

EUROPEAN WATER SHREW

CARD 92

GROUP 1: MAMMALS



ORDER
Insectivora

FAMILY
Soricidae

GENUS & SPECIES
Neomys fodiens



The European water shrew is a semiaquatic animal and is one of the largest of all shrews. It spends its time swimming and hunting for food in streams and rivers.

KEY FACTS



SIZES
Length: 5 in., including tail.
Weight: Up to 3/4 oz.



BREEDING
Sexual maturity: Male, 12 weeks.
Females, 6 weeks.
Mating: April to September.
Gestation: 24 days.
Litter size: 3-8 young.



LIFESTYLE
Habit: Short, alternate periods of activity and sleep at regular intervals, day and night. Lives alone or in family groups.
Diet: Snails, insects, crustaceans, earthworms, frogs, small fish.
Lifespan: 14-19 months.



RELATED SPECIES
There is only one other species in this genus, *Neomys anomalus*. There are 246 different species in the family *Soricidae*.



Range of the European water shrew.

DISTRIBUTION

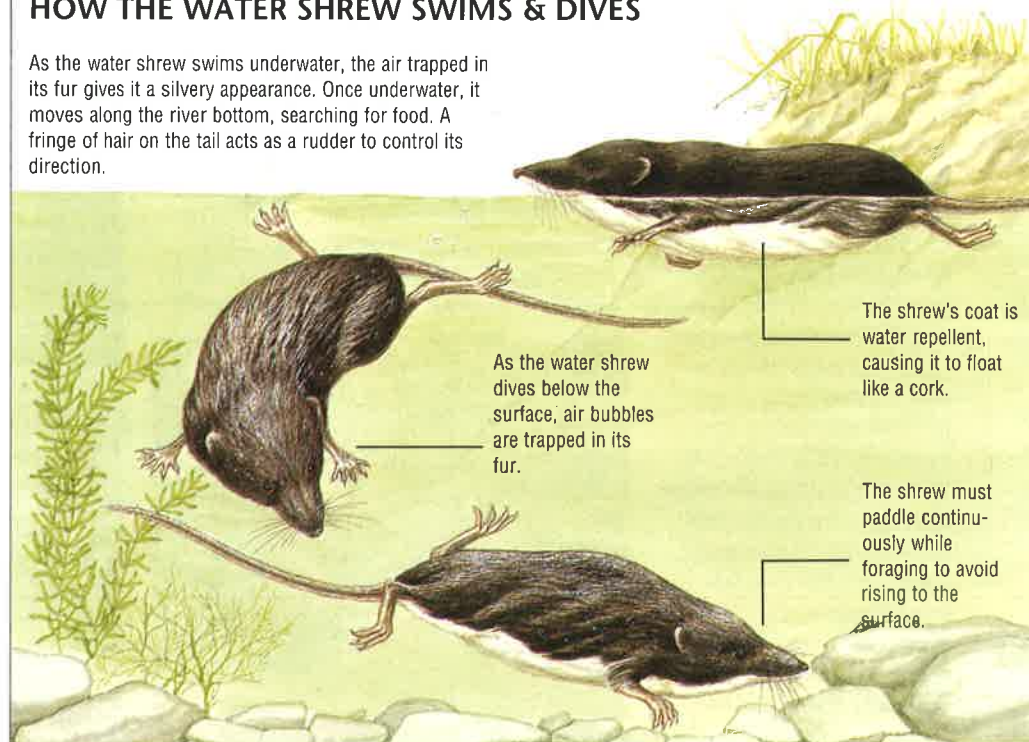
Throughout most of Europe and Asia. Found at all altitudes.

CONSERVATION

The shrew is sometimes considered a pest because it eats the spawn of valuable fish stocks. Pollution and draining of waterways and wetlands threaten its habitat in some areas.

