

GENTOO PENGUIN

CARD 81

GROUP 2: BIRDS

ORDER
Sphenisciformes

FAMILY
Spheniscidae

GENUS & SPECIES
Pygoscelis papua



The gentoo penguin breeds on islands around the Antarctic and spends part of each year at sea. Like other penguins, it is an excellent swimmer and is well suited for a life in the water.

KEY FACTS



SIZES

Length: 1 1/2-2 ft.
Weight: 10-20 lb.



BREEDING

Sexual maturity: 3-4 years.
No. of broods: 1.
Breeding season: Late spring.
Eggs: 2.
Incubation period: 36 days.



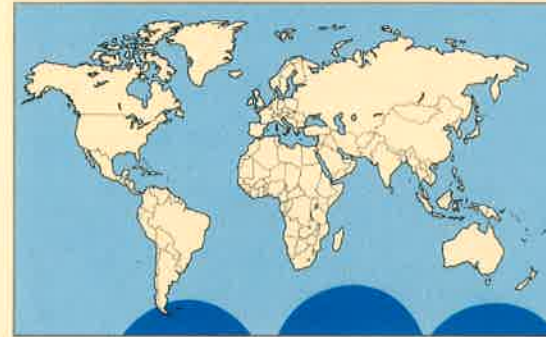
LIFESTYLE

Habit: Rather timid, breeds in small colonies.
Diet: Krill, small fish, crabs, and squid.
Lifespan: Up to 18 years.



RELATED SPECIES

Closely related to the adeliae penguin, *Pygoscelis adeliae*, and the chinstrap penguin, *P. antarctica*.



Range of the gentoo penguin.

DISTRIBUTION

Sub-Antarctic islands of the southern Atlantic and Indian oceans, including the Falklands and islands off Cape Horn. It also breeds on the edge of the Antarctic Peninsula.

CONSERVATION

Until the twentieth century, penguins were hunted for their oil by both whalers and seal hunters. Today, marine pollution is the main threat to their survival.

FEATURES OF THE GENTOO PENGUIN

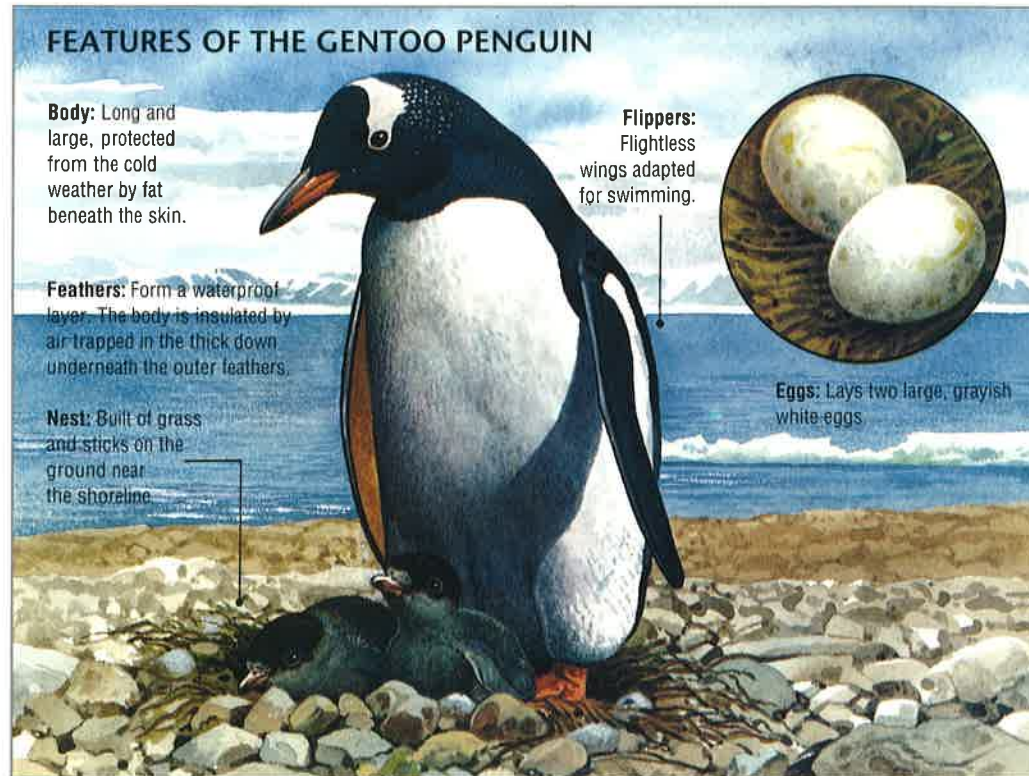
Body: Long and large, protected from the cold weather by fat beneath the skin.

