

# Maryland Envirothon: Class Amphibia & Reptilia

WILDLIFE AND HERITAGE  
SERVICE



Nov 2024 edit by K. Gorsuch/S. Wilcher, original author Kerry Wixted, all photos by K. Wixted unless otherwise stated.  
Note: All scientific names are per field guide editions used by Envirothon; taxonomy may have changed.

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## Amphibia Overview

- >40 species in Maryland
- Anura (frogs & toads)
- Caudata (salamanders & newts)
- Lay soft, jelly-like eggs (no shell)
- Have larval state with gills
- Breathe & drink through skin



**Note:** This guide is an overview of select (not comprehensive) species found in MD.

Gray Treefrog

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## Anura

- ~20 species in Maryland
- Frogs & toads
- Short-bodied
- Tailless (as adults)
- Typically lay eggs in water & hatch into aquatic larvae



Order: Anura

Green Treefrog

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## Family Bufonidae (Toads)



Photo by Larry Chisholm/CC BY 2.0

**American Toad (*Anaxyrus americanus*)**  
 2-3.5"; typically 1-2 spots/ wart; parotoid gland is separated from the cranial crest or connected narrowly by a spur; enlarged warts on tibia.  
**Call:** an elongated trill or whir lasting 5-30 seconds and resembles a simultaneous whistle and hum

**Fowler's Toad (*Anaxyrus fowleri*)**  
 2-3"; typically 3+ spots/ wart; parotoid gland is in contact w/ the cranial crest;  
**Call:** a short, brash and whiny call lasting 2-4 seconds

Order: Anura; Family: Bufonidae

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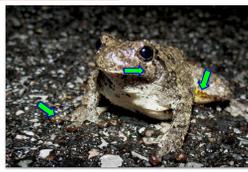
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## Family Hylidae (Treefrogs)



**Spring Peeper (*Pseudacris crucifer*)**  
 0.75 - 1.25"; Brown, tan, or yellowish with dark X-shaped mark on back; Dark bar between eye; Mask from nose through eye and tympanum, often extending down side  
**Call:** Clear, shrill, high-pitched whistle or peep

**Gray Treefrog & Cope's Gray Treefrog (*Hyla versicolor* & *Hyla chrysoscelis*)**  
 1.25 - 2" (Identical in appearance); Gray to white with darker streaking, resembling a tree knot; Cream square below each eye; inner thigh yellow or orange; enlarged toe pads;  
**Call (*H. versicolor*):** Musical, bird-like trill  
**Call (*H. chrysoscelis*):** Rapid, ratchet-like trill

Order: Anura; Family: Hylidae

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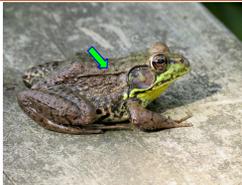
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## Family Ranidae (True Frogs)



**Green Frog (*Lithobates clamitans*)**  
 2.25 - 3.5"; Underside white (or yellow in breeding males); dorsolateral ridges on the back end before reaching the groin  
**Call:** Short and accented multi-part call, bursts of sound akin to the plucking of a banjo string

**Bullfrog (*Lithobates catesbeianus*)**  
 3.5 - 6+"; Underside white with mottling (or yellow in breeding males); no dorsolateral ridge  
**Call:** Deep pitched, resembling the bellow of a bull

Order: Anura; Family: Ranidae

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## Caudata

- > 20 species in Maryland
- North America has more salamander species than the rest of the world combined!
- Undergo metamorphosis



Order: Caudata

Marbled Salamander

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## Family Ambystomatidae (Mole Salamanders)



**Marbled Salamander** (*Ambystoma opacum*)

3.5 – 5.5"; Has a stout body with light gray (female) or white (male) crossbars on dark gray to black body; breeds in the fall at the edge of small, shallow wetlands (vernal pools); lives in woodland habitat and spends most time underground

Order: Caudata; Family: Ambystomatidae

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## Ambystomatidae (Mole Salamanders)



**Eastern Tiger Salamander** (*Ambystoma tigrinum*)  
7 – 8.25"; Dull black to deep brown with irregular light olive or yellowish brown spots extending down sides; breeds in winter; **State Endangered**



**Spotted Salamander** (*Ambystoma maculatum*)  
4.5 - 8"; Black or dark gray with paired yellow spots; spots occasionally orange or absent; found in hardwood forests & breeds in early spring

Order: Caudata; Family: Ambystomatidae

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## Family Cryptobranchidae

### Eastern Hellbender (*Cryptobranchus alleganiensis*)

- State Endangered
- Up to 29" in length
- Flat head, sides w/ wrinkled flesh folds
- Clear, flowing streams