HOW THE WATER SHREW SWIMS & DIVES

As the water shrew swims underwater, the air trapped in its fur gives it a silvery appearance. Once underwater, it moves along the river bottom, searching for food. A fringe of hair on the tail acts as a rudder to control its direction.



As the water shrew dives below the surface, air bubbles are trapped in its fur.

The shrew's coat is water repellent, causing it to float like a cork.

The shrew must paddle continuously while foraging to avoid rising to the surface.



Left: Although shrews have poor eyesight, they have excellent senses of smell and hearing. They communicate with one another by scent and also with high-pitched squeaks and twitters. They are aggressive when protecting their territories from other shrews.

The water shrew lives

near slow-flowing, clear rivers and streams.

It swims and dives well but seldom ventures

far from the bank. The shrew is a solitary

and territorial animal, but occasionally

it lives in family groups.

BREEDING

The shrew's mating season is from April to September. If the male approaches a female that is not ready to mate, they often fight instead. During mating, the male behaves aggressively, which might trigger the female to ovulate (produce eggs).

The female often mates again soon after giving birth. Three to eight young are born in the nesting chamber. The female may bear two or three litters a year.



Left: The young are naked and blind at birth, and they weigh only a fraction of an ounce. They grow quickly and are weaned after four weeks, when they are ready to leave the nest.

HABITS

Although it sometimes lives in family groups, the water shrew is mainly solitary and occupies its own territory. It builds a nest in an existing hole in a riverbank or it digs a tunnel. The shrew lines the nest with grass, roots, and moss.

The shrew alternates between activity and rest both day and night. It comes ashore at frequent intervals to dry off by squeezing through the narrow passageways of its tunnel to rid its fur of moisture. It then grooms itself.

DID YOU KNOW?

- Because the water shrew completely digests its food in three hours, it must feed frequently throughout both day and night.
- Water shrews occasionally migrate in groups of several hundred.
- The water shrew's saliva contains venom that it uses to stun larger prey, such as fish and frogs, to prevent the prey from struggling. The salivary glands of one shrew contain enough poison to kill 200 mice.

FOOD & FEEDING

The water shrew regularly leaves its nest for short periods throughout the day to forage. It mainly eats crustaceans and other aquatic animals such as whirligig beetles and water gnats. It also catches larger prey like frogs and small fish.

On land the water shrew uses its good sense of smell to hunt for earthworms and insects. In water it searches along the bottoms of streams and rivers. It looks for prey under stones and among weeds in much the same way it does on land. Once the shrew has caught its prey, it rises quickly to the surface. The water shrew has sharp,

pointed teeth, which allow it to overpower prey that is considerably larger than itself. A water shrew eats more than its own weight in food every day and hoards food when it is plentiful.

Right: A shrew dives toward the bottom of a river.

Below: A shrew eats a bullhead fish.



NATUREWATCH

Despite their wide range and constant activity, shrews are very difficult to spot. The best places to keep watch are near the banks of slow-moving and clear, shallow streams

and rivers. Shrill squeaks coming from the grass near the water's edge indicate that the water shrews are fighting among themselves to defend their territories.



ARCTIC HARE

CARD 95

GROUP 1: MAMMALS

ORDER
Lagomorpha

FAMILY
Leporidae

GENUS & SPECIES
Lepus timidus



The Arctic hare lives farther north than any other hare. By conserving its body heat, it can survive in temperatures as low as -36° F.

KEY FACTS



SIZES

Length: Body, 1-3 ft. Tail, 3-5 in.
Weight: 5-10 lb.



BREEDING

Sexual maturity: 1 year.
Mating season: Spring and summer.
Gestation: 50 days.
No. of young: 1-9, usually 5-6.



LIFESTYLE

Habit: Mostly solitary, but seen in large groups during breeding season and also in autumn and winter in northernmost regions.
Diet: Grasses and arctic willow; grain in warmer climates.
Lifespan: Average 2 years.



