

Snakes of Cape Cod National Seashore

by Dr. Robert P. Cook, Wildlife Ecologist

Cape Cod National Seashore's 46,000 acres play a critical role in supporting the Cape's abundant and diverse wildlife. While the species found along our beaches may be familiar to visitors, the majority of those found in the seashore are not. Most reside in uplands and freshwater wetlands, and although these habitats comprise most of the park, they are less visited. Also, most wildlife species, such as snakes, are small or secretive. Largely unnoticed, they are still important ecologically and are a significant part of the natural heritage preserved by the National Park Service.

Snakes are unique and immediately recognizable. They have long been the subjects of mythology and objects of fear, which appears to be an evolutionary holdover of humans. Because snakes preyed on small, early primates, the ability to detect snakes and recognize them as a threat had survival advantages, and even for larger, more recent primates, such as early humans, this was true. Thus, although the actual threat to humans posed by snakes in the United States is extremely minor, we are genetically predisposed to recognize them and we readily learn to fear them. Unfortunately, this now prevents many people from appreciating their beauty, adaptations, and behaviors, and can result in persecution.

Snakes are reptiles, the first vertebrates fully adapted to life on land. Unlike amphibians, reptiles hatch into miniatures of their parents and although neither is able to maintain constant body temperature, they differ in temperature preferences. Reptiles prefer higher temperatures and, because they are more resistant to drying, are more inclined to bask in direct sun to warm up. Snakes are noteworthy in being legless (although some lizards are, too), having upper and lower jaws that separate so they can swallow large prey whole, and using a forked tongue for taste and smell (not for stinging).

Although 10 species of snakes occur on Cape Cod, only seven occur in Cape Cod National Seashore. Based on observations and recent surveys, we have a good idea of distribution and a general sense of abundance. There are no venomous snakes on Cape Cod. As with most snakes, those found at the seashore perceive humans as predators, and avoid us by hiding or fleeing. If unable to flee, they use defensive displays to make themselves appear larger and more ferocious, and some species mimic rattlesnakes by shaking their tails. Watching these bluffs is a highlight of snake watching, but unfortunately many people misinterpret them as aggressive rather than defensive. As a result, behaviors that have helped snakes deal with predators for millennia now result in their death at the hands of people unfamiliar with them. Please remember that the snakes found here are harmless. Most do not bite, even when handled, but they are wild animals and the larger species may bite in self-defense. As with all wildlife at the national seashore, it is illegal to harm or harass snakes. If you are fortunate enough to encounter a snake, enjoy it from a respectful distance.

The **RING-NECKED SNAKE** is widespread and probably our most abundant snake. In recent surveys, they comprised 73% of all snakes captured under boards laid on the ground. Few people see ring-necked snakes because they are small (usually 10 to 15 inches long), secretive, and mostly nocturnal. They are mostly found in woodlands, where they feed on another secretive woodland animal, the red-backed salamander. Despite spending most of their time hiding, ring-necked snakes are eaten by larger snakes, birds, and small mammals. Through them, energy from forest invertebrates and small salamanders flows up the food chain. Young ring-necked snakes hatch in late summer and often crawl into buildings via the small space under the door.



ring-necked snake

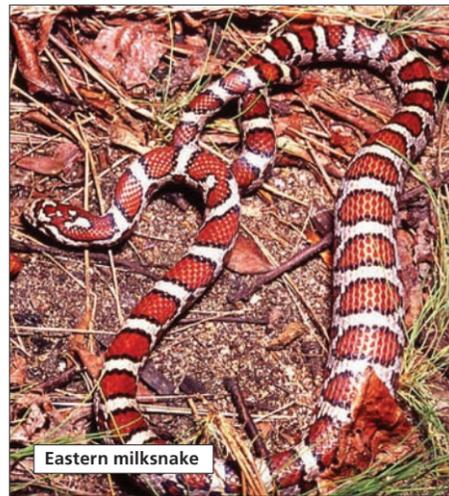
The size of the **BLACK RACER** (usually 3 to 5 feet) and speed enables it to flee most threats. These large, fast-moving snakes are active in daytime (diurnal). They are often seen in and around open, grassy habitats and edges. Although they are probably not the most numerous snake here, black racers are probably the species most frequently seen by visitors. Racers accounted for 19% of snakes in our survey, but because they are less inclined to hide under boards than some species this may be an underestimate. Racers occur park-wide, primarily in open habitats where they feed on a variety of small mammals, birds, and other snakes. Although black racers typically flee danger, when cornered, they coil up, raise their heads to confront the threat, and vibrate their tails. Black racers lay their eggs under old boards and logs, and in underground burrows of small mammals. Their hatchlings, generally about 10 inches long, have mottled markings and bear little resemblance to their parents, except for their "nervous" behavior.



