wary, always ready to take off. As it flees, the white patches on its wings probably alert other wood pigeons to potential danger.

In urban areas, however, the bird is often as tame as the feral pigeon, having learned that urban residents are more likely to throw it a handful of crumbs than a barrel of buckshot.

Outside the breeding season, the wood pigeon roosts communally and often gathers in flocks that can number tens of thousands. It does not make long migrations: the younger birds of some northern European populations regularly fly south when winter arrives, but only as far as Britain.

▶ **GROUP PRACTICE**
Wood pigeons leave their roost at dawn to search for food.

PROFILE Wood Pigeon

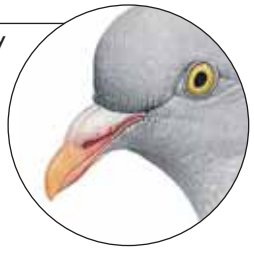
The jerky walk of the wood pigeon is a familiar sight in urban areas, but its broad feet also allow it to perch and roost in trees.

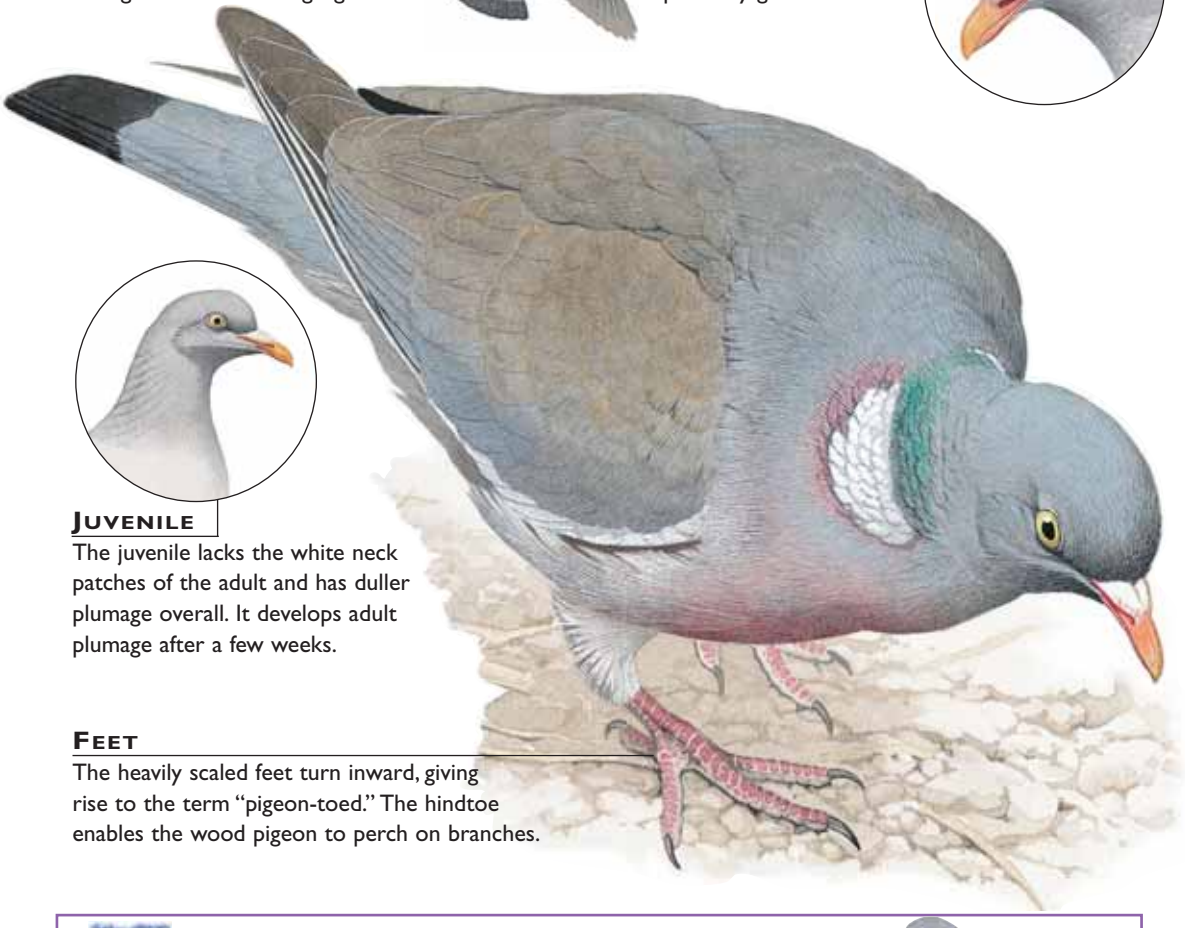
Wings

The patches of white on the wood pigeon's wings flash when the bird is in flight and are thought to act as recognition and warning signals.

Nose

The nostrils are in a fleshy bulge, or *operculum*; it is coated with white, powdery granules.





Juvenile

The juvenile lacks the white neck patches of the adult and has duller plumage overall. It develops adult plumage after a few weeks.

Feet

The heavily scaled feet turn inward, giving rise to the term "pigeon-toed." The hindtoe enables the wood pigeon to perch on branches.

Vital Statistics

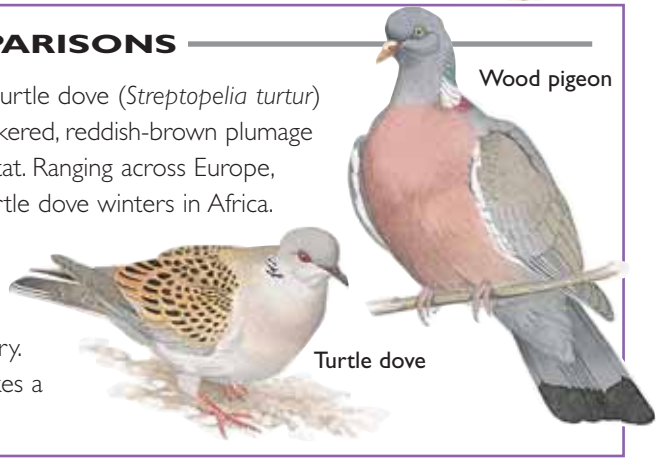
Weight	10–24 oz.
Length	16.5–18"
Wingspan	30–32"
Sexual Maturity	1 year
Breeding Season	Mostly between April and September
Number of Eggs	Usually 2
Incubation Period	17 days
Fledging Period	33–34 days
Breeding Interval	1 year
Typical Diet	Grain, nuts, leaves, berries, flowers; some insects
Lifespan	Up to 16 years

Related Species

● **The wood pigeon is one of 51 species in the genus *Columba*. It is a member of the family *Columbidae*, which includes the rock dove, *Columbia livia* (below). The feral pigeon, which inhabits many cities, is descended from this bird.**

Creature Comparisons

Growing to a length of around 11", the turtle dove (*Streptopelia turtur*) is smaller than the wood pigeon. Its checkered, reddish-brown plumage helps camouflage it in its woodland habitat. Ranging across Europe, North Africa and southwest Asia, the turtle dove winters in Africa. Unlike the wood pigeon, it has never adapted to cities. The turtle dove owes its name to its soft *turr-turr* call; it repeats the notes to advertise its territory. In times of distress or excitement, it makes a terse, popping sound.



Wood Stork

• ORDER •
Ciconiiformes

• FAMILY •
Ciconiidae

• GENUS & SPECIES •
Mycteria americana

KEY FEATURES

- Strong, stout bill acts like a trap in the muddy water; snaps shut in only 25 milliseconds, one of the quickest reactions among vertebrates
- Nests in extremely large colonies that number in the thousands; up to 50 nests have been found in a single tree
- Breeds only when there is an abundance of food in the region

WHERE IN THE WORLD?

Found throughout the lower southeastern states of the U.S.; also found along both coasts of Mexico through Central and South America to northern Argentina

LIFECYCLE

Fish play a major role in a stork's life; the bird flies to distant feeding sites in search of them, uses its sensitive bill to seize them and starts breeding when they are plentiful.

HABITAT

The American wood stork frequents freshwater wetlands, including inland marshes, swamps, lake-edge marshes and river bottoms, as well as mangrove swamps and lagoons. The water depth of these habitats fluctuates with the change of seasons, and in the dry season fish become highly concentrated in the pools and ponds remaining when water levels suddenly fall. This increase in the food supply triggers the start of the wood stork's breeding season. To take advantage of food resources, the stork may exploit tidal waters along the coasts.

▼ **STANDING ROOM ONLY**
A large colony of American wood storks basks in a crowded treetop.

DID YOU KNOW?

- **An adult wood stork requires about 18 oz. of fish per day, and a nestling requires about 36 lbs. of food from hatching to fledging. Thus, an average wood stork family requires about 440 lbs. of food per nesting season.**
- **In Florida, wood storks fly on average 40 miles — but sometimes as much as 85 — from their home colony to entirely new foraging grounds. Storks tend to feed closer to the colony site when their young are small.**

CONSERVATION

Though the American wood stork is not globally threatened, the population decreases in Florida have resulted in the stork being placed on the List of Endangered Species in the United States. Cutting of cypress stands and drainage of wetlands have affected North American populations.

BEHAVIOR

The wood stork is highly gregarious; it roosts and nests in colonies numbering in the thousands. Storks travel long distances from their colonies to forage, using warm air currents to soar to heights up to 5,000', before descending with steep dives to a feeding site. The birds almost always feed in small groups of 2–6 birds.

During defense displays, storks shake their heads from side to side and grab at their opponent's bill. Normally silent, vocalizations usually occur at the nest; adults hiss when relieving each other from incubation duties. Chicks are noisy, producing a high-pitched bray when begging and a repeated *hiccough* when distressed. To cool off, both adults and chicks urinate on their legs; when it evaporates, it cools the blood in the legs and, ultimately, the stork's body.

▲ **STRETCHING OUT**
A tired wood stork rests its weary wings.

