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# Managing Beaver

## Problems in Kentucky

*Thomas G. Barnes*

Historically, the beaver *(Castor canadensis)* was North America's most important fur resource. During the 1800s, the unrelenting pursuit and uncontrolled harvest of beavers for their pelts led to extermination throughout much of the animal's range. However, in the early 1900s the beaver received protection. Because of this protection and resulting restoration efforts, including transplanting beaver and changing land management practices, the beaver made a remarkable comeback. Beaver numbers today are at, or exceed, their population levels before the arrival of white settlers in North America.

Beavers sometimes cause problems or become a nuisance when their feeding and dam-building activities conflict with man. This publication provides information on the identification, biology and natural history of beavers and how their feeding and dam-building activities can be prevented or controlled.

## Identification

The beaver, fairly common throughout Kentucky, is North America's and Kentucky's largest rodent. It belongs to the family *Castoridae.* Adult beavers weigh between 35 and 60 pounds, with some reaching weights of 70 to 80 pounds. Adult beavers range in size from 25 to 31 inches from the tip of their nose to the base of their paddle-shaped tail. Beavers typically have large heads, indistinct necks, thick, stout bodies and small ears and eyes.

Perhaps their most recognized feature is a large, flat, hairless tail shaped like a paddle. This six- to eight-inch wide and 10- to 12-inch long tail is used for support when the beaver is on land and as a steering, swimming and communication device when it is in the water (Figure 1).

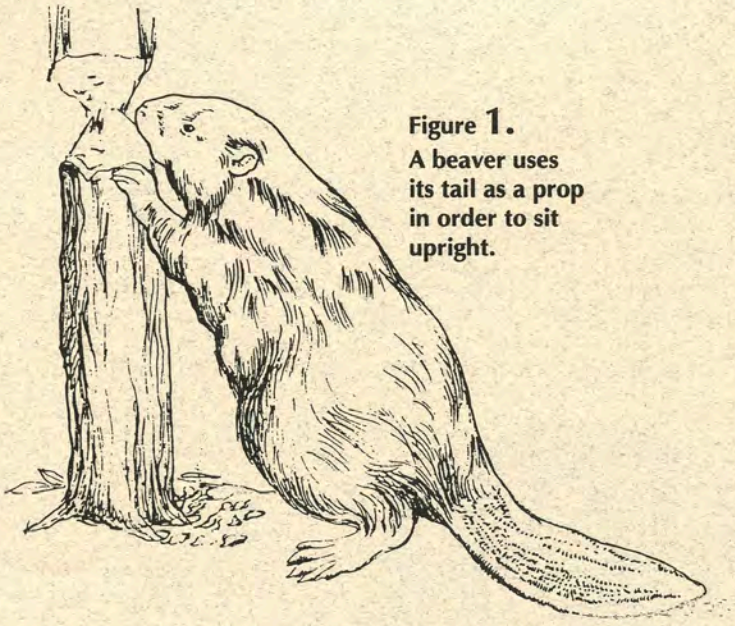


**Figure 1.**
**A beaver uses its tail as a prop in order to sit upright.**

Beavers are uniquely adapted for life in the water. They have short, stout legs specialized for swimming and working. The large, fully webbed hind feet are adapted for swimming, whereas the small front feet are very dexterous, nimble and not webbed. Beavers use their front feet for digging as well as for holding and manipulating small twigs while they peel the bark off with their teeth.

Other adaptations for an aquatic lifestyle include ears and nostrils with valves that close when the beaver is submerged, eyes that are set high on the head to allow the beaver to see above water when swimming and lips located behind the front teeth that close when a beaver is submerged, allowing it to use its teeth under water.

Like many other rodent species, beavers have a pair of continually growing, large, orange front teeth *(incisors)*. The beaver must keep the incisors worn back by using them daily.

