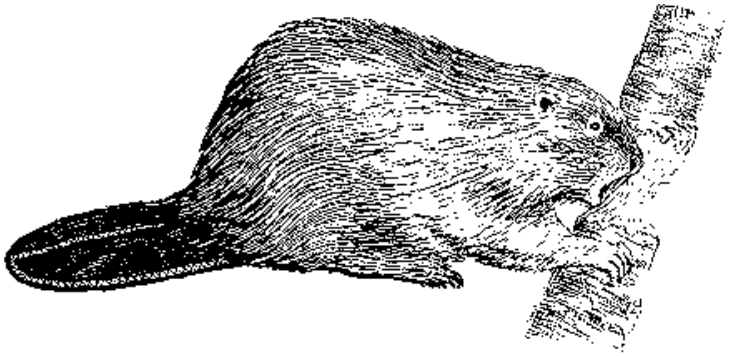
MIDDLE CREEK WILDLIFE MANAGEMENT AREA

Self-Directed Curriculum

Connect With Wildlife



By Dan Lynch, Wildlife Education Specialist

www.pgc.pa.gov 2017

Self-Directed Curriculum Kits

- Connect With Wildlife

  Students compare and identify twelve different Pennsylvania mammals using their pelts and wildlife background information.

- Decoy Detective

  Students use the decoys to learn about waterfowl identification and divide birds into a diver or puddle duck classification.

- Feet Are Neat

  Students explain the role of bird feet in bird survival and compare and contrast bird feet adaptations.

- Let's Wing It

  Students compare and identify the different types of flight feathers that make up a bird's wing.

- Scatology

  Students create fake animal scat and learn to identify an animal by its droppings.

- Skull King

  Students infer from a skull what classification and niche the animal inhabits.

- The Nose Knows

  Students identify different food smells and will compare the ability to distinguish different smells to animals using their sense of smell to find mates, offspring and food.

- Wildlife Tracks

  Students use a variety of methods to observe, identify, collect and document tracks of different common wildlife species in Pennsylvania.

Connecting With Wildlife - Teacher's Page

Objective:

Students will compare and identify twelve different Pennsylvania mammals using their pelts and wildlife background information.

Materials Needed:

- Collection of 12 wildlife pelts
- Set of corresponding Critter Cards
- Set of corresponding Wildlife Notes

Background:

Information about all of the animals is included in the Critter Cards and Wildlife Notes

Activities:

There are multiple ways to teach this activity:

1) Teacher reads the Critter Card and Wildlife Note information beforehand and then holds up each pelt asking students for their ideas as to what species it is. Then the teacher has the students take notes while he/she provides the background information to the students on each species.

2) Teacher sets up 6 - 12 learning stations with 1 - 2 pelts at each station along with the Critter Cards and Wildlife Notes. Small student groups rotate through the learning stations.

3) Teacher gives each group of students a pelt and the appropriate Critter Cards, Wildlife Notes and poster paper. Students are given 15 - 20 minutes to research their species and create a poster highlighting 5 - 10 different characteristics about their species. Students team teach their information to the rest of the group.

CRITTER CARDS

Designed and created by
Daniel Lynch & Cheryl Trewella
Pennsylvania Game Commission

TABLE OF CONTENTS

Designed and created by
Daniel Lynch & Cheryl Trewella
Pennsylvania Game Commission

BEAVER

Animal Family: Rodent
Latin Name: Castor canadensis
Preferred Habitat: Streams, rivers, ponds, lakes near hard-woods forests
Eating Habits: Herbivore: prefer the cambium (growing layer), twigs, buds and leaves of trees such as willow, aspens, cottonwoods, birch, alder, cherry, oak and other trees. Fleshy roots of cattails and water lilies.
Fun Facts:

- largest rodent in PA, poor eyesight, excellent sense of smell and hearing
- webbed hind feet used for swimming and one split toenail on each hind foot used for grooming coat
- build dams to back up water closer to their food sources
- tail used for swimming, balance, fat storage and danger alert
- scent gland for marking territory

Designed and created by
Daniel Lynch & Cheryl Trewella
Pennsylvania Game Commission

BOBCAT

Animal Family: Felidae
Latin Name: Felis rufus
Preferred Habitat: Ideal habitat is wooded land broken up by brushy thickets, reverting fields, and south-facing rock outcroppings

Eating Habits: Carnivore: small mammals, birds, insects, reptiles, fish, carrion and deer

Fun Facts:

- common in PA, mountain lions are not!
- nocturnal and secretive by nature
- retractable claws similar to all cats
- track pattern does not show claws
- populations seem to be increasing and road kill cats are showing up in southern PA counties where they never did before
- PA has a limited trapping and hunting season
- short or "bobbed" tail 3" to 7" long

Designed and created by
Daniel Lynch & Cheryl Trewella
Pennsylvania Game Commission

COYOTE

Animal Family: Canidae
Latin Name: Canis latrans
Preferred Habitat: Brush-land, mixed forests, marshes, agricultural areas and suburban settings
Eating Habits: Omnivore: small mammals to deer, birds, eggs, insects, fruits, berries, grasses, crops, human garbage, domestic cats, poultry, carrion

Fun Facts:

- coyotes are found in all 67 PA counties,
- they have adapted well to living around people
- coyotes do not eat people
- come in all color varieties from red, brown, black, blonde and crosses of these colors
- can be hunted 365 days a year
- howl, bark and whine similar to domestic dogs
- scat is black when fresh, twisted and approximately 3" to 7" long

Designed and created by
Daniel Lynch & Cheryl Trewella
Pennsylvania Game Commission

WHITE-TAILED DEER

Animal Family: Cervids
Latin Name: Odocoileus virginianus
Preferred Habitat: Brush staged forest with a wide variety of plants, forest and field edges, woodlots in farming country, suburbs and deep woods

Eating Habits: Herbivore: primarily a browser feeding on soft and woody tissue from a wide variety of trees, shrubs and crops

Fun Facts.:

- deer hides used by early settlers and Indians for clothing/shelter
- deer hair is hollow and when it is bent over in your fingers it breaks into a tepee shape
- male deer called a buck, female a doe, young are fawns, male deer grow antlers which are the fastest growing bones known to man
- we age deer by looking at the wear on their molar teeth

Designed and created by
Daniel Lynch & Cheryl Trewella
Pennsylvania Game Commission

FISHER

Animal Family: Mustelidae or weasel
Latin Name: Martes pennanti
Preferred Habitat: Large unbroken tracts of mature hardwood and coniferous forests
Eating Habits: Carnivore: mice, shrews, chipmunks, rabbits, snowshoe hares, birds, eggs, carrion and porcupine

Fun Facts:

- preys on porcupine (have been known to charge at porcupine to try and bite in face region and then chase up trees and out to the end of branches to make animal fall and injure itself)
- were once extirpated (gone from PA forests and then re-introduced into the state by the aid of out-of-state trappers and wildlife agencies)
- spend a great deal of time searching for prey in trees

Designed and created by
Daniel Lynch & Cheryl Trewella
Pennsylvania Game Commission

GRAY FOX

Animal Family: Canidae
Latin Name: Urocyon cinereoargenteus
Preferred Habitat: deciduous or mixed hardwoods, swamps, rugged mountainous terrain
Eating Habits: Omnivore: small mammals, birds, eggs, insects, fruit, berries, crops, grasses and reptiles

Fun Facts:

- not normally seen in as close proximity to humans as the red fox
- have semi-retractable claws that aid the fox in climbing trees to find food and avoid predators like domestic dogs and coyotes
- usually have a black stripe of hair down the tail and a black tip to the tail
- scat is black when fresh, twisted and 3" to 4" long

Designed and created by
Daniel Lynch & Cheryl Trewella
Pennsylvania Game Commission

MINK

Animal Family: Mustelidae or weasel
Latin Name: Mustela vison
Preferred Habitat: Streams, rivers, marshes, wooded bottomlands, agricultural areas
Eating Habits: Carnivore: rabbits, mice, shrews, muskrats, fish, snakes, crayfish, frogs, turtles, birds, eggs

Fun Facts:

- long slender body
- people use fur for coats
- will travel over both land and water
- explores all crevices, holes and undercut banks along streams for food
- related to skunk, weasel, fisher and otter in PA
- prominent musk glands
- scat is usually 1" - 3 " long, folded, twisted, tapered at the ends and black in color

Designed and created by
Daniel Lynch & Cheryl Trewella
Pennsylvania Game Commission

MUSKRAT

Animal Family: Rodent
Latin Name: Ondatra zibethicus
Preferred Habitat: Swamps, marshes, bogs, wetlands, streams, ponds, lakes and rivers
Eating Habits: Primarily herbivore: feeding on cattails, sedges, grasses, bullrushes and other aquatic plants, but will eat clams, mussels, snails, crustaceans, fish and frogs
Fun Facts:

- smaller rodent than beaver
- will dig holes along banks of ponds and streams
- sign includes small green or black droppings on top of rocks as well as clumps of floating grass along water's edge
- preyed upon by many different predators like hawks, owls, mink, otter, fox
- sometimes build lodges up to 2 feet high made of aquatic plants and mud

Designed and created by
Daniel Lynch & Cheryl Trewella
Pennsylvania Game Commission

OPOSSUM

Animal Family: Marsupial (animal with a pouch)
Latin Name: Didelphis virginiana
Preferred Habitat: Bottomlands with woods and streams, urban development, forested areas and agricultural areas
Eating Habits: Omnivore: earthworms, insects, mice, voles, shrews, birds, eggs, fish, salamanders, snakes, toads, carrion

Fun Facts:

- has a prehensile tail for grasping branches
- opposable thumbs on hind feet (only 2 other mammals in PA have these thumbs; bats and humans)
- can feign death or play "possum" by rolling over on side and slowing down breathing and heart rate until danger passes
- has most teeth of any North American mammal (average 50 teeth)

Designed and created by
Daniel Lynch & Cheryl Trewella
Pennsylvania Game Commission

RACCOON

Animal Family: Procyonidae (only member of this family found in PA)

Latin Name: Procyon lotor

Preferred Habitat: Marshes, swamps, streams, rivers, agricultural areas, urban developments, wooded areas

Eating Habits: Omnivore: insects, fish, crayfish, salamanders, frogs, snakes, turtles, fruit, berries, crops, human garbage, carrion, birds, eggs

Fun Facts:

- walk "plantigrade" or flat-footed like bears
- do not need to clean food before consuming it
- are known "vectors' or carriers of rabies and distemper in PA
- well adapted to living around people

Designed and created by
Daniel Lynch & Cheryl Trewella
Pennsylvania Game Commission

RED FOX

Animal Family: Canidae
Latin Name: Vulpes vulpes
Preferred Habitat: Woodlots and fields in agricultural areas, forest edges, suburban woodlots and developments

Eating Habits: Omnivore: small mammals, birds, eggs, insects, fruit, berries, crops, domestic cats, poultry and carrion

Fun Facts:

- very adaptable to living around humans
- usually has white tip on tail
- can be seen day or night especially in spring and summer hunting for food to feed the pups
- bark and scream at night may sound like a human baby crying
- known carrier of rabies, mange and distemper
- scat is black when fresh, twisted and 3" to 4" long

Designed and created by
Daniel Lynch & Cheryl Trewella
Pennsylvania Game Commission

SKUNK

Animal Family: Mustelidae or weasel
Latin Name: Mephitis mephitis
Preferred Habitat: Woodland, fields, agricultural areas, urban developments
Eating Habits: Omnivore/insectivore: mice, voles, shrews, insects, birds, eggs, salamanders, snakes, frogs, spiders, fruits, berries, crops, carrion

Fun Facts:

- can spray its musk (up to 15') from 2 glands near anal region
- color of black and white is contrasting so the animal can be seen easily day or night
- usually a nocturnal creature
- preyed upon by owls (owls cannot smell) and other predators
- two sub-species, striped (most common) and spotted

Designed and created by
Daniel Lynch & Cheryl Trewella
Pennsylvania Game Commission

Wildlife Note — 14
LDR0103

Beaver

by Chuck Fergus

The beaver, *Castor canadensis*, is North America's largest rodent. Before European colonists arrived, the species was plentiful from the Mexican border to the Arctic. Beaver fur is thick and considered valuable; untanned pelts brought four dollars each in the early 1800s, when the skins were used to make top hats and to trim clothes. Tremendous demand for beaver fur sent trapping expeditions throughout the unexplored West, stimulating expansion of the new American nation.

By the end of the nineteenth century, uncontrolled trapping had eliminated beavers in Pennsylvania and other states, but today this aquatic furbearer is back. Aided by modern wildlife management and its own prolific breeding potential, the beaver has repopulated a great deal of its former range.

Today, beavers are found throughout Pennsylvania. The highest concentrations are found in the northern counties, often in remote territory and always in areas with plentiful, constant water sources. Using branches, mud and rocks, beavers build dams and lodges on streams and creeks, and along the edges of lakes and rivers. Beavers are shy and mainly nocturnal, but people interested in catching a glimpse of a beaver may get lucky by staking out a beaver pond in the early morning and near sundown.

Biology

Adult beavers weigh 40-60 pounds and grow up to 40 inches in length. (An extinct giant beaver of the Pleistocene era was the size of a bear.) They have blunt heads, short necks and legs, and stocky bodies. The coat is glossy tan to dark brown above, paler below; it consists of dense underfur covered with longer guard hairs. The thick pelt and deposits of body fat insulate the animal and allow it to remain in the water many hours at a time.

