

# Snakes

NC STATE

EXTENSION

# Contents

<b>Intro.....</b>	<b>1</b>
What are Snakes? .....	1
Why are Snakes Important?.....	1
Where are Snakes? .....	1
<b>    Biology of Snakes .....</b>	<b>1</b>
People and Snakes .....	3
Managing Snakes .....	3
<b>Family Colubridae .....</b>	<b>5</b>
Eastern Worm Snake— <i>Harmless</i> .....	5
Scarlet Snake— <i>Harmless</i> .....	5
Black Racer— <i>Harmless</i> .....	5
Ring-Necked Snake— <i>Harmless</i> .....	6
Mud Snake— <i>Harmless</i> .....	6
Rainbow Snake— <i>Harmless</i> .....	7
Rough Earth Snake— <i>Harmless</i> .....	7
Eastern Hognose Snake— <i>Harmless</i> .....	7
Southern Hognose Snake— <i>Harmless</i> .....	8
Scarlet Kingsnake— <i>Harmless</i> .....	8
Eastern Kingsnake— <i>Harmless</i> .....	9
Mole Kingsnake— <i>Harmless</i> .....	9
Eastern Milk Snake— <i>Harmless</i> .....	9
Black Swamp Snake— <i>Harmless</i> .....	10
Glossy Crayfish Snake— <i>Harmless</i> .....	10
Eastern Coachwhip— <i>Harmless</i> .....	10
Red-Bellied Water Snake— <i>Harmless</i> .....	11
Banded Water Snake— <i>Harmless</i> .....	11
Northern Water Snake— <i>Harmless</i> .....	12
Brown Water Snake— <i>Harmless</i> .....	12
Rough Green Snake— <i>Harmless</i> .....	12
Eastern Rat Snake— <i>Harmless</i> .....	13
Corn Snake— <i>Harmless</i> .....	13
Pine Snake— <i>Harmless</i> .....	14
Queen Snake— <i>Harmless</i> .....	14
Pine Woods Snake— <i>Harmless</i> .....	14
Dekay's Brown Snake— <i>Harmless</i> .....	14
Red-Bellied Snake— <i>Harmless</i> .....	15
Southeastern Crowned Snake— <i>Harmless</i> .....	15
Eastern Ribbon Snake— <i>Harmless</i> .....	16
Eastern Garter Snake— <i>Harmless</i> .....	16
Smooth Earth Snake— <i>Harmless</i> .....	16
<b>Family Elapidae .....</b>	<b>17</b>
Eastern Coral Snake— <i>Venomous</i> .....	17
<b>Family Viperidae .....</b>	<b>17</b>
Copperhead— <i>Venomous</i> .....	17
Cottonmouth— <i>Venomous</i> .....	18
Eastern Diamondback Rattlesnake— <i>Venomous</i> ..	18
Timber Rattlesnakes— <i>Venomous</i> .....	19
Pigmy Rattlesnake— <i>Venomous</i> .....	19
<b>References .....</b>	<b>21</b>
<b>Additional Resources.....</b>	<b>21</b>

# Intro

## What are Snakes?

Snakes are reptiles in the order *Squamata*, which also includes lizards. Snakes are among the most modern of reptiles and have diverged from other animal groups relatively recently in geological time. Snakes are covered in scales and must shed their outer epidermal layer to grow. Snakes are *ectothermic* and rely on environmental temperatures for regulating body temperatures—this is why you may see snakes lying in the sun. Unlike most other reptiles, snakes lack legs and rely on muscular contractions associated with their ribs for movement.

## Why are Snakes Important?

### **Ecological Importance**

Ecologically, snakes play important roles in food webs. Snakes feed on a wide variety of prey, including fish, amphibians, invertebrates, small mammals, birds, and other reptiles—even other snakes. Snakes help to naturally control these prey species while serving as food for larger mammals, birds, and fish. As both predators and prey, snakes connect food webs and maintain a healthy ecosystem.

### **Economic Importance**

Small rodents and invertebrates can cause a great deal of damage to property and crops. Snakes provide a natural form of control on these pest species. Large snakes, like eastern rat snakes (*Pantherophis alleghaniensis*), feed heavily on rodents and spare farmers from spending money on rodent control. Also, some snakes feed on insects, slugs, and grubs that may damage crops.

### **Religious and Cultural Importance**

Although snakes are demonized in the Judeo-Christian religions, being associated with sin, the devil, and treachery, there are biblical stories depicting snakes in a positive light and as a symbol of wisdom. In addition, many other religions and cultures revere snakes. For example, in Hinduism, snakes are a figure of reincarnation, the origin of humans, rain, and wind. Native American cultures believed snakes were the reincarnation of grandfathers and refused to kill them, and some Native American cultures believed snakes were a sign of healing and the guardians of life. In the 1700s, the rattlesnake became a prominent symbol of the American Revolution and American independence with the Gadsden flag (Don't Tread on Me). Also, snakes were prominently featured in the Join or Die political

cartoon attributed to Benjamin Franklin that encouraged the colonies to unite against British rule.

### **Medical Importance**

Snake venoms contain unique organic chemical compounds with medical applications. For example, snake venom from rattlesnakes and other pit vipers is used to treat certain forms of cancer and high blood pressure. In addition, snake venoms are used to create antivenoms, which save lives by blocking destructive venom proteins from binding with their target(s). Within the twenty-first century, researchers have developed antivenoms that are capable of treating snake bites from multiple species. As scientists learn more about the molecules in snake venom, they may discover more compounds and medical applications.

## Where are Snakes?

Native snakes occur everywhere in the world except the North and South Poles, Greenland, New Zealand, Ireland, and Hawaii. However, Hawaii has recently become inhabited by invasive nonnative snakes. Snake diversity is highest in the tropical regions due to resource availability.

## Biology of Snakes

### **Senses**

Snakes rely on the key senses—sight, hearing, and smell—for detecting prey and avoiding predation. However, snakes do not hear or smell in conventional ways. Snakes lack outer ears and have very rudimentary vestiges of an inner ear. However, snakes can still sense vibrations stemming from sounds or movements through their bodies. Snakes have external *nares*, or nostrils, that are used only for respiration. A snake flicks its tongue out to collect particulate matter from the air and then inserts the tongue into a specialized organ called Jacobson's organ (Figure 1). The Jacobson's organ processes the particulate matter, allowing the snake to smell or taste

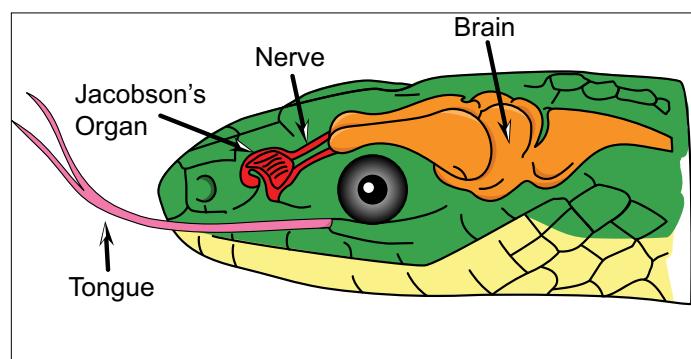


Figure 1. Snake morphology with tongue protruded showing Jacobson's organ, also known as the vomeronasal organ. Image from User:Fred the Oyster / Wikimedia Commons / CC BY-SA 2.5.

the air. Additionally, some pit vipers have special organs called loreal pits that allow them to sense heat signatures.

### Scales

The scales that cover the epidermis of a snake can either present a smooth feel and shiny appearance or a rough feel (Figure 2). These differences are caused by the absence or presence of a keel on each scale. The keel is a raised ridge on the scale that scatters light differently than a smooth scale, resulting in a duller appearance. Also, the ridge results in a rougher texture. Snakes can have different degrees of keel and may be referred to as weakly keeled or strongly keeled. Also, snake scales display multiple colors and patterns within and among species. These colors and patterns serve different biological functions for snakes, such as camouflage or *aposematism* (using conspicuous colors to warn predators it is toxic). These colors and patterns can be used to differentiate species.

### Locomotion

There are five main forms of locomotion in snakes, including lateral undulation (or serpentine), sidewinding, concertina, rectilinear, and slide-pushing (Figure 3 – with the exception of slidepushing). Lateral undulation is the most common form of locomotion in snakes. This motion involves slithering in an “S” formation using the *ventral*, or bottom, scales to gain traction and propel the animal forward. Different species may use different forms of locomotion more often than others, and different forms of locomotion may be used for different situations, depending on the surfaces and obstacles snakes are traveling through.