▼ **BRANCHING OUT**
A stork carries material back to build its nest.

FOOD & FEEDING

The wood stork thrives on fish, but also eats small alligators and snakes, using its sensitive bill to locate prey. While standing in shallow, muddy water, the wood stork submerges its bill, opened about 2.5–3". When the bill comes into contact with prey, it snaps shut in only 0.025 second, seizing its unsuspecting victim. The stork prefers fish that are over 1.5"; in the Florida Everglades, sunfish, flagfish and marsh killifish make up 72% of its diet. In drying ponds, there may be up to 8,000 fish per sq. yard, offering quick and easy meals for the stork and its young.

A TOUCHING ENCOUNTER

1 Wade and follow…
A group of wood storks walks slowly through shallow water, which is filled with aquatic vegetation and fish.

2 Close the gap…
A large catfish, one of the wood stork's favorites, attempts to hide in the tangled plants as the stork submerges its bill in the water.

3 Quick snap…
The wood stork doesn't need to see the fish: as soon as its bill touches the catfish, it snaps shut and traps the victim inside.

4 Short swallow
The catfish cannot escape; the wood stork raises its head above the water and swallows the fish whole in one gulp.

BREEDING

The stork begins breeding during the dry season when fish are plentiful. Males arrive first and move from tree to tree before settling on a nesting site. Females approach displaying males and choose a mate. The paired storks build a platform nest of sticks and vines. Nests are built up to 95' high in cypress trees, measuring 17–35" in diameter and 4–6" deep. Stork colonies may include thousands of birds, with up to 50 nests in a tree. The female lays 2–5 eggs at 1–2 day intervals. Both sexes take turns incubating the eggs for about 29 days; when they hatch, the gray, down-covered nestlings weigh only 2.2 oz. each. The parents feed the young regurgitated food 4–15 times per day and, by the third week of life, the nestlings are almost half as large as the adults. The young fledge within 65 days and leave the nest soon after. They reach sexual maturity at 4 years of age, though nesting is usually not successful until 5 years.

PROUD PARENTS
A nestling rests under its parents' watchful eyes.

PROFILE WOOD STORK

The American wood stork has a stately stance and soars gracefully in flight when searching for nesting and feeding sites.

EAR

Despite a lack of outer ears, the stork has an acute sense of hearing. Unlike humans, storks have only a single earbone, the columella (A), which is attached to the eardrum. The cochlea (B) transforms soundwaves into nerve impulses, which are carried to the brain by the cochlea nerve. The stork maintains its equilibrium with the help of the three semicircular canals (C).

WINGS

Long, broad wings enable the stork to elegantly soar in flight, using warm air currents (thermals) to keep aloft.

FEET

The stork's toes are webbed only at the base, ideal for slowly wading or rapidly darting after prey.

HEAD & NECK

The long neck gives the stork a better chance at snatching prey that tries to escape. The head and neck are covered with scaly, blackish gray and pink skin, which doesn't pick up debris when the bird feeds.

BILL

The dark, stout bill curves downward. Sensitive areas near the tip enable the bird to find food by touch rather than sight.

CHICK

A chick is easily identified by the feathers on its head; it loses them when the bird matures. The downy plumage is similar to the adult's in color but duller.

VITAL STATISTICS

WEIGHT	Male 10 lbs.; female up to 6 lbs.
LENGTH	32.5–45"
WINGSPAN	59–65"
SEXUAL MATURITY	4 years
BREEDING SEASON	November –April
NUMBER OF EGGS	2–5
INCUBATION PERIOD	28–32 days
FLEDGING PERIOD	55–65 days
BREEDING INTERVAL	1 year
TYPICAL DIET	Mainly fish; also small snakes and small alligators
LIFESPAN	Over 27 years

RELATED SPECIES

● **The American wood stork is 1 of 4 species in the genus *Mycteria,* which includes the milky stork, *M. cinerea,* and painted stork, *M. leucocephala.* There are 19 species of stork in the family *Ciconiidae,* including the large marabou stork, *Leptoptilos crumeniferus,* which can grow up to 5' tall. Storks join herons, ibises and spoonbills in the order *Ciconiiformes.***

CREATURE COMPARISONS

Yellow-billed stork

Wood stork

The yellow-billed stork (*Mycteria ibis*) is found in Africa, south of the Sahara, far from the New World range of the wood stork. In both species the males are larger. Though both birds have white plumage, the yellow-billed stork's yellow bill, red face and pink blush on the wing coverts easily distinguish it from the wood stork, though both species search for aquatic prey by touch. While the dry season signals the start of the wood stork's breeding season, the yellow-billed stork waits for the rains. At 41" long, the yellow-billed stork is similar in size to the American wood stork.

WRYNECK

• ORDER •
Piciformes

• FAMILY •
Picidae

• GENUS & SPECIES •
Jynx torquilla

KEY FEATURES

- Hunts by digging into anthills with its bill, and by licking ants off trees and the ground with its long, threadlike tongue
- Has a highly flexible neck; can turn its head almost 180°
- Plumage is patterned with delicate brown and gray markings, which provide superb camouflage against the trees and branches in its woodland home

WHERE IN THE WORLD?

Breeds across Europe and north-central Asia, from Iberia east to Japan, with small populations in North Africa, the Himalayas and China; migrates to sub-Saharan Africa and southern Asia for winter

LIFECYCLE

The wryneck is perfectly adapted to woodland life. Feeding mostly on ants, it breaks open their mounds to induce them to emerge, and then snaps them up by the hundreds.

HABITAT

▲ **LOW-LEVEL HUNTER**
The wryneck favors branches near the ground.

The wryneck is common in lightly wooded habitats with warm, sandy soils that house healthy numbers of ants. Ants — and the wryneck — flourish in woodland clearings, scrub, orchards, parks and riverside trees, along the edges of woods and on heathland. Strongly favoring a continental climate, the wryneck prefers lowland, deciduous woodland and shuns dense forest, although it occurs in coniferous forests in northern parts of its range.

As the air temperature drops, ants die or retreat underground, depriving the wryneck of its primary food. By the end of August, the wryneck deserts its summer home and flies to its wintering grounds. Birds from Europe and western Russia spend the winter on the grasslands of tropical Africa, while those from central and northern Asia migrate to the Indian subcontinent and Southeast Asia. The wryneck returns north between March and May.

FOOD & FEEDING

The wryneck feeds on ants at every stage of their lifecycle, from eggs, grubs and pupae to flightless worker ants and fully winged adults. The bird favors ant species that build yard-high anthills housing thousands of ants each, so it can eat its fill once it has breached the anthill. At other times, the wryneck waits beside trails of moving ants, licking them up as they march by.

The wryneck boosts its diet with beetles, grasshoppers, spiders, woodlice, flies and moths taken from leaf litter and branches. It seldom ventures into the treetops when foraging, preferring to stay nearer the ground where the mainstay of its diet is found.

▶ **PICKY**
A wryneck gathers beakfuls of insects and takes them back to feed to its young.

FORAGING ANTICS

1 Jerky gait...
A wryneck hops around the woodland floor in search of a new anthill. It moves clumsily on flat ground, with its tail raised.

2 Break-in...
With a few hammer blows from its bill, the wryneck breaks into the nest. Ants swarm out, like lambs to the slaughter.

3 Hidden secrets...
The wryneck flies to an oak tree, gripping the rough bark with its strong feet. It looks in holes in the bark for grubs and food items.

4 Juicy reward
The wryneck detects the tiny sound of a beetle moving behind the bark, and swiftly inserts its long tongue to catch the insect.

DID YOU KNOW?

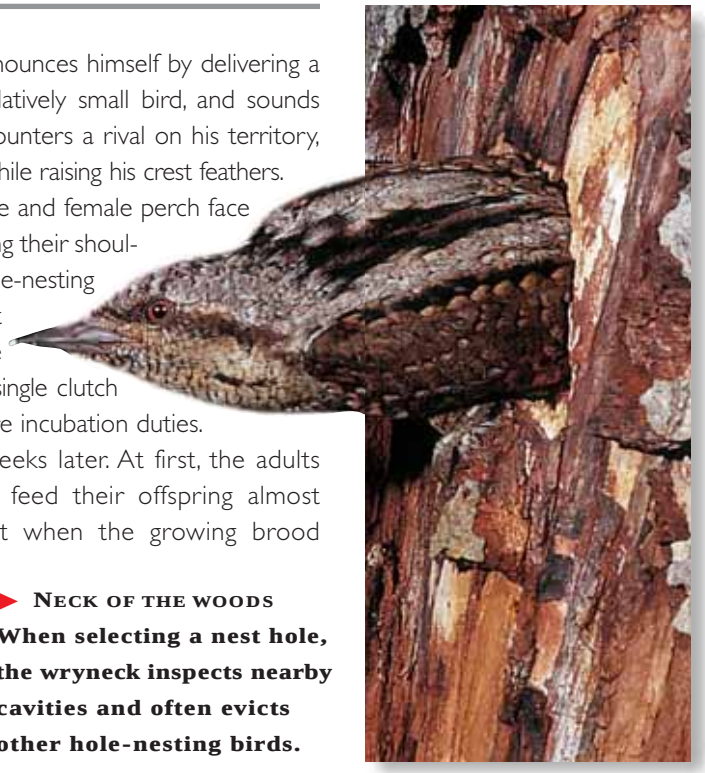
- **The wryneck often collects indigestible fragments, such as shells, stones and bones, and feeds them to its young to provide them with extra minerals.**
- **During migration, the wryneck often turns up in suburban gardens, desperate for a quick meal.**
- **The wryneck can hold 150 ants in its throat at any one time; 0.5 cu. inch of its feces may contain the remains of up to 800 ants.**

BREEDING

In late spring, the male wryneck announces himself by delivering a shrill song. It is very loud for a relatively small bird, and sounds rather like a falcon. If the male encounters a rival on his territory, he stretches out and points his bill, while raising his crest feathers.