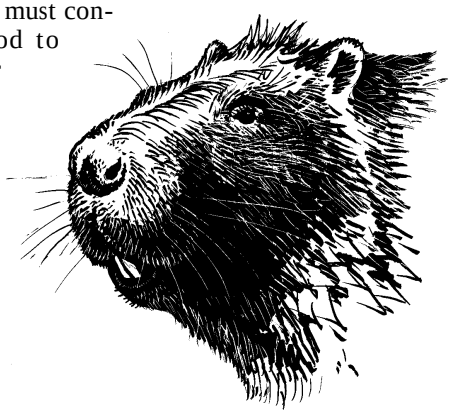
A beaver's tail is trowel-shaped, 8-12 inches long and five or six inches wide. It has a scaly, leathery covering. When the animal swims, it uses its tail as a propeller and a rudder; the tail also supports a beaver when it sits erect or gnaws a tree on dry land. A sharp slap of the tail on water is a signal warning other beavers of danger.

A beaver's front feet are remarkably dextrous. They have long claws and are used for digging, handling food and working on dams. The thumb is small and weak, but the little finger is strong and has taken over the thumb's role. The hind feet, broad and webbed between the toes, propel the animal through the water. The second claw from the outside on each hind foot is double (or split) and is used for grooming.

A beaver's vision is weak, but its hearing and sense of smell are acute. Most food is located by smell. Beavers are slow on dry land but quite mobile in the water. A beaver can stay submerged up to 15 minutes; membrane valves seal the ears and nostrils while it's submerged.

Both males and females possess musk sacs, or castors, which produce an oily, heavily-scented substance called "castoreum," which the animals use to mark territories. Commercially, castoreum has been used as an ingredient for some medicines and perfumes, not to mention trapping lures. Beavers have two other sacs, one on each side of the urogenital opening, which secrete an oil. The animal rubs this oil into its fur to repel water.

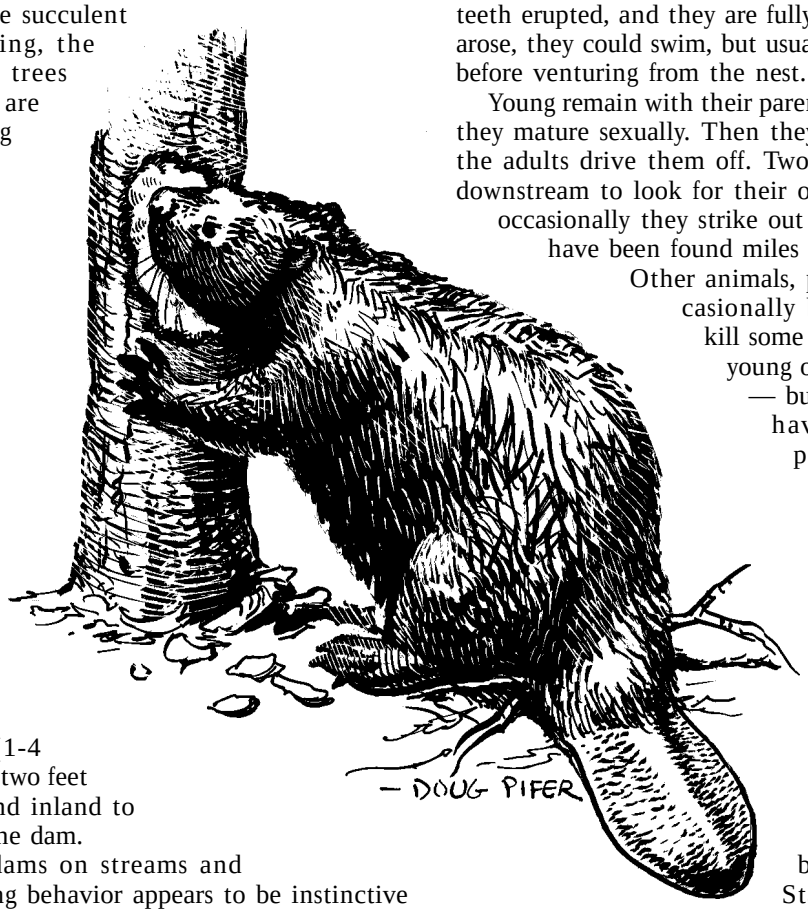
Because its front teeth never stop growing, a beaver must continually cut wood to offset incisor growth. The upper and lower incisors are the primary cutters. A beaver can close its lips behind its incisors to gnaw on and transport saplings while underwater.



Beavers eat vegetable matter. They prefer soft plant foods, including grasses, ferns, mushrooms, duckweed, algae, and the leaves, stems and roots of water plants such as cattails and water lilies. When soft foods are available, beavers cut down few trees unless they're needed for dam or lodge repair.

They also eat the bark, twigs and buds of aspen, maple, willow, birch, black alder and black cherry trees. In autumn, beavers cut branches, twigs and small logs, carry them to the bottom of their home ponds, and anchor them in the mud. Then, when the pond freezes over in the winter, they still have access to food. They may also remove some sticks from the dam to lower the water and create air space under the ice.

Beavers fell trees to get at the higher, newer, more succulent growth. After eating, the beavers gnaw the trees into pieces which are then used in building dams or lodges. Small trees are eaten more completely than larger, woodier ones.



Beavers usually cut trees within 200 feet of the water's edge; apparently they feel safest within this zone, and the trees don't need to be dragged far. Beavers cannot cut trees and make them fall in a certain direction. They sometimes dig canals (1-4 feet wide and up to two feet deep) from the pond inland to float logs back to the dam.

Beavers build dams on streams and creeks. This building behavior appears to be instinctive rather than learned. Dams are made of wood cuttings packed together with mud and rocks; while a dam may hold back a sizeable pond, it also allows most of the stream flow to seep through. A dam backs up a barrier of water around the beaver's home lodge, much like a moat around a castle.

Dams require periodic maintenance, especially after heavy rains and during snow melt. Beavers may heighten the dam to raise the water level so they can reach more food without having to leave the water; or they may build additional dams upstream for the same reason.

For shelter and rearing young, beavers construct lodges. These are dome-shaped islands of sticks and logs plastered with mud. A lodge's interior compartment (the den) may be up to five feet high, with a small air hole at the top. The mud freezes in winter, making the lodge impregnable to predators that might visit. Along fast, turbulent streams — or creeks and rivers too wide to dam — beavers either burrow deep into the bank or build lodges at the water's edge. The entrance to a lodge (whether it's on the bank or in the middle of a pond) is always below water level, while the den is dry and above water.

Beavers are generally congenial, although rivals fight during the February-March breeding season. Females are believed to be monogamous, while some authorities think males may breed more than one female. A female usually drives her family out of the lodge when she nears the end of the 12-week gestation period. In April or May, she bears 3-6 (usually 4 or 5) young called "kits." Newborns weigh about a pound; their eyes are open, their teeth erupted, and they are fully furred. If an emergency arose, they could swim, but usually they nurse 5-7 weeks before venturing from the nest.

Young remain with their parents up to two years, when they mature sexually. Then they leave on their own, or the adults drive them off. Two-year-olds usually travel downstream to look for their own territories, although occasionally they strike out across dry land. Beavers have been found miles from water.

Other animals, particularly dogs but occasionally bobcats and bears, may kill some individuals — especially young ones away from the water — but on the whole, beavers have little to fear from predators. Some are struck by cars, and a few die when hit by trees they felled. Beavers live up to 15 years in captivity; the estimated lifespan in the wild is 10-12 years.

Population

By the beginning of the twentieth century, there were few if any beavers in the Keystone State. In 1903, the state legislature passed a law protecting the species; in 1917, the Game Commission released a pair of Wisconsin beavers in a remote Cameron County valley. Over the next decade, the pair and its offspring reproduced and prospered. Beavers from this original stock — supplemented with animals bought from Canadian agencies — were live-trapped and released on refuges throughout the state. By 1934, the population was large and stable enough to allow a trapping season. That year more than 6,000 were harvested. Today, beavers are found throughout Pennsylvania in suitable habitat.

We have had mild winters and good trapping conditions since the winter of 1995-96. Over the past six seasons, we've harvested an average of 9,811 beavers per year. During the prior six years, we had an average of 5,244 beavers harvested per year — nearly half the re-

cent harvests.

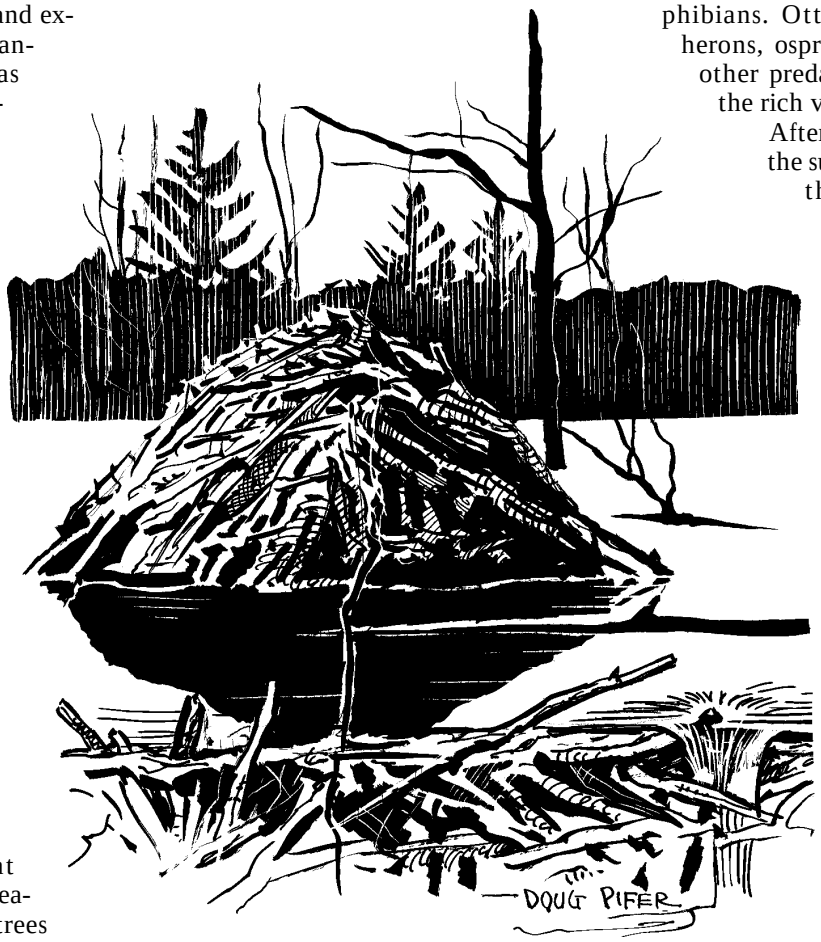
Beavers can and do become troublesome for some people. Water backed up by their dams floods pastures, crop fields and roads, disrupts public water supplies and kills trees. They also cut down valuable shade trees and excavate unwanted channels. Trapping has proven to be an acceptable and economical method of controlling their numbers.

Habitat

Beavers prefer streams and creeks narrow enough to be dammed. They also live along rivers, on timbered marshland and around forest-edged lakes. They prefer remote areas, but will live near man if other sites aren't available.

Beavers prosper in maple, aspen and willow environments. Studies have indicated that each year an adult beaver cuts up to 300 trees (most having diameters less than three inches); and that under average conditions, one acre of aspen supports a five- or six-member colony for 1 to 2½ years.

The dam building of beavers affects many other wildlife species. After a dam is built, a portion of a wooded valley is changed to an open pond. Water covers the bases of trees; this prevents oxygen from reaching the roots and kills the trees within a few years. These "snags" provide homes for many cavity-nesting birds. Ponds vary in size from a few to many acres. They provide habitat for ducks, geese, shorebirds, fish, reptiles and amphibians. Otters, raccoons, mink, herons, ospreys, hawks, owls and other predators are attracted by the rich variety of life and food.



After the beavers exhaust the supply of winter food in the area — this may take 10 or more years — they move on. Their dam usually lasts several years longer, accumulating silt, leaves and other organic material. Finally during the spring thaw, or after a long, hard rain, the dam gives way. Most of the pond water drains off, leaving an open area. Grass grows in the rich soil; later, berry bushes and shrubs. Insects and small rodents thrive in the new habitat. Deer, bear, grouse, turkeys, songbirds and insectivorous birds come to these beaver meadows, which provide edge and openings in the forest.

The stream continues to flow through the meadow, amid many standing dead trees. Aspens and willows send up shoots. In time, another beaver colony may find this valley to be good habitat.

Wildlife Notes are available from the
Pennsylvania Game Commission
Bureau of Information and Education
Dept. MS, 2001 Elmerton Avenue
Harrisburg, PA 17110-9797
www.pgc.state.pa.us
An Equal Opportunity Employer

Wildlife Note — 3
LDR0103

Bobcat

by Chuck Fergus

Tawny, tireless, smooth-moving and shy, bobcats are truly beautiful animals. Few persons ever actually see a bobcat; spotting one in the wild is a tremendous thrill. Despite the bobcat's elusiveness, many Pennsylvanians are intrigued by this predator.

Biology

The bobcat — also known as the bay lynx, wildcat, red lynx and swamp tiger — is our state's only feline predator. Its scientific name is *Lynx rufus*, and it is closely related to the Canada lynx, which is not found in Pennsylvania.

Bobcats are efficient, wary predators equipped with sharp senses of sight, smell and hearing. They have four large canine teeth to pierce deeply into prey; behind the canines are sharp cutting teeth. Five retractable, hooked claws on each front foot and four on the rear add to the armament.

Though it's a fierce fighter, a bobcat isn't a large animal. A mature bobcat averages 36 inches in length, including a stubby, 6-inch tail. This bobbed tail gives the bobcat its name. Pennsylvania bobcats weigh 15 to 20 pounds, with large individuals as heavy as 35 pounds.