### Venom vs Poison

Although the terms “venom” and “poison” both describe forms of toxins, they are quite different. Poison is a toxin that may be ingested or absorbed into the body (through the skin or a mucus membrane), whereas venom is typically injected into the body through a bite or sting. Most venomous snakes possess fangs, which are enlarged hollow teeth that inject venom into prey, whereas other venomous snakes deliver venom through chewing action of the teeth. Although one genus of snake (*Rhabdophis*; only found in Asia) is truly poisonous, most snakes capable of toxin delivery are venomous. In North Carolina, the six venomous snake species cause bites that are medically significant. Venoms are a mixture of different types of toxins, and venom composition can vary within and among species. There are two primary types of venom—neurotoxic or hemotoxic. Neurotoxic venom occurs primarily in elapids (eastern

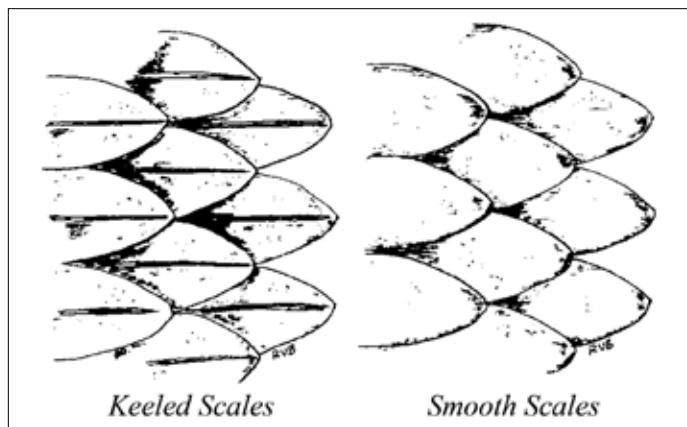


Figure 2. A snake's scale pattern can help in identifying its species. Image from Bosmans (2012).

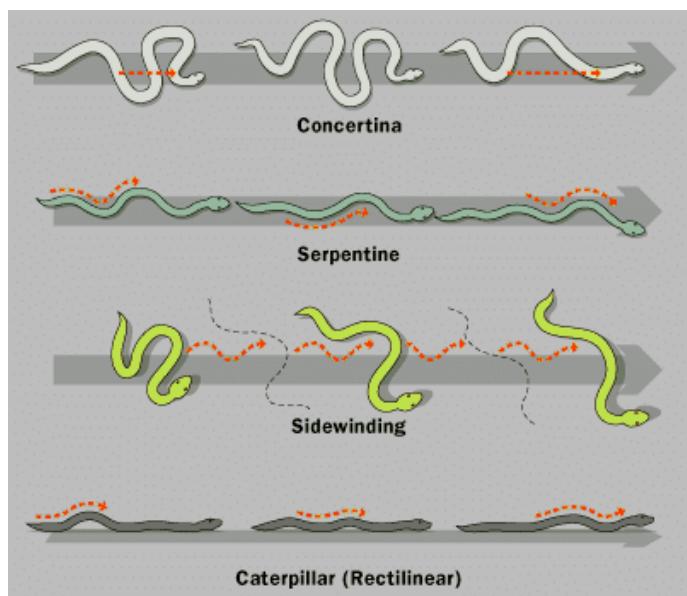


Figure 3. Four of the five types of movement that snakes use. Image from Prada et al. (2012).

coral snake [*Micrurus fulvius*]) and causes tingling, pain, and paralysis. Hemotoxic venom is more typically exhibited by viperids (like copperheads [*Agkistrodon contortrix*], cottonmouths [*Agkistrodon piscivorus*], pygmy rattlesnakes (*Sistrurus miliaris*), and rattlesnakes [*Crotalus* spp.]). Hemotoxic venom causes tissue degradation, red blood cell destruction, hemorrhaging, and localized blood clots.

### Reproduction

Most snakes reproduce sexually. Snakes have two main approaches to giving birth: egg-laying and live-bearing. Egg-laying snakes are known as *oviparous*. Eggs laid by oviparous snakes are leathery and pliable, unlike bird eggs. Live-bearing snakes are known as *ovoviviparous*; the snake holds membranous eggs within her body that hatch inside and are later born as live young from the *cloaca*, which is an opening used for waste elimination.

and reproduction. Snakes may deposit eggs in or near natural or artificial cover or underground.

### Diet

All snakes are carnivorous, and many species have highly variable diets, feeding upon a variety of organisms. Conversely, some species have highly specialized diets and feed primarily on a single organism (for example, queen snakes [*Regina septemvittata*] primarily feed on crayfish).

## People and Snakes

*Ophidiophobia*, or fear of snakes, is common and may have biological, biblical, mythical, and pop culture roots. Nevertheless, snakes provide many biological and economic benefits and are an integral part of ecosystems where they naturally occur. Also, snakes have historical, medical, and religious importance around the world. However, due to irrational fears and myths, snakes have long been demonized and deliberately killed. We hope that dispelling common misconceptions about snakes and providing opportunities to learn about the ecological benefits of snakes will help people tolerate them and respect their role in ecosystems.

### Venomous Snakes compared to Nonvenomous (Harmless) Snakes

In North Carolina, venomous snakes can be distinguished from nonvenomous (harmless) snakes by a few key morphological features (Figure 4). The pupils of the venomous copperhead are elliptical compared to the rounded pupils of the harmless eastern milk snake (*Lampropeltis triangulum*). Additionally, venomous snakes in the family Viperidae have pits located below their nostrils that are lacking in nonvenomous snakes native to North Carolina. Also, viperids tend to have triangular-shaped heads. However, this characteristic can be tricky to distinguish because some nonvenomous snakes will flatten their heads and flare their jaw outward, thus making their heads appear wider. Elapids are difficult to distinguish from some harmless snakes because they lack pits and elliptical pupils. Ultimately, learning patterns and other identifying characteristics is the best way to distinguish venomous snakes from those that are harmless.

### Snake Bites

Snake bites generally occur when people intentionally handle or unintentionally encounter snakes. In North America, being bitten by a venomous snake is rather uncommon and rarely results in death. According to the Centers for Disease Control and Prevention,

approximately 7,000 to 8,000 people are bitten by snakes in North America each year; of those, only about five die. If someone is bitten by a venomous snake, seek medical attention immediately. Although not all snake bites are avoidable, you can avoid most by not handling snakes, using caution, and showing proper respect for the animals.

## Managing Snakes

There are many reasons snakes may occur in and around homes. Human dwellings can provide warmth, shelter, prey, and water. Identifying the attractant(s) is helpful in managing property to reduce the number of snakes and snake encounters. For example, snakes are attracted to hiding places, such as downed wood, pots, rocks, and other debris. In particular, piles of wood, metal, or plastic may be attractive to snakes for *thermoregulation*—regulating their body temperature. Snakes may use openings between rocks, bricks, or other building materials for refuge, to aid in skin shedding, or to locate prey. Snake encounters may be reduced by minimizing the presence of these structures.

The best way to discourage snakes from your property is to identify and address what may be attracting them. Homeowners can eliminate pests like rodents and insects from buildings by making entry more difficult. For example, sealing off small openings or cracks will make

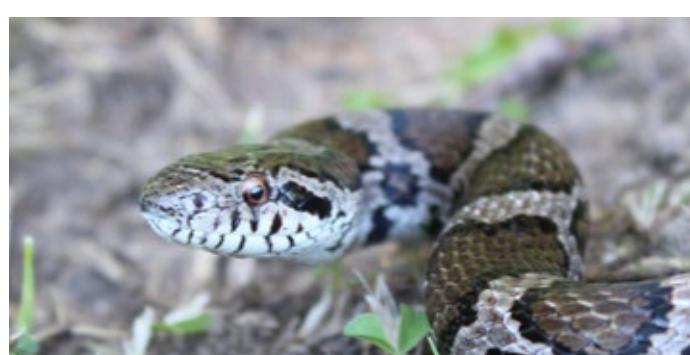


Figure 4. A comparison of a venomous and harmless snake. Top: copperhead (*Agkistrodon contortrix*), venomous. Bottom: eastern milk snake (*Lampropeltis triangulum*), nonvenomous (harmless). Photos by Daniel Guinto.

it more difficult for animals to enter buildings. To deter snakes, it is best to remove any objects that may provide shelter for snakes or prey species.

