



NORTH AMERICAN BEAVER

GROUP 1: MAMMALS

ORDER
Rodentia

FAMILY
Castoridae

GENUS & SPECIES
Castor canadensis



The industrious beaver plays a vital role in maintaining the natural balance of its habitat. It constructs a complex system of dams and canals that regulates flooding, creates marshland, and prevents soil erosion.

KEY FACTS



SIZES

Body length: 24-32 in.
Tail length: 10-18 in.
Shoulder height: 12-24 in.
Weight: 25-55 lb.



BREEDING

Sexual maturity: 3 years.
Mating: January-February.
Gestation: 105 days.
No. of young: Up to 8 kits.



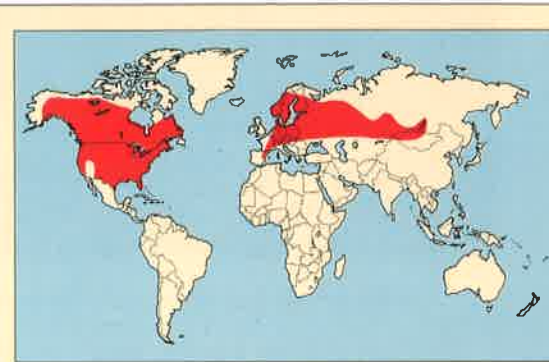
LIFESTYLE

Habit: Social, aquatic, mainly nocturnal. Builds dams, flooding large areas to provide suitable habitat.
Diet: Mainly bark.
Lifespan: 15-21 years.



RELATED SPECIES

The genus *Castor* contains only one other species, the European beaver, known as *C. fiber*.



Range of the North American beaver.

DISTRIBUTION

Extends from most of Canada into most of the United States. The European beaver is found in Scandinavia, western and eastern Europe, central Asia, and north-western China.

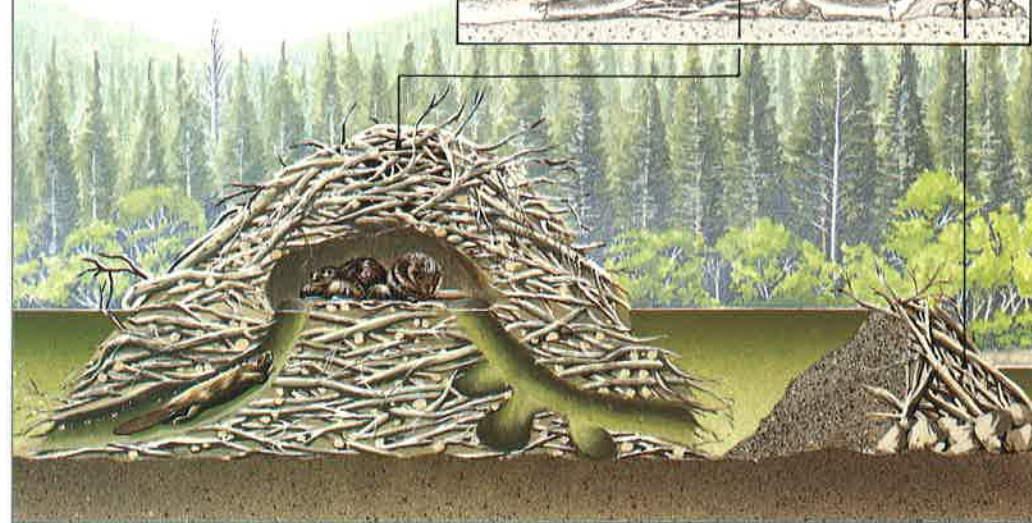
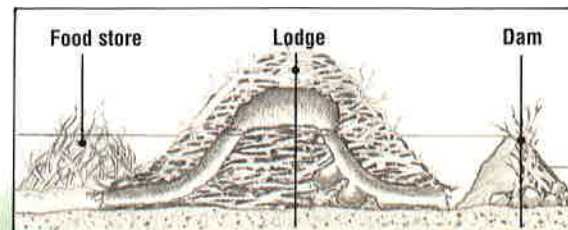
CONSERVATION

The North American beaver has been actively repopulated by state and federal wildlife agencies.