Eight bobcat subspecies are found in the continental United States, with slightly varying pelt coloration and sizes. The bobcats in our state have gray-brown fur with dark spots and bars, which are especially noticeable on the legs. Lips, chin, the underside of the neck and the belly are white. A ruff of fur extends out and downward from the ears.

The bobcat's rangy, muscular back legs are longer than its front legs. This gives the animal a high-tailed, bobbing gait when it runs. The bobcat is a strong swimmer — although it usually jumps creeks or fords them on fallen logs — and an excellent climber.

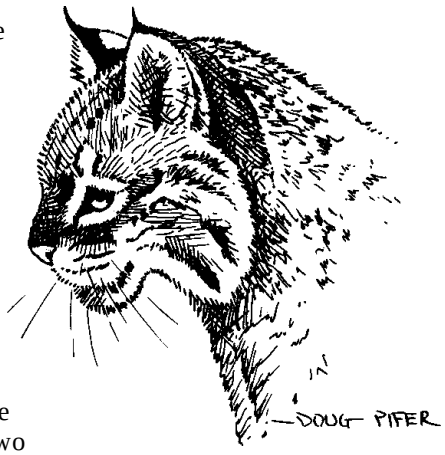
Bobcats are mainly nocturnal, but they sometimes venture out in the daytime. They have large eyes, well-adapted to see in the dark; bobcat pupils are slit-shaped rather than round and can open wide to admit light. Two other eye adaptations that help night vision are abundant light-sensitive rods and a reflecting layer that makes an object stand out sharply from its background. Bobcats are colorblind and see only in shades of gray.

Small animals — mice, rats, shrews, squirrels, chipmunks, birds, rabbits and hares — form the nucleus of the bobcat's diet. But like most other predators, cats are opportunists, and porcupine, mink, muskrat, skunk, fish, frog, insect and fox remains have also been found in their stomachs.

Occasionally bobcats take sick, weak or crippled deer, but predation by bobcats has little or no effect on the size of Pennsylvania's deer herd. After feeding on a deer, a bobcat may cover the rest of the carcass with leaves. Bobcats also feed on whitetails which have starved during winter or died of other causes.

Breeding takes place from late February to early March. Male bobcats don't become sexually mature until two years old. Females can breed in their first year, but often do not. During estrus, a male may travel up to 20 miles in a single night searching for a receptive female. Radio telemetry research indicates that the male leaves the female after mating and plays no part in rearing young.

Kittens are born following a 50- to 60-day gestation period. Litters range from one to four young, with about two the average. Females guard their litters carefully, as an adult male bobcat may try to kill and eat the young. Owls and perhaps foxes may take kittens. A mature bobcat has few enemies other than man.



Bobcats give birth in dens — rock crevices, caves and hollow logs insulated with dry leaves and mosses. Though fully furred, kittens are blind and helpless at birth; their eyes open after eight or nine days and they are weaned within two

months. Kittens stay with their mothers for several more months, learning to hunt and kill prey, and reach 60 percent of their adult weight by winter.

Most wild animals are bothered by parasites, and bobcats are no exception. Fleas, mites and stomach and intestinal worms afflict bobcats. There have been few reports of rabid bobcats.

Some individuals live up to 14 years in the wild. Researchers aged captured animals by examining their teeth; each year the outer cementum layer of a bobcat's canine teeth lays down a growth ring, much like a tree does, thus making age determination possible. Bobcats in captivity usually live longer than those in the wild; one 30-pound captive male reached age 25. Research has shown a high mortality rate among bobcats during their first and second winters, before the young cats have completely mastered hunting skills.

During bad winter weather, a bobcat may shelter under overhanging rocks or in rock crevices. As soon as the storm subsides, though, the bobcat will be out hunting. If you can find its tracks in the snow, follow a bobcat on the prowl. Tracks will lead up and down mountains, cross streams (often on logs) and continue for miles. A hunting bobcat trots to a vantage point — a rock formation, steep hillside, low-leaning tree — and surveys its surroundings. Rock crevices, stumps, brush piles and thickets will be checked by a bobcat in search of a meal.

Individual bobcats have a definite territory, which is marked with feces, urine and scrape marks, and which may overlap the territories of other bobcats. Size of the territory depends on availability of food. In areas where food is abundant, the range may be as small as five miles in diameter. In the Western states, a low density of prey forces bobcats to range wider.

Habitat

In Pennsylvania, bobcats usually inhabit mountains, deep forests, swamps and, occasionally, agricultural areas.

Obviously, bobcats will live in areas where they can find ample shelter and food. Bobcats seem to prosper in remote areas near clearcuts. Studies have shown that the number of small mammals — rats, mice, shrews, etc. — increases following clearcutting (due to better food and cover conditions), and apparently cats respond to this increased prey supply. Oak leaf roller and gypsy moth caterpillars, insect pests which kill timber, may also indirectly increase small mammal populations by opening up the forest canopy and thus stimulating low, brushy growth.

A century ago, much of Pennsylvania was brushy, second-growth forest with an accompanying large population of grouse, rabbits, hares and small rodents. This terrific animal food supply and abundant uninhabited land allowed the bobcat to prosper. But when the forest matured, when saplings and sprouts grew into mature timber, when brush, thick laurel and blackberry tangles were replaced by a bare forest floor — and when man's cities and towns continued to expand — the amount of habitat suitable for bobcats shrank.

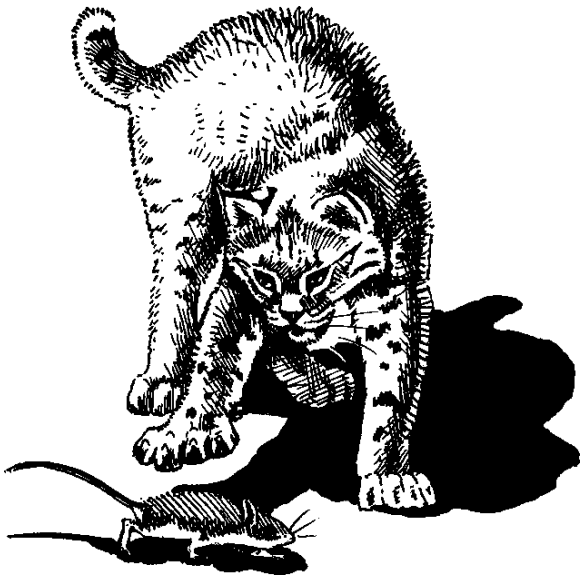
Bobcats are generally found in the state's mountainous areas. They are well established in northcentral and northeastern counties. Over the past 20 years, bobcats have increased in number statewide and have been continually expanding their range.

Population

Population is in many ways a factor of habitat — poor habitat means low population. As Pennsylvania's second-growth forests matured and the number of prey animals decreased, the bobcat population fell, too. Fewer and fewer bobcats were spotted, and even tracks became hard to find. In 1970, the Game Law was changed to give the bobcat complete protection, and bobcat numbers subsequently increased.

Tough, resilient predators, bobcats are, nevertheless, affected by development of once-remote land, more and more houses, woods roads that open previously untouched areas to noise, and disturbances from ATVs and other vehicles. These intrusions, coupled with habitat change are threats to the bobcat's well-being in the more developed areas of the state.

Beginning in the 1980s, the Game Commission began various field research projects to better understand the factors affecting bobcat density and distribution throughout the state. Based on these studies and related surveys, in 2000 Pennsylvania's bobcat population was estimated to be approximately 3,500, and a hunting and trapping season, very limited, was once again offered.



Wildlife Notes are available from the
Pennsylvania Game Commission
Bureau of Information and Education
Dept. MS, 2001 Elmerton Avenue
Harrisburg, PA 17110-9797
www.pgc.state.pa.us
An Equal Opportunity Employer

Wildlife Note — 39
LDR0603

Coyote

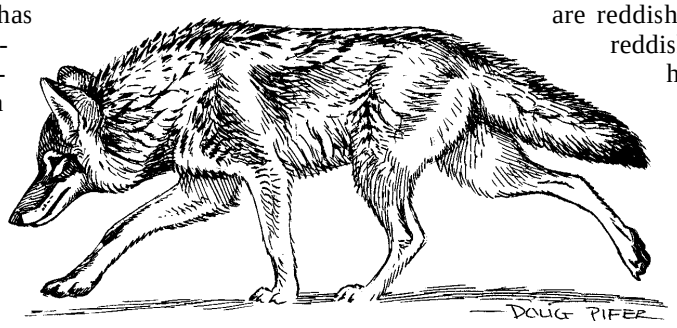
by Arnold Hayden

The eastern coyote has stirred as much interest and emotion as any other animal in Pennsylvania. Seeing a coyote or hearing the howl of this wild, wily animal is a great reward of nature to many people. Others fear this animal just knowing it is in the wild. Some sportsmen hate coyotes because they think the predators kill too many game animals. Trappers and hunters find coyotes to be especially challenging. Some farmers lose livestock due to coyote predation. The coyote has been referred to as the brush wolf, prairie wolf, coy-dog and eastern coyote.

The eastern coyote *(Canis latrans)* is found throughout northeastern United States and southeastern Canada. Recent research shows the eastern coyote is an immigrant whose origin may have involved interbreeding between coyotes and gray wolves. Analysis of DNA suggests coyote/wolf hybridization has occurred. Other studies indicate that the eastern coyote is intermediate in size and shape between gray wolves and western coyotes. As a result, the eastern coyote exhibits different behavior, habitat use, pelt coloration, prey preferences and home range sizes from its western cousin. The eastern coyote is the largest canine found in Pennsylvania. The following information pertains to the coyote in Pennsylvania and throughout northeastern United States.

History

Fossil records indicate coyotes have existed in what is today eastern North America since the Pleistocene period, a million years ago. Occurrence has been intermittent over that time, and only in the past 75 to 100 years has the animal appeared to become common. The coyote status in Pennsylvania during the 1700s and 1800s is clouded with that of the wolf. Old bounty records indicate both coyotes and wolves from other sections of the country were fraudulently turned in as wolves here during the late 1800s.



Little is known of the wolf in Pennsylvania, or if indeed the same animal now called the “eastern coyote” may in fact have been similar to the wolf of the past. Pictures dating to the 1930s have appeared in *Game News* over the years. These animals look like the same coyotes being killed today. The first coyote identified as an animal similar to what we today call the “Eastern coyote” was killed in Tioga County in 1940.

In the late 1960s, it appears an influx of coyotes entered northern Pennsylvania from the Catskill Mountains in New York, and from there they spread south and west across the state. In the 1970s, the highest population was in the Pocono Mountains of the state. The coyote continued to expand its range during the late 1970s and occupied the entire state by 1990, with the highest populations across the northern half of the state.

Biology

The eastern coyote is much larger than its western counterpart. Adult males in Pennsylvania weigh 45 to 55 pounds. The heaviest known male caught here weighed 62 pounds. Females are smaller, 35 to 40 pounds. The heaviest known female in Pennsylvania weighed 42 pounds. Total body length of eastern coyotes ranges from 48 to 60 inches. Their pelage colors range from light blond, reddish blond, gray to dark brown washed with black, and black. Generally, coyotes are gray to a German shepherd coloration. Their legs are gray, tan and reddish with black markings or lines down the front of the front legs. The cheeks and behind the ears are reddish or chestnut colored. Blond, reddish and black coyotes may not have any noticeable black stripes on their front legs. Their ears are erect and their bottle brush tail is usually held in a downward position. Normally, their eyes are yellow, but some with brown eyes have been found.

Coyotes are monogamous; they maintain pair bonds for several years. The social unit evolves around the mated pair and its offspring. However, the delayed dispersal of some offspring may result in extended family relationships beyond a year. A social group occupying a territory may include a pair of adults (generally more than a year old), transients (aged 6 to 18 months), predispersing sub-adults (usually less than a year old) and non-breeding associates that are more than one year old. Observations indicate other coyotes living in a territory may help provide food to a growing litter.

Normally, females do not breed — or implant embryos — until their second winter, but there are cases of some yearling females breeding and producing litters. They have one heat period that lasts 4 to 5 days, usually in February. The litters are born from mid-April to early May, and litter sizes average 5 to 7 pups. Coyotes compensate for unusually high mortality by having larger litters. Known denning sites range from beneath overturned trees, piles of tree stumps, rock dens, and dug out red fox dens. Dens are usually located on southerly exposures. The pups are moved frequently to new dens to avoid detection.

Young coyotes begin to disperse from the family group during October, when they're six months old. Studies in Pennsylvania indicate some juvenile coyotes dispersed up to 100 miles, but 30 to 50 miles is more common.

Coyotes use a variety of yips, barks and howls to communicate and periodically assemble into larger packs. Coyotes at times will "pack" and at other times will hunt alone or in the company of another coyote or two. They are primarily nocturnal, but often hunt during daylight hours, especially in the morning. Howling may occur at any time of day, but the highest activity is usually at night. A coyote's sense of smell, hearing and alertness are especially keen.

Habitat

The coyote has adapted to a wide variety of habitats in Pennsylvania. The animals can be found in the heavily forested northeast and northcentral regions of the state, in dairy and cropland areas, and even around the heavily populated areas of Philadelphia, Harrisburg, Pittsburgh and Erie. Coyotes prefer heavy brushy cover, such as clearcuts, and often live along edges between forest and agricultural areas where prey is abundant.

Food Habits

The coyote is a generalist. An analysis of 300 coyote scats collected in Pennsylvania indicate a wide array of food items in their diet. Mammals from at least 13 genera were found, ranging from small mice and voles to deer. Overall, deer was the dominant food, occurring in 57 percent of the scats. That deer were a dominant food item was not surprising given the high deer density in many areas, the large number of deer killed on the highways, starvation losses, and deer that have died for any number of other reasons.

