The Northern Copperhead

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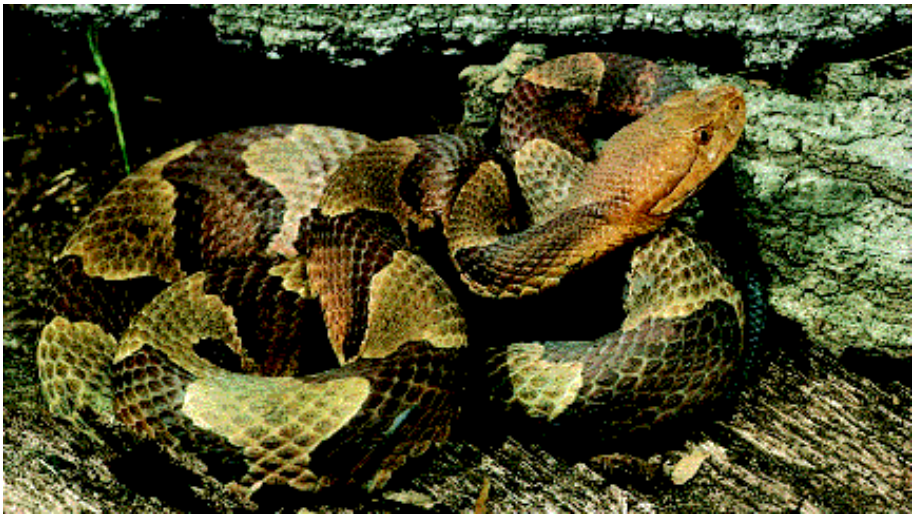
Northern Copperhead
photo-Joe McDonald

The northern copperhead (*Agkistrodon contortrix mokasen*) is the most widely distributed and locally abundant of Pennsylvania's three native venomous snake species. The timber rattlesnake (*Crotalus horridus horridus*) and eastern massasauga rattlesnake (*Sistrurus catenatus catenatus*) are the other two. Copperheads belong to the taxonomic genus Agkistrodon, which includes both Old World and New World species. In North America, there are three species and five subspecies of copperheads. They are widely distributed from Mexico north into the central U.S. and in the east from the tip of Florida to the New England states. The various subspecies display different physical attributes that are usually reflected in the width of the hourglass-like banding patterns on the body. In Pennsylvania, copperheads are found in appropriate habitat in all but the upper portions of the northern tier counties and the extreme northwestern counties. The limit of the copperhead's range in Pennsylvania for the most part coincides with the southern limit of glacial activity. They occur in remote wilderness areas in addition to suburban and sometimes urban areas.



Northern Copperhead
photo-Joe McDonald

Copperheads are medium-sized snakes. Adults typically range in length from 26 to 42 inches. Still, most copperheads encountered in the field will be less than 36 inches long. The copperhead was aptly named because its most distinctive feature is the copper or bronze-colored top and sides of the head. This species also uses cryptic coloration, or camouflage, in the form of tan, brown and rust-colored bands that allow the copperhead to disappear easily into dried up, fallen leaves, sticks and limbs. The exception to this stealthy approach is that newborn and juvenile copperheads possess a yellow-tipped tail that is believed to act as a lure to entice potential prey close enough for capture.

Even though copperheads are common in Pennsylvania, they are not as abundant as many homeowners who discover a snake in their basement may believe. Copperheads are often misidentified because they are not the only Pennsylvania snakes that use brown, tan and rust-colored patterns in an attempt to camouflage themselves. The eastern milk snake (*Lampropeltis triangulum triangulum*), northern water snake (*Nerodia sipedon sipedon*), and the eastern hognose snake (*Heterodon platyrhinos*) have all been mistaken for copperheads. In particular, the harmless milk snake most often ends up at the wrong end of a garden hoe or shovel because it was believed to be a copperhead. Telephone calls to the Commission from homeowners with a snake in their basement, yard or garage usually begin with the person excitedly declaring, "we have copperheads!" In the end, after some information has been exchanged in all but a very few cases, the unexpected visitors are determined to be a species other than the copperhead.

Eastern Milk Snake
photo-G. Rocco

Pennsylvania's nonvenomous snakes have round pupils, like the eastern milk snake above and the northern water snake, below. Compare these snakes' eyes with the elliptically shaped pupil of the copperhead at the beginning of this web page.

Northern Water Snake
photo-A. Shiels

The simplest, quickest way to differentiate between a Pennsylvania native venomous snake and a nonvenomous Pennsylvania snake is to carefully observe the snake's eyes. This can be performed from a safe distance. All of Pennsylvania's native venomous snakes possess eyes with elliptical pupils that appear similar to those of a house cat in bright light. Conversely, nonvenomous species such as the eastern milk snake have round pupils just like a human. For most people, the concerns involved with an unwanted snake on their premises are greatly lessened once they have determined that it is not dangerous.

Eastern Milk Snake
photo-G. Rocco

The checkerboard pattern on the belly of the harmless eastern milk snake is another characteristic that can help people distinguish copperheads from nonvenomous snakes.

