

NEW YORK'S WILDLIFE RESOURCES

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Woodchuck (*Marmota monax*)

Description

Woodchucks are the largest members of the squirrel family (Family Sciuridae) in New York State. So, their closest "relatives" include tree and ground squirrels, chipmunks, and prairie dogs. This large rodent is known by several "aliases": woodchuck, groundhog, chuck, and whistle pig to name a few! The Indian word "monax", meaning "the digger", accounts for the woodchuck's scientific name and aptly refers to its burrow-digging habit. Many subspecies of woodchucks occur throughout North America. Subspecies show slight differences in color and size, so it is difficult to distinguish between them, especially in areas where their ranges overlap.

Woodchucks are chunky-bodied, blunt-faced, and short-legged rodents. They are dark brown with a grayish or grizzled appearance. This grizzled appearance is caused by alternating bands of black and light buff on the guard hairs (the longer hairs of the fur). Belly fur is sparser and a lighter buff color, while fur on the legs, feet, tail and top of the head are darker -- a blackish brown. The nose, lips, chin and side of the face have a "frosted" appearance; these features are tinged with light hairs. In New York State, woodchucks typically have an overall cinnamon cast to their bodies with reddish undersides, but their color may range from blonde to black. Males and females are alike in color. Immature woodchucks may be slightly paler than adults, since the young's fur remains finer and shorter until September. These descriptions of color are merely guides; there may be great color variation from individual to individual living in the same area.



The only other animals with which the woodchuck might be confused are the muskrat and the beaver. In both cases, the tail is a main distinguishing feature. The woodchuck's tail is short and well furred. The muskrat's tail however, is virtually hairless and scaly. The beaver's tail is scaly, too, but it is wide. Another main difference between these animals is in their habitat preferences. Muskrats and beavers are usually found very near water, though muskrats sometimes feed in fields and cropland near water. Woodchucks prefer upland hillsides, but may be seen in a variety of dry habitats.

Woodchucks are intermediate in size between muskrats and beavers. In fact, beavers and porcupines are the only other rodents larger than woodchucks in New York State. Woodchucks in this state range from 510-600 mm (20.4-24 in.) in total length, and average 555 mm (22.2 in.) in length. Tail length ranges between 120-150 mm (4.8-6.0 in.) and averages 125 mm (5.0 in.). Hind foot length ranges from 76-78 mm (3.04-3.12 in.) and averages 76 mm (3.04 in.). Woodchucks' weights may vary tremendously between seasons, between individuals of different ages, and between individuals from different areas. An average adult woodchuck in New York State weighs 2.25-4.5 kg (5-10 lbs.). Males usually weigh slightly more than females. Occasionally, a woodchuck may weigh up to 5.4-6.3 kg (12-14 lbs.). Within one year, from

spring to fall, a woodchuck may more than double its weight from 1.8 kg to 4.5-4.95 kg (4 lbs. to 10-11 lbs.) in preparation for the winter months of hibernation.

Woodchucks have several interesting adaptations for the part-time underground lives they lead. The woodchuck's chunky, muscular body and relatively short, strong forelimbs are adapted for the power necessary to excavate its burrows. It uses heavy claws on its forefeet to scrape at the soil, and its hindlegs to push the soil behind it. Large, chisel-like incisors (front teeth) are adapted for tearing at roots obstructing its burrowing progress. The woodchuck is able to use its front paws like "hands", although it is not quite as dexterous as the raccoon. Short, round ears close around the woodchuck's ear openings to prevent dirt from getting inside them. Eyes, ears, and nose are all located at the top of a woodchuck's head, allowing it to peer out of the burrow while hiding its body from a predator's view.

Distribution and Abundance

The woodchuck is found throughout much of North America. Its range extends south to Mississippi, central Alabama, and northern Georgia then north and west across Canada and into Alaska. On the east coast, its range extends north to Labrador and Nova Scotia. This extensive range makes the woodchuck one of the most widely distributed mammals in North America.

Although woodchucks historically inhabited wooded areas, they are not able to establish large populations in such habitat. With the agricultural activities of humans, woodchucks have greatly increased in numbers. Abundance of woodchucks varies greatly from one area to another due to: food availability, soil type, and hunting and predator pressure. A very dense population of 6 or 7 individuals per acre (.4 hectare) is seldom reached. Four woodchucks per acre is considered a fairly dense population. The average in New York State is probably one woodchuck per acre.