Rabbits and woodchucks ranked behind small mammals and deer as important food items. Birds were found in 10 percent of the scats and insects in 18 percent. Plant material occurred in 50 percent of the scats. Various kinds of fruits were important during the late summer and fall, but plant material appeared important on a year-round basis. While no livestock was found in the analysis, predation on sheep, chickens, ducks, goats and domestic rabbits does occur, but at a low rate. However, depredation can be significant in localized areas or at certain farms.

Population

Coyotes are found throughout Pennsylvania, but are most common in the northern half. The total population in 1995 was probably between 15,000 to 20,000. The harvest in the early '90s exceeded 6,000; incidental to turkey, bear and deer hunting. Coyote hunters and trappers accounted for the other half. Mortality from hunting and trapping approaches 60 percent for young coyotes, but only 15 percent for adults.

Coyote populations throughout North America have continued to expand, despite man's attempt to control them. If there's one thing we have learned about this intriguing animal, it's that the coyote controls its own destiny, not man.

Wildlife Notes are available from the
Pennsylvania Game Commission
Bureau of Information and Education
Dept. MS, 2001 Elmerton Avenue
Harrisburg, PA 17110-9797
www.pgc.state.pa.us
An Equal Opportunity Employer

Wildlife Note — 5
LDR0103

Red and Gray Foxes

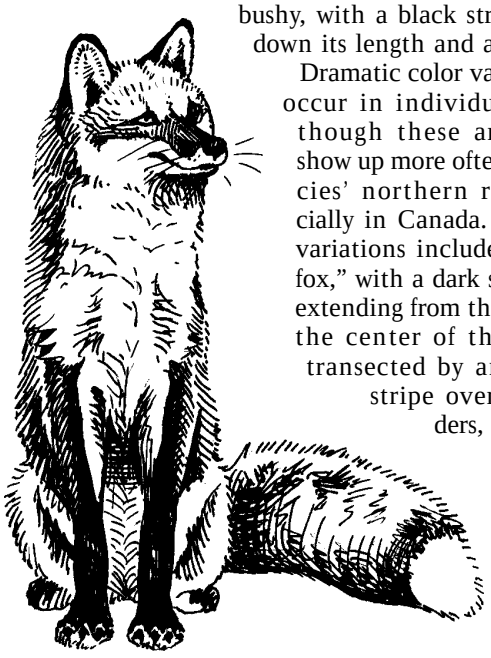
by Chuck Fergus

Red and gray foxes are small, agile carnivores belonging to the same family (Canidae) as the dog, coyote and wolf. Both red and gray foxes are found throughout Pennsylvania. They are intelligent predators with extremely sharp senses of sight, smell and hearing (A fox can hear a mouse squeal at about 150 feet).

Biology

The red fox (*Vulpes vulpes*) is 22 to 25 inches in length, with an additional 14- to 16-inch tail, and weighs 8 to 12 pounds. The gray fox (*Urocyon cinereoargenteus*) is 21 to 29 inches in length, plus an 11- to 16-inch tail, and weighs 7 to 13 pounds. Foxes look like they are heavier than these weights, an impression created by their full, thick fur.

The red has long, reddish-orange fur slightly darkened on the back; black ears, legs and feet; and a long, bushy, white-tipped tail. The gray fox has a grizzled gray coat, somewhat coarser than the red's, with buff-colored underfur. The gray's tail is also long and bushy, with a black streak running down its length and a black tip.



Dramatic color variations may occur in individual reds, although these are rare and show up more often in the species' northern range, especially in Canada. These color variations include: the "cross fox," with a dark stripe of hair extending from the head down the center of the back and transected by another dark stripe over the shoulders, thus forming a cross-like shape; the "black fox," a melanistic red fox; and the "silver fox," simply a black individual with white-tipped guard hairs giving a frosted appearance. The red fox always has a white tail tip, no matter the color phase or shade of red fur (which also varies slightly in individual animals).

Foxes are swift runners and can swim if they have to. Both reds and grays are mainly nocturnal. The gray can climb trees — it is the only member of the canine family with this ability.

Foxes are "opportunists" when it comes to feeding. This means they will eat whatever is most easily obtained. Foods include mice, rats, rabbits, woodchucks, opossums, porcupines, domestic cats, chickens, insects, squirrels, game birds, songbirds, bird eggs, fruits and grasses.

Foxes are also scavengers, feeding on roadkilled animals and winter kills. Diets of both reds and grays are essentially the same, but different food preferences, behavior patterns and preferred habitat often result in different types and amounts of food eaten. Both species cache uneaten food by burying it in loose earth.

Males are called "dog" foxes and females "vixens." In late winter, foxes can be heard barking at night, making their presence known to members of the opposite sex. Breeding usually takes place in February.

Young are born following a 51-day gestation period for red foxes and a 63-day period for grays. Litters range from 4 to 10 young, with 6 the average. Young are born in dens. The red fox usually enlarges a woodchuck burrow or may den in a hollow log; the gray may also den beneath the ground or in crevices in rocky ledges. Underground dens for both species usually have several entrances.

Fox pups weigh about eight ounces at birth, and their eyes are closed for the first 8 to 10 days. They are nursed by the female in the den for around a month. When the pups emerge, both mother and father keep them supplied with solid food until they are completely weaned after two or three months.

They leave the den area in mid-July or August and may forage with their parents for another month until the family disbands. Foxes trapped in the fall are often young ones, on their own for the first time and establishing new territories. Both males and females are sexually

mature at 10 months and may breed during their first winter.

Red foxes seldom seek shelter in holes or dens during winter, preferring to sleep in the open with their bushy, well-insulated tails curled over their noses to keep them warm. Grays often hole up for three or four days at a time during severe weather.

Foxes may be afflicted with many parasites, including ticks, fleas, lice, mites, flukes and worms. Reds seem to be more susceptible to mange than gray foxes. Both species can contract rabies. Diseases and parasites strike foxes the hardest when they overpopulate an area; this is nature's way of managing an excessive population.

Wildlife researchers have live-trapped foxes, tagged and released them. These studies have shown that foxes, especially young adults, are susceptible to many limiting factors, including trapping, hunting, highway mortality and coyote predation. A life span of 10 to 12 years is possible, however.

Habitat

Red and gray foxes generally favor different types of habitat. The red prefers sparsely settled, rolling farm areas with wooded tracts, marshes and streams. The gray fox is more commonly found in brushy areas, swampy lands and rugged, mountainous terrain. But both species are very adaptable and can be found throughout the state, sometimes in areas not considered prime habitat.

Red foxes seem less bothered by people than grays and often inhabit heavily populated areas, although they are rarely seen due to their nocturnal habits. There are countless stories of reds rearing young in suburban settings. Generally, if the area can provide food and shelter, foxes will consider it, especially since coyotes continue to push out, or displace, reds from their historic haunts.

Grays are usually more aggressive than reds and where the ranges of the two overlap, the gray is typically the dominant species. But there are exceptions to every broad statement made about wildlife. Knowing that, you can figure somewhere out there are places where reds rule or where the two species coexist without problem.

Population

Fox populations are affected by availability of food, habitat suitability, coyote predation and hunting and trapping pressure. Pennsylvania studies have documented that some high-use agricultural areas — with little cover for either prey or predators — had only one fox per 300 acres, or 2.1 foxes per square mile. Wooded and less heavily farmed areas had one fox per 50 acres or 12.8 per square mile, a high concentration.

Fox populations can be measured by different methods, including counting droppings on the snow, den reconnaissance and tracking studies. The gray fox has much larger toe pads and a smaller foot than the red, so the two can often be distinguished by their tracks.

Movements in gray and red fox populations are basically of two types. The first is dispersal, or the movement of young in late summer or early fall. Dispersal spreads the population out, with each young fox moving several miles — occasionally 50 miles or more — to set up its own home territory. The second type of movement is displacement, which is caused by habitat changes and predation. There are also localized movements, the travels of individual within their home territory or range. From tracking studies, biologists estimate that a fox travels an average of five miles in search of food on a winter night.

Populations fluctuate and shift, often as a result of human activities such as logging, farming, construction and hunting. Disease also plays a role. In areas where mange outbreaks occur, red fox populations are often severely impacted. But foxes are very resilient. Both species seem to readily rebound from disease and other limiting factors, so long as the area they inhabit can provide food, escape cover and safe havens.

Proof of the resiliency of foxes was their ability to weather decades upon decades of persecution through bounties in Pennsylvania. Abolished in 1966, bounties were a fee paid to people for each fox they killed. Bounties were discontinued because it was determined the monies used to pay them were better spent on habitat enhancements.

Foxes are often blamed for decreasing game populations, but most of the time the number of game animals taken by foxes and other predators is insignificant compared to other natural losses. When all facts are considered, habitat change is most often found to be the main contributor to lower small game populations. It's true that foxes take grouse, pheasants, rabbits and other game, but these are usually "surplus" individuals, those animals that would likely die from other causes — accidents, disease, starvation, etc. — before the next breeding season.

More and more people are accepting predators as valuable members of our natural world. Foxes are no exception. Their presence in Pennsylvania provides recreation and wildlife diversity, two important facets of any wildlife management program.

Wildlife Notes are available from the
Pennsylvania Game Commission
Bureau of Information and Education
Dept. MS, 2001 Elmerton Avenue
Harrisburg, PA 17110-9797
www.pgc.state.pa.us
An Equal Opportunity Employer

Wildlife Note — 22
LDR0103

Minks and Muskrats

by Chuck Fergus

Often two wildlife species are associated closely with each other. The fox and the rabbit, the bobcat and the snowshoe hare, and the mink and the muskrat are good examples. While not one of the three mentioned predators subsists solely on its "partner" species, the prey often makes up a sizeable portion of the predator's diet. When it comes to mink and muskrats, it's fair to say that although the muskrat is not the principal prey of the mink, the mink is the principal predator of the muskrat.

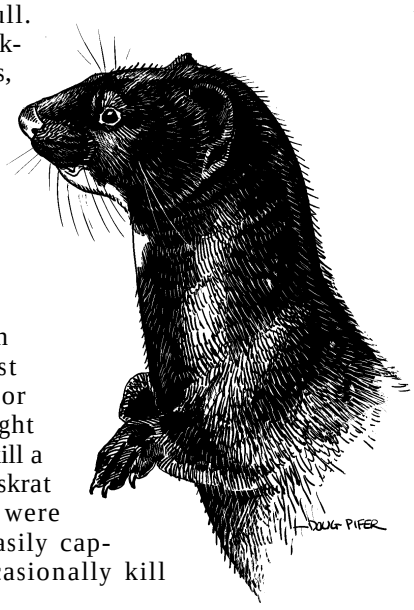
Both mink and muskrats are found in suitable wetland habitat throughout Pennsylvania. They are classified as furbearers, and trappers harvest both species. By far, more muskrats are trapped than minks, but a mink pelt is more valuable than a muskrat's.

Mink (*Mustela vison)* — is a semi-aquatic member of the family Mustelidae. Other mustelids include weasels, martens, fishers, wolverines, badgers, skunks and otters. Mink are found over most of the northern hemisphere in both Europe and North America. They live on the edges of lakes, streams and rivers in forested areas.

Adult males average two feet in length, including an 8-inch tail. They weigh 1½ to 2 pounds. Females are 10 to 15 percent smaller than males and up to half a pound lighter. Body configuration resembles that of a weasel: short legs; long, bushy tail; long, sinuous neck and body; short head; and pointed muzzle. A mink's coat is thick, full and soft. A short, tight layer of underfur is covered with longer guard hairs, which give the pelt its luster. Colors range from russet to a deep, chocolate brown. Unlike some weasels, the mink does not turn white in winter.

Mink have excellent hearing and sight, and a good sense of smell. On land, they travel at a slow, arch-backed walk or a bounding lope, which they can keep up for miles. They swim and dive with ease; a webbing of stiff hairs between the toes of their hind feet helps propel them through water. Mink are most active at night and early morning, although they sometimes venture out during the day as well.

Active year-round, mink may curl up and sleep for several days during winter cold spells. Like most mustelids, they are agile and fierce fighters, killing prey with a hard bite to the back of the skull. Prey includes muskrats, mice, rabbits, shrews, fish, frogs, crayfish, insects, snakes, waterfowl and other birds, eggs and domestic poultry. Generally, a mink is an opportunist, feeding on whatever is most easily caught or found; thus, it might avoid fighting to kill a healthy adult muskrat if, say, crayfish were abundant and easily captured. Mink occasionally kill

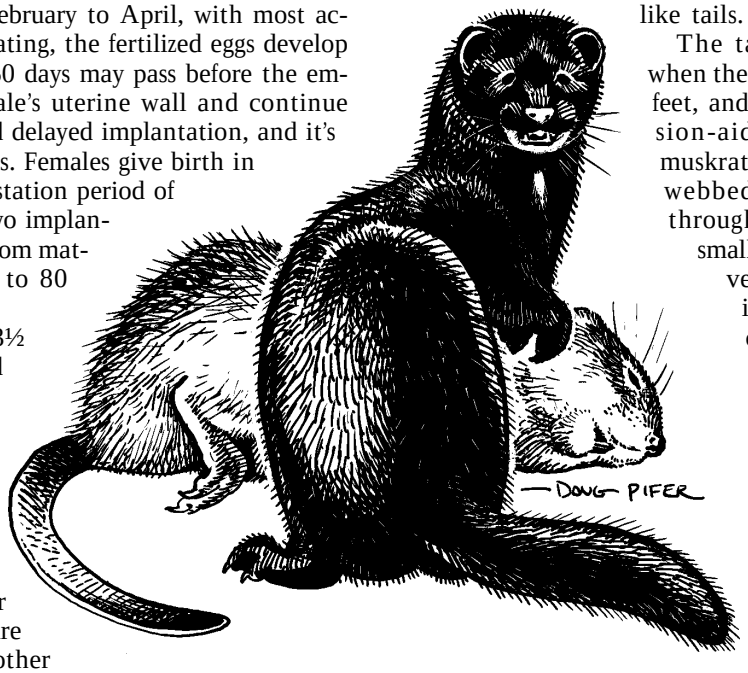


more than they can eat. In winter, they cache carcasses and revisit them to feed.