RELATED SPECIES

A subspecies *Lepus timidus scoticus*, is found in Scotland. Another, *L. timidus hibernicus*, occurs in Ireland but does not turn white.



Range of the Arctic hare.

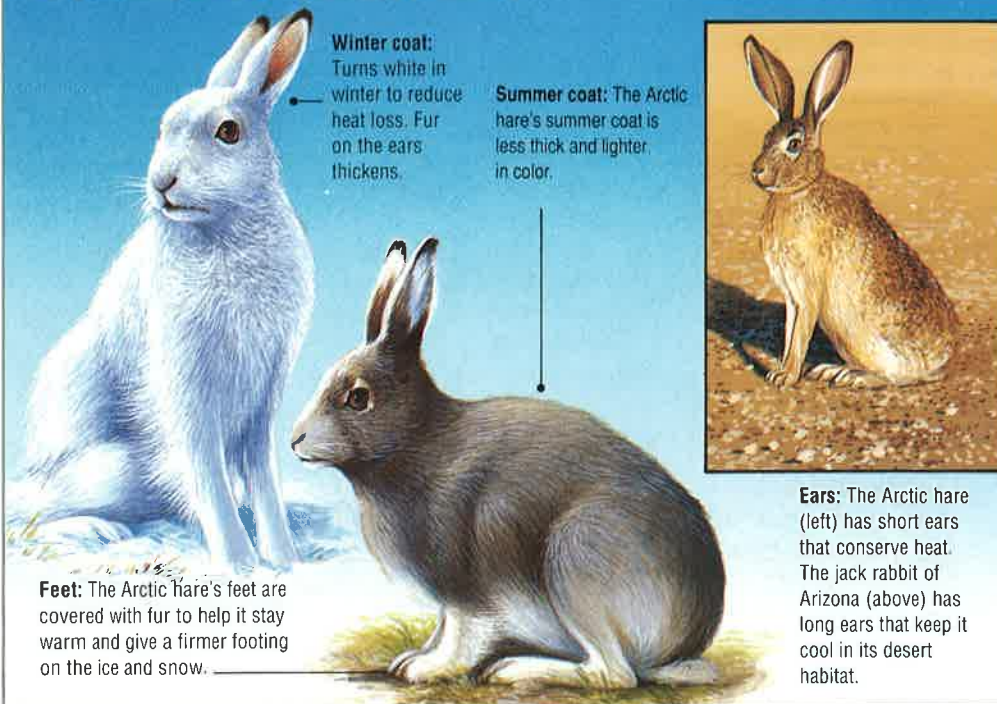
DISTRIBUTION

Arctic and northern temperate regions of the world, including Alaska, Greenland, Europe, and Asia.

CONSERVATION

The Arctic hare is currently in no danger of extinction. Still, as the human population expands into the Arctic region, and as pollution increases, the threat to its survival grows as well.

FEATURES OF THE ARCTIC HARE



The Arctic hare inhabits

some of the most inhospitable terrain

in the world. The barren landscape provides

little cover, and the hare is exposed to stinging

winds and freezing snow

throughout the year.



SPECIAL ADAPTATIONS

Like many grazing animals, the Arctic hare is preyed upon by *carnivorous* (meat-eating) animals, such as the Arctic fox, the wolf, and the golden eagle. To protect itself from predators, the Arctic hare has several features that help it to escape detection and attack.

During winter, the hare's coat turns completely white, which provides excellent camouflage in the snow and ice. Depending on the temperature and location, the hare usually *molts* (sheds) its coat in spring, re-

placing it with a darker one. The color change is triggered by the temperature and the sunlight, as well as by the hare's need to blend in with its seasonal surroundings.

The most important adaptations of the Arctic hare are its keen eyesight, acute hearing, and speed. Its eyes are set at the top of its head, giving the hare a wide field of vision. Once it has sighted a predator, it freezes. The hare bounds away only when it knows that it has been detected.

Left: The Arctic hare's winter fur camouflages it in snow and conserves body heat.