If you encounter a snake inside a building, it is important to properly identify the species, to assess the risk involved. If a snake is nonvenomous, homeowners can easily remove the animal on their own with little or no risk to themselves or the animal. Homeowners can sweep nonvenomous snakes out of a home with a broom. Alternatively, homeowners can pick up nonvenomous snakes and remove them by hand; however, there is some risk of being bitten. Thick gloves and long sleeves may be helpful in preventing a bite. However, never try to move venomous snakes, no matter what clothing you wear.

If you are uncertain of the species of a snake or you suspect it to be venomous, do not attempt to handle the snake. It is best to leave the snake alone or contact a wildlife professional if the snake does not leave. Unless you are an experienced snake handler with the proper permits, you should never attempt to handle or remove a venomous snake on your own.

Once you remove a snake from a building, it should be released onto the same property where the building stands. Snakes have distinct home ranges, and moving them large distances has been shown to result in an increased risk of mortality. Also, some snakes may carry diseases, so it is important to avoid moving snakes from one location to another to minimize the spread of diseases and avoid potentially harming other snakes.

Commercial snake repellents exist, but these products can be harmful to people and pets if not used properly and have not been scientifically shown to be effective in repelling snakes.

### **Attracting Snakes**

Some property owners may want to attract snakes to their property for ecological or economic benefits, or just because they like snakes. Having snakes in gardens can help control rodents and other pests that may destroy plants or harbor disease.

To attract snakes to your property, do the opposite of what we previously described. Snakes will select locations that provide food, cover, and areas to cool off and warm up. Property owners could maintain places to hide, support dense vegetation, and provide water sources to attract snakes.

### **Common Misconceptions**

*"Snakes are mean."*

Snakes vary in their responses to encounters with humans, differing by species and the temperament of individuals. In general, most snakes will remain still or flee to avoid an encounter with humans. If escape is not possible, snakes may take a defensive posture and strike (depending on species).

*"Snakes are evil."*

Snakes, like all animals, are driven by biological processes and are not moral or immoral. Snakes simply eat, reproduce, and regulate their body temperature to survive.

*"Snakes form hoops to chase people."*

No snake species has been shown to form a hoop to move like a wheel. This myth is probably based on the feeding behavior of the mud snake (*Farancia abacura*). The mud snake primarily feeds on slippery, long-bodied amphibians and will orient its body like a hoop when eating. In addition, when encountered, a mud snake may curl up in a circle with its head under its tail for protection, thus resembling a hoop. But they do not roll or chase people.

*"Eastern milk snakes steal milk from cows."*

Eastern milk snakes feed primarily on small mammals, snakes, and lizards. Eastern milk snakes do not suckle milk from cows but are drawn to barns to prey on rodents.

*"Eastern rat snakes crossbreed with copperheads to create venomous black snakes."*

Eastern rat snakes and copperheads are not closely related and cannot produce viable offspring. In fact, eastern rat snakes and copperheads have different forms of reproduction. Copperheads are live-bearing and eastern rat snakes are egg-layers.

*"Snakes can sting with their tails."*

Although most snakes have pointed tails, their tails are harmless and not strong enough to break the skin of a person. No snake possesses a stinger. Venomous snakes use fangs, which are modified teeth, to inject venom into prey.

### **Snakes of North Carolina**

North Carolina is home to 38 snake species. Thirty-two of these species belong to the family Colubridae, five belong to the family Viperidae, and one belongs to the

family Elapidae. Although some colubrids possess a mild form of venom, they are all considered harmless to people. That is because the venom does not target mammalian prey or because their delivery method is less efficient than hollow fangs near the front of the mouth. In some cases, both reasons apply. North Carolina snakes in the families Viperidae and Elapidae are venomous, and their bites are considered medically significant to people. But if you treat snakes with respect and caution, you may avoid bites.

The North Carolina Wildlife Resources Commission recognizes some snakes as needing special protection. These species are listed as endangered, threatened, or of special concern.

## Family Colubridae

### Eastern Worm Snake—Harmless (*Carphophis amoenus*)



Eastern worm snake. Photo by Daniel Guinto

Eastern worm snakes occur statewide and typically reach 13 inches in length. Eastern worm snakes have smooth scales and are typically glossy brown *dorsally* (on top) and glossy pink *ventrally* (underneath). They are egg-laying, highly *fossorial* (located underground), and are usually only encountered on the surface at night. Eastern worm snakes have a small spine on the end of their tail that helps restrain prey. They primarily eat earthworms and soft-bodied invertebrates. When handled, they may try to burrow into your hand or poke you with their spine. However, they typically do not bite, and their spine is harmless.

### Scarlet Snake—Harmless (*Cemophora coccinea*)

Scarlet snakes occur throughout much of the Coastal Plain and Piedmont of North Carolina, but they are rare to



Scarlet snake. Photo by Daniel Guinto

absent in the Mountains. They are most common in the southern Coastal Plain and Sandhills. The scarlet snake reaches 26 inches in length when fully grown. They have smooth scales with a white base color overlain with red saddles edged by thin black bands. They may be confused with the eastern coral snake or the scarlet kingsnake but can be easily distinguished. The scarlet snake does not have bands that completely encircle the body. In addition, the scarlet snake has a red snout and a black-on-red color scheme interspersed with white, compared to the eastern coral snake, which has a black snout and thick red and black bands interspersed with narrow yellow bands. The scarlet kingsnake has the same color scheme as the scarlet snake but has bands that completely encircle the body and a less pointed snout. Scarlet snakes are egg-laying and spend most of the day underground or in rotting logs, emerging on warm nights. Scarlet snakes primarily eat small reptile eggs but will occasionally eat smaller snakes and lizards. They rarely bite when handled.

### Black Racer—Harmless (*Coluber constrictor*)



Black racer. Photo by Daniel Guinto

Black racers typically reach 66 inches in length and occur statewide. Relatively common, the black racer has smooth scales, and is entirely black dorsally and

black or dark gray ventrally as an adult. Some individuals may have varying levels of white on the lip or neck. As juveniles, they have a gray base color with light brown splotches dorsally. The black racer may be confused with an eastern rat snake. However, the eastern rat snake has weakly keeled scales and a checkerboard pattern ventrally. In addition, the eastern rat snake has a flatter head with smaller eyes featuring small, distinct black pupils. As juveniles, black racers may be confused with juvenile eastern rat snakes, northern water snakes, and eastern milk snakes. Juvenile eastern rat snakes can be distinguished using the same features common to the adults, as above. Northern water snakes (*Nerodia sipedon*) have strongly keeled scales and a different banding pattern. The eastern milk snake has smaller eyes and a different head pattern, with a black line behind the eye. Black racers are only active during the day and will hide at night. They are egg-laying and prey on insects, amphibians, birds, other reptiles, mammals, and eggs. Despite their scientific name, they are not constrictors and will consume prey live. When approached, black racers usually try to escape and are extremely fast, as their name implies. If cornered, the black racer may vibrate its tail, strike repeatedly, and emit a foul-smelling musk from its cloaca. The bite of a racer is likely to break the skin and may leave small scratches, but these are superficial wounds and are not dangerous.

## **Ring-Necked Snake—Harmless** *(Diadophis punctatus)*



Ring-necked snake. Photo by Jeffrey Hall

Ring-necked snakes reach 20 inches in length and occur statewide. The ring-necked snake is black or slate gray on top and yellow or orange ventrally with a complete or nearly complete yellow or orange ring around the neck. The scales are smooth. Ring-necked snakes are primarily active at night and hide during the day. They are egg-laying and feed primarily on salamanders and earthworms but will eat small frogs, lizards, and other snakes. When

handled, ring-necked snakes will thrash and emit a foul-smelling musk, but rarely bite.

## **Mud Snake—Harmless** *(Farancia abacura)*



Mud snake. Photo by Thomas Reed

Mud snakes reach a maximum length of 73 inches and occur in the Coastal Plain and lower Piedmont of North Carolina. They are black on top with iridescent, smooth scales. Ventrally, mud snakes can be black with red, orange, or pink markings and rarely can be black and white with yellow around the head. The ventral color extends up the sides of the snake in a triangular-shaped marking. Mud snakes are highly aquatic and feed primarily on amphiumas and sirens, two types of aquatic salamanders, but will eat other amphibians. Mud snakes are egg-laying and possess a pointed tail tip similar to that of the eastern worm snake. When cornered, mud snakes usually thrash and poke their captors with their harmless tail tips. Mud snakes rarely bite.

