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Controlling Beaver Damage

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This NebGuide summarizes beaver biology, behavior, and damage. It describes control methods, equipment, and legal restrictions associated with managing beavers and the damage they can cause.

Biology, Behavior, and Reproduction

Beavers (*Castor canadensis*) are North America's largest rodents with adults ranging from 40 to 60 pounds (*Figure 1*). Beavers are industrious, curious, and social. Demand for their valuable fur led to the exploration of North America and, partly, the beavers' dramatic decline in numbers. Thanks to responsible wildlife management in the late 1900s, beaver populations have rebounded to sustainable levels.

Beavers have several physical characteristics that enable them to thrive in aquatic environments, such as webbed feet, nostrils, and ears that can close underwater, membranes that cover the eyes underwater, and a broad, flat, scaly tail. They can remain submerged for up to 20 minutes by slowing their heart rates and using oxygen stored in their large livers. Beavers mark their territories by excreting a sweet, yet pungent, musk from paired glands around their anus, called castors. Typically, beavers deposit castor on mounds of grass and mud found at the water's edge. In addition to the distinctive odor, newly established mounds exhibit a reddish stain.

Beavers have large webbed hind feet and produce tracks up to 6 inches long (*Figure 2*). A tail mark sometimes is present in soft mud.

Beavers have large incisors that enable them to cut and girdle trees. These incisors continue to grow throughout their lives and are sharpened continuously during gnawing activities. Beavers are mostly nocturnal and often begin their activities shortly after sundown.

Beavers are herbivores. They eat the inner bark of birch, cottonwood, willow, aspen, alder, maple, and dogwood trees. Beavers also store plant material in underwater caches in preparation for the winter. These caches are composed of limbs and branches up to 5 inches in diameter and are located by dams or dens for easy under-ice access. In the spring and summer, the diet of beavers switches somewhat to herbaceous vegetation, including water lilies, corn, soybeans, wheat, clover, and alfalfa.

Mated beavers form lifelong bonds. They breed during January with two to four young born three to four months later. The young, called "kits," begin eating leafy material at about 6 weeks of age. They typically remain with their parents for two years. Upon arrival of the second year's young, parents drive out the 2-year-olds to establish territories of their own. Thus, the mature beaver colony is composed of three generations of beavers. Most beavers are 4 years old or younger but some can live up to eight years. The territorial nature of beavers means that they tend to stay in their chosen location. Beavers often move out of an area, however, if they determine that it lacks sufficient woody food.

Figure 1. A rare occurrence of a beaver on land during midday (Photo by Nebraskaland Magazine, Nebraska Game and Parks Commission).

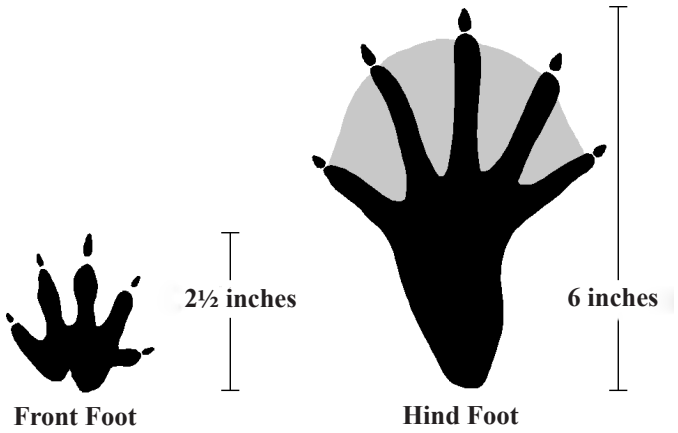

Figure 2. Beaver tracks (Illustration by Dee Ebbeka).

Harvest by humans has the largest impact on beaver populations, but river otters, wolves, coyotes, bobcats, and large birds of prey occasionally kill beavers. Beavers warn the colony of danger by slapping the water with their flat tail before diving to safety.

Figure 3. Beaver dam (Photo by Stephen M. Vantassel).

Figure 4. Beaver lodge with food cache (Photo by Stephen M. Vantassel).

