



Wildlife Information Guide

BEAVER (*Castor canadensis*)

DESCRIPTION

The North American beaver (*Castor canadensis*) is the continent's largest rodent and a remarkable example of evolutionary adaptation for aquatic life. The beaver is North America's largest rodent and is built for life in the water. Adults can be up to four feet long and weigh over 60 pounds, with exceptional specimens reaching weights of 75-80 pounds.

PHYSICAL CHARACTERISTICS

The beaver has webbed hind feet and a large, flat, nearly hairless tail. The distinctive tail serves multiple functions including balance support, temperature regulation, communication, and fat storage. It uses its tail to help maintain its balance when it is gnawing on trees. It will also slap its tail against the water to signal danger or to warn away predators. The beaver has short front legs with heavy claws designed for digging and manipulation of construction materials. Their rear legs are longer and their webbed feet help propel them through the water when they are swimming. This powerful swimming ability allows beavers to navigate efficiently through their aquatic territories.

Aquatic Adaptations When the beaver is under water, its nose and ears close up, allowing for extended submersion periods of up to 15 minutes. Transparent eyelids function as "goggles" for underwater vision, while specialized lips can seal behind their large orange incisors, enabling them to chew underwater without drowning. Their dense, waterproof fur consists of two layers: long, coarse guard hairs that repel water, and a thick undercoat that provides insulation. This dual-layer system maintains body temperature in New England's cold waters throughout winter months. **Dental Adaptations** Beavers possess continuously growing orange incisors that are self-sharpening through use. The orange coloration comes from iron deposits that strengthen the tooth enamel, making them exceptionally effective tools for cutting through woody vegetation.

BEHAVIOR

Beavers are primarily nocturnal and crepuscular, with peak activity occurring during



dawn and dusk hours. They are highly social animals that live in family units called colonies, typically consisting of an adult pair and their offspring from the current and previous year. **Engineering Behavior** Beavers are renowned as "ecosystem engineers" due to their remarkable construction abilities. They build dams, lodges, and canal systems that significantly modify their environment. Beavers have the ability to modify ecosystems profoundly to meet their ecological needs, with significant associated hydrological, geomorphological, ecological, and societal impacts. Dam construction serves multiple purposes: creating deep water for protection from predators, facilitating transportation of food and building materials, and providing access to food resources during winter months. These structures can range from small installations of 10-20 feet to massive complexes exceeding 500 feet in length. **Communication** Beavers employ multiple communication methods including scent marking with castoreum (a secretion from specialized glands), tail slapping on water surfaces, and various vocalizations. At the Smithsonian's National Zoo, beavers have occasionally been heard hissing if they are unhappy. **Territorial Behavior** Beaver families maintain territories along waterways, with territory size dependent on food availability and water quality. Territories are marked with scent mounds containing castoreum and are defended against intrusion by other beaver families. **Seasonal Behavior Patterns** During autumn, beavers intensify construction activities and food caching behavior in preparation for winter. They create underwater food caches near their lodges, storing branches and logs beneath the ice where they remain accessible throughout winter months.

REPRODUCTION

Beavers are monogamous, typically mating for life with pair bonds lasting multiple years. Sexual maturity is reached at 2-3 years of age, though first breeding often occurs at 3-4 years when individuals establish territories. **Breeding Season** Mating occurs during late winter, typically January through March in New England. The female's estrus period lasts only 12-24 hours, requiring precise timing for successful reproduction. **Gestation and Birth** Gestation lasts approximately 105-110 days, with births occurring from April through June. Litters typically contain 2-6 kits (average 3-4), born fully furred with eyes open and capable of swimming within hours of birth. **Parental Care** Both parents participate in kit care, with nursing continuing for 6-8 weeks. Kits remain with the family group for approximately two years, learning essential skills including dam construction, food procurement, and territory maintenance. **Family Structure** Beaver colonies typically consist of 6-10 individuals: the adult breeding pair, the current year's kits, and yearlings from the previous season. Two-year-old beavers disperse to establish their own territories, often traveling considerable distances to find suitable



unoccupied habitat. **Population Dynamics** Beaver populations are naturally regulated through territorial behavior and habitat availability. Dispersing juveniles face significant mortality risks and may travel 5-10 miles seeking suitable territory.