## Rainbow Snake—Harmless

(*Farancia erytrogramma*)



Rainbow snake. Photo by Jeffrey Hall

Rainbow snakes reach 66 inches in length and have a blue or black base color dorsally with three red longitudinal stripes. These highly aquatic snakes are active at night and occur primarily along the Coastal Plain of North Carolina but are rarely seen. The scales of the rainbow snake are smooth and iridescent. Ventrally, the scales are red or pink with two to three rows of black spots. These egg-laying snakes feed on amphibians and American eels. Also, rainbow snakes possess pointed tail tips like those of the mud snake and eastern worm snake. When cornered, rainbow snakes press their harmless tail tips into the captors' hands but rarely bite.

## Rough Earth Snake—Harmless

(*Haldea striatula*)



Rough earth snake. Photo by Daniel Guinto

Rough earth snakes reach a length of 13 inches and occur throughout the eastern Piedmont and the Coastal Plain. Dorsally, the scales are keeled and brown or grayish brown. Usually, they have a pale band across

the top of their heads that resembles a collar. Ventrally, they are glossy white or greenish white. Rough earth snakes are highly fossorial and spend the majority of their time underground or under cover objects. They are live-bearing and feed primarily on earthworms. If cornered, rough earth snakes may squirm and emit a foul-smelling substance called musk, but are not known to bite.

## Eastern Hognose Snake—Harmless

(*Heterodon platirhinos*)



Eastern hognose snake. Photo by Daniel Guinto

Eastern hognose snakes reach 47 inches in length. They occur throughout North Carolina and have highly variable color patterns. In North Carolina, common color variations include black or gray, while others have a mottled pattern of gray, brown, red, yellow, or orange markings with black spotting on the dorsum. The surface underneath is white toward the head but darkens further down the body, turning to black near the cloaca. Ventrally, the tail is usually lighter than the belly. Eastern hognose snakes have keeled scales and upturned snouts. Eastern hognose snakes may be easily confused with southern hognose snakes, however southern hognose snakes have a more upturned snout and a more uniform ventral color. Southern hognose snakes do not have an all-black form. Eastern hognose snakes are most common in the Coastal Plain and tend to be associated with sandy or loamy soil. They are strictly active during the day and feed primarily on toads but will eat other amphibians. Both eastern hognose snakes and southern hognose snakes are egg-laying. When encountered, eastern hognose snakes will perform a dazzling array of theatrics. First, they will rear up, flatten their necks, and hiss. They will occasionally bluff strike but rarely actually bite. If further threatened, they may thrash, hiss, emit a foul-smelling substance called musk, regurgitate, and eventually play dead, rolling onto their backs and sticking their tongues out. If righted, they may immediately roll onto their backs.

## **Southern Hognose Snake—Harmless**

**(*Heterodon simus*)—Threatened in  
North Carolina**



*Southern hognose snake. Photo by Daniel Guinto*

The southern hognose snake is smaller than the eastern hognose snake and reaches 29 inches in length. The southern hognose only occurs in the southeastern portion of the Sandhills and Coastal Plain. On top, they have a gray, light brown, or tan base color with dark spots. Ventrally, they are whitish with mottled gray or brown. The scales are keeled. Southern hognose snakes may be confused with eastern hognose snakes but have a much more upturned snout and a more uniform ventral color. Southern hognose snakes are associated with coarse sandy or loamy soils and are active during the day. They are excellent burrowers and spend most of their time underground. They are egg-laying and feed primarily on spadefoot toads but will eat other amphibians and reptiles. When encountered, the southern hognose snake will flatten its head and puff out its neck and may play dead, similar to the eastern hognose, but the southern hognose snake tends to be less dramatic. Southern hognose snakes may emit a foul-smelling substance called musk, but they rarely bite.

## **Scarlet Kingsnake—Harmless**

**(*Lampropeltis elapsoides*)**



*Scarlet kingsnake. Photo by Josh Warden*

The scarlet kingsnake is a close relative of the eastern milk snake and can reach 27 inches in length. It occurs primarily in the Coastal Plain but also in small populations in the Piedmont and Mountains. The scarlet kingsnake has smooth scales and red, black, and white or yellow bands that usually encircle the body or extend to the ventral surface. The harmless scarlet kingsnake is considered a mimic of the venomous eastern coral snake, but it can be distinguished by its color pattern in the eastern United States. (The color pattern does not easily distinguish the species in Central and South America.) The eastern coral snake has red bands that touch the yellow bands and has a black snout. The scarlet kingsnake has red bands that only touch the black bands, and it has a red snout. The common saying, “Red touches black, you’re OK Jack; red touches yellow, you’re a dead fellow” is often used to remember this difference. Also, the scarlet kingsnake may be confused with the harmless scarlet snake. However, the bands on the scarlet snake do not completely encircle the body, and the snout is more pointed. Scarlet kingsnakes are active at night and spend most of their time hiding. They are egg-laying and feed primarily on skinks but will eat small snakes, other lizards, and small mammals. When handled, the scarlet kingsnake might bite and emit a foul-smelling substance called musk.

## **Eastern Kingsnake—Harmless**

### **(*Lampropeltis getula*)**



Eastern kingsnake. Photo by Daniel Guinto

Eastern kingsnakes can reach a length of 69 inches. They occur across most of North Carolina, most commonly in the Coastal Plain, but are absent from much of the Mountains. Eastern kingsnakes are black dorsally with white or cream chain-like markings. The dorsal scales are smooth and shiny. Eastern kingsnakes may be confused with eastern rat snakes, especially when the adult eastern rat snake maintains slight banding, but they can be readily distinguished by the smooth scales. Ventrally, they have irregularly spaced black-and-white patches. On the Outer Banks, this species has a more brownish base color and more speckling within each dark segment, though this pattern can occasionally be seen elsewhere. The eastern kingsnake is egg-laying and feeds on turtle eggs, lizards, birds, small mammals, and other snakes, including venomous snakes. Eastern kingsnakes sometimes bite and emit a foul-smelling substance called musk if cornered. But they are harmless and will usually calm down soon after being captured.

## **Mole Kingsnake—Harmless**

### **(*Lampropeltis rhombomaculata*)**



Mole kingsnake. Photo by Daniel Guinto

Mole kingsnakes can reach 46 inches in length. They occur throughout most of North Carolina except for most of the Mountains and the northeastern Coastal Plain. Mole kingsnakes have smooth scales; dorsally, they have a light brown, red, or tan base color with darker reddish-brown diamond-like blotches. Underneath, they are light yellow or cream, sometimes with a checkboard pattern of tans and browns. Juveniles are often brighter than adults. As they age, the pattern may begin to fade to brown or tan in some adults. This species may be easily confused with the eastern milk snake and the corn snake, but it can be distinguished by the size, shape, and color of the blotches on the back. The eastern milk snake has wider, more rounded blotches, whereas the mole kingsnake has more elliptical blotches. Also, the eastern milk snake has a row of brown, circular blotches on the side. Corn snakes are more vibrant, and their markings are wider and more circular than the markings of the mole kingsnake, which are thinner and elliptical. The mole kingsnake is primarily fossorial but also spends some time above ground under objects. Active day or night, they feed on small mammals, lizards, and other snakes. Mole kingsnakes are egg-laying. When encountered, they may vibrate their tail and attempt to bite.

## **Eastern Milk Snake—Harmless**

### **(*Lampropeltis triangulum*)**



Eastern milk snake. Photo by Daniel Guinto

Eastern milk snakes can reach a length of 45 inches and occur primarily in the Mountains of North Carolina. Dorsally, this snake is smooth and has a light brown or tan base color with wide brown, red, or gray blotches outlined with black. This snake has small circular markings on the sides of its body that are the same color as the dorsal blotches, and it has a Y-, U-, or V- shaped marking on the neck. Ventrally, they are checkered black and white. The eastern milk snake may be confused with the mole kingsnake or juvenile eastern rat snake. The eastern milk snake has wider, more rounded blotches,

whereas the mole kingsnake has more elliptical blotches. Also, the eastern milk snake has a row of brown, circular blotches on the side. Eastern milk snakes can be distinguished from juvenile eastern rat snakes by the smooth dorsal scales. Eastern milk snakes spend much of their time under cover objects and may be active during the day or night. They are egg-laying and feed on small snakes, lizards, and small mammals. Eastern milk snakes are generally nonaggressive when handled but might bite.

