

The Muskrat



in South Carolina

BIOLOGY, MANAGEMENT & CONTROL

More information about muskrats can be obtained by writing:

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For **Depredation Permits** or information about obtaining permits, contact the Wildlife Permitting Office at:

WildlifePermitting@dnr.sc.gov
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DESCRIPTION

The muskrat (*Ondatra zibethica*) is not actually a rat, but is classified as a rodent because of its teeth: four large, yellowish incisors in the front of its mouth. The animal also has flat molars for grinding vegetation. Southeastern muskrats average about 2 pounds in weight and 2 feet in length, including a vertically flattened 8-to 12-inch tail. The waterproof fur is soft and thick and is generally dark brown on the back and sides, becoming light grayish-brown on the belly. The muskrat has a stocky appearance due to the apparent lack of a neck, and the ears are short and concealed in the fur. Its back feet are partially webbed and its smaller front feet are adapted for digging and feeding. Muskrats have lips that act as valves that close behind the front incisors allowing it to gnaw underwater. The musky odor comes from two perineal scent glands located beneath the skin at the ventral base of the tail. This musk is used during the breeding season to mark an area.

DISTRIBUTION

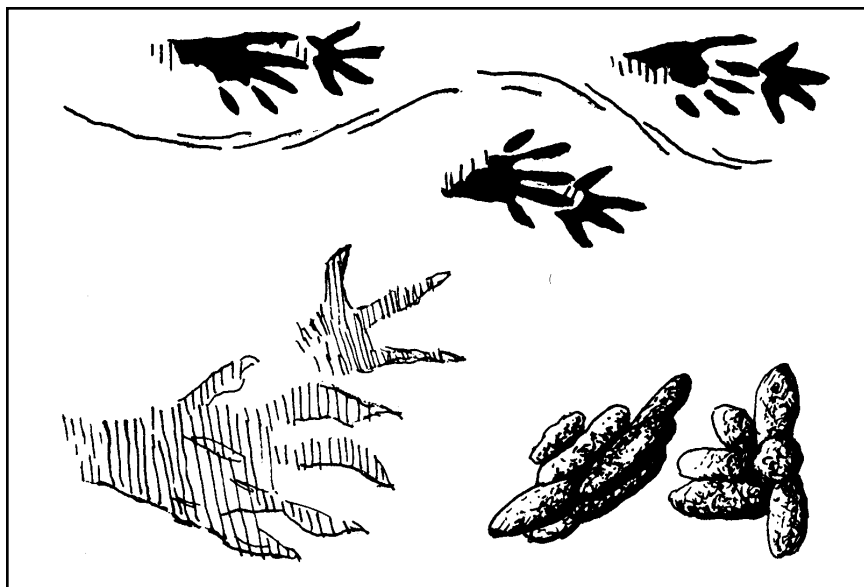
Muskrats are found throughout North America and were introduced into Europe in 1905. In South Carolina, muskrats are abundant in places in the Piedmont and there are scattered populations in the Upper Coastal Plain as well. They are semi-aquatic mammals, living along streams, lakes, ponds, swamps, and marshes.

HABITS

Muskrats are polygamous, and begin breeding in early March and continue throughout the summer. Populations can build up quickly, as a pair of muskrats can produce four to five litters with five to seven young per litter each year. In addition, muskrats can begin breeding in the most southern parts of their range as early as six to eight weeks of age.

Muskrats are active mostly at night, but they may be active during the early morning and late evening as well. Primarily vegetarians, they eat plants such as cattails, water lilies, bulrushes, smartweed, water potato, and willows, and may also eat corn, carrots, apples, and other cultivated plants. Muskrats will occasionally eat meat in the form of freshwater mussels, clams, frogs, and crayfish. Fish that are found dead will be scavenged and, in rare instances, a muskrat may catch one of the slower swimming rough fishes. It is a common misconception that muskrats pursue and capture many of the game fish species. It is simply too much work for a creature that is mainly a vegetarian.

In South Carolina, muskrats sometimes build small huts out of marsh grasses, leaves, small sticks, etc. However, it is more common for them to dig bank tunnels and dens. The entrances to bank dens are generally 1 to 2 feet underwater and slope upward to the living quarters above water level. This provides a protective



Muskrat Sign

underwater entrance into their den that helps protect them from terrestrial predators.