THE BEAVER'S DAM AND LODGE

The **dam** provides a reservoir in which to construct the **lodge**.

Underwater **entrance tunnels** lead to the **living chamber**. Branches stored nearby provide a **winter food supply**.





Although the beaver is usually thought of as a resident of North America, there is a closely related species that lives in Europe. Still, there are more beavers in North America than anywhere else in the world. They live in family groups in dams built across streams and lakes.

BEAVER & MAN

Much of the early exploration of North America was carried out by trappers, who hunted the beaver for its valuable fur. The beaver population had declined dramatically by the beginning of the 20th century as a result.

The beaver's numbers are now regulated by careful planning that allows them to be harvested for their fur and meat. In the 1950s, before regulations were enforced, 600,000 beavers were killed in Canada. During the 1970s, after hunting was controlled, 100,000 to 200,000 beavers were killed in the United States.

FOOD & HUNTING

Bark is the beaver's staple food. To ensure a constant supply of food throughout the winter, the beaver spends a great deal of time in the fall felling trees. The beaver tows the logs along the canals it has

made and stores them underwater.

Beavers do not hibernate in winter, but in the northern parts of their range they generally only leave their lodges to feed from stored food sup-

plies. During this time, beavers live in constant darkness and lose track of time.

Aquatic plants, thistles, leaves, twigs, seeds, and roots make up most of the beaver's summer diet.



Top left: A dammed, tree-lined river is the ideal environment for the beaver.

Left: An underwater store of branches is kept near the beaver lodge as a winter food supply.

HABITS

Beavers are found in streams and lakes in both remote and settled areas. Using their huge front teeth, they can fell very large trees and branches. Beavers prefer oak, ash, elm, willow, poplar, and birch trees. They use the trees, together with mud, stones, and sticks, to construct dams across fast-flowing streams. The damming of streams causes the area behind the

dam to flood, producing a large marsh that is rich in aquatic plants, insects, birds, and fish.

Within the dam, beavers construct lodges that have various underwater entrance tunnels (see back cover). They excavate mud from portions of the marsh with their front paws, constructing a system of canals along which they travel to and from their feed-

ing areas. They also push floating logs and tow sticks and branches down the waterways to new dam sites.

Beavers use scent to mark their territories. They deposit anal secretions and a strong-smelling substance called castoreum on rocks and mud throughout their territories.

Beavers warn each other of danger by slapping their tails violently on the water.

BREEDING

Beavers live in large, stable family groups consisting of one adult pair, their latest-born young, and the young born the previous year. Most beavers leave their family groups at 2 years of age to find territories and mates.

Beavers pair for life, and mating occurs during the winter. The kits—beaver young—are born in late spring in a chamber in the lodge. They

have full coats of fur and can swim within several hours.

They are nursed for six weeks, after which all members of the group share the task of bringing them food. The kits soon venture outside the lodge, but it will be many months before they can survive on their own.

Below: Week-old kits are nursed by their mother. They may stay at the lodge for up to two years.



Above: Even a young oak presents no problems to the sharp teeth of the beaver.



SPECIAL ADAPTATIONS

Fur: Waterproof; the silky underfur is covered by a coat of long, shiny hair.

Teeth: Coated with a hard, yellowish-red enamel to provide a hard, sharp edge on the front surface to prevent wear.

Feet and tail: The large,

scaly tail is flattened. It can be used for propulsion or like a rudder. The hind feet are large and webbed.

Diving adaptations: Nose and ears close when diving, and a membrane protects the eyes. Beavers can gnaw underwater because the

lips close behind the front teeth, while the back of the tongue seals the throat.

Scent glands: Paired scent glands release a musky-smelling substance that is known as castoreum, with which the beaver marks its territory.

DID YOU KNOW?