### Black Swamp Snake—Harmless

#### (*Liodytes pygaea*)—Special Concern in North Carolina



Black swamp snake. Photo by Jeffrey Hall

Black swamp snakes can reach 19 inches in length and occur in the outer Coastal Plain from Bodie Island southward. Dorsally, the black swamp snake has smooth scales and is glossy black. The ventral surface is red or orange with a jagged edge. Black swamp snakes are occasionally seen active at night but are rarely encountered. This is likely due to a combination of their rarity coupled with their habit of spending most of their time in aquatic vegetation or under vegetation or moss near the edge of slow-moving water. They are live-bearing and feed primarily on worms, leeches, fish, and amphibians. When cornered, they rarely bite.

### Glossy Crayfish Snake—Harmless

#### (*Liodytes rigida*)



Glossy crayfish snake. Photo by Daniel Guinto

Glossy crayfish snakes can reach lengths of 31 inches and occur in portions of the southern and outer Coastal Plain. The glossy crayfish snake has keeled scales and a glossy appearance. Dorsally, they are solid brown or dark olive. The lips are dark yellow brown. Ventrally, they have a yellowish base with two rows of crescent-shaped spots. Glossy crayfish snakes are most commonly seen at night and spend most of their time in or around fresh water. They are live-bearers and feed primarily on crayfish but will also eat other aquatic invertebrates and some small vertebrates. If cornered, they will flatten their heads and may bite and emit a foul-smelling substance called musk.

### Eastern Coachwhip—Harmless

#### (*Masticophis flagellum*)



Eastern coachwhip. Photo by Daniel Guinto

The eastern coachwhip is the longest snake in North Carolina and can reach lengths of 94 inches. This snake occurs primarily in the southeastern Coastal Plain and

Sandhills. As an adult, the eastern coachwhip is dark brown or black dorsally on its head and anterior third of the body, which fades to light brown with a braided, whip-like appearance. As juveniles, eastern coachwhips have dark, wavy cross bands covering their dorsal side; underneath, they are light with two rows of black or brown spots toward the anterior end. Additionally, juveniles have white outlines on their heads and on the back of their necks. The scales are smooth. Eastern coachwhips are egg-laying and feed on lizards, snakes, birds, bird eggs, and small mammals. These slender snakes are one of the fastest, if not the fastest, snake species in North Carolina and will rapidly flee or seek refuge when encountered. However, when cornered, they will vibrate their tail, strike, and may even play dead. Also, they may continuously bite and strike at the face.

### **Red-Bellied Water Snake—Harmless**

#### **(*Nerodia erythrogaster*)**



Red-bellied water snake. Photo by Daniel Guinto

Red-bellied water snakes can reach 60 inches in length and occur in the eastern half of North Carolina. On top, adults are reddish brown to dark brown and are keeled. Ventrally, this species is orange or reddish with a small amount of white on the chin. Juveniles have a pinkish to light-brown base color dorsally with dark-brown cross bands. Ventrally, juveniles are light orange. Juveniles may easily be confused with northern water snakes and banded water snakes; however, northern water snakes have brown or reddish, half-moon-shaped spots along their ventral surface. Banded water snakes have unbroken bands the length of the body and a black or brown line extending from the eye to the back of the upper jaw. Red-bellied water snakes are live-bearing and feed on fish, toads, and frogs. Red-bellied water snakes can be active day or night. Although they usually are located near water, they are occasionally located far from water. When encountered, these water snakes will

usually flee; but if they are cornered, they will defend themselves by continuously biting.

### **Banded Water Snake—Harmless**

#### **(*Nerodia fasciata*)**



Banded water snake. Photo by Daniel Guinto

Banded water snakes can reach lengths of 55 inches and occur in the Coastal Plain and Sandhills of North Carolina. This species has keeled scales and is highly variable in base color. Dorsally, it can range from light brown to reddish orange and black with dark-brown or reddish unbroken cross bands and a dark line behind each eye running to the corner of the jaw. Sometimes this species can be so dark that the patterns are indistinguishable. Ventrally, this species has squarish or triangular markings. The patterns on juveniles are usually darker, with a high contrast. This species can be very difficult to differentiate from northern water snakes and will hybridize where their ranges overlap. Northern water snakes usually have broken bands and lack the dark lines behind the eyes. Juvenile banded water snakes may be confused with northern water snakes but can be differentiated by the ventral patterns. Banded water snakes may be active day or night and tend to be located near fresh water. They are live-bearing and feed on fish and amphibians. Like the other water snakes in North Carolina, banded water snakes will usually flee when encountered. But when cornered, they will readily and repeatedly bite and emit a foul-smelling substance called musk.

## **Northern Water Snake—Harmless**

**(*Nerodia sipedon*)**



*Northern Water Snake. Photo by Daniel Guinto*

Northern water snakes can reach a length of 50 inches and occur throughout most of the Mountains, Piedmont, the northeastern Coastal Plain, and the Outer Banks. This species is absent from much of the southern Coastal Plain and Sandhills. They are highly variable in appearance and have keeled dorsal scales. Its base color ranges from brown to gray to reddish. Dorsally, they have dark-brown or black cross banding near the head that has broken bands or alternating blotches for the posterior two thirds of the body. Ventrally, northern water snakes are yellowish with brown or reddish, half-moon-shaped spots. Juveniles usually have much more prominent patterns and vivid coloration than the adults do. In populations on the Outer Banks and near brackish water, individuals have a dark-brown base color with black cross bands; these individuals are considered a subspecies known as the Carolina water snake (*Nerodia sipedon williamengelsi*), which are listed as a species of special concern in North Carolina. Northern water snakes can be easily confused with banded water snakes and may hybridize in areas where their ranges overlap. Also, this species may be confused with juvenile red-bellied water snakes but can be distinguished by the presence of a belly pattern. Northern water snakes may be active day or night and commonly bask on tree limbs extending over water or on debris in or near the water. Northern water snakes are live-bearing and feed on fish and amphibians. When encountered, these snakes will usually flee, but if cornered, will defensively bite and emit a foul-smelling substance called musk.

## **Brown Water Snake—Harmless**

**(*Nerodia taxispilota*)**



*Brown water snake. Photo by Daniel Guinto*

The largest of the water snakes in North Carolina, the brown water snake can reach lengths of 64 inches and has a heavy body, flat head, and protruding eyes. Brown water snakes occur in the Coastal Plain, southern Piedmont, and Sandhills. Their scales are dorsally keeled. Brown water snakes have a brown base color with dark-brown or black, squarish blotches on the back and sides. Ventrally, they are yellow with mottled brown or black. Brown water snakes can be active day or night, and they are *aquatic* (spend time in water) and *arboreal* (spend time in trees). They are live-bearing and feed on fish, especially catfish. If cornered, they will usually bite and emit a foul-smelling substance called musk. While lying on a tree limb over water, the brown water snake occasionally will get spooked and unintentionally fall into boats passing by; however, they are not venomous and will retreat if given access back into the water.

## **Rough Green Snake—Harmless**

**(*Opheodrys aestivus*)**



*Rough green snake. Photo by Daniel Guinto*

Rough green snakes can reach lengths of 36 inches. They occur throughout North Carolina except for the higher elevations in the Mountains. Dorsally, the scales are keeled and entirely green. Underneath, they are yellow or greenish yellow. Newly hatched snakes are gray or grayish green on top and white ventrally. Dead rough green snakes will fade to blue when left exposed to the sun. They are active during the day and are arboreal, using small trees, shrubs, vines, and other foliage. They are egg-layers and feed on spiders, grasshoppers, crickets, caterpillars, small snails, and other soft-bodied invertebrates. Rough green snakes can be very difficult to spot. If cornered, they will gape their mouths but typically will not bite.