MUSKRAT PROBLEMS

The habit of digging tunnels in the banks of ponds and streams causes conflict between man and muskrat. Muskrat dens dug into a farm pond dam could cause failure of the dam, and there is also danger of people and livestock breaking through the top of a tunnel and being injured. Riprap along the dam face can deter muskrats from burrowing into a dam. The stone should be less than 6" in diameter to prevent making cavities for the muskrats to enter through. Riprap should be at least 3 feet below water level and extend to at least 1 foot above the water level. This technique can be used for dams

that are already constructed as well as for ponds under construction. Water control devices in dams should have a concrete apron to prevent muskrat burrows from compromising these structures.

Adhering to a few simple rules when constructing a pond can minimize future muskrat damage to pond dams. The dam should have a minimum width of 20 feet at water level and be well sodded to bind the soil together. A gradual slope (3:1) on the inner or pond side of the dam and a spillway large enough to prevent water from rising more than about 6 inches on the dam are desirable. This will discourage muskrats from burrowing into the dam, and less damage will be done if the animals select the embankment as a den site. Welded-wire or chain-link fencing embedded into the dam

or riprap along the dam face at construction time will also act as a barrier to muskrat tunneling.

Another problem sometimes arises on lakes where the shoreline may be too rocky or shallow for muskrats to dig satisfactory dens. They often turn to floating docks where Styrofoam presents a convenient tunneling site. Covering the sides with treated lumber and covering the exposed foam on the bottom with 1" x 2" welded wire can best protect the Styrofoam (chicken wire is not strong enough and will be chewed and destroyed by muskrats). The wire should be galvanized or vinyl-coated to resist corrosion. Coating Styrofoam with a light layer of cement, followed by paint, may also be effective.

Encapsulated floatation is often effective at deterring muskrats from burrowing and should be used on all new dock construction and renovations in areas where muskrats are known to occur. Typical encapsulated floatation has a molded polyethelene shell over a polystyrene core. This type of floatation material is usually more environmentally friendly than Styrofoam and may be required on docks in certain public lakes or waterways. Plastic drums can also be an effective muskrat-resistant floatation material for docks, but are often not as durable as other types of floatation unless filled with a water resistant inner floatation material.

Muskrats have been known to cause significant monetary damage to boats left in the water for extended periods of time. Wiring

damage is the most common problem, affecting boats where muskrats can access wires and cables. Typical outboard boats are most likely to have damage to depth and fish finder wiring, as it is common for this wiring to extend down the outside of the transom down to the transducer.

However, muskrats have even been known to sink boats by chewing on a watercraft's outdrive boot and also on underwater exhaust outlets in larger boats. Using stainless steel mesh sleeves on wires and cables, and installing exhaust guards on boats with wet exhaust openings of 3" or larger can help to prevent damage to boats. Improvised wire cages may help protect outdrives, but have to be removed to use the boat.

In South Carolina, reported damage to boats tends to occur more often on pontoon boats. These seem to be more problematic as there are usually several places for a muskrat to enter or climb up on and damage wiring. Because it tends to be easier for a muskrat to climb onto the deck of a pontoon boat, even exposed wiring under the console can be damaged.

HABITAT MODIFICATION

Muskrats can be beneficial to pond managers in that they can help keep invasive plant species such as cattails from overtaking ponds. Open areas in cattail-infested ponds can allow for more desirable aquatic plants to become established, increasing its value to other wildlife. Therefore, it may be advisable to keep muskrats in

ponds where emergent vegetation is a problem so long as dams and other water control structures are not affected by burrowing activity.

It may be possible, however, to encourage muskrats to leave a pond by removing its food sources. Since muskrats are primarily herbivorous, an aquatic plant control program targeting their preferred foods may be enough to make muskrats abandon the area in search of more suitable habitat. Plants containing less starch such as spike rush and leafy bulrush may have little to offer as far as the muskrat is concerned and may not need to be removed. If this type of habitat modification does not encourage muskrats to leave, most likely the animals will have to be removed by trapping.

MUSKRAT TRAPPING

Trapping is generally the most practical solution to a nuisance muskrat problem. The muskrat is classified as a furbearing animal in South Carolina, and may be legally trapped by persons with a commercial trapper's license from December 1 to March 1. Persons may trap problem muskrats at other times of the year, and without a commercial trapping license using a *depredation permit* (see **Depredation Permit** Section).

