

### Cottonmouth/Water Moccasin (Venomous)

Do not occur naturally throughout most of Tennessee. They bask on land or on logs and stumps near the water surface; swim with their heads elevated above the water and their bodies riding on the water surface. They may vibrate their tails and gape their mouths when threatened. Cottonmouths, if banded, have bands that are widest on the sides and narrow on top; have triangular heads with elliptical eye pupils and a heat-sensing pit; and have a single row of scales on the underside of their tails.



Adult—dark phase



Juvenile



Adult—banded



Adult—light phase

### Water Snakes (Nonvenomous)

Occur in aquatic habitats throughout Tennessee. Water snakes bask on limbs overhanging water; typically swim below the water surface. If banded, the bands are widest on top and narrow on the sides. Water snakes have round eye pupils and have a double row of scales on the underside of their tails.



Yellowbelly



Northern



Broad-banded



Mississippi Green

All snakes play an important role in the environment, including venomous species such as cottonmouths. Please help protect these unique animals. **It is illegal in Tennessee to harm, kill, remove from the wild or possess animals taken from the wild, including ALL snakes, without the proper permits.**

## is it a COTTONMOUTH?



Some people ask this question when they see a snake in the water. Unfortunately, many people assume all snakes in the water are cottonmouths and kill them “just in case.” Along with sharks and bats, snakes are among the most misunderstood and mistreated animals on earth. Yes, some species of snakes, including the cottonmouth (*Agkistrodon piscivorus*), also known as the water moccasin, are venomous and therefore a potential danger. However, of the 32 snake species native to Tennessee, only 4 are venomous—all others are completely harmless. Among the 28 harmless nonvenomous snakes, water snakes (*Nerodia* and *Regina* species) and eastern hognose snakes (*Heterodon platirhinos*) are often unfortunate victims of mistaken identity—thought to be cottonmouths. This brochure was developed to highlight the differences between water snakes, hognose snakes, and cottonmouths with the hope that familiarity with these snakes will prevent further unnecessary killing of snakes.



Nonvenomous water snakes, such as this diamondback, may be mistaken for venomous cottonmouths.



Adult queen snake

The cottonmouth’s rumored reputation as a vicious snake far exceeds its true character. This is not an aggressive snake that attacks without provocation, and rarely does it strike even when harassed. Venom is a precious commodity that cottonmouths use for subduing prey, and wasting venom on anything that is not “food” may prevent a snake from catching its next meal. Further, the gaped display of the “cottony” inner-mouth of a cottonmouth is not an act of aggression, but rather a warning of its toxicity—no different than the rattling behavior of rattlesnakes. Venomous snakes pose very little threat to humans who leave them alone—the vast majority of snakebites result from attempting to capture, harass, or kill them.



### COTTONMOUTHS (WATER MOCCASINS) vs. WATER SNAKES

These species of water snakes are native to Tennessee and may be mistaken for the cottonmouth: broad-banded water snake (*Nerodia fasciata confluens*), copperbelly and yellowbelly water snakes (*Nerodia erythrogaster neglecta* and *N. e. flavigaster*), diamondback water snake (*Nerodia rhombifera*), Mississippi green water snake (*Nerodia cyclopion*), northern and midland water snakes (*Nerodia sipedon sipedon* and *N. s. pleuralis*) and the queen snake (*Regina septemvittata*). Adult water snakes and cottonmouths may be similar in appearance. Both are both large, heavy-bodied species with

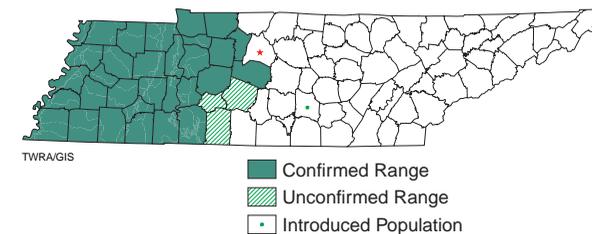


Midland water snake

rough scales and relatively dull coloration. However, the following characteristics of behavior and appearance should assist in differentiating between these snakes:

### Range and habitat...

The first step in discerning “Is it a Cottonmouth?” should be to refer to the distribution map that illustrates the range of the cottonmouth. Collectively, water snakes can be found in every county of Tennessee, unlike the cottonmouth, which **does not** naturally occur in most of the middle and eastern half of the state. However, since distributions are not static and snakes may be moved around intentionally or accidentally, physical features and behaviors of questionable snakes should also be examined. Although it is difficult to summarize the habitat preferences of these snakes, in general cottonmouths do not prefer large, open reservoirs, whereas many water snakes do. Cottonmouths tend to inhabit slow-moving streams, swamps, and backwaters.



### Basking behavior...

Stories of cottonmouths falling from high overhanging limbs into boats are most likely based on misidentifications. Cottonmouths are not built for climbing! They typically bask on land, stumps, or logs near

the water surface and only occasionally climb to low limbs when vines or a gradually sloping branch afford access. Water snakes are very agile climbers and spend a great deal of time basking on the limbs of shrubs and trees overhanging the water.



