A Key to the Amphibians and Reptiles of Maryland

Martin O'Malley
Governor

MARYLAND

Anthony G. Brown
Lt. Governor

A message to Maryland's citizens

The Maryland Department of Natural Resources (DNR) seeks to preserve, protect and enhance the living resources of the state. Working in partnership with the citizens of Maryland, this worthwhile goal will become a reality. This publication provides information that will increase your understanding of how DNR strives to reach that goal through its many diverse programs.

John R. Griffin
Secretary

MARYLAND
DEPARTMENT OF
NATURAL RESOURCES

Tawes State Office Building
580 Taylor Avenue
Annapolis, Maryland 21401

Toll free in Maryland: 1-(877)- 620-8DNR ext. 8610
Out of state call: 410-260-8610
TTY via Maryland Relay: 711 (within MD)
800-735-2258 (out of state)
www.dnr.maryland.gov

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A Key to the Amphibians and Reptiles of Maryland

Compiled by:
Scott Stranko
Scott Smith
Lori Erb
Dana Limpert

Illustrations:
David Kazyak

Mapping:
Martin Hurd
Dana Limpert
Lori Erb
Marcia Snyder
Matthew Evans
Jay Kilian
Miguel Dodge

Layout:
Luke Roberson

Cover Photos:
Long-tailed Salamander - Rebecca Chalmers
Queen Snake - Mark Tegges
Cope's Gray Treefrog - Corey Wickliffe
Northern Map Turtle - Jim Harding
Marbled Salamander - Lori Erb
Northern Copperhead - William Harbold

Credits for photos used in species descriptions are included with each photo

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Long-tailed Salamander
Photo: Matt Sell

How to Use this Key

Red-backed Salamander
(Black Morph)
Photo: Matt Sell

This document consists of a dichotomous key and descriptions of physical characteristics that can be used to identify the reptiles and amphibians that are known to exist in Maryland. Distribution maps and photographs are included with descriptions to aid in identification. The general format of the document begins with a dichotomous key to the major taxonomic groups (Classes followed by orders and suborders) of Maryland's reptiles and amphibians. It then consists of a key for identifying the species and subspecies within each order and/or suborder and is followed by more detailed descriptions of the distinguishing characterisitics for the families, species, and subspecies in the group.

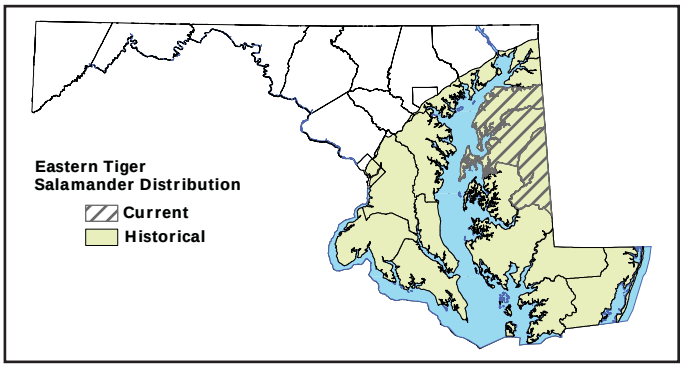
Amphibian and reptile scientific and common names were taken from Scientific and Standard English Names of Amphibians and Reptiles of North America North of Mexico, a Society for the Study of Amphibians and Reptiles circular by Crother, et al. 2008. This publication is officially recognized by the Society for the Study of Amphibians and Reptiles, the American Society of Ichthyologists and Herpetologists and The Herpetologists' League and serves as the official list of scientific and common names for herpetology species of the named organizations.

Crother, B.I. (ed) 2008. Scientific and Standard English Names of Amphibians and Reptiles of North America North of Mexico, with Comments Regarding Confidence in Our Understanding. SSAR Herpetological Circular No. 37. 84 pp.

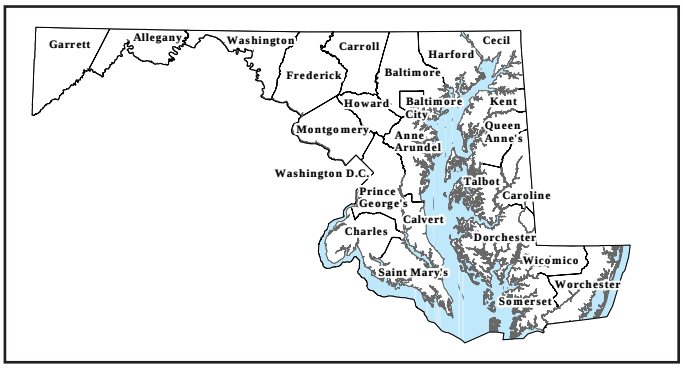
Interpreting Distribution Maps

The distribution maps shown in this document include historical and current distribution information by county. Counties in green represent the historical distribution of the species and counties with hatches represent the current one. The split in current and historical distributions is based on Harris' work on herpetofauna surveys in Maryland, published in 1975. The distribution may only be shown as portions of a county where the species is known only to occur in one of the physiographic regions in a county. Counties and physiographic provinces are referred to frequently when describing the distribution of a species.

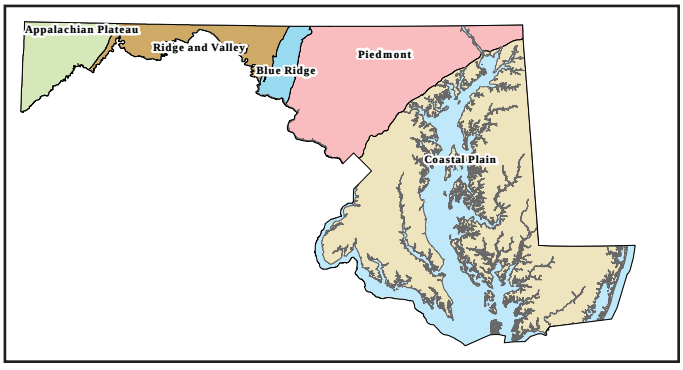
Hypothetical salamander distribution map showing the current and historic range.



Maryland's Counties



Maryland's Physiographic Regions



Dichotomous Key to the Reptiles and Amphbians of Maryland

Eastern Wormsnake
Photo: Corey Wickliffe

Along with personal observations by professional biologists of the reptiles and amphibians of Maryland, the following publications were used to compile the dichotomous key portions of this document:

Bishop, S.C. 1941. The salamanders of New York. New York State Museum Bulletin 324:1-365.

Conant, R., and J.T. Collins. 1998. A field guide to reptiles and amphibians of eastern and central North America, 3rd Edition. Houghton Mifflin, New York. 450 pp.

Harris, H.S., Jr. 1969. Distributional survey (Amphibia/Reptilia): Maryland and the District of Columbia. Bulletin of the Maryland Herpetolotist Society 11:73-167.

Hulse, A.C., McCoy, C.J., and E. Censky. 2001. Amphibians and reptiles of Pennsylvania and the northeast. Cornell University Press, Ithaca, New York. 419 pp.

Petranka, J.W. 1998. Salamanders of the United States and Canada. Smithsonian Institution Press, Washington, District of Columbia and London. 587 pp.

White, J.F., Jr. and A.W. White. 2007. Amphibians and reptiles of Delmarva. Tidewater Publishers, Centerville, Maryland. 248 pp.

Publications that were consulted to write species accounts are listed in the literature cited section at the end of the document.

Key to Maryland's Classes of Herpetofauna

A. Soft glandular skin, no scales or claws on limbs.

Amphibians
(Class Amphibia)
Page 6

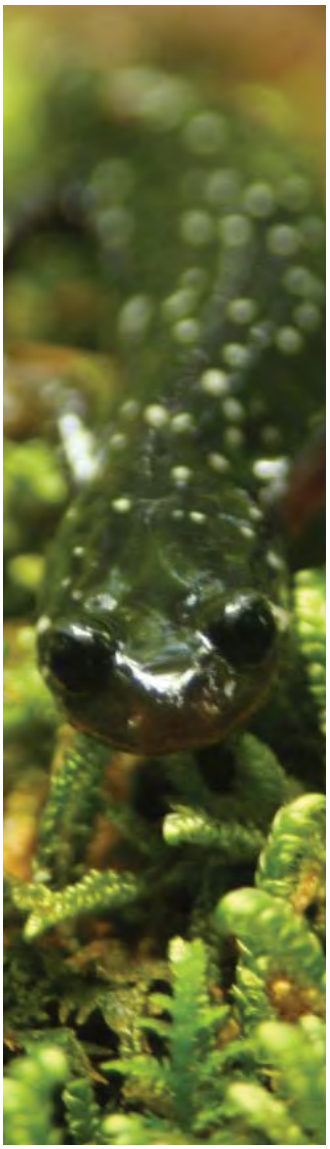
Green Treefrog
Photo: Corey Wickliffe

B. Scales, shields, or plates on body, claws on toes.

Reptiles
(Class Reptilia)
Page 118

Eastern Box Turtle
Photo: Mark Tegges

Key to the Orders of Maryland's Amphibians



Northern Slimy Salamander
Photo: Matt Sell

A. A tail present; two pairs of relatively equal-sized limbs (with the exception of the sirens, which do not occur in Maryland); costal grooves usually present; head usually separated from the body by a discernable neck.

Salamanders
(Order Caudata)
Page 7

B. No tail; hind legs are longer than the front legs and are modified for jumping; costal grooves not present; relatively short body, head not separated from body by a discernable neck.

Adult Frogs and Toads
(Order Anura)
Page 64

C. A tail present; head not separated from body by a discernable neck, costal grooves not present; without legs (except for late in development, just prior to metamorphosis to adult form).