During the courtship display, male and female perch face to face, shaking their heads and rolling their shoulders. Aggressive toward other hole-nesting birds, the pair often usurps the nest of another species and evicts the original residents. The female lays a single clutch of 7–10 eggs, and both parents share incubation duties.

The chicks hatch about two weeks later. At first, the adults clamber inside the nest hole to feed their offspring almost solely on insects and larvae, but when the growing brood begins to fill the entire nest space, they are forced to perch at the entrance. Within three weeks, the young wrynecks have left the safety of the nest.



NECK OF THE WOODS
When selecting a nest hole, the wryneck inspects nearby cavities and often evicts other hole-nesting birds.

BEHAVIOR

The wryneck is normally solitary, although groups of up to 20 may gather at rich hunting grounds.

Confident of its camouflaging plumage, the wryneck does not flee at the first sign of danger. When it detects a predator, such as a stoat, weasel or bird of prey, it flattens itself against a branch and melts from sight. If out in the open, it also crouches and has even been known to feign death, hanging limp with its eyes closed, to fool a predator.

COLOR CODE
The wryneck's coat provides exceptional camouflage in the forest.

CONSERVATION

Across most of their range, wryneck populations are stable. However, the species has suffered a significant decline in northwestern Europe, particularly in Britain. The wryneck could be seen throughout Britain until the middle of the 19th century, but by the 1950s, it was almost extinct in England and Wales. Its decline may be the result of climate change, but a rise in pesticide use over the last few decades has not helped. Today, only a handful of pairs breeds in the Scottish Highlands.

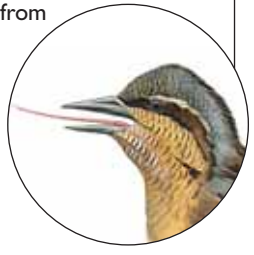
PROFILE WRYNECK

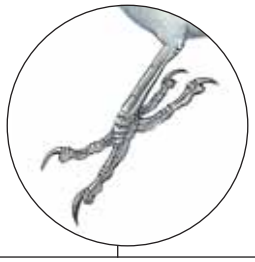
The wryneck's patterned plumage conceals the bird so well in woodland areas that the only clue to its presence is the rapid twisting of its head.

HEAD
The wryneck can twist its head to look directly behind. This habit, which gives the bird its name, enables it to check all around for danger and plays an important part in certain breeding displays.

CRYPTIC PLUMAGE
A complex pattern of spots, stripes and smudges breaks up the wryneck's outline. If threatened, it hunkers down, and its plumage mimics the texture of tree bark and the effect of dappled light so perfectly that it effectively vanishes from sight.

BILL & TONGUE
The bird's sharp, chisel-tipped bill enables it to smash into anthills. Specially adapted salivary glands keep its tongue sticky, so it can pick up ants with a flicking action. The tongue is also long enough to extract prey from under stones and within cracks in the bark.





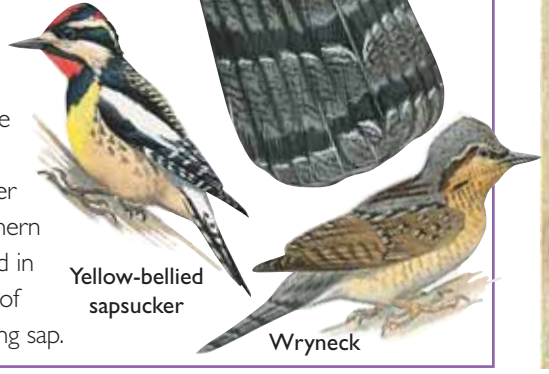
FEET
The wryneck has extremely strong, *zygodactylous* feet (two toes point forward, two backward) that have a vicelike grip on bark. This shape of foot is unique to members of the order *Piciformes*.

TAIL
The long tail feathers are relatively flexible, and so the wryneck seldom perches on vertical tree limbs. Instead, it tends to hop along horizontal or oblique branches, perching crosswise for stability.

CREATURE COMPARISONS

The yellow-bellied sapsucker (*Sphyrapicus varius*) has a bright plumage of crimson, canary yellow, black and white. Stockier than the wryneck, the sapsucker has a heavier bill, thickset neck and stiffened tail feathers to use as a prop when climbing up tree trunks.

Both birds are long-haul migrants. The sapsucker lives in deciduous forest and breeds in central and northern North America, wintering in the southern U.S. states and in Central America. It feeds by drilling evenly spaced rows of holes in trees and then returning later to drink the oozing sap.



VITAL STATISTICS

WEIGHT	1–1.5 oz.
LENGTH	6.4–6.8"
WINGSPAN	10–11"
SEXUAL MATURITY	1 year
BREEDING SEASON	Late April –August
NUMBER OF EGGS	7–10 per clutch
INCUBATION PERIOD	11–14 days
FLEDGING PERIOD	8–22 days
BREEDING INTERVAL	2 broods a year
TYPICAL DIET	Ants, beetles, grasshoppers and other insects; spiders
LIFESPAN	Oldest tagged bird: 10 years

RELATED SPECIES

- There are about 200 species in the woodpecker family, *Picidae*, which is divided into 3 subfamilies: *Jynginae* contains a single genus, *Jynx*; the wryneck and red-breasted wryneck are its only members. *Picinae* has about 170 true woodpeckers, and *Picumninae* has 29 species of piculet. Close relatives of woodpeckers include the toucans, honeyguides, jacamars, puffbirds and barbets.

Yellow-billed Cuckoo

• ORDER •
Cuculiformes

• FAMILY •
Cuculidae

• GENUS & SPECIES •
Coccyzus americanus

KEY FEATURES

- Wide-set eyes enable it to see to the rear without turning its head
- Able to climb among branches in search of insects when just 9 days old
- Can fly at speeds up to 22 mph
- Rears its own young, unlike the European cuckoo

WHERE IN THE WORLD?

Nests in North America from Canada, throughout most of U.S.; winters in Central and South America; occasionally found in Europe

LIFECYCLE

The secretive yellow-billed cuckoo blends well with its surroundings, but its repetitive song reveals its presence throughout the countryside.

HABITAT

▲ **PARENTAL PERCH**
An adult yellow-billed cuckoo surveys the area.

The yellow-billed cuckoo lives in dense tangles of undergrowth. Once a woodland bird, it has adapted to a variety of locations, but is seldom seen in dense forests. It prefers country roadsides and willow thickets by streams and ponds, as well as orchards and brushy farmlands. The bird migrates at night and winters in the tropics of Central and South America, as far south as Uruguay. It spends the rest of the year in North America, as far north as southern British Columbia in Canada. During its nighttime migrations, some cuckoos fly into TV towers.

▲ **ADOLESCENT ANGST**
A juvenile yellow-billed cuckoo will still not have the characteristic yellow bill at the end of its fall molt.

FOOD & HUNTING

Insects — especially hairy caterpillars and beetles — are the mainstay of the yellow-billed cuckoo's diet. The bird locates its prey by sight, scanning its surroundings from a hiding place. Camouflaged in the foliage, the cuckoo climbs with slow, stealthy movements. It grasps its prey with its curved bill, shaped for gleaning insects such as grasshoppers, tree crickets or army ants from the underside of rounded branches. The cuckoo also slips among trees and thickets in search of small frogs and lizards as well. It flies swiftly and purposefully across clearings, always heading straight from one plant to another, often foraging on fruits, including raspberries and grapes.

CUCKOO AT WORK

1 Scanning...
A yellow-billed cuckoo perches in an old apple tree, searching for prey among the branches from its hidden retreat.

2 Seizing...
The cuckoo spots one of its slow-moving favorites, a hairy caterpillar, and flies down to grab the unlucky insect.

3 Detaching...
The bird rubs the caterpillar across a branch to remove some of its irritating hairs before swallowing it whole.

4 Discovering
A large black beetle is not safe from the persistent yellow-billed cuckoo, even in a crevice in the bark of the tree.

BEHAVIOR

Cuckoos were originally named for the males' repetitive songs. The yellow-billed cuckoo is no exception; however, its song has a more guttural sound, *ka-ka-ka-kow-kow-kow-kowp-kowp*. This call is repeated throughout the day or night and from May to October. During the breeding season, the song seems to permeate the woods and roadside underbrush of North America. The yellow-billed cuckoo's eyes are set so that it can see toward the rear without turning its head. This enables the secretive bird to focus on an intruder or predator approaching from behind, while still seemingly unaware and looking ahead.

▲ **BROWN SURROUND**
The yellow-billed cuckoo's large, brown eyes can focus both in front and behind.

CONSERVATION

The yellow-billed cuckoo is rare in the western U.S., and its numbers are seriously declining with the loss of its streamside habitat. The U.S. Geological Survey and Arizona Game and Fish Department are studying this cuckoo to find a solution to its problem of vanishing habitat. The use of pesticides also kills birds and thins out the numbers of available insects for food.

BREEDING

The yellow-billed cuckoo incubates and raises its own young, unlike its cousin, the European cuckoo, which deposits its eggs in the nests of other birds to be incubated and raised. The yellow-billed cuckoo builds its nest on the horizontal limb of a small evergreen tree or a thorny bush, from 2–12' off the ground. The nest is flimsy and almost flat, made of short twigs and lined with dry leaves, grasses, moss, rags or catkins of oaks or willows. The female usually lays 3 or 4 pale, blue-green eggs at intervals of 2–3 days. Both parents share incubating duties, and the first egg hatches in 14 days. The chicks are black and covered with long, pointed feather sheaths. The parents feed the chicks insects until the young are able to climb around the nesting bush or tree at about 7–9 days old. They fledge shortly thereafter.