Life History

Woodchucks usually begin breeding activity during March, though they sometimes begin in late February. The male emerges from hibernation first, and travels from burrow to burrow in search of a mate. Copulation typically takes place within the burrow. The female breeds with only one male. The gestation period lasts 31-32 days.

The young are born anytime from early April to mid-May in this state. There may be 2 to 9 young per litter, but the average is 4. Woodchucks have only one litter per year, and the male does not assist in their rearing. The newborn are hairless and blind. Their eyes are closed, ears are flattened and vibrissae (whiskers) are short. These helpless kits weigh between 25-35 g (nearly an ounce) and are 100-110 mm (4-4.4 in.) long. Nursing lasts about 44 days, during which time the young grow rapidly. By one week of age, hair has appeared on the snout and forehead. When the young woodchucks are 2 weeks old, they are about 152 mm (6 in.) long and weigh about .1 kg (3.5 oz.). By this time, their bodies are nearly covered with soft, short hair. At 4 weeks of age they are fully furred, weigh nearly .18 kg (6.5 oz.), and their eyes are open. Now, the young are being weaned, and may be seen near the burrow entrance. When 6 weeks old, the young "chucks" weight about .224 kg (1/2 lb.), are active outside the burrow, and feed on grasses. From June to September, these voracious young may gain 19 g (.67 oz) per day in weight. Woodchucks will not be full grown until they are 2 years old, but they will reach sexual maturity and breed when they are 1 year old. The young leave the parental den by early July. They disperse into nearby habitats and usually take over an abandoned burrow. Because of this, good woodchuck habitat is seldom unoccupied.

As farmers can well attest, woodchuck life centers around their burrows. Here is where the female gives birth to and nurses the young, and here is where the animals hibernate during the cold months. Around the burrow, too, is centered the daily summer activity of the woodchuck. In fact, its safety and survival are dependent upon this feature. The woodchuck burrow has one approximately 25 cm (10 in.) diameter main entrance hole characterized by a large mound of freshly excavated dirt and gravel. One or more plunge holes or "back doors" are dug from the inside of the burrow, so there are no tell-tale mounds. Often the entrances are camouflaged by dense vegetation, stone walls or tree stumps.

Burrows may be located anywhere close to the woodchuck's preferred foods. They may be in hedgerows, woodlands, or overgrown or cultivated fields. Sometimes, a woodchuck will build both a winter and a summer den. The winter den may be located on wooded, sloped, well-drained areas, and may have only one entrance. This well-protected burrow is used primarily for hibernation but may also be used year-round. The summer den may have many

entrances, and is usually located on open, flat or rolling ground very near food.

The complexity and depth of the burrow depend on the soil type. Longer, deeper burrows are easier to build on loose, sandy soils. Generally, from the entrance hole, the burrow extends downward steeply for a length of about 0.9 m (3 feet). Then the burrow becomes narrower, and more level at a depth of 0.6-1.5 m (2-5 feet) below the ground surface. The length of the burrow systems varies greatly; they are usually 3-12 m (10-40 feet) in length, but one author reported a burrow 34 m (114 feet) long!

Branching off the main "tunnel" are several chambers about 37.5 cm (15 in.) wide and 20 cm (8 in.) high. Woodchucks maintain several chambers for separate functions; for example, one chamber may be for nesting, one for hibernation, and one for urination and defecation. Woodchucks are also immaculate housekeepers. In nesting chambers, when nesting material (dried grasses and vegetation) becomes too damp and "dirty", the female replaces it. Defecation and urination are only done within certain chambers, and sometimes feces are buried within the entrance mound.

Woodchucks rarely move very far from their burrows. Their home range depends mostly on the distance between burrow entrances and food sources. Their daily range averages 15-30 m (50-100 feet) from the den, and rarely exceeds 400-800 m (1/4 to 1/2 mile). Males tend to travel farther than females, especially during the spring search for a mate. Occasionally, woodchucks travel several hundred yards to feed on fallen orchard fruits. There are three short-distance seasonal movements which may make woodchucks more vulnerable to predation: 1) from winter den to summer den, just after hibernation; 2) dispersal of the young from parental den to new den; and 3) from summer den to winter den in the fall.

Woodchucks are not social animals. Occasionally, two animals may be found within one burrow and sometimes several burrow systems may be found within one large field. In general, though, the woodchuck is considered a solitary animal, unlike some of its western, ground squirrel "cousins". Aggressive behavior (fighting) among woodchucks has been observed, especially during the breeding season.