Order: Caudata; Family: Cryptobranchidae

Photos By Dave Kazzyk

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## Family Plethodontidae

### Eastern Red-backed Salamander (*Plethodon cinereus*)

- 2.25 - 4" in length
- Salt & pepper pattern on belly
- Has striped (with reddish mid-dorsal stripe) & leadback variants (uniformly dark gray-black)
- One of most abundant vertebrates in North America



Order: Caudata; Family: Plethodontidae

Redback (top) and Leadback (bottom & right)

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## Family Salamandridae

### Red-spotted Newt (*Notophthalmus viridescens*)

- 2.25 - 4.8" in length
- Aquatic or semi-aquatic adults olive green with red spots outlined in black
- Terrestrial juveniles (efts) orange-red or brownish with red spots outlined in black
- Skin is granular in appearance compared to other salamander species



Order: Caudata; Family: Salamandridae

Adult (top) and Eft (bottom)

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## Reptilia Overview

- >50 species in Maryland
- Testudines (turtles)
- Squamata (lizards & snakes)
- Lack aquatic larval stage
- Have scaly skin
- Lay eggs w/ shells or give live birth



Eastern Snapping Turtle

**Note:** This guide is an overview of select (not comprehensive) species found in MD.

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## Testudines

- ~22 species in Maryland
- Upper part of shell= carapace
- Lower part of shell= plastron
- Scales= scutes
- Largest species= leatherback sea turtle



Order: Testudines

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## Family: Chelydridae

### Eastern Snapping Turtle (*Chelydra serpentina*)

- 8-19" carapace length
- Long neck and big head with powerful jaws
- Skin covered in many bumps and tubercles
- Long tail with three rows of spiky tubercles
- Rear of shell is saw-toothed



Juvenile & Adult Snapping Turtle

Order: Testudines; Family: Chelydridae

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## Family Emydidae

- ~12 species in Maryland
- Includes box turtle, sliders, terrapins, and more
- Many are adapted for swimming



Order: Testudines; Family: Emydidae

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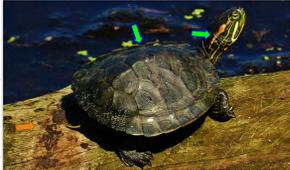
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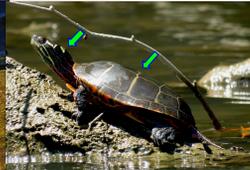
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## Pond Turtles



**Red-eared Slider**  
(*Trachemys scripta elegans*)

- 5-8"; **invasive**; plastron yellow with dark blotches; has broad reddish-stripe behind eye in most individuals



**Eastern Painted Turtle**  
(*Chrysemys picta picta*)

- 4.5-8"; plastron yellow and lightly spotted; scutes on carapace almost in straight lines across back

Order: Testudines; Family: Emydidae

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## Spotted Turtle (*Clemmys guttata*)



- 3.5-4.5" carapace
- Yellow spots on shell



- Head & neck w/ yellow or orange spots
- Found in shallow, marshy meadows and bogs, swamps and small ponds

Order: Testudines; Family: Emydidae

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## Bog Turtle (*Glyptemys muhlenbergii*)

- Federally Threatened
- State Threatened
- 3-4" carapace
- Orange patches on sides of head
- Lives in sphagnum bogs and open swamps



Photo by USFWS

Order: Testudines; Family: Emydidae

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## Eastern Box Turtle (*Terrapene carolina*)

- 4.5 - 6" carapace
- High, domelike shell
- Extremely variable in color & pattern
- 4 toes on hindlimbs
- Female:
  - Eyes normally brown
  - Flat plastron
- Male:
  - Eyes often red
  - Central concave on plastron
- Woodlands and thickets= habitat



Order: Testudines; Family: Emydidae

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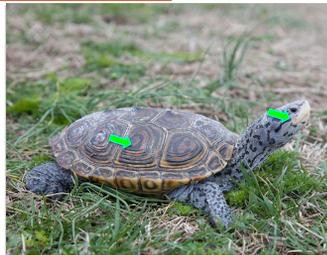
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## Northern Diamond-backed Terrapin (*Malaclemys terrapin terrapin*)

- Female: 6 - 9.3" carapace
- Male: 4 - 5.5" carapace
- Concentric grooves and ridges or concentric dark and light markings on each carapace scute
- Skin coloration is cream or light silver to dark gray or black, often with dark spotting
- Light-colored beak, sometimes with dark "mustache"
- MD state reptile
- Coastal marsh habitat



This Photo by Unknown Author is licensed under CC BY-SA

Order: Testudines; Family: Emydidae

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## Squamata

- ~33 species in Maryland
- “Scaled reptiles”
- Lizards & snakes
- Introduced:
  - Mediterranean Gecko