The South Carolina Department of Natural Resources (SCDNR) maintains a Wildlife Control Operators list of nuisance wildlife control specialists throughout South Carolina that will assist



#110 Bodygrip Trap Set at Entrance to Den

property owners with nuisance furbearer problems on a fee-contract basis. For more information see **Wildlife Control Operators** Section at the end of this publication.

Bodygrip traps No. 110, 120 (commonly known as Conibear® traps) and foothold traps No. 1 or 1½ are those most commonly used for muskrats. Bodygrip traps may only be set in the water or in a well-used vertical slide and may not be used with bait. For more trapping information check with the SCDNR Furbearer Program before purchasing or setting traps.

There are many effective sets for trapping muskrats. The underwater entrance to a bank den is an ideal place to set a bodygrip trap. Wading along the edge of the pond or stream and probing the bank with a stick can often

locate den entrances. Make the set so that the muskrat must pass through the trap in order to enter or leave the den. Sticks should be used to stabilize bodygrip traps by wedging them within the trap springs. If placed outside the spring mechanism, the sticks will impede the operation of the trap. Sticks and other materials placed around the trap site can help guide the animal through the trap so long as the trap function is not interfered with.

Foothold traps should be set for muskrats only where the animal will drown quickly. A trapped muskrat will head for deep water, and the weight of the trap will generally drown it. The trap should be chained to a stake driven in the ground in water at least 14 inches deep. A tangle or drowning stick driven near the trap stake will



Slide Set



Runway Set

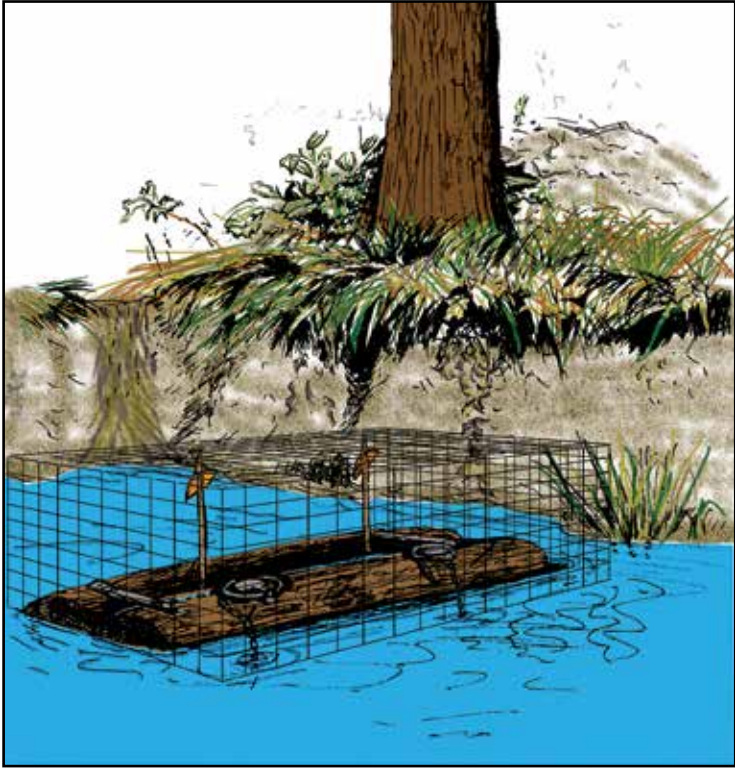
increase the effectiveness of the set. Foothold traps can be baited with a slice of apple or carrot on a stick over the trap trigger. Lures and scents are also effective.

Foothold or bodygrip traps can be placed at the bottom of a muskrat slide, just under the water. Slides are used over and over as they climb into and out of the water. Muskrats also use runways through thick aquatic vegetation and muddy stream bottoms as they swim to and from feeding places. A trap set in the middle of the runway will often be successful.

One of the most effective trap sets where muskrats are destroying boat docks is the floating log set. Foothold traps are set in notches cut on top of a log, and the chains stapled or nailed to the bottom of the log. The set can be baited, but muskrats like to crawl up on a floating

object anyway. When trapped, the muskrat will dive off the log and be drowned by the weight of the trap. It may be advisable to cover the top and sides with a wire covering (such as hardware cloth) to act as an "exclusion cage." This helps prevent capturing non-target animals. The cage must extend out at least 10 inches on the side(s) where traps are located so that muskrats can enter by going underwater and resurfacing inside the open bottomed cage.