- A beaver family can fell as many as 300 trees in a single winter. A pair of beavers can gnaw through a 4-inch-thick branch in 15 minutes.
- The beaver is the second largest rodent in the world.
- Giant beavers weighing as much as 700 pounds existed 10,000 years ago.



GREATER INDIAN RHINOCEROS

CARD 15

GROUP 1: MAMMALS



ORDER
Perissodactyla

FAMILY
Rhinocerotidae

GENUS & SPECIES
Rhinoceros unicornis



The greater Indian rhinoceros is a descendant of an old species of rhinoceros. Despite its fearsome appearance, it is a generally peaceful animal.

KEY FACTS



SIZES
Height: 3-7 ft.
Length: 7-14 ft.
Weight: 3,300-4,800 lbs.



BREEDING
Sexual maturity: Males, 7-9 years.
Females, 3 years.
Mating: Females come into season every 5-8 weeks until pregnant.
Gestation: 462-489 days.
No. of young: 1 calf.



LIFESTYLE
Habit: Partly social, partly solitary.
Call: Social grunts and snorts; females whistle when in season.
Diet: Grass, twigs, bamboo shoots, wheat, lentils, and potatoes.
Lifespan: About 50 years.



RELATED SPECIES
The Javan rhino, *Rhinoceros sondaicus*, is its closest relative.



Range of the greater Indian rhinoceros.

DISTRIBUTION

Now limited to 10 locations in India and two in Nepal.

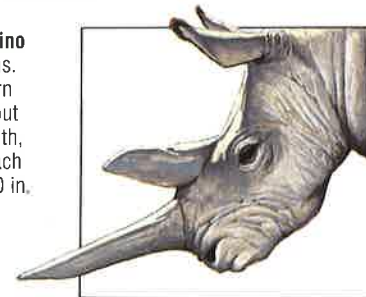
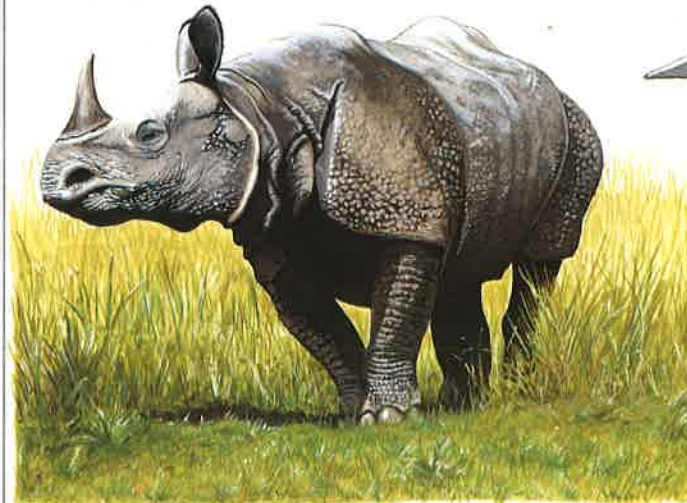
CONSERVATION

Survives only in protected areas. The population is rising steadily; however, it is threatened by poaching for its valuable horn and is listed as endangered.

FEATURES OF THE GREATER INDIAN RHINOCEROS

The **greater Indian rhino** has a single, blunt, rather stubby horn, which is often ragged in older animals. It is made of a mass of hairlike fibers clumped together above a bony knob on the skull. The animal's thick, dark gray skin falls in distinct folds at the joints of the shoulders and flanks, giving an armored plate appearance.

The **white rhino** has two horns. The front horn averages about 24 in. in length, but it can reach more than 60 in.



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Measuring more than 12 feet long, and weighing up to 2 tons, the greater Indian rhinoceros is bigger and heavier than a car. It may appear to be ponderous and slow, but it can suddenly charge at frightening speed to drive off rivals or enemies who stray too close.

HABITAT

The greater Indian rhinoceros lives in dense growths of tall elephant grass in swampy areas near rivers. Here it wal-

lows in the shallow water and mud to keep cool during the day. It may also head for higher ground in search of food.

