

Muskrat (*Ondatra zibethicus*)

Size:

18–26” long, including the 10–12” long tail. Weigh 1½–4 lbs.; most average about 2½ pounds. They look like a large rat with a long, narrow tail (the tail is flattened vertically).

Signs of their presence:

- Tracks: Hind print about twice as long as front, may overlap front track. May see foot drag and tail drag.
- Scat: Oval pellets, often seen in clusters on rocks, logs, or any object that sticks out above the water line. Usually, the ½” long pellets are stuck together, but may flatten with age.
- Dens (also called “bank burrows”). Muskrats may burrow into the banks of streams or ponds. The entrance, usually 5–6” in diameter, is often found about 6” below the water’s surface; this tunnel, which connects to the den, could be up to 45 feet long. Muskrat dens are found above the high-water line (this may still be 4–5 ft. below ground level). The den is usually only a bit bigger than the tunnel that leads to it, often 6–8” wide. A small air shaft at the top connects it to the surface; it’s often “screened” with loose twigs or plants. Dens generally have several underwater entrances. In fast-moving water, muskrats are more likely to burrow into the bank than to construct a lodge.
- Muskrats may build a den in the outer wall of a beaver lodge, even when the beavers are using their lodge.
- Lodges. If the water’s shallow and plants are abundant, muskrats may build a lodge that looks a bit like a smaller version of a beaver lodge. Muskrat lodges are usually a dome-shaped hut of weeds, sticks, and leaves piled on a platform of mud and rotted debris. They’re often slightly lopsided, 3–6 ft. wide, and about 1½–4 ft. above the high-water line. The walls of the lodge are often a foot thick. Its inside is hollowed into several chambers. There are several underwater entrances, called “plunge holes.” Muskrats will add to the lodge as long as they’re using it. (Same is true for feeding platforms.)
- “Runs.” As the muskrats enter and leave their dens, their hind feet scour out a path in the muck in the bottom of the pond. You may be able to see the run in clear water, or feel the smoothed trail with your hands or feet. Muskrats will also travel over land, especially in the fall and right after ice-out. Trails, both in the water and on land, are kept open by frequent use and pruning, and are noticeable. You may see tracks and scat in their trails.

- Feeding stations. They may look like a small lodge. Muskrats will tow food out to this platform. They’ll also push mud and aquatic plants up through a hole in the ice (called a “push-up”). When the mud freezes, it keeps the hole open and creates a shelter for the muskrats, protecting them from both predators and the cold. They’ll rest in the push-up instead of returning to the lodge, which may be further away. May see floating blades of cattails, sedges, or other plants near their feeding platforms, or piles of clamshells on the platform.
- Scent posts. Male muskrats will secrete an oily, pungent liquid on a scent post, which is often a twist of grass at the water’s edge, to mark their territories. The musky odor of muskrats (both genders) is especially noticeable during the breeding season.

Diet:

Mostly aquatic plants and some field crops, such as corn, soybeans, wheat, oats, grain sorghum, sugarcane, and rice grown as a flooded crop. Muskrats prefer cattails, pickerelweed, bulrushes, sedges, arrowheads, reeds, pondweeds, water lilies, and young willow. They can survive entirely on upland plants such as bermuda grass, clover, and johnsongrass, if grown near a farm pond. They will eat freshwater clams, crayfish, mussels, snails, crustaceans, small fish, turtles, and frogs when aquatic plants are scarce.

Typical activity patterns:

Social style: In the winter, 3–4 muskrats may share a lodge temporarily to stay warm, but they are not colonial, like beavers. As the breeding season approaches, they will become territorial. Dens are occupied only by a female and her young while she’s raising them. When populations are high, males are more likely to fight.

Daily activity: Most active at dawn and dusk, but may be active throughout the night or day. Spends most of its time in the water and can remain submerged for a long time.

Hibernator? No.

Migrates? No. During the spring (usually late February–early March), males will leave in search of mates. In the fall, young muskrats may seek new territories. These dispersals are more likely to happen when their populations peak. The muskrats may travel over a half-mile from their home.

Where found:

Distribution in NY and the Northeast: Widespread and

abundant. Found throughout New York, except in the higher regions of the Adirondacks.

Habitat: Wetlands (both fresh and slightly salty water), especially with still or slow-moving water and dense cattail stands. They're found in marshes, beaver ponds, lakes, swamps, streams, drainage ditches, canals, reservoirs, and mine pits. Expect to find muskrats in beaver ponds, farm ponds, and any semi-permanent waterway.

Territory and home range: Both sexes are aggressively territorial just before and during the breeding season and may kill other muskrats, even their own young, during a squabble. Home range is small, usually within 200 yards of den.

Breeding habits:

Pair bonding style: Polygamous. A pair may remain together for a breeding season. Both male and female may build and maintain the den, but the female mostly cares for the young by herself.

Breeding dates: Mid-March–September. Females may breed while still nursing.

Litter size: Usually 1–8, typically 5–6 young. Average 2–3 litters/year.

Birth period: 1st litter: April–May. 2nd litter: June–July (about half of New York's muskrats have a second litter). 3rd litter, less common: August. The young are born in a grass-lined nest in the lodge or den.

Weaning dates: About 1 month old.

Amount of time young remain with parents beyond weaning date: Young are driven off after weaning.

Special note: Muskrat populations boom and crash every 10 years, in a regular cycle. Droughts and floods may cause population crashes, too.

Common nuisance situations:

Time of year: Spring.

What are they doing?

