



# THE COPPERHEAD'S ----- ROAD -----

*Despite centuries of persecution, our most common  
venomous snake continues to thrive*



*written by Jeff Beane  
photographed by Todd Pusser*

S nakes and humans go way back. Along that sinuous road, we've respected, revered, even worshipped snakes. But Western culture and religion spawned malignment and abuse. Often despised, creatures possessing potential to inflict hurt nonetheless evoke fascination—few more so than venomous snakes. I was thus surprised to learn that *Wildlife in North Carolina* had never included a full feature on North Carolina's most familiar venomous snake.

Occurring statewide (excepting the Outer Banks, the highest mountain peaks and super-urbanized areas), the copperhead (*Agkistrodon contortrix*) is the most common and widespread of our state's six venomous snakes. While all have suffered significant habitat loss and persecution (two are currently state-listed Endangered and two Special Concern), the copperhead has persisted, and even thrived, under that adversity. How is that so?





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**Top:** A copperhead's dead-leaf camouflage pattern enhances its survival in a hostile world. **Bottom:** A juvenile copperhead resembles an adult except for a bright yellow tail tip, often used to lure prey. **Opposite:** Copperheads share a favored retreat with a mother timber rattlesnake and her litter.

## COPPER CAN COPE

I have been fascinated by snakes since I can remember. Since seeing my first copperhead at about age 5, I have wondered how anyone could mistake its beautiful pattern for that of any other snake's. My fascination with snakes (and all other living things) led me to the N.C. Museum of Natural Sciences, where I have worked the past 36 years, including 26 in my current role as collections manager of herpetology. While I am admittedly passionate about my work and the animals I study, I believe everyone could learn to better share our natural resources with snakes with a little more understanding and compassion.

One chapter in the copperhead's success story is its superb camouflage. The chestnut-brown crossbands, on lighter brown, tan or pinkish background, have narrow centers and wide sides—like hourglasses, dumbbells or saddlebags (from the side, Hershey's Kisses). Only the closely related cottonmouth is similarly patterned (its wider, less distinct, ragged-edged crossbands are boldest in juveniles and darken with age). Many snakes, however, have blotches instead of bands or differently-shaped bands. For example, Northern and banded watersnakes feature crossbands with wide centers and narrow sides—the opposite of copperheads' features.

A copperhead's rather triangular head is indeed coppery, usually patternless except for two tiny dark dots. There is a heat-sensory pit between the eye and nostril, and the pupils are vertical and elliptical, but identification doesn't require getting close enough to see those. Familiarity is the key. Those who fear or dislike snakes resist becoming familiar with them. But the thing is, familiarity replaces fear and dislike with appreciation.

Copperheads vary geographically. Mountain specimens are often darker than Coastal Plain animals. Traditionally, these were considered separate subspecies, among five recognized range-wide (Massachusetts to west Texas and northern Mexico), but recent genetic analyses support two distinct species—Eastern copperhead (*A. contortrix*) here in the East and broad-banded

copperhead (*A. laticinctus*) in the West—and no subspecies.

Another success factor is diet. Among snakes, copperheads are remarkably indiscriminate feeders. Some 40 prey species—mostly mice, shrews, lizards, small snakes, amphibians and large insects—have been documented in North Carolina. Cicadas are important fare, and copperheads may congregate to feed on emerging nymphs, even ascending trees or shrubs in pursuit of adults (although they are poor climbers and otherwise strongly terrestrial). Large caterpillars are also esteemed. Other spicy meals have included millipedes, slimy salamanders, hatchling box turtles and Eastern spadefoots. Scavenging also occurs. A South Carolina copperhead was found dying with a fish crow's partial skull embedded in its throat—apparently it found and swallowed the bird's (somehow detached) head, suffering fatal puncture wounds from the sharp bill and mandibular bones.

Primarily ambush predators, copperheads may lie motionless for hours, awaiting opportunities. They may also forage actively, depending on prey type and availability. Generalized feeding habits permit survival in relatively small habitat patches and in varying habitat types, although wooded areas are favored. Where the once-ubiquitous timber rattlesnake ("Beleagured Icon," July/August 2018) suffered widespread extirpation, the copperhead's smaller size, adaptability, flexible habitat requirements and lack of a telltale rattle bolstered its survival blueprint. Today's rapidly changing, human-dominated world greatly favors generalists over specialists.