Mink den in abandoned woodchuck tunnels, hollow logs, vacant muskrat lodges, holes in stone piles and beneath large tree roots. Dens are usually near water and may have more than one entrance. Mink line their nests with dried grass, leaves and feathers; bones and scraps of kills often litter the nest area.

Mink are basically solitary, except during mating season, when they use a powerful scent from their anal glands to attract mates. Males fight over receptive females. It's not known whether mink pair up after mating, although males are believed to mate with several females.

Mating occurs from February to April, with most activity in March. After mating, the fertilized eggs develop slightly, but then 13 to 50 days may pass before the embryos attach to the female's uterine wall and continue developing. This is called delayed implantation, and it's common among mustelids. Females give birth in early May following a gestation period of 28 to 30 days after embryo implantation. Thus, total time from mating to birth may be 40 to 80 days.



At birth, young are 3½ inches in length, blind and hairless, and they weigh only a fifth of an ounce. Litters include 2 to 7 young, with an average of four. In two weeks, young are furred; their eyes open after five weeks; and after six or seven weeks they are out foraging with their mother and learning how to hunt. The family disperses by late summer. Minks are sexually mature at 10 months.

Minks are best suited for areas where water pollution is minimal, because these waters will hold the greatest concentrations and varieties of prey. A male covers a range up to three miles in diameter, while a female's range is much less. Individual territories overlap, and the same den may be used by several animals in succession. One mink will have several dens along its hunting route.

Minks live up to 10 years in captivity, but a wild one would be fortunate to survive two or three winters. Disease, cars and trapping are mortality factors, and the species is preyed on by foxes, bobcats and great horned owls.

The American mink was introduced to Sweden in the 1920s, and in 35 years spread throughout that country. M. Iutreola, the European mink, is found from France east to the Caucasus Mountains. Pennsylvania has two subspecies of mink, the less common mountain race, Mustela vison vison, being somewhat smaller and darker.

Muskrats (*Ondatra zibethica*) — Why the name "muskrat?" "Musk" refers to a strong smelling substance released from this animal's perineal glands (between the thighs), while "rat" describes its rat-like appearance. The muskrat is a rodent — related to mice, voles, beavers and rats. The nation's most abundant furbearer, the muskrat lives on or near the still or slow-moving water of ponds, marshes, streams and rivers and, to a lesser extent, faster mountain streams. The species is found over most of North America north of the Rio Grande River, including the coastal tidal marshes. It's common in Pennsylvania, but nearly abundant as it used to be.

Adult muskrats are 22 to 25 inches in length, including the tail. They weigh 2 to 3 pounds, have a stout body, short legs, and an 8- to 12-inch tail that is flattened vertically, scaly and practically hairless. Ears and eyes are small but well-developed. In appearance, muskrats resemble small beavers with long, rat-like tails.

The tail functions as a prop when the animal stands on its hind feet, and as a rudder and propulsion-aid when it swims. The muskrat's large, broad, partially webbed hind feet power it through water. Its forefeet are small and agile, with well-developed claws for burrowing. To insulate against cold water, a muskrat's underfur is dense, silky and soft, overlain with long, dark brown guard hairs shading to gray-brown on the throat and belly. Overall pelt color can be chestnut-brown to almost black, or any color in between.

Food: roots and stems of aquatic plants (the cattail is often an important item; also bullrushes, water lilies, pickerelweed and others), and, when they grow near water, legumes, grasses, grains, garden crops and fruits. Muskrats eat a small amount of animal protein, including crayfish, freshwater mussels, fish and frogs — the last two often as carrion — and even carcasses of other muskrats. They don't hibernate; over winter they subsist on roots and shoots dug from marsh bottoms, and the twigs, buds and bark of various trees, including willows, cottonwoods, ash and box elders.

Muskrats build houses (also called lodges) of vegetation, or they burrow into stream banks, earthen dikes and dams, often causing considerable damage. Both lodges and burrows have underwater entrances and above-water living quarters. Lodges are built of cattail stalks or other vegetation, chinked with mud and weeds above the waterline. They may be 8 to 10 feet across and 2 to 3 feet above water, with a single living chamber plus offshoots, or several chambers. Muskrats do not dam streams.

In breeding season, muskrats leave musk, or scent, in likely places around their territories to attract potential mates. Males may impregnate several females, and play no part in raising young.

Muskrats have a high reproductive potential, giving

birth to large litters and breeding from spring to fall. Mature females have two, three or even four litters each year, depending on the length of the warm season (more litters in southern Pennsylvania, fewer in the north).

After a 30-day gestation period, the female bears 5 to 8 naked, blind and helpless young. In a month they are weaned and fully furred, and the female drives them off, especially if she is about to bear another litter. A female may overwinter with her final litter of the year, the family breaking up in the spring. Young disperse along streams or colonize new sections of marsh.

Muskrats are sexually mature the year following their birth, but few survive long enough to breed. Young muskrats and dispersing immatures are especially vulnerable to minks, hawks, owls, foxes, snapping turtles and snakes. Surplus animals — individuals beyond the number that the habitat can support in good health over winter — are often lost to predators, taken by trappers or forced to move to new areas. Surplus individuals are more vulnerable to predation, starvation and disease than are members of the secure, basic population.

Some prey populations may limit their own numbers by failing to breed in crowded conditions, by aggressively defending a territory in overpopulated areas, or by some other type of behavior. Overcrowded muskrats are strongly territorial, and predation by mink is just a way of reducing the excess population. Mink seldom have much effect on local muskrat populations; the surplus animals would probably die soon anyway. Only if the habitat should change, such as when drought comes and the marsh dries up, would formerly secure muskrats be vulnerable to minks; the habitat can no longer support as large a muskrat population, some of the basic population would become surplus. A bad winter, an outbreak of disease such as coccidiosis, or a flood during the height of breeding season may also cut muskrat numbers. The population varies widely from year to year, but tends to show a peak in abundance about every 10 years.

Muskrats are tenacious fighters. Minks prefer to tackle young or sick muskrats, because a mature adult puts up a brisk defense. Females defending young have been observed driving off attacking minks. Muskrats are parasitized by mites, fleas, flatworms, roundworms and tapeworms. While the average life span is under 12 months, some individuals may live as long as five or six years.

Through their feeding, muskrats open up areas of densely vegetated marsh; this can change local habitats to benefit waterfowl and other aquatic wildlife. Muskrats also damage agricultural and ornamental crops near water, and their tunnels riddle dams, dikes, canal banks, etc. This is a serious problem and trapping is the most effective and least expensive solution to it.

Wildlife Notes are available from the
Pennsylvania Game Commission
Bureau of Information and Education
Dept. MS, 2001 Elmerton Avenue
Harrisburg, PA 17110-9797
www.pgc.state.pa.us
An Equal Opportunity Employer

Wildlife Note — 25
LDR0103

Opossum

by Chuck Fergus

The opossum, *Didelphis virginiana*, is one of the world's oldest species of mammal, and the only marsupial on our continent. Marsupials are born before they are well developed, compared to other mammals, and continue their growth and development in a pouch on their mother's abdomen. Most members of the order Marsupialia are native to Australia and South America. Structurally, they have changed little for millions of years; the opossum's relatives date back to the Cretaceous Period, 90 million years ago. However, the opossum didn't appear in North America until the Pleistocene Epoch, less than a million years ago.

"Opossum" is derived from the Algonquin Indian word *apasum*, meaning "white animal." A creature without specialized body structure or food preference, the opossum thrives in many settings. It is found throughout Pennsylvania, and it is classified as a furbearer.

Biology

Mature opossums are 24-40 inches long, including a 10- to 12-inch tail. They weigh 4-12 pounds. Males are larger and heavier than females, and the average adult is about the size of a large house cat.

An opossum has a long, pointed snout with 50 teeth — more than any other North American mammal — small, dark eyes and rounded, bare ears. The tapering tail is naked and scaly, like a Norway rat's. Their feet have five toes, each with a claw, except the first toe of each hind foot, which is long and capable of grasping, like a thumb.

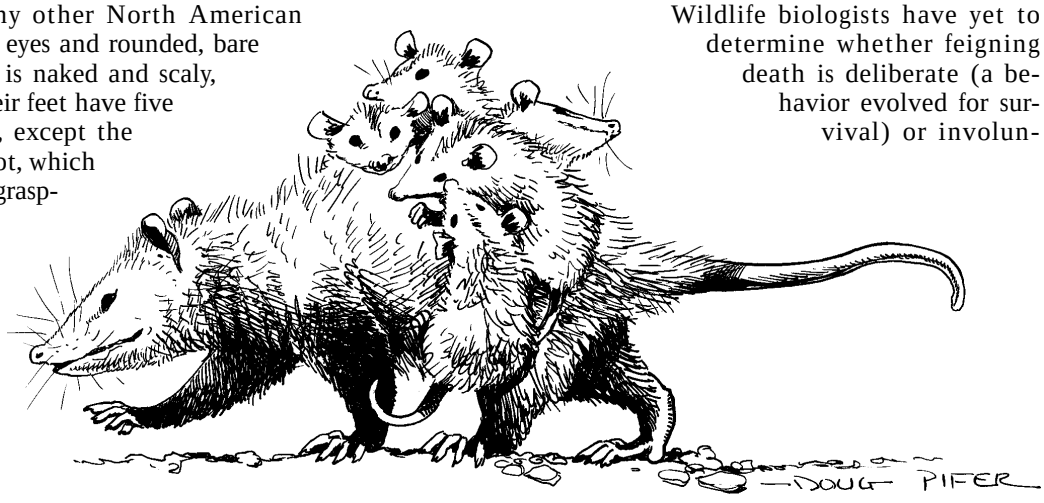
Their long, coarse body fur is light gray; outer hairs may be tipped yellow-brown. Legs and feet are dark brown or black. Males, females and immatures are colored alike, although fur and skin color may vary among different geographic areas.

Opossums walk with an ungainly shuffle, averaging 0.7 mph; their running speed is a little over 4 mph. Excellent climbers, they ascend hand-over-hand, using their prehensile tails for gripping and balancing. They are good, but slow, swimmers.

An opossum's brain is small and of primitive structure. Senses of smell and touch are well developed, but hearing is not especially keen and eyesight is weak. When walking, an opossum sniffs the air and occasionally stops and stands on its hind feet to look around. Although normally silent, it may growl, hiss or click its teeth when annoyed.

If an opossum is threatened and cannot climb a tree or hide in rocks or brush, it may crouch and defend itself — or, if struck, may feign death.

When feigning death, also called "playing possum," an individual lies limp and motionless, usually on its side. Its eyes and mouth remain open, its tongue protrudes, its forefeet clench, and its breathing becomes shallow. This state may last from a few minutes to several hours. Feigning may help an opossum survive an attack, because some predators ignore dead prey. Opossums also exude a musky odor that may repel some enemies. Wildlife biologists have yet to determine whether feigning death is deliberate (a behavior evolved for survival) or involun-



tary (perhaps caused by nervous paralysis).

Opossums are omnivorous and opportunistic — they eat whatever they can find. Animal food includes terrestrial and aquatic invertebrates (mainly insects), lizards, snakes, toads, the young of small mammals, bird eggs and young birds. Plant foods include berries (grapes, pokeberries, blackberries, etc.), mushrooms, acorns, cultivated plants. Opossums eat more animal than plant food. They consume garbage and carrion, including animals killed on highways. Sometimes opossums forage by day, but they are mostly nocturnal. They take shelter in hollow logs, woodchuck burrows, rock crevices, tree cavities, the abandoned leaf nests of squirrels and beneath porches and old buildings. They seldom spend two successive nights in the same den. Opossums do not dig their burrows, but they will occupy abandoned burrows.

Opossums are solitary. Females and unweaned offspring stay together, and the sexes come in contact during breeding season, late February and March in Pennsylvania. After mating, the female drives off the male. The male plays no part in raising young.

The opossum's gestation is short — 12 or 13 days. Newborn young are hairless, pink-skinned, blind and scarcely past the embryonic stage. They are about one-half inch in length and weigh 0.005 ounces. Hind limbs are rudimentary, but the front limbs and feet are well-developed and equipped with claws. The young crawl upward, with overhand strokes as if swimming, through the mother's fur to a pouch in the skin of her belly.

Most litters vary from 5-13 young, averaging 8 (as many as 21 have been reported). The pouch is lined with fur and contains mammary glands. When a young opossum attaches and begins to nurse, the nipple enlarges, forming a bulb on the end which swells in the baby's mouth and helps it stay attached. The female usually has 13 mammary glands, so offspring in excess of this number die. The mother can close her pouch to keep the young from falling out.

Young grow rapidly, increasing their weight 10 times and doubling their length in 7 to 10 days. By seven weeks, they are 2¾ inches long. After eight to nine weeks, their eyes open, and they let go of the mammary glands for the first time. They begin leaving the pouch for short periods, riding atop their mother's back, gripping her fur with their claws.