A variation of the floating log set is to join the bottom of two wooden floats with a thinner rectangular piece of board, wide enough to hold a foothold trap between or on both ends of the wooden floats. The traps are held just below the water's surface and used by muskrats to attempt to step up on to the floating platform. A similar exclusion cage may be necessary on this trap as well.



**Floating Log Set
(shown with exclusion cage)**

Baited cage traps (secured from tipping) on a float in the water or placed on the bank where muskrats have been active may be successful as well. Apples, carrots, or parsnips can be used as bait.

It is often necessary for several adjacent dock or landowners to work together, because removing muskrats around only one dock or property may only be a very temporary solution.

There is usually some commercial demand for muskrat fur because of its soft, dense undercoat. Muskrats are relatively easy to skin, and pelts are worth

about \$2 each, but this value can vary from year to year. In addition, the dark meat is good to eat.

Muskrats are a natural part of a stable environment. Unless they are causing real problems, total elimination from the area should not be considered. Furthermore, complete elimination of muskrat in a given area may require considerable effort. Due to a high reproductive ability, nearly 75% of a muskrat population can be removed each year without impacting the overall population in an area. Overpopulation can lead to disease and habitat destruction problems.

CHECKING TRAPS

Traps should be checked the following morning. By State law, traps must be checked at least once daily from two hours before sunrise to two hours after sunset. Body gripping traps in water sets and traps used in submersion sets must be checked every 48 hours. Reapply scent or bait after a couple of days at unsuccessful trap sites. To minimize human scent and disturbance to the trap site, only approach close enough to assess if an animal is caught or whether the trap site has been disturbed. Muskrats caught in traps should be dispatched with a single .22 caliber shot to the head. It is sometimes possible to catch additional animals at the same trap site; therefore reset the trap(s) in the same place, if possible.

DEPREDATION PERMITS

Persons without a commercial fur harvest license (trapping license), or anyone trapping outside of the trapping season, may trap problem muskrats with a depredation permit. This permit is available from any SCDNR Wildlife Management or Law Enforcement office at no cost to the applicant. Depredation permits can also be issued to those without a hunting license in order to attempt to control muskrats through hunting or shooting. Muskrats are a furbearing animal that includes a hunting season that encompasses the traditional small game season from Thanksgiving to March 1. Persons with a valid hunting license

can hunt muskrats during daylight hours throughout this season.

Persons desiring to shoot muskrats at night may request a depredation permit to shoot at night. However, not all shoot at night requests will be approved as location, practicality, and even the requestor's past history of natural resources violations may be considered. Any permits to shoot at night must come from the SCDNR Law Enforcement Division. Generally, Depredation Permits are valid for 30 days and can be renewed if additional time is needed to alleviate the situation.

OBTAINING PERMITS

Any person (or their designee) may trap (or shoot*) damage-causing muskrats within 100 yards of their *residence* without any license or permit from SCDNR, so long as the trapping occurs on the owner's property, or with written permission of adjacent property owners (See following illustration).

Nothing allows the trapping on the property of another without permission from the owner or occupant. A free depredation permit is required to trap damage-causing muskrats outside of 100 yards of a person's residence where damage is occurring. A depredation permit will always be required to trap problem muskrats where there is no residence at the location where damage is occurring, unless the person is a licensed trapper *and* is trapping during the trapping season.

**Shooting allowed only where legal and safe to discharge a firearm*



Description of the 100-yard distance limit around a residence (hashed area) within the owner's property boundary where trapping can take place without permission of adjacent landowners and without a license or depredation permit.

For **Depredation Permits** or other information about permits, contact the Wildlife Permitting Office at:

WildlifePermitting@dnr.sc.gov
(803) 734-3887

WILDLIFE CONTROL OPERATORS

The SCDNR's Furbearer Project maintains a list of Wildlife Control Operators (WCOs) that can assist property owners with various nuisance wildlife problems for a fee. The amount charged is negotiable between the customer and the WCO, and will often depend on the distance traveled, number of trips required, time expended, and/or number of animals removed.

The WCO list is available on the SCDNR website or at any local SCDNR Wildlife Management or Law Enforcement Office.

Further information about the WCO list can be obtained by contacting the Furbearer Project at (803) 734-3609, by email at *furbearerprogram@dnr.sc.gov*, or by visiting the SCDNR website at *dnr.sc.gov*.

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20-12596

Total Cost: \$1,970
Total Copies: 5,000
Cost Per Copy: \$0.394