Below: The Arctic hare has very keen eyesight and hearing to help it detect predators.



FOOD & FEEDING

A large part of the Arctic hare's diet consists of the small arctic willow shrub. The hare looks for food at night. In the northernmost part of its range, snow covers the ground for as many as 280 days a year.

Most of the plants on the tundra grow close to the ground for protection against

freezing winds. When the plants become covered with snow and ice, hares have a difficult time digging out enough food for survival and may die of starvation.

Below: The Arctic hare is a timid, solitary animal, but it sometimes joins other hares for protection.

HABITS

The timid Arctic hare, also known as the mountain hare, is solitary throughout most of the year. But, in winter it gathers in large groups with other hares to give it some protection from predators. When the group is attacked, the hares scatter in all directions to confuse the predator.

The hares living in the southern part of the Arctic

move into the forests that border the *tundra* (Arctic plain) at the onset of winter, which give them some protection from the cold winds. Those remaining on the tundra seek shelter behind scattered rocks.

During the day, the Arctic hare rests in a shallow hole that it scrapes in the ground, called a *form*.

DID YOU KNOW?

- The natural habitats of rabbits and hares are found throughout the world. One exception is Australia, where hares were absent until they were introduced by man.
- The Alaskan hare has the fastest growth rate of any

- hare in the world.
- Hares appear often in the cave paintings of prehistoric civilizations. The ancient Romans raised them in walled enclosures for their meat, which was regarded as a delicacy.

BREEDING

During the breeding season, the male hare, called a *jack*, fights with other males to attract a female, or *doe*. Mating takes place in spring throughout most of the range, except in the most northern parts, where breeding begins in May.

One to nine young rabbits, called *leverets*, are born 50 days after mating. Although this is a longer gestation period than is usual for

hares, the extra time spent developing in the mother's womb means that the leverets are well developed at birth, which increases their chances of survival in the harsh environment.

The leverets have complete coats of fur at birth and are able to see clearly. They feed on the doe's rich milk once a day. The leverets often scrape out their own *forms* (holes) several days after birth.

RIGHT WHALE

CARD 97

GROUP 1: MAMMALS

ORDER
Cetacea

FAMILY
Balaenidae

GENUS & SPECIES
Balaena glacialis



The right whale is a giant of the seas. Instead of teeth, it uses long plates called baleen or whalebone to strain its food while skimming the surface of the water.

KEY FACTS



SIZES

Length: Adults, 40-60 ft. Calves, 12-18 ft. at birth.
Weight: Adults, about 60 tons.



BREEDING

Sexual maturity: 5-10 years.
Mating: Early spring.
Gestation: 9-10 months.
No. of young: 1.



LIFESTYLE

Habit: Sociable; lives in small herds of 6 adults and young.
Call: Loud bellows, soft moans and belches, series of pulsing sounds.
Diet: Plankton, krill, and ocean-bottom mollusks.
Lifespan: Not known, but thought to be about 30 years.



RELATED SPECIES

There are 3 very similar sub-species: *Balaena glacialis glacialis*, *B. g. japonica*, and *B. g. australis*.



Range of the right whale.

