Beavers: A brief history

Beavers (*Castor canadensis*) are the largest rodent in North America; adults typically weigh from 35 to 50 pounds. They differ in color from light to dark brown or red-brown.

Their fur contains long, shiny guard hairs covering dense, soft underfur that traps air and helps protect them from the cold.

Beavers are widely distributed, living in every Canadian province below tree line and in every U.S. state except Hawaii, and the American beaver's cousin (*C. fiber*) can be found widely distributed over the Eurasian continent.

Beavers can regulate their blood chemistry, heart rate, and circulation pattern to enable them to remain underwater for 15 or more minutes. Beavers have relatively few external or internal parasites.

An important requirement for beavers is water deep enough to provide aquatic habitat beneath winter ice. Beavers are vegetarians whose diet varies with changes in season. In spring and summer, they feed on non-woody plants or plant parts such as water lilies, algae, grasses, sedges, herbs, ferns, and shrub leaves and shoots. In the fall and winter, they favor twigs, roots, bark and inner bark of woody plants.

Aspen, birch, alder and willow are favored tree species, but beavers have been known to cut almost every kind of tree, including conifers. Bark and leaves may be eaten where they fall in the woods or dragged back to the water.

After being trapped and hunted to near-extinction, their population has increased, although not to pre-trapping and hunting numbers.

Family life

Beavers live in small, closed family units that generally consist of an adult pair and young from one or more years.

One litter of three or four is born each year, and the young usually remain with the family until they are about 21-22 months old and then typically disperse. Some young may remain with the family for one or more additional years.

An established family contains an adult pair, kits of the current year (less than 12 months old), yearlings born the previous year (12 to 24 months old), and possibly one or more non-breeding young adults from prior breeding seasons (over 24 months old). The adult pair is long-term and monogamous.

Beavers and ecology

Beavers are considered a “keystone” species. That means that ecologists and biologists have learned that beavers play a crucial role in maintaining biodiversity in the ecosystem.

Beaver engineering:

- Decreases damaging floods
- Recharges drinking water aquifers
- Removes pollutants from surface and ground water
- Provides drought protection
- Decreases erosion
- Produces food for fish and other animals
- Supports biodiversity, including 43% of our endangered species
- Creates vital habitats for mammals and water birds
- Maintains stream and river flow

Ponds created from beaver dams provide excellent wetland habitat for numerous plants and animals. Beaver ponds are critical habitat for many species of waterfowl and other migratory birds.

Beaver ponds also act as a natural filtration system, removing silt and other impurities from water.

Beavers in urban and residential areas

Beavers are smart and adaptable animals. They need water deep enough to submerge the entrances to their family homes, or lodges, to keep them safe from predators. To do this, beavers will sometimes create their own “ponds” by building dams to prevent water from rushing away and exposing their lodges.

Beavers have been living in parks and next to human neighborhoods for a long time, so we need to learn how to be good neighbors to them.

Beaver construction

Beavers display many construction abilities, based on local environmental conditions. For example, beavers occupying stream or pond habitat build dams to increase water depth, whereas those living on lakes or rivers rarely construct dams.

Burrows and lodges

Beavers dig with their forepaws a burrow underwater into the bank and extend it upward. If the ground surface is broken, sticks, branches, and mud are used to cover the exposed burrow, and a nest chamber is excavated out of the sticks; otherwise a nest chamber is excavated underground above the water level. All beavers, except kits, assist in digging and covering.

All family members perform lodge maintenance. Kits can carry sticks and younger beavers cooperate as

"apprentice builders", carefully learning how to build and maintain a lodge until they are old enough to move out.

Beaver dams

Dams are built where water flows over obstructions in streams and at outlets to pools; dam-building starts when a beaver hears or physically senses rushing water.

Dams begin with beavers pushing pond or stream sediment and stones into a ridge. Ridge size depends upon stream velocity and when the ridge no longer holds back water, sticks and branches are

added for support, followed by more mud. Building generally ceases when water no longer flows over or around the dam or when ice forms.

Living peacefully: Non-lethal methods to minimize conflict

The beaver is making a comeback. Nearly driven to extinction by the fur trade, nature's engineers are now 6-12 million strong in the United States.

Although beavers deserve protection in their own right, we are slowly realizing that this return can provide significant benefits.

But we are also finding ourselves in conflict with beavers, usually over who gets to occupy floodplains.

Because of this, we should recognize the environmental benefits we can derive from working with – rather than against – the beaver.

The most common complaints against beavers are flooding that can sometimes occur when beavers block flowing water such as a culvert and the destruction of trees that beavers use for food and construction.

There are, however, many ways to mitigate these problems, ways that do not involve killing or trapping the animals.

Protecting trees

Guards

Place homemade tree guards around the trunk. The guards should be about three feet high and made of galvanized welded wire (2 x 2 or 2 x 3 inch is recommended). This material can be found in hardware or home improvement stores, usually sold as fencing. Try not to use the lighter chicken wire, as it is generally too flimsy to provide good protection. You should pin guards to the ground using something like well-designed tent stakes.

Paint and sand

Although some have had a degree of success using a paint and sand mixture to coat the bases of at-risk trees, we do not advocate this because of the potentially serious negative effects on the trees and on the plants, such as fungi and mosses, and various species of tiny animals living in the bark.

Fencing

Because beavers are not good climbers, three to four-foot-high fencing can also be a highly effective way to block their access to larger groves.

Flood protection

In the past, "solutions" to the presence of beaver dams have often involved the use of heavy machinery to tear the dams apart or explosives to destroy them. Neither approach is particularly useful: Beavers will quickly attempt to rebuild their structures using new material or parts of the dams left behind.

Likewise, trapping or shooting resident beavers is ineffective, because it only creates a vacuum into which new beavers will move, often quickly.

Most importantly, all of the strategies aimed at removal or destruction deny the presence of beaver wetlands—landscapes which are far more important and necessary habitats to nature than they are an "inconvenience" to people.

Beaver devices

Here are some of the devices that can help prevent or control flooding caused by beaver dams:

The Beaver Deceivers™, Round Fence™ and Castor Master™, all developed by Skip Lisle

Above: A "Beaver Deceiver" in place.

(www.beaverdeceivers.com) —simple, but rugged enough to withstand the force of ice, and CulverClear™, developed by Mike Callahan (www.beaversolutions.com). Whether constructed of wood or steel frames, the overall savings these devices represent compared to the cost of repeated beaver removal or dam destruction, make them highly cost effective as well as humane.

Other strategies

Notching an existing dam and running a pipe through the gap will stimulate the beaver to repair the dam at the site of the notch, but not at the pipe ends. This allows the water level to be set to one that meets human needs.

In the past, the culvert pipes installed under roads were often undersized and easily plugged by beavers. Newer installations generally take beaver activity into account and are designed correctly from the start to prevent plugging.

For existing, smaller culverts, you can use the Beaver Deceiver™, sometimes in conjunction with Round Fence™ and a pipe system at its front, or as a stand-alone device. This strategy involves creating a fence barrier in front of the culvert, taking the beavers far away from running water at the culvert head. This seems to defeat the beavers' instinctive motivation to dam.

For more information, please visit our website for links to more resources: *www.UnexpectedWildlifeRefuge.org*

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