Habitat

In their natural setting, copperheads are generally secretive and nonaggressive. They can exist in a variety of habitats. Typically, copperheads use rock outcrops or rocky areas with talus slopes for cover, feeding and as entrance ways to subterranean hibernating quarters. Like all reptiles, basking in the sun is important for the regulation of body temperature and metabolic processes. Thus, overwintering and basking areas are usually located where the snakes can receive maximum sunlight exposure. They may overwinter alone or with other species such as timber rattlesnakes. Unlike timber rattlesnakes, copperheads have for the most part adapted well to habitat conditions created by people's activities. They can be found in wood slab piles, sawdust piles, rock

piles and brush piles created by land clearing, or along utility rights of way. These areas provide foraging, basking and sheltering habitat. Abandoned farms, auto junkyards and foundations of barns or old homesteads, especially those with brushy fields and old fencerows, provide prime habitat for copperheads and their prey.

Copperheads can be active in Pennsylvania from mid-April to late October, and depending on the air temperature and latitude, even into November. They have been known to eat small mammals, reptiles such as other snakes and skinks, amphibians (frogs, salamanders) and even insects. Foraging and the pursuit of mates can lead them up to two miles from their overwintering habitat. During the warm months they may occupy a variety of habitats such as emergent wetlands, areas along streams and upland areas. When daytime air temperatures soar during the summer, they tend to become nocturnal. Humid, warm nights during or after a rain are prime times for copperheads to be active. This occurs for several reasons. Small animals are most active on rainy nights. Scent trailing of prey or other snakes is improved by wet conditions. Air temperatures are sufficiently warm to allow the copperhead's metabolic rate to be high enough for active movement. Lastly, the cover of darkness shields them from many predators.

Northern Copperhead
photo-Joe McDonald

Copperheads are found in appropriate habitat in all of Pennsylvania except the northern-tier counties and the extreme northwestern counties. They occur in remote wilderness areas in addition to suburban and sometimes urban areas.

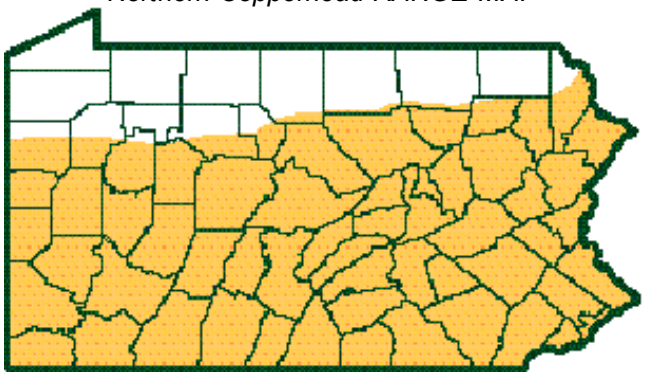
Reproduction

Copperhead mating can occur in the late spring or early fall. Female copperheads, like many reptiles, can store sperm for long periods of time. However, ovulation takes place only in the spring. Thus, several males may successfully mate with a single female. As a result, multiple paternity often occurs within a single litter. Males often engage in agonistic behavior (fighting for mating rights). Generally, the larger male emerges the victor. However, if a copperhead male has fought and lost previously, they typically never again challenge other males for breeding rights. Apparently, only the strongest, most fit males successfully pass on their genes to the next generation.

As an additional level of quality assurance, female copperheads have been observed to mimic the fighting postures normally exhibited by males. Male copperheads that retreat from a female in fighting posture are not selected by the females to engage in mating. Thus, both male and female copperheads play an active role in mate selection.

Young snakes are usually born near the overwintering site during September and October. They range from eight to 10 inches long. Copperhead young are ovoviviparous. This means that the newborns are encased in a membrane when they are expelled from the female, instead of hatching from an egg. They break through the membrane to begin life as fully functional, miniature versions of their parents. They also possess fangs and venom at birth. Shedding the skin occurs within a few days of birth. The young snakes stay close to the overwintering site. If they are fortunate, they may procure a meal or two before going underground to wait out their first winter.

Northern Copperhead RANGE MAP



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Myths

Simply by being snakes, copperheads are often the subject of myths, tall tales and unsubstantiated claims of extraordinary behavior. One old tale suggests that a person can tell when a copperhead is nearby because they give off an odor that smells like cucumbers. Fact is, most snakes when handled or frightened release a fluid-like musk from their vent. This is done to discourage predators. This musk has an unpleasant odor and is certainly not a smell that you would want on your salad.

Another more recent tale is that copperheads are interbreeding with black rat snakes, thus creating a new species of venomous snake. If one considers the biology of our venomous and nonvenomous snakes, particularly the copperhead and black rat snake, it becomes obvious that this claim is untrue. As mentioned earlier, copperheads give birth to fully formed young, which are encased in a membrane. Black rat snakes lay eggs from which their young hatch after several months. Thus, it is a biological impossibility for these two species to breed and produce offspring.

How myths get started is unclear. The fact that they persist is based on the continued misunderstanding of these important predators.

Education is the key to changing attitudes and long-held false beliefs about snakes. As more people become aware that these creatures are not mythical, but rather an

important and interesting species of wildlife, the prospects of their long-term future in Pennsylvania will improve. Because of their adaptability to human habitat alterations, they are still relatively common. Species such as the copperhead will persist in the Commonwealth only if we appreciate them for the role they play in our natural environment.