M. Gecko by Jim Brighton, Maryland Biodiversity Project



Order: Squamata

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## Family Phrynosomatidae

### Eastern Fence Lizard (*Sceloporus undulatus*)

- 4-7.25" in length
- Heavily keeled scales
- Dark, lateral cross bars (horizontal stripes)
- Females are gray with darker cross bars
- Males may be brownish with very faint crossbars (if present) and an iridescent blue and black patch at the base of the throat and on each side of the belly



Male Eastern Fence Lizard

Order: Squamata; Family: Phrynosomatidae

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## Family Teiidae

### Six-lined Racerunner (*Aspidoscelis sexlineatus*)

- 6-10.5" in length
- Slender body w/ very long tail
- Six light-colored stripes from the head through the tail
- Sandpaper-like scales on body; keeled scales on tail which appear rough
- Open areas with sand or loose soil= habitat



Six-lined Racerunner

Order: Squamata; Family: Teiidae

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## Snakes of Maryland

Two species, the Eastern Copperhead and the Timber Rattlesnake, are pit vipers (Family Viperidae, Subfamily Crotalinae) and possess medically significant venom. Pit vipers are named for the heat-seeking pit between each eye and nostril. Both of Maryland's pit vipers should be treated with caution and should not be approached or handled. The graphic on the left, and the associated table below, show characteristics of pit vipers in Maryland versus other Maryland snakes. These characteristics do not work for venomous snakes outside of Maryland! For more information on snakes, please visit: [dnr.maryland.gov/wildlife](http://dnr.maryland.gov/wildlife)



Other Maryland Snake ID Characters	Pit Viper ID Characters
1. Round pupils	1. Elliptical pupils
2. No sensory pit	2. Sensory pit between eye and nostril
3. Head slightly wider than neck*	3. Head much wider than neck*
4. Divided anal plate scale**	4. Single anal plate scale**
5. Double row of scales on the underside of tail**	5. Single scales on underside of tail**

\* Some snake species, like Eastern Ratsnakes, Common Watersnakes, and Common Gartersnakes will flatten their heads when threatened to mimic pit vipers. Ratsnakes will also vibrate their tails to mimic rattlesnakes.  
 \*\* These characteristics are helpful when examining shed snake skins.

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## Family Colubridae

- Egg-laying snakes
- Includes ratsnakes, racers, green snakes, and more



Eastern Ratsnake

Order: Squamata; Family: Colubridae

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## Eastern Ratsnake (*Pantherophis alleghaniensis*)



**Juvenile:** Grayish with dark blotches along back. Has dark bar between eyes that continues past the eye to corner of mouth.

**Adult:** 42-72"; Uniform black on top or with faint traces of a spotted pattern. Throat and underside light colored. Adept climber.

Order: Squamata; Family: Colubridae

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## Northern Black Racer (*Coluber constrictor constrictor*)



**Juvenile:** Strongly patterned, like watersnakes and ratsnakes, but have more blotches down the back, a set of blotches along the centerline and proportionally larger eyes, an adaptation for open field hunting.

**Adult:** 36 - 60"; Sleek in appearance. Plain black above and steely gray to black below. Often white coloration seen on the chin. Large prominent eye.

Order: Squamata; Family: Colubridae

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## Family Dipsadidae

- Formerly in Colubridae
- Rear-fanged snakes
- Small to moderately sized



**Eastern Wormsnake**  
(*Carphophis amoenus amoenus*)

7.5-11"; brown above w/ pink belly; tail ends in sharp spine; scales smooth; found in woodland habitats

Order: Squamata; Family: Dipsadidae

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## Family Dipsadidae: Ring-necked Snakes

### Northern Ring-necked Snake (*Diadophis punctatus edwardsii*)

10-15"; Back is a uniform dark gray, bluish black or brown. Has cream-to-yellow or orange neck collar and yellow belly, which may grade to red towards the tail. Has complete neck ring and belly has no or small black spots down the midline.



Photo by: Lina Phu

### Southern Ring-necked Snake (*Diadophis punctatus punctatus*)

10-15"; Back is a uniform dark gray, bluish black or brown. Has cream-to-yellow or orange neck collar and yellow belly, which may grade to red towards the tail. Has broken or notched neck ring behind head and belly has large, black half-moon shaped spots down the midline.



Photo by: Matt Dove

Order: Squamata; Family: Dipsadidae

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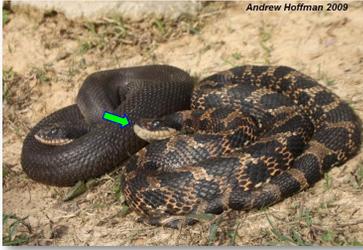
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## Eastern Hog-nosed Snake (*Heterodon platirhinos*)

- 20-30" in length
- Coloration variable with yellow, brown, gray, orange or red on a dark splotch-patterned back
- Some are an un-patterned ebony black or dark grey
- Snout upturned
- Often will flatten out head, hiss, pretend to strike and/or play dead if disturbed



Order: Squamata; Family: Colubridae

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## Family Natricidae

- Formerly in Colubridae
- Harmless, live-bearing snakes

### DeKay's Brownsnake (*Storeria dekayi*)

Small, brownish/gray snake with small, paired black spots running down the back. A thin dark line extends from the back of the head behind the eye to the base of the jaw. Juveniles have a light band across their neck.