Copperheads mate in spring and fall. Males may engage in a "combat dance" (ritualized shoving match) until one withdraws. A male may guard a female for days after mating, defending his genetic investment. Females can store sperm for several months. During summer gestation, they may congregate in spots providing optimal cover and sun exposure. Especially in montane populations, such "birthing rookeries" may be shared with timber rattlesnakes or other species. Young arrive between late July and early October—usually late August or

September. Litters range in size from two to 18, averaging seven or eight. Females may give birth in consecutive years if resources are plentiful; if not, they may skip years, especially at high elevations.

Newborns typically remain with their mother for several days, until shedding their natal skins, subsequently dispersing to fend for themselves. Young measure 7 to 10 inches in length at birth. They resemble adults except for bright sulfur-yellow tails that fade in about a year. The colorful tails are used in "caudal luring"—the otherwise motionless snake slowly twitches its tail, mimicking a caterpillar or worm and hopefully inviting a lizard or frog over for dinner. Other pit vipers practicing this behavior include cottonmouths, Mexican cantils and massasauga and pigmy rattlesnakes. Rattlesnakes likely evolved rattles initially as caudal lures, and secondarily as defensive warning.

Copperheads reach sexual maturity at around three years. Males grow larger than females. The largest recorded North Carolina specimen was 48 inches in total length, and the largest anywhere was 53 inches. A

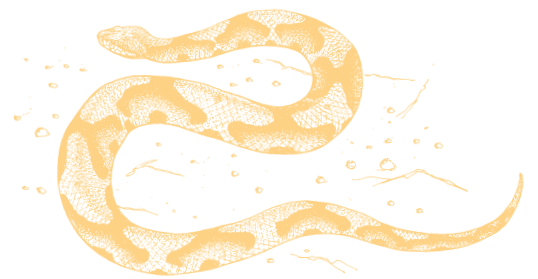
3-foot-long copperhead is considered large. Although captives have survived nearly 30 years, wild individuals rarely elude predators for more than 10.

Although active day and night, copperheads are more nocturnal in hot weather. They overwinter in stump holes, mammal burrows or rock fissures below the frost line. Often among the last snakes to emerge in spring, they may occasionally bask on warm winter days.

## COPPER CASUALTIES

Owing to abundance, habitat adaptability and camouflage, copperheads account for most venomous snakebites in the United States, and perhaps 90 percent of those in North Carolina. Severity of bites varies. Complex enzyme cocktails, venoms evolved for efficiently immobilizing and digesting prey. Defensive use arose secondarily.

Metabolically expensive, venom isn't something snakes want to waste, and defensive bites are sometimes "dry" with no venom injected. When envenomation does occur, the usual result is immediate pain, swelling and discoloration. Nausea,



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**Top:** A copperhead's face, like that of all pit vipers, features vertical, elliptical pupils and a heat-sensory pit in front of each eye. **Bottom:** Rock outcrops provide crucial warmth and shelter to many species, including copperheads.

hypotension and sometimes anaphylactic shock can occur. The copperhead's hemotoxin—produced in modified salivary glands and injected via hollow, folding fangs in the front of the upper jaw—ranks among the mildest of pit viper venoms and is not considered life-threatening to healthy adults. The likelihood of death from a copperhead bite is miniscule.

Nonetheless, bites should be taken seriously. Recommended first-aid includes remaining calm and seeking medical attention immediately. Otherwise, tissue damage or long-term disability could result. Virtually no two snakebites are alike. Antivenin may or may not be administered, or recommended, depending on the bite. Due to production costs, low demand and limited shelf life, antivenin is expensive. Some bite recipients have claimed the worst part of their ordeal was the medical expense.

Copperheads bite for two reasons: food acquisition or self-defense. Having worked with them for most of my 60-plus years, and never having been bitten or made to feel threatened, I sometimes wonder how so (relatively) many bites do occur. Attempts to capture, antagonize or kill snakes account for many bites, the point being frequently made that no one gets bitten by a snake while leaving it alone. Other bite scenarios include accidentally stepping on one or otherwise inadvertently inviting a bite. Ways to

prevent these types of bites include protective garb, using flashlights at night and paying attention to your surroundings.

Most bites can be avoided with situational awareness. Avoid haphazardly reaching into dense brush, rock or log piles and wear protective clothing like leather gloves, close-toed shoes and thick pants when working or playing in areas where snakes could

be seeking shelter. Caution and awareness of your surroundings can help avoid a lot of unpleasant outdoor experiences—from bites and stings to rashes and sprains—and a little understanding of what's out there can go a long way toward reducing risk. This goes even for a herpetologist who is around venomous snakes routinely. My closest calls have involved feeding overzealous captives and handling road kills that weren't quite dead.