Beaver fur, which was highly sought after and is somewhat in demand today, is comprised of a gray, soft, dense undercoat protected by long, coarse reddish-brown guard hairs. Color can vary from blond to almost pure black. Beavers carefully groom and comb their fur with oil from various glands, using the second claw on each hind foot, which is split lengthwise. Grooming with oil helps keep the beaver from becoming wet at the skin's surface. The beaver also has a pair of scent glands called "castor sacs." These glands produce a substance called castoreum which is used as a chemical signal to other beavers. It is almost impossible to tell the difference between male and female beavers unless the female is lactating and has swollen mammary glands.

# Beaver Facts and Biology

The beaver is one of a few mammals, other than man, capable of modifying its habitat to suit its needs. When beavers move into an area, they quickly begin building dams to modify the habitat more to their liking. Once the dam has been built from surrounding timber, the subsequent flooding causes growing timber to die, and other aquatic vegetation begins growing. Often, the new plants growing around the edge of the pond (willows, sweetgum and blackgum) are preferred beaver foods. Thus, good beaver habitat can be almost anywhere there is a year-round source of water. Appropriate habitat can include streams, rivers, ponds, lakes, large reservoirs, swamps, wetlands and drainage ditches.

Beavers are incredible, highly skilled engineers. They build dams on fast- and slow-moving streams to create a pond with a stable water level. They show unusual skill in selecting dam locations. The dam is usually constructed of sticks, mud and stones and provides the water impoundment for the main lodge.

Home to a beaver is its lodge or bank den, depending on the situation. Lodges are dome-shaped structures built of sticks and mud with a large interior chamber above the water line. Lodges vary in size from 6 to 40 feet, depending on the number of beavers in the colony. Beavers sometimes dig burrows into the banks of ponds, rivers and drainage ditches instead of building a lodge. All lodge and bank den entrances, normally two or more, are located underwater.

Beavers live in family units called colonies, which range in size from two to eight beavers (the average colony size is five to six). A colony consists of the adult pair, the current year's offspring (kits), the previous year's offspring (yearlings) and occasionally a 2 1/2 year old offspring. Beavers are highly territorial animals, and they actively defend the colony's territory against outsiders by using scent marking. When beavers become sexually mature around age two, they leave their home colony to form a colony of their own.

Beavers mate in January or February. Two to four one-pound kits (similar in appearance to the parents) are born in March or April. Kits grow rapidly, nursing for approximately 60 days, and by six months of age they weigh between eight and ten pounds. Beavers have a relatively long life span for a wild animal. Most beavers do not live beyond ten years of age, although some may live 20 years or more.

"Busy as a beaver" appropriately describes beaver behavior. Primarily a nocturnal animal, beavers are active for approximately 12 hours each

night, feeding and working on the dam. It is not uncommon to see beavers during daylight hours, particularly in large reservoirs. Most daily movements are centered around the pond and lodge. Individual movements vary greatly.

The female parent in the colony is relatively sedentary, occupied with caring for young during the spring and summer. Two-year-old beavers may travel five to six miles in search of appropriate habitat conditions necessary for establishing a new territory. Other travels by individual beavers include wanderings by yearlings and adults who have lost their mates.

Beavers feed on the cambium layer (just under the bark) of woody plants and a variety of aquatic and upland vegetation. Preferred woody foods include willow, birch, maple, alder, cherry and poplar, although they can and will feed on the leaves, twigs and bark of most species of woody plants. During the summer beavers will also eat water lilies, pond weeds and cattails. Sometimes beavers will travel substantial distances from the pond or stream to get to corn or soybean fields, where they cut the plant off at ground level and drag it back to the water. What they do not eat, they use for construction material in dams and lodges.

# Benefits of Beavers

Beavers are generally considered beneficial in situations where they do not compete with people for the use of the land, water or timber. Harvest of beaver pelts may be a source of income. While fur prices vary from year to year based on fashion trends, a recent survey done by the Kentucky Department of Fish and Wildlife Resources reported that more than 1,500 beaver pelts, valued at more than $20,000, were sold during the 1986-87 trapping season. Beaver ponds also attract a wide variety of other furbearing animals including mink, muskrat and raccoon. The value of these pelts, based on the same survey, was in excess of $1.4 million.