black racer

A reddish-brown snake with bands of black and creamy white, the **EASTERN MILKSNAKE** is our most colorful snake. Unfortunately, these colors lead some people to think they are venomous and kill them. In fact, these harmless, gentle snakes feed predominantly on small mammals, and help regulate their populations. The milksnake is a moderate-sized species, usually 2 to 3 feet. Lacking speed to flee danger, milksnakes tend to be secretive and nocturnal, spending most of their time

under cover. The name derives from an old belief that, because they were often found around barns, they milked cows. In reality, they were there because of the mice. Milksnakes appear to be locally common, and comprised 4% of the animals recorded in our survey. They have been found recently in Wellfleet, Truro, and Provincetown, but not Eastham.



Eastern milksnake

The **EASTERN HOG-NOSED SNAKE** is perhaps the ultimate Cape Cod snake, a species specialized for the sandy habitats that typify the national seashore. Its up-turned snout is used for burrowing into sand, where it hides or searches for its primary food, Fowler's and spadefoot toads. Although toads produce toxins to protect themselves from predators, hog-nosed snakes evolved a tolerance to these toxins, and became specialized predators. Highlighting this specialization, and the strategy/counter-strategy nature of predator/prey relations, is a pair of enlarged teeth in the rear of the hognose snake's mouth. A common defense of toads is to inflate themselves, to appear larger and prevent themselves from being swallowed. Hognose snakes use their rear teeth to counter the inflated toad, by puncturing and deflating them.

Stocky and slow moving, the hog-nosed snake reacts to potential predators by performing a multi-act defensive display. First, it hisses loudly and uses a series of bluffs, flattening out its head and neck into a "hood," similar to a cobra, to appear large and ferocious. It may twist and turn, and strike, without actually opening its mouth or biting. If acting tough does not work, it rolls over and plays dead, going limp, with mouth agape and tongue hanging out. Coupled with foul-smelling secretions from musk glands, this second strategy aims to convince the predator it is too dead to be palatable. Hog-nosed snakes are so persistent in feigning death that if you place them right side up, they will continue to roll over and "play" dead. Because many people are unfamiliar with these harmless behaviors, hog-nosed snakes have been killed. Road kill is also a widespread problem and every year we record a few road-killed hog-nosed snakes in the seashore. Although we record them each year from Wellfleet, Truro, and Provincetown, little is known of their actual numbers.



Eastern hog-nosed snake

The final three species, **EASTERN GARTERSNAKE**, **EASTERN RIBBON-SNAKE**, and **NORTHERN WATER-SNAKE** are closely related, and differ from the previous four in being "viviparous" or "live-bearing." Their young develop within the mother's body and, similar to mammals, are nourished through a placenta. Although all of these species are associated with wetland habitats, they vary in their aquatic preferences. This enables them to partition the seashore's numerous wetlands between them, which reduces competition. Gartersnakes, so named because their stripes suggest fancy stocking garters, are the least aquatic, found primarily in swamps and wetland edges. They eat a broad variety of invertebrates and small vertebrates, both terrestrial and aquatic, and also tolerate toad toxins. Because the gartersnake ranges into uplands, and does well in some urban and suburban settings, it is the most familiar species of snake in the Northeast. Its name is often twisted into "garden" snake. Ribbonsnakes have color and striping patterns very similar to gartersnakes, but are much more slender. Unlike gartersnakes, ribbonsnakes feed primarily on amphibians, which explains their stronger affinity for wetlands. We often encounter them in vernal ponds in early spring, and they are also common in the shallow, coastal plain ponds of the Province Lands. While both the garter-snake and ribbonsnake are found from Eastham to Provincetown, the northern watersnake is only known from the large kettle ponds of Wellfleet and Truro, and the nearby freshwater wetlands of the upper Herring River. Although our kettle ponds abound with fish and frogs, for reasons unknown, water snakes appear to be the rarest of our snakes.



Eastern gartersnake



Eastern ribbonsnake



Northern watersnake

At a recent conference I attended on snakes, concern was expressed that black racer, hog-nosed snake, and ribbonsnake, are declining in the Northeast, primarily from impacts of development, habitat change, and road kill. Certainly these factors are increasingly at play here. Nonetheless, the landscape of outer Cape Cod, with its relatively high proportion of lands protected within the national seashore and town conservation lands, has enabled many of our native wildlife species to survive here. As habitat continues to be lost elsewhere, Cape Cod National Seashore is becoming increasingly important as one of the last remaining places where species once taken for granted as "widespread and common" can still be experienced. Enjoy our park's wildlife but please treat it with care and respect.