DISTRIBUTION

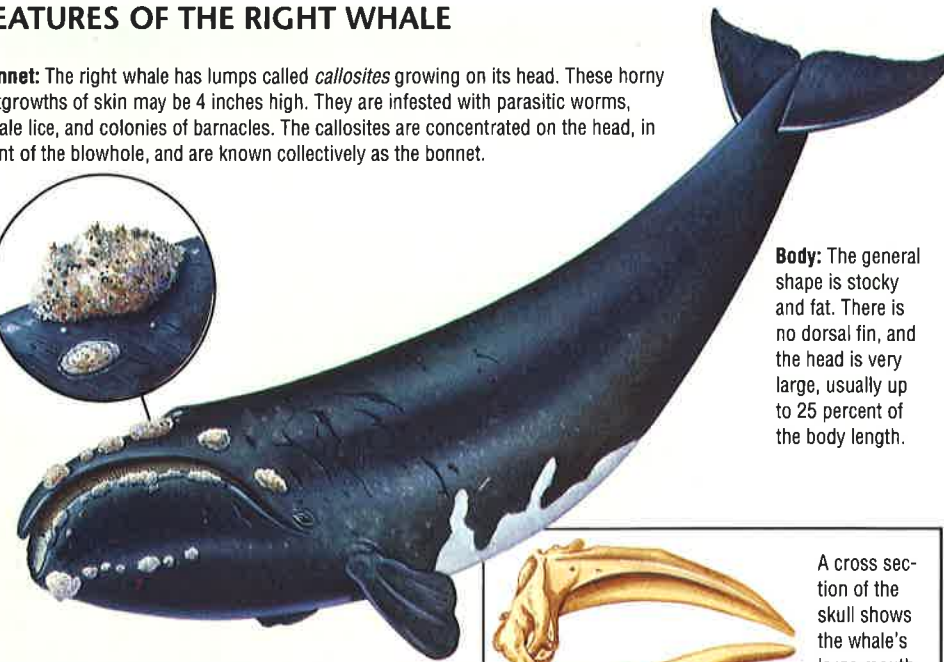
Now found only off the coasts of Newfoundland, Madeira, Patagonia, southwestern Australia, New Zealand, Chile, Alaska, and the Aleutian Islands.

CONSERVATION

Once the most hunted of all whales, the right whale is now protected by law. There are only about 2,000 left. Although its numbers are increasing, it is still endangered.

FEATURES OF THE RIGHT WHALE

Bonnet: The right whale has lumps called *callosites* growing on its head. These horny outgrowths of skin may be 4 inches high. They are infested with parasitic worms, whale lice, and colonies of barnacles. The callosites are concentrated on the head, in front of the blowhole, and are known collectively as the bonnet.



Body: The general shape is stocky and fat. There is no dorsal fin, and the head is very large, usually up to 25 percent of the body length.



A cross section of the skull shows the whale's large mouth area.

Baleen: There are 225 to 250 plates at each side of the mouth. Each is up to 8 feet long and fringed with stiff bristles.

Old-time whalers gave the right whale its unusual name because they thought it was the "right" whale to hunt—it swam very slowly, floated even when it was dead, and yielded large quantities of oil and whalebone.



BREEDING

Mating occurs in early spring, after a playful courtship ritual in which the male pushes and nuzzles the female and then

Below: With a powerful leap, a large male clears the water.

strokes her with his flippers and tail flukes.

After a gestation period of nine to ten months, a single calf is born tail first in a shallow bay. Right away the newborn is pushed to the surface

so it can take its first breath.

The calf nurses for seven months and spends the next two or three years close to its mother. It begins to breed at five to ten years. It is thought that right whales breed earlier

and more frequently today than in the days before whaling to compensate for their lost numbers.

Below: A calf spends its first three years close to its mother.



HABITS

The right whale lives in shallow coastal waters in herds of up to six family members. Individuals may swim off to join another group, but in a few days they return to the original herd.

The right whale often leaps

up from the water's surface (called *breaching*) and blows its V-shaped spout up to a height of 16 feet. It cruises on the surface for 5 to 10 minutes, blowing about once a minute, and then dives below for 10 to 20 minutes.

When diving, the whale lifts its tail out of the water and brings it crashing down onto the surface. This action is called *lob-tailing* and is how a whale indicates its position when the sea is too rough to allow its voice to be heard.

DID YOU KNOW?

- Right whales are rarely stranded because they are familiar with shallow water.
- The right whale is also known as the Biscay whale, Biscayan right whale, and great right whale.