Feathers: Form a waterproof layer. The body is insulated by air trapped in the thick down underneath the outer feathers.

Nest: Built of grass and sticks on the ground near the shoreline.

Flippers: Flightless wings adapted for swimming.

Eggs: Lays two large, grayish white eggs.



The gentoo penguin looks like a typical black and white "dinner suited" penguin with a white band across its head. It has become so well adapted for living at sea that it can only waddle awkwardly on land.



FOOD & FEEDING

The gentoo penguin mainly eats krill (tiny shrimplike crustaceans) and a few small fish. It catches the krill on short, shallow dives.

The well-oxygenated Antarctic seawater is rich; it

usually supports vast quantities of krill. But high levels of pollution have decreased the krill supply. The overfishing of krill around the world has also diminished this food supply.

BREEDING

The gentoo penguin mates in late September or October when the snow and ice melt. The male mates after establishing a territory, usually on an old nest site on a flat area close to the beach. He and his mate then build a nest of grass.

The female lays two white eggs and the pair takes turns incubating them. The chicks hatch about 36 days later, spending the first few days sheltered under their parents. The adults take turns collecting food and guarding the chicks from predators.

After three or four weeks the chicks leave the nest and gather in groups called



creches. At feeding times adults lead the young to the beach and encourage them to find their way back to the nest. This behavior helps chicks to quickly become

independent. After seven to eight weeks the young leave the nest for the sea.

HABITS

The gentoo penguin swims fast, using its tail and flippers to steer. At high speeds it dives up and down through the water (called *porpoising*) so it can breathe at regular intervals without slowing down. It can stay underwater from 30 seconds to two minutes and can reach depths of 230 feet.

The penguin stays at sea three to five months a year, feeding to build up fat reserves. Penguins have been seen off the coast of Argen-

tina, Tasmania, and New Zealand. Birds in the southern nesting colonies are thought to travel far distances.

Less sociable than other penguin species, the gentoo penguin congregates in small, slightly inland breeding colonies called *rookeries*.

After the chicks leave the nest, the adult *molts* (sheds its feathers) and replaces its dirty brown plumage with black and white feathers. It then leaves the colony and returns to the sea to feed.

Above: Adult males call to other penguins as part of a territorial ritual.

Right: An adult opens its beak to feed a chick regurgitated food.

Far right: A penguin launches itself into the icy water.



DID YOU KNOW?

- There are records of albino gentoo penguins that have white feathers over most of their body.
- The three subspecies of gentoo penguins differ mainly in bill, flipper, and foot measurements.
- The male performs its elaborate trumpeting display to attract unmated females and warn off other males.

MACARONI PENGUIN

CARD 82



GROUP 2: BIRDS

ORDER
Sphenisciformes

FAMILY
Spheniscidae

GENUS & SPECIES
Eudyptes chrysolophus



The flightless macaroni penguin is an excellent swimmer. It is well-adapted for spending long periods of time in the water without being affected by the cold.

KEY FACTS



SIZES
Height: 2 ft. Male, slightly larger, with stronger bill.
Weight: Up to 13 lb.



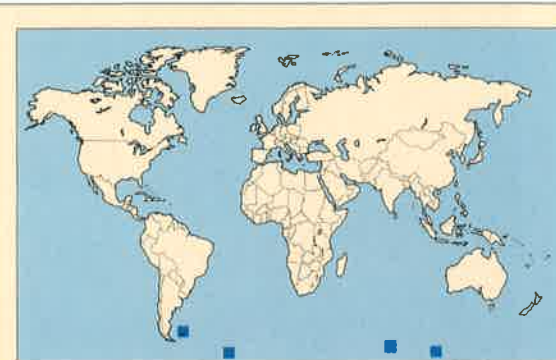
BREEDING
Sexual maturity: 6 years or older.
No. of broods: 1.
Breeding season: Late spring.
Eggs: 2.
Incubation period: 31-37 days.



