



**NEWTON
CONSERVATORS**

SPRING ISSUE

NEWSLETTER

Newton's land trust working to preserve open space since 1961

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Beavers: Urban Wildlife Extraordinaire

Beavers are big — no, *really* big. The North American beaver, *Castor Canadensis*, is the second largest rodent in the world — the capybara in South America is the largest. How big? Visualize a large golden retriever: an adult beaver is three to four feet from nose to tail tip and can weigh in at 60 pounds or more.¹ Everything about *Castor Canadensis* is so big and so interesting that Newton Conservators is presenting the beaver profile in two installments. This first covers the beaver's anatomy, adaptations, and life cycle. The second, in our summer newsletter, will explore the profound ecological effects this keystone species has on our landscape.

Most people assume a beaver is smaller than it really is and often mistake muskrats for beavers. A muskrat, running six to seven pounds, is about the size of a beaver's head.



This beaver hut near the entrance to Cutler Park and Kendrick Pond may not be currently active.

Take a look at the picture of the beaver swimming, and you'll see how easy it is to assume a beaver is small — all one usually sees is its head. Newton Animal Control officers tell me that the calls they get from residents about beavers in their backyard are all really muskrats. But are there any beavers



PHOTO: KJLOMBARD

A beaver swimming with only head showing doesn't show how big beavers really are.

in Newton for you to observe? Yes, you can see lodges on Kendrick Pond in Cutler Park and on the Charles River by Quinobequin Road. However, to watch them you'll have to be out from dusk to dawn, when beavers are active.



PHOTO: WINIFRED A. LUTZ

Freshly beaver-felled tree.

What you are more likely to see is the signs of beavers: their teeth marks on trees and branches. As lumberjacks of the

animal kingdom, beavers' teeth are big — they need to be to gnaw through trees. According to South Dakota's Division of Wildlife, a beaver can gnaw down a five-inch diameter willow in three minutes². Can a beaver get splinters? Yes, according to web sources, but I could find no authoritative information about this. I theorize that because a beaver gnaws *living* wood, which is softer and wet, *across* the grain horizontally to the ground, it would be harder for them to encounter splinters.

I recall seeing the orange teeth of a rodent, a gopher, for the first time as a child and thinking, "Eew, that animal has serious dental hygiene issues." Not true! All rodents and especially beavers have orange enamel covering the front of their incisors to add strength to the teeth — the color comes from

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PHOTO: ERIC OLICK

Life-sized beaver skull replica.

molars by a large gap — this allows the beaver to suck in its cheeks to block water while it is gnawing bark or carrying branches underwater. If an accident should break or misalign an incisor, the beaver is in serious trouble: its teeth grow continuously and must be worn down or they will grow so far as to render the animal unable to eat and penetrate any opposing flesh.

Beavers eat a wide variety of green plants, both land and aquatic. They readily graze on poison ivy, ferns, and water-lily, going so far as “...rolling up a lily pad, burrito-style, for easier munching.”³ However, when winter arrives and greenery is scarce, beavers resort to eating the cambium, the inner bark layer, of trees. Their favorites are aspen, cottonwood, and willow⁴ and also alder, maple, birch, and poplar.^{5,6} Their heavy molars can grind the bark efficiently. They also have a hugely diverse microbiome in their guts that enables them to extract nutrients from this woody material. And finally, they practice coprophagy, eating their feces, to make sure they get every last bit of nutrient possible.



PHOTO: DALE MONETTE

A beaver's large back feet propel it through water.

are large, about seven inches long, webbed affairs that propel the animal powerfully through the water while the broad flat tail works as a rudder. The front feet are smaller, about four inches long, and make a beaver look remarkably human when you see them waddling upright while carrying sticks, mud, and stones to some building project. These front paws also make beavers look like squirrels when eating the aquatic greens they so love.

iron. As the incisors wear down from use, the iron-enhanced front enamel wears more slowly than the softer dentine on the back of the incisors, forming a sharp chisel edge. The beaver's upper and lower incisors are separated from its

are separated from its



PHOTO: DALE MONETTE

A beaver's front paws look remarkably human as it munches aquatic vegetation.

but is mostly fat. (Apparently, broiled beaver tail makes excellent eating for us humans — something like the fatty marrow in osso buco.)⁹ The beaver's tail serves a multitude of purposes: a brace to hold the beaver upright while gnawing trees, a fat reserve to tap in lean winters, a heat dissipating device in the heat of summer, and an alarm signal. When a beaver senses danger, it slaps its flat tail down on the water with great force making a gunshot loud whack.



PHOTO: DALE MONETTE

The tail and fur are on full display as this beaver tries to escape over a stone wall — and it's an urban myth that they use their tails to plaster mud on their lodges.



PHOTO: DALE MONETTE

Beavers can use their tails to slap the water and sound alarm.

