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MUSKRAT (*Ondatra zibethicus*)

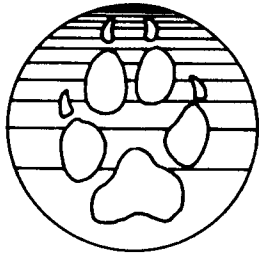
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NEBRASKA WILDLIFE

Nebraska Game and Parks Commission

MUSKRAT

(Ondatra zibethicus)

Description: The muskrat is a medium-sized mammal that, at first glance, looks like a common rat, though it is not closely related to that rodent. The name "muskrat" stems from a mild, unobjectional musky odor that emanates from the animal. Adult muskrats average about 2½ pounds, with some animals exceeding three pounds, and are usually 16 to 25½ inches long. The muskrat's fur has a dense undercoat that is virtually waterproof and provides excellent buoyancy for swimming. Its back and head are a rich, dark brown, which gradually shades to lighter brown on its sides and becomes grayish on its underparts. The long tail is scaly, nearly hairless, vertically flattened, and serves as a rudder. The muskrat's front legs and feet are short with heavy claws, with good dexterity for feeding, grooming, digging and lodge construction, while the powerful, partly-webbed toes on its hind feet provide propulsion for swimming. Muskrats have developed special respiratory controls, which allow them to remain submerged for nearly 20 minutes. Even the eyes, ears, nose and mouth are highly specialized to serve well during underwater excursions.

In common with other rodents, muskrats possess four large front incisors adapted for gnawing. These specialized teeth are unrooted and grow throughout the life of the animal. Each incisor has a layer of hard enamel on the front surface, with progressively softer material toward the back. This assures that through gnawing, the softer tooth surface in back wears faster than the front surface. The result is a sharp, chisel-shaped edge well adapted for gnawing and carrying food and building materials through water, which also commits them to a basically herbivorous mode of feeding.

Distribution and abundance: Muskrats are found throughout Nebraska wherever suitable aquatic habitat exists, and are among the most abundant furbearers in Nebraska. In general terms, muskrats require readily accessible water, food and secure lodging throughout the year, though these requirements vary with the season. In the case of water, the muskrat can tolerate minimal water conditions during summer and fall. However, muskrats are virtually entombed under a layer of ice in the winter and need at least three feet of water to survive.

Habitat and Home: Muskrats live in marshes, sloughs, streams, rivers, ponds and lakes. A muskrat will dig its home in a stream or pond bank if convenient, or it may gather vegetation

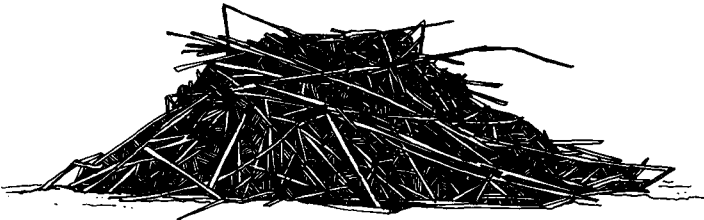


from nearby areas and build a large house in shallow water. Cattails and bulrushes are packed in a conical pile three to four feet high and five to eight feet in diameter. Passages into the house are under water and lead to two to four chambers in the dome, which are connected by tunnels. Each lodge contains at least two exits, one of which must be to deep water to ensure access in the winter. The inner chamber of the lodge serves a multitude of purposes from bearing and raising young to a room for eating and sleeping. The foot-thick walls of the house act as insulation, keeping out the summer heat and the winter cold.

Where strong current, wind, wave action or lack of adequate water depth or construction materials preclude a free-standing conical lodge, a burrow and bank den are excavated. Muskrats will readily dig burrows into the banks of creeks and farm ponds, where soils and water depth permit safe year-round access to dens. As with the lodges, burrows lead to an above-water chamber or chambers providing both comfort and security.

Habits: As fall approaches, muskrats turn their attention to building new lodges or excavating new burrows. This construction activity begins in late August and peaks in October. Increased feeding activity during that time builds body fat reserves for the long winter when it is more difficult to find food. Food and space are usually in shortest supply in winter. The quality and quantity of vegetation, water, habitable dwellings, and the density of muskrats using this habitat will dictate body condition for the breeding season.