Woodchucks eat mostly grasses and succulent summer plants. Their preferred foods include clover, alfalfa, plantain, and perennials. They will

eat the bark of hickory and maple trees, and leaves and buds of dandelion, chickweed, wild onion, goldenrod, aster, daisy, fleabane, and wild mustard. They will raid vegetable gardens to feed on beans, peas, corn and carrot tops, and will enter orchards in the fall to feed on fallen apples. For water, woodchucks depend on dew or on the moisture in the succulent plants. For this reason they often feed during early morning and late afternoon hours.

In the summer, woodchucks rest or sleep in the burrows for most of the day. Usually they remain inside during cool, rainy days. They are diurnal animals, but may be active during nights in March. During spring and summer days, they sun themselves while lying at their burrow entrances, on rock piles, or logs. Woodchucks do climb trees to sun themselves, to feed on leaves and buds, to escape from enemies or just to survey their surroundings. They ascend and descend head first, climbing only to a height of 2.4-3.6 m (8-12 feet), or occasionally to 4.5-6 m (15-20 feet). Woodchuck "activity" is usually just a slow waddling walk, although they may gallop at speeds up to 16 km per hour (10 mph) to their burrows when frightened. These rodents are good swimmers, too.

Unlike other squirrel "relatives" such as the red squirrel, the woodchuck does not cache (collect and store) its food. Instead, the woodchuck's "strategy" for winter survival is to slow down its body functions in the process of "hibernation". The only other true hibernators in New York State are bats and jumping mice. True hibernators show marked decreases in body temperature, and breathing and heart rates whereas bears, chipmunks, raccoons and skunks show only slight changes in these functions. The body temperature of a true hibernator drops to almost that of its environment. During hibernation, the body temperature of a woodchuck falls from a normal of 96°F (35.6°C) to about 42°F (5.6°C), the temperature of the den. Its heart rate drops from 80-100 beats per minute to 4-5 beats per minute. Breathing rate drops from a normal of 260 breaths per hour to about 14 breaths per hour (or one breath every 4-5 minutes)! The woodchuck hibernates this way for 5.5-6 months, in a curled position which helps to conserve body heat.

In New York State the woodchuck begins hibernation around mid-September through October and does not emerge until late February or March (although

there are some reports that they arise and emerge from their dens on particularly warm days in late January or early February). Woodchucks may lose up to 30-40% of their body weight during hibernation and until foods become available in the spring. They eat voraciously during the summer, preparing for the next winter's hibernation. During summer months a woodchuck may double its body weight, accumulating fat reserves which serve as insulation and "food" during the winter.

Although winter starvation is not a problem for woodchucks, they are susceptible to other forms of mortality. Hunting and road kills are common human-induced mortality factors. Additionally, natural mortality occurs. The red fox is a major predator of the woodchuck; a fox may kill the rodent "owner" of the burrow, then enlarge the den and take it over. Hawks, owls, mink, and weasels occasionally prey on young chucks, and dogs, coyotes, black bears, and bobcats, sometimes take woodchucks. Young woodchucks may drown in flooded burrows, but this is rare since chucks usually build their homes on well-drained upland hillsides.

Woodchuck parasites include fleas, ticks, mites, nematodes and lice. Diseases have little effect on populations of this rodent, but occasionally the woodchuck may suffer from tularemia, hepatomas, arteriosclerosis, Powassan virus, fibroma, and nose and ear infestations by cuterebra larvae.

Sometimes, like other rodents, a woodchuck's ever-growing incisors will not meet properly (called malocclusion). The teeth will continue to grow, curling backwards then upward toward the skull. The animal may die because it cannot eat or because the abnormal teeth may actually pierce the skull.

The most obvious evidence of woodchuck presence is the mound at the burrow entrance. Here, in the freshly excavated soil, woodchuck tracks may be found. Their tracks are similar to those made by raccoons or skunks. All tracks resemble "handprints", but a woodchuck's tracks are smaller than those of a raccoon. A skunk's tracks show no claw marks, whereas a woodchuck's tracks clearly show claw marks. Also, raccoons and skunks have 5 toes on their forefeet; a woodchuck has only four. The tracks of the woodchuck's hindfeet are 5-7.5 cm (2-3 in.) long and partially cover the imprints of the forefeet. There are about 10 cm (4 in.) between sets of tracks made by a walking adult woodchuck.