FOOD & FEEDING

The greater Indian rhino is principally a grazing animal. It moves around constantly to take advantage of fresh plant growth. Adaptable in its feeding methods, the rhino has a widely varied diet. It eats new plant growth as well as bamboo shoots, water hyacinths, and a variety of crops, which can make the rhino a nuisance to farmers.

Right: Elephant grass is the rhino's principal food, but it also eats crops and bamboo shoots.



BEHAVIOR

The greater Indian rhinoceros is somewhat territorial. Rhinos share communal bathing pools, wallows, and dung heaps, but they establish their own feeding and sleeping areas, which average 5,000 square yards. If any other animal should wander into its private area, the greater Indian rhinoceros will charge at it to drive it away.

Rhinos remain submerged in their wallows during the

hottest part of the day. Wallowing is important for rhinos because it protects them from biting insects and prevents overheating.

In the morning, the rhinos feed in open areas, slowly moving toward cover as the sun rises higher. Throughout the day, local populations of rhinos come into contact while travelling to wallows and bathing pools. New arrivals to communal areas are chal-

lenged by those already there, until they are permitted to join the group.

At dusk, they will move again to their feeding areas and graze until midnight, before resting. The females who have young calves move into the shelter of tall grass to protect the young from tigers. The other rhinos, too big to fear any predators, lie down wherever they happen to be feeding.



Left: Rhinos and their young spend their days wallowing in an area of shallow water and mud. Communal wallowing holes are shared by groups of rhinos with no sign of aggression.

DID YOU KNOW?

- Greater Indian rhinoceroses are vulnerable to sunburn. By wallowing in mud, they protect their skin from the sun.
- In the first weeks after giving birth, mother rhinos produce 5 to 7 gallons of milk a day.
- The Baluchitherium, an ancestor of the greater Indian rhino, was the largest land mammal that ever lived at 18 feet high and 36 feet long. It lived more than 20 million years ago.

RHINO & MAN

Conflict between man and the greater Indian rhinoceros arises from the damage that rhinos do to crops, and the damage that man does to the rhino's food supply—elephant grass.

However, in Nepal, villagers who use elephant grass to build their houses are now allowed to collect grass in national parks at certain times of year. This encourages new growth, which benefits the rhinos.

BREEDING

The female greater Indian rhino comes into heat (is ready to mate) for 24 hours every five to eight weeks. She attracts the male by spraying urine and by making a gentle, whistling sound. The male often chases the female, and they may fight, until she is ready to mate.

The solitary female seeks dense cover when it is time to give birth. The calf will stay with its mother until the birth of her next offspring, between 18 months and two years later.

Right: At birth, a newborn rhino calf weighs about 150 pounds. It begins to graze at 2 months, but will continue to suckle from its mother for at least a year.



CHIMPANZEE

CARD 16

GROUP 1: MAMMALS

ORDER
Primates

FAMILY
Pongidae

GENUS & SPECIES
Pan troglodytes



H. Van Lawick/Nature Photographers

Intelligent and lively, the sociable chimpanzee shows an ability to learn as well as act instinctively. Its behavior could provide a clue to that of our early ancestors.

KEY FACTS



SIZES
Height: Males, 5½ ft. Females, 4¼ ft.
Weight: 100-175 lb.



BREEDING
Sexual maturity: 8-10 years.
Mating: Female mates when previous offspring is about 3 years old.
Gestation: 202-261 days.
No. of young: 1-2.



LIFESTYLE
Habit: Sociable, in small troops.
Diet: Mainly fruit, but also leaves, buds, blossoms, bark, resin, honey, termites, and ants. Occasionally, other mammals.
Lifespan: 40-50 years.



RELATED SPECIES
The pygmy chimpanzee, *Pan paniscus*, found in Zaire.



Range of the chimpanzee.

DISTRIBUTION

In Africa from Guinea to western Uganda and Tanzania, in forest and savannah country.