## **Eastern Rat Snake—Harmless**

**(*Pantherophis alleghaniensis*)**



Eastern rat snake. Photo by Daniel Guinto

Eastern rat snakes are one of the largest snakes in North Carolina, reaching up to 85 inches long. They occur statewide. Featuring weakly keeled scales, the adult is dorsally black with a white chin. Underneath, the front half of the body tends to be lighter and checkered, while the back half tends to be darker. Juveniles have a light gray or brown base color with darker brown or gray blotches. Adults may easily be confused with black racers, but can be distinguished by the presence of keeled scales as well as the shape of the head and the size of the eyes. The eastern rat snake has a flatter head

with smaller eyes featuring small, distinct black pupils compared to black racers. Juveniles may be confused with juvenile black racers and eastern milk snakes. However, eastern rat snakes have keeled scales, unlike the black racer and the eastern milk snake. Excellent climbers, eastern rat snakes are commonly encountered in trees and bushes. Eastern rat snakes are egg-laying and primarily eat small rodents, birds, and amphibians. When encountered, eastern rat snakes may try to escape or may remain motionless and then begin to vibrate their tails. If cornered, eastern rat snakes may bite and emit musk but are often quick to relax.

## **Corn Snake—Harmless**

**(*Pantherophis guttatus*)**



Corn snake. Photo by Daniel Guinto

Corn snakes reach 72 inches in length and occur statewide. Corn snakes have a glossy red, orange, gray, or brown base color dorsally with reddish-brown markings outlined with black. Underneath, corn snakes have a checkered black-and-white pattern. Corn snakes may be easily confused with many snake species. They are active both day and night depending on the temperature. Corn snakes are excellent climbers and will eat birds, bird eggs, frogs, lizards, and small mammals. Corn snakes are egg-laying. They vary in temperament and may or may not bite when first handled. They typically emit musk but may relax quickly in some instances.

## Pine Snake—Harmless

### (*Pituophis melanoleucus*)—Threatened in North Carolina



Pine snake. Photo by Thomas Reed

Pine snakes can reach a length of 72 inches. They occur primarily in the Sandhills, but small populations also persist in the extreme southeastern Coastal Plain and in the far southwestern Mountains. Pine snakes have keeled scales, exhibiting a white or yellow base color with black or brown blotches. The blotches are less distinct toward the head but become more distinct toward the posterior of the body. Pine snakes are primarily *diurnal* (active during the day) and fossorial. They are egg-layers and feed primarily on small mammals, birds, and bird eggs. If cornered, they may vibrate their tails, hiss, and attempt to bite.

## Queen Snake—Harmless

### (*Regina septemvittata*)



Queen snake. Photo by Daniel Guinto

Queen snakes can reach a length of 34 inches and occur in the Piedmont and Mountains of North Carolina.

Dorsally, they have keeled scales and are dark brown. Occasionally, queen snakes will have three obscure dorsal stripes. Queen snakes have yellow lines on both sides of their bodies and yellow lips. Ventrally, they are yellow with brown or tan striping. Generally, juveniles have more prominent patterning than adults. Queen snakes are primarily active during the day and are usually located in or near water. They tend to bask on tree limbs over the water and may seek shelter under rocks or debris near the water's edge. Queen snakes are live-bearing and feed primarily on freshly molted crayfish. When cornered, they may bite.

## Pine Woods Snake—Harmless

### (*Rhadinaea flavigata*)



Pine woods snake. Photo by Thomas Reed

Pine woods snakes can reach 15 inches in length and occur in the southeastern Coastal Plain, with separate populations in the Sandhills and on Roanoke and Bodie islands on the Outer Banks. Dorsally, they have smooth scales and are an iridescent golden brown or reddish brown. The head is a darker shade of the base color, and a light-brown line extends behind each eye. Ventrally, they are glossy yellow or white. They are primarily active at night and fossorial. Pine woods snakes are egg-laying and feed primarily on lizards and frogs. Although they are harmless to humans, they do use a weak venom to paralyze prey. When cornered, pine woods snakes may emit a foul-smelling substance called musk, but they are not known to bite.

## Dekay's Brown Snake—Harmless

### (*Storeria dekayi*)

Dekay's brown snakes can reach 18 inches in length. They occur throughout North Carolina except for portions of the Mountains. Dorsally, the scales are keeled and brown, gray, or reddish brown. This species usually has



Dekay's brown snake. Photo by Daniel Guinto

a pale stripe down the center of the back and paired dark-brown or black blotches that run the length of the body. Some individuals may have a half-collar behind the head; especially in juveniles, that half-collar may lack other patterning. Ventrally, this species is white or pinkish and may have small black dots down the sides. They are primarily active at night and spend much of their time under cover objects. Dekay's brown snakes are live-bearers and feed primarily on slugs and earthworms. When cornered, Dekay's brown snakes usually do not bite, but may emit a foul-smelling substance called musk and flatten their heads.

### **Red-Bellied Snake—Harmless** *(Storeria occipitomaculata)*



Red-bellied snake. Photo by Daniel Guinto

Red-bellied snakes can reach 12 inches in length and occur throughout North Carolina. Dorsally, they have keeled scales and range from light grayish and black to tan, brown, or reddish. Red-bellied snakes usually have a white blotch on the last lip scale, three yellowish or orange blotches on the neck, and a white or gray chin. A light stripe may occur down the mid-dorsum, edged

with black; some of the scales may have small white spots. Ventrally, they are red or orange and usually have gray or black markings at the edges of the scales. Red-bellied snakes are primarily active at night but may sometimes be active during the day. They are most common in upland areas and shelter under rocks, logs, or other ground debris. Red-bellied snakes are live-bearing and feed primarily on slugs and snails. When cornered, they may flatten out and emit a foul-smelling substance called musk, but they are not known to bite. Also, red-bellied snakes have a curious behavior of lip-curling when handled or threatened.

### **Southeastern Crowned Snake—Harmless** *(Tantilla coronata)*



Southeastern crowned snake. Photo by Thomas Reed

Southeastern crowned snakes can reach 12 inches when fully grown. They are most common in the southeastern Coastal Plain and Sandhills, but they also occur over much of the Piedmont and in portions of the southeastern Mountains and foothills of North Carolina. Dorsally, the scales are smooth and tan or reddish brown. Southeastern crowned snakes have a black or dark-brown head, followed by a cream-colored ring and subsequent dark collar. Ventrally, they are white or yellow. Southeastern crowned snakes are active at night and spend most of the day underground or under cover objects. These snakes are egg-laying and feed primarily on centipedes but will eat other soft-bodied arthropods. When cornered, these snakes are not known to bite. Though harmless to humans, southeastern crowned snakes are rear-fanged and do use a weak venom to subdue prey.

## **Eastern Ribbon Snake—Harmless**

### **(*Thamnophis sauritus*)**



Eastern ribbon snake. Photo by Daniel Guinto

Eastern ribbon snakes can reach a length of 38 inches. They are most common in the Coastal Plain, but also occur throughout much of the Piedmont and in portions of the Mountains. On top, they have keeled scales and a dark-brown or black base color with three yellow stripes running the length of the body. Ventrally, they are white or pale yellow. Eastern ribbon snakes have a vertical white stripe in front of their eyes, a marking that helps to distinguish them from the closely related eastern garter snake. Eastern ribbon snakes are most active during the day but may be active at night. They are semiaquatic and are usually associated with wetlands. Eastern ribbon snakes are live-bearing and feed on fish and amphibians. When cornered, they usually thrash and emit a foul-smelling substance called musk and occasionally bite.

## **Eastern Garter Snake—Harmless**

### **(*Thamnophis sirtalis*)**



Eastern garter snake. Photo by Daniel Guinto

Eastern garter snakes can reach a length of 42 inches and occur throughout North Carolina. Dorsally, they have keeled scales, and their base color ranges from green and blue to brown and red. They usually have a light stripe down the center of the dorsum coupled with two less-defined stripes on either side of the body. Some individuals lack the stripe and instead have spots reminiscent of a checkered pattern. Eastern garter snakes are active at day and night. They tend to be located in moist environments and may be under rocks, logs, or other cover objects. They are live-bearing and feed mostly on earthworms, fish, and amphibians. When cornered, they may flatten their bodies, emit a foul-smelling substance called musk, and bite. Harmless to humans, eastern garter snakes do use their mildly toxic saliva to capture prey.

## **Smooth Earth Snake—Harmless**

### **(*Virginia valeriae*)**



Smooth earth snake. Photo by Jeffrey Hall

Smooth earth snakes reach an adult length of 13 inches. They range over much of the Piedmont, southern Mountains, and Coastal Plain of North Carolina. Dorsally, they have smooth scales and are gray, brown, or reddish brown with scattered black spots. Ventrally, they are creamy white. This species may be easily confused with the rough earth snake but can be distinguished by the lack of keeled scales. They are primarily active at night and are occasionally encountered on roads. Also, they can be located under objects on the ground. The smooth earth snake is live-bearing and feeds primarily on earthworms. When cornered, they may emit a foul-smelling substance called musk, but are not known to bite.