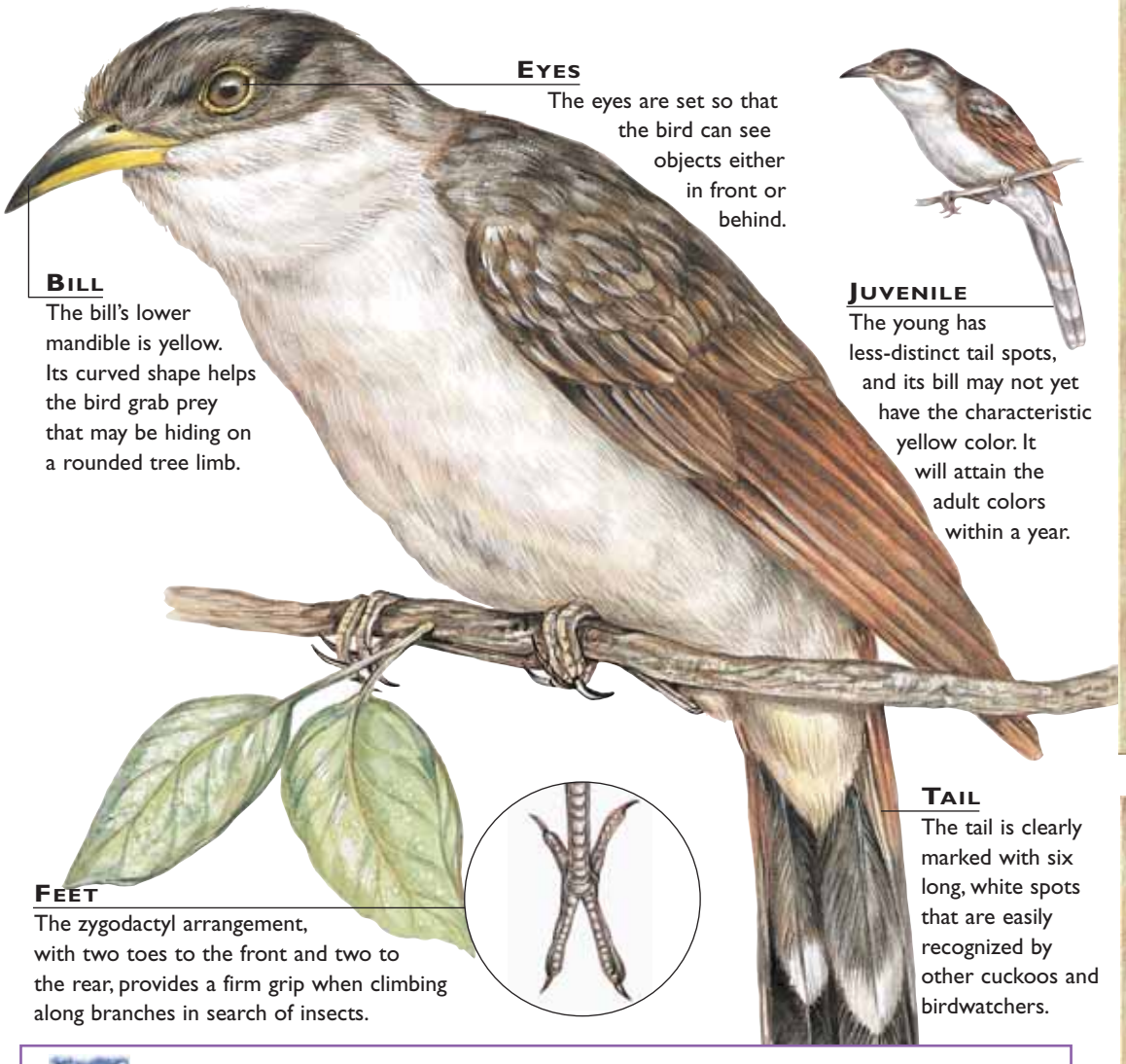
▶ **SING FOR SUPPER**
Newborn chicks open their mouths wide and beg for more insects.

DID YOU KNOW?

- **The yellow-billed cuckoo's calls are often heard before rain storms. The bird has been given the nickname "rain crow," and is thought to predict rain.**
- **As many as 325 hairy caterpillars, one day's meals, have been found in a yellow-billed cuckoo's stomach. One cuckoo consumed 41 caterpillars in 15 minutes.**

PROFILE YELLOW-BILLED CUCKOO

The yellow-billed cuckoo is able to climb trees just days after birth to forage among the branches for food — especially hairy caterpillars.



EYES
The eyes are set so that the bird can see objects either in front or behind.

BILL
The bill's lower mandible is yellow. Its curved shape helps the bird grab prey that may be hiding on a rounded tree limb.

JUVENILE
The young has less-distinct tail spots, and its bill may not yet have the characteristic yellow color. It will attain the adult colors within a year.

TAIL
The tail is clearly marked with six long, white spots that are easily recognized by other cuckoos and birdwatchers.

FEET
The zygodactyl arrangement, with two toes to the front and two to the rear, provides a firm grip when climbing along branches in search of insects.

VITAL STATISTICS

WEIGHT	1.5–2 oz.
LENGTH	11–13"
WINGSPAN	15.5–17"
SEXUAL MATURITY	About 1 year
BREEDING SEASON	March–August
NUMBER OF EGGS	1–5, but usually 3–4
INCUBATION PERIOD	14 days
FLEDGING PERIOD	2 weeks
BREEDING INTERVAL	1 year
TYPICAL DIET	Mainly insects; also berries, frogs and small lizards
LIFESPAN	Unknown

CREATURE COMPARISONS

The Didric cuckoo (*Chrysococcyx caprius*) measures up to 7.5" in length and is smaller than the yellow-billed cuckoo. The male Didric is a brilliant, iridescent green, with coppery reflections, and is not as shy as the secretive and less colorful yellow-billed cuckoo. Found far from the North and South American homes of the yellow-billed cuckoo, the Didric cuckoo frequents areas of Africa, such as northern and eastern Kenya, wherever the bird can find permanent water supplies.

Yellow-billed cuckoo

Didric cuckoo

RELATED SPECIES

- The yellow-billed cuckoo's genus, *Coccyzus*, includes the black-billed cuckoo, *C. erythropthalmus*. The roadrunner, *Geococcyx californianus*, and the giant coua, *Coua gigas*, join both Old and New World cuckoos in the family *Cuculidae*, which contains 138 species of cuckoos and their relatives. These birds join touracos (also called plaintain eaters) in the order *Cuculiformes*.

GLOSSARY

Aerie—the nest of a bird on a cliff or mountainside.

Adaptation—features of an animal that help it adjust to its environment and aid in its survival.

Adult—a fully-developed and mature individual, capable of breeding and producing a family.

Air sac—thin walled structure connected to the lungs of birds that aid in respiration.

Alpine——living in a mountainous area.

Arboreal—associated with or living in trees.

Avian——of or pertaining to birds.

Beak——see Bill.

Bill—synonymous with beak. The two mandibles that allow birds to gather food.

Brood—a group of young raised simultaneously by a pair of birds.

Call—short bursts of sounds made by birds to alert others to danger.

Camouflage—the ability of concealment by blending into the surrounding area.

Canopy—a continuous layer of forest produced by the connectedness of tree branches.

Class—a taxonomic level. All birds belong to the class Aves.

Clutch—eggs laid in one breeding attempt.

Colony—a group of animals gathered together for breeding.

Comb—a fleshy protuberance on the top of a bird's head.

Cooperative breeding—a system in which parents of young are assisted in the care of their young by other adults in the group.

Covey—a collective name for groups of birds, usually gamebirds.

Crest—long feathers on the top of the heads of birds.

Crop—a food pouch in the chest of many birds that serves as a place of storage and preliminary digestion.

Display—any conspicuous pattern of behavior that conveys information to others such as courtship behavior or threat actions.

Double brooded—birds which breed twice or more each year.

Family—a group of closely related species or a pair of birds and their offspring.

Fledge—the moment of flying at the end of the nesting period when young birds are fully feathered.

Fledgling—a recently fledged young bird.

Flight feathers—the large feathers of the wing.

Forage——to search for food.

Genus——the taxonomic grouping of species.

Guano——bird excrement.

Habitat—the type of environment in which an animal lives.

Hatchling—a young bird recently emerged from the egg.

Home range—an area in which an animal generally lives.

Incubation—the act of keeping an egg warm so that it can develop.

Incubation period—the time it takes for an egg to develop from the start of incubation to hatching.

Juvenile—a fledged bird not yet in adult feathers.

Keratin—the substance from which feathers are formed.

Migration—the behavior in which birds fly from one part of the world to another at different times of the year.

Molt——the replacement of old feathers with new ones.

Monogamous—taking only one mate at a time.

Natural selection—the process by which individuals with the most appropriate adaptations manage to survive and produce offspring, thereby increasing their population.

Nestling—a young bird in the nest.

Pair bond—the faithfulness of a mated pair to one another.

Pelagic—living on or near the open sea.

Pigment—a substance that imparts color to eggs and feathers.

Plumage—the feathers of a bird.

Predator—birds that hunt and eat other vertebrates.

Primary feather—one of the large feathers of the outer wing.

Range—a geographical area over which an organism is distributed.

Roosting—sleeping or resting.

Scrub—vegetation area dominated by shrubs and grasses.

Sibling group—a group containing brothers and sisters.

Species—a population which interbreeds freely but not with those of other species.

Spur—the sharp projection on the leg of some game birds, often used in fighting.

Territory—area that an animal or animals consider their own and defend against others.

Wattle—a fleshy protuberance, usually near the base of the bill.

Wing—front limb of a bird that enables it to fly.

Wintering ground—the area where a migrant group spends its non-breeding season.

BIBLIOGRAPHY

Castro, Isabel and Antonia Phillips. *A Guide to the Birds of the Galápagos Islands*. Princeton, N.J.: Princeton University Press, 1996.

Farner, Donald S. and James R. King, eds. *Avian Biology*. New York: Academic Press, 1971.

Forshaw, Joseph, ed. *Encyclopedia of Birds, Second Edition*. San Diego: Academic Press, 1998.

