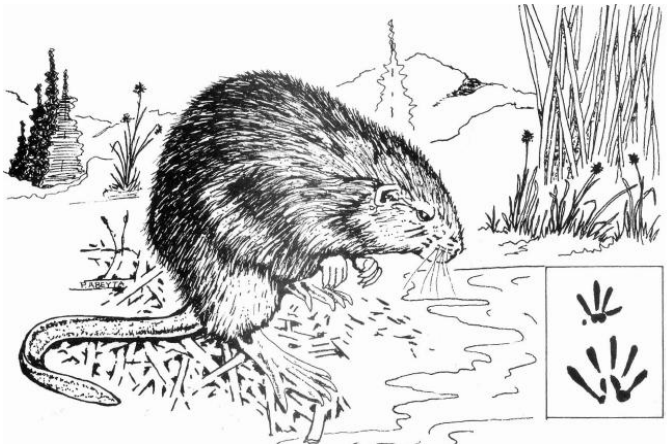
BIOLOGY, LEGAL STATUS, CONTROL MATERIALS, AND DIRECTIONS FOR USE

Muskrat

Ondatra zibethica

Family: Cricetidae

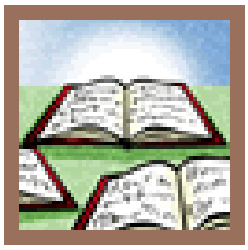


Introduction: The muskrat is the largest microtine (relating to voles or lemmings) rodent in the United States. It spends most of its lifespan in aquatic habitats and swims well. The term muskrat derives from paired perneal musk glands found beneath the tail area of both sexes. These musk glands are used throughout the breeding season to mark an area.

Identification: The muskrat is a large, stout, semi-aquatic rodent. Its head is broad and blunt with small eyes and rounded short ears. The muskrat's coat is practically waterproof and is soft, dense, and grayish brown in color. Its large hind feet are partially webbed, stiff hairs align the toes, and its laterally flattened tail is about the length of its body. Its front feet are much smaller than the hind feet and are adapted for digging and feeding. The muskrat is further adapted for its semi-aquatic life with lips that act as valves, closing behind the front incisors so it can actually gnaw underwater.

Adult muskrats are 18 to 24 inches) in length. Males can be larger, up to 30 inches. Average weight is 1 ½ pounds to 4 pounds.

Muskrats can swim slightly faster than 3 miles per hour and when feeding often swim backwards. They can stay underwater for up to 20 minutes. Muskrat activity is mainly nocturnal, seen chiefly in the twilight they occasionally can be seen during the day.



Legal Status: Muskrats are classified as fur-bearing mammals by the California Fish and Game Code. Muskrats which are injuring growing crops or other property may be taken at any time and in any manner.

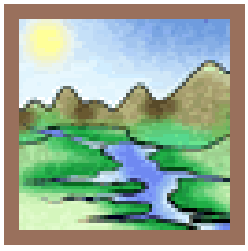
When trapping fur bearing mammals in California the manner of taking is strictly controlled. California law is very specific regarding trapping conditions and restrictions: steel jawed, spiked and large body gripping traps are prohibited, restricted use in some cases. Trap and snares are restricted both as to type and placement, and each trap is required to have individual trap identification issued by the California Fish and Game Department; and daily trap visitation and maintenance is required.

Note this 'trapping statute' still applies to Structural Pest Control Licensed Operators and DPR Licensed and Certified Persons or Businesses when trapping mammals other than rats, mice, gophers, moles, and voles.

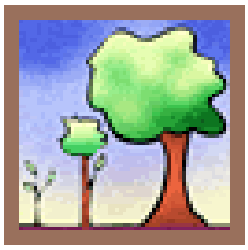
Damage: Muskrats damage rice, milo, sugar beets, and tomatoes. Much crop damage attributed to muskrats in the Delta area is actually caused by resident Norway rat populations. The major damage done by muskrats is the weakening or washing out of levees, culverts and head gates due to their burrowing in earthen banks. This problem is more serious where levee soils are peaty or sandy, and where levee or ditch bank walls are thin. Other burrowing damage may include pond dams, floating styrofoam marinas, docks, boathouses, and lake shorelines.

Range: Central Valley of California, Imperial Valley and Colorado River area, northeastern California and scattered along coastal California, mostly in aquatic habitats; streams, ponds, wetlands, swamps, drainage ditches and lakes. In the 1920's they were introduced to the central valley for the fur trade (Messa 1980).

Common Muskrat



Habitat: Muskrats live year round wherever water and food are present; marshes, edges of ponds, lakes, and streams; cattails, tules, water lilies, and open water (Errington 1961).



Biology: Muskrats are almost always found near water. They may wander overland in search of new feeding grounds or to escape floods.

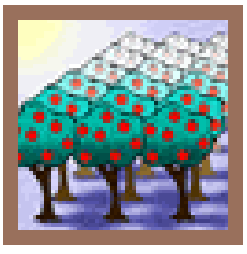
Muskrats may live in burrows in banks, or they may build conical houses 3 or 4 feet in height out of reeds in ponds or marshes. There may be one or more entrances, which are usually underwater. Burrows made by crayfish may be confused with those made by muskrats. Where water levels fluctuate, the nest chambers are above high water.

Muskrats are primarily vegetarians, eating cattails, tules, and other aquatic plants, bulbs, grasses and some animal food such as tadpoles, mussels, and snails. Some wildlife refuges are stocked with muskrats in hopes of keeping tules and other water plants under control; other refuges encourage trapping to alleviate damage to dikes and levees.

