

8 Blue Hills History – Timber Rattlesnakes

There are multiple species of snakes in the Blue Hills... but two are 'special', the Timber Rattlesnake and the Copperhead. This article will focus on the Timber Rattlesnake. I hope you will find it... *interesting*... even if some of you are a bit uncomfortable reading it.

Let's start with a brief discussion about evolution. "Why would a creature which once had legs evolve to lose them?" It doesn't seem to make any sense to *us*. I mean, imagine if rattlesnakes also had legs, so they could run after you. Now *that* would be scary. But they don't have legs, because they evolved to lose them. We know they *used to have them*, because researchers have taken the fertile eggs from snakes, and at a point in their development tiny mounds of tissue that are known as limb buds appear on their sides, just as in most legged creatures, where they eventually become legs. But in snakes the legs don't develop.ⁱ It seems that once the snakes evolved to be long and skinny, and learned to move about by slithering, they found it worked better *for them, in their environment*, than running on legs. Who knew?

So, with that introduction, let's look a bit closer at this special snake.

Timber Rattlesnakes, *Crotalus horridus*



*A light-phase timber rattlesnake.
Photo by William Hoffman.*



*A dark-phase timber rattlesnake. The color of the head determines whether it is dark or light phase.
Photo by William Hoffman. ii*



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The rattlesnakes were probably here in New England before we humans. There is some debate about when the first such snakes arrived, it may have been 40 million years ago, across the Bearing Strait from Asia... or 'only' 20 million years ago. At any rate they got here, and now there are 31 species of rattlesnakes, from Canada to Argentina. However, after the rattlesnakes first arrived, then came the glaciers. At that point all of the snakes were driven south by the multiple glacial periods, and have only

been back here in New England since after the last glaciers receded. They started migrating north from the Florida/Georgia area as the area warmed up and as small animals populated the areas. Everyone has to eat, and rattlesnakes eat small mammals and occasionally birds. Since an adult Rattlesnake typically never moves more than a few miles from where it was born, the migration took some time. But it's been 18,000 years since the last glacier receded, so they have been re-established in New England for a long time.

Rattlesnakes were common in Native American lore, and while the native Americans may have killed *some* rattlesnakes, they didn't attempt to kill them all. As many as ten thousand Massachusetts inhabitants coexisted with the rattlesnakes here in eastern Massachusetts for generations before the Europeans arrived. The Native Americans told many fanciful stories about the wildlife, here is a Maine Passamaquoddy story of the creation of the rattlesnake.



The Algonquin Legends of New England, by Charles G. Leland, [1884], at sacred-texts.com

How Glooskap changed Certain Saucy Indians into Rattlesnakes.

(Passamaquoddy.)

You know At-o-sis, the Snake? Well, the worst of all is Rattlesnake. Long time ago the Rattlesnakes were saucy Indians. They were very saucy. They had too much face. They could not be put down by much, and they got up for very little.

When the great Flood was coming Glooskap told them about it. They said they did not care. He told them the water would come over their heads. They said that would be very wet. He told them to be good and quiet, and pray. Then those Indians hurrahed. He said, "A great Flood is coming." Then they gave three cheers for the great Flood. He said, "The Flood will come and drown you all." Then these Indians hurrahed again, and got their rattles, made of turtle-shells, in the old fashion, fastened together,

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filled with pebbles, and rattled them and had a grand dance. Afterwards, when the white men brought cows and oxen into the country, they made rattles of horns.

Yes, they had a great dance. The rain began to fall, but they danced. The thunder roared, and they shook their rattles and yelled at it. Then Glooskap was angry. He did not drown them in the Flood, however, but he changed them into rattlesnakes. Nowadays, when they see a man coming, they lift up their heads and move them about. That's the way snakes dance. And they shake the rattles in their tails just as Indians shake their rattles when they dance. How do you like such music?

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But when the Europeans arrived things changed for the rattlesnakes. While the Massachusetts hadn't attempted to kill all the rattlesnakes, these new European inhabitants wanted to control their environment, and one step was by exterminating *all* of the rattlesnakes. Frequently bounties were paid by the towns for each dead rattlesnake turned in. Over time all of the towns were cleared of rattlesnakes. But, since the Blue Hills weren't densely populated, and were rocky and difficult to traverse in places, the rattlesnakes managed to survive here. Outside of the Blue Hills? The nearest others are in western Massachusetts, again in less populated, rocky, areas.