Gotch, A. F. *Birds—Their Names Explained*. New York: Blandford Press, 1981.

Greensmith, Alan. *Birds of the World*. London: DK Publishing, 2002.

Hayman, Peter. *Shorebirds: An Identification Guide to the Waders of the World*. Boston: Houghton Mifflin, 1986.

Johnsgard, Paul A. *Hawks, Eagles, and Falcons of North America: Biology and Natural History*. Washington, D.C.: Smithsonian Institution Press, 1990.

Kaufman, Kenn. *A Field Guide to Advanced Birding*. Boston: Houghton Mifflin, 1990.

National Geographic Society. *Field Guide to the Birds of North America*. Washington, D.C.: National Geographic Society, 2001.

O'Connor, Raymond J. *The Growth and Development of Birds*. New York: Wiley, 1984.

Perrins, Christopher M., ed. *Firefly Encyclopedia of Birds*. Toronto: Firefly Books, 2003.

Peterson, Roger Tory. *A Field Guide to the Birds of Britain And Europe*. Boston: Houghton Mifflin, 1993.

Peterson, Roger Tory. *A Field Guide to the Birds of Eastern and Central North America*. Boston: Houghton Mifflin, 2002.

Pizzey, Graham. *A Field Guide to Birds of Australia*. Princeton, N.J.: Princeton University Press, 1980.

Stuart, Chris and Tilde. *Birds of Africa: From Seabirds to Seed-eaters*. Boston: MIT Press, 1999.

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Pitman; Vireo/Arthur Morris; **BLACK WOODPECKER:** Eric Soder/Planet Earth; **BLACKBIRD:** Ardea/Laub P; BBC/Wilkes M; BBC/Reese P; FLPA/Karmali J; Natural Science/Barnes A; NHPA/Soder E; **BLUE-AND-YELLOW MACAW:** Ardea/Florence A; B Coleman/Claudio Marigo L; BBC/Clare J; FLPA/Brandl H D; OSF/Franklin P; OSF/Tilford T; OSF/Schneidermeyer F; Plan Earth/Kenney B; **BLUE-FOOTED BOOBY:** Ardea/Parer-Cook D & E.; BBC Nat Hist Unit/Oxford P; FLPA/Mullen C.; FLPA/Newman M.; OSF/Jones M.; OSF/Ulric T.; Plan Earth/Scoones P.; Plan Earth/Oxford P.; **BLUE TIT:** Ardea/Smith R; B Coleman/Taylor K; B Coleman/Taylor K; FLPA/Walker M; NHPA/Dalton S; OSF/Tipling D; Read M/Read M; **BOAT-BILLED HERON:** Barrett & MacKay; **BOHEMIAN WAXWING:** B Coleman/Jurka J; FLPA/Hautala H; Harlequin Pictures/ Chittenden R; NHPA/Williams A; NHPA/Williams A; OSF/Tilford T; **BROAD-BILLED HUMMINGBIRD:** William Bernard/Color-Pic, Inc.; Wagner Photo; **BROWN CREEPER:** Ardea/Bailey J.; B Coleman/Taylor K.; B Coleman/Burton J.; FLPA/Cark H.; OSF/Saunders D; OSF/Laub P.; **BROWN PELICAN:** B Coleman/McCarthy G.; B Coleman/Read M.; NHPA/Hawkes B.; OSF/Osolinski; OSF/De Roy T.; OSF/De Roy T.; **BROWN SKUA:** Ardea/Mickleburgh; Ardea/Bunge R; Ardea/Mickleburgh; B Coleman/Brehin H; OSF/Osolinski; **BUDGERIGAR:** Ardea/Beste H & J; Lochman/Sarson D; Lochman/Sarson D; NHPA/Shaw J; OSF/Wells B & B; OSF/Green J; **BURROWING OWL:** Photo Researchers; **CANADA GOOSE:** B Coleman/Walz U.; B Coleman/Nielsen Dr S.; OSF/Lynn R.; **CARRION CROW:** Eric Soder; **CATTLE EGRET:** Minden/Frans Lanting; Minden/Mitsuaki Iwago; Natural Selection/Brian Kenney; **CHAFFINCH:** B Coleman/Jurka J; B Coleman/McKavett M; B Coleman/Green D; FLPA/Wilmhurst R; FLPA/Wilmhurst R; Natural Science/Barnes A; Plan Earth/Bracegirdle J; **CHIFFCHAFF:** B Coleman/Evans Dr P; B Coleman/McCarthy G; B Coleman/Compost A; NHPA/Le Moigne J L; OSF/Tilford T; OSF/Hamblin M; OSF/Heathcote T; **COCKATIEL:** Vireo/Rob Curtis; **COMMON EIDER:** Ardea/Daniels J; Ardea/Swedberg J; FLPA/Withers M; NHPA/Kraseman S; OSF/O'Toole P; Plan Earth/Paton W; Plan Earth/Matthews R; **COMMON GRACKLE:** Vireo/John Heidecker; Vireo/ Michael Patrikeev; **COMMON GUILLEMOT:** Animals Animals; Photo Researchers; Planet Earth; **COMMON KESTREL:** Ardea/Beames I; B Coleman/Potts A; BBC/Vezo T; BIOS/ Cavignaux; NHPA/Ingen H & V; Plan Earth/Paton W; **COMMON LOON:** B Coleman/ Lankinen W; B Coleman/Lankinen W; B Coleman/Lankinen W; B Coleman/Lankinen W; NHPA/Krasemann S; NHPA/Williams A; OSF/Cox D; **COMMON NIGHT-HAWK:** Ardea/Burgess E.; B Coleman/Shaw J.; B Coleman/ Carr R.; FLPA/West L.; OSF/Slocum D; OSF/Ulrich T.; **COMMON PEAFOWL:** B Coleman/Purcell A J.; NHPA/Pott Dr E.; OSF/Richards M.W.; OSF/Wothe K.; OSF/Schneidermeyer F.; OSF/Schneidermeyer F.; OSF/ Austuman M.; **COMMON PHEASANT:** Natural Selection/John Cancalosi; **COMMON QUAIL:** Ardea/Watson M; B Coleman/Reinhard H; B Coleman/ Reinhard H; BBC/Wilkes M; Natural Science/Stuart C & T; Robert Harding/ Collins K; **COMMON SNIPE:** Aquila/Wilkes M; Aquila/Cave M.; FLPA/Hosking D; NHPA/Le Moigne J L; OSF/Shattil and Rozinski; OSF/Perrins C; **COMMON TAILORBIRD:** B Coleman/Ziesler G; NHPA/Strange M; Natural Science/Jayaram K; OSF/Sinha V; **COMMON YELLOWTHROAT:** Vireo/Rick & Nora Bowers; Vireo/Arthur Morris; **COOPER'S HAWK:** Minden/Tim Fitzharris; Natural Selection/Anthony Mercieca; Natural Selection/Daniel J Cox; Vireo/Johann Schumacher; Vireo/Brian K. Wheeler; **CORNCRAKE:** Aquila/Tollerton D; Aquila/Mills R;