- The right whale's head is about one-fourth its length. It has an arched jaw to accommodate the eight-foot-long baleen plates.
- A recording picked up a regular clacking noise that

was thought to be the right whale's *echolocation* system, sounds that enable whales to navigate. The noise was discovered to be made by baleen plates banging into each other during feeding.

RIGHT WHALE & MAN

Because it moves slowly (its top speed is just over six miles per hour) and yields large quantities of oil and whalebone, the right whale has been hunted more than any other whale. It was finally protected by law in 1936.

Most hunting occurred in the Southern Hemisphere, with huge catches recorded off New Zealand. Once widespread, this whale is now found only in scattered herds.

Below: Moving slowly, a whale feeds on krill and plankton.



FOOD & FEEDING

The right whale feeds by slowly skimming the ocean surface with its mouth open. Every few minutes it closes its lips and presses its tongue against the roof of its mouth to strain the water out between long baleen plates. The baleen is actually made of fused hairs, not bone.

Plankton and krill trapped by the bristles are collected by the whale's tongue and swallowed. Debris also gets caught on the plates, and the whale frequently stops to roll the debris into a ball with its tongue and then flick it out of its mouth.

POLECAT

CARD 99

GROUP 1: MAMMALS

ORDER
Carnivora

FAMILY
Mustelidae

GENUS & SPECIES
Mustela putorius



A solitary, nighttime hunter, the polecat is a European relative of the skunk. It was once widespread in Europe but was almost wiped out in some areas.

KEY FACTS



SIZES

Height: 3-4 in.
Length: 15-18 in.
Weight: 1-4 lb.



BREEDING

Sexual maturity: By March of the year after birth; can be as young as 8 months.
Breeding season: Between March and June.
Gestation: 40-43 days.
No. of young: 5-10. May sometimes produce 2 litters per year.



LIFESTYLE

Habit: Solitary, nighttime hunter.
Diet: Rabbits, hares, mice, birds and their eggs, lizards, frogs, and large insect larvae.
Lifespan: 4-5 years in the wild, up to 14 in captivity.



RELATED SPECIES

The ferret, *Mustela putorius furo*, and the steppe polecat, *Mustela eversmanni*, are close relatives.



Range of the polecat.

DISTRIBUTION

Europe from Atlantic coast to Urals, north to southeastern Norway and south to the Mediterranean and Black seas.

CONSERVATION

Once nearly extinct in Britain, it is now recovering and its numbers are multiplying rapidly. Common in other parts of Europe in areas away from human settlement.

HOW TO RECOGNIZE THE POLECAT

The polecat has a long, low body with a bushy tail. Its creamy yellow underfur is covered with long, coarse guard hairs in dark brown or black. A striking feature is the characteristic "face mask" that differs from the markings of the polecat-ferret.



The polecat-ferret is a cross between a ferret and a polecat and usually has a pale coat.



A ferret is a domesticated polecat used for catching rabbits. Usually smaller, it often has creamy white fur.





The polecat lives in a wide variety of habitats, from woodlands to sand dunes. Once disliked because of its habit of killing game birds, it is now appreciated by foresters for controlling the rodents and rabbits that destroy the bark of trees.

HABITS

Polecats are solitary hunters and are active mainly at night. Males may have territories as large as 6,000 acres, which they patrol regularly in search of prey. Females have smaller territories that may overlap those of other females and males. Territories are marked by secretions of an oily, pungent musk. The polecat also sprays its scent when frightened or angry.

Left: A dark-faced adult polecat sniffs the night air for the scent of prey.

DID YOU KNOW?

- The male polecat is almost twice as heavy as the female. Males hunt larger prey, leaving smaller prey for females, thus avoiding competition for food between the sexes.
- In winter, the polecat's coat changes to silver-gray, which provides excellent camouflage.
- The skunk, a close relative of the polecat, has highly developed anal scent glands. Its secretions are so pungent that they may temporarily stop a predator's breathing.