When three to four months old, young opossums begin to look for their own food and care for themselves. Soon they stop nursing, but they may stay with the female a few weeks longer. Six to nine young usually survive to fend for themselves.

Females may bear a second litter, breeding again from mid-May to early July. At least two weeks pass between weaning of the first litter and birth of the second, as the female is not sexually receptive while still nursing. Females can breed when they are a year old.

In fall and winter, opossums devote almost twice as much time to feeding and improving their nests as they do the rest of the year. Opossums do not hibernate, but may den up during cold or snowy periods. Although they add a layer of fat, they do not grow a winter pelt, and their fur is poor insulation. Pennsylvania is near the species' northern limit, and many opossums lose the tips of their ears and tails to frostbite.

Ticks, fleas, cestodes and nematodes parasitize opossums, and the species is preyed on by foxes, bobcats, hawks and owls. Trappers also take some. Many opossums are killed by vehicles while feeding on other highway-killed animals. An opossum's life expectancy in the wild is about 1½ years, with a few reaching age 5.

Population

The opossum is common in wooded areas throughout Pennsylvania. On a continental scale, it ranges from southeastern Canada south through New England to Florida, west to Minnesota, Nebraska and Texas, and south to middle America. It has been introduced in several western states.

Opossums are unspecialized animals that can utilize a variety of foods and habitats. The species has expanded its range north and west during the past century. Their population is stable.

Habitat

Opossums are at home in farmland and woodlots, reverting fields, brushy woods, open woods, in dry or wet terrain and at varying elevations. They inhabit suburbs and the edges of towns where food and cover are available. Ideal habitat is bottomland woods surrounding streams.

An opossum's range depends on food availability and the individual's tendency to wander. In one study, biologists found that opossums had elongated, rather than circular ranges (circular being the pattern of most other land-based wildlife), following the edges of rivers and streams. The average home range was 0.6 miles, the study determined.

Where food is plentiful, an opossum may range only a few hundred yards; in intensely cultivated areas, where fencerows, rocky field corners and reverting fields have been cleared for crops, an opossum would have to range farther (up to two miles) to find food.

Habitat management aimed at helping other wildlife often benefits opossums. Forest thinning and edge planting stimulate the growth of low, food-producing plants (blackberries, wild grapes, etc.) and create thick cover for escape or daytime loafing. When managing a woodlot, sparing old wolf trees (wide-spreading trees with little timber value) preserves the hollow limbs used by opossums. Well-managed game habitat — such as a state game land — provides many wildlife species ample food and cover.

Wildlife Notes are available from the
Pennsylvania Game Commission
Bureau of Information and Education
Dept. MS, 2001 Elmerton Avenue
Harrisburg, PA 17110-9797
www.pgc.state.pa.us
An Equal Opportunity Employer

Wildlife Note — 11
LDR0103

River Otter

by Chuck Fergus

The river otter, *Lutra canadensis*, is an elusive aquatic mammal. It belongs to the mustelid or weasel family and is closely related to the sea otter, mink, badger, wolverine and weasels.

Otters slide on ice or snow, shoot down slick muddy banks into creeks, play with food, sticks and stones, and wrestle each other. Few people are lucky enough to see otters in the wild, but those who do rarely forget the experience.

Biology

A mature male otter weighs 10 to 25 pounds and is 30 to 40 inches in length, plus a 12- to 15-inch tail. Females are slightly smaller. An otter is muscular, streamlined and solidly built, somewhat like a dachshund; height at the shoulder is about 10 inches. An otter's tail is long and tapered, thickest where it joins the body and furred its entire length. The face is broad, and the eyes protrude slightly.

Otter fur is a rich dark brown, lighter on the underparts; the throat and chin are grayish, the nose black and bare. Two fur layers — short dense underfur and longer guard hairs — combine with a subcutaneous layer of fat to insulate the body. In autumn, the normally thick fur grows in even thicker for extra cold resistance. All four feet are wide and webbed between the toes, although the hind pair are used more in swimming than the front pair.

Otters obtain most of their food from the water. Fish are favorites: minnows, sunfish, suckers, carp and trout. Other foods are frogs, turtles, snails, mussels (an otter crunches the shells with its teeth), crayfish, snakes and snake eggs, worms, insects, aquatic plants, roots and, on occasion, muskrats.

An otter's hearing is acute, its eyesight adequate above water and superb below. It has a keen sense of smell and a set of long, stiff, sensitive whiskers just behind and below the nose; these serve as sense organs when the animal is searching for food in murky or turbulent water.

An otter is a fast, graceful swimmer, probably the most adept in water of all the land mammals. It can travel underwater a quarter-mile without coming up for air, dive up to 50 feet and, if necessary, stay submerged up to four minutes. While underwater, valve-like structures seal an otter's ears and nose, and its pulse rate drops, slowing blood and oxygen circulation, making long submersion possible.

Underwater locomotion is mainly by body movement, with the feet and tail used for steering; propulsion comes from up-and-down body flexing, as opposed to the side-to-side movement of a swimming fish. An otter's top swimming speed is about seven miles per hour.

Otters den on the edges of lakes, rivers or streams, or occasionally on islands or patches of high ground in marshes. Dens may be excavations under tree roots or rock piles, abandoned beaver, muskrat or woodchuck burrows, or unused beaver lodges. A typical den has an underwater entrance hole, a living space above water level and several air or exit-entry holes to dry ground.

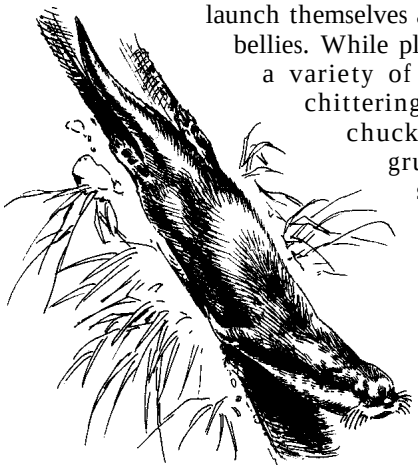
Otters mature sexually by two years of age. They breed sometime between January and May, mating taking place in the water. As with many other mustelids, otters have delayed implantation. This means that after fertilization, eggs remain dormant in the female's uterus until the following December, January or February, when they attach to the uterine wall and start to develop. Approximately two months later, from February to April, one to five

(most often two or three) young are born. Females usually have their first litter at age three.

Pups weigh 4 to 5 ounces and are blind and toothless at birth. They do not open their eyes for five weeks, and their mother keeps them in the den until they are three or four months old. The female breeds shortly after giving birth, but she will not allow a male near her young for several months. Males are polygamous.

When a young otter emerges from the den, its mother must teach it to swim. First she carries or pushes the pup into the water; then she submerges, remaining nearby as the pup tries to swim and letting it climb onto her back when it tires. After several such lessons, young otters begin to enter the water on their own and eventually play, hunt and feed in it. By autumn, they are nearly adult size. They may remain with their mother until she is ready to bear another litter.

Curious and playful, otters romp and wrestle with each other or play by themselves, even as adults. On snow, they take three or four running steps, launch themselves and slide on their bellies. While playing, they make a variety of sounds: chirps, chittering noises and low chucklings and grumblings. A scream is the danger call. Otters are mainly nocturnal but occasionally venture out during the day.



Otter predation isn't common as few of our predators can catch an otter and females go to great lengths to protect their young. Too swift and agile to be caught in the water, otters are able fighters if cornered on land. They have tremendous strength, reflexes and endurance, sturdy teeth and powerful muscles.

Otters do not store food for winter, nor do they hibernate. If lakes or rivers freeze, they swim under the ice; they breathe on the surface of open water, in their dens or from air pockets lodged against the underside of the ice. In winter, they spend much time in the water, which is often warmer than the air. Otters are more sedentary in winter than in summer — especially during extreme cold spells — although winter food shortages may force individuals to cover as much as 50 miles of stream over the season.

Otters groom themselves frequently and are in the water much of the time, so external parasites are not too common; however, lice have been found on some pelts. Internal parasites include liver flukes and stomach and intestinal worms. An otter's lifespan is 10 to 20 years.

Population

Various types of otters are found throughout the world, except in Australia, New Zealand, the extreme arctic and antarctic regions, and desert areas. In North America, otter populations remain large in the lake region of eastern Canada, Florida, Louisiana, the Carolinas, Alaska, the Pacific Northwest, Michigan and Wisconsin.

In Pennsylvania, the species has been protected since 1952, with no hunting or trapping allowed. Because otters are secretive and nocturnal, it's hard to estimate the population. Many of the state's otters are found in our northeastern counties, but they can be found in every major river basin in the state.

Both New York and Maryland have substantial otter populations. Their numbers are fairly stable, and trapping is permitted in both states. This situation is brought about by the large amounts of suitable aquatic habitat — numerous lakes in New York, and the Chesapeake and seaboard areas of Maryland.

The Game Commission, Wild Resource Conservation Fund, Pennsylvania State University and other partners have funded otter restocking efforts in the state since the early 1980s, and related research and management efforts are ongoing.

Water pollution — strip mine run-off, industrial wastes, sewage — made many Pennsylvania streams, lakes and rivers unfit for aquatic life, otters included. But much progress has been made in cleaning up many of the state's polluted waterways. A direct benefit of that is the return of river otters.

Habitat

Clean water supporting fish and other aquatic life is the foundation of good otter habitat. Although otters have been sighted miles from water — usually during the breeding season — they were probably en route to another water source.

Otters are found in extremely varied habitat in North America, including high Rocky Mountain lakes, spruce and birch forests in the North, marshes and swamps in the South, and major river basins.

While otters sometimes live near towns and cities, they seem to prefer wilder territory. Water quality, more than any other factor, will determine where otters will live in the future. Right now, the future's bright as fish and other aquatic life are prospering in many of our once-polluted waterways. Moreover, tough anti-pollution laws now safeguard these waters from returning to the crippled state they were in not too long ago. For the otter's sake, that's good news and should translate into continuing range expansion for some time to come.

Wildlife Notes are available from the
Pennsylvania Game Commission
Bureau of Information and Education
Dept. MS, 2001 Elmerton Avenue
Harrisburg, PA 17110-9797
www.pgc.state.pa.us
An Equal Opportunity Employer

Wildlife Note — 9
LDR0103

Raccoon

by Chuck Fergus

The raccoon is a medium-size woods mammal with the scientific name *Procyon lotor*. *Procyon* means "before dog," implying the raccoon is less advanced than the dog from an evolutionary standpoint; *lotor* refers to the species' habit of dunking food in water before consumption. The common names "raccoon" and "coon" are anglicized versions of the Indian word "arocoun." It's fitting that the common names evolved from a Native American word, as the raccoon is strictly a New World animal, found in North and Central America.

As with many wildlife species, we view the raccoon with mixed emotions. Some raccoons are destructive, damaging crops and gardens, and raiding nests of domestic birds. They're valuable in many ways, too: a prime pelt brings good money on the fur market, and hunting raccoons with hounds is an exciting, sport with a tradition as old as the hills. But in the end, the true value of any life form cannot be measured in man's terms. Raccoons have worth simply because they are one of the many fascinating and interlocking segments of nature.

Biology

Raccoons range in size from 28 to 38 inches, which includes a 10-inch tail, and weigh 10 to 30 pounds. Males are generally larger and heavier than females. Records exist of raccoons weighing up to 40 pounds, but individuals this heavy are extremely rare in the wild.

A raccoon's fur is long, soft and colored a grizzled black-brown. The bushy tail is marked with alternating rings of light and dark fur. Broad cheeks, a long slender muzzle, erect, rounded ears and a black strip or mask across the cheeks and eyes give the raccoon a masked bandit-like appearance. Albinism (a lack of pigment producing a white individual with pink eyes) and melanism (which produces a totally black animal) occur infrequently. The fur on a raccoon's feet is light gray, and the soles of the paws are hairless. Raccoons shed in April, producing coats with thinner, lighter guard hairs; in autumn, heavier fur fills in. Usually by late November the winter coat has replaced the shorter summer fur. At that time the pelt becomes prime.

Raccoons are found throughout Pennsylvania, often near water — lakes, streams, rivers — but also on ridges and in suburban areas. They adapt well to people and human activities; some raccoons live in cities, where they den in storm drains and attics and raid garbage cans and pet dishes.

Raccoons are omnivorous. This means they eat both vegetable and animal matter, including wild cherries and grapes, raspberries, blackberries, persimmons, apples, beechnuts, acorns, melons, corn, grass, leaves, earthworms, crickets, grasshoppers, beetles, grubs, fish, frogs, crayfish, mice, carrion, eggs, etc.

Raccoons have excellent senses of hearing, sight and smell. They also possess an acute sense of touch in their forefeet, enabling them to catch fish and other small, quick prey. Long, sharp claws anchor slippery food items. No one knows exactly why raccoons occasionally dunk food taken in or near water before eating it. Many naturalists believe raccoons derive some information from handling the food underwater, which may cause them to accept or reject it.

Raccoons are adept climbers and, being nocturnal, they spend most of their daylight hours in trees. On warm, bright days they like to sun themselves while lying flat on horizontal limbs, in squirrel leaf nests or curled up in the crotches of trees. Then at night, they descend in search of food. They travel, feed and hunt almost exclusively on the ground. Most raccoons have central home dens as well as others scattered about their feeding ranges. Adult home ranges are about a mile in diameter, greater when food is scarce. An ideal den or nesting site is a hollow in a large tree trunk or limb, but raccoons also use old woodchuck burrows, caves, rock crevices and abandoned farm buildings.

Raccoons have short, stout builds. Like bears, they are plantigrade (flat-footed), walking on the sole of the foot with the heel touching the ground. They're relatively slow runners but fierce fighters — especially females with young. Men and dogs are the adults' main enemies, al-

though owls, foxes and bobcats may take young that stray from their mothers' protection. Raccoons are strong swimmers.

