Natural Heritage & Endangered Species Program

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Massachusetts Division of Fisheries & Wildlife

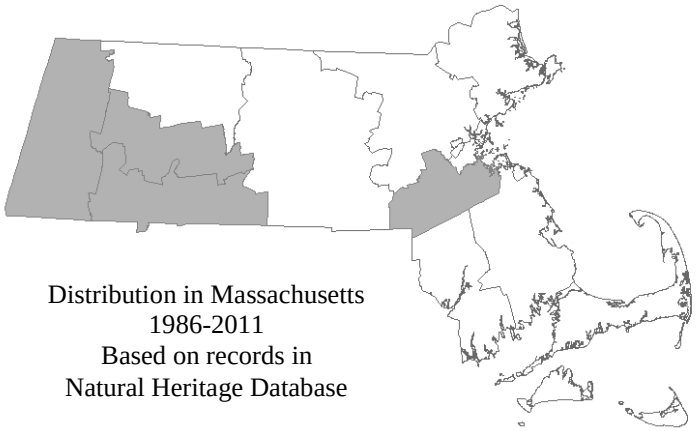
Timber Rattlesnake
Crotalus horridus

State Status: **Endangered**
Federal Status: **None**

GENERAL DESCRIPTION: Timber Rattlesnakes are large, heavy-bodied snakes in the pit viper family. As with all pit vipers, they have broad, triangularly shaped heads, with a distinct narrowing just behind the head. Color patterns are extremely variable in this species with some individuals almost jet black and others sulphur-yellow with black, brown, or rust-colored blotches separated by cross bands on the back and sides. Timber Rattlesnakes are distinguished from other North American species of rattlesnakes by a lack of stripes or bands on its head and face and by a solid black tail.

The Timber Rattlesnake has a structure uniquely characteristic of all rattlesnakes at the tip of its tail that makes a rattle-like sound when vibrated. A new rattle segment is added each time the rattlesnake sheds its skin, although snakes often lose the rattle during shedding. The approximate age of the snake can be determined from the rattle only if the snake still has the "prebutton" with which it was born.

The Timber Rattlesnake has keeled scales (*i.e.*, a ridge protrudes from the middle of each scale), giving the snake a relatively rough-skinned appearance.



Distribution in Massachusetts
1986-2011
Based on records in
Natural Heritage Database

The photos show the variation in colors possible among Timber Rattlesnakes.
Top photo: The bands are clear on the lighter colored snake: Photo by Anne Stengle
Bottom photo: The triangular head is obvious in this snake in sub-feeding posture. Photo by Brian Butler

Adults are 90 to 152 cm (36-60 inches) long; the newborn young are usually 20 to 41 cm (8-16 inches). There is no reliable external cue to differentiate the sexes although males usually have longer tails. On average, male Timber Rattlesnakes weigh 2 pounds (max 3.9 lbs) and females average1.3 pounds (max 3.1 lbs).

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SIMILAR SPECIES: Three Massachusetts snakes have dorsal (back or upper side) blotches, saddles, or bands: Timber Rattlesnake, Northern Water Snake, and Milk Snake; however, they all have different ventral (belly or under side) markings. Timber Rattlesnakes are almost uniformly light below with just a little dark flecking; Eastern Milk Snakes (*Lampropeltis triangulum*) have a distinctive black and white checkerboard pattern; and Northern Water Snakes (*Nerodia sipedon*) have reddish and black crescents. Like Timber Rattlesnakes, Milk Snakes may vibrate their tails rapidly when disturbed, which, when they are in dry leaves, can produce a rattling sound.

Copperheads (*Agkistrodon contortrix*) are the only other pit vipers in Massachusetts, but they are more reddish-brown with an hour-glass pattern on the body. Although they have facial pits, their heads are narrower and less triangular.

Eastern Hognose Snakes (*Heterodon platirhinos*) have a dark phase that superficially resembles the dark phase of Timber Rattlesnakes, but Eastern Hognose Snakes have uniformly wide heads, distinctively sharply-upturned snouts, and lack a rattle.

RANGE AND HABITAT: Timber Rattlesnakes range throughout the eastern US, west to central Texas and Wisconsin. In the northeast, populations are small, declining or extirpated.

Timber Rattlesnakes are generally restricted to mountainous terrain characterized by second-growth deciduous or coniferous forest, with steep ledges, rock slides, and large rodent populations. Rattlesnakes hibernate communally in underground crevices.

In other parts of its range, Timber Rattlesnakes are sometimes found in pine barrens and wetlands, and may occasionally be found in fields and pastures.

LIFE HISTORY AND ECOLOGY: Like other reptiles, rattlesnakes are vertebrates (they have backbones) and they are ectothermic (they cannot control their body heat by physiological means and must move to a warmer or cooler environment to control their body temperature). Rattlesnakes belong to the family of snakes known as pit vipers. There is one pit on each side of the head, containing sensitive nerve ends that react to radiant heat. They assist the snake in detecting warm-blooded prey in darkness. Sight is fairly keen within a limited range; moving objects are perceived more readily than stationary ones. The Timber Rattlesnake is extremely sensitive to ground vibrations and can detect very slight ground disturbances which may aid with locating prey or avoiding their own predators.

This species has two well-developed and enlarged venom-conducting fangs in the front of the mouth. The fangs fold against the roof and are covered by a sheath when the mouth is closed. Timber rattlesnakes have control over the amount of venom injected, from none to the maximum volume. In addition to these enlarged fangs, pit vipers, like other snakes, have many curved smaller teeth on the palate and lower jaw.