Muskrat Lodge



Foods: Muskrats are essentially vegetarians. Because they do not hibernate but remain active throughout winter, food must be readily accessible even under ice and snow. Muskrats prefer aquatic stands of cattail, bulrush and pondweeds, both for the green shoots during the growing season and for under-ice foraging for tubers and roots during late fall and winter. Roots and bulbs, stems, and leafy parts of a variety of plants make up the bulk of their diet. Choice among these plants are cattails, three-square bulrushes, burreed, duck potato and other aquatic plants. Dryland weeds, grasses, white clover and cultivated corn are readily utilized by muskrats. On occasion, they will eat freshwater clams, snails, frogs, crayfish, fish and salamanders. In hard times, they can subsist on dried stems and leaves and may resort to cannibalism.

Reproduction: Muskrats produce large numbers of young, but offer little parental care. They can potentially have up to four litters and 45 young a year, but Nebraska muskrats normally have two to three litters of five to seven young each. Additionally, first-litter females will sometimes have a litter late in the same year they were born. In the spring, dispersal and mating are the two most noticeable activities of muskrats. Dispersal is associated with ice break-up and is primarily the result of increased aggression between animals. Dispersal movements can be long, cross-country treks or shorter, less dramatic movements within a marsh. Dispersing muskrats experience extremely high mortality from predators, exposure, starvation and accidents, but the movements play a vital role in repopulating vacant habitat.

In Nebraska, the breeding season begins in March and runs through summer. After pair bonds are established, muskrats establish territories and defend them fiercely against neighbors. Peaks in litter production occur in April, May and June, and there is another small peak during August-September. Litters are born blind and helpless, four weeks after mating occurs. The young go on short excursions within two weeks and are weaned at about three weeks. Adult females breed soon after the birth of a litter and prepare their dens for the new arrivals soon after the litter is weaned.

Mortality: While muskrats are prolific, they are short-lived. Most muskrats live less than one year, and two- to three-year-olds are extremely rare. Muskrats are prey for a wide range of predators, including hawks, owls, mink and northern pike.

Many muskrats are killed or mortally wounded in territorial battles throughout spring and summer, and few spring dispersers make it safely to a new home.

Muskrat populations can fluctuate wildly from year to year, based on vegetation and water conditions, and populations can actually be too successful for their own good. Sometimes a marsh produces so many muskrats during the summer that there is insufficient vegetation left in the fall for food and lodge construction. This is called an "eat out"—the muskrats eat themselves out of house and home. When muskrat numbers get too high in late summer and fall, the population becomes stressed. Fighting and cannibalism increase, reproduction decreases and malnutrition increases. Two contagious diseases, Tyzzer's disease and tularemia, can have devastating effects on local muskrat populations under these conditions. Muskrat numbers can be reduced to a fraction of the original population in just a few weeks by these diseases. Unfortunately, these diseases will persist in a marsh and continue to depress muskrat populations for a number of years.

Regulated trapping can reduce the impacts of disease, starvation and fighting on muskrat populations, by removing surplus animals when numbers are high and populations are under stress.

Importance: Muskrats have both positive and negative economic values to the people of Nebraska. Positive values center on the income generated by the harvest of muskrats by trappers for their meat and fur, as well as the recreational value derived from their pursuit. From 1942-89, an estimated 6.1 million muskrats were taken by fur trappers in Nebraska. Harvest totals from 1980-89 indicate an average annual harvest of 95,900 muskrats valued at over \$283,000.

Muskrat is highly desirable for the manufacture of women's coats because the fur is very durable and the skin is tough and makes excellent leather which takes and holds dye well. People who eat muskrat say its flesh has a moderate gamey flavor that is in no way unpleasant. Musk dried from the animal's glands is used to make perfumes and a scent used for trapping other animals.

Management: Muskrats are also important in the management of wetlands. Muskrat lodge construction provides openings in vegetation-choked wetlands which greatly increase the wetland's value to waterfowl and shorebirds.

The negative economic impacts of muskrats center around burrowing activities that can cause shoreline erosion and structural damage to farm ponds, stock dams and dikes. This damage can be controlled, however, with proper population regulation.

Nature made the muskrat prolific, but most of each year's production dies before the next year's breeding season begins. It is from this surplus that trappers take their pelt crop, causing no harm to the breeding stock.

Ease of trapping and pelting make the muskrat a great favorite of young trappers. Many a farm lad in Nebraska looks upon a nearby muskrat marsh as money in the bank.