Tadpoles
(Order Anura)
Page 69

A

B

C

Key to the Salamanders of Maryland

1a. External gills present

Aquatic larvae and common mudpuppy.
21

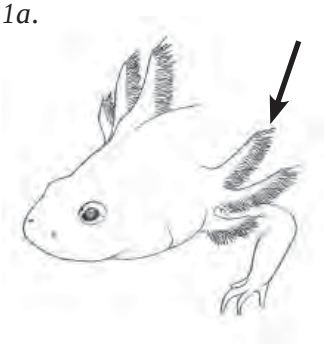
1b. No external gills present

Adults, other than common mudpuppy, and terrestrial larvae.
2

1a. External gills

1b. No external gills

1a.



1b.

2a. Skin relatively rough and granular (sandpaper-like); aquatic adult has olive green to yellowish-brown dorsum with red spots or broken lines; belly light yellow with fine black spotting; terrestrial juvenile bright orange-red to dull red or orange; red spots may only be distinguishable from ground color by the dark line surrounding them.

Red-Spotted Newt
(*Notophthalmus viridescens viridescens*) p. 62

2b. Skin smooth and slimy.

3

3a. Body strongly dorsoventrally compressed; sides of body with wrinkled folds of skin; two small gill slits present, but no external gills. Adults up to 61 cm long.

Eastern Hellbender
(*Cryptobranchus alleganiensis alleganiensis*) p. 28

3b. Body not dorsoventrally flattened; sides without wrinkled folds of skin.

4

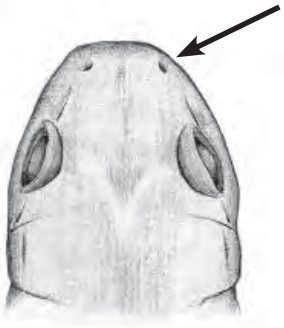
4a. No nasolabial grooves; stout body; rounded head and snout; conspicuous costal grooves; teeth in roof of mouth in a transverse row.

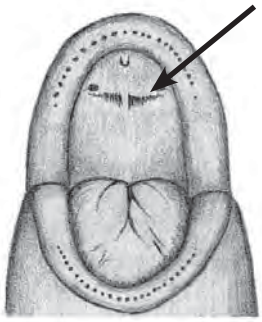
Mole Salamanders
(Ambystomatidae)

4b. Nasolabial grooves present (although they may be difficult to see without magnification); costal grooves not conspicuous; dentition includes a curved, nearly transverse row and an elongated patch that extends posteriorly between the orbits; lungs absent.

Lungless salamanders
(Plethodontidae)
8

4a.





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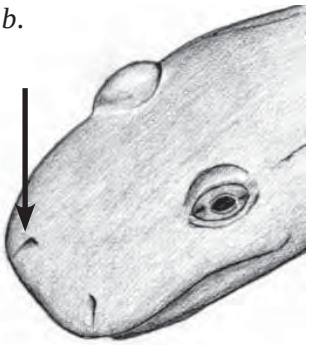
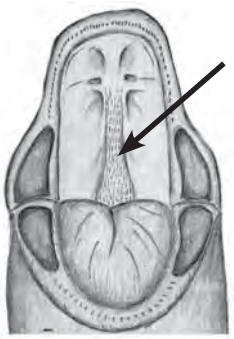




4a. No nasolabial groove; wide tooth patch

4b. Nasolabial groove present; long tooth patch

5a. Venter black; dorsum black with white (male) or gray (female) cross bands.

Marbled Salamander
(*Ambystoma opacum*) p.24

5b. Venter light colored; dorsum without white or gray cross bands.

6

6a. Dorsum with stripes, bold bars, bands, or spots.

7

6b. Dorsum without stripes, bold bars, bands, or spots; fleck-like bluish markings often concentrated along sides and on limbs.

Jefferson Salamander
(*Ambystoma jeffersonianum*) p. 22

7a. Dorsum steel gray to black with large, round, yellow or orange spots forming two irregular rows that extend onto tail (rarely lack spots); head often with either yellow or orange spots; venter medium to light gray; 11-13 costal grooves.

Spotted Salamander
(*Ambystoma maculatum*) p. 26

7b. Dorsum highly variable (three basic patterns): (1) gray or black with large greenish to yellowish bars, blotches, spots, or marbling, (2) yellowish with black bars or blotches, (3) brownish to gray with small dark spots or no markings; venter often spotted or blotched, usually yellow with dark marbling; if spotted, spots not arranged in two paired irregular rows.

Eastern Tiger Salamander
(*Ambystoma tigrinum tigrinum*) p. 20

8a. Rear limbs conspicuously larger than front limbs; pale diagonal line from eye to angle of jaw; costal grooves usually 14 (rarely 13).

Desmognathus spp. 9

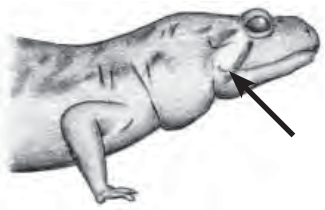
8b. Rear limbs not conspicuously larger than front limbs; no pale diagonal line from eye to angle of jaw; number of costal grooves variable.

11

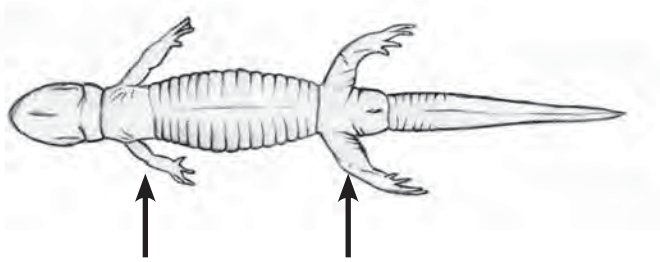
8a. Pale diagonal line from eye to angle of jaw

8b. Rear limbs conspicuoulsly larger than front limbs

8a.



8b.



9a. Midpoint of tail rounded or oval in cross section; keel absent from tail; adults often less than 100 mm in total length (TL); most specimens have relatively straight dorsolateral stripes and often have a row of middorsal melanophore patches that are frequently chevron-shaped.

Allegheny Mountain Dusky Salamander (*Desmognathus ochrophaeus*) p.34

9b. Midpoint of tail at least somewhat triangular in cross section; keel present on posterior half of tail; adults often greater than 100 mm TL.

10

9a. Midpoint of tail rounded or oval in cross-section

8b. Midpoint of tail somewhat triangular in cross-section

9a.

9b.

10a. Digit tips with darkened friction pads and appearing grayish-black to black; belly whitish to light gray and uniformly colored; dorsum often with bold, dark, wormy marks or spots on a lighter ground color; tail rounded near base.

Seal Salamander (*Desmognathus monticola*) p. 38

10b. Digit tips lacking friction pads and appearing white or light gray; venter cream-colored, with varying amounts of brown mottling; dorsum often conspicuously blotched or striped and if unblotched, then suffused with brown.

Northern Dusky Salamander
(*Desmognathus fuscus*) p. 36

11a. Four toes on each hind foot; tail with a conspicuous constriction near the base; belly distinctly white with black spots.

Four-Toed Salamander
(*Hemidactylium scutatum*) p. 50

11b. Five toes on each hind foot; tail without a constriction near the base; belly not white with large black spots (although may be white and black mottled or with a salt and pepper pattern).

12

12a. Tail triangular in cross section (often only on posterior half); dorsal ground color often reddish, yellowish, or brownish; belly usually light colored.

13

12b. Tail rounded or oval in cross section along entire length; dorsal ground color dark gray to black (often overlain with dorsal stripe, blotches, light spotting, or flecking).

17

13a. Dorsal coloration yellowish or brown; body slender; costal grooves 13-16.

14

13b. Dorsal coloration red, salmon, or orangish with dark spots or faint reticulations (may be rusty red to reddish-brown in old animals); body stout; 16-19 coastal grooves.

15

14a. Tail greater than 50% TL; dorsum bordered by mottled bands on sides and tail with herringbone pattern along sides.

Long-tailed Salamander
(*Eurycea longicauda longicauda*) p. 40

14b. Tail less than 50% TL; dorsum with yellowish brown to yellowish orange stripe bordered by two solid, broad bands that extend from the eyes well onto the tail.

Northern Two-lined Salamander
(*Eurycea bislineata*) p. 42

15a. Canthus rostralis, a light line bordered by gray or black extending from eye to nostril present (may be difficult to see); snout squarish; costal grooves 17-19.

Northern Spring Salamander
(*Gyrinophilus porphyriticus porphyriticus*) p. 44

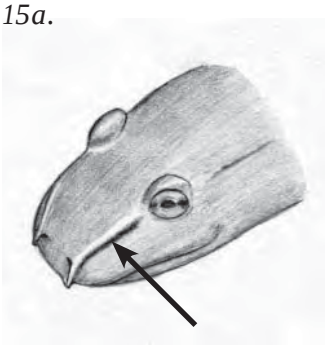
15b. Canthus rostralis absent; snout rounded; costal grooves 16-17.

16

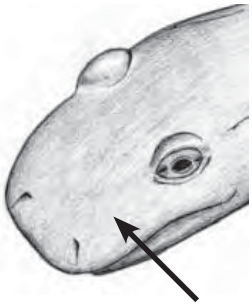
15a. Canthus rostralis present

15b. Canthus rostralis absent

15a.



15b.



16a. Eyes brown; coloration on sides and belly sharply contrasts; dorsum with widely scattered black spots; snout short compared to northern red salamander.

Eastern Mud Salamander
(*Pseudotriton montanus montanus*) p. 46

16b. Eyes gold or yellow; coloration on sides and belly intergrades; dorsum covered with numerous black spots; snout long compared to eastern mud salamander.