Adult rattlesnakes typically grow to 3 - 5 feet in length. They are covered in scales, which have a 'keel', or ridge, down the center, which makes the snake feel rough to the touch. (But then again, you don't want to touch one, see below.) The average life span for a timber rattlesnake is 10-15 years.^v Their sight is pretty good, within a limited range; however, moving objects are perceived more readily than stationary ones. The Timber Rattlesnake is very sensitive to ground vibrations and can detect very slight ground disturbances which may help with locating prey or avoiding predators.^{vi}

Rattlesnakes are pit vipers. "Pit" refers to the presence of a heat-sensing pit organ located between the eye and the nostril on both sides of the head. These pits are the external openings to a pair of extremely sensitive infrared-detecting organs, which in effect give the snakes a sixth sense to help them find and perhaps even judge the size of the small, warm-blooded prey on which they feed.^{vii} "Vipers" refers to the fact that they only have two teeth in their upper jaw. These fangs can be folded back when not in use, and are hollow and used to inject their venom when they bite. 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.^{viii}

The rattle

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 when they shed their skin. 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.^{ix} (Snakes shed their skin to allow for further growth and it also may help remove parasites that have attached to their old skin.)^x By the way, the snakes don't rattle their tail for their own amusement, they are deaf. They only rattle their tails as a warning to you to go away and leave them alone. They are trying to avoid confrontation, help them do so! (Note: Some other snakes also shake their tails as a warning, and if they are in dry leaves it can make some noise, but not as loud as a rattlesnake.)

Because they are cold blooded, to survive the cold winters, timber rattlesnakes in the northeast spend the winter in a communal den, a rocky area with crevices leading to a den below frost line. They emerge from the den in May, and proceed to transient habitat, a relatively exposed rocky area where they can alternately bask and seek shelter from the sun; this may or may not be the den site. Males and non-pregnant females often bask until the skin is shed, before making extensive movements into summer range habitat, often mixed deciduous forest. Pregnant females are relatively sedentary and remain near exposed slopes and protective rocks until giving birth, around September. Males pursue reproductive females by scent pheromone trails in order to mate with them, usually mid to late summer. The resulting copulations provide sperm that is retained through hibernation for the next years' ovulation.

One of the problems created because the snakes are cold blooded is that if they are migrating during the evening hours and they cross a paved road, the warm asphalt feels nice to them, so they tend to stop on the road to warm up. You and I can predict this is not a good idea, but rattlesnakes, unfortunately, don't understand the relationship between paved roads and cars. So being run over is one of the leading causes of death for rattlesnakes these days.

The timber rattlesnake is a sit-and-wait predator, primarily preying on small mammals, and birds to a lesser extent. All individuals of the population return to the den in September or October. Depending on

weather conditions, they may bask at the den, but they often go into the den immediately upon return. Young snakes may follow the scent trails of adults to find these communal den sites”^{xi}

Rattlesnake bites

Rattlesnakes *are* poisonous. I reviewed the reports of deaths caused by Timber Rattlesnakes since 2000 and found... interestingly a large minority fell into one of two categories: 1) Those handling pet snakes or handling them as part of a religious service and 2) those trying to remove an unwanted snake. So, my first suggestion is... *don't do those things*. Rule #1: Stay away from rattlesnakes. There, we have now significantly reduced your risks. The rest of the cases? Most were down south, where they seem to have more, and larger, more venomous, species of rattlesnakes, and also where they aren't confined to steep rocky areas. The nearest death was Pennsylvania.

Do you need to worry about rattlesnakes at the Blue Hills? Well, you should *always* be cautious, however DCR does a pretty good job of keeping people and rattlesnakes separated. [Don't get *too* excited... their main objective is to protect the endangered rattlesnakes, not you!] Seriously, I think DCR tries to keep people away from the rattlesnakes for *three* reasons: 1) To protect the endangered snakes and 2) to protect the people, *and* 3) to make their jobs easier. Let's face it, DCR's lives are much calmer if people aren't even *seeing* rattlesnakes, never mind being bitten. But rattlesnakes, like all creatures, do wander, and one could show up in a popular hiking area. Every year or two a story shows up in the news about a rattlesnake wandering into a neighborhood adjoining the Blue Hills. One year it was the neighborhood near the bottom of the inclined railroad at the quarries. Another year it was in a parking lot on Wood Road. In neither case was anyone bitten. ^{xii xiii}

Neither Joe Keogh or Paul Brookes (2 hikers who have each hiked all the Blue Hills trails 10 times.) have seen one. Charlie Farrell, who tends to wander off trail a lot has never seen one at the Blue Hills. Michael Swartz, who has hiked every trail more than 16 times (not counting the 3 times in the winter when the snakes would have been in their dens) has seen... one rattlesnake. Some of the trails we hike *are* their type of terrain, and so there is certainly no harm in watching where you step, and you should *always* look before putting your hand out to grab something. There are more things than just rattlesnakes you might not want to grab. And high leather boots *do* have an advantage over trail runners in this case, as it's better the snake bite your leather boot than your ankle.

