As I walk silently through the woods, often hopping from rock to rock, I pause for a few moments every now and then, scanning my surroundings and listening. The forest seems to come alive. Chipmunks scurry about and sound as loud as a bear, while the chirps of songbirds and the knocking of woodpeckers fill the air. I continue my search, knowing that the rather shy creature I’m pursuing is not likely to make a sound. My excitement builds as I carefully step through a patch of dense huckleberry and over a small rock pile when something catches my eye.
Just ahead of me lies an adult timber rattlesnake, coiled with its head resting on a log. Like a statue, it remains motionless waiting for an unsuspecting chipmunk to happen by. I pause and take in the moment to reflect on how lucky I am to be observing one of the last known timber rattlesnakes in New Hampshire.

On the Brink

Timber rattlesnakes are widely distributed across the eastern United States. While they can be considered a relatively common species in the Mid-Atlantic States and throughout the Midwest, here in New Hampshire they are at the northern extent of their geographic range. Within the six New England states, they have disappeared from Maine and Rhode Island, and only about a dozen populations remain in all of Connecticut, Massachusetts, Vermont, and New Hampshire.

While they were not likely ever a common species here at the edge of their range, timber rattlesnakes were much more abundant in New Hampshire during colonial times than they are today. Over the past few centuries, many populations were undoubtedly lost due to the intense human use of the land and the intentional killing of snakes. A bounty was even proposed at one time in New Hampshire because other states offered $1 rewards into the 1970s. Because timber rattlesnakes congregate at den sites before and after hibernation, it would have been rather easy to wipe out entire populations if ill-intentioned people discovered an active den. There are numerous historic accounts of people killing rattlesnakes, so much so that by the early 1980s rattlesnakes were thought to be completely gone from the state. They were officially listed as state endangered in 1988.

It was not until the early 1990s that an active population was discovered in the Granite State. A forester accurately described a rattlesnake to a professor at the University of New Hampshire, and the den site was located shortly thereafter. In coordination with the New Hampshire Fish and Game Department (NHFG), local herpetologists conducted an initial multi-year assessment of the population, and the site was periodically monitored by NHFG Conservation Officers for the next fifteen years.

Then in 2006, biologists from the Nongame and Endangered Wildlife Program initiated regular standardized monitoring to determine the current population status, identify important habitat areas and potential threats, and sometimes shake their tail when they feel nervous or threatened.

The dark color and faint patterning of New Hampshire’s timber rattlesnakes can appear similar to other native snakes. Black racers are solid black but have a sleek and smooth appearance. Northern water snakes may be very dark with no visible banding. Although they are stout with keeled (rough) scales like rattlesnakes, they also have vertical lines running across their jaw unlike the timber rattlesnake. And of course neither black racers nor water snakes have a rattle.

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develop appropriate conservation measures needed to protect the population. Through weekly surveys, biologists began to record the size and sex of every snake encountered. Individual snakes were marked using a variety of techniques so that the population size could be estimated. One marking technique employed was passive integrated transponder (PIT) tags, small numbered microchips similar to those used by veterinarians to identify pets. These were inserted under the skin so that each snake could be identified if it was encountered again.

By the end of 2006, more than twenty-five unique snakes had been counted. Unfortunately, many of the snakes had also been observed with crusty scabs or lesions on their faces and bodies. A few were later found dead, but most were simply not observed in subsequent years. This phenomenon was later reported in other states and was termed snake fungal disease. In New Hampshire, there was a significant population impact, and by 2010 it was estimated that more than fifty percent of the known timber rattlesnakes had died.

Snake Fungal Disease is now known to affect many species of snakes across the Eastern United States and has gained the attention of state wildlife agencies, wildlife researchers, universities, and pathology laboratories across the country. Fortunately, in New Hampshire not all of our timber rattlesnakes succumbed to the disease, and the population appears to be steadily rebounding. During recent annual monitoring, fewer snakes have been observed with lesions, and there has been successful reproduction every year.
Snakes are unique animals. Armless and legless, their adaptations for movement and capturing prey are quite remarkable. Many species are quick and rely on actively seeking and capturing prey with their jaws and small teeth, while others, like rattlesnakes, are more methodical and rely on specialized tools such as fangs and venom to capture prey. Both strategies are successful but depend on the type of prey being pursued.

The diet of a timber rattlesnake consists primarily of small rodents, which can be quite quick themselves. To catch speedy prey, rattlesnakes rely on ambush tactics and use their venom to neutralize their quarry. They will often rest against a rock or fallen log waiting for an unsuspecting mouse to run past. The venom is critical to a timber rattlesnake’s survival because they are too slow to chase and catch small rodents.