Figure 5. A beaver trail (Photo by Stephen M. Vantassel).

Figure 6. Young trees girdled by beavers (Photo by Stetson Wildlife Management).

Dams

Beaver dams vary in size according to need but can range from just a few feet to several hundred feet in length. Beavers use a variety of materials to build their dams, including tree limbs, branches 2 to 4 inches in diameter, mud, rocks, cornstalks, and even trash (*Figure 3*). Beavers have an innate drive to stop the sound of running water, so their dams can become quite large. The resultant pond can range in size from a few to dozens of acres. Since beavers prefer to build dams where water flow is constricted, they are attracted to culverts, overflow pipes, and other human-made conduits.

Signs of Beavers

Beavers in Nebraska typically dig their dens into banks of streams, but some live in dome-shaped lodges built of limbs and mud placed in the middle of a pond (*Figure 4*). Entrances usually are underwater, with the floor inside several inches higher than the water level. Entrances may be exposed during periods of low water.

Beavers clear routes through vegetation that grows in shallow water. Smooth trails that run down an incline to the water are called slides (*Figure 5*). Sometimes, beaver runways can be seen at the bottom of ponds and canals.

Damage Caused by Beavers

Beavers are one of the few vertebrates capable of altering their environment to suit their needs. The flooding from beaver dams can result in the flooding of large areas with deep standing water where once only shallow, slow-moving water existed. Plants and animals adapted to pond life and associated wetlands quickly establish themselves in the newly flooded area. The environmental benefits provided by beaver ponds and wetlands should be weighed against the damage before implementing any beaver control.

Girdling and Felling Trees

Beavers prefer to fell small trees from 2 to 6 inches in diameter but have been known to cut trees up to 3 feet in diameter (*Figure 6*). They also harm trees by stripping off tree bark in a process called "girdling." Even if the beaver fails to girdle the trunk's circumference completely, the damaged tree may still die or fail to thrive.

Flooding Crops, Timber, and Damaging Structures

Depending on the location and size, beaver ponds can cause significant damage to human interests. Flooding can remove pastures and crops from production and drown stands of trees. One study estimated that flooding caused by beavers results in annual losses of $22 million to the southeastern U.S. timber industry. Flooding also may threaten public safety by compromising the integrity of levies, dikes, roadways, bridges, and trestles by saturating the soil with water. Dens can pose risks by undermining the integrity of a water-holding structure or collapsing under the weight of farm equipment.

Giardiosis

Also known as "beaver fever," this disease of humans is caused by a protozoa that is carried by beaver. It is shed in the feces and contaminates water that may be consumed by humans. Be sure that water is clean and sterile before drinking.

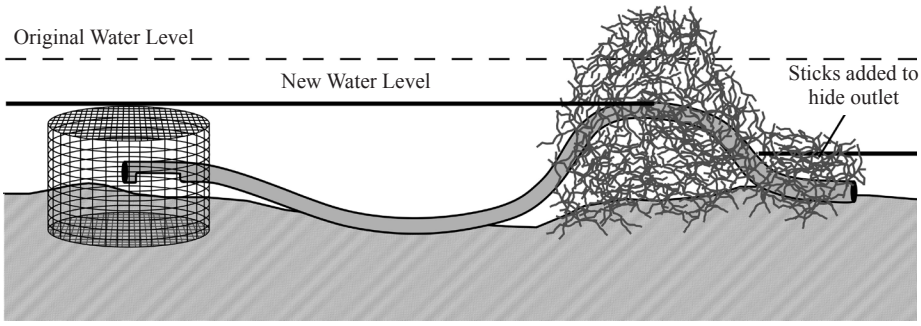

Figure 7. A beaver pond leveler (Illustration by Dee Ebbeka).

Control Strategies for Beaver

Beaver damage is most often managed by: 1) installing a beaver pond leveler to manage water levels, 2) fencing valuable trees and crops, and 3) removing a local beaver population and preventing recolonization.

Non- or Less-lethal Beaver Control

Often we can live with beavers if we can keep them from damaging the resources we value by altering their habitat, excluding them, or rendering resources unattractive. Fertility control is not yet a practical, registered, or authorized approach.