CONSERVATION

Not endangered at present, except in a few locations. Trapping for medical experiments once posed the greatest threat, but this is now decreasing under pressure of public opinion.

FACIAL EXPRESSIONS OF THE CHIMPANZEE

Like humans, chimpanzees can use their faces to show emotion. Researchers have discovered that they have a wide range of expressions conveying several different emotions.



Aggressive expression, left. The chimp is showing anger or warning a rival.



Friendly expression, right. A chimpanzee greets another peacefully.



Passive expression, above. The chimpanzee is calm and at ease.



Pleased expression, left. This smile, showing the bottom teeth, conveys active enjoyment or pleasure.

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The chimpanzee is the animal that resembles man most closely. It shares familiar human characteristics, such as problem-solving abilities, a high degree of parental care, and a variety of facial expressions.



P. Jackson/Bruce Coleman Ltd.

HABITS

Chimpanzees live in troops numbering between 25 and 80. Each troop has a dominant male. The troop's home range varies in size from seven to eight square miles in forest to 40 to 75 in open country.

Active by day, the chimpanzee sleeps at night in a

nest that it makes in a tree, well above the ground, safe from its predators. The same nest may be used for several nights if the troop is not on the move.

Chimps stay mainly in trees during the wet season and on the ground when it is dry.

FOOD & FEEDING

The chimp has two intensive feeding periods every day: early in the morning and late in the afternoon.

Fruits of all kinds make up the majority of the chimpanzee's diet. It will also eat insects and honey. It gets

most of the water it needs from fruit.

It was only recently discovered that the chimpanzee eats meat. It is now known that it hunts, kills, and feeds on a variety of mammals, including other primates, such as the

colobus monkeys, blue monkeys, and baboons.

The killing is almost always done by one adult male, who smashes the animal's head on the ground. The male eats his fill before sharing with the rest of the troop.

DID YOU KNOW?

- Chimpanzees suffer from many human diseases, including malaria.
- Chimpanzees are the only animals apart from humans that can recognize themselves in mirrors.

BREEDING

Breeding takes place year-round. When one of the females in the group comes into season, or *heat*, she will mate with several different males. The males show no signs of competition between themselves. Female chimpanzees have menstrual cycles much like humans, and come into estrus every 36 days unless they are pregnant. They give birth about every three years, after a gestation period of seven to eight months.

The young chimp is carried everywhere for its first five months, and is dependent on its mother for two years. By the time the youngster is 4 years old, it spends most of its time with other chimpanzees close to its own age. The young chimp reaches sexual maturity at 8 to 10 years old.



P. Morris Photography



T. Whitaker/Frank Lane Agency

Top: Chimpanzees may live to 50 years old, graying with age.

Above: The males will drum the ground and scream when trying to establish dominance.

Right: A mother carries her youngster everywhere.



H. Albrecht/Bruce Coleman Ltd.

SPECIAL ADAPTATIONS

Of the few animals that can use tools, the chimp is the most skilled. It uses sticks as weapons and to dig out the contents of insect nests. Some chimps will wet a long stick with saliva so that soldier ants will stick to it.



CHIMPANZEES & MAN

The chimpanzee's survival is more threatened by man than by anything else. Chimpanzees were driven away when large human populations took over their habitats. Today, hunting and trapping of chimpanzees for zoos and experimental use is a highly prof-

itable business in several parts of Africa.

Because of their biological and behavioral similarities to humans, chimpanzees have been used extensively for testing drugs. There is growing opposition to this practice, but it is still widespread.

SPERM WHALE

CARD 18



GROUP 1: MAMMALS

ORDER
Cetacea

SUBORDER
Odonoceti

FAMILY
Peridae

GENUS & SPECIES
Physeter macrocephalus



The sperm whale is the largest of the toothed whales and can reach a length of 65 feet. Its massive round head accounts for about one-third of its total body length.