A raccoon makes a variety of sounds, including barks, hisses, a wailing tremolo, a *churr-churr* noise often given while the animal is feeding, and a piercing scream of alarm or fear.

By late autumn, raccoons have eaten enough to produce a heavy layer of fat that helps sustain them until spring, although they eat whatever food they can find in winter. They do not store food. Unlike woodchucks, raccoons are not true hibernators; they den up and sleep soundly when temperatures fall below about 25 degrees, but emerge at different times throughout the winter during warm spells. They are considerably leaner by spring, having burned up much fat.

Breeding takes place in January or February. Following a 2-month gestation period, young are born in March and April. Usual litter size is 3 to 5 young, with 4 the average. Cubs weigh about three ounces at birth, are covered with yellow-gray fur and have faintly banded tails. After about 19 days their eyes open, and when four weeks old they begin to accompany the female on short feeding forays. Weaning starts at about eight weeks; by the time they're three or four months old, cub raccoons are large and independent enough to be on their own.

The male usually stays with the female after mating and until babies are born, and may help rear the young. By the time the young mature, however, the father has usually gone off on his own.

Many family groups — mother and offspring — stay together through the young raccoons' first winter. Most yearling females breed at this time, but males of the same age probably do not breed for another year. If for some reason a female doesn't breed in winter, she may become receptive later in the spring and bear young in the summer. Small raccoons found in the fall are the result of this late breeding. By late fall, young raccoons follow their mother away from the den nightly in search of food.

In spring, juveniles disperse from the areas in which they were born. Young raccoons may move only a mile or two or may travel long distances. Records exist of young males apparently dispersing up to 150 miles, although movement of this magnitude is unusual.

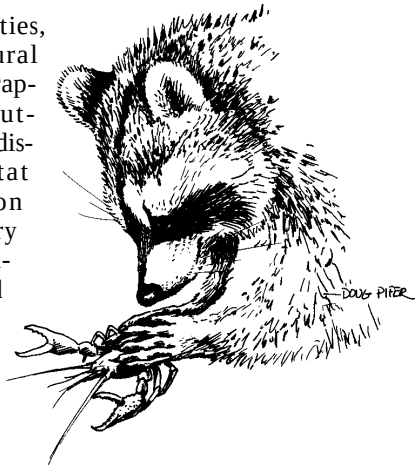
Raccoons exhibit some social hierarchy; most dominant are older males and females with young. However, individuals do not defend fixed territories or ranges against other raccoons.

Captive raccoons have lived up to 18 years, but their life expectancy in the wild is probably about 10 years. Important mortality factors are lack of food in a hard, long-lasting winter, parasitism, hunting, trapping and disease. Many raccoons are also killed on highways.

Population

Although it experiences occasional declines, Pennsylvania's raccoon population is stable. Nationwide, raccoons occur in all of the lower 48 states and into Central America, but they're not found in the higher reaches of the Rocky Mountains or some of the Western deserts.

Local populations may fluctuate because of severe weather, food scarcities, development of rural land, hunting and trapping pressures, outbreaks of rabies and distemper, and habitat changes. Population concentrations vary with habitat; researchers have estimated one raccoon per 0.63 acres of excellent habitat and one raccoon per two acres of good habitat.



Raccoons become more susceptible to disease if they overpopulate an area, because they'll encounter one another more often. However, as long as fur prices provide an impetus for trappers to harvest raccoons, disease will only minimally impact populations.

Habitat

Raccoons are adaptable, and many types of terrain provide suitable areas for them to live. As a rule, they prefer forested areas offering plenty of den sites. They favor hardwood over coniferous forests, because hardwoods provide more food (nuts, fruits) and are more apt to develop cavities and hollow limbs suitable for shelter. Swamps and fertile bottomlands are good habitat; raccoons often thrive near water courses, where good hunting opportunities exist. A raccoon will wade up a small spring run in search of crayfish, aquatic insects, minnows and other food.

The Game Commission has never had to improve habitat specifically for the raccoon because the species manages well on its own. In managing forests on state game lands, however, the Commission tries to protect mature hardwoods, which are used as den trees by raccoons and many other wildlife species.

A varied habitat — trees of different ages and types, brush, herbaceous vegetation — is ideal because it provides food during all seasons. In general, habitat improvement for turkeys, squirrels or deer also benefits raccoons. Grassy openings are excellent sources for insect food. Food-producers such as grapevines, blackberry, raspberry and greenbrier patches, black cherry trees, oaks and beeches should be encouraged and maintained. Beaver dams benefit raccoons — and many other wildlife species — by producing plentiful aquatic food.

Wildlife Notes are available from the
Pennsylvania Game Commission
Bureau of Information and Education
Dept. MS, 2001 Elmerton Avenue
Harrisburg, PA 17110-9797
www.pgc.state.pa.us
An Equal Opportunity Employer

Wildlife Note — 23
LDR0603

Striped Skunk

by Chuck Fergus

The striped skunk (*Mephitis mephitis*) belongs to the mustelid family, which includes weasels, ferrets, martens, fishers, mink, otters and badgers. Three other skunk species live in the United States: hooded and hognose skunks, which inhabit the Southwest; and the spotted skunk, found over much of the country, but in the East, north only to southwestern Pennsylvania.

The species commonly found in Pennsylvania is the striped skunk. Widespread, it occurs in all 48 contiguous states, southern Canada, and northern Mexico, from sea level to timberline in suitable habitat. The word "skunk" comes from the Algonquin Indian name for the animal, *seganku*. Other names include polecat and the French Canadian *enfant du diable*, or "child of the devil."

Biology

Adult skunks are about two feet long, including a 7- to 10-inch tail. They weigh 3 to 12 pounds, depending on age, sex, physical condition and time of year. Males on average are 15 percent larger and heavier than females.

Skunks have small heads, with small eyes and ears and a pointed nose; short legs; and wide rear ends. The bottoms of their feet are hairless, like those of bears or raccoons. And, like these two other mammals, skunks walk in a plantigrade manner — on the soles of their feet with heels touching the ground. The claws of a skunk's forefeet are long and sharp, well-adapted to digging.

A skunk is colored black and white. Its body is often mostly black, with white occurring in a narrow blaze up the middle of its forehead; a broad patch on the back of its head, and a V-shaped mark over its shoulders, which forms stripes that continue along the animal's back, often uniting at the base of its tail. Stripes vary in length and width among individuals. The tail is bushy and black, usually tipped white. Sexes are colored and marked alike.

A skunk's pelt is composed of soft, wavy underfur overlain with long, coarse guard hairs. Skunks molt yearly, beginning in April and ending some time in September.

Skunks make a variety of sounds, including hisses, growls, squeals, soft cooings and churrings.

By nature, skunks are placid and sluggish. They move at a deliberate walk, slow trot or clumsy gallop; their top speed is about 10 miles per hour. They can swim, but are poor climbers. Their senses of sight, smell and hearing have been judged poor to fair compared with those of other wild mammals; their sense of touch, however, is acute.

Skunks are armed with a potent defensive weapon: a pair of large scent glands found beneath the skin on either side of the rectum. These glands have nozzle-like ducts, which protrude through the anus. Skunks discharge their scent, or musk, through these nozzles, powering the stream with a strong hip muscle contraction.

Musk is an oily liquid, creamy or yellowish in color. Its active ingredient is a sulphide called mercaptan. Field guides refer to the musk as "highly repellent to all mammals." In short, it stinks. Musk can make a predator sick or, if the skunk has been able to direct the substance into the animal's eyes, temporarily blind.

A skunk can shoot musk about twelve feet, but will use it as only a last resort, preferring, instead, to bluff an enemy. If threatened, a skunk drums its forefeet on the ground, snarls, arches its back and raises its tail. It can spray in any direction by twisting its rump toward the target. And, contrary to popular opinion, it can discharge when hoisted by the tail.

Striped skunks are omnivorous. What they eat depends on where they live and what's available. In summer, they feed heavily on insects — adult and larval forms — including grasshoppers, crickets, beetles and wasps. (Pest insects eaten: potato bugs, tobacco worms and Japanese beetles.)

Skunks dig out bumblebee nests and scratch at the entrances of beehives, catching and eating any honeybees that fly out. Frequently they leave evidence of their

feeding: small, cone-shaped holes in the soil, pine needles, leaf duff or suburban lawns mark where they've dug for grubs. Other summer foods: spiders, toads, frogs, lizards, snakes, mice, chipmunks and the eggs of turtles and ground-nesting birds.

In fall and winter, skunks eat fruit such as wild grapes and cherries; small mammals such as moles, mice, voles and shrews; plant items such as grasses, leaves and buds; mast and carrion. Chiefly nocturnal, they hunt from dusk until dawn.

They den in ground burrows, beneath buildings, stumps, wood and rock piles and overhanging creek banks. Often a skunk will use an abandoned woodchuck burrow, although if none is available it will dig its own. The burrow has a central chamber (12 to 15 inches in diameter) about three feet underground, connected to the surface by one or more tunnels 5 to 15 feet long. The central chamber is lined with dry grass and leaves. Skunks seem to prefer slopes for den sites, probably because these areas drain well. In spring, summer and early fall, a skunk may den in several different burrows; in winter, it tends to use just one.

Normally solitary, males and females get together for breeding in February and March. Males fight with each other, although they rarely discharge musk during these conflicts. They travel widely in search of mates and breed with several females if possible.

A mated female drives off males shortly after her 3-day estrus period ends. After 60 days' gestation, she bears 2 to 10 young (usually 5 to 7). Skunk are capable of breeding in their first year. Younger females may bear fewer young and give birth later in the year than older females.

At birth, striped skunks weigh less than an ounce. Although they're blind and unfurred, the pattern of their future black-and-white pelage shows on their pinkish, wrinkled skin. They develop quickly. After three weeks, their scent glands become functional; at four weeks, their eyes open; and at about two months the young are weaned and ready to leave the den for nighttime hunting forays.

By November, young of the year are as large as adults. While family ties are usually broken in August or September, some mothers over-winter with their offspring. Community dens have been found containing 12 or more skunks, mostly females and young.

Skunks do not hibernate, although they may remain dormant underground all winter. Their body temperature remains near normal. Several skunks may share the same winter den. Females usually lose 10 to 30 percent of their body weight by spring; males lose only about 10 percent, as they are more inclined to leave their dens and feed during mild spells, mostly at night but occasionally during the day.

The great horned owl, which lacks a well-developed sense of smell and apparently is not bothered by the skunk's musk, is a predator. Dogs, foxes, coyotes and bobcats take an occasional skunk, but the skunk's potent musk warns off most predators.

Other mortality factors are diseases such as pneumonia, distemper, pulmonary aspergillosis, tularemia, brucellosis and rabies; highway kills, starvation and trapping. Skunks are host to fleas, lice, mites, ticks and various internal parasites. Most skunks live two to three years in the wild; in captivity, they have lived 10 years.

Population

Striped skunks live throughout Pennsylvania. Highest numbers are found in farming areas; lowest populations occur in densely forested mountain regions. Wildlife researchers have estimated an average of one skunk per 10 acres of prime habitat and 13.5 skunks per square mile of agricultural land.

Mephitis mephitis has proven highly adaptable. Along with the woodchuck, raccoon, Canada goose, mourning dove, several species of blackbirds and other wildlife, the skunk prospers wherever humans clear land for farming and remove or drive out larger predators.

Skunks can live in an area for years and, because of their nocturnal habits, remain unseen — although perhaps not "unsmelled" — by most people. Some farmers welcome their presence, realizing that these small predators eat many pest insects and rodents.

Skunks are susceptible to distemper and rabies. Trapping may help minimize the impacts of disease on a skunk population. Local populations are also affected by severe weather, food scarcities and habitat change.

Habitat

Skunks live in a variety of habitats. They favor mixed woods and brushland, rolling weedy fields, fencerows, wooded ravines and rocky outcrops in or near agricultural areas. For day retreats (resting cover), they use hayfields, pastures, fencerows and brushy borders of waterways. Cornfields are good feeding areas, where skunks forage for grasshoppers, grubs and beetles; high corn plants also protect young skunks from airborne and land predators without impeding their movements.

Although they may cover several miles each night while hunting, established individuals rarely wander more than a half-mile from their home burrows. In general, adults range more widely than juveniles, males more widely than females.

Wildlife Notes are available from the
Pennsylvania Game Commission
Bureau of Information and Education
Dept. MS, 2001 Elmerton Avenue
Harrisburg, PA 17110-9797
www.pgc.state.pa.us
An Equal Opportunity Employer

Wildlife Note — 26
LDR0603

Weasels

by Chuck Fergus

Weasels are mammals belonging to the family Mustelidae. The mustelids, which are characterized by strong musk, vary in size, color, behavior and habitat. They are found worldwide, except for Antarctica and most oceanic islands. Other Pennsylvania mustelids are the striped skunk, mink, otter and fisher. Ferrets, badgers and wolverines also belong to the family.

Three weasel species occur in Pennsylvania: the ermine, also called the short-tailed weasel, Bonaparte's weasel, and stoat; the long-tailed weasel, also known as the New York weasel; and the least weasel, or mouse weasel. Ranges of the three species overlap in Pennsylvania, the Great Lakes states and parts of Canada. In Pennsylvania, the ermine is found mostly in the northern and eastern parts, the long-tailed is common throughout the state, and the least is found in greatest numbers in the southcentral and northwest.

Weasels have long, slim bodies. Their short legs have five small-clawed toes on each foot. Their necks are long, their heads small and triangular; eyes are small in relation to head size, and the ears, set low on the skull, are rounded and well-furred. Weasels travel with a loping gait, stopping occasionally to sit on their haunches or stand on their back legs to look around.