Northern Red Salamander
(*Pseudotriton ruber ruber*) p. 48

17a. Digits square-tipped and expanded; body appearing flattened; dorsum black to grayish with conspicuous blotches of green or yellow-green, mimicking lichens on rocks.

Green Salamander
(*Aneides aeneus*) p. 52

17b. Digits not square-tipped and expanded; body not appearing conspicuously flattened; dorsal ground color dark gray to black (often overlain with dorsal stripe or light spotting or flecking), but without green or yellow blotches; belly uniformly dark, with salt and pepper dark mottling, or dark with white blotching.

18

17a. Digits square-tipped and expanded

17a.

18a. Costal grooves typically 18 or more; belly not uniformly colored, either dark with white mottling or mottled to produce a salt and pepper pattern.

19

18b. Costal grooves typically 16-18; belly usually lighter than dorsum (uniformly gray) and without mottling.

20

19a. Costal grooves typically 18-19; dorsum often unmarked or with a straight red, yellowish, or brownish stripe; belly mottled to produce a salt and pepper pattern; throat same color as belly.

Eastern Red-backed Salamander
(*Plethodon cinereus*) p. 54

19b. Costal grooves typically 20-22; dorsal ground color brown to brownish black, usually with conspicuous brassy flecks; belly dark with white mottling; throat mostly white.

Valley and Ridge Salamander
(*Plethodon hoffmani*) p. 56

20a. Throat dark and similar in color to belly; dorsum black with conspicuous white spots or brassy flecking; chin rounded; costal grooves 16-17 (rarely 18).

Northern Slimy Salamander
(*Plethodon glutinosus*) p. 58

20b. Throat white or blotched with white and lighter than belly; dorsum with conspicuous brassy spots and flecks and scattered, fine white spots; red spotting sometimes present; costal grooves typically 17-18;

Wehrle's Salamander
(*Plethodon wehrlei*) p. 60

21a. Greater than 130 mm TL; four digits on each foot; dorsum gray to rusty brown with scattered, indistinct spots; venter unspotted or with a few large spots.

Common Mudpuppy Adult
(*Necturus maculosus maculosus*) p. 30

21b. Less than 130 mm TL.

22

22a. Snout broad and depressed; skin appearing loose along sides; digits flattened and fleshy.

Eastern Hellbender larva
(*Cryptobranchus alleganiensis alleganiensis*) p. 28

22b. Snout not broad and depressed; skin not appearing loose along sites; digits not flattened and fleshy.

23

23a. Tail-fin extends well onto the back from the tail; typically found in lentic water systems.

24

23b. Tail-fin terminates on tail or near junction of tail and body; typically found in lotic systems.

29

24a. Four digits on each rear foot; costal grooves 13-14; snout rounded.

Four-toed Salamander Larva
(*Hemidactylium scutatum) p. 50*

24b. Five toes on each rear foot; snout rounded or somewhat pointed in dorsal view.

25

25a. Head rounded in dorsal view; body stout; three gill slits; skin smooth in small and large specimens; keratinized jaw sheath usually present.

Ambystomatidae Larvae
26

25b. Head somewhat pointed in dorsal view; body slender; four gill slits; keratinized jaw sheath absent; skin of large specimens may be granular; conspicuous dark spots on tail.

Red-Spotted Newt Larva
(*Notophthalmus viridescens viridescens*) p. 62

26a. Chin and throat lightly to heavily pigmented. Paired row of light spots along the mid-line of the back.

Marbled Salamander Larva
(*Ambystoma opacum*) p. 24

26b. Chin and throat immaculate.

27

27a. Digits flattened, broad at base; 13-24 gill rakers on third gill arch; larvae often attain lengths of greater than 80 mm TL.

Eastern Tiger Salamander Larva
(*Ambystoma tigrinum tigrinum*) p. 20

27b. Digits rounded in cross section, not broad at base; less than 12 gill rakers on third gill arch; larvae usually less than 80 mm TL.

28

28a. Tail-fin mottled with black; large dark dorsal blotches present in all but large larvae; head conspicuously wider than trunk.

Jefferson Salamander Larva
(*Ambystoma jeffersonianum*) p. 22

28b. Head not conspicuously wider than trunk; tail-fin moderately pigmented but not conspicuously mottled; dorsum drab and lacking large dark blotches.

Spotted Salamander Larva
(*Ambystoma maculatum*) p. 36

29a. Four digits on each rear foot; center of dorsum dark and bordered laterally on each side by a conspicuous yellow stripe; snout angular when seen from top.

Common Mudpuppy Larva
(*Necturus maculosus maculosus*) p. 30

29b. Five digits on each rear foot; center of dorsum not dark and bordered laterally by yellow stripes; snout rounded.

30

30a. Gills without rachises, short and branched from base; four gill slits; tips of digits and soles of feet often keratinized.

31

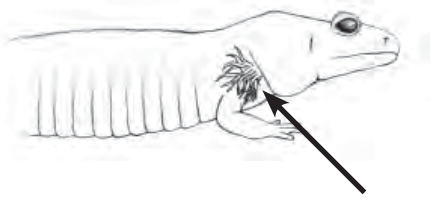
30b. Gills with rachises and with fimbriae throughout length; three or four gill slits; tips of digits and soles of feet not keratinized.

33

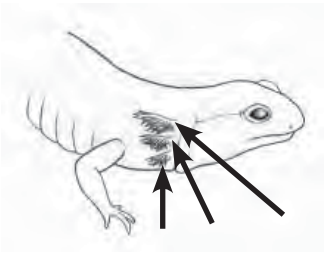
30a. Gills without rachises

30b. Gills with rachises

30a.



30b.



31a. Anterior portion of the dorsum lacking spots and with a pale mid-dorsal stripe, or with two to seven pairs of spots generally restricted to the posterior half of the body; tail fin poorly developed and occurring as a keel on the posterior half of the tail; posterior region of the head with a dark spot (V- or Y- shaped pattern on older larvae) bordered by a pair of round light spots on either side.

Allegheny Mountain Dusky Salamander larva
(*Desmognathus ochrophaeus*) p. 34

31b. Anterior portion of the dorsum with spots; tail fin well developed; no central dark markings bordered by pale round spots on either side of head.

32

32a. Dorsum with 5-10 pairs of light tan to yellowish-colored spots separated by a pale mid-dorsal stripe; tail fin well developed, and extending forward to base of tail.

Northern Dusky Salamander Larva
(*Desmognathus fuscus*) p. 36

32b. Dorsum with 4 or 5 pairs of distinct, light, chestnut-colored spots between the legs without dark margins; underside of tail diffusely blotched; angle of mouth falls within vertical lines from anterior to posterior margins of eyes.

Seal Salamander Larva
(*Desmognathus monticola*) p. 38

33a. Body slender; dorsal ground color light tan; 13-16 costal grooves; dorsal pattern consists of either a mid-dorsal light stripe or a series of paired spots.

34

33b. Body stout; dorsum light brown to flesh-colored; 16-19 costal grooves; if pattern present on dorsum, never consists of a mid-dorsal light stripe or series of paired light spots; parallel lines or streaks not present on sides; venter whitish.

35

34a. Dorsum with 6-9 pairs of light spots; 13-16 costal grooves; venter with margin of dark pigmentation and abundant wavy iridophores.

Northern Two-lined Salamander Larva
(*Eurycea bislineata*) p. 42

34b. Dorsum lacking light spots, but usually has a light, mid-dorsal stripe; typically 14 costal grooves, but may occasionally have 13.

Long-tailed Salamander Larva
(*Eurycea longicauda longicauda*) p. 40

35a. Snout upturned, often with a distinct canthus rostralis; supra-optic lateral line pores arranged in an ellipse; costal grooves 17-19.

Northern Spring Salamander Larva
(*Gyrinophilus porphyriticus porphyriticus*) p. 44

35b. Dorsum with a distinct pattern of small or large dark spots, dots, or reticulations; snout not upturned, bluntly rounded; canthus rostralis never present; supra-otic lateral line pores arranged in a circle; 16-17 costal grooves.

36

36a. Dorsum and sides of older larvae weakly mottled or with black streaks, and usually without distinct spots; typically from small, clear streams.

Northern Red Salamander Larva
(*Pseudotriton ruber ruber*) p. 48

36b. Dorsum and sides of older larvae uniformly brown with widely scattered black spots; typically from muddy ponds, swamps, or sluggish, bottom land streams.

Eastern Mud Salamander Larva
(*Pseudotriton montanus montanus*) p. 46

Salamanders (Order Caudata)

Northern Spring Salamander
Photo - Mark Tegges

Salamanders (order Caudata) are amphibians that possess a tail and two pairs of relatively equal-sized limbs. Costal grooves are usually present along the side of the body and mark the position of the ribs. Unlike frogs (order Anura), salamanders usually have a neck that separates the head from the body.

There are five families and 21 species of salamanders found in Maryland.

The number of costal grooves, the number of toes on the hind foot, and tooth patterns are frequently used to distinguish families and species of salamanders. Dorsal and ventral color pattern, and the presence or absence of spots, mottling, or blotching are also important (however, in some species these are quite variable). The most easily recognizable features for identifying adults, larvae, and eggs of each species of salamander that could be encountered in Maryland are included in the section that follows. Distinguishing characteristics of the mole salamander and the lungless salamander families are also included. The distinguishing characteristics of the other three families are not included because there is only one species in each family. Since there are a large number of species (14) in the lungless salamander family, characteristics that can be used to distinguish certain groups of species within this family are also included.