KEY FACTS



SIZES

Length: Males, 50-65 ft.
Females, 35-55 ft.
Weight: Males average 80,000 lb.
Females, 44,000 lb.



BREEDING

Sexual maturity: About 10 years (40 ft. long) for males, but they usually breed after 25 years.
Mating: Males, annually. Females, about every 4 years.
Gestation: 14-16 months.
No. of young: Single calf.



LIFESTYLE

Habit: Sociable, live in groups.
Call: Whistles and clicks.
Diet: Bottom-dwelling fish.
Lifespan: Up to 70 years.



RELATED SPECIES

The pygmy sperm whale (*Kogia breviceps*) and the dwarf sperm whale (*K. simus*).



Range of the sperm whale.

DISTRIBUTION

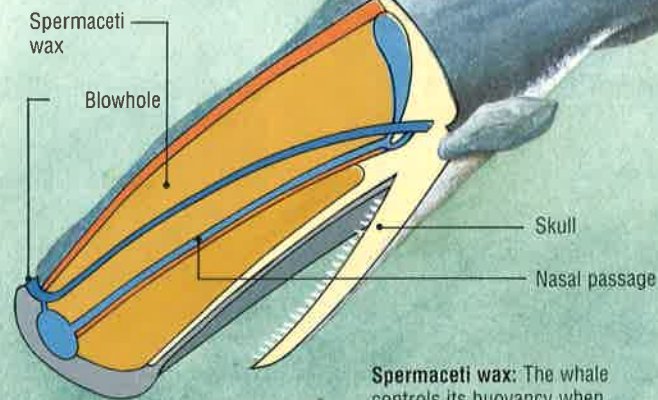
Sperm whales live in the oceans of the world in two groups—one migrates north of the equator to the Arctic and the other south of the equator to the Antarctic.

CONSERVATION

Despite protection from the International Whaling Commission, numbers have dropped from 170,000 males and slightly fewer females to only 71,000 males and 125,000 females.

SPECIAL ADAPTATIONS OF THE SPERM WHALE

Blowhole: The sperm whale can hold its breath for more than an hour underwater. It returns to the surface to blow (expel) spent air from its blowhole.



Spermaceti wax: The whale controls its buoyancy when ascending or diving by drawing water through the nasal passages to heat or cool the vast amount of spermaceti wax.



Sperm whales will protect an injured member of their group by gathering around it in a Marguerite formation.

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It is believed that the sperm whale dives deeper than any other marine mammal and may reach depths of more than 10,000 feet—although the deepest recorded dive is 4,000 feet. A large bull whale can dive deepest and for the longest period of time, staying underwater for up to 45 minutes.

BREEDING

Groups of sperm whales begin their migration to the equator from the Arctic and Antarctic every fall for the winter breeding season. The bulls attempt to form harems of up to 30 adult females. Fierce fights between rival males for females are not uncommon. Once the harem is established, the bull mates with any female not already pregnant or with young.

After mating, the female gives birth 14-16 months later. The other females protect her while she is giving birth, and then help the calf to the surface to take its first breath. The mother feeds her calf with fat-rich milk for as long as two years, by which time it has grown to a length of 23 feet.

Right: A female sperm whale with her day-old calf.



DID YOU KNOW?

- The sperm whale is born without teeth, which do not begin to grow until it reaches sexual maturity. The largest teeth are 11 inches long.
- A small group of whales is called a pod.
- The sperm whale can dive 560 feet per minute; it ascends to the surface at 460 feet per minute. When the whale expels air after a deep dive, the noise it makes can be heard half a mile away.

FOOD & HUNTING

The sperm whale feeds on bottom-dwelling organisms, such as squid. Sometimes, giant squid put up such a struggle that scars are made on the whale's head by its tentacles. Scientists are not certain how the sperm whale

catches its prey, but it is believed that the whale stuns it with very loud sound waves.

The sperm whale will also eat snapper, lobster, and even shark. It swallows its prey whole. An adult whale will eat up to 1 ton of food every day.