Summer of 2020 I saw my first, and so far only, rattlesnake. We were walking down a wide trail and it crossed just ahead of us. We took a few pictures, from a safe distance, then moved on so as not to unnecessarily upset it. Certainly an exciting sighting!

If all this talk of rattlesnake bites makes you nervous, consider this... “the last reported fatality from a timber rattlesnake bite in Massachusetts was in 1791.”^{xiv} Since the reservation was opened in 1893, no one has been poisoned there from a rattlesnake bite.^{xv} The odds dying from a rattlesnake bite are much lower than the odds of getting killed by lightning. And lower than dying in an accident driving to or from the Blue Hills.

And they are called ‘rattle’snakes for a reason... they rattle before they strike. They really aren't out to get you. They would *much* prefer you just go away and leave them alone so they can get some sunshine to warm up (remember, they are cold blooded), or get on with trying to catch supper. Given a choice

they would prefer not to bite you. Don't, intentionally or unintentionally, annoy them and you will be much safer!

The other 'good news' is rattlesnakes don't have legs, remember? They slither. A coiled 5' rattlesnake strikes by straightening itself out. Well, when it does so, unless it's up against a ledge, only half of it goes forward while the other half goes backward, so it can only strike less than 3' away from itself. Stay further away and you are safe. 10' and you are very safe. You can always crop that photo later, you don't have to get in the snake's face to take a close up. And skip the selfies... keep your eyes on the snake as you back away. And, especially in spring or fall, if you see one, watch for others... you may have stumbled upon their den.

Snake bite cures

The good news is that we have come a very long ways in curing rattlesnake bites. The Native American population relied on 'snakeweed', which they claim cured the person. Among the Europeans, at one time high volumes of alcohol were the favored treatment. Up to 3 quarts of brandy in 4 hours. (1 quart in 1 hour is considered potentially deadly.) As a result of one study, it was estimated that as many as 5% of snakebite deaths were actually deaths resulting from alcohol poisoning. And alcohol wasn't the only 'great idea' we've had, we have also used potassium permanganate (which kills the surrounding tissue), and strychnine, which is rat poison... (Hey, if it kills rats it must be a good cure for snake bite, right?). Ok, on to 'modern' medicine...

Antivenom

Antivenom is made by collecting venom from the rattlesnake and injecting small amounts of it into a domestic animal. The antibodies that form are then collected from the domestic animal's blood and purified. Normally if you are bitten by a rattlesnake and go to a hospital, they will not immediately rush to give you the antivenom shot. They will make you sit there while they evaluate you and your symptoms. The reason? Well first of all, rattlesnakes are not great at biting and delivering their venom. (Approximately 1 time in four the bites result in no venom being administered, because they either squirt the venom before they bite, or after they have let go. In those cases, you may have been bitten, but not poisoned. If you are lucky, you sit a while, have no symptoms, and go home with a couple small holes as a souvenir of your experience.) Also, people's reactions to the venom varies, some folks are not as affected. Lastly, antivenoms are recommended only if there is significant toxicity or a high risk of toxicity, because the side effects of the antivenom may be severe. These can include serum sickness, shortness of breath, and allergic reactions including anaphylaxis. So, you don't want the antivenom if you don't need it. However, if you are bitten, *and* the snakes injects you with the venom, *and* you are allergic to it... then be thankful that the hospitals do have the antivenom available. Unfortunately, even with prompt treatment some people do still die. It is estimated that there is a 1 in 1000 chance of dying from a bite, even if treated.^{xvi} (You might be super allergic to the venom, you may have some preexisting condition, or it could just be your bad luck.)