Beaver Pond Leveler

Beaver pond levelers are designed to manage the flooding caused by beaver dams at a tolerable level. Typically, pond levelers consist of flexible corrugated plastic pipes inserted through a dam to allow water to flow *(Figure 7)*. The upstream end of the pipe is protected with a 6- by 6-inch welded-wire mesh cage to keep beavers from plugging the pipe. While an important tool, these devices are not appropriate for locations where tree cutting and minor flooding by spring thaw or heavy rains cannot be tolerated. Install pipes only in areas where you can maintain a water depth of 3 feet (18 inches under ice). Pond levelers tend to fail in drainage ditches or flat canals. When used with fences, however, they can be very effective in protecting culverts from beaver damming. Pond levelers and fences require regular maintenance. Inspect them in the spring and fall to repair damage and to remove floating debris that may have collected around the pipe or fences. Publications detailing the proper use of beaver pond levelers and fences are available at *http://icwdm.org*.

Exclusion

Protect ornamental trees and plants from beaver damage by installing a 3-foot-high hardware cloth, screen, metal flashing, plastic culvert, or drain tile around the plants. Stake them securely to prevent beavers from tearing down the barriers. Exclusion rarely is practical for protecting acres of timber or tree belts. Electric wires positioned at 8 and 12 inches aboveground along the shoreline can prevent passage by beavers, provided that vegetation is controlled properly and the system is well-grounded.

Use of concrete spillways may reduce or prevent damage to dams caused by burrowing beavers. Riprap also can be used on earthen dams or levies.

Repellents

Trees can be protected by painting a mixture of alkyd paints with coarse sand on tree bark at a rate of 4 ounces of mason sand per quart of paint, but results have not been consistent. Castor placed on mounds may prevent beavers from becoming established in an area. Be aware that castor will only be effective if applied and maintained before the beavers reach the area. Wolf urine sprinkled on overland trails may cause beavers to forage elsewhere. Beavers have avoided plants treated with repellents containing putrescent egg, blood products, and hydrolyzed casein.

Lethal Beaver Control

Trapping is the most effective method for removing beaver from damaged areas. Biologists with the Nebraska Game & Parks Commission (NGPC) monitor beaver populations and establish trapping regulations to ensure the viability of the species and to protect public interests. Property owners are encouraged to harvest problem beavers during the regular trapping season. Many complaints about beavers could be prevented if landowners would allow trappers to harvest beavers on their property. The rapid reproduction rate of beavers, however, coupled with their ability to travel many miles to discover new territory, allows them to recolonize habitat where beavers have been removed. Therefore, it should not surprise landowners if beaver trapping is required annually.

A variety of traps are available for capturing beavers. Effective and safe trapping requires knowledge of beaver behavior, habitat conditions, traps and lures, and nontarget animals. Anyone interested in learning how to use traps should contact the NGPC or visit *http://icwdm.org*.

Body-grip Kill Traps

Traps, such as the Conibear®, are designed to cause the quick and humane death of beavers (*Figure 8*). In Nebraska, traps with a jaw spread greater than 8 inches may only be used in underwater sets to catch beavers. Place body-grip traps in runways or at lodge entrances. Body-grip traps, when used correctly, present little risk to nontarget animals.

Foothold Traps

Use size No. 3 or larger foothold traps for beavers. Place footholds near or in active runways of beavers in a way that will catch either the front or rear foot (*Figure 9*). Anchor footholds in water greater than 4 feet deep and use a slide wire to ensure that the beaver drowns quickly. Specific training is required for the use of foothold traps.

Snares

Snares can be set to catch beavers around the body. They consist of a cable formed into a loop with a locking device and a swivel to reduce cable twisting and breakage. Snares typically are placed in beaver runways, lodge entrances, and baited sets. If snaring before ice forms, be prepared to dispatch a live beaver in the snare. Information on euthanasia is available at *http://icwdm.org*.