The unique dam- and pond-building attributes of beavers create favorable habitat for a variety of wildlife species, including fish, ducks, shorebirds, amphibians and reptiles. The variety of wildlife attracted to these ponds can be used for recreational, scientific or aesthetic purposes.

Ponds created in beaver dams help stabilize water tables, reduce rapid runoff from heavy rainfall and reduce soil erosion by depositing silt in the pools. Beaver castoreum is used in numerous trapper's lures, perfumes and cosmetics. Finally, beaver meat is excellent table fare if properly prepared.

# Damage Assessment

Most beaver damage is relatively easy to identify (Figure 2). Much of this damage is associated with or is a result of dam building, bank burrowing, tree cutting or flooding. Spring and fall are the periods when landowners experience the most severe damage from beavers.

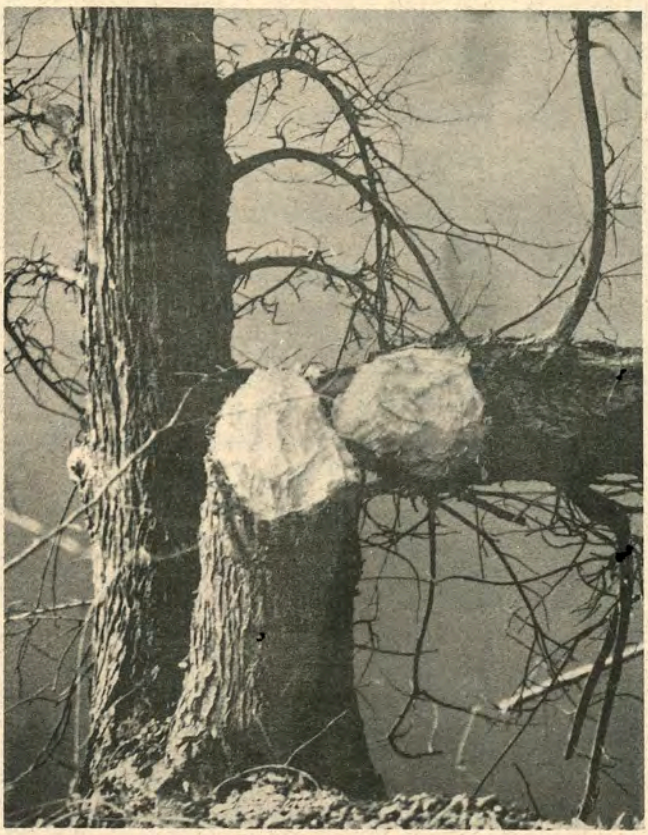


**Figure 2. Beaver damage is easy to identify.**

Damage in urban areas includes cutting or girdling of ornamental and shade trees or shrubs. Because beavers are rodents with large sharp incisors, damage to trees appears as clean, knife-like cuts at a 45-degree angle.

In rural areas, beavers may dam drainage ditches and small streams and plug drain pipes or culverts. This can lead to localized flooding of roads, timber lands or agricultural cropland.

A hazard associated with beavers is giardiasis, a disease caused by a protozoan *(Giardia lamblia).* This pathogenic intestinal parasite can be carried by beavers and transmitted to humans through the local water system. The extent of giardiasis is unknown in Kentucky, although some beavers with the parasite have been found in the state.

# Prevention and Control of Beaver Problems

Beavers are classified as furbearing animals in the state of Kentucky. An open trapping season is established for the legal harvesting of these animals, and they are subject to all applicable state laws and regulations. Consult the Kentucky Department of Fish and Wildlife's trapping digest for more information on removal of beavers during the legal trapping season.

If a beaver is damaging your property, you can kill the animal at times other than the legal trapping season. After the animal has been destroyed, you must contact your local conservation officer for disposal of the carcass.