LIFESTYLE
Habit: Sociable; breeds in groups or large colonies and seeks out feeding grounds in large flocks.
Diet: *Krill* (shrimplike marine crustaceans), small fish, crabs, and squid.
Lifespan: Up to 10 years.



RELATED SPECIES
Closely related to other species of crested penguin including the rockhopper penguin, *Eudyptes crestatus*, and the erect-crested penguin, *Eudyptes atratus*.



Range of the macaroni penguin.

DISTRIBUTION

Sub-Antarctic islands of the southern Atlantic and Indian oceans, including the Falklands and islands off Cape Horn.

CONSERVATION

Seal hunters were a threat in the early 20th century; now oil spillages can be fatal. Many species of penguin are increasing, probably due to the dwindling numbers of whales which compete with them for food.

FEATURES OF THE MACARONI PENGUIN

Feathers: Back and belly feathers are slightly bent, overlapping to form a waterproof layer. Thick down at the base of each feather conserves body heat by trapping a layer of air around the penguin's body.

Tail: Triangular-shaped, used as a rudder in the water.



Body: Long and egg-shaped. Thick deposits of fat under the skin protect it from the cold.

Flippers: Stiff, flightless wings, adapted for swimming.



Macaroni penguin



Rockhopper penguin

The two penguins of the genus *Eudyptes* (crested) are distinguished by the striking yellow crests on their heads.



The macaroni penguin is a member of the crested penguin family whose members all have plumes of golden yellow feathers over their eyes. Unlike other penguin species that waddle clumsily, the macaroni penguin hops along on both feet.

BREEDING

The macaroni penguin mates in spring, usually at the same site and with the same partner as the previous year. The male establishes the pair's breeding territory, and the female soon joins him.

The female lays two eggs of different sizes. The first is small and the second egg may be 70 percent larger. It is rare for more than one egg to survive.

Both parents incubate the surviving egg and take turns leaving the nest every few days to feed. For the first few days after hatching, the chick is sheltered under the body of one parent while the other forages for food.

The chick is born with a covering of thick down, which is soon replaced by feathers. It soon heads out to sea with the colony. Although it grows adult feathers at the end of its first year, the chick does not breed until it is at least six years old.

Right: A parent feeds its chick.
Below: Adults are aggressive to intruders.
Below right: Parents take turns incubating the eggs.



DID YOU KNOW?

- The macaroni penguin's family name comes from the Greek word *spheniskos*, meaning "small wedge." It refers to the shape of the bird's flipperlike wings.
- It was once thought that

penguins lived only in the cold Antarctic waters. They actually inhabit waters that have a wide range of temperatures and are found as far north as the Galápagos Islands.

FOOD & FEEDING

The macaroni penguin feeds mainly on *krill* (small, shrimp-like crustaceans). It also eats small fish and squid.

Large amounts of krill are found throughout the Antarctic because they thrive in the well-oxygenated water. Krill

are most plentiful on the surface of the ocean at night, and large groups of macaroni penguins travel between their colonies and feeding grounds.

During the day, the penguin dives underwater to catch small fish and squid.

HABITS

The macaroni penguin is more at home in the water than on land. After it breeds and *molts* (sheds its feathers), it returns to the sea, at which point scientists believe that it migrates northward to warmer waters, although this has not been proven.

The macaroni penguin is an extremely sociable animal. It spends much of its life in the company of other penguins. It breeds and molts in large colonies on shore and gathers in

large groups to feed at sea.

The macaroni penguin swims on or just below the surface of the water, using its tail and flippers to change direction. When moving at fast speeds, it rises to the surface of the water at regular intervals to breathe, much like a dolphin does, so that it does not have to slow down.

The penguin rarely dives for longer than two to three minutes; the heat-conserving air trapped beneath its feath-

ers makes it too buoyant to stay submerged for a longer period of time.

As soon as its chicks become independent, the macaroni penguin begins its annual molt. The bird's old, dirty feathers are gradually replaced during a several-week period. New feathers grow beneath the old ones, gradually pushing them out of the skin. The old feathers fall out only when the penguin is fully covered with new feathers.