BREEDING

Polecats breed from March to June. The female allows the male to drag her around by the scruff of her neck for as long as an hour. They then mate several times. The repeated mating usually guarantees fertilization.

The female gives birth in a nest of dry grass and moss to a litter of 5 to 10 young 40 to 43 days later. She guards them carefully and, for the first few days, leaves the nest briefly to feed. She also leaves the nest to defecate and urinate, which

keeps the nest clean and is a habit that the young soon acquire.

The female suckles her young for a month, during which time she brings them small pieces of meat, which they suck and chew. When the young are a month old, their eyes open and they follow their mother out of the nest to begin exploring their surroundings. After learning to hunt, the young polecats are ready to fend for themselves in the fall.



NATUREWATCH

The most common sign that polecats live in the area is the presence of young that have been run over on the roads. Young are especially vulnerable to cars in the fall, when they

leave their mother to establish territories of their own.

Polecats' droppings contain fur and bones. Mink droppings are similar but usually contain fish bones.



FOOD & HUNTING

The polecat preys on many other animals, including birds, toads, frogs, lizards, and snakes. It also eats smaller prey such as earthworms and insect larvae.

Polecats are ruthless hunters, killing entire litters of animals but eating only one or two. They have even killed all the birds in a henhouse without eating a single one.



Far left: Polecats paralyze frogs and toads by pithing, or biting through the brain stem. This leaves the victims alive but immobile.

Left: Polecats are fierce hunters, often catching prey much larger than themselves, such as rabbits. They kill them with a bite to the neck.

POLECAT & MAN

At one time, the polecat was hunted for sport. Today it is appreciated in wildlife reserves because it controls the numbers of small rodents that destroy saplings by gnawing the bark. The polecat is also welcomed by some farmers, who encourage it to live in barns and kill rats and mice.

The polecat's fur is thick and silky and was valuable to the fur trade. As recently as the 1970s, thousands of polecats were killed for their skins each year. Now that public opinion has turned against the wearing of animal furs, the trade in polecat skins has almost ended.



Top & above: Born in a secure nest, the young are watched over by their mother.

Left: Baby polecats on an outing with their mother.

LYNX

CARD 100

GROUP 1: MAMMALS

ORDER
Carnivora

FAMILY
Felidae

GENUS & SPECIES
Felis lynx



The lynx is a nocturnal hunter that ambushes its prey. This solitary animal inhabits the forests of North America, Europe, and the Soviet Union.

KEY FACTS



SIZES
Length: 2-3 feet. Male larger than female.
Height to shoulder: 2 ft.
Tail length: 2-6 in.
Weight: 11-55 lb.



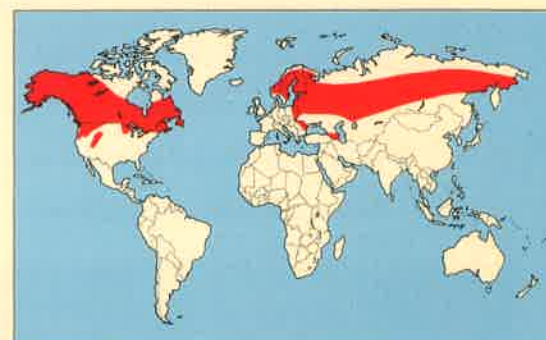
BREEDING
Sexual maturity: 1 year.
Mating season: Mid-March to early April.
Gestation: 60-73 days.
No. of young: Up to 4, but usually 1 or 2.



LIFESTYLE
Habit: Solitary.
Diet: Small mammals such as birds, hares, rabbits, foxes, and deer.
Lifespan: 10-20 years.



RELATED SPECIES
 The pardel lynx, *Felis pardina*, found in southern Europe, is closely related, as is the bobcat, *F. rufus*, of North America.



Range of the lynx.

DISTRIBUTION

Canada and Alaska south into Washington, Oregon, Idaho, and Montana. Parts of New England, New York, Michigan, and Wisconsin. Also parts of Europe and the Soviet Union.

