

Background Information on Beavers (Castor canadensis)

The largest American rodent, averaging 30-75 pounds, beavers once numbered more than 60 million in pre-colonial North America. Native Americans used the beaver for food and for clothing, and they also used the beaver's castoreum, a musk gland secretion, as a medicine. Trappers seeking beaver started the exploration and settlement of western North America to obtain the beaver's fur, which is extremely dark, thick and waterproof. (The word *Beaver* comes from the Anglo-Saxon word *beofor*, meaning "brown.") Of economic importance to the American pioneers, beaver pelts were shipped to Europe where they were made into hats. Beavers were also consumed as food by French settlers in particular; they ate beaver on Roman Catholic fast days, since the pope had declared this aquatic mammal a fish because of its scaly tail. By 1930 beavers had to be protected, having been nearly trapped to extinction. However, beavers have been restored to most of their original range, which includes all of North America except the extreme north, desert areas, and Florida.

Chiefly crepuscular, the beaver has a variety of adaptations to ensure its success in its habitat. It is capable of staying warm in cold water due to a dense fur layer covered by water-repelling oil and layers of body fat to provide additional insulation. The front teeth, or incisors, protected by orange enamel, grow continuously to keep pace with constant wear from gnawing on wood. Each of the beaver's eyes has a third eyelid that acts like an underwater goggle. In addition, special muscles close the beaver's ears and nose while swimming. (A beaver can stay underwater for nearly 15 minutes.) The back of its mouth closes while allowing exposure of the teeth to move branches underwater as well.

The beaver's sense of sight is weak, but its hearing and sense of smell are acute. It finds most of its food (inner tree bark, known as cambium, grasses, ferns, mushrooms, leaves, stems, bulbs, and roots of water plants) by smell. The beaver also has a variety of adaptations to its aquatic lifestyle. The back feet are webbed for swimming while the front feet are not; this allows the beaver to maneuver branches and limbs dexterously both in and out of the water. The fur is extremely water-resistant due to oil from their sebaceous glands, which beavers use while grooming with their special, comb-like nails. The beaver's tail serves many functions on land and in water: propeller and rudder, a seat while gnawing on trees, a fat storage area, and an alarm signal when slapped on the water. (Note: Beavers actually have few natural predators except wolves, coyotes, bobcats and bears, plus the threat of humans and cars.)

Living together in lodges or in stream bank dens, beavers are affectionate with one another, munching on a shared twig, rubbing noses or swimming together. They live in family groups that include a monogamous breeding pair and three to four of their immediate offspring, ranging in age from newborn (kits) to about two years old. Three to eight family lodges may form a colony that cooperatively maintains a dam. At around age two, normally the young beavers leave the parents and establish colonies of their own. This social structure allows the young to acquire valuable social skills from their parents while contributing to the work force. This is especially important because the

method that beavers have evolved to ensure their survival requires a great deal of individual strength as well as interfamily cooperation. Beavers spend their lifetime within five miles of their birthplace. They mark their territories with scent mounds known as "middens," on which they secrete castoreum (which smells somewhat like a horse barn) from their castor glands.

The beaver is quite an engineer. It responds to the sound of running water by building dams of mud and wood chips to stop the flow. In colder northern areas, small trees, branches and twigs are stored in the mud at the bottom of their home ponds as supplies for winter when the pond freezes. Large trees (three to eight inches in diameter) are gnawed until they topple, bringing the more tender parts at the top within reach. (One beaver can fell a five-inch diameter tree in three minutes.) Leftovers are used to build the lodge. Lodges are intricate, with many rooms and underwater entrances. (The largest lodge on record was 40 feet wide by 16 feet high.) These unique behaviors have made the beaver a very successful survivor. Many species depend on the beaver's talents, since beaver ponds are home to many kinds of plants and animals. Native Americans believed that the Beaver was sent from the World Above to create the World Below - nature's first engineer.

Along the Chattahoochee River and the CNC ponds, beavers dig dens under large trees. They only heap logs on top if the roof caves in. Beavers around the CNC have also opened up spaces in the forest by felling numerous trees, allowing more sunlight to filter to the forest floor. As a result, spring wildflowers now exist along the Kingfisher Pond Trail where they had not bloomed in over 10 years.

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The beaver has been of great benefit to many wildlife species across North America, as well as to the environment itself. Beaver ponds are important water storage systems; for example, slowing and trapping runoff and releasing it gradually. The silt-laden water slows down in the pond, releasing the heavier particles so that the water is clearer downstream. Plant communities established in the sediment help to stabilize the floodplain. The stored water can raise subterranean water tables, an asset to downslope forests and agricultural crops. Although beavers have been cited as a negative factor in trout habitats, where their damming efforts have slowed down oxygen-rich, fast-flowing waters necessary to trout survival, they have proven their worth in a broader aspect. The creation of many wetland areas and the dynamic alteration and regeneration of forest communities may be attributed to the Beaver's "engineering" behavior.