

Figure 5. Tadpole dichotomous tree for Maryland.

Snakes

Snakes (order Squamata, suborder Serpentes) are limbless reptiles with scaled and elongated bodies. All snakes lack external ear openings and eyelids, and have long-forked tongues. There are 29 different varieties of snakes in two families found in Maryland. Two, the rainbow snake (*Farancia e. erythrogramma*) and the mountain earthsnake (*Virginia valeriae pulchra*) are state endangered. There are three state watchlist species: red-bellied watersnake (*Nerodia e. erythrogaster*), northern scarletsnake (*Cemophora coccinea copei*) and timber rattlesnake (*Crotalus horridus*).

The timber rattlesnake is one of two venomous snake species in Maryland; the other is the copperhead (*Agkistrodon contortrix*). They are in the viper family (Viperidae) and there are several morphological characteristics that can be used to easily identify these two species from other nonvenomous species (Figure 8). The remaining species are in the family Colubridae, which is the largest snake family in the world. There are venomous and nonvenomous species of Colubrids, but only nonvenomous species are found in Maryland.

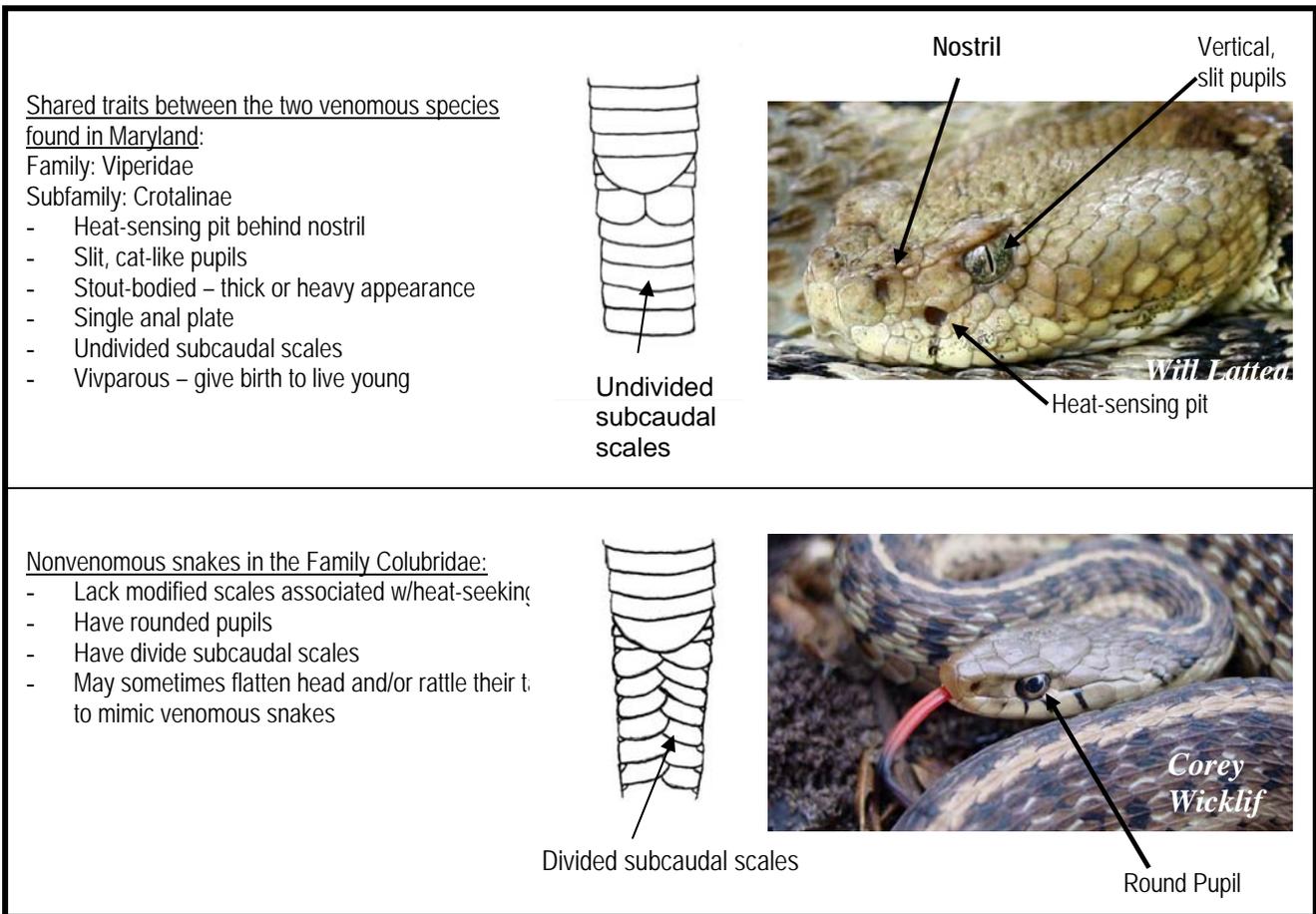


Figure 8. Key features of Maryland’s venomous vs. nonvenomous snakes.