### COPPER CURSE

For most of my life, I suffered an odd affliction: never finding a copperhead in my yard. Growing up in Asheboro in the 1960s and '70s, we left our first house when I was not quite 4, so I don't recall it well, but copperheads I'd have remembered, given how vividly the one snake I saw there—a rough greensnake—stood out. The next house was home until I was 18 (and I visited often for 40-plus more years). In that partially wooded neighborhood, copperheads appeared occasionally—always in neighbors' yards. Invariably, the neighbors would kill them, if they could. But if I was around, I'd offer to “watch” the snake while they ran for some deadly instrument, shooing it into thick cover the moment they were gone. I'd then point in the opposite direction: “It went over there, really fast!” Yep—I was that kid. The neighbors probably caught on eventually, but knowing I might have spared just one or two felt far better than, say, receiving awards for memorizing Bible verses, or good math grades (which seldom occurred anyway).

Years later, I realized I had resided at 11 addresses and never saw a copperhead at any, despite inordinate amounts of time looking. Maybe I wasn't good at finding them. But my field notes included upwards of 2,000 copperhead entries, and it was nothing to see six or eight on a good night road-cruising in the Uwharries. Finding one on home turf became an obsession. But even the rural Wake County acre I owned for 14 years never produced, despite deploying coverboards, scouring the property for herps (38 amphibian and reptile species recorded) and never mowing the yard.

In October 2002, I bought a farmhouse on 6 acres in the Sandhills, as a field station and weekend retreat. By 2019, I had documented 47 herp species there, including 20 snakes. Canebrake rattlesnakes and a road-killed cottonmouth represented pit vipers, and I often saw copperheads in surrounding areas, but not in the yard.

The shutout streak lasted until 7:27 a.m. on May 11, 2019. Less than an hour remained in our 20th annual Wildathon (a grueling conservation fundraiser; see “The Wildest Day of the Year,” April 2004), and my yard represented the home stretch. Exhausted, we flipped my numerous coverboards, hoping for species not encountered during the previous 23 hours. One particular tin sheet had lain alongside my barn for 16 years, never producing a snake. But that morning it concealed a small adult copperhead! Although we'd seen many more unusual species and had scored a copperhead earlier, it was my favorite moment of that Wildathon, and possibly my all-time favorite copperhead encounter (I never saw it again). The curse was lifted, after only 58 years!

### COPPER CONSECRATION

I'm occasionally reminded that some folks, perhaps even most, might pay handsomely to never encounter a copperhead, anywhere, ever. I pity them. Fear or loathing of any of the remarkable life forms on this singular planet, or inclination to destroy one simply because it could harm a human in self-defense, continually eludes me.

I have friends with stronger copperhead affinities than I. They often explain aggression versus defense; poisonous versus venomous; how that DeKay's brownsnake is not a baby copperhead, and that juvenile ratsnake is also not a copperhead; how neither sulfur, mothballs nor “black snakes” repel copperheads; how removing copperheads from suitable habitat simply results in Mother Nature replacing them, as she really does abhor a vacuum; how ecosystems work; and how much easier it really is to choose appreciation and coexistence over futile elimination attempts. People will respond with concerns about the safety of their pets and children. I too think about the children

and whether their childhood can possibly be as rich as mine was, due in part to the thrill of playing in woods where I might see copperheads.

Ironically, copperheads may ultimately prevent more human suffering—and certainly more deaths—than they've ever caused. Venom research is still young, and venom-derived compounds are proving effective against cancers, heart and neurological diseases, brain injuries, stroke and high blood pressure. Copperhead venom holds special promise for breast cancer treatment. But these also are tired old arguments—classifying as “good” only that which provides perceived direct benefit. (I nearly forgot: They eat mice.)

Humans alone can perceive beauty and worth in all things and appreciate other species' inherent right to simply exist. But we haven't even learned to love each other yet. Or if we ever knew, we forgot somewhere along our relatively short road—the one that seems increasingly destined to dead-end. The copperhead's road has been, and likely will be, much longer. I can only count it a blessing to have traveled my short stretch of it. ♦

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**A Coastal Plain copperhead engages in its favorite activity: resting peacefully and waiting for a meal to drop by.**