CONSERVATION

Although its range is greatly diminished, particularly in Europe, the lynx is still quite common.

FEATURES OF THE LYNX

Coat: Its coat varies in color from pale, sandy gray to a rusty red. Its thin summer coat has faint spots. In winter the coat becomes much denser and is a frosty gray color.

Feet: Its feet are large, round, and padded underneath to help it travel over deep snow.

Smell: The lynx has an exceptional sense of smell that helps it detect prey over varying distances, depending on the animal.



Ears: The lynx has long tufts of fur in its ears that help it to hear.



The lynx once inhabited forests throughout North America, Europe, and Asia, but today its range is severely limited because of the clearing of woodlands. The lynx has also been widely hunted for its pelt, further decreasing the population.



Above: Lynxes rest on a rocky outcrop before starting their nightly hunt.

HABITAT

The lynx is found in forests among dense vegetation. It is a nocturnal hunter, and it occupies a home range that varies in size according to the availability of prey. When prey is abundant, the male roams over an area of up to 20 miles, while the female has a range half that size. When prey is scarce, the lynx roams farther to find food.

The male marks his territory by shredding the bark on tree trunks and spraying them with urine. Like a domestic cat, the lynx buries its droppings. Still, when it is marking the boundary of its territory, it leaves them unburied to warn other animals of its presence.

DID YOU KNOW?

- The name lynx is derived from Lyncaeus, the name of the sharp-eyed pilot on Jason's ship, the Argos.
- Studies of the lynx in captivity reveal that its acute sense of smell can detect a rat at 250 feet.
- Although the lynx swims and climbs well, it does not run very fast.
- A lynx can jump six feet into the air to catch a bird as it takes off from the ground.
- In some parts of Europe, Stone Age man hunted the lynx to extinction.

LYNX & MAN

The lynx was once more widespread than it is today, especially in Europe. The clearing of forestland has destroyed the animal's habitat and forced it to retreat into a smaller range. Hunting has decreased its numbers as well. Like other members of the cat family, the lynx has been extensively hunted, primarily for its fur, but also for its meat.

The main threat to the lynx is the farmer. Although some farmers see the lynx as beneficial since it kills foxes, rodents, and horseshoe hares, others regard the lynx as a pest because it kills sheep, goats, and other livestock. In western Europe the species has been almost exterminated for this reason.

BREEDING

The normally solitary male leaves its range and searches for a mate in mid-March to early April. He fights with rival males, and he can be heard making a high-pitched shriek and wail during this time.

After mating, the female

gives birth to a litter of up to four kittens in a hollow tree or beneath dense undergrowth. The furry kittens are born blind and helpless, and they develop slowly. They open their eyes after 10 days and begin to venture outside the

den five weeks later.

The kittens are weaned at two months but remain with their mother until the following spring.

Below: The young cannot survive their first winter without their mothers.



FOOD & HUNTING

The lynx is a carnivore, or meat eater. It is not as fast as some of its feline relatives, so it locates its prey with its sharp eyesight and acute hearing, often ambushing it rather than chasing it.

It catches its prey by waiting behind a boulder or on a low branch of a tree, attacking before the victim has a chance to escape.

In northern Europe, the lynx hunts foxes, rabbits, hares, rodents, birds, and small deer. In warmer parts of its range, the lynx buries the remains of a kill to eat later, but if it were to do so during the winter, the meat would freeze and become

difficult to eat.

In the United States and Canada, the lynx mainly hunts snowshoe hares. In these areas, the lynx's population fluctuates, paralleling that of the snowshoe hare, whose population peaks every 9 to 10 years. The lynx also eats meadow voles, small deer and moose, caribou, and sheep. Unlike its European relative, the North American lynx hides meat by covering it with a thin layer of snow or leaves.

Right: The lynx's short, powerful legs and especially large paws are well adapted for hunting in deep snow.