Order: Squamata; Family: Natricidae

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## Northern Watersnake (*Nerodia sipedon sipedon*)



22-42"; pattern highly variable with variations including bands that are thicker at the top and thinner at the bottom, incomplete bands or no bands. Has dark lip stripes. Often mistaken for cottonmouth (water moccasin) which does not occur in Maryland.

Order: Squamata; Family: Natricidae

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## Family Viperidae

- All are venomous
- Heads are wider than the neck
- Possess facial pits between eye & nostrils
- Scales under tail are in a single row



Timber Rattlesnake

Order: Squamata; Family: Viperidae; Subfamily: Crotalinae

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## Eastern Copperhead (*Agkistrodon contortrix*)

- 24-36"
- Has Hershey-kiss shaped markings that are skinny at the top and wider at the base
- Head is coppery in color with a contrasting upper lip
- Juveniles have bright yellow caudal lure



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Order: Squamata; Family: Viperidae; Subfamily: Crotalinae

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## Timber Rattlesnake (*Crotalus horridus*)

- 36-60"
- Found in western Maryland
- Color variable from light and striped to almost dark black with jagged stripes
- Has distinct rattle at end of tail
- Found in wooded areas near rocky outcroppings



Photo by Peter Penness CC BY 2.0

Order: Squamata; Family: Viperidae; Subfamily: Crotalinae

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## Juvenile Snake Comparisons



Northern Copperhead

North American Racer

Eastern Ratsnake

Common Watersnake

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## Preventing Snake Bites

Snake bites are not common, but it is important to be aware they can occur and how to deal with them. Below are some tips on how to avoid being bitten:

1. Learn how to identify the [copperhead](#) and the [timber rattlesnake](#).
2. When hiking or camping, watch where you put your hands and feet. Be mindful of where you sit and where you place your sleeping bag.
3. Wear suitable clothing when hiking, especially through tall grass or heavy brush. Long pants and heavy boots are usually best in tall grass and heavy brush.
4. Avoid rock piles and stacks of old boards or wood in forested areas as snakes use these areas frequently, especially sunny areas with canopy gaps.
5. Be careful working around brush piles or other debris. Use a rake or long handled tool to move brush, debris, or other material before picking it up.
6. Never handle venomous snakes, alive or dead.
7. Leave snakes alone. Many bites occur when people attempt to capture or kill venomous snakes.

If bitten by a venomous snake, immediately contact:

**Maryland Poison Center**  
800-222-1222

Open 24 hours a day and staffed by pharmacists or nurses who are specially trained and certified in emergency poisoning and overdose cases. Do not apply ice, a tourniquet, or make an incision around the wound as these methods do not work and may cause complications.

[https://dnr.maryland.gov/wildlife/Pages/plants\\_wildlife/serp/venomous-snakes.aspx](https://dnr.maryland.gov/wildlife/Pages/plants_wildlife/serp/venomous-snakes.aspx)




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## Ranavirus

- Viruses that impact cold-blooded animals
- Larval wood frogs, spotted salamanders and marbled salamanders have experienced the most mortality
- 1<sup>st</sup> significant box turtle die-off in Maryland in 2008
- Disinfection of equipment (boots, waders, etc) before entering wetlands is recommended
  - Protocol: <https://northeastparc.org/docs/NEPARC-Field-Equipment-Disinfection-Protocol.pdf>



Eastern box turtle w/ Ranavirus  
by Scott Farnsworth

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## For Additional Information

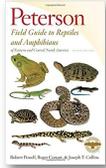
Special thanks to Rachel Gauza for assistance putting together this guide. For more information on Maryland's reptiles and amphibians, please visit our webpage at: [dnr.maryland.gov/wildlife](http://dnr.maryland.gov/wildlife). Additional information can be found in the following resources.

### Book Resources:

- The Maryland Amphibian and Reptile Atlas
- Peterson Field Guide to Reptiles and Amphibians of Eastern and Central North America, 4th Ed

### Online Resources:

- [Maryland Environment \(Wildlife and Heritage Service\)](#)
- [Maryland Biodiversity Project \(Amphibians\)](#)
- [Maryland Biodiversity Project \(Reptiles\)](#)
- [Virginia Herpetological Society](#)



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For questions about this presentation, contact Sarah Wichee at [sarah.wichee1@maryland.gov](mailto:sarah.wichee1@maryland.gov).

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