Clamshell and Cage Traps

Clamshell traps, such as Hancock® and Bailey® traps, are designed to capture beavers and have been used in reintroduction programs. They are effective, but each trap can cost more than $350. Their heavy metal frames and suitcase design make them cumbersome to carry to remote locations. Visit *http://icwdm.org* for training on the use of clamshell traps. Raccoon-sized cage traps (10 inches by 12 inches by 3 inches or larger) can be used to capture beavers. Place them where beavers climb onto the land.

Spotlighting and Shooting

The NGPC requires landowners to obtain a Beaver Damage Permit before shooting beavers. Shooting and spotlighting are most effective when the number of problem beavers is low or they have become trap shy. Shooting may provide immediate relief from a problem but can be more time-consuming than trapping. Shooting is best left to trained professionals as beavers quickly

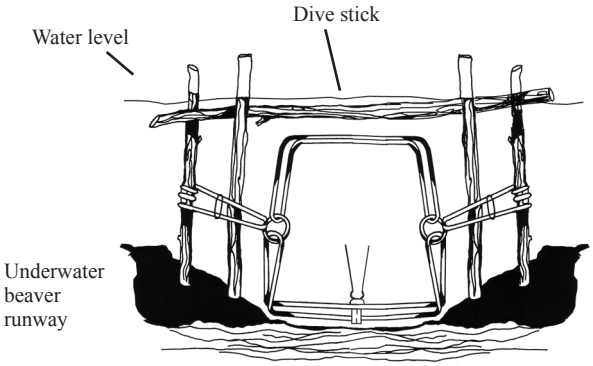

Figure 8. An underwater set of a body-grip trap (Illustration by Renee Lanik).

Figure 9. A foothold trap set underwater (Illustration by Renee Lanik).

learn from a shooter's mistakes. Care must be taken when shooting to ensure a safe background and minimize ricochet.

Toxicants

No toxicants are registered for controlling beavers in Nebraska.

Beaver Dam Removal

Remove beavers before removing beaver dams. Failure to remove beavers first can disrupt dam removal activities and hinder efforts to remove any remaining beavers.

Remove dams to return water flow to normal. Dam removal is an inherently dangerous activity, due to the risk of drowning. Dams located inside culverts are particularly dangerous and should be breached only by properly trained and equipped individuals. Remove unwanted beaver dams with hand tools, such as a potato rake, or with power tools, such as a winch or backhoe. Ideally the dam should be breached gradually over several days to reduce downstream flooding and erosion. If possible, dams should not be disturbed during the winter to prevent negative impacts to wildlife in and around the waterway.

Farmers and road maintenance personnel who need water levels reduced rapidly should consult with USDA-APHIS-Wildlife Services personnel (402-434-2340) about using explosives to remove beaver dams (*Figure 10*).

Legal Status

Beavers are classified as furbearers and thereby are protected by Nebraska state game laws. Information on current furbearer seasons and regulations is available from local NGPC offices or online at *http://outdoornebraska.ne.gov/*. A special depredation permit is required to remove problem beavers in the off-season. Contact your local conservation officer or wildlife manager to obtain a permit. Call 402-471-5531 to obtain the number of the officer in your area or 402-471-0641 to obtain the number for the nearest wildlife manager. Dens can be disturbed only with a depredation permit. Property owners may legally breach beaver dams at any time. Translocation of beaver is not permitted in Nebraska.

Obtaining Assistance

The NGPC maintains a list of private trappers who may be willing to do depredation work to eliminate or reduce local beaver colonies. Discuss your needs with the trapper prior to the initiation of control activities. Expectations should be made clear to prevent misunderstanding between the needs of the landowner and the abilities of the trapper. Use of unqualified trappers can result in additional time and effort to remove beaver that the unqualified trappers missed. Private wildlife control operators may be available for hire and USDA-APHIS-Wildlife Services may be available for hands-on assistance in certain cooperating counties in Nebraska (402-434-2340).

Figure 10. Use of explosives to remove a beaver dam and reduce flooding (Photo by Michael T. Mengak).

Resource

The Internet Center for Wildlife Damage Management at *http://icwdm.org* has more information about beaver control.

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