## Family Elapidae

**Eastern Coral Snake—Venomous**

**(*Micruurus fulvius*)—Endangered in North Carolina**



Eastern coral snake. Photo by Jeffrey Hall

Eastern coral snakes reach a maximum length of 35 inches. These rare snakes are currently located only in the southeastern corner of North Carolina. Dorsally, the scales are smooth and red, yellow, and black. The snout is always black followed by alternating bands of yellow, red, and black that encircle the entire body. Eastern coral snakes can be distinguished from the similar-looking scarlet kingsnake and scarlet snake by the order of the bands. The eastern coral snake always has thick red and black bands interspersed with narrow yellow bands, whereas the scarlet snake and the scarlet kingsnake have red bands touching black bands. The common saying, "Red touches black, you're OK Jack; red touches yellow, you're a dead fellow" is often used to remember this difference. Eastern coral snakes are *crepuscular* (active at dusk and dawn) and *fossorial* (located underground). They are egg-laying and feed on small snakes and lizards. Eastern coral snakes are highly venomous, possessing venom that can cause paralysis and respiratory failure. Eastern coral snakes are typically not aggressive and are only known to bite if restrained. Eastern coral snakes are endangered in North Carolina; if you encounter this species, leave it alone!

## Family Viperidae

**Copperhead—Venomous**

**(*Agkistrodon contortrix*)**

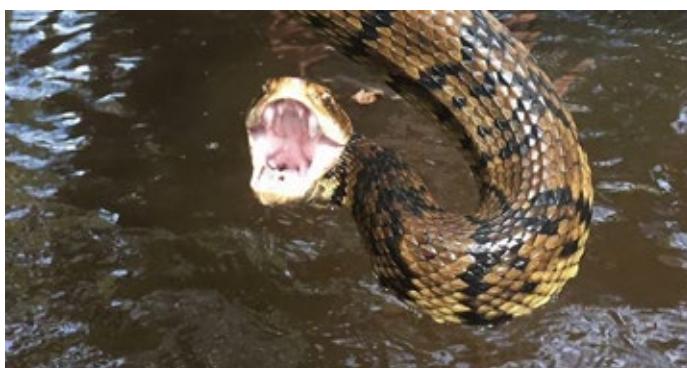


Copperhead. Photo by Daniel Guinto

Copperheads can reach 48 inches in length. They are the most common venomous snake in the state and occur across North Carolina, except for the Outer Banks. Dorsally, copperheads have keeled scales. Their base color is brown, grayish brown, tan, or pinkish with dark-brown, hourglass-shaped cross bands that are light in the center. From the side, these bands look like Hershey's Kisses. The pupils of the copperhead are elliptical, and they have a pit on each side of the head between the eye and the nostrils. Ventrally, copperheads have dark-brown blotches on the edges of the scales running the length of the body. Juveniles usually have greenish-yellow or yellow tail tips. Copperheads can be active during the day or night. They can be located under cover objects and are not aggressive. Copperheads are live-bearing and feed on amphibians, reptiles, birds, small mammals, and large insects. When encountered, they usually try to escape but may attempt to bite if stepped on, cornered, or restrained. Copperhead venom is rarely fatal but requires immediate medical attention. If you encounter this species, leave it alone!

## Cottonmouth—**Venomous**

### (*Agkistrodon piscivorus*)



Cottonmouth. Photo by Daniel Guinto

The cottonmouth (sometimes called water moccasin) can reach a length of 71 inches and occurs in the Coastal Plain and Sandhills of North Carolina. Dorsally, they have keeled scales and an olive or brown base. They usually have tight black cross bands with light centers extending the length of the body. They may occasionally be uniformly dark with no obvious cross bands. Cottonmouths have elliptical pupils and a pit between the eyes and nostrils on each side of the head. Ventrally, they have dark blotches down the length of the body. Juveniles usually have bolder, more chestnut-brown dorsal patterns and yellow tail tips. Cottonmouths can be active night or day and are semiaquatic and are usually located near wetlands. They are live-bearing and feed on fish, reptiles, amphibians, birds, and small mammals. Cottonmouths usually flee when encountered, but may coil, rear up, and gape the mouth. If cornered, stepped on, or antagonized, cottonmouths will readily bite. Bites are rarely fatal but require immediate medical attention. If you encounter this species, leave it alone!

## Eastern Diamondback

### Rattlesnake—**Venomous**

### (*Crotalus adamanteus*)—**Endangered in North Carolina**



Eastern diamondback rattlesnake. Photo by Thomas Reed

One of the largest snakes in North Carolina, the eastern diamondback rattlesnake can reach 78 inches in length. This rare snake occurs only in the southeastern corner of North Carolina. Dorsally, they have keeled scales with an olive or dark-brown base. Eastern diamondbacks have dark, diamond-shaped blotches with light centers and yellow bordering; their heads feature black bars with yellow bordering on each side running from the eyes to the corners of the mouth. Ventrally, they are yellowish. The scales at the end of this snake's tail forms a rattle used to warn away potential predators. Eastern diamondback rattlesnakes are active primarily during the day and can be located in stump holes, under cover objects, or in burrows. Eastern diamondbacks are live-bearing and feed on rabbits, mice, and other small mammals. They usually coil up and rattle their tails when encountered; if antagonized, they will bite. The bite of an eastern diamondback rattlesnake is very dangerous and requires emergency medical attention. Eastern diamondbacks are endangered in North Carolina; if you encounter this species, leave it alone!

## **Timber Rattlesnakes—Venomous**

### **(*Crotalus horridus*)—Special Concern in North Carolina**



Timber rattlesnake. Photo by Thomas Reed

Timber rattlesnakes can reach a length of 72 inches. These rattlesnakes once occurred statewide, but have been extirpated from many portions of the Piedmont. Dorsally, the scales are keeled and vary in color across their range. They have a segmented rattle composed of shed tail scales on the end of their tail. In the Mountains, timber rattlesnakes have a base dorsal color of yellowish or black, while in the rest of the state (where they are often referred to as "canebrake rattlesnakes"), the base is brown, gray, or pinkish. This species has a dorsal pattern of dark blotches and wavy, chevron-shaped cross bands. The canebrake color phase has a reddish or brown mid-dorsal stripe and an orange or dark-brown bar on the face from the eye to the corner of the mouth. Ventrally, these snakes are whitish or yellowish with black stippling or mottling. Like all pit vipers, they have a pit on each side of the head, between the eye and nostrils. Timber rattlesnakes are active day and night. Their habitats include rocky outcroppings and fields near wetlands or forests. They frequently use stump holes and cover objects. Timber rattlesnakes are live-bearing and feed primarily on small mammals and birds. When encountered, they usually try to avoid being noticed or to escape. If cornered, captured, or antagonized, timber rattlesnakes will rattle their tails and strike. Bites from timber rattlesnakes should receive immediate medical attention. Timber rattlesnakes are a species of special concern in North Carolina; if you encounter this species, leave it alone!

## **Pigmy Rattlesnake—Venomous**

### **(*Sistrurus miliarius*)—Special Concern in North Carolina**



Pigmy rattlesnake. Photo by Thomas Reed

Pigmy rattlesnakes reach a length of 26 inches and occur primarily in the eastern and southeastern Coastal Plain and Sandhills of North Carolina. Dorsally, the scales are keeled with a base of gray to red with dark-brown or black spots; some have a reddish stripe down the length of the body. Near the Albemarle Peninsula, individuals have glossy red, orange, or pink patterns. This species has long, black or dark-brown spots on the top and sides of the head in addition to a small pit between the eye and nostrils on each side. Ventrally, they are white or pinkish with dark spots. Juveniles have white or yellow tail tips. Pigmy rattlesnakes have small rattles on the tips of their tails. Active day or night, they are sometimes located near cypress ponds or other bodies of water when they are not under logs or other cover objects. They are live-bearing and feed on small snakes, frogs, lizards, large arthropods, and small mammals. When cornered, captured, or antagonized, this species will rattle its tail and strike. Pigmy rattlesnakes are one of the less venomous species in the state, but their bites still require immediate medical attention. Pigmy rattlesnakes are a species of special concern in North Carolina; if you encounter this species, leave it alone!

