

# BEAVER



by Chuck Fergus

Bureau of Information and Education  
Pennsylvania Game Commission

The beaver, *Castor canadensis*, is North America's largest rodent. Before the white man 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 noticeably decreased the population of this species, but today this aquatic furbearer is back. Aided by modern wildlife management and its own prolific breeding habits, the beaver has repopulated much of its former range.

Beavers are found throughout Pennsylvania (the highest concentrations are in the northeastern and northwestern 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. Shy and mainly nocturnal, beavers are seldom seen. Late evening is the best time to look.

## 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 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, manipulating 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; during a dive, the heart slows and valves close off the ears and nostrils.

Both males and females possess musk sacs, or castors, which produce an oily, heavily scented substance called "castoreum," with which the animals mark off territory. (Commercially, castoreum is used in the manufacture of some medicines and perfumes. Trappers also bait beaver

traps with it.) 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 keep it water repellent.

Because its front teeth are always growing, a beaver must continually cut on wood to keep them worn down. The upper and lower incisors are the primary cutters. The lips can be closed behind the incisors, and the tongue fits tightly against the roof of the mouth, so the beaver doesn't choke when gnawing underwater.

Beavers eat vegetable matter. They prefer soft plant foods, including grasses, ferns, mushrooms, duckweed, algae, and the leaves, stems, or 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 so far. Contrary to popular belief, they cannot cut a tree so as to make it fall in a certain direction. They sometimes dig canals (1-4 feet wide and up to two feet deep) from the pond inland, in which to float logs back to the pond.

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 which might approach over the ice. Along fast, turbulent streams—or creeks and rivers too wide to dam or whose water levels do not fluctuate much—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 four or five) young, which are called "kits." New-born kits 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 away from water.

Other animals, particularly dogs but occasionally bobcats and bears, may kill some individuals—especially young ones migrating overland—but on the whole, beavers have little to fear from predators. Some are struck by cars, and a few die when hit by trees which they have gnawed down themselves. 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 over 6000 were harvested. Today, beavers are found throughout Pennsylvania's suitable habitat, which is largely in the northern tier counties.

Beavers live in colonies. A colony is a group occupying a pond or a stretch of stream, feeding from a common food supply, and maintaining a common dam or series of dams. Usually only one family lives in a lodge or bank burrow. Beavers are believed to maintain a certain territory, and colonies do not overlap.

Generally, 5-12 beavers (usually a single family) form a colony; in summer, this could include parents, kits, and young born the previous year. The following winter, the adults would drive the young—which would be almost two years old by then—from the colony before the birth of a new litter. The two-year-olds move to new sections of stream, find mates, and build their own dams and lodges. This disperses the population and establishes colonies in new areas.

As the range of the population expands, beavers inevitably come into conflict with man—and his activities. Water backed up by their dams may flood pastures, fields, and roads, disrupt public water supplies, and kill trees. Also, beavers cut down trees for food and to build their dams. Trapping has proven to be an acceptable and economical method of controlling their numbers.

## Habitat

Beavers prefer streams and rivers narrow enough to be dammed. They also live along rivers, on timbered marshland, and around forest-edged lakes. They favor land as far from human activities as possible, in most cases.

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 1-2½ 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, shore birds, fish, reptiles, and amphibians. Otters, raccoons, 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 ten years or longer—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. Deer, bears, 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, past standing dead trees. Aspens and willows send up shoots. In time, another beaver colony may find this valley to be good habitat.

This Wildlife Note is available from the  
Pennsylvania Game Commission, Bureau of  
Information and Education, Dept. MS, 2001  
Elmerton Avenue, Harrisburg, PA 17110-9797  
An Equal Opportunity Employer

### WILDLIFE NOTES AVAILABLE

- |       |   |        |   |
|-------|---|--------|---|
| 175-1 | Squirrels<br>(Gray, red, fox and flying squirrels)  | 175-10 | Raptors<br>(Goshawk; sharp-shinned, Cooper's,<br>red-tailed, red-shouldered, broad-<br>winged, rough-legged hawks; harrier,<br>peregrine, merlin and kestrel) |
| 175-2 | Ruffed Grouse   | 175-11 | Otter   |
| 175-3 | Bobcat  | 175-12 | Crows & Ravens  |
| 175-4 | Cottontail Rabbit   | 175-13 | Woodpeckers   |
| 175-5 | Red and Gray Foxes  | 175-14 | Beaver  |
| 175-6 | Woodchuck   | 175-15 | Bobwhite  |
| 175-7 | The Varying Hare (Snowshoe Rabbit)  | 175-16 | Heron Family  |
| 175-8 | The Night Hunters: Owls<br>(Barn, great horned, snowy, barred,<br>long-eared, short-eared, screech, and<br>saw-whet owls) | 175-17 | Wild Turkey   |
| 175-9 | Raccoon   |        |   |