FLPA/Callan M; NHPA/Dennis N; NSP/Johnstone L; OSF/Furlong F; Windrush/Tipling D; **CRAB PLOVER:** Planet Earth; **DIPPER:** Ardea/Avon D; B Coleman/Green D; B Coleman/Manzanares A; FLPA/Silvestris; OSF/Packwood R; OSF/Leach M; **DOUBLE-WATTLED CASSOWARY:** Ardea/Ferrero JP.; Ardea/Best H & J.; B Coleman/Frith CB & DW; FLPA/Robinson L.; OSF/Bromhall C.; **DOVEKIE:** B Coleman/Van Meurs R; B Coleman/Van Meurs R; BBC/Shale D; NHPA/Tidman R; OSF/Day K; Plan Earth/Oxford P; **DWARF CASSOWARY:** NHPA; Oxford Scientific Films; Peter Arnold; Photo Researchers; **EAGLE OWL:** Ardea/Laub; Ardea/Gordon N; B Coleman/Paton W S; FLPA/Tidman R; NHPA/Leach M; NHPA/Danegger M; Natural Selection/Joe McDonald; Natural Selection/Joe McDonald; **EASTERN SCREECH OWL:** Leonard Rue Enterprises; Natural Selection; Photo Researchers; **ECLECTUS PARROT:** Ardea/Avon D; B Coleman/McCoy M; B Coleman/Frith C B; B Coleman/Coates B J; FLPA/Carvalho C; OSF/Tilford T; Plan Earth/Clay M; **EGYPTIAN PLOVER:** Ardea/Fink K; B Coleman/Blake N; Bios/Laboureur M; Bios/Bonneau S; Plan Earth/Du Feu G; **EGYPTIAN VULTURE:** BBC/Rico & Ruiz; BBC/Rico & Ruiz; FLPA/Marcoaldi G; NHPA/Ingen H; OSF/Osolinski S; **ELF OWL:** Animals Animals; Photo Researchers; **EMPEROR PENGUIN:** B Coleman/Reinhard H; B Coleman/Reinhard H; **EMU:** B Coleman/Frith C & D; NHPA/Harvey M; NHPA/A.N.T; NHPA/Griffiths K; NHPA/Watts D; Plan Earth/Kristo F; **EURASIAN AVOCET:** B Coleman/Davies A.; FLPA/Hosking D.; FLPA/Wisniewski; FLPA/Hosking D.; FLPA/Perry P.; NHPA/Coster B.; NHPA/Blossom J; NHPA/Janes E A.; **EURASIAN BUZZARD:** B Coleman/ Paton W.; OSF/Hamblin M.; OSF/Leach M.; OSF/Hamblin M.; OSF/Hamblin M.; Plan Earth/Paton W.; Plan Earth/Bracegirdle J.; **EURASIAN CUCKOO:** B Coleman/McCarthy G.; FLPA/Watkins J.; FLPA/Hamblin A.R.; OSF/Tilford T.; OSF/Hamblin M.; OSF/Hamblin M.; **EURASIAN KINGFISHER:** Aquila/ Wilkes M.; Ardea/Daniels J.; Ardea/Avon D.; B Coleman/Markham J; OSF/ Heathcote T.; Plan Earth/Olivieri P; Plan Earth/Dennis W.; **EURASIAN NUTHATCH:** FLPA/Watkins J; FLPA/Watkins J; FLPA/Clark H; NHPA/Dalton S; OSF/Tilford T; Plan Earth/Charles H; **EURASIAN OYSTERCATCHER:** Ardea/Roberts S; FLPA/Hamblin A; Harlequin Pics/Chittenden; Natural Science/Bonsall D; NHPA/Williams A; OSF/Hamblin M; **EURASIAN ROBIN:** B Coleman/Taylor K; B Coleman/Evans Dr P; FLPA/Wilmshurst R; FLPA/Kalker M; FLPA/Wilmshurst R; Natural Science/Barnes A; **EURASIAN SPARROW-HAWK:** BBC/Rico & Ruiz; FLPA/Wilmshurst R; FLPA/Hawking J; NHPA/Karp D; NHPA/Dalton S; OSF/Saunders D; **EURASIAN SWIFT:** Ardea/Bergens U; B Coleman/Taylor K; FLPA/Merlet F; NHPA/Coster B; OSF/Bromhall D; OSF/Bromhall D; **EURASIAN WOODCOCK:** Ardea; B Coleman/Green D.; B Coleman/ Reinhard H.; NHPA/Karp D.; Plan Earth; OSF; **EUROPEAN STARLING:** Ardea/Beames I; Ardea/Avon D; B Coleman/Taylor K; B Coleman/ Taylor K; B Coleman/Labhardt F; BBC/O'Reilley C; Plan Earth/Du Feu G; **FERAL PIGEON:** Ardea/Morris P.; B Coleman/Burton J.; B Coleman/Paton W.S.; FLPA/ Reynolds P.; NHPA/Dalton S.; NHPA/Watts D.; **FLIGHTLESS CORMORANT:** Animals Animals; Photo Researchers; Planet Earth; **GALAPAGOS GROUND FINCHES:** Ardea/Greensmith A; Bios/Cavignaux R; FLPA/Gore M; NHPA /Harvey M; NHPA/Middleton D; Plan Earth/Oxford P; **GOLDCREST:** Ardea/ Knights C; FLPA/Brandl H D; NHPA/Dalton D. N.; OSF/Tilford T; **GOLDEN EAGLE:** Ardea/Sage B.; B Coleman/Reinhard H.; B Coleman/Potts A.; NHPA/Woodfall D.; Plan Earth/Read M.; **GOLDEN ORIOLE:** Photo Researchers; Planet Earth; **GOLDEN PHEASANT:** B Coleman/Burton J; BIOS/Prevot J-M; Harlequin/Chittenden R; Natural Science/Cole K.; Plan Earth/ de Feu G; **GOLIATH HERON:** The Wildlife Collection/HPH Photography; Vireo/Peter Craig-Cooper; Vireo/Ron Cartmell; **GOULDIAN FINCH:** Auscape; Photo Researchers; **GRAY-CROWNED CRANE:** Ardea/ Fink K; NHPA/Heuclin D; B Coleman/HPH Photography; B Coleman/Purcell A; B Coleman/ Williams R; B Coleman/Fredricksson C; **GRAY HERON:** B Coleman/Burton J.; B Coleman/Barrett T.; B Coleman/Hughes C.; B Coleman/Zwaenepoel; NHPA/Campbell L.; NHPA/Campbell L.; NHPA/Dennis N.; NHPA/Karp D.; **GRAY PARTRIDGE:** Vireo/Bob de Lange; **GRAYLAG GOOSE:** Ardea/ Greensmith A.; B Coleman/Walz U.; B Coleman/Gonzalez Grande J L.; BBC Nat Hist Unit/Downer J.; BBC Nat Hist Unit/Osborn W.; FLPA/Brown S C.; NHPA/Karp D.; **GREAT ARGUS PHEASANT:** The Wildlife Collection/ Martin Harvey; **GREAT BLACK-BACKED GULL:** Barrett & MacKay; **GREAT BUSTARD:** B Coleman/Williams R; BIOS/ Lundberg B; BIOS/Seitre; OSF/Sanchez C; OSF/Sierra J; Plan Earth/Cottle R; **GREAT CORMORANT:** Ardea/Dossenbach H; FLPA/Wisniewski W; FLPA/Wisniewski W; FLPA/Withers M; OSF/Deeble M & Stone V; OSF/Davidson B; **GREAT CRESTED GREBE:** B Coleman/Van Gaalen P.; B Coleman/Taylor K.; BBC Nat Hist Unit/Rico & Ruiz; FLPA/Hosking E & D.; FLPA/Callan M.; FLPA/Callan M.; NHPA/Williams A.; **GREAT CURASSOW:** Photo Researchers; Planet Earth; **GREAT GRAY OWL:** B Coleman/Kraseman S; B Coleman/Lankinen W; BBC/Foott J; OSF/Lech M; OSF/Leach M; OSF/Newman O; **GREAT GRAY SHRIKE:** Ardea/England M; Ardea/Bevan B; BBC/Wilkes M; FLPA/Hosking E & D; NHPA/Dalton D; OSF/Meyr R; **GREAT HORNED OWL:** Minden/Shin Yoshino; **GREAT INDIAN HORNBILL:** The Wildlife Collection/Martin Harvey; **GREAT SPOTTED WOODPECKER:** FLPA/Clark H; FLPA/Withers M; FLPA/Clark H; NHPA/Soda B; Plan Earth/Bracegirdle J; **GREAT WHITE PELICAN:** Ardea/Adrea; B Coleman/Plage D & M; B Coleman/Plage D & M; B Coleman/ Plage D & M; B Coleman/Meitz P; FLPA/Spalding; OSF/Hill M; **GREATER FLAMINGO:** Ardea/Iijima N; Ardea/Fink K.; B Coleman/Williams R; B Coleman/ Layer W; B Coleman/Cancalosi; FLPA/Lee Ruse L; **GREATER PRAIRIE CHICKEN:** Minden/Jim Brandenburg; Natural Selection/Judd Cooney; **GREATER RHEA:** Vireo/Dr. Robert Ridgely; B Coleman/Bartlett J & D.; FLPA/ Maslowski; FLPA/Langrish; OSF/Cooke J.A.L.; **GREATER ROADRUNNER:** FLPA/Langrish/Maslowski D; BBC Nat Hist Unit; OSF/Cooke J.A.L.; B Coleman/ Bartlett J & D; **GREEN JAY:** Vireo/Peter La Tourrette; **GUIANAN COCK-OF-THE-ROCK:** Ardea/Warren A.; Ardea/Dunning J.; FLPA/Eichorn/Zingel; Nature Photographers/Callow N; NHPA/Sauvanet J.; Vireo/Mueller H.; **GYRFALCON:** Ardea/Fink K; Ardea/Cavendish P; FLPA/Watkins J; NHPA/ Middleton D; NHPA/Lacz G; OSF/Lemker J; OSF/Day R; **HAMERKOP:** FLPA/Gore M; NHPA/Dennis N; OSF/Osolinski S; OSF/Root A; Plan Earth/ Scott J; Plan Earth/Paton W; **HARLEQUIN DUCK:** Ardea/Wrightman J.; Ardea/Fink K.; FLPA/Nostrand V.; FLPA/Hosking D.; NHPA/Kirchner R.; NHPA/Tidman R.; **HAWFINCH:** Ardea/Roberts S; B Coleman/Rydell J; FLPA/Tidman R; FLPA/Brandl H D; OSF/Tilford T; OSF/Korenromp J; **HELMETED GUINEAFOWL:** Minden; Visual Unlimited; **HERRING GULL:** B Coleman/Purcell A; B Coleman/Paton W; B Coleman/Evans P; B Coleman/ Paton W S; B Coleman/Tomalin N O; OSF/Woods E; Plan Earth/Salm R; **HILL MYNAH:** Ardea/Avon D; Ardea/Avon D; B Coleman/Williams R; FLPA/Hosking D; NHPA/Stange M; NHPA/Stange M; **HIMALAYAN SNOWCOCK:** Vireo/James D. Bland; **HOATZIN:** TSI; Ardea; B Coleman; OSF; **HOODED VULTURE:** Ardea/Ferrero-Labat; B Coleman/Marigo L.C.; FLPA/Hosking E & D.; FLPA/ Hamblin A R.; NHPA/Harvey M.; NHPA/Meech J.; OSF/Osolinski S.; **HOOPOE:** Ardea/Haagner C; BBC/Rico & Ruiz; BBC/Rico & Ruiz; BBC/Tabor A; BBC/Ruiz J; Plan Earth/Fioratti P; Plan Earth/Clay M; **HOUSE SPARROW:** B Coleman/ Varndell C; BBC/Wilks M; FLPA/Bird R; FLPA/Bird R; OSF/Fox D; Plan Earth/ Blackburn F; **HYACINTH MACAW:** Vireo/Tom J. Ulrich; **JAPANESE CRANE:** Ardea/Gordon N.; B Coleman/Bruemer F.; B Coleman/ Foott J.; B Coleman/ Orion Press; FLPA/Lane F.W.; NHPA/Orion Press; OSF/Gause W.; **KAKAPO:** B Coleman/Cubitt G; B Coleman/Cubitt G; B Coleman/Van Meurs R; FLPA/Moon G; FLPA/Moon G; FLPA/Moon G; NHPA/Ryan P; OSF/Cook P; **KEA:** Minden/Tui de Roy; Minden/Tui de Roy; Minden/Tui de Roy; Natural Selection/John Cancalosi; **KING PENGUIN:** Image Bank; Photo Researchers; **KING VULTURE:** Ardea/Fink K; B Coleman/Williams Rod; B Coleman/ Williams Rod; FLPA/Perry P; Plan Earth/Farneti C; Plan Earth/Farneti C; **KIWI:** Ardea/Morrin P & J; Ardea/Morrin P & J; Ardea/Fink K; Ardea/Morrin P & J; B. Coleman/Furlong F; FLPA/Moon G; OSF/Fleetham D; **KORI BUSTARD:** The Wildlife Collection/Martin Harvey; The Wildlife Collection/Martin Harvey; **LAMMERGEIER:** BBC Nat Hist Unit/Lundberg B.; NHPA/Dennis N.; NHPA/ Dennis N; NHPA/Dennis N; Plan Earth/de la Harpe, R.; Plan Earth/de la Harpe R.; **LAPPET-FACED VULTURE:** Photo Researchers; Planet Earth; **LAUGHING KOOKABURRA:** FLPA/Van Nostrand R; Lochman/Lochman J; Lochman/ Lochman J; Lochman/Belson B; OSF/Turner S; **LOVEBIRDS:** Ardea/Ferrero Labbatt; Ardea/Avon D; Ardea/Labbatt; NHPA/Strange M; NHPA/Buckingham J; OSF/Schneidermeyer F; OSF/Fogden M; OSF/Schneidermeyer F; **LUZON BLEEDING-HEART:** Animals Animals; Image Bank; Photo Researchers; Planet Earth; **MACARONI PENGUIN:** Natural Selection/Daniel J Cox; Vireo/ Dr. Robert Ricklefs; Vireo/Greg Lasley; **MAGNIFICENT FRIGATE-BIRD:** Ardea/ Gohier F.; Coleman B./Pott Dr E.; FLPA/Polking F.; FLPA/Perry P.; FLPA/Polking F.; Plan Earth/Bracegirdle J.; **MALLARD:** Ardea/Beames I; B Coleman/Nielsen S; B Coleman/Nielsen S; FLPA/Hamblin A; FLPA/ Wilmshurst R; NHPA/Sorenson R; Plan Earth/Clay M; Plan Earth/Paton W; **MALLEEFOWL:** B Coleman/Cancalosi J; Lochman/Beste H & J; Lochman/ Beste H & J; Lochman/Beste H & J; OSF/Brown R; **MANDARIN DUCK:** B Coleman/Burton J.; BBC Nat Hist Unit/Vezo T; FLPA/Broadhurst W.; FLPA/ Wilmshurst R; OSF/West I.; **MANX SHEARWATER:** Ardea/Bomford L.; Ardea/Vaughan R.; B Coleman/Evans P.; FLPA/Grewcock D.; FLPA/Watkins J.; OSF/Hamblin M; OSF/Shepherd T.; Plan Earth/Tearle P.V.; **MARABOU STORK:** Minden/Tim Fitzharris; **MARTIAL EAGLE:** Ardea/Steyn; B Coleman/ Walz U; FLPA/Schrewmpp; NHPA/Bannister A; NSP/NSP; OSF/Colbeck; OSF/ Townshend; TCL/Scott; **MUTE SWAN:** B Coleman/Labhardt F; B Coleman/ McCarthy G; B Coleman/Van Gaalen P; BBC Nat Hist Unit/Wagner J & P; FLPA/Dore G; NHPA/Hermansen P; TSI/Corbett V; **NAMAQUA SAND-GROUSE:** Gerald Cubitt; **NEW HOLLAND HONEYEATER:** Natural