Top left: A colony of 50,000 nesting pairs uses all available space to rear the young.

Left: Colonies resound to the sounds of courting. This soon leads to a period of frenzied nest building.

NORTHERN SHOVELER

CARD 85

GROUP 2: BIRDS

ORDER
Anseriformes

FAMILY
Anatidae

GENUS & SPECIES
Anas clypeata



The northern shoveler is the only shoveler duck found in the Northern Hemisphere. It is named for its huge bill, which it uses to filter food from inland seas, lakes, and marshes.

KEY FACTS



SIZES
Length: 1 1/2 ft. Male larger.
Wingspan: 2 1/2-2 3/4 ft.
Weight: About 1 1/2 lb.



BREEDING
Sexual maturity: 1 year.
Breeding season: April to May.
No. of eggs: 9-11, buff-colored.
Incubation period: 22-23 days.
Fledging period: 40-45 days.



LIFESTYLE
Habit: Migratory, freshwater, dabbling duck.
Diet: Crustaceans, mollusks, aquatic plant seeds and leaves.
Lifespan: 2-3 years. Oldest known bird, 20 years 5 months.



RELATED SPECIES
There are 3 other shoveler species: the South American red shoveler, *Anas platalea*; the African Cape shoveler, *A. smithii*; and the Australasian shoveler, *A. rhynchos*.



■ Range of the northern shoveler. ■ Winter range.

DISTRIBUTION

Common and widespread throughout the Northern Hemisphere. Breeds from Alaska to eastern Russia. Winters in southern United States, Mexico, southern Europe, Africa, India, and Southeast Asia.

CONSERVATION

Some populations have declined due to loss of their habitat, but numbers are generally stable or increasing.

FEATURES OF THE NORTHERN SHOVELER

Flight: The shoveler takes to the air easily and flies with strong wing strokes.

Plumage: The male has a glossy green head, chestnut belly, and white chest in contrast to the dull-colored female.



Eggs: 9 to 11 eggs are laid and incubated for 3 1/2 weeks.



Bill: Very distinctive, wide, and spatulalike.



The northern shoveler is one of four species of shoveler duck. It is found throughout North America and Eurasia, while its three relatives live separately on the continents of Africa, South America, and Australia.

HABITS

The northern shoveler is usually found in the shallow areas of freshwater lakes, ponds, or marshes, especially lowland sites with dense reeds or grass. Large flocks of birds may dabble around the muddy edges of the water, but they avoid deeper areas. Shovelers will alight on surprisingly small stretches of water, provided there is a rich aquatic life.

These birds take to the air easily and fly strongly, so they are able to move freely from site to site.

Shovelers are most often seen in pairs or small parties containing up to 20 ducks. Large flocks may gather during the fall and spring migrations, especially at stopover points between the northern breeding grounds and the southern winter quarters.

Not all northern shovelers migrate. Some live in central, temperate regions throughout the year. In the fall they are frequently joined by large numbers of migrants from the north.

FOOD & FEEDING

The shoveler feeds by filtering water through its large spatulalike bill. Usually it feeds in the shallows, either alone or in groups of two or three. It swims in circles, sweeping its partly open bill from side to side through the water. After drawing in a beakful of water, the shoveler closes its bill so that the hairlike jagged edges in its *mandibles* (jaws) intermesh to form a filter. When the water drains, particles of food remain in the duck's bill. The mesh is so fine it even traps microscopic plankton.

The shoveler swims with its head and neck submerged, occasionally upending itself to reach food beneath the surface. It consumes crustaceans, mollusks, insects, larvae, and the leaves and seeds of a variety of water plants. Although the shoveler feeds mainly by day, in areas where it is hunted or otherwise disturbed it also feeds at night.

DID YOU KNOW?

- The northern or common shoveler is popularly known as the spoonbill duck and the "smiling mallard."
- When the shoveler takes to the air, its wings produce a buzzing noise that is believed to be a territorial warning.
- When feeding alone, the shoveler often swims in tight circles to create a whirlpool that stirs up food from the bed of the lake or pond.



Left: Shoveler ducks mate toward the end of winter.

Right: Over a period of two weeks, the female lays up to 11 pale green eggs.