Generally, snakes are adapted for hunting their prey and are well-camouflaged. Copperheads and rattlesnakes are exemplary examples of ambush predators. The northern rough greensnake has a vine-like appearance and keeled scales that assist in climbing and foraging for spiders. Eastern ratsnakes have a bread loaf-shaped body and weakly keeled scales that assist with climbing in pursuit of bird nests and rodents. Still other snakes are drab in color and small in stature, allowing for preying upon soft-bodied insects. Some species of snakes, such as the northern black racer, eastern gartersnake, and common ribbonsnake, frequently stalk amphibians in wetlands, while others are nearly fully aquatic. Northern watersnakes hunt a variety of aquatic prey while others, such as the queen snake and rainbow snake are specialized hunters (preying upon soft-shelled crayfish and American eels, respectively).

A few of Maryland’s snake species are conspicuously colored. These species have evolved a form of mimicry in which they resemble the venomous coral snake. The eastern coral snake is found primarily in the southeastern United States; there is also a Texas subspecies. Body shape and stature, markings on the head, and dorsal and ventral patterning are the most important considerations for distinguishing Maryland Colubrids.

Snakes are among the most misunderstood of all herpetofauna. Many harmless species of snakes are often mistaken for venomous species and killed, impart to their appearance as well as behavior. Many species of snakes coil up, flatten their heads and strike (or feign striking) when threatened. Some, such as the eastern ratsnake, will even rattle their tails to mimic rattlesnakes. Juvenile ratsnakes, juvenile racers, northern watersnakes, red cornsnakes, eastern milksnakes, and eastern hog-nosed snakes are the most frequent victims. It is illegal in Maryland to intentionally kill a snake without a special license.

Since many species can be easily-confused, this document breaks them out into general groupings. Table 13 presents “black snakes”, Table 14 presents “red-brown and blotchy snakes”, Table 15 presents coral snake mimics, Table 16 compares “small, brown, and drab snakes”, and Table 17 presents “striped snakes”.

Table 13. “Black snakes”: Eastern ratsnake versus Northern Black Racer

Feature	Eastern Ratsnake <i>(Pantherophis alleghaniensis)</i>	Northern Black Racer <i>(Constrictor coluber)</i>
Dorsum coloration	Black, faint trace of spotting pattern	Dorsum plain black (no pattern in adult)
Venter coloration	Varying amounts of white and a hint of a checkerboard pattern	Venter dark gray, sometimes black or steely blue. Underside of head & neck white.
Eye characteristic	Smaller, lighter-colored eye	Large, dark eye
Scales	Weakly keeled	Smooth
Body form	Shaped like a bread loaf in cross-section	Body round in cross-section
Body function	Good climbers!	Very visual predators that move quickly!
Juveniles	Postocular stripe that stops at mouth & is entirely dark (resembles a mask or bandana); patterning continues onto posterior half of tail	Large eyes; no dorsal patterning on the posterior half of tail
Others to watch out for...		
- The eastern kingsnake (<i>Lampropeltis g. gutela</i>) is black, but has white or cream-colored crossbands that create a chain-like pattern.		
- There are also melanistic phases of timber rattlesnake and eastern hog-nosed snake.		

Table 14. “Red-brown and blotchy snakes”: Eastern milksnake vs. Red cornsnake vs. Mole kingsnake vs. Northern watersnake