Status Listing of Maryland Salamanders

Below is a list of the families and species in each family along with the state listing status (Maryland Department of Natural Resources 2010) for the species:

	Common Name	Scientific Name	State Status
Mole Salamanders (Ambystomatidae)	Eastern Tiger Salamander	*Ambystoma tigrinum tigrinum*	Endangered
	Jefferson Salamander	*Ambystoma jeffersonianum*	Watch List
	Marbled Salamander	*Ambystoma opacum*	
	Spotted Salamander	*Ambystoma maculatum*	
Giant Salamanders (Cryptobranchidae)	Eastern Hellbender	*Cryptobranchus alleganiensis alleganiensis*	Endangered
Waterdogs and Mudpuppies (Proteidae)	Common Mudpuppy	*Necturus maculosus maculosus*	Endangered/Extirpated
Lungless Salamanders (Plethodontidae)	Allegheny Mountain Dusky Salamander	*Desmognathus ochrophaeus*	
	Northern Dusky Salamander	*Desmognathus fuscus*	
	Seal Salamander	*Desmognathus monticola*	
	Long-tailed Salamander	*Eurycea longicauda longicauda*	

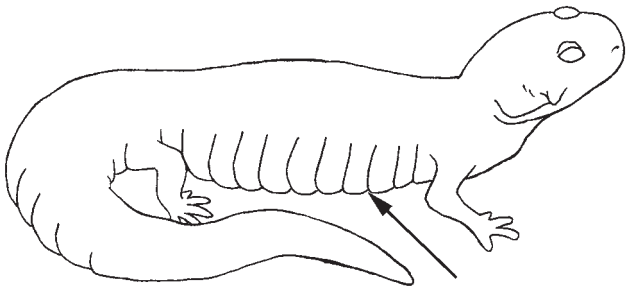
	Common Name	Scientific Name	State Status
Lungless Salamanders (Plethodontidae)	Northern Two-lined Salamander	*Eurycea bislineata*	
	Northern Spring Salamander	*Gyrinophilus porphyriticus porphyriticus*	
	Eastern Mud Salamander	*Pseudotriton montanus montanus*	
	Northern Red Salamander	*Pseudotriton ruber ruber*	
	Four-toed Salamander	*Hemidactylium scutatum*	
	Green Salamander	*Aneides aeneus*	Endangered
	Eastern Red-backed Salamander	*Plethodon cinereus*	
	Northern Slimy Salamander	*Plethodon glutinosus*	
	Valley and Ridge Salamander	*Plethodon hoffmani*	
	Wehrle's Salamander	*Plethodon wehrlei*	In Need of Conservation
Newts (Salamandridae)	Red-spotted Newt	*Notophthalmus viridescens viridescens*	

Mole Salamanders (Family Ambystomatidae)

Mole salamanders are relatively large salamanders. They have stout bodies, rounded heads and snouts, and conspicuous costal grooves. Their name is derived from their use of small mammal burrows for shelter. Only the eastern tiger salamander is a strong enough digger to sometimes excavate its own tunnels.

Mole salamanders have an aquatic larval stage that takes place in lentic, usually ephemeral and almost always fishless, water bodies. Because they live in a lentic environment, the larvae exhibit pond type morphology that consists of large bushy gills and a tail fin that extends well onto the body.

The mole salamanders that can be found in Maryland include the eastern tiger salamander (*Ambystoma tigrinum tigrinum*), Jefferson salamander (A*mbystoma jeffersonianum*), marbled salamander (*Ambystoma opacum*), and spotted salamander (*Ambystoma maculatum*).



Right:
Costal grooves are conspicuous on members of the Mole Salamander Family

Eastern Tiger Salamander

Ambystoma tigrinum tigrinum

Identification

The dorsal coloration of the eastern tiger salamander is highly variable, but usually consists of a very dark brown to black dorsum with a pattern of cream to greenish-yellow blotches that often form bands that extend along the sides. However, some specimens may have no dorsal markings at all or only small dark spots. The eastern tiger salamander is Maryland's second largest salamander. Adults typically range from 15.5 to 24.0 cm in length, and have been found up to 33 cm long (Stine 1954; White and White 2007). There are 12 or 13 costal grooves along each side (Petranka 1998).

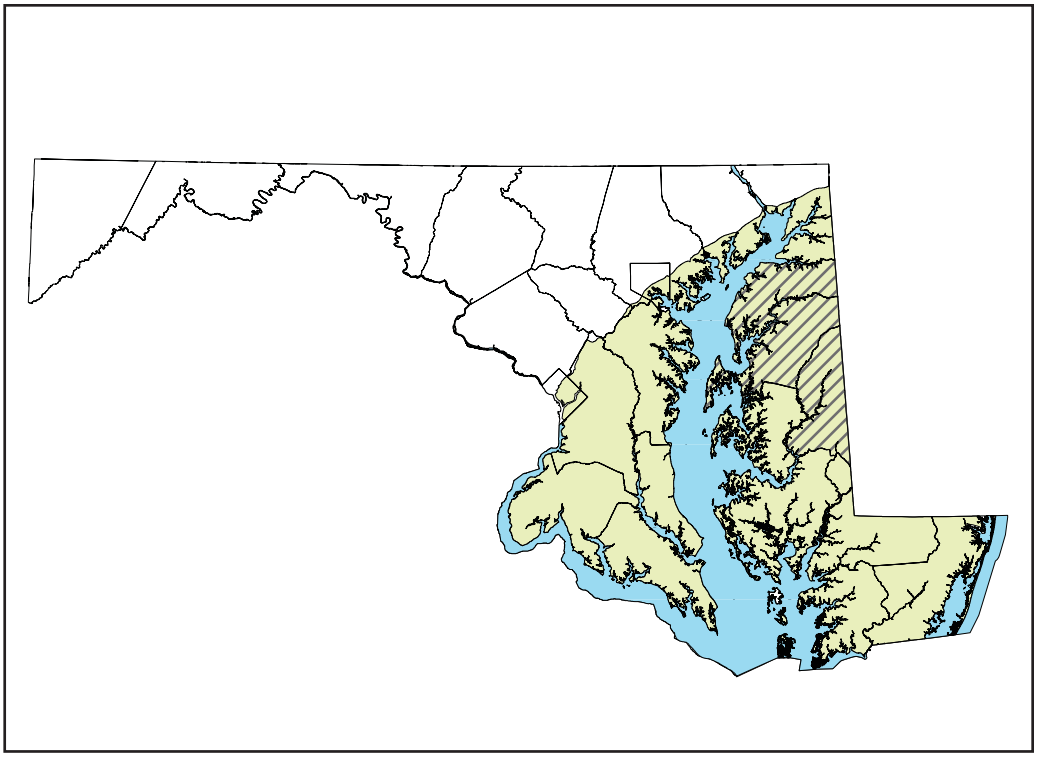
Young

Larval eastern tiger salamanders grow relatively large before metamorphosis. Gilled individuals greater than eight cm long are not uncommon. The chin and throat of larvae are immaculate. The digits are flattened, and are broad at the base (Petranka 1998).

Eggs

Eggs are deposited in masses on twigs, weed stems, and other support structures in ponds. Ova are two to three mm (0.08-0.12 in.) in diameter. Egg masses are firm and globular or oblong in shape and are about 5.5 cm wide and seven cm long on average and may be laid up to one meter deep in ponds (Petranka 1998). Although freshly laid tiger salamander egg masses are firm, they soon loosen and readily slip through the fingers when handled. All other Ambystomid egg masses stay firm after they are laid.

Photos, from top:
Adult - Linh Phu
Larval - John White



Distribution and Habitat

Breeding occurs in temporary and permanent, fishless pools from November through late March (most often in January; Lee 1973; Stine 1954). Adults may be found up to hundreds of meters from ponds in deciduous and mixed forests outside of the breeding period and spend most of their time underground. Larvae metamorphose to sub-adults from May to August. Eastern tiger salamanders are listed as endangered by the Maryland Department of Natural Resources, Natural Heritage Division and are found in only a few locations on Maryland's Coastal Plain (Harris 1975).

Photos, from left:
Juvenile - Mark Tegges
Habitat - Scott A. Smith

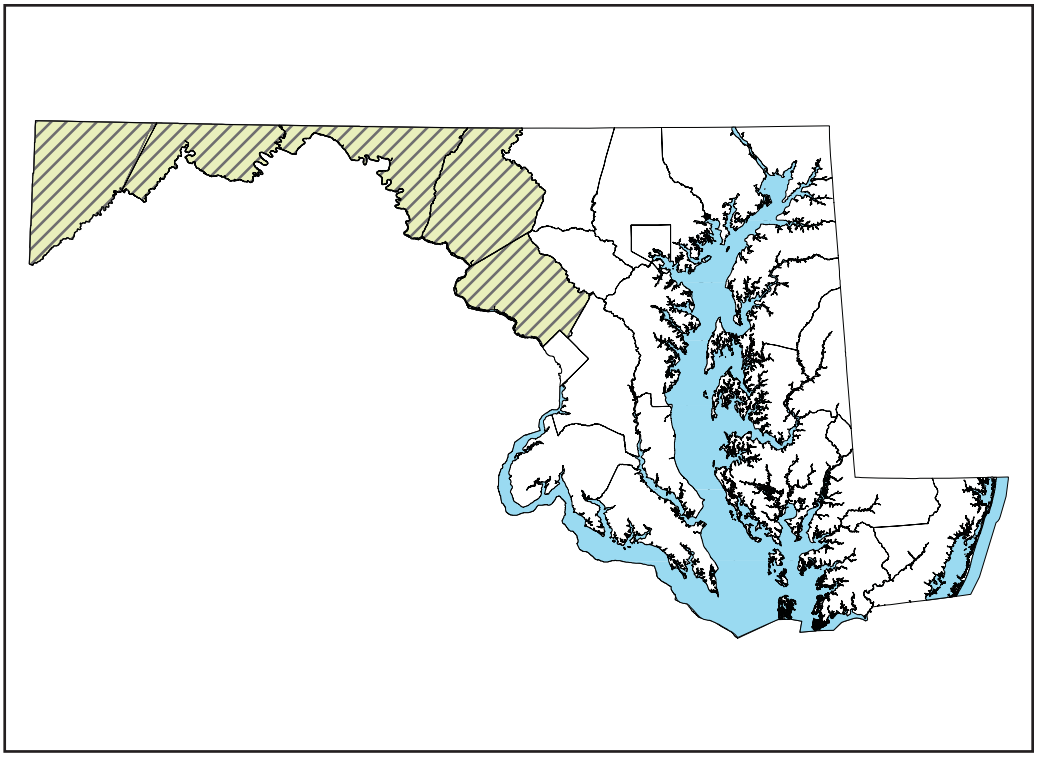
Jefferson Salamander
Ambystoma jeffersonianum