HABITS

The sperm whale is a sociable animal that lives in groups. The group structure varies according to the age and sex of the whale. Males generally live apart from females. The females form groups together with their young, numbering from five to 30 animals. There are also smaller bachelor pods of young, non-breeding whales,

as well as much larger harem groups, consisting of many females, young, and a dominant, sexually mature bull.

The whales, swim, dive, feed, and sleep together within their group. They also have a language of sonar clicks with which to communicate.

In summer, the whales migrate to feed in the Arctic and Antarctic.



WHALE & MAN

The sperm whale has been ruthlessly hunted by man for centuries, and continues to be persecuted. Whalers have taken advantage of the whale's protective instinct, whereby all members of a group will surround an injured animal in what is known as the Marguerite formation. Whalers harpoon a single sperm whale to attract other whales who come to its rescue and then kill them as well.

Man hunts the sperm whale for food, and for the oil its blubber provides. It is also hunted for the spermaceti wax found in its head and for a substance called *ambergris*, found in its intestines.

Top left: An adult sperm whale is about 150 times the size of a man.

Left: The sperm whale dives deeper than any other marine mammal.

Right: Human exploitation of the sperm whale has left the species in a fierce struggle for survival.



BACTRIAN CAMEL

GROUP 1: MAMMALS

ORDER
Artiodactyla

FAMILY
Camelidae

GENUS & SPECIES
Camelus bactrianus



The Bactrian camel is the only truly wild, two-humped camel in the world. It lives in the Gobi desert, and, like the one-humped camel, it can go for long periods without water.

KEY FACTS



SIZES
Height to shoulder: 6 ft.
Height to hump: Up to 7 ft.
Length: 11-12 ft., including tail (21-25 in. long).
Weight: 1,000-1,500 lb.



BREEDING
Sexual maturity: 5 years.
Mating: February.
Gestation: About 13 months.
No. of young: 1 calf.



LIFESTYLE
Habit: Females live in small herds with 1 male. Other males solitary.
Diet: Grasses and shrubs.
Lifespan: Longest recorded, 50 years.



RELATED SPECIES
The one-humped camel, *Camelus dromedarius*. *Camelidae* is the only family in the suborder *Tylopoda*.



Range of the Bactrian camel.

DISTRIBUTION

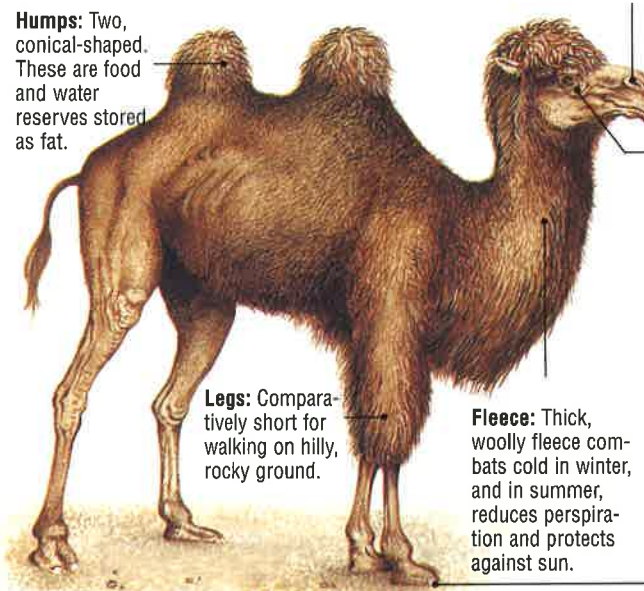
In its wild state, it is found only in the Gobi desert in Mongolia. Domestic Bactrian camels occur in Afghanistan, Turkey, the former Soviet Union, Iran, and China.

CONSERVATION

There are thought to be fewer than 1,000 wild camels in the Gobi desert. It is now considered an endangered species.