If the beaver pond has been in existence for a considerable period of time (even if it is flooded cropland), the area may be officially classified as a wetland. Under the provisions of the 1985 Food Security Act, Conservation Reserve Provision, it may be illegal to destroy the dam and drain the wetland. Contact the U.S. Army Corps of Engineers in Louisville or your local Agricultural and Soil Conservation Service, Soil Conservation Service or Kentucky Department of Fish and Wildlife Resources office for an on-site visit and recommendation.

## Nonlethal Prevention and Control

Individual high-value shade or ornamental trees can be protected from beavers by wrapping them with 1/4- or 1/2-inch hardware cloth to a height of four feet. Small areas around culverts, drains and ponds in urban areas can be fenced using netwire with small mesh wire.

Another method of discouraging beavers is to install a device to manipulate the water level of a pond. This can be accomplished by installing a three-log drain (Figure 3) or wire mesh culvert that the beavers cannot plug. Lowering the water level in the summer encourages wild or planted foods to grow, providing excellent habitat and food for waterfowl.

For more information on constructing water control structures to discourage beavers and enhance waterfowl habitat, contact a Kentucky Department of Fish and Wildlife Resources District biologist or the Cooperative Extension Service.

**Figure 3a. Three-log drain**

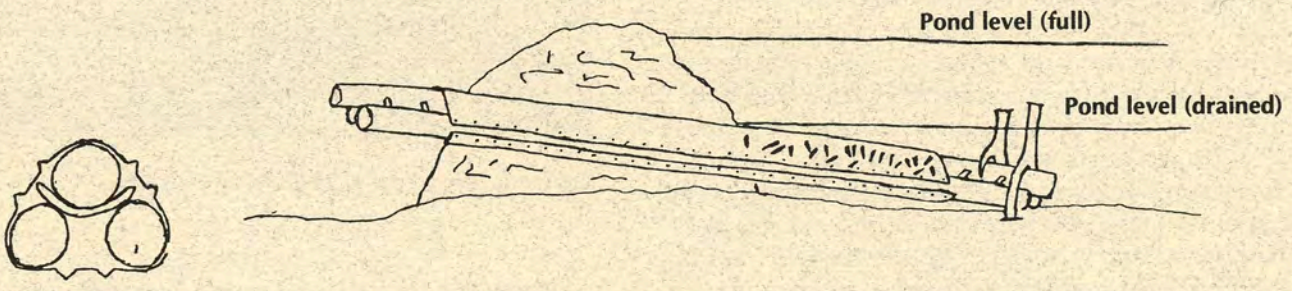
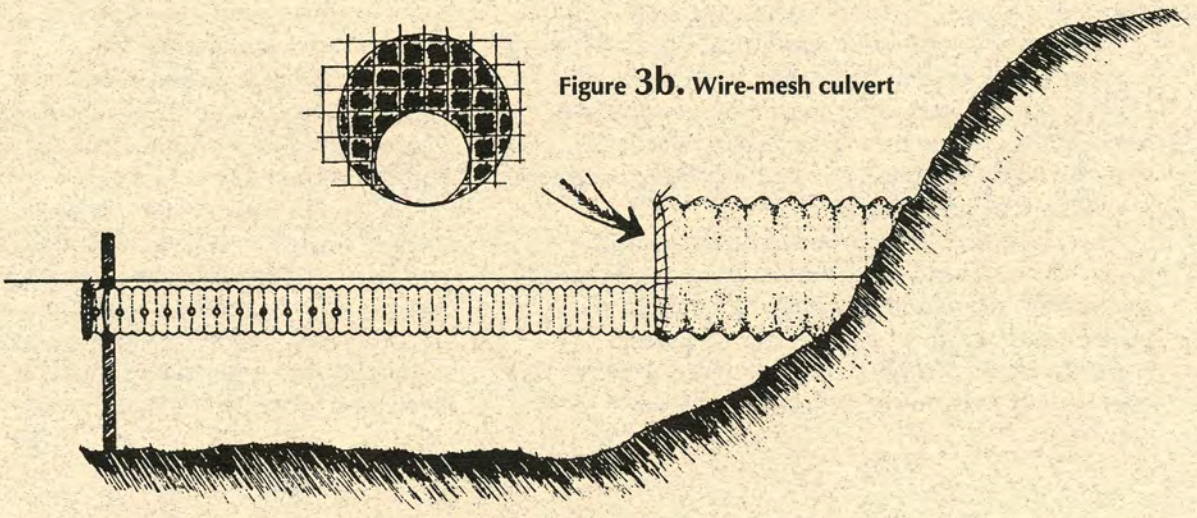