Endangered Species

"The Northeast Endangered Species and Wildlife Diversity Technical Committee determined that the timber rattlesnake is a species of regional concern in the northeastern United States. This species warrants federal endangered or threatened species listing consideration, including prelisting status

reviews. In New England, timber rattlesnakes are listed as extirpated in Maine and Rhode Island, and endangered in Connecticut, Massachusetts, Vermont, and New Hampshire. In New Hampshire, the timber rattlesnake is likely the most endangered of any wildlife species, as there is only one known extant population. Timber rattlesnakes have large home ranges, especially males, and individuals may be killed as they cross roads or as human-snake encounters increase.”^{xvii} So, while you see “Rattlesnake Mountain” on many maps, most of these are names that were given years ago, before people finished the job of exterminating these snakes. And people aren’t the rattlesnake’s only problem. There is also...

Snake Fungal Disease

Snake Fungal Disease (SFD) is caused by the fungus *Ophidiomyces ophiodiicola* and it poses a significant threat to wild snakes in the eastern United States. First discovered in 2006 in a declining New Hampshire population of timber rattlesnakes, SFD has now been recorded in over a dozen species. Like other recently emerged fungal diseases, snake fungal disease is often fatal and difficult to control. SFD is an infectious disease with serious conservation implications for snake populations, particularly rattlesnakes. Habitat loss, climate change, and human persecution have caused fragmentation of populations of many native snake species (particularly rattlesnakes). Snake fungal disease now has the capacity to drive these last remaining populations to extinction.^{xviii}



Rattlesnake with SFD

So, how do we help protect these snakes? Since you asked...

MANAGEMENT RECOMMENDATIONS:

- Increasing public and conservation land holdings in prime Timber Rattlesnake terrain.
- Educating the public. (Hey, I just did *my* part. Feel free to forward this...)
- Maintaining a level of secrecy about their location.
- Limit and eliminate trails on public lands near dens and basking areas and implement seasonal road closures in areas of high vehicle caused mortality.^{xx}

So, to close the circle, let’s go back to the evolution question. We now have the rattlesnake, who hunts mostly by lying in wait, frequently at night, and using its 6th sense to locate and strike at small mammals

to poison them. As the prey then scurries away before dying the rattlesnake uses its sense of smell to follow, and if necessary, slithers down into their burrow, where it swallows them whole. Perhaps this ability to retrieve its prey from their burrows is where those legs got it the way, and the snakes with the smallest legs had an advantage, so were more successful and more likely to live to reproduce... leading to ever smaller and smaller legs. Hmmm, maybe sometimes legs *aren't* beneficial.

And Michael's story? "It was about twenty years ago, on the south branch of the Skyline Trail, near the western end of the South Branch (on GBH). We scared each other and it slithered away into the undergrowth." See, it didn't chase him, thank goodness it didn't have legs. 😊

Take care and be safe,

Bob Vogel

ⁱ Landscape with Reptile, Thomas Palmer P 79. (Great book!)

ⁱⁱ <https://www.dec.ny.gov/animals/7147.html>

ⁱⁱⁱ Photo courtesy of the U.S. Fish and Wildlife Service Midwest

^{iv} <https://www.sacred-texts.com/nam/ne/al/al25.htm>

^v <https://www.patriotledger.com/article/20160603/NEWS/160609882>

^{vi} <https://www.mass.gov/doc/timber-rattlesnake-factsheet/download>

^{vii} https://en.wikipedia.org/wiki/Pit_viper

^{viii} <https://www.mass.gov/doc/timber-rattlesnake-factsheet/download>

^{ix} <https://www.mass.gov/doc/timber-rattlesnake-factsheet/download>

^x <https://www.wonderopolis.org/wonder/why-do-snakes-shed-their-skin>

^{xi} <https://cwhl.vet.cornell.edu/article/everything-you-wanted-know-about-snake-fungal-disease-were-afraid-ask>

^{xii} <https://boston.cbslocal.com/2015/06/24/5-foot-rattlesnake-found-outside-office-building-near-blue-hills/>

^{xiii} <https://www.patriotledger.com/news/20180830/rattlesnake-brings-police-to-braintree-go-kart-track>

^{xiv} <https://www.patriotledger.com/article/20160603/NEWS/160609882>

^{xv} Landscape with Reptiles, Thomas Palmer, p22.

^{xvi} Ibid., p211.

^{xvii} <https://www.wildlife.state.nh.us/wildlife/profiles/wap/reptile-timberrattlesnake.pdf>

^{xviii} <https://cwhl.vet.cornell.edu/article/everything-you-wanted-know-about-snake-fungal-disease-were-afraid-ask>

^{xix} Ibid.

^{xx} <https://www.mass.gov/doc/timber-rattlesnake-factsheet/download>