Selection/ Anthony Mercieca; Natural Selection/Rich Kircher; **NIGHTINGALE:** Aquila/Wilkes M.; Aquila/Baker L.; Aquila/Wilkes M.; NHPA/Williams A.; OSF/Tilford T; **NORTH AMERICAN BITTERN:** Animals Animals; Image Bank; Photo Researchers; **NORTHERN CARDINAL:** Vireo/Warren Greene; **NORTHERN FLICKER:** Photo Researchers; **NORTHERN GANNET:** FLPA/Callan M; FLPA/Jonasson S; OSF/Tipling D; OSF/Packwood R; OSF/Packwood R; Plan Earth/Kjaer D; Plan Earth/Matthews R; **NORTHERN GOSHAWK:** Minden/Gerry Ellis; Minden/Michael Quinton; Vireo/Brian K.Wheeler; **NORTHERN HARRIER:** Ardea/Roberts S; BBC/Vezo T; FLPA/Jones N; NHPA/Eriwin R; NHPA/Pettit P; OSF/Aitkenhead R; OSF/Bomford T; **NORTHERN MOCKINGBIRD:** Natural Selection/Steve Bentsen; Natural Selection/Brian Kenney; **NORTHERN PINTAIL:** Minden/Tim Fitzharris; The Wildlife Collection/Rick & Nora Bowers; **NORTHERN WHEATEAR:** Ardea/Bailey J; Ardea/Beames I; Ardea/Bailey J; BBC/Wilks M; FLPA/Hamblin A; FLPA/Chittendon R; NHPA/Pettit P; **OILBIRD:** Ardea/England M; Ardea/England M; Ardea/England M; Nature Photographers/Bisserot S.; OSF/Ronjifo J; Vireo/Parker T.; **OSPREY:** Ardea/Gohier F.; Ardea/Gohier F.; FLPA/Polking F.; NHPA/Shaw J.; NHPA/Ingen H &V.; NHPA/Janes E A.; OSF/Bartlett J & D.; Plan Earth/ Trinder G.; **OSTRICH:** Ardea/Arthur-Bertrand Y.; NHPA/Dennis N.; OSF/Green J.; TSI; **OVENBIRD:** Vireo/Doug Wechsler; Natural Selection/Joe McDonald; Natural Selection/Joe McDonald; **OXPECKER:** B Coleman/Taylor K; BBC Nat Hist Unit/Du Toit R; BIOS/Seitre; ICCE/Parrott J; OSF/Osolinski S; OSF/Cook P; **PAINTED BUNTING:** Vireo/Tom Vezo; Vireo/Sid & Shirley Rucker; Vireo/Sid & Shirley Rucker; Vireo/Sid & Shirley Rucker; **PALM COCKATOO:** Animals Animals; Photo Researchers; **PARADISE WHYDAH:** The Wildlife Collection/Martin Harvey; The Wildlife Collection/Martin Harvey; Vireo/ Lisa Freeman; **PEL'S FISHING OWL:** Planet Earth; **PEREGRINE FALCON:** Ardea/Cavendish P; Ardea/Birks N.N.; B Coleman/Reinhard H; B Coleman/Green D; NHPA/Rouse A; BBC Nat Hist Unit; Plan Earth; **PHEASANT COUCAL:** Art Wolfe, Inc.; NHPA; **PHEASANT-TAILED JACANA:** Ardea/Van Gruisen J.; Ardea/Van Gruisen J.; Ardea/Van Gruisen J.; Ardea/Van Gruisen J.; Ardea/Van Gruisen J.; B Coleman/Wothe K.; **RAGGIANA BIRD OF PARADISE:** Ardea/D & E Parer-Cook; B Coleman/Ziesler G.; B Coleman/Compost A.; NHPA/Beehler B.; NHPA/Beehler B.; NHPA/Beehler B.; OSF/McHugh T.; **RAINBOW BEE-EATER:** Auscape-Australia; **RAINBOW LORIKEET:** Natural Selection/Dave Watts; **RAVEN:** Ardea/Tunka Z; B Coleman/Walz U; NHPA/Kitchen T & Hurst V; NHPA/Karp D; OSF/Leach M; OSF/Hamblin M; Plan Earth/Oxford P; **RAZORBILL:** Minden/Tim Fitzharris; **RED CROSSBILL:** Ardea/Avon D; B Coleman/Lankinen W; FLPA/Hawkins J; FLPA/Maslowski S; OSF/Rinehardt H; OSF/Perrins C; Plan Earth/Hobson P; **RED JUNGLEFOWL:** B Coleman/Burton J; B Coleman/Burton J; B Coleman/Williams R; B Coleman/Williams R; B Coleman/Williams R; FLPA/Whittaker T; FLPA/Hosking D; **RED KITE:** Aquila/Maier R.; FLPA/Silvestris; NHPA/Janes E.A.; NHPA/Sauvanet J.; NHPA/Danegger M.; OSF/Birkhead M.; **RED-AND-YELLOW BARBET:** Animals Animals; Photo Researchers; **RED-BILLED QUELEA:** Natural Science/Oxford P.; NHPA/Harvey M.; NHPA/Harvey M.; NHPA/Dennis N.; OSF/Ward P &W.; OSF/Fogden M & P; Plan Earth/Ryan B.; **RED-BREASTED GOOSE:** Oxford Scientific; Planet Earth; **RED-BREASTED MERGANSER:** The Wildlife Collection/Martin Harvey; Vireo/Arthur Morris; **RED-HEADED WOODPECKER:** Natural Selection/Jeff Lepore; **RED-TAILED TROPICBIRD:** Minden/Frans Lanting; Minden/Mitsuaki Iwago; Natural Selection/Nancy Battaglia; **RED-WINGED BLACKBIRD:** Vireo/Arthur Morris; Vireo/John Heidecker; **REDDISH EGRET:** Vireo/E. Bartels; Vireo/Arthur Morris; Vireo/Arthur Morris; **REED WARBLER:** Planet Earth; **ROCKHOPPER PENGUIN:** Ardea/Stein P; BBC/Stone L; FLPA/Hosking D; OSF/Osolinski S; OSF/Hill M; OSF/Osborne B; Plan Earth/Price A; **ROSE-RINGED PARAKEET:** BBC/Hamilton James C; BBC/Bean N; FLPA/Tidman R; Natural Science/Pal A; NSP/Singh A; NSP/Brosset T; **RUBY-THROATED HUMMINGBIRD:** FLPA; OSF; **RUDDY DUCK:** Aquila/Wilks M; Aquila/Wilks C; BBC Nat Hist Unit/Bremhm T; BBC Nat Hist Unit/Vezo T; OSF/Schneidermeyer F; Windrush Photos/Tipling V; Windrush Photos/Coster B; **RUDDY TURNSTONE:** Vireo/Arthur Morris; Vireo/Doug Wechsler; **RUFF:** Ardea/Vaughan R; Ardea/Laub J. P; B Coleman/McCarthy G; FLPA/Wisniewski W; NHPA/Le Moigne J L; OSF/Hamblin M; Plan Earth/Du Feu G; **RUFOUS HUMMINGBIRD:** Vireo/Hugh P. Smith, Jr; Vireo/Arnette Heidcamp; **SACRED IBIS:** B Coleman/Barratt T; NHPA/Dennis N; NHPA/Blossom J; NHPA/Dennis N; OSF/Osolinski S; Plan Earth/Dennis W; Plan Earth/Dennis N; **SACRED KINGFISHER:** Natural Selection/Anthony Mercieca; Vireo/Roger Brown; **SADDLE-BILL STORK:** BBC/Du Toit R; OSF/Colbeck M; OSF/Nunnington R; Plan Earth/Scot J; Plan Earth/Krahmer F; Plan Earth/Shah A & M; **SATIN BOWERBIRD:** Ardea/Beste H & J.; Ardea/Ferrero J.P.; B Coleman/Firth C & D.; B Coleman/Prenzel F.; FLPA/Gardner T & P.; OSF/Lloyd N.; OSF/Day K.; **SCARLET IBIS:** The Wildlife Collection/Martin Harvey; The Wildlife Collection/Martin