**Figure 3b. Wire-mesh culvert**



**Manipulating the water level of a pond with either a three-log drain or a mesh culvert will discourage beavers**

One innovative way to discourage beavers is the use of a high tensile electric fence (Figure 4). Stake a portable battery or solar-powered charging unit some distance from a run (slide) or a hole knocked into the dam. If you are placing the wire across a slide, mow or trim the vegetation very close to the ground. Finally, string a single strand of wire three inches above the ground or water's surface so the beavers will strike it as they pass through the slide or attempt to repair the hole in the dam. This electric shock acts to repel the animals; if they are shocked enough, they will move to another area.

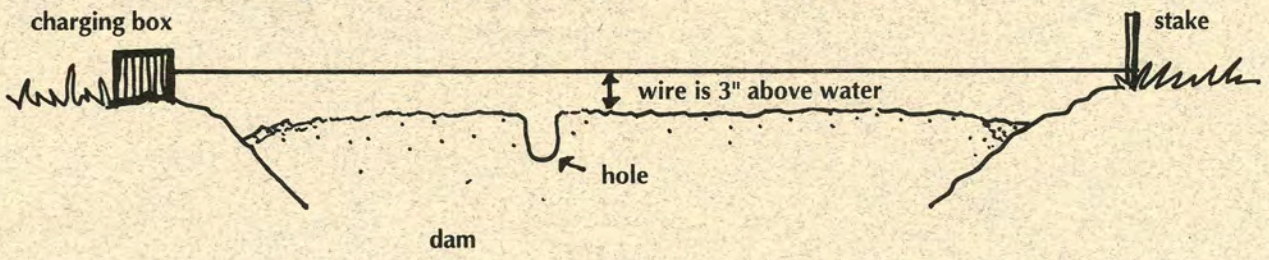
Daily tearing out dams and removing dam construction materials with dynamite may cause a colony or individual beaver to move. This is very dangerous and not recommended. Even if this procedure is effective, the beavers may move into a new area and become even more troublesome.

## Lethal Control

There are no chemical repellents or toxicants (poisons) registered for controlling beavers in Kentucky. The only control method that works well is trapping. The most effective trap is a number 330 Conibear (instant-kill-type) trap. This trap is designed to be placed underwater near a break in the dam, at the lodge entrance, near a slide or on a beaver run (Figure 5). Trapping should be done by an experienced trapper because these traps exert a tremendous pressure and impact when tripped. Therefore, appropriate care must be taken when setting and placing the trap.

The Kentucky Department of Fish and Wildlife Resources, #1 Game Farm Road, Frankfort, KY 40601 provides technical guidance to landowners experiencing beaver problems. If the beaver problem is large in scope or particularly severe, contact USDA-APHIS-ADC, 3231 Ruckriegel Parkway, Louisville, KY 40299 for assistance.