David E. Scott

*Cottonmouths (left) rarely climb, whereas water snakes, like this copperbelly (below), typically bask on limbs that hang over water.*



Wayne Van Deventer

### Swimming behavior...

When disturbed, cottonmouths either hold their ground or swim away. When swimming, their heads are usually elevated above the water and their bodies appear overly buoyant, riding on, or nearly on, the water surface, although they frequently forage for fish and amphibians beneath the water surface. Water snakes, on the other hand, do not swim high on the water, their heads are not elevated, and they more typically swim below the surface. When water snakes are disturbed, they almost always flee by diving beneath the water.



David E. Scott

*A juvenile cottonmouth swimming. Also illustrated is the typical "hourglass" banding pattern*

### Head posturing and mouth-gaping behavior...

Cottonmouths typically keep their heads cocked at an approximately 45° angle, and when threatened will gape their mouth revealing the whitish inner lining. Although water snakes do not display either of these behaviors, they too have whitish coloration in the mouth lining. Therefore, dead cottonmouths cannot be positively identified based solely on the color of their inner-mouth lining. (**Caution:** Venom may remain fully toxic even in dead snakes. It is best to leave dead snakes of uncertain identification alone).



David E. Scott



John Jensen

*Mouth-gape warning behavior (top right) and head angle typical of cottonmouths.*

### Tail vibration...

In addition to mouth gaping, cottonmouths will often rapidly vibrate their tail when agitated or threatened. Although several other nonvenomous snakes also exhibit this behavior (black racers, for example), water snakes do not.

### Pattern...

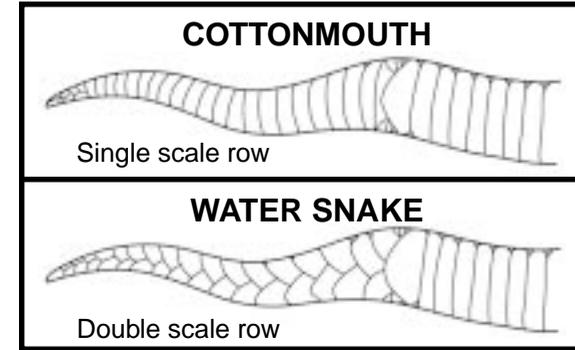
The most common water snake in Tennessee, the northern water snake, has bands that are widest on top. Juvenile and patterned adult cottonmouths have "hourglass" bands that are widest on the sides and appear to be hourglass shaped.



John Jensen

### Underside of tail...

Cottonmouths have a single row of scales (similar to the belly scales) on the underside of their tail from the vent back. A double row of scales is present from the vent back on water snakes (**Caution:** If uncertain as to species, scale characteristics should only be examined on dead snakes and shed skins).



### Head shape and features...

Cottonmouths have triangular shaped heads, however the shape of the head is not a reliable way to differentiate these species since water snakes can flare out their head when they feel threatened, making it appear triangular. However, the elliptical shape of the pupil (round in water snakes) and the presence of a pit between the eye and nostril (absent in water snakes) are reliable characteristics of cottonmouths.



John Jensen



David E. Scott

*A heat-sensing "pit" present in cottonmouths is absent in water snakes like the banded water snake below. Cottonmouths also have elliptical pupils, whereas nonvenomous water snakes have round pupils.*



David E. Scott



David Snyder/Foyt Scott

### Eastern Hognose Snakes (Nonvenomous)

Another snake commonly mistaken for the cottonmouth is the eastern hognose snake (*Heterodon platirhinos*). They can be found in every county of Tennessee and prefer sandy habitats often near water, upland woods, cultivated fields, and woodland meadows. They have an upturned snout and can be almost black and patternless; or have large, dark blotches on a tan or yellowish background. Eastern hognose are more likely to be seen at dawn or dusk searching for toads and frogs. They seldom climb and are occasionally seen basking on the ground. Their unique defense display involves raising and flattening the head (cobra-like) and hissing; if this fails the snake may play dead, sticking out its tongue and rolling onto its back. Hognose snakes have round eye pupils and a double row of scales is present from the vent back.

**For additional information on snakes please contact the Tennessee Wildlife Resources Agency office nearest you:**

- West Tennessee (Region I) ..... 1-800-372-3928
- Middle Tennessee (Region II) ..... 1-800-624-7406
- Cumberland Plateau (Region III) ..... 1-800-262-6704
- East Tennessee (Region IV) ..... 1-800-332-0900
- Website: ..... [www.state.tn.us/twra](http://www.state.tn.us/twra)

Partners in Amphibian and Reptile Conservation website: [www.parcplace.org](http://www.parcplace.org)

This document was a joint production of the Tennessee Wildlife Resources Agency (TWRA), The Nature Conservancy of Tennessee (TNC) and the Wolf River Conservancy. Brochure adapted with permission from the Georgia Department of Natural Resources Nongame-Endangered Wildlife Program (GADNR) and the Savannah River Ecology Laboratory (SREL). Text by John Jensen (GADNR) and Lisa Powers (Froghaven Farm). Layout and design by Laura L. Janecek (SREL) and Raleigh Holtam (TWRA).