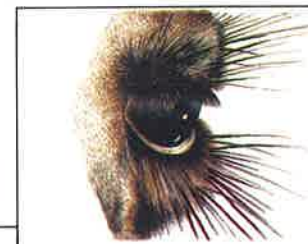
SPECIAL ADAPTATIONS OF THE BACTRIAN CAMEL

Humps: Two, conical-shaped. These are food and water reserves stored as fat.



Legs: Comparatively short for walking on hilly, rocky ground.

Fleece: Thick, woolly fleece combats cold in winter, and in summer, reduces perspiration and protects against sun.



Eyelashes: Long, in double rows to protect eyes from wind-blown dust and sand.



Feet: Soles have thick, elastic pads that expand to distribute the camel's weight. They help to support it in soft sand.

The Bactrian camel is named after the part of the region it inhabits, Bactria, on the border of Afghanistan and Uzbekistan (former Soviet Union). The first camels appeared in North America 40 to 50 million years ago, descended from an animal the size of a small dog. They migrated to Europe and Asia two million years ago and became nearly extinct in their original habitat.

HABITAT

Once found over a vast range in Asia, Bactrian camels now inhabit only Mongolia's remote Gobi desert. They are specially adapted to cope with the extremes of climate found in this region. They form small groups of six to 20 animals that are led by a mature male. Young males spend most of their time wandering alone.

Within their habitat, the camels may be found in

desert, semidesert, grassy steppes, and mountainous regions up to 6,500 feet. In the summer, they are most likely to be found in dry valleys and on nearby hills. During the winter, they frequent dried-up creek and stream beds and oases.

Below: The wild landscape of the Gobi desert is now the last refuge of the Bactrian camel in its natural habitat.



BREEDING

In the wild, Bactrian camels mate in February. The males chase off young animals in order to have access to the females.

Mating takes place while the camels are sitting down, but the female gives birth in a standing position a year and a month later. A single young is born. Within several days, it can walk perfectly with the

ambling gait that is characteristic of the adult camel.

The females nurse for five years until the young reach sexual maturity. Young males are then driven out to form bachelor herds; young females remain with their mothers. Older males return to the herd during mating season, but are often driven out by younger rival males.



Left: Thick, shaggy fur insulates the camel from extremes of temperature, preventing it from losing warmth at night and slowing the warming process during the day.



Left: A calf will remain close to its mother for the first five years of its life. The young camel's coat eventually becomes the same color as its mother's.

FOOD & FEEDING

Like domestic cows, camels are *ruminants*—that is, they feed and then regurgitate the food and chew it again. This is also called chewing cud. Able to survive on extremely sparse vegetation, they eat the tough grass, herbs, thin branches, and foliage of the shrubs that grow in their arid environment. They search for food in the morning and evening and chew cud in the afternoon.

The camel can tolerate great variations in its body temperature—from 86° F to 105° F—and therefore, it loses little water through perspiration. Although camels can go for long periods without water, they do not actually store it in their humps. The humps are, in fact, reserves of fat that are converted into water when the camel becomes dehydrated.

DID YOU KNOW?

- A Bactrian camel can drink quantities equaling up to 30 percent of its body weight at one time.
- In the desert without water a camel can survive up to 10 times as long as a human and four times as long as a donkey.
- Camels dislike wet conditions, but they can tolerate temperature variations ranging from 16° F to 120° F.
- Males, females, and young camels are known respectively as stallions, mares, and calves.
- In 1860, 15 Bactrian camels were imported to the United States to haul salt across 200 miles of desert.

CAMEL & MAN

It is thought that the Bactrian camel was domesticated by man as early as 2,000 B.C. It is presumed to be a descendant of the feral camel.

At the end of the 19th cen-

ture, Bactrian camels were discovered in China's Lobnor desert by Russian explorer Nikolai Przewalski. It was established that, in its natural state, the Bactrian camel is a

truly wild, rather than domesticated, animal.

The Bactrian camel is also an important source of wool, milk, meat, and transportation in the desert.



Left: Camels can drink up to 25 gallons at once and can suffer huge losses of water without ill effect.