Identification
A moderately large salamander, lengths for Maryland adult Jefferson salamanders range from 14-21 cm (E. Thompson, unpubl. data). The color pattern of the Jefferson salamander varies with age, with older individuals exhibiting a uniform brownish-black color, while younger individuals are typically grayish-black with lighter color gray on the sides and venter (Hulse et al. 2001). The dorsum and sides are covered with pale blue flecks that tend to be both larger and more numerous on the sides than on the back. The spots become less evident with age and may be entirely absent in older individuals (Hulse et al. 2001). Albino individuals have been reported from Maryland (Dyrkacz 1981). Compared to other Ambystomids, the toes are long and slender and the tail is taller than it is wide and usually tapers to a point. There are 12 costal grooves along each side (Hulse et al. 2001).

Young
Larval Jefferson salamanders can be distinguished from other Maryland Ambystomids by the presence of large dorsal blotches in all but the largest larvae. The head is also conspicuously wider than the trunk of the body (Petranka 1998).

Eggs
Relatively small masses of eggs are laid on grasses, twigs, fallen tree branches, and other support structures, usually in temporary pools of water. Freshly laid ova are 2.0 to 2.5 mm in diameter. Masses are usually somewhat cylindrical, averaging about five cm in length and about 2.5 cm in diameter (Petranka 1998). Algae often colonize them, making them appear somewhat green.

Photos, clockwise from top:
Adult - Lori Erb
Eggs - Ed Thompson
Larval - Ed Thompson



Distribution and Habitat

Jefferson salamanders breed in vernal pools that are surrounded by deciduous and mixed forests during late winter (January-February). Outside the breeding period, terrestrial forms can be found in the vicinity of pools under rocks, logs or in underground burrows. This species can be found from Montgomery County to Garrett County in areas where appropriate vernal wetlands are available for spring breeding (Thompson 1984b; Stranko et al. 2004). This is a state watchlist species. It was formerly state listed as "threatened" but has been found to have a larger Maryland distribution than previously known and is locally abundant in some areas.

Photos, clockwise from left:
Juvenile - Mark Tegges
Adult- Mark Tegges
Habitat - Rebecca Chalmers

Marbled Salamander

Ambystoma opacum

Identification

The marbled salamander is the only Ambystomid found in Maryland that has a completely black venter. The dorsum is also black, but has white or silvery-gray cross bands. The sexes can be distinguished by their different colored dorsal cross bands. Males typically have white bands, while females' are silvery-gray (Petranka 1998). There are 11 or 12 costal grooves along each side (Hulse et al. 2001). The range of total lengths for Maryland specimens is 4.4 -13.1 cm.

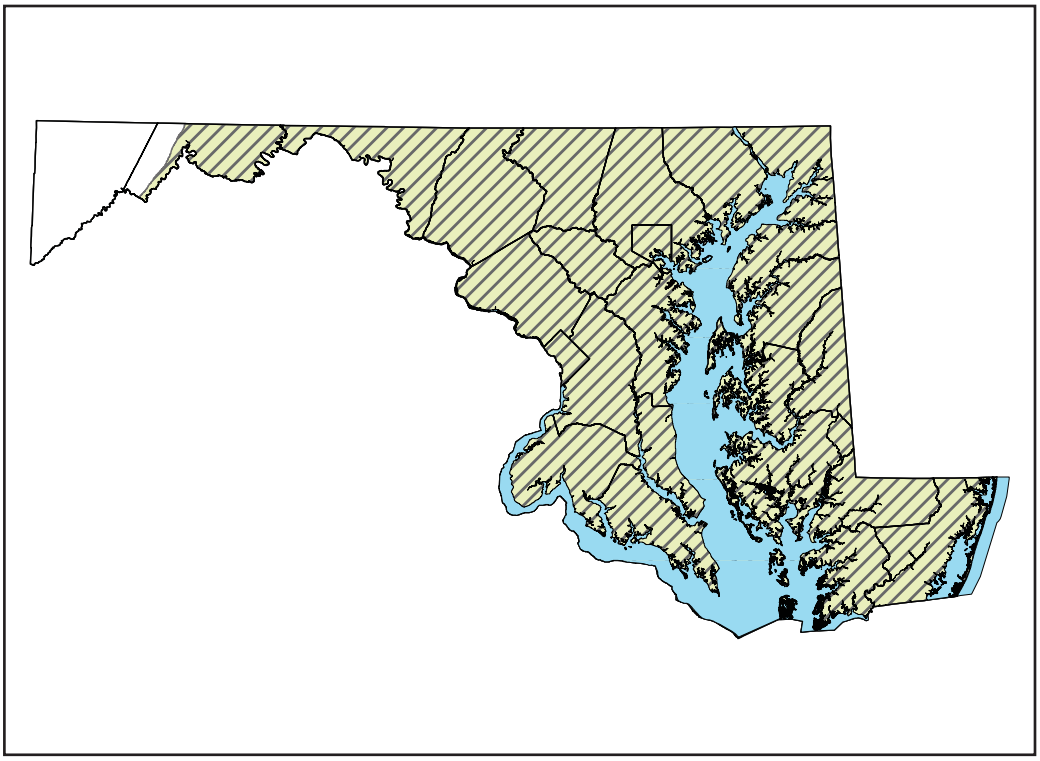
Young

Larvae start out black upon hatching and usually become brown with a row of small, light spots along the sides before metamorphosis (White and White 2007). They can most easily be distinguished from other Maryland Ambystomids by the presence of light or heavy pigment on the chin and throat (Petranka 1998).

Eggs

The marbled salamander is the only Maryland Ambystomid that does not lay egg masses in water. About 50 to 150 eggs are deposited singly in a nest on a dry or partially dry bed of a temporary pond or ditch. The female guards the eggs. They typically hatch within a couple of hours or days after the pool is filled with water, depending on their stage of development. Freshly laid ova are 1.9 to 2.6 mm (0.08 – 0.1 in.) in diameter and increase in size as development proceeds. They have a tough, sticky outer membrane and often appear black from the dirt and debris that sticks to them (Petranka 1998).

Photos, clockwise from top:
Adult - Lori Erb
Larval - Tony Prochaska
Larval - John White
Adult - Paul Kayzak



Distribution and Habitat

Marbled salamanders breed in fall or late summer (August-November). Outside the breeding period, terrestrial forms can be found in the vicinity of pools under rocks, logs, and in underground burrows within deciduous or mixed forests. Recently transformed sub-adults leave temporary pools during May and June (Petranka 1998). Their distribution is spotty west of the Coastal Plain and absent from the Allegheny Plateau of Garrett County (Harris 1975).

Photos, from top:
Adult/Eggs - Mark Tegges
Adult - Corey Wickliffe
Adult- Lori Erb
Habitat - Rebecca Chalmers