How does a beaver sense danger? Beavers have an extraordinary sense of smell and very good hearing. Their eyesight, though, is notoriously poor, making me wonder how they manage to navigate between their lodges and their

underwater food caches while under winter ice. A beaver's sense of smell and hearing helps it patrol for its predators — black bears, mountain lions, coyotes, and wolves.¹⁰ Beavers prefer to escape predators by diving into the water but can use their teeth to good effect if caught on land. A man in Belarus was killed by the beaver which severed his femoral artery when he tried to wrestle it into position for a selfie.¹¹

Beavers are active year-round; they do not hibernate. They are able to stay warm while staying so wet because of their remarkable fur. Beavers have two kinds of fur — their longer guard hairs and their shorter underfur. Beaver underfur is extremely thick — “a stamp-sized patch of beaver skin is



PHOTO: KJLOMBARD

A beaver's guard hairs extend well beyond its dense underfur.

carpeted with up to 126,000 individual hairs — more than the average human has on her entire head,”¹² and the hairs are barbed so they interlock like Velcro to keep water out and the animal warm and dry.¹³

This marvelous interlocking fur, so sought-after by hatters in London, can be blamed for quite a bit of our nation's history as noted by historian Don Berry: “Many men died, a continent was explored, an indigenous race degraded and its culture crushed ... all because beaver fur, with its tiny barbs, felted up better than any other.”¹⁴

Beavers spend significant time grooming their fur to keep it waterproof and warm. They sit on their flat tail, exposing an anal gland so they can reach its castoreum oil. They spread



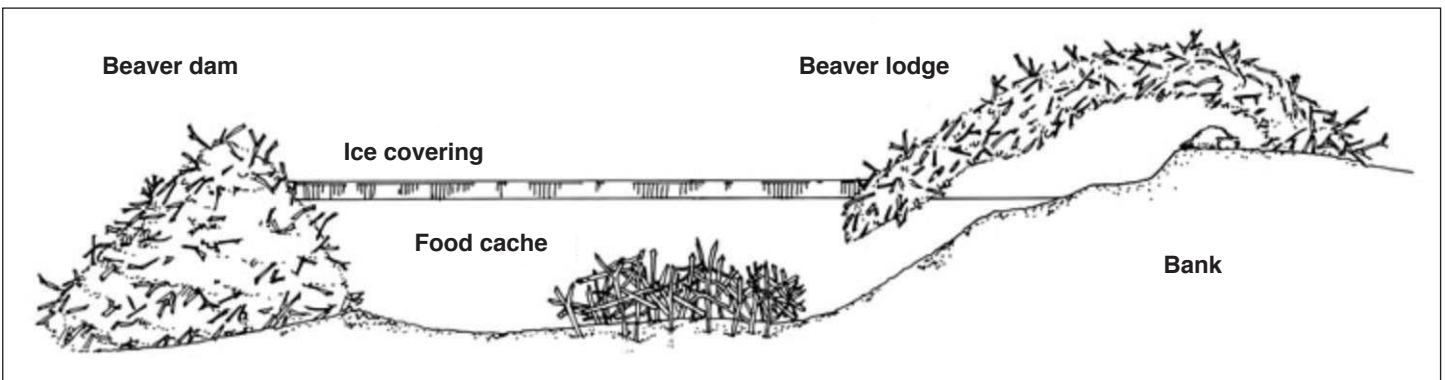
PHOTO: DALE MONETTE

A food cache is visible to the right of this lodge.

single beaver needs about 20–30 ounces of bark every two days, approximately the amount from a one to three-inch diameter tree *and* its branches.¹ Often their food cache is so large it is visible above the water line.

Beavers will also tunnel underwater directly into a stream bank as far as 20 feet before excavating an above-water cave for themselves.¹⁶ Washington Department of Fish and Wildlife illustrates¹⁷ a typical bank lodge as shown in the drawing below:

Beaver lodges are also nurseries. Beavers are monogamous. An adult pair will mate in winter and produce four to five kits inside their lodge in May or June. The newborn kits weigh about one-pound and have fur, front-teeth and open



A typical bank lodge is shown in this Washington Department of Fish and Wildlife illustration.

this oil over their fur to help waterproof it, combing the oil in while untangling strands with a special split claw on their hind foot.¹⁵

Beavers also stay warm in winter by retreating to the lodges they build. The lodges look like simple piles of sticks, but beavers pile mud, sticks, and logs in a thick shell that predators find hard to penetrate. The lodge has a below-water entrance, and the shell has enough vents to allow fresh air inside. The interior is small and dark, above the water line with a floor lined in bark shreds or grasses to absorb moisture, and just big enough for a single beaver clan. However, the lodge is considerably warmer inside than out — usually above freezing inside when it is sub-zero outside.

Sometimes beavers build these lodges at the banks of a pond or river, sometimes far out in the pond. They cache sticks near their lodge as an underwater winter food source, sticking them in the mud to prevent them from freezing. A

eyes. “... within a week they are skilled swimmers although, if tired, they may be carried on the mother's back.”¹⁸ Kits are weaned by two months. The kits stay with the parents until the end of their second year. A lodge, then, may contain the adult pair, the newborn kits, and the “teenagers” from the previous year. It can get pretty crowded in there!

Yes, beavers are here to stay in Newton. However, as they multiply and try to establish new ponds, they may become less enjoyable for some. The Newton Conservators' next installment on the beaver will delve into the beaver as keystone species and engineer extraordinaire, exploring its dam-building, ecological significance, and its conflicts with that other engineer — humans. ♦

🌿 Barbara Bates

Note: Footnote references in this article can be found on [Newton Conservators.org/newsletters](http://NewtonConservators.org/newsletters)