Left: The female duck is highly protective of her ducklings. She raises only one brood each year.

BREEDING

The northern shoveler begins to search for a mate in mid-winter. Groups of up to 12 males may court a single female. They swim alongside her with their beaks in the air and make short "follow me" flights in front. They may also circle quickly in the air above the water, calling repeatedly

Top left: As with most ducks, the male shoveler's plumage is much more colorful than the female's.

to the female. To make her selection, the female swims close to one male and discourages the others.

At the breeding grounds the pair searches for a nest site. The nest is usually built on the ground, but close to the water.

The female duck presses her breast against the ground to make a cup-shaped hollow, which she then lines with

grass, leaves, and down. Although the female cares for the eggs, the male is usually on guard nearby.

The female takes about two weeks to lay 9 to 11 eggs. Incubation begins after the last egg is laid, so all the young hatch together. The ducklings can feed themselves shortly after hatching, but their mother continues to guard them from predators.



BIRDWATCH

The northern shoveler breeds primarily in western North America. During the fall migration, it flies southward and eastward, and it can be seen in eastern areas during the winter months.

The northern shoveler is

usually found in freshwater marshes. In winter it may also visit saltwater areas.

From close up, you can easily identify the northern shoveler by its large bill. Two other distinguishing features are its pale blue forewing

and green rear patch. The male's bottle-green head, white breast, and chestnut belly are also unmistakable. After breeding, the male's plumage becomes duller, but it is still more colorful than the female's.

OSPREY

CARD 87



GROUP 2: BIRDS

ORDER
Falconiformes

FAMILY
Pandionidae

GENUS & SPECIES
Pandion haliaetus



The osprey is known for both its beauty and its impressive hunting technique. A fish-eater, it plunges down to the water surface to snatch unwary prey in its strong claws.

KEY FACTS



SIZES

Length: 2 ft.
Wingspan: 4 1/2-5 1/2 ft.
Weight: 2-4 lb.



BREEDING

Sexual maturity: 3 years.
Breeding season: Varies according to region.
Eggs: 2-4, usually 3.
Incubation: About 38 days.
Fledging period: About 50 days.



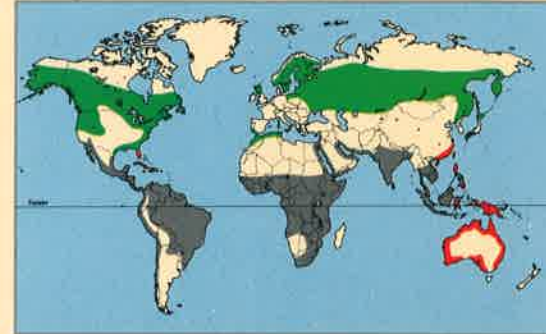
LIFESTYLE

Habit: Migratory. Found both alone and in loose groups.
Diet: Fish. Occasionally small mammals, birds, reptiles, amphibians, and invertebrates.
Lifespan: Can be 15-20 years.
Oldest recorded 32 years.



RELATED SPECIES

The osprey, the only member of its family, is related to the hawk, eagle, vulture, and falcon.



Resident range. Winter range. Breeding range.

DISTRIBUTION

Worldwide along coasts and near inland waters. This map shows breeding, wintering, and resident areas. The bird is found elsewhere during winter migration.

CONSERVATION

Shooting and pesticide poisoning threaten the rare and endangered osprey in many areas of its range. Strictly protected in some regions.

IDENTIFYING THE OSPREY



Eggs: Two or three creamy white eggs, blotched with reddish brown.

Nest site: High in treetops, at tops of rocky columns, or on ground if safe.



Identification:

Brown plumage with white head feathers. Male and female similar. Flies with wings forming "M" shape.

Chick:

Fed by the female. Flies after 50 days.

PLUNGE-DIVING FOR PREY



Diving from as high as 100 feet, the osprey thrusts its feet forward just before reaching the water and grabs the prey with its talons.



The osprey's tendency to prey on fish stocks makes it unpopular with fisheries. Hunted almost to extinction in many areas, it has also been a victim of chemical pollution. With protection, its numbers are growing in some areas.