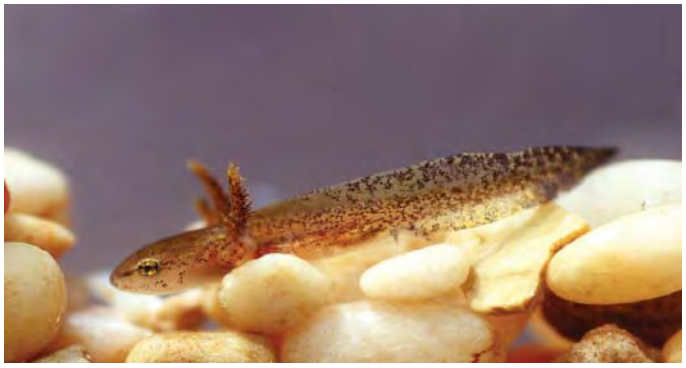
Spotted Salamander
Ambystoma maculatum

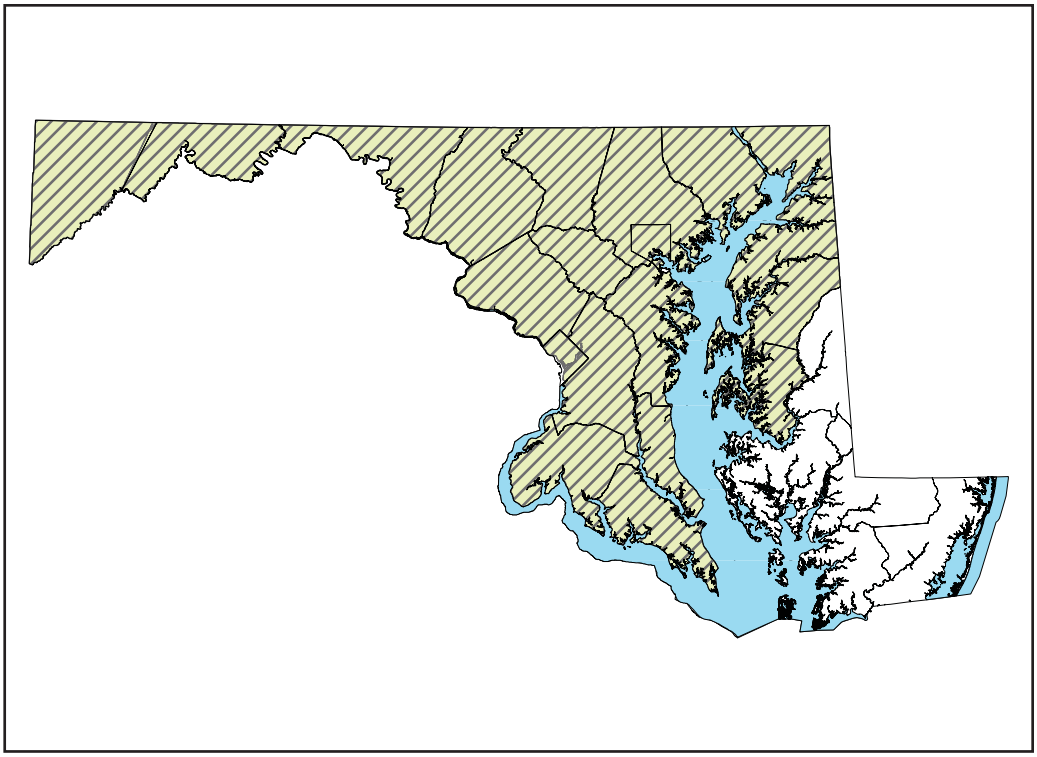
Identification
The dorsum of the spotted salamander is black or grayish-brown with two rows of distinct yellow or orange spots that extend from the back of the head to the tip of the tail. Some individuals lack spots or have very few (White and White 2007). The venter is pale gray with no conspicuous stripes or spots. There are 11 to 13 costal grooves along each side (Hulse et al. 2001). The range of total lengths for Maryland specimens is 3.0-21.1 cm.

Young
Spotted salamander larvae are grayish-brown with no prominent markings. The tail fin is moderately pigmented but not conspicuously mottled. The head is relatively narrow (not conspicuously wider than the trunk) compared to other Maryland Ambystomids (Petranka 1998).

Eggs
Egg masses consist of clear, cloudy, and intermediate color morphs. Cloudy egg masses are always spotted salamander's, whereas clear can be from Jefferson or eastern tiger salamander. Egg masses are usually deposited on twigs, tree branches or aquatic plants. They are firm, ovoid to cylindrical in shape, and are about 5.0 to 15.0 cm wide and 5.0 to 25.0 cm long. They are either scattered about the pond or laid in dense communal aggregates that may contain 50 or more egg masses. Algae often colonize the egg masses giving them a greenish color (Petranka 1998).

Photos, clockwise from top:
Adult - Mark Tegges
Eggs - Lori Erb
Larval - John White
Adult - Corey Wickliffe

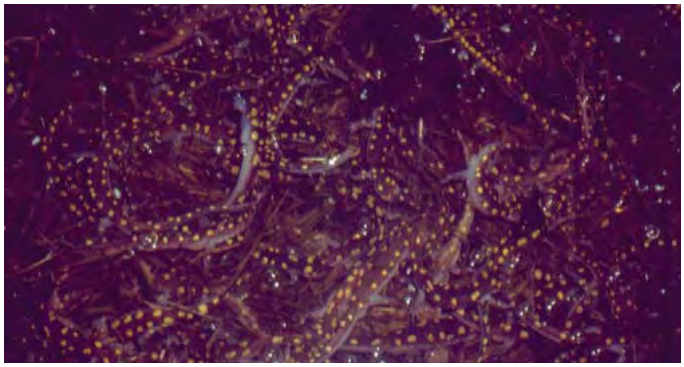




Distribution and Habitat

Spotted salamanders breed in vernal pools during late February, March, and April. During other times of the year, terrestrial forms can be found in the vicinity of pools under rocks, logs or in underground burrows in deciduous, coniferous, and mixed forests. They prefer bottomland and floodplain forests compared to uplands. Larvae transform to sub-adults and leave pools from June through August and burrow underground (Petranka 1998). Spotted salamanders are found throughout most of Maryland, with the exception of the lower eastern shore (Harris 1975).

Photos,
Clockwise from left:
Laying Eggs - Lori Erb
Habitat - Rebecca Chalmers
Breeding - Ed Thompson



Giant Salamanders (Family Cryptobranchidae)

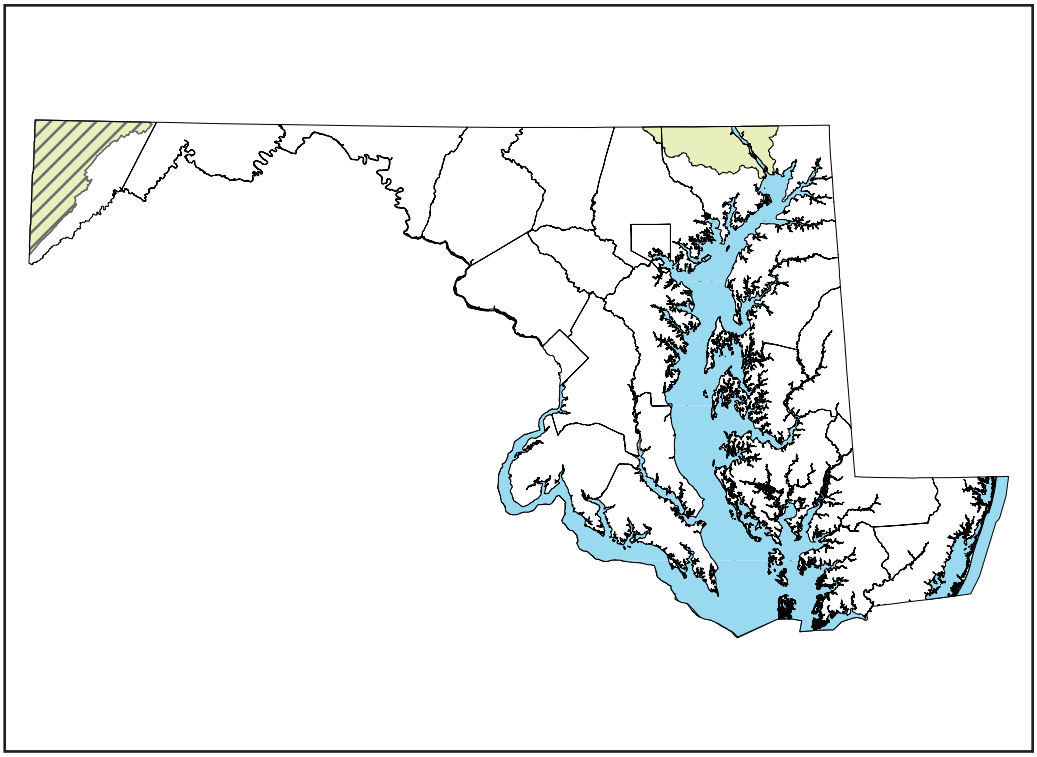
Eastern Hellbender
Cryptobranchus alleganiensis alleganiensis

Photos, from top:
Adult - Mark Tegges
Eggs - Dale Madison
Adult - Mark Tegges

Identification
The eastern hellbender is Maryland's largest (29-50 cm) and most bizarre-looking salamander. It is one of only two permanently aquatic salamanders found in Maryland. The body is dorsoventrally compressed with sides having distinct wrinkled folds of skin. The body color is usually brown or gray, but may be yellowish or greenish, often with numerous irregular dark or light spots on the back. The lighter belly is a uniform brown or gray. The tail is laterally compressed (keeled), with a dorsal fin. Two small gill slits are present on each side of the flattened round head . The eyes are small, beady, and lidless. The skin is coated in mucus, making them very slippery and difficult to handle (Petranka 1998; Conant and Collins 1998; Hulse et al. 2001).

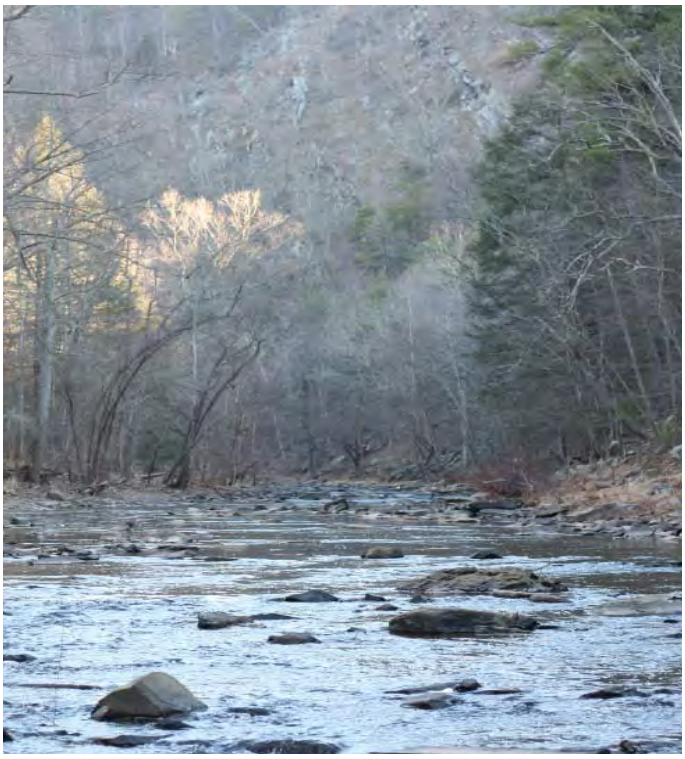
Young
Much like the adult, the larval eastern hellbender has a broad and depressed snout, and skin that appears loose along the sides. The digits are flattened and fleshy (Petranka 1998).