In Massachusetts, Timber Rattlesnakes are active from mid-April to mid-October. For several weeks beginning in mid-April, rattlesnakes emerge from hibernation and begin basking on ledges during the day. There is little movement or feeding early in the spring and the snakes often appear lethargic. At this time, the population is concentrated in and around the hibernaculum with some courtship and mating taking place. Timber Rattlesnakes re-enter dens between early September and late October, depending on the weather.

Timber Rattlesnakes are known to mate both in the spring and autumn. After mating, snakes move up to 4.5 miles away from the den, although shorter distances are more usual. In the summer, male Timber Rattlesnakes use woods where the forest canopy is closed and females stay in open forest or edges of fields where temperatures are higher than in surrounding locations. Gravid (pregnant) females have the smallest movements, often remaining close to the den.

Female Timber Rattlesnakes retain their eggs in their bodies and young are born alive (ovoviviparity). Between late August and mid-September, four to five months after mating, five to nine young are born. The young stay in the vicinity of the "nursery" area for several weeks until after they shed their first skins. Each of the young is equipped with venom, fangs, and a single, tiny rattle segment called a prebutton. The young, nourished by egg yolk retained in their bodies, grow rapidly during their first few weeks.

Newborn rattlesnakes follow a trail left by their mother or other adult snakes to the wintering den.

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In northern latitudes and at higher elevations, females give birth only every second or third year. Because gravid females generally fast for the summer and have little opportunity to eat in the autumn after giving birth, they may be under physical stress for some time and must use the next active season to restore their bodies. Male Timber Rattlesnakes reach sexual maturity by age four, while females reach sexual maturity between 7 and 10 years of age. Estimated life span is 10-15 years Timber Rattlesnakes feed almost entirely on warm-blooded rodents, although their diet may include birds, insects and amphibians. During the spring and in the autumn, they hunt mainly by day. As the weather warms, rattlesnakes change to nocturnal activity when rodents and amphibians are more active.

The typical hunting behavior of Timber Rattlesnakes consists of long periods of lying motionless, with intervals of prowling. The prey is detected by sight, scent, and the sensory pit which can detect the heat radiating from a warm-blooded animal. After a strike, the rattlesnake uses its sense of smell to track the victim. The length of time before the prey dies depends largely on the size and kind of prey and the amount of venom injected.

The use of the venom as a defensive weapon is secondary. A snake resorts to striking and biting only as a last resort—generally only when cut off from retreat or when actually touched or handled. Even when pushed to the limit and aggressively handled, Massachusetts Timber Rattlesnakes snakes rarely use their venom to the fullest extent. In the field, this species tends to be shy, nervous, and will quickly seek shelter if approached. They really just want to be left alone. The last known human fatality from a Timber Rattlesnake bite in Massachusetts was in 1791.

POPULATION STATUS IN MASSACHUSETTS:
The Timber Rattlesnake is listed as Endangered under the Massachusetts Endangered Species Act (MESA), because of its rarity and declining population. All listed species are protected from killing, collecting, possessing, or sale and from activities that would destroy habitat and thus directly or indirectly cause mortality or disrupt critical behaviors. Historically, this species was widespread throughout the state. In Massachusetts, Timber Rattlesnakes are currently (past 25 years) documented only in Berkshire County, the Connecticut River Valley, and the Boston area. Timber Rattlesnakes are imperiled by destruction of rocky and woodland habitats, excessive removal by collectors, and mortality and persecution at the hands of snake hunters and the general public.

MANAGEMENT RECOMMENDATIONS:
Increasing public and conservation land holdings in prime Timber Rattlesnake habitats continues to be an important conservation strategy for this species. In addition to land protection, educating the public and residents local to Timber Rattlesnake populations with biologically accurate information remains important; highlighting the importance of Timber Rattlesnakes as beneficial native “top predators” of the deciduous forest communities is key.

Along with having a high level of protection of dens and basking sites, maintaining a level of secrecy about their locations is important for restricting human access to key habitat features in order to avoid disturbing and stressing snakes. Additionally, there continues to be a need to limit and eliminate trails on public lands near dens and basking areas and implement seasonal road closures in areas of high vehicle caused mortality.

A black phase male Timber Rattlesnake. Photo by Bill Byrne, MassWildlife

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Due to their locations, denning sites are rarely directly affected by construction-type development, but Timber Rattlesnakes are at risk from nearby development. When encountering roads, they tend to avoid small culverts, crossing over the road instead, with resulting high death rates Timber Rattlesnakes also may bask along roads and trails, increasing their visual exposure with unfortunate resulting risk of mortality.

The Timber Rattlesnake is one of two Massachusetts snake species (the other being the Copperhead) that is significantly affected by direct intentional persecution; they are killed out of a deep-rooted sociological fear. Too frequently, a Timber Rattlesnake coiled quietly in its natural habitat is a target of deliberate, unprovoked killing. Timber Rattlesnakes' communal dens made them easy targets for historic "rattlesnake roundups" where all snakes in a den were killed at once. Since this species is currently listed as Endangered in Massachusetts and is protected under law, educating the public about the Timber Rattlesnake and the laws protecting it is critical to the long-term survival of the species.

At the other end of the spectrum from the fearful are people who are fascinated by Timber Rattlesnakes and Copperheads and make frequent visits to snake dens and basking areas. The development of unauthorized, but well-trodden paths puts Timber Rattlesnakes at risk from increased visibility of the dens and "nursery" areas. These unofficial paths provide easy trails for anyone, including individuals with an intention to harm or collect the snakes, to follow. In addition, frequent disclosure of dens and basking areas between enthusiastic individuals through verbal, photo, and digital means continues to place this species at risk.

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