FOOD & HUNTING

The osprey feeds mainly on fish caught in surface water. It flies 65 to 100 feet above the water until it sees a fish. The pale plumage on the osprey's underside makes it difficult for fish to see it against the sky.

The osprey plunges down with wings swept back. Before reaching the water, it swings

its feet forward, its legs breaking the surface.

Curving talons and small hooks in its toes help the osprey catch fish and take them to its perch to eat. Still, larger birds such as the sea eagle may chase the osprey and force it to drop its catch.

Left: The osprey prefers to build its nest in treetops or on crags.

Right: The osprey carries its catch to a perch to eat.



DID YOU KNOW?

- Although rare, the osprey can catch two fish in one dive.
- The osprey's large outer toe can turn backward, improving its grip on prey.
- The osprey's feet are so well adapted for gripping that some birds have been dragged underwater and drowned by large fish.
- On Gardiner's Island near New York, a single osprey colony contained over 300 breeding pairs.

OSPREY & MAN

The osprey has been hunted for preying on fish stocks. It was almost exterminated in 1900 but returned in 1950.

The osprey suffers from pesticide poisoning in North America. Chemicals such as DDT (used to kill pests on

farmland) seep into rivers and lakes and build up in fish that the osprey eats. The chemicals do not usually kill adult birds, but they thin the shells of their eggs, making them fragile and more likely to break. Few of these young hatch.

BEHAVIOR

The only member of its family, the osprey is a large bird with long legs and powerful talons. It holds its long, slender wings in a shallow "M" shape while flying around the lakes, rivers, and coastal regions where it catches fish.

The osprey has one of the greatest ranges of any bird. It

breeds in Europe, Asia, Africa, Australia, and North America. In winter it leaves northern regions and heads south to more temperate climates. European birds fly to Africa, the North American species migrates to Central and South America, and birds from northern Asia go to India.



BIRDWATCH

After a 50-year absence, the osprey returned to Scotland in the 1950s. Nesting sites across the Highlands are protected, and the Loch Garten nesting site is a favorite osprey viewing area

for European birdwatchers.

By 1990, over 50 pairs nested in Scotland, and that number is rising. After breeding season, the ospreys fly to Africa, and can be seen at several stops along the way.



BREEDING

The male osprey performs displays during the breeding season to attract a mate or to strengthen his bond with an established mate. The male rapidly flies up 1,000 feet or more, carrying a fish in his talons. He then hovers briefly,

Left: Nests are used year after year so they grow to large sizes.

displaying the fish to the female before diving down with his wings folded. This may be repeated several times.

Breeding pairs build their nests in treetops or on rocky heights—or on the ground with no predators nearby. The large nests, made of sticks and debris, may be used and added to each year.

The clutch contains three creamy white eggs blotched with red. The female, with some help from the male, incubates the eggs for 38 days. At seven weeks, the young ospreys fly and leave the nest.



Left: The osprey looks similar to fellow birds of prey, the hawk and eagle.

BROWN KIWI

CARD 89

GROUP 2: BIRDS

ORDER
Apterygiformes

FAMILY
Apterygidae

GENUS & SPECIES
Apteryx australis



The brown kiwi is a strange-looking creature that at first glance barely resembles a bird. It has no visible wings. Instead, it has short, thick legs and coarse feathers that look like fur.

KEY FACTS



SIZES

Length: 20 in.
Height: 14 in.
Weight: 5 lbs. Female about 20 percent heavier than male.



BREEDING

Sexual maturity: Not known, but probably at least 2 years.
Laying season: July to February.
Eggs: 1 or 2, white.
Incubation: About 80 days.



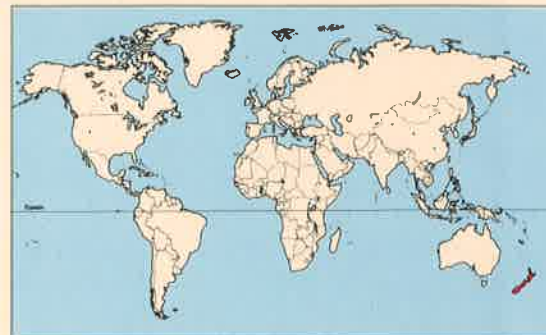
LIFESTYLE

Habit: Lives in pairs. Active mainly at night.
Diet: Insects, worms, berries, seeds. Some larger prey such as reptiles and amphibians.