Weasels are consummate predators. Their senses of sight, smell and hearing are acute, their hunting instinct is keen, and they are active, aggressive and quick. They kill and consume a wide variety of prey, including animals larger than themselves. Small rodents form the bulk of most weasels' diets. Although mainly nocturnal, weasels may hunt during the day.

They find prey mainly by scent, darting in and out of rodent burrows, checking brushpiles and rock crevices. A weasel pounces on its prey and bites it at the base of the back of its skull; the weasel's forelegs hug the prey, and the hind legs kick and scratch.

A weasel has a fast metabolism and must eat more food in proportion to its body weight than other mammals of similar size. Males are typically larger than females; some biologists believe this size difference may lead males to concentrate on larger prey, relieving feeding competition when prey species are scarce.

Secretive and wary, weasels are difficult to study in nature, and many gaps remain in our knowledge of their reproduction. Two of the species covered in this Wildlife Note (the ermine and the long-tailed weasel) exhibit delayed implantation, common in mustelids. In delayed implantation, mating takes place in summer or autumn; the fertilized eggs go through a short period of development and then lie dormant within the female until spring, when they implant themselves in the uterine wall and continue to grow. About 25 days later, young are born.

Delayed implantation has two possible adaptive advantages: It assures that all litters arrive at a time when prey is abundant and competition for food is not extreme. Additionally, it doesn't restrict mating to one short period, increasing the odds that females will come in contact with males and be bred. Female weasels give birth to 4 to 12 young, usually in underground nests. Least weasels are thought to produce several litters each year, while ermines and long-tailed weasels bear one litter in April or May. Young of all species are born blind and naked or sparsely furred. Adult males may bring food to the mother and nursing young, which develop rapidly and are on their own after weaning.

Weasels remain active year-round, seldom denning for long periods regardless of weather. During spring, summer and fall, their fur is brown with creamy or white underparts. In Pennsylvania, most or all ermines change from brown to white for winter, and perhaps one in six long-tailed weasels turn white. Some least weasels undergo the brown-to-white transformation, which is triggered by shortening days.

Ermine (*Mustela erminea*) — The ermine is found in northern regions around the world. In North America, it occurs from Pennsylvania and Maryland north to New England, west across the Great Lakes states and Canada, from western Montana south in the Rocky Mountains to New Mexico, and from northern California north to Alaska. Although present throughout Pennsylvania (ex-

cept perhaps in the southwestern corner), the ermine is much scarcer here than the closely related long-tailed weasel.

Adults are 9 to 15 inches in length, including a 1.6- to 3.2-inch tail; males are larger and heavier than females. Weights are 1.6 to 3.7 ounces. Both sexes are smaller than corresponding sexes of the long-tailed weasel; a large male ermine is about the same size as a small female long-tailed. The ermine's bushy tail is shorter than that of the long-tailed weasel.

An ermine's pelt consists of soft, short underfur and long, coarse, glossy guard hairs. The sexes are colored alike, and immatures are similar to adults. Albinos are rare.

In summer, an ermine's upper-parts are dark brown, slightly darker on the head and legs. The chin and throat are white, and the underparts are white or cream-colored, extending down the insides of the legs and including the feet. The end third of the brown tail is black. In winter an ermine is white, tinged with yellow on the underparts and back. The tail tip remains black.

An ermine molts twice a year, in spring and autumn. The molts are triggered not by temperature but by amount of light per day, increasing in spring and decreasing in fall. Molts usually begin on the belly and spread to the sides and back, finishing with the tail. Aside from the varying hare, the weasels are the only Pennsylvania animals to turn white in winter.

The autumn molt (brown to white) begins in October and is usually complete by late November or early December. A molting ermine looks mixed brown and white. The white-to-brown spring molt runs from mid-March to late April.

Like all weasels, ermines are alert, curious and bold. They make a rapid *took-took-took* sound, hiss, purr, chatter, grunt and screech. When annoyed, they stamp their feet or emit musk from their anal scent glands.

Ermines can swim (sometimes pursuing prey in water) and climb trees, but spend most of their time on the ground. Their normal gait is a series of short bounds (about 20 inches), made with back arched. An ermine can leap five or six feet and run about 8 mph for short distances.

Prey includes mice, voles, rats, chipmunks, shrews, cottontail rabbits, frogs, lizards, small snakes, birds, insects and earthworms, and carrion when hunting is poor. Captive ermines eat food equal to about one third of their weight every 24 hours.

Ermines consume flesh, fur, feathers and bones of small prey, but generally just the flesh of larger animals. They may lick warm blood from a kill, but do not suck blood. They often kill more than they can immediately eat and cache excess kills.

An ermine spends most of the daytime in a den beneath a stone wall, rock pile, log, fallen tree, or abandoned building. A den may have three or four tunnels leading to it.

Ermine

Breeding habits are similar to those of the long-tailed weasel. Females — including young of the year, 2 to 3 months old — come into heat in summer. (Males do not mature sexually until late winter or early spring following the year they were born.) Young are born from mid-April to mid-May, after a gestation period of about nine months due to delayed implantation.

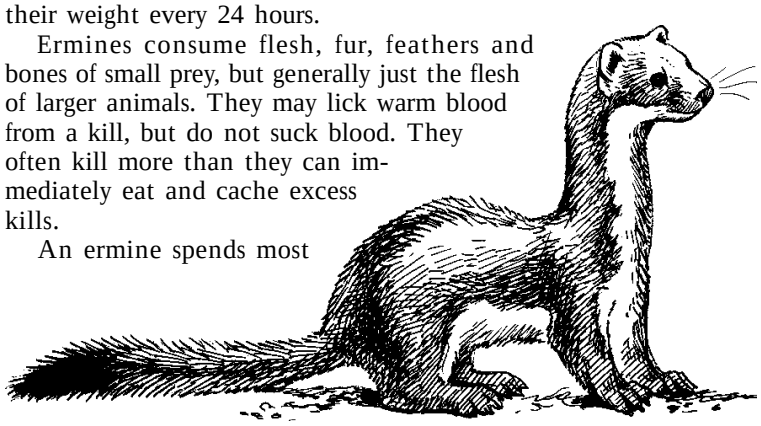
The natal nest is underground, lined with leaves, grasses, fur and feathers. The female bears 4 to 9 young, usually 6 to 7. Newborns are blind, pink and weigh about half an ounce.

Young develop rapidly. Their eyes open at 35 days; they are lightly furred and play with each other inside and outside the den at 45 days. The male may help the female care for them. A 7-week-old male is larger than its mother.

Ermines are preyed on by man, large hawks and owls, foxes, snakes and domestic cats and dogs; they are parasitized by fleas and intestinal worms. Longevity is estimated at five or six years.

An ermine's home range is thought to be about 30 to 40 acres, and 20 individuals have been found per square mile of good habitat. In winter and early spring, ermines travel long distances for food, often 2 to 3 miles per night.

In the northern part of its range, *Mustela erminea* lives in low brush and thickets along waterways in heavily forested areas. To the south, ermines inhabit open country with fencerows and rockpiles, brushy land and, occasionally, swamps.


Long-Tailed Weasel

Long-Tailed Weasel (*Mustela frenata*) — The long-tailed weasel is found from sea level to timberline from Maine across the United States and southern Canada, south to Florida, Mexico and South America, excluding the U.S. Southwest. Pennsylvania's largest weasel, it is fairly common statewide; during years when Pennsylvania paid a bounty on weasels, eight of every 10 turned in were long-tails.

The long-tailed weasel is similar to the ermine in proportion, color and markings, although the long-tailed species is slightly larger and its tail is longer.

Adult males are larger and heavier than females. Length varies from 15 to 23.5 inches, including a 3.2- to 6.3-inch tail; weights are 2.5 to 9.3 ounces. Sexes are colored alike. In summer, upper parts are a uniform dark brown, extending onto the feet and toes (feet and toes

of an ermine are white). The dark brown tail is tipped black.

The long-tailed weasel normally becomes white only in northern sections of its range; in Pennsylvania, five of every six stay brown in winter, and farther south all individuals probably remain brown.

Two molts occur each year. The fall molt is from October into November, the spring molt from mid-February or early March into April. In autumn, molting starts on the belly and moves upward; in spring, the order is reversed.

Behavior of the long-tailed weasel is similar to that of the ermine. Long-tailed weasels are good swimmers and adept climbers that will chase a squirrel up a tree. Although generally solitary, two individuals may play together. A long-tailed weasel is a persistent, efficient predator, chasing prey, pouncing on it, hugging it with the forelegs, and biting the victim at the base of the skull.

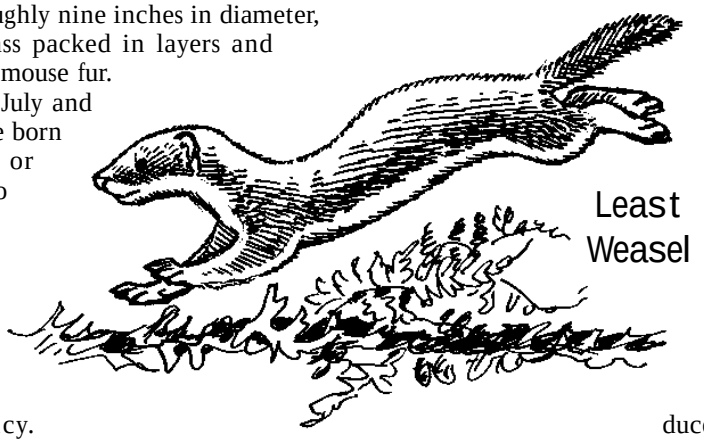
Prey: small terrestrial mammals, bats, hares, rabbits, birds and their eggs, frogs, snakes, earthworms, insects and carrion; smaller victims are eaten whole. A weasel can drag prey much heavier than itself.

A long-tailed weasel seldom digs a den, preferring to modify a chipmunk burrow, enlarge a hole under a stump, or move into a hollow log or a crevice in rocks, stone walls, or beneath an abandoned building. Nests are located about six inches underground and two feet from burrow entrances. Roughly nine inches in diameter, they are made of grass packed in layers and lined with shrew and mouse fur.

Breeding season is July and August, and young are born the following April or May after a 205- to 337-day gestation (average is 279 days). Delayed implantation occurs, with development of the eggs resuming during the last 27 days of pregnancy. One to 12 young may be born (average, 6 to 8).

Newborns are about 2½ inches long and weigh 0.11 ounces. They are blind, naked and pink-skinned, and tend to make more noise in the nest than young ermines. The male brings food to mother and young. Young develop quickly. After 21 days, their backs are well-furred; at 28 days, teeth erupt; at 36 days, their eyes open and the female begins weaning them. Soon after, the young leave the nest and disperse, and by November are almost fully grown.

Females breed in their first autumn, while males do not mature sexually until the following year. Man, foxes, dogs, hawks and owls prey on long-tailed weasels; captive specimens have lived five years, but wild individuals probably do not survive that long. *Mustela frenata* lives in open woodlands and brushy fields, preferably near water. Rocky fencerows are favorite hunting grounds. Size of an individual's range would vary with food availability and type and quality of cover.



Least Weasel *(Mustela nivalis)* — The least weasel is the world's smallest carnivore. It is found in Europe, northern Asia and North America. On our continent it inhabits the Appalachian Mountains from Pennsylvania south to North Carolina, the northern Midwest, Canada and Alaska (it's absent in New England and the Pacific Northwest). In Pennsylvania, *Mustela nivalis* is most common in the Allegheny Plateau area of our northwest and in the southcentral part of the state.

Least weasels are 6 to 8½ inches long, including a 1½-inch tail. They weigh 1 to 2 ounces. Males are slightly larger and heavier than females. Coloration is brown above, white below. The chin and feet are white, and the brown tail has no black tip. Sexes are colored alike. In Pennsylvania, some least weasels turn white in winter; in Canada, most or all individuals change into white pelage, including the tip of the tail.

Least weasels are just as aggressive and predatory as the larger weasels and kill in the same manner. If disturbed near its nest, an adult least weasel will chirp at its enemy. The chirp is a threat cry; least weasels also hiss (when afraid or threatened) and trill (in friendly encounters with other least weasels). When agitated, they spray musk from their anal scent glands.

The species preys on mice, voles, small birds, insects, earthworms and small amphibians. Sometimes they kill more than they can eat and cache uneaten prey in their dens. Least weasels are nocturnal, solitary and are seldom seen; they spend most of their time hunting and consume food equaling 40 to 50 percent of their body weight each day.

Least weasels breed and reproduce year-round, with the possible exception of winter. Delayed implantation does not occur, and two or more litters may be produced each year. A female's estrus lasts four days. If bred, she bears 1 to 6 young (usually 4 to 5) following a 35-day gestation period.

Young are blind and naked, but develop rapidly. Hair covers their bodies in four days; canine teeth erupt at 11 days; eyes open at 26 to 30 days; and weaning occurs between 42 to 49 days, after which they are on their own. Immatures reach adult length after about eight weeks, and adult weight when 12 to 15 weeks old. Females mature sexually in four months, males in eight.

Least weasels inhabit meadows, fields, brushy land, or woods. They may take over nests and burrows of mice, moles and voles, lining them with fine grass or fur; in winter, the fur lining may be an inch thick and matted like felt. Least weasels rarely travel more than 100 yards from their home burrows, and the average individual range is estimated at two acres.

This tiny weasel occupies a lower position in the food chain than ermines and long-tailed weasels. It is preyed on by the larger weasels, snakes, owls and cats. Longevity in the wild is not known.