- Most muskrat damage is caused by their burrowing.
- They burrow into earthen dams, dikes, levees, and railway embankments, weakening their structures. They also burrow into the banks of ponds, canals, and irrigation and drainage ditches. Their tunnels may drain a small farm pond. They may damage floating docks, marinas, and boathouses.
- Muskrats will cross yards. Some people are frightened of them, or mistake them for Norway rats.
- Occasionally eat field crops. May cause substantial financial losses in states with major rice and

aquaculture operations, because they eat rice, cut it down to use as building material for their lodges, and damage the field by burrowing through levees.

- Damage aquaculture sites by burrowing into levees or pond banks.
- Damage ornamental aquatic gardens by eating water lilies or cattails or other plants.
- When their populations grow too high, they may “eat out” all of the aquatic plants in the area, reducing the quality of the habitat for other species, such as waterfowl.
- Disease risks: tularemia, hemorrhagic septicemia, leptospirosis, salmonellosis, ringworm, pseudotuberculosis. They are hosts for many ticks, mites, fleas, and various worms.

Legal status in New York:

Game species with set season. Special DEC permits needed for the taking of nuisance muskrat. Actions that change the nature of freshwater wetlands or protected streams may require additional DEC permits.

From ECL 11-0521: “1. The department may direct any environmental conservation officer, or issue a permit to any person, to take any wildlife at any time whenever it becomes a nuisance, destructive to public or private property or a threat to public health or welfare, provided, however, that where such wildlife is a bear, no such permit shall be issued except upon proof of damage to such property or threat to public health or safety presented to the department. Upon presentation of such proof, the department may issue a permit authorizing the use of trained tracking dogs pursuant to section 11-0928 of this article, and, if the department has determined that no other alternative is feasible, a separate permit to take the bear. Wildlife so taken shall be disposed of as the department may direct.”

Best practices

To prevent damage, “overbuild” a dam or farm pond:

- Normal water level should be at least 3 feet below the top of the dam.
- Spillway should be wide enough to prevent the water level from rising more than about 6” during heavy rainfall.
- Inside face of dam (towards water) should be built at a 3:1 slope (three feet out for every foot of height)
- Outer face of dam should be built at 2:1 slope.

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- Top of dam should be at least 8 feet wide, best if it's 10–12 feet wide.

To solve an existing conflict, reduce their food sources (this may be necessary if there's extensive damage):

- Around a pond, mow grassy areas frequently.
- Remove the aquatic plants that muskrats eat. They prefer starchy foods including cattails, pickerweed, bulrush, smartweed, duck potato, horsetail, water lily, sedges, young willow trees, and rice, when grown as a flooded crop.
- Remove the following upland plants from around the pond (and replant with other species): bermuda grass, clover, johnsongrass, and orchard grass. Muskrats can survive entirely on those plants.
- If muskrats are traveling from the pond to feed in fields or gardens, fence those areas. Muskrats will eat corn, soybeans, wheat, oats, grain sorghum, sugarcane, and ornamental flowers.
- If you don't want to remove plants from your pond, try to attract muskrat predators instead. Increase cover in and along the pond's edge to attract mink, one of the main predators of muskrat.

Protect vulnerable ponds and dams:

- Before attempting to modify a wetland environment, speak to DEC staff. In some cases, permits would be needed.
- Riprap the inside of the pond's dam with rocks or cover it with vinyl-coated welded wire. Rocks should be flat and closely-fitted. The rock layer must be at least 8" thick, extending 3 ft. below and 1 ft. above the normal water line.
- "Draw down ponds" during the winter (requires a permit). Remove the muskrats, and make sure they're gone. Reduce the water level to expose their burrows (this often means lowering the water from 1½–3 ft). Then fill in any burrows and tamp down the soil. Cover them with rocks.

Trapping strategies:

- Trapping is often a critical part of a strategy to control muskrat damage. When possible, invite licensed trappers to remove muskrat during the legal season.

To avoid catching beaver, otter, mink, and birds:

- Avoid trapping if there's sign of otter nearby, if possible.
- Use natural baits (in the spring, try muskrat musk. In the fall and winter, use sweet-smelling oils such

as oil of sweetflag, spearmint, or anise; apples, parsnips, or carrots also work well). Do not use baits made from beaver or otter glands.

- Use only small foothold or body-gripping traps, and anchor all traps so they'll hold any live animal that may be accidentally caught. Put crossed hoops over a floating log set to discourage birds from landing on the log.
- Use catchpoles to release any otters or beavers that are accidentally caught in the trap.
- Don't set traps in spillways, channels, large bank holes, or other natural funnels.

Live traps:

- Cage traps, 8x8x24"

Lethal traps:

- body-gripping trap, #110 or 120, set on land or in the water. The underwater set is more selective.
- foothold trap, # 1 or 1½, set in 1–2" of water and anchored in at least 18" of water.
- set traps in active runs as close to the den's entrance as possible. Traps must be set 5 ft. or more away from a muskrat lodge, unless allowed by permit. Pole sets, under-ice sets, and float sets also work.
- if the water is less than 18" deep, use a body-gripping trap (preferable) or a guarded foothold trap.

Preferred killing methods:

- lethal trap
- foothold trap in a submersion set
- shooting (practical if removing a few muskrat from a small pond)

Acceptable killing methods:

- CO₂ chamber
- stunning and chest compression
- stunning and cervical dislocation

Control strategies that don't work particularly well, or aren't legal in New York:

- Conventional frightening techniques aren't effective against muskrats.
- Several trap designs, including barrel traps, stove-pipe traps, and multiple-capture traps, are not legal for use on muskrats in New York.
- There are no repellents or poisons registered in New York for muskrats.