RELATED SPECIES

There are 2 other species of kiwi, both in New Zealand: the great spotted kiwi, *Apteryx haastii*, and the little spotted kiwi, *A. owenii*.



Range of the brown kiwi.

DISTRIBUTION

Found in New Zealand, on South Island, Stewart Island, and parts of North Island.

CONSERVATION

The brown kiwi is threatened by the destruction of its habitat and by predatory and competitive species. It still survives in large numbers in some areas, especially in protected reserves.

FEATURES OF THE BROWN KIWI

Plumage: Gray-brown, stubby and coarse but dense. Feathers are useless for flight.

Eggs: One or two, white. They are hidden in a hole among vegetation. The 11-week incubation period is the longest of any bird.

Whiskers: Sensitive hairs around the bill help the kiwi feel around for its food in the dark.

Feet: Used for running swiftly through forests, scraping soil for food, and kicking out in defense.

Bill: Long, with sensitive nostrils at tip. It enables the kiwi to root for food and to smell its prey in soil.

Daytime nest: A hidden corner among dense vegetation or logs, where the kiwi sleeps until dusk.



The brown kiwi is one of New Zealand's most celebrated and unusual birds. It spends the day fast asleep in a spot concealed by undergrowth or logs. Unable to fly, it probes and scrapes for its food at night among the fallen leaves covering the forest floor.

HABITS

The peculiar habits and odd appearance of the brown kiwi owe much to the isolation of New Zealand's North and South islands. In most places a flightless bird of the kiwi's size—about the size of a hen—would be easy prey for flesh-eating mammals. But until settlers arrived with domestic animals, land mammals could not even reach New Zealand.

In the absence of mammals, some New Zealand birds

developed habits normally associated with mammals. The brown kiwi, for example, cannot fly and feeds on insects at night.

The kiwi's habitat is mainly the forest, where it relies on its strong legs to scurry through thick undergrowth.

It generally lives in pairs, calling to its mate to keep in contact in the dense forest.

The pair occupies and defends a territory, vigorously chasing away intruding kiwis.

BREEDING

The female produces one or two huge eggs, which may weigh more than one-sixth of her body weight. Each contains a large, nutritious yolk that lasts for the long incubation and provides the hatching chick with food.

The female lays her eggs in a hole among dense vegetation, between tree roots, or in a hollow log. Her mate incubates them for 11 weeks—the longest incubation period of any bird. By hatching time each chick is open-eyed and fully feathered. Within a week it can leave the nest alone to gather food for itself.

Left: Looking for food, the kiwi scrapes and pecks at the forest floor. Its keen sense of smell helps it to uncover earthworms and insects.

Right: Once the female has laid her eggs, the male guards them until they hatch. The incubation period is very long.



DID YOU KNOW?

- Europeans did not believe accounts of the kiwi until a specimen's skin was brought back in 1813.
- Sensitive bristles at the base of its bill help the kiwi root for food.
- The kiwi has such good

eyesight that it can run quickly in pitch darkness. • During breeding the female's efforts in laying eggs and the male's role in incubation cause them to lose about one-fifth of their body weight.

BROWN KIWI & MAN

Early Maori settlers of New Zealand prized the feathers of the kiwi for use in decorative cloaks. They also hunted the bird for its meat.

Today the kiwi is the country's national emblem, and New Zealanders often refer

to themselves as "Kiwis."

But now the kiwi's survival is threatened by the clearing of forest and by land mammals introduced by modern settlers. It has few defenses against such egg-thieving mammals as rats and ferrets.

FOOD & FEEDING

The kiwi uses the pair of very sensitive nostrils at the tip of its bill to find food and locate fellow birds. Its good senses of hearing and touch also help it secure food.

The kiwi's diet includes insects, worms, berries, fruit, and occasionally small reptiles or amphibians. To find food, it scratches through dead leaves with its powerful claws or probes the soil with its bill to smell and feel for invertebrate prey.



Left: The brown kiwi is an odd-looking bird, with a long beak and bulky, wingless body. During the heat of the day it sleeps in a safe place. Then, at dark, it strides off on its large feet in search of food.