Eggs
Eastern hellbender eggs are laid in large streams during August and September in rosary-like strings in depressions (usually under large rocks). Freshly laid eggs are 2-3 cm in size and pale to light yellow and surrounded by two gelatinous envelopes (Petranka 1998).



Distribution and Habitat

The eastern hellbender occurs in large streams and rivers in Maryland. It is primarily nocturnal, solitary and relatively sedentary, though during the August-September mating season may be observed moving about during the day along the bottom. It is currently only found in drainages within the Allegheny Plateau region of Garrett County. There are historic (confirmed and unconfirmed) records for Cecil County and unconfirmed historic records for Harford County all in the Susquehanna River and tributaries. It is listed by the Maryland Department of Natural Resources, Natural Heritage Program as endangered.



Photos, from top:
Adult - Dale Madison
Juvenile - Dale Madison
Habitat - Matt Kline

Waterdogs and Mudpuppies (Family Proteidae)

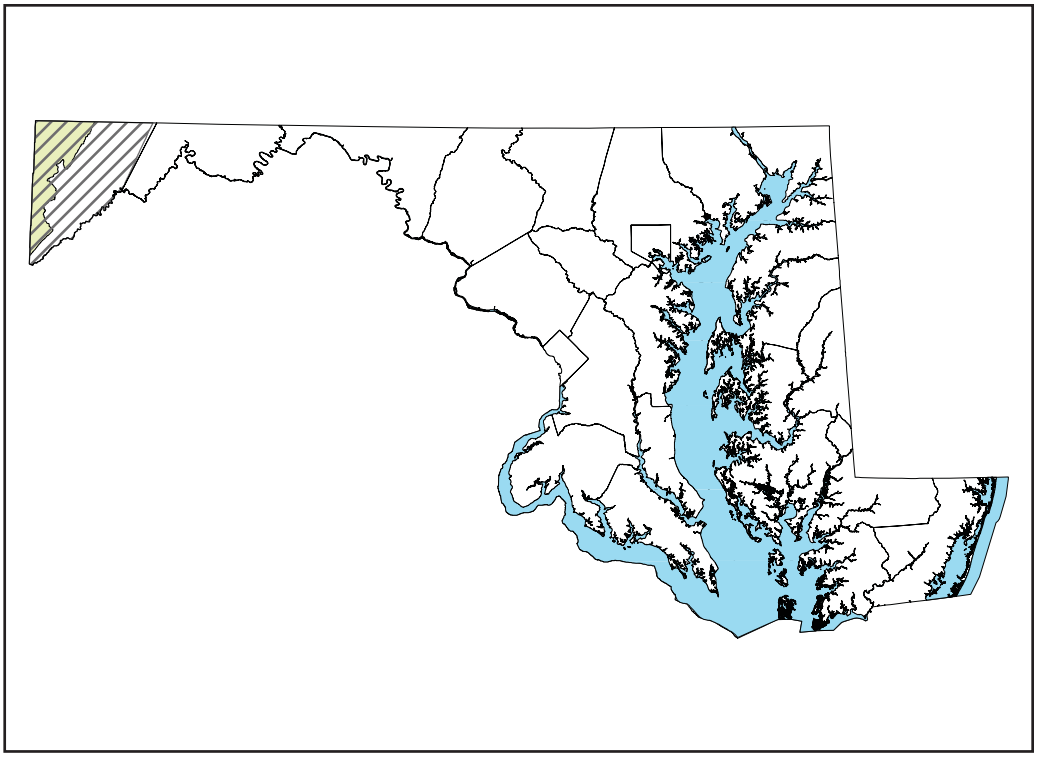
Common Mudpuppy
Necturus maculosus maculosus

Photos, from top:
Detail of Head - Scott Smith
Juvenile - Linh Phu
Adult - Art Hulse

Identification
The common mudpuppy is easily distinguished from other salamanders. The common mudpuppy retains its gills as an adult and attains lengths of greater than 19 cm. No other salamander of this size in Maryland has external gills. The head is flattened and tapered leading to a blunt snout. The hind feet have four digits, unlike most salamanders, which have five. The dorsum is gray to rusty brown with scattered, indistinct spots. The venter is usually unspotted, but may have a few large spots (Petranka 1998). The tail is laterally compressed or keeled, with a distinct fin. It is one of only two permanently aquatic salamanders found in Maryland, the other being the eastern hellbender.

Young
The center of the dorsum in young mudpuppies is dark and bordered laterally on each side by a conspicuous yellow stripe. The dorsal fin terminates on the tail (does not extend onto body). The snout is angular rather than rounded as in the eastern hellbender. As with the adults, there are only four digits on each rear foot (Petranka 1998).

Eggs
Common mudpuppy eggs are attached singly by a short stalk to the underside of rocks, logs, or boards which are submerged. The eggs are laid in late April, May, or early June. When eggs are freshly laid, they are cream to light yellow, and 5.0 to 6.5 mm (2.0-2.5 in.) in diameter. They are usually found in water that is greater than 0.5 m (20 in.) deep near riffles, but not in the fastest flowing part of the riffle. The openings to the cavities containing eggs typically face downstream (Petranka 1998).

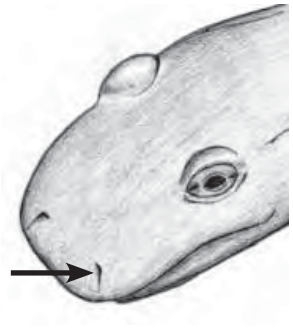


Distribution and Habitat

Common mudpuppies are found in large gulf coast drainage rivers. This species is strictly nocturnal and secretive, spending daytime hours under submerged logs, rocks and other debris, or hidden in thick aquatic vegetation. At night they walk slowly across the bottom, though capable of fast but short bursts of swimming. Lee (1972) reported finding three individuals in the Youghiogheny River near Sang Run. This is the only published Maryland observation. The common mudpuppy is state-listed as endangered extirpated, meaning it occurred in Maryland historically, but currently no known populations exist.

Photos, from left:
Adult - Scott Smith
Habitat - Matt Kline

Lungless Salamanders (Family Plethodontidae)



Above:
Nasolabial groove

Lungless salamanders can be distinguished from other groups of salamanders by the presence of a nasolabial groove. Although the nasolabial groove may be difficult to see without magnification, it extends from the nostril to the upper lip. As the name implies, lungless salamanders lack lungs and respire entirely through cutaneous respiration. Their body forms are highly variable, but most species are relatively small.

There are fourteen species of lungless salamanders that can be found in Maryland. The four-toed salamander (*Hemidactilium scutatum*) and the green salamander (*Aneides aeneus*) are relatively easy to distinguish from all other salamanders based on distinct physical characteristics. However, when attempting to distinguish the other twelve species it is helpful to separate them into four groups including the *Desmognathus* spp., *Eurycea* spp., *Gyrinophilus* and *Pseudotriton* spp., and *Plethodon* spp.

1. Genus *Desmognathus*
The rear limbs of *Desmognathus* species tend to be conspicuously larger than the front limbs. There is also a pale diagonal line that extends from the eye to the angle of the jaw. This group includes three species that occur in Maryland: Allegheny mountain dusky salamander (*Desmognathus ochrophaeus*), seal salamander (*Desmognathus monticola*), and northern dusky salamander (*Desmognathus fuscus*)

2. Genus *Eurycea*
The rear limbs of Eurycea species are usually about the same size as the front limbs, and there is no pale diagonal line that extends from the eye to the angle of the jaw. The tail is triangular in cross section (often only on the posterior half) and the dorsal ground color is often brownish or yellowish with a light-colored venter. This group includes two species that occur in Maryland: long-tailed salamander (*Eurycea longicauda longicauda*) and northern two-lined salamander (*Eurycea bislineata*).

3. Genus *Gyrinophilus* and *Pseudotriton*
The dorsal ground color of species in this group is usually reddish, salmon or pinkish. The tail is triangular in cross section and the front and back limbs tend to be about the same size. This group includes three species that occur in Maryland: northern spring salamander (*Gyrinophilus porphyriticus porphyriticus*), eastern mud salamander (*Pseudotriton montanus montanus*), and northern red salamander (*Psuedotriton ruber ruber*).

4. Genus *Plethodon*

The tail of *Plethodon* spp. is typically rounded or oval in cross section along its entire length. The dorsal ground color is usually a dark gray to black and may include flecking, spotting, or a dorsal stripe. The venter is usually dark and may have mottling, blotching, or spotting. This group includes four species that occur in Maryland: eastern red-backed salamander (*Plethodon cinereus*), valley and ridge salamander (*Plethodon hoffmani*), northern slimy salamander (*Plethodon glutinosus*), and Wehrle's salmander (*Plethodon wehrlei*).

Northern Dusky Salamander
Photo - Linh Phu

Allegheny Mountain Dusky Salamander

Desmognathus ochrophaeus

Identification

The Allegheny mountain dusky salamander is small, typically less than ten cm long (nine Maryland specimens measured 3.2-7.4 cm; Appendix A). It has 14 costal grooves. The midpoint of the Allegheny mountain dusky salamander's tail is rounded or oval in cross section, as opposed to the tails of other *Desmognathus* species, which typically have keels on at least the posterior portion of the tail. Most specimens have relatively straight dorsolateral stripes and often have a row of middorsal melanophore patches that are frequently chevron-shaped (Petranka 1998).

Young

The dorsum either lacks spots and has a pale middorsal stripe, or has two to seven pairs of spots generally restricted to the posterior half of the body. The tail fin is poorly developed and occurs as a keel on the posterior half. The posterior region of the head of older larvae often has a dark V- or Y- shaped pattern, bordered by a pair of round, light spots on either side (Petranka 1998).