<p style="text-align: center;">Eastern Milksnake <i>(Lampropeltis triangulum triangulum)</i></p>	<p style="text-align: center;">Red Cornsnake <i>(Pantherophis guttatus)</i></p>
<ul style="list-style-type: none"> - A, Y, U, or V-shaped light patch on nape - 3 or 5 rows of reddish-brown, black-bordered blotches down the body - Overall strongly blotched with 32+ blotches on body - Venter has a black and white checkerboard pattern - Smooth scales 	<ul style="list-style-type: none"> - Arrowhead pattern on head (dorsal view) - Postocular stripe extends below the mouth (<i>P. alleghaniensis</i> (juvenile) has stripe that ends at mouth) - Dorsal background color is gray, brown, orangish brown (wild populations) - Rectangular red to reddish brown blotches that are typically bordered w/black. There are smaller more irregular blotches on the sides. - Venter black and white checkered pattern - Body shaped like mailbox or breadloaf in cross section - Weakly keeled scales
<p style="text-align: center;">Mole Kingsnake <i>(Lampropeltis calligaster rhombomaculata)</i></p>	<p style="text-align: center;">Northern Watersnake <i>(Nerodia sipeidon sipeidon)</i></p>
<ul style="list-style-type: none"> - Small head that is not distinct from neck - Dorsal background light to dark brown which may have yellow or greenish hues on sides - Up to 71 well-separated reddish-brown, dark-edged spots down back (or may be lacking altogether) - Smooth scales 	<ul style="list-style-type: none"> - Extremely variable coloration and patterning - Dorsum of the body and tail have a variable number of complete, closely-spaced, dark crossbands and blotches; blotches occasionally touch - Venter w/2 irregular rows of half moons - Strongly keeled scales - Typically aggressive when threatened

Table 15. “What’s small, black, & white/yellow, & red all over?”: Northern scarletsnake vs. Coastal Plain milksnake vs. Scarlet kingsnake vs. Rainbowsnake

<p style="text-align: center;">Northern Scarletsnake <i>(Cemophora coccinea copei)</i></p>	<p style="text-align: center;">Coastal Plain Milksnake <i>(Lampropeltis triangulum temporalis)</i></p>
<ul style="list-style-type: none"> - Upper jaw protrudes noticeably beyond the lower jaw - Bold red, black-bordered blotches on a yellow, cream, or gray background - Distinct black band lies across the head, behind the eyes - Venter white or yellowish and unpatterned 	<ul style="list-style-type: none"> - 31 or fewer blotches that appear as bands when viewed from above - Full or partial neck collar - Lack patterning at nape when compared to <i>L.t. triangulum</i>
<p style="text-align: center;">Rainbowsnake <i>(Farncia e. erytrogramma)</i></p>	<p style="text-align: center;">Scarlet kingsnake <i>(Lampropeltis t. elapsoides)</i></p>
<ul style="list-style-type: none"> - Longitudinal stripes on dorsum - Paired rows of small black spots on venter - Glossy and iridescent (like a Brazilian rainbow boa) - State endangered 	<ul style="list-style-type: none"> - Bands of yellow, black, and red - Black bands separate the other two colors - Red snout (coral snake has black snout/face) - * not confirmed in Maryland

Table 16. “Small and brown snakes”: Northern brownsnake vs. Northern red-bellied snake vs. Eastern wormsnake vs. Eastern smooth earthsnake vs. Mountain earthsnake

Northern brownsnake (<i>Storeria dekayi dekayi</i>)	Northern red-bellied snake (<i>Storeria occipitomaculata occipitomaculata</i>)
<ul style="list-style-type: none"> - Two parallel rows of blackish spots down the back - Dark downward streaks on the side of the head, behind the eye - Belly virtually unmarked - Juveniles have incomplete light ring around neck - Keeled scales - Throughout MD 	<ul style="list-style-type: none"> - Three pale/light-colored spots on the nape of the neck (do not match venter) - Belly is most often red, but can be orange, pale yellow, or even blue-black - Keeled scales - Throughout MD (spotty; rare on coastal plain)
Eastern Wormsnake (<i>Carphophis amoenus amoenus</i>)	Eastern Smooth Earthsnake (<i>Virginia valeria valeria</i>)
<ul style="list-style-type: none"> - Small, pointed head - Smooth & iridescent - Tail ends in short spine - Venter typically pink - Statewide w/exception of far Western Md 	<ul style="list-style-type: none"> - Tiny dark spots; not in parallel rows - Underside of head, body, and tail are plain white, grayish, or yellowish - No spine on tail - Scales smooth (except for faint keels on back above cloaca) - Piedmont and coastal plain (western shore) of MD
Mountain Earthsnake (<i>Virginia valeria pulchra</i>)	Other superficially similar species...
<ul style="list-style-type: none"> - Resembles <i>V.v. valeria</i> - Weakly keeled scles - Different scale row count (17 midbody & posteriorly : 15 anteriorly) - Far Western MD; Endangered 	<ul style="list-style-type: none"> - Northern ring-necked snakes are most often black with a complete ring that matches the yellow or orange belly. - Southern ring-necked snakes differ from the northern subspecies by having an incomplete/broken ring, black half-moons down the center of the venter, and small black spots on the chin and lips