The long, blackish, somewhat cylindrical scats (or feces) are rarely seen, for they are buried in the "entrance mound" or are within chambers of

the burrow. Short trails 10-15 cm (4-6 in.) wide through grass, briars, and hedges are used to travel to and from den entrances, and may be conspicuous when vegetation is short.

Woodchucks are fairly vocal. They were dubbed "whistling pigs" because of a sharp, shrill whistle they make as an alarm call when diving into burrows to escape harm. Before the whistle, they may first make a short, low "phew" sound. They grind their teeth to produce another anger or fear call. They sometimes grunt, purr softly, or make a "chuck, chuck" noise while feeding contentedly.

Habitat

Before North America was settled by Europeans, the woodchuck lived within the extensive wilderness forestland. Later, after settlers cleared the land and planted crops, the woodchuck took advantage of human agricultural activities. Now, ideal woodchuck habitat consists of a thick, brushy hedgerow bordering pastures or hayfields, in rolling upland country. This animal's two main habitat requirements are food and cover in close proximity to each other. The woodchuck prefers to burrow in hedgerows and brushy woodland edges, but may also burrow in mid-field. This rodent may also be found near or under buildings, lumber piles or stone fences, and even occasionally in urban areas.

Ecological Role

Woodchucks play several ecological roles. Most importantly, they are herbivores, converting plant material into animal flesh. In turn, the woodchuck is an important prey species for a variety of predacious mammals and birds. This rodent is a primary food of red fox in New York State.

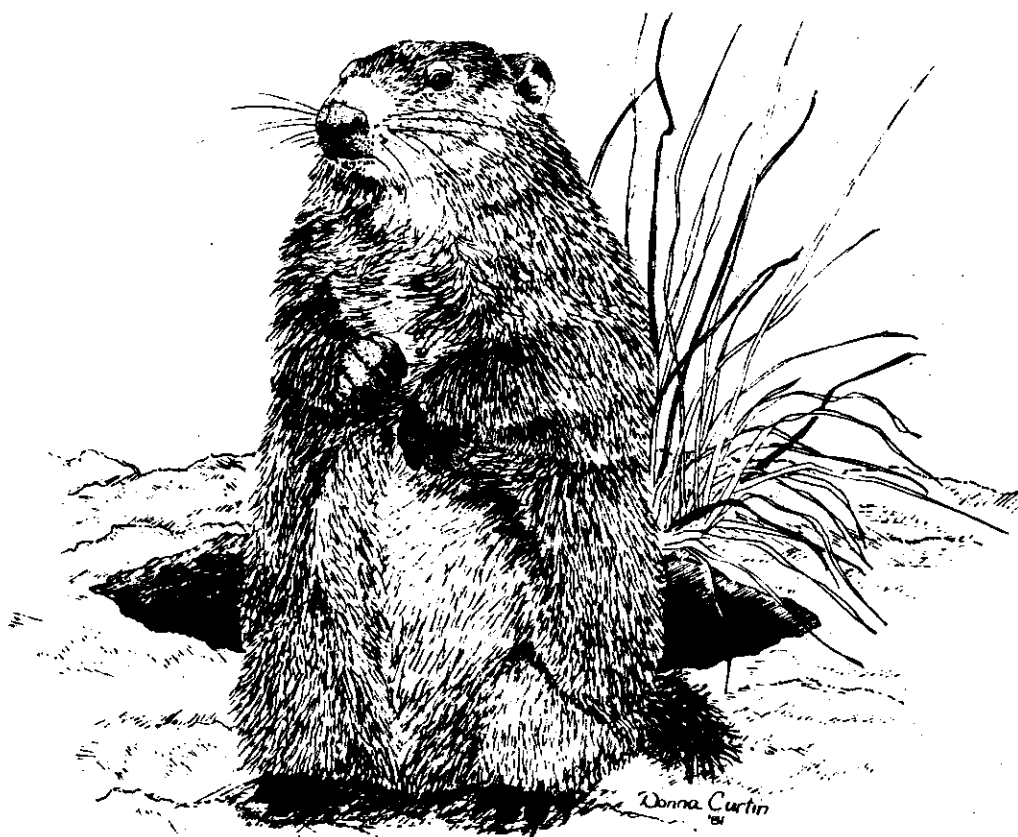
Besides the woodchuck's role as a food source for predators, woodchuck burrows provide homes or temporary refuge for several other wildlife species. Opossums and certain mice may occupy woodchuck burrows. Raccoons and skunks may make their homes within the convenient burrow systems. Chipmunks have been discovered hibernating in them, and weasels take temporary refuge in them. Red foxes often establish dens within the