Muskrats are more active by night than by day and do not hibernate. Young may be born at any time of year, but there are fewer births in winter. The gestation period is 22 to 30 days, and 2 or 3 litters a year are raised. There are usually 5 or 6 young (range of 1 to 11) per litter and they are weaned when about one month old.

Young muskrats are especially susceptible to predation by owls, hawks, raccoons, mink, foxes, coyotes, even adult muskrats. Man is also an enemy, the muskrat being the most important fur-bearer in the United States. The flesh is palatable and is sold in some areas as "marsh hare."

Muskrats are hosts to parasites and carry a number of diseases; tularemia, hemorrhagic diseases, leptospirosis, ringworm, pseudotuberculosis. Common extoparasites include mites and ticks.



Damage Prevention and Control Methods

Exclusion

Damage caused by muskrats is mainly burrowing damage. Often this damage may not be readily apparent. One way to identify early burrowing is to walk along the edge of the dam or shorelines when the water is clear and look for 'runs' or trails just below the water surface to a depth of 3 feet. Also look for droppings along the bank or on logs or structures. Any burrows found should be filled, tamped in and covered with rock.

In some situations the digging can be prevented in farm ponds by using stone riprap at the edge of the pond or dam. Serious damage can be prevented by this type of construction. Specifications include: the inside face of the dam should be built at a 3 to 1 slope; the outer face of the dam at a 2 to 1 slope with a top width of not less than 8 feet, preferably 10 to 12 feet. The normal water level in the pond should be at least 3 feet below the top of the dam and the spillway should be wide enough to support heavy rainfall.

Fencing is another exclusion method to prevent muskrats from leaving areas such as ponds where plants and crops are at risk.

Control in rice fields

Preventive measures: The enlargement of check-banks and the construction of substantial check boxes reduce damage from muskrat burrowing. A check-bank with a base of six feet offers more resistance to the erosion of muskrat burrows than does a narrower bank. Wide banks require wider check boxes, which are less vulnerable to burrowing by muskrats. A recommended box size is two feet wide, eighteen inches high, and four feet long; made of two inch lumber. Additional protection is obtained by the use of lateral wings, two feet in length, to discourage muskrats from burrowing along the side of the box. Headgate foundation should be constructed to prevent muskrat burrowing. This may be done by extending a concrete apron 15 feet in both directions from the headgate, along the sides and bottom of the canal.

Control in irrigation canals

Frequently muskrats make burrows at junctions of canals, especially when there is a wooden or cement structure damming the water. Such burrows may lead from one canal to another, often beneath the protection of the structure. Differences in water level cause burrows to erode rapidly and those covered by the cement structure of the headgate are difficult to destroy or fill.

Preventive measures: Headgate foundation should be constructed to prevent muskrat burrowing. This may be done by extending a concrete apron 15 feet in both directions from the headgate, along the sides and bottom of the canal.

Using the wire netting on canal banks about headgates and other especially vulnerable trouble spots will prevent digging. Two inch diamond mesh (no. 14 gauge, galvanized after weaving) placed two feet above and two feet below the water should be used.

Habitat Modification

Eliminating food and other aquatic matter eaten by muskrats can make the habitat less desirable to muskrats. Where farm ponds and levees are being damaged, use winter 'draw down' to expose muskrat dens, burrows, and runs. Fill these and then riprap the edges with stone. Also while the water is drawn down, trap muskrats.

Frightening

Not a recommended method, ineffective as a permanent solution.

Fumigants

Not a recommended method.

Repellents

Not a recommended method.

Toxic Bait

CDFA labels 0.005% Chlorophacinone grain bait
0.005% Diphacinone grain bait
0,005% Diphacinone Rodent Bait Block

Anticoagulant baits, 0.005% (diphacinone, chlorophacinone) are also effective. Spot Baiting - (Bait boxes and paraffin blocks see below) are effective. Broadcast baiting is NOT EFFECTIVE.

Directions for Use:

Anticoagulant Baits: NOTE: Bait must be eaten over a period of several days to give adequate control.

Anticoagulant paraffin bait blocks: The anticoagulant block (diphacinone) is a muskrat control alternative which is effective along ditches and waterways. The bait is used by placing near muskrat burrows, runways, and locations where fresh activity is apparent. The method has proven effective in agricultural areas. No adverse effects are known to occur to waterfowl or other birds. Care must be taken if dogs are in the area since they might chew on and ingest some of the bait.

Floating bait stations: Exposure to anticoagulant baits in floating bait stations is a satisfactory method of muskrat control. Place one to five pounds of bait in floating bait box. Inspect stations daily and add bait as needed; increase the amount when bait in bait box is entirely consumed overnight. Replace moldy or old bait with fresh bait. An uninterrupted supply of bait should be maintained as long as any bait is taken. Stations can be constructed of 1/4" plywood. Styrofoam glued to the base provides an adequate float when waterproofed. Floating bait stations will drop as the water level lowers and may be difficult to service. A handy device to service these boxes may be made by fastening a small can on one end of a six foot pole and a hook (used to raise and lower the lid) on the other end.

Trapping

In California muskrat leg hold type traps are illegal. When trapping fur bearing mammals in California the manner of taking is strictly controlled. California law is very specific regarding trapping conditions and restrictions: steel jawed, spiked and large body gripping traps are prohibited, restricted use in some cases. Trap and snares are restricted both as to type and placement, and each trap is required to have individual trap identification issued by the California Fish and Game Department; and daily trap visitation and maintenance is required.

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An effective muskrat trap is the Conibear trap, size 110, which kills the animal almost immediately. These should be set in the run, house, or den entrance.

Other

Shooting where legal is only useful in eliminating one or two individual muskrats i.e. from a small farm pond. Dusk or during dawn are the best time.

REFERENCES AND ADDITIONAL READING

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