Harvey; **SCREAMERS:** Photo Researchers; Planet Earth; **SECRETARY BIRD:** Ardea/Haagner C.; Ardea/Haagner C.; B Coleman/Pott Dr E.; B Coleman/Pott Dr E.; Plan Earth/ Scott J.; Plan Earth/Avery S.; **SHOEBILL:** BBC/White A; BBC/Buxton C; NHPA/Schafer K; NHPA/Harvey M; Plan Earth/Tackett L; **SHORT-TOED SNAKE EAGLE:** Oxford Scientific Films; Photo Researchers; **SKYLARK:** Aquila/Carlson K; Aquila/Speake B; FLPA/Hawkins J; FLPA/Wilmshurst R; Windrush/Mason D; **SLAVONIAN GREBE:** Vireo/Arthur Morris; Vireo/Frank Schleicher; Vireo/Bob de Lange; **SMEW:** Ardea/Fink K; Ardea/Fink K; B Coleman/McCarthy G; FLPA/Tidman R; Plan Earth /Coleman E; Windrush Photos/Van den Berg A; **SNAIL KITE:** Minden/Frans Lanting; Vireo/Tom J. Ulrich; Vireo/Helen Cruickshank; **SNOW BUNTING:** Vireo/Rob Curtis; Vireo/Tom Vezo; **SNOW GOOSE:** B Coleman/Walz U; BBC/Flood S; NHPA/Hawks B; NHPA/Coster B; NHPA/Hawks B; Hermansen P; OSF/Colbeck M; Osolinski S; OSF/Colbeck M; Plan Earth/Walker T; **SNOWY OWL:** NHPA/Hawkes B; NHPA/Ingen H & V; OSF/Newman O; OSF/Degginger E. R; TSI; **SNOWY SHEATHBILL:** B Coleman/Langsbury G; FLPA/Hosking E & D; FLPA/Withers M; FLPA/Hosking E & D; OSF/Osborne B; **SOOTY TERN:** Minden/Frans Lanting; Minden/Frans Lanting; **SOUTHERN GIANT PETREL:** The Wildlife Collection/Tom Vezo; Vireo/K. Matthew; Vireo/Bahrt Inc.; **SOUTHERN GROUND HORNBILL:** Gerald Cubitt Photos; **SOUTHERN YELLOW-BILLED HORNBILL:** Ardea/Haagar C.; B Coleman/Pott Dr E.; B Coleman/Pott Dr E.; NHPA/Lacz G.; NHPA/Harvey M.; OSF/Lee Rue L.; OSF/Bernard G.I.; Plan Earth; **SPOTTED NUTCRACKER:** North Wood Images; **STONE CURLEW:** Natural Selection/Joe McDonald; Natural Selection/Dave Watts; Natural Selection/Joe McDonald; **SULPHUR-CRESTED COCKATOO:** Ardea/Avon D.; FLPA/Gardner T & P; FLPA/Hosking D; NHPA/Griffiths K; NHPA/A.N.T; OSF/Atkinson K; Plan Earth/Kristo F; Plan Earth/Kenny B; **SUN BITTERN:** Ardea/Weisser W; Ardea/Fink K; B Coleman/Evans P; FLPA/Brooks R; Fogden Photo Lib/Fogden M & P; OSF/Clare J; OSF/Fogden M; **SUPERB LYREBIRD:** Ardea/Beste JH & J; Ardea/Beste JH & J; B Coleman/Reinhard H; OSF/Beste JH & J; OSF/Brown R; Plan Earth/Kristo F; Plan Earth/Kristo F; **SWALLOW-TAILED GULL:** Animals Animals; Planet Earth; Wildlife Collection; **TAWNY FROGMOUTH:** B Coleman/Green D; FLPA/Robinson L; NHPA/ANT; NHPA/ANT; OSF/Brown R; OSF/Brown R; **TINAMOU:** Ardea/Morris P; Ardea/Fink K; Ardea/Fink K; B Coleman/Foott J; FLPA/Hosking E & D; **TOCO TOUCAN:** Ardea/Laidler K & L; Ardea/Laidler K; Ardea/Gottier F; NHPA/Palo H; NHPA/Soder E; NHPA/Palo H; **TORRENT DUCK:** Ardea/Avon D; B Coleman/Ziesler G; FLPA/Hosking E; FLPA/Hosking E; FLPA/Hosking E; NHPA/Tidman R; **TRUMPETER SWAN:** Minden/Michael Quinton; **TUFTED DUCK:** Ardea/Bomford L & T; Ardea/Knights C; B Coleman/Purcell A; B Coleman/Fredricksson C; FLPA/Van Daalen F; OSF/Green D; **TUNDRA SWAN:** Natural Selection/Jeff Lepore; The Wildlife Collection/Gary Schulz; **TURTLE DOVE:** Photo Researchers; Planet Earth; **VERREAUX'S EAGLE:** The Wildlife Collection/Martin Harvey; Vireo/John Henry Dick; **VICTORIA CROWNED PIGEON:** Art Wolfe; Planet Earth; **VILLAGE WEAVER:** B Coleman/Evans P; BBC/Wilkes M; BBC/Wilkes M; NHPA/Dennis N; OSF/Turner S; Plan Earth/De La Harpe; **WALLCREEPER:** Eric A. Soder; **WANDERING ALBATROSS:** Ardea/Ferrero J.P.; B Coleman/Van Meurs R.; BBC Nat Hist Unit/Ellis G.; OSF/Richards M.; OSF/De Roy T.; OSF/Osborne B.; **WATER RAIL:** Photo Researchers; **WAVED ALBATROSS:** Minden/Tui de Roy; Minden/Tui de Roy; Vireo/John Henry Dick; Weka:Minden/Tui de Roy; Vireo/Robert L. Pitman; Vireo/Robert L. Pitman; Vireo/Brian Chudleigh; **WEKA:** Vireo/Robert L. Pitman; Minden; **WESTERN CAPERCAILLIE:** Animals Animals; Planet Earth; **WESTERN TANAGER:** Vireo/Brian E. Small; Vireo/Brian E. Small; **WHIMBREL:** Vireo/Tom Vezo; Vireo/Dr. Robert Ricklefs; **WHIPPOORWILL:** Vireo/Ned Smith; Vireo/O.S. Pettingill, Jr.; Vireo/Warren Greene; Vireo/Arthur Morris; **WHITE–FRONTED BEE–EATER:** B Coleman/Evans P; B Coleman/Kahl M P; B Coleman/Wothe K; B Coleman/Berg PVD; NHPA/Lacz G; OSF/Bernard G I; **WHITE STORK:** Ardea/Ferrero-Labat; Ardea/Krishnan M.; B Coleman/Cancalosi J; FLPA/Bahat L & O; FLPA/Polking F.; FLPA/Hawkins J.; FLPA/Wilmshurst R.; OSF/Hamblin M; TSI; **WILD TURKEY:** B Coleman/Kraseman S; B Coleman/Kraseman S; NHPA/Blossom J; OSF/Schneidermeyer F; OSF/Cooney J; OSF/Griffen M; **WILLOW PTARMIGAN:** B Coleman/Lankinen; BBC Nat Hist Unit/Vezo T.; BBC Nat Hist Unit/Vezo T.; BBC Nat Hist Unit/Vezo T.; FLPA/Hamblin T.; FLPA/Wharton T.; Plan Earth/Kjaer D.; **WINTER WREN:** B Coleman/Taylor K; B Coleman/McCarthy G; FLPA/Watkins J; NHPA/Grey M; OSF/Reinhard H; Plan Earth/Clay M; **WOMPOO FRUIT DOVE:** Vireo/Lynx Edicions; **WOOD DUCK:** Natural Selection/Joe McDonald; **WOOD PIGEON:** Ardea/Avon D; B Coleman/Cancalosi J; B Coleman/Maier R; FLPA/Wisniewski W; FLPA/Wilmshurst R; Natural Science/Brigham R; OSF/Paton W; **WOOD STORK:** Minden/Frans Lanting; The Wildlife Collection/Ken Howard; **WRYNECK:** Ardea/Avon D; FLPA/Hosking E; OSF/Tilford T; OSF/Fioratti P; Plan Earth/Charles H; **YELLOW-BILLED CUCKOO:** Vireo/Richard & Susan Day.