The venom requires energy to produce and therefore is “wasted” if used on anything other than something the snake is going to eat. Like any animal, a rattlesnake will try to defend itself from predators, animal or human, but will only use the venom as a last resort. Yet because they are venomous, rattlesnakes have been villainized and persecuted for centuries.

Timber rattlesnakes are ambush hunters, striking their prey as it passes by. Small rodents such as chipmunks, squirrels, and especially mice, make up most of their diet.

Baby rattlesnakes, called neonates, will be cared for by the mother during the first week of their life. When born, a baby rattlesnake has a single “button” at the end of its tail that will become the tip of the rattle. Timber rattlesnakes may live 30 years or more.
Life as a Rattlesnake

Compared with the other ten snake species in New Hampshire, timber rattlesnakes are slower to emerge from hibernation, typically not before the first few weeks in May. We confirmed that one snake emerged the first week of June! The reason for this delayed emergence is directly related to the depth and type of structure in which they hibernate. Deep rock crevices and underground caverns warm much more slowly than the more shallow burrows that other snakes may hibernate in, such as chipmunk holes. Through the use of radio telemetry with temperature-sensitive transmitters, we have found that the body temperatures of rattlesnakes reach their lowest point, typically 40-45°F, at the end of March before they slowly start to warm up. This means that both the cooling process in the fall and the spring warm-up are slower to happen than in other snakes, a result of the depth and insulation of the den.

Upon their spring emergence, rattlesnakes tend to bask in the sun for a couple of weeks, warming their bodies each day from the previous cool night. During this time, they will also search for the scent trails of small rodents and find a spot against a fallen log to wait for a mouse or chipmunk to scurry by. They may consume several meals in the spring before finding a suitable spot to shed their skin. The location they choose can vary from snake to snake, and may be a rocky outcropping, a wetland edge, or a canopy gap in the forest. Each location provides access to direct sunlight which helps facilitate the shedding process. Oftentimes individual snakes will return to the same location consistently to shed, sometimes using the exact same rock crevices year after year.

Through the summer months, timber rattlesnakes may move several miles in search of prey and a mate, and late summer is the primary time that males seek out females. Once together, the male may court the female for several days as they intertwine their tails and the male makes many twitchy head and body movements. After mating, the two snakes then part ways and the female will actually retain the sperm over the winter and become pregnant the following year. In their gravid year, females will spend the entire summer basking amongst warm rocks to grow their embryos and may go without food for months. In September or early October they will give birth to live young. While it is unusual for other New Hampshire snakes, mother rattlesnakes will offer some maternal care, often watching over their young for up to a week before leaving them in search of a long-awaited meal. We have witnessed some females give birth to more than ten baby snakes. One large female gave birth to at least seventeen neonates.

Newborn rattlesnakes will typically shed in seven to ten days and then search for a meal before following the scent trails of other rattlesnakes to their winter den. During this time they are vulnerable to many predators including ravens, raptors, coyotes, bobcats, and even turkeys. If they make it through their first winter, juvenile snakes will have years of growing to do before they can become part of the breeding population. It may take females more than 10 years until they can bear young. After that they will reproduce every three or four years, only a handful of times over the remainder of their life.

Looking to the Future

Timber rattlesnakes face several challenges in New Hampshire. Long winters spent underground, habitat encroachment, and an overall misunderstanding of their true nature are likely to continue as hurdles. While we cannot do anything about their short window of activity, biologists from the Nongame and Endangered Wildlife Program at New Hampshire Fish and Game will continue to work with landowners and land trusts to manage and protect the remaining critical habitats, which will not only benefit rattlesnakes but also other species of greatest conservation need. The large tracts of land and the variety of habitat types required to support rattlesnake populations also support Blanding’s turtles, smooth green snakes, whip-poor-wills, and hundreds of other common species. Habitat preservation and the annual monitoring of the timber rattlesnake population have been funded in part by federal State Wildlife Grants, New Hampshire “Moose Plate” Conservation License Plate revenue, and private donations to the Nongame and Endangered Wildlife Program.

It is Fish and Game’s mandate to protect all native species from extinction, not only to maintain environmental integrity but to safeguard wild populations for the appreciation and enjoyment of future generations. New Hampshire’s last remaining timber rattlesnakes are the most endangered of any wildlife species in the state, largely because opportunities for restoration have been substantially reduced. These reclusive and rather docile snakes are worthy of our fascination and protection, not our fear.

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