**Figure 4. A high-tensile electric fence discourages beavers.**

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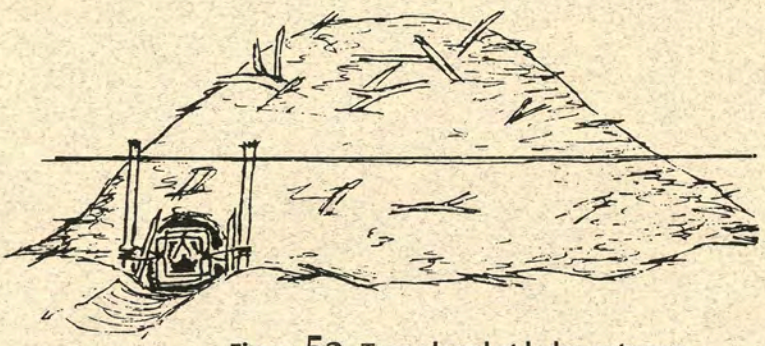

**Figure 5a. Trap placed at lodge entrance**

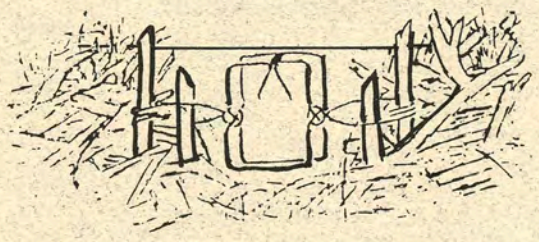

**Figure 5b. Trap placed at hole chopped in dam**

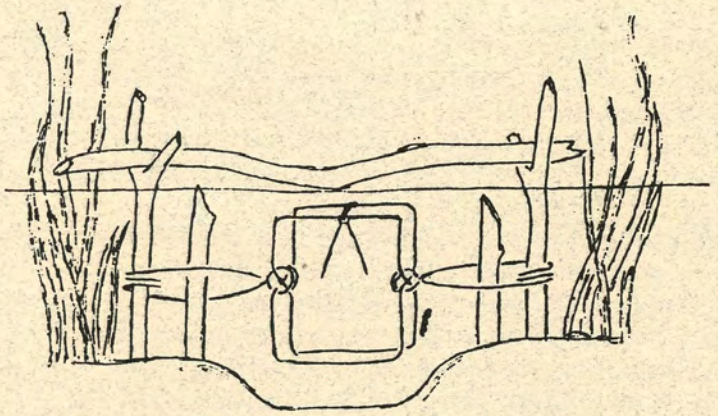

**Figure 5c. Trap in an underwater runway**

It is against the law in Kentucky to destroy or harm a beaver lodge or den. Contact the Kentucky Department of Fish and Wildlife Resources or USDA-APHIS-ADC in Louisville for technical guidance before destroying dams.

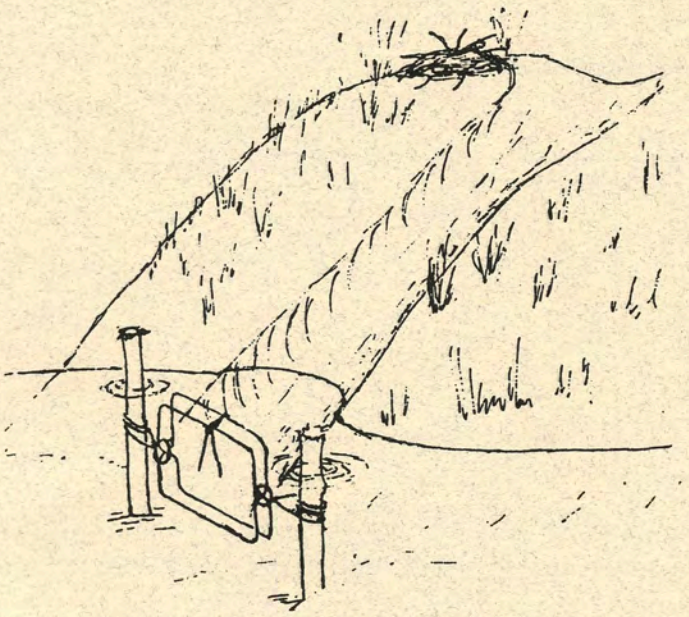

**Figure 5d. Trap placed at bank slide with castoreum scent pile at top of slide**

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