older, more complex woodchuck burrows, enlarging them to suit their needs. (Fox activity is distinguished by large mounds of excavated earth, a large entrance 40 cm - 15" - wide, and food debris nearby). Finally, the abundance of cottontail rabbits in New York State depends somewhat upon availability of woodchuck burrows for escape cover (to "hole up" when pursued) and as winter dens. The pre-constructed burrows are vital to the cottontail since it is not a burrower itself. Thus, without the industrious "digger", many other New York State animals which are important furbearers, game species, predators, and prey would have less available escape cover or den sites.

Woodchuck burrowing activities also provide other benefits to the ecosystem. In an overgrazed pasture or overworked cropland, a burrow may improve soil drainage and provide a water reservoir. Often, though, woodchucks excavate their burrows on upland hillsides where soils are already well-drained and where there is little chance of flooding. Woodchuck activities do provide other services to soils, though. W.J. Hamilton, Jr., in his book Life History of the Rufescent Woodchuck, estimated that a population of 1 woodchuck per acre in New York State could excavate 1,600,000 tons of earth per year. This serves two important functions: 1) the soil is aerated, and 2) subsoil is exposed to weathering processes which form valuable topsoil. In turn, this helps increase growth of vegetation near excavated sites.

Economic and Social Values

The woodchuck presents a dilemma to society. On one hand, this burrowing animal is beneficial. Its activities aerate the soil and provide homes for game and furbearing animals important to humans. Although the woodchuck's fur is too coarse and too thin to be valuable, it is a challenging quarry for the hunter. This pastime mainly helps farmers reduce local populations of this rodent, but some of the harvested woodchucks are eaten, too. Woodchuck meat is good if soaked in buttermilk or parboiled in salt water before cooking. Finally, this interesting rodent is the focus of attention for many winter-weary people on February 2nd each year. As the "Groundhog Day" legend goes, if the emerging woodchuck sees its shadow, there will be 6 more weeks of winter, and it will return to its den to continue hibernating. There are differing accounts about the origin of this legend.



One source indicates that it may have been brought to this country by German immigrants who looked to bears or badgers in a similar manner on "Candlemas Day". In New York State, this belief remains merely a legend; here, woodchucks usually do not discontinue hibernation and emerge from burrows until late February or March. Woodchucks are fascinating and easy to observe along rural New York State roads during the summer. Motorists often see this rodent standing up on its haunches at the burrow entrance.

On the other hand, woodchucks are considered a nuisance by farmers, orchardists, and gardeners. These animals will feed on crops, gnaw on fruit trees and ornamental shrubs, and raid small gardens. Burrows may damage farm equipment and present a danger to farm animals or horse and rider.

There is current interest among researchers in using the woodchuck as a biological model to study liver tumors of viral origin. The woodchuck contracts a hepatitis virus that causes liver tumors; this virus is similar to one that causes liver tumors in humans.

Control Methods

Woodchucks which have become pests in orchards, fields, or gardens may be controlled by several methods. One method is fumigation. This may be done in April or May, if burrow occupants have been clearly identified as woodchucks. Special cartridges, available at garden supply stores, burn slowly to emit lethal gas. These should not be used where fire hazards exist (e.g., under an outbuilding).

Nuisance woodchucks may be trapped by setting and concealing two No. 1 1/2 or No. 2 steel traps at the burrow entrance. This method should not be used where other animals might be accidentally trapped. Instead, a live trap baited with apples or fresh corn, and with a 9x9 in. (23x23 cm) door may be set near the burrow entrance. Live-trapped woodchucks should be transported at least 8 km (5 mi.) before release in suitable habitat.

Another control method is shooting. In New York State, although a valid hunting license is required, there are no closed seasons and no bag limits on woodchuck hunting. These factors make this challenging sport popular in many parts of the state. Here is an opportunity for hunters and landowners/farmers to cooperate for the benefit of all. Trapping and shooting will need to be repeated often, though, since other woodchucks may move in and take over the abandoned burrows.

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-- S. L. McCarty
W. J. Fleming
D. J. Decker
J. W. Kelley