Snakes of North Carolina				
Family	Common Name	Genus	Species	Page
Colubridae	Banded Water Snake	<i>Nerodia</i>	<i>fasciata</i>	11
Colubridae	Black Racer	<i>Coluber</i>	<i>constrictor</i>	5
Colubridae	Black Swamp Snake	<i>Liodytes</i>	<i>pygaea</i>	10
Colubridae	Brown Water Snake	<i>Nerodia</i>	<i>taxispilota</i>	12
Viperidae	Copperhead	<i>Agkistrodon</i>	<i>contortrix</i>	17
Colubridae	Corn Snake	<i>Pantherophis</i>	<i>guttatus</i>	13
Viperidae	Cottonmouth	<i>Agkistrodon</i>	<i>piscivorus</i>	18
Colubridae	Dekay's Brown Snake	<i>Storeria</i>	<i>deKayi</i>	14
Colubridae	Eastern Coachwhip	<i>Masticophis</i>	<i>flagellum</i>	10
Elapidae	Eastern Coral Snake	<i>Micruurus</i>	<i>fulvius</i>	17
Viperidae	Eastern Diamondback Rattlesnake	<i>Crotalus</i>	<i>adamanteus</i>	18
Colubridae	Eastern Garter Snake	<i>Thamnophis</i>	<i>sirtalis</i>	16
Colubridae	Eastern Hognose Snake	<i>Heterodon</i>	<i>platirhinos</i>	7
Colubridae	Eastern Kingsnake	<i>Lampropeltis</i>	<i>getula</i>	9
Colubridae	Eastern Milk Snake	<i>Lampropeltis</i>	<i>triangulum</i>	9
Colubridae	Eastern Rat Snake	<i>Pantherophis</i>	<i>alleganiensis</i>	13
Colubridae	Eastern Ribbon Snake	<i>Thamnophis</i>	<i>sauritus</i>	16
Colubridae	Eastern Worm Snake	<i>Carpophis</i>	<i>amoenus</i>	5
Colubridae	Glossy Crayfish Snake	<i>Liodytes</i>	<i>rigida</i>	10
Colubridae	Mole Kingsnake	<i>Lampropeltis</i>	<i>rhombomaculata</i>	9
Colubridae	Mud Snake	<i>Farancia</i>	<i>abacura</i>	6
Colubridae	Northern Water Snake	<i>Nerodia</i>	<i>sipedon</i>	12
Viperidae	Pigmy Rattlesnake	<i>Sistrurus</i>	<i>miliarius</i>	19
Colubridae	Pine Snake	<i>Pituophis</i>	<i>melanoleucus</i>	14
Colubridae	Pine Woods Snake	<i>Rhadinaea</i>	<i>flavilata</i>	14
Colubridae	Queen Snake	<i>Regina</i>	<i>septemvittata</i>	14
Colubridae	Rainbow Snake	<i>Farancia</i>	<i>erythrogramma</i>	7
Colubridae	Red-Bellied Snake	<i>Storeria</i>	<i>occipitomaculata</i>	15
Colubridae	Red-Bellied Water Snake	<i>Nerodia</i>	<i>erythrogaster</i>	11
Colubridae	Ring-Necked Snake	<i>Diadophis</i>	<i>punctatus</i>	6
Colubridae	Rough Earth Snake	<i>Haldea</i>	<i>striatula</i>	7
Colubridae	Rough Green Snake	<i>Opheodrys</i>	<i>aestivus</i>	12
Colubridae	Scarlet Kingsnake	<i>Lampropeltis</i>	<i>elapsoides</i>	8
Colubridae	Scarlet Snake	<i>Cemophora</i>	<i>coccinea</i>	5
Colubridae	Smooth Earth Snake	<i>Virginia</i>	<i>valeriae</i>	16
Colubridae	Southeastern Crowned Snake	<i>Tantilla</i>	<i>coronata</i>	15
Colubridae	Southern Hognose Snake	<i>Heterodon</i>	<i>simus</i>	8
Viperidae	Timber Rattlesnake	<i>Crotalus</i>	<i>horridus</i>	19

## References

- Beane, J. C., A. L. Braswell, J. C. Mitchell, W. M. Palmer, and J. R. Harrison. 2010. *Amphibians & Reptiles of the Carolinas and Virginia*. Second edition. University of North Carolina Press, Chapel Hill.
- Bosmans, R. 2012. *Snakes*. University of Maryland Extension Specialist, Home and Garden Information Center.
- Centers for Disease Control and Prevention. The National Institute for Occupational Safety and Health. "Venomous Snakes," a Workplace Safety and Health Topic. 2018. Retrieved from <https://www.cdc.gov/niosh/topics/snakes/default.html>
- Krysko, Kenneth L., and F. Wayne King. 2014. "Online Guide to the Snakes of Florida." Florida Museum of Natural History, University of Florida, Gainesville, FL. [Online: September 2014] Available at: <http://www.flmnh.ufl.edu/herpetology>.
- Moon, B. 2001. *Snake Locomotion. Comparative Physiology and Functional Morphology*. University of Louisiana at Lafayette. <https://www.ucs.louisiana.edu/~brm2286/locomotn.htm>. Accessed 29 Jul 2019.
- Ovaska, K., and C. Engelstoft. 2003. "Attracting Snakes into your Backyard." Government of British Columbia. [http://www.env.gov.bc.ca/wld/documents/snake\\_landscape\\_brchr.pdf](http://www.env.gov.bc.ca/wld/documents/snake_landscape_brchr.pdf). Accessed 29 Jul 2019.
- Parkhurst, J. 2010. "Managing Wildlife Damage: Snakes." Virginia Cooperative Extension, Virginia Tech. <https://pubs.ext.vt.edu/420/420-021/420-021.html>. Accessed 29 Jul 2019.
- Prada, E, L. Miková, R. Surovec, and M, Kenderová. 2012. Complex kinematic model of snake-like robot with holonomic constraints. Mezinárodní vědecká konference k problematice technologických a inovačních procesů Technnológia Europea 2012, At Hradec Králové, The Czech Republic, Volume: 2.
- Ruppert, B. 2016. "The Rattlesnake Tells the Story." Journal of the American Revolution. <https://allthingsliberty.com/2015/01/the-rattlesnake-tells-the-story/>. Accessed 29 Jul 2019.
- Stanley, J. W. 2008. "Snakes: Objects of Religion, Fear, and Myth." *Journal of Integrative Biology* 2:42–58.
- Thompson, H. 2015. "What's the Difference Between Poisonous and Venomous Animals?" Smithsonian.com. Smithsonian Institution. <https://www.smithsonianmag.com/science/whats-difference-between-poisonous-and-venomous-animals-180956186/>. Accessed 29 Jul 2019.
- Tkaczyk, F. "Snake Tracks: Understanding Serpent Locomotion." Alderleaf Wilderness College. <https://www.wildernesscollege.com/snake-tracks.html>. Accessed 29 Jul 2019.

## Additional Resources

Amphibians and Reptiles of North Carolina  
[www.herpsofnc.org](http://www.herpsofnc.org)

**Authors:**

**Daniel Guinto**

Graduate student, Purdue University-Fort Wayne, Fort Wayne, Indiana

**Christopher S. DePerno**

Professor, Fisheries, Wildlife, and Conservation Biology, North Carolina State University, Raleigh, North Carolina

**Jeffrey G. Hall**

Partners in Amphibian & Reptile Conservation Biologist, North Carolina Wildlife Resources Commission, Raleigh, North Carolina

**Published by:**

**NC State Extension**

**NC STATE UNIVERSITY** College of Natural Resources

Distributed in furtherance of the acts of Congress of May 8 and June 30, 1914. North Carolina State University and North Carolina A&T State University commit themselves to positive action to secure equal opportunity regardless of race, color, creed, national origin, religion, sex, age, veteran status, or disability. In addition, the two Universities welcome all persons without regard to sexual orientation. North Carolina State University, North Carolina A&T State University, U.S. Department of Agriculture, and local governments cooperating.

08/19—DB/DI

AG-472-02

[content.ces.ncsu.edu/snakes](http://content.ces.ncsu.edu/snakes)

© 2019 North Carolina State University

1,000 copies of this publication were printed at a cost of \$### or \$## per copy.