Table 17. “Striped snakes”: Eastern gartersnake vs. Common ribbonsnake vs. Queen snake

Eastern Gartersnake (<i>Thamnophis sirtalis sirtalis</i>)	Common Ribbonsnake (<i>Thamnophis sauritus sauritus</i>)	Queen Snake (<i>Regina septemvittata</i>)
<ul style="list-style-type: none"> - Bold mid-dorsal/ longitudinal stripe - Pale lateral stripes - Two rows of dark spots alternating between stripes - Variable patterning - Stockier build than <i>T. s. sauritus</i> - Statewide and Common 	<ul style="list-style-type: none"> - Three bold cream, yellow, or greenish longitudinal stripes - Yellowish spot in front of each eye - Long tail (>1/3 Total Length) - Very slightly built - Statewide (but uncommon in Western MD) 	<ul style="list-style-type: none"> - Yellow stripe along lower side of body (at lower jaw level) - Striped belly (yellow w/brown (4) - Stripes down the back (may be difficult to see) - Keeled scales - Most common in Piedmont and Western MD (some Northern Coastal Plain)

Literature Cited

Species names in accordance with:

Crother, B.I. (ed.). 2008. Scientific and Standard English Names of Amphibians and Reptiles of North America North of Mexico, pp. 1-84. SSAR Herpetological Circular 37.

Figures from:

1. Petranksa JW. 1998. Salamanders of the United States and Canada. Washington and London: Smithsonian Institution Press. 587 pp.
2. Stranko S, S Smith, L Erb, and D Limpert. 2010. A key to the reptiles and amphibians of Maryland. Produced by Maryland Department of Natural Resources, Chesapeake Bay and Watershed Programs, Monitoring and Non-tidal Assessment Division.
3. Photos as credited.

Recommended Reading

Gratitude to Scott A. Smith for his compilation; categorized and updated by Rachel Gauza.

Websites & Online Materials

- [AZA] Association of Zoos and Aquariums. Species list by state and territory. Available online: www.aza.org/states-and-territories
- Altig R, RW McDiarmid, KA Nichols, PC Ustach. Tadpoles of the United States and Canada: A Tutorial and Key. Available online: www.pwrc.usgs.gov/tadpole/
- Davidson College. Amphibians and reptiles of North Carolina. Available online: www.herpsofnc.org/herpcons.html
- eNature. FieldGuides. Reptiles and amphibians. Available online: www.enature.com/fieldguides/view_default.asp?curGroupID=7&shapeID=1056
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- Towson University Department of Herpetology. Herpetofauna of Maryland Series. Available online: wwwnew.towson.edu/herpetology/index.htm
- [USGS] United States Geological Survey. National Amphibian Atlas (NAA). Available online: www.pwrc.usgs.gov:8080/mapserver/naa
- [VHS] Virginia Herpetological Society. Herpetofauna of Virginia Series. Available online: www.virginiaherpetologicalsociety.com

Frog & Toad Calls

In addition to some of the online guides above (i.e., Davidson College, eNature, MDDNR, VHS), recordings and/or practice quizzes are also available from the following:

- Cornell Lab of Ornithology. Voices of the night: The calls of the frogs and toads of eastern North America. Audio guide.
- Elliot L, C Gerhardt, and C Davidson. 2009. The frogs and toads of North America, a comprehensive guide to their identification, behavior and calls. Houghton Mifflin Harcourt, New York, NY. 343 pp + CD.
- [USGS] United States Geological Survey. North American Amphibian Monitoring Program (NAAMP). Frog call look up and quiz: www.pwrc.usgs.gov/frogquiz

Field Guides

- Behler JL and FW King. 1979. The Audubon Society field guide to North American reptiles and amphibians. Alfred A. Knopf, Inc. New York, NY. 743 pp.
- Conant R and J Collins. 1998. A Field Guide to Reptiles and Amphibians of Eastern and Central North America. 3rd Edition. Peterson Field Guide Series. Houghton Mifflin. 616 pp.
- Gibbs JP, AR Breish, PK Ducey, G Johnson, JL Behler, and RC Bothner. 2007. The amphibians and reptiles of New York state: identification, natural history, and conservation. Oxford Univ. Press, New York, NY. 422 pp.
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Local Public Participation in Scientific Research (PPSR) Programs for Herpetofauna

- FrogWatch USA™ - www.frogwatch.org or www.aza.org/frogwatch
- North American Amphibian Monitoring Program (NAAMP) - www.pwrc.usgs.gov/naamp/
- Maryland Amphibian and Reptile Atlas (MARA) - www.marylandnature.org/mara

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