DIET

Beavers have a herbivorous and a generalist diet with specialized digestive adaptations for processing woody vegetation. During the spring and summer, they mainly feed on herbaceous plant material such as leaves, roots, herbs, ferns, grasses, sedges, water lilies, water shields, rushes, and cattails. **Seasonal Dietary Shifts** Spring and Summer: About 90% of their summer diet consists of herbaceous vegetation such as grasses, sedges and other aquatic plants. This period focuses on high-protein, easily digestible plant materials that support growth and reproduction. **Fall and Winter** During the fall and winter, they eat more bark and cambium from woody plants. Tree bark, twigs and leaves are more commonly consumed in the autumn and winter when herbaceous vegetation becomes unavailable. **Preferred Species** Their chief building materials are also their preferred foods: poplar, aspen, willow, birch and maple. Trees such as Willow and cottonwoods are particular favourites, providing both construction materials and high-quality nutrition. Unlike other mammals, beavers can digest cellulose, which is a major component of their diet. The beaver's gut microbiome is complex and specialized for a wood-heavy diet, sharing a number of similarities with other mammalian herbivores. **Foraging Behavior** Beavers feed on the leaves, twigs and inner bark (cambium) of trees, with cambium providing essential nutrients during winter months. They typically fell trees 2-6 inches in diameter, though they can handle much larger specimens when necessary. Trees are sectioned into manageable pieces and either consumed immediately or transported to underwater food caches for winter storage. Beavers also eat aquatic plants and can consume up to 20% of their body weight in vegetation daily during active periods. **Digestive Adaptations** Beavers practice coprophagy, consuming nutrient-rich soft feces to maximize extraction of nutrients from their challenging woody diet. This adaptation allows them to survive on vegetation that would be indigestible to most other mammals.

DEFENSIVE MECHANISMS

Beavers have evolved multiple defensive strategies to protect themselves from predators and environmental threats. **Aquatic Escapes** Superior Swimming Ability: Beavers can remain submerged for up to 15 minutes and swim at speeds reaching 5 mph underwater. This aquatic prowess provides escape routes unavailable to most terrestrial predators. **Deep Water Refugia** Dam construction creates deep water areas that provide safety from most predators. Beaver lodges are constructed with underwater entrances, making



them inaccessible to terrestrial threats. **Warning Systems** Tail Slapping: The distinctive tail slap serves as an alarm signal audible over considerable distances, alerting family members to potential threats. This communication system enables coordinated defensive Responses. **Territorial Marking** Scent mounds containing castoreum establish territory boundaries and may deter potential intruders through chemical communication. **Structural Defenses** Lodge Construction: Beaver lodges feature thick walls of mud and sticks that harden to concrete-like consistency, providing protection from weather and predators. Multiple underwater entrances offer escape routes if the lodge is compromised. **Dam Systems** Dams create controlled water levels that maintain deep water refugia while potentially impeding access by some predators.

PHYSICAL DEFENSES

Large Size Adult beavers' substantial size deters many potential predators. Their powerful build and sharp teeth can inflict serious injury when cornered. **Sharp Incisors** Orange incisors designed for cutting wood can serve as formidable weapons in defensive Situations.

BEHAVIORAL ADAPTATIONS

Nocturnal Activity Primarily night-active behavior patterns reduce exposure to diurnal predators while maintaining access to necessary resources. **Family Cooperation** Colony living provides multiple sets of eyes and ears for threat detection, plus coordinated defensive responses when danger is detected. **Habitat Modification** By creating extensive wetland systems, beavers establish environments that favor their survival while potentially limiting predator access and effectiveness. Primary predators of beavers include wolves, black bears, lynx, and occasionally large birds of prey for young kits. However, their aquatic lifestyle and engineering abilities provide effective protection against most natural threats.

MANAGEMENT CONSIDERATIONS

Effective beaver management requires understanding their behavior, biology, and the specific circumstances leading to human-wildlife conflicts. Management strategies should emphasize prevention, timing, habitat modification, and when necessary, professional removal services.

SCIENTIFIC REFERENCES

1. Baker, B.W., & Hill, E.P. (2003). Beaver (*Castor canadensis*). In *Wild Mammals of North America* (pp.288-310). Johns Hopkins University Press.
2. Busher, P.E. (2016). Beaver ecology and management. In *Ecology and management*



- of terrestrial vertebrate invasive species (pp. 201-220). University of Chicago Press.
3. Gurnell, A.M. (1998). The hydrogeomorphological effects of beaver dam-building activity. *Progress in Physical Geography*, 22(2), 167-189.
 4. Jenkins, S.H., & Busher, P.E. (1979). *Castor canadensis*. *Mammalian Species*, 120, 1-8.
 5. Müller-Schwarze, D., & Sun, L. (2003). *The Beaver: Natural History of a Wetlands Engineer*. Cornell University Press.
 6. Rosell, F., Bozser, O., Collen, P., & Parker, H. (2005). Ecological impact of beavers *Castor fiber* and *Castor canadensis* and their ability to modify ecosystems. *Mammal Review*, 35(3-4), 248-276.
 7. Schulte, B.A. (1998). Scent marking and responses to male castoreum by beavers. *Journal of Mammalogy*, 79(1), 191-203.
 8. Wilsson, L. (1971). Observations and experiments on the ethology of the European beaver (*Castor fiber* L.). *Viltrevy*, 8(3), 115-266.
 9. Wright, J.P., Jones, C.G., & Flecker, A.S. (2002). An ecosystem engineer, the beaver, increases species richness at the landscape scale. *Oecologia*, 132(1), 96-101.

This document represents current scientific understanding of beaver biology and behavior as of 2025. Information should be used in conjunction with local wildlife management guidelines and regulations