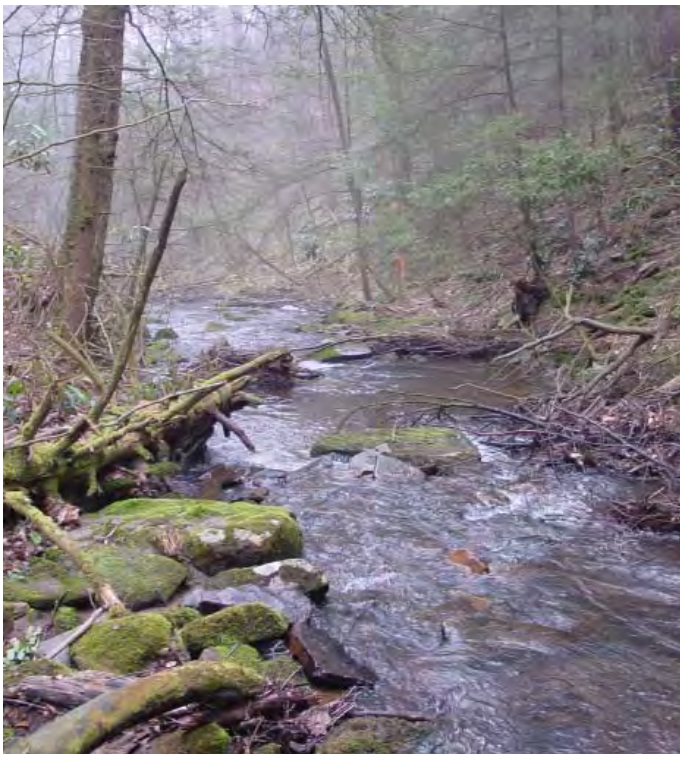
Eggs

Allegheny mountain dusky salamanders may nest underground or in seeps, muddy banks, dry stream-beds, under logs, and stumps that are embedded in mud. Eggs are deposited in small, grapelike clusters, with each egg having a short gelatinous stalk. Oviposition begins in March and continues through September (Petranka 1998).

Photos, from top:
Adult - Mark Tegges
Juvenile - Jay Kilian

Distribution and Habitat
Allegheny mountain dusky salamanders are found almost exclusively on the Allegheny Plateau (Harris 1975). They are usually discovered in and along small streams under rocks, logs or other substrates and are sometimes found a long distance from water, particularly in narrow, sandstone cliff crevices.

Photos, from left:
Adult - Lori Erb
Habitat - Matt Kline



Northern Dusky Salamander

Desmognathus fuscus

Identification

A great deal of variability exists in the dorsal color pattern and pigmentation of northern dusky salamanders, but often involves conspicuous blotches or stripes. If the dorsum is unblotched, it is often diffused with brown. The venter is cream-colored, with varying amounts of brown mottling. A keel is present on the posterior half of the tail so that it appears triangular in cross section. The digit tips lack friction pads and appear white or light gray (Petranka 1998). Some individuals are entirely black. This species has 14 costal grooves and ranges in length from 6-14 cm (Petranka 1998).

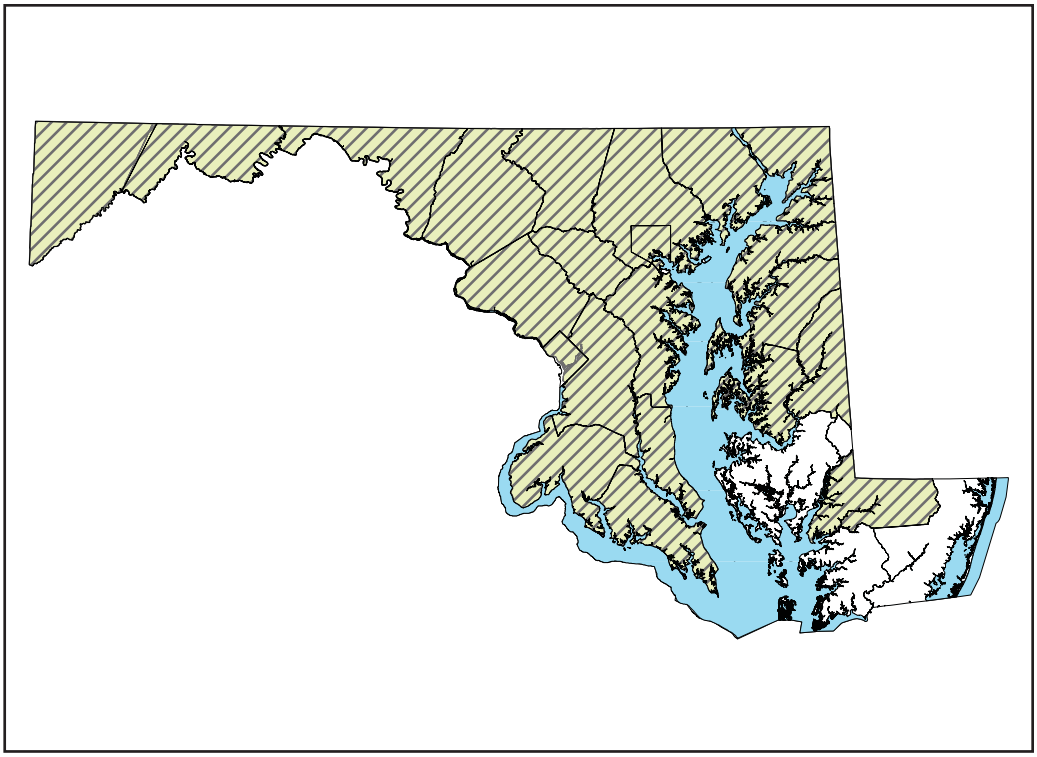
Young

The dorsum of young northern dusky salamanders have five to ten pairs of light tan-colored spots. The tail fin is well developed and extends forward to the base of the tail. There are no central dark markings bordered by pale round spots on the head (Petranka 1998).

Eggs

Eggs are laid in or near water and are attached to the undersides of rocks in streams or in cavities, in and under rotting logs, and in leaf mats or clumps of moss near streams and seeps. The eggs are deposited in a globular or grapelike structure. Ova are cream-colored to whitish and are surrounded by three envelopes. They are deposited during June through September and are typically guarded by the female (Petranka 1998).

Photos, from top:
Juvenile - John White
Eggs - Linh Phu
Adult - Ed Thompson



Distribution and Habitat
Northern dusky salamanders are found in and around streams throughout Maryland. They may be common in some areas and conspicuously absent from others. They can usually be found under rocks, logs, or other substrates along the stream edge.

Photos, from left:
Closeup - Ed Thompson
Habitat - Rebecca Chalmers

Seal Salamander

Desmognathus monticola

Identification

Seal salamander adults are often greater than ten cm long, ranging from 7.5-15 cm, and have 14 costal grooves. A keel is present on the posterior half of the tail, and the tail is rounded near the base. The digit tips have darkened friction pads that appear grayish-black to black. The dorsal color pattern often consists of bold, dark wormy marks or spots on a lighter ground color. The belly is whitish to light gray and uniformly colored (Petranka 1998).

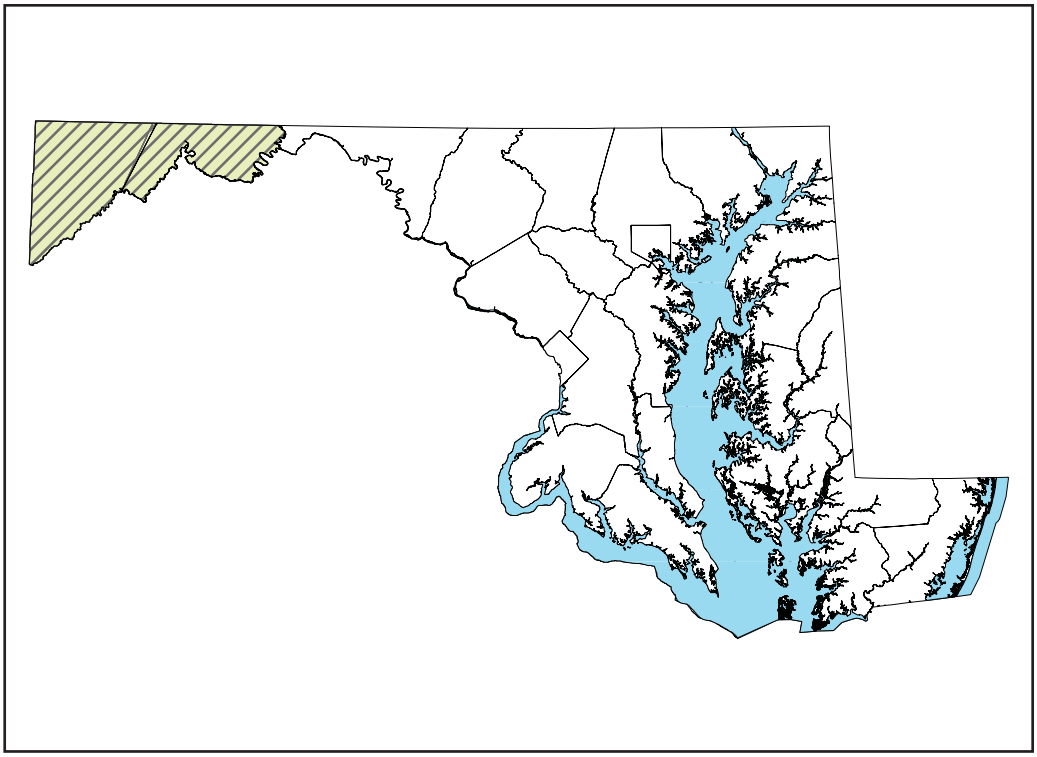
Young

The body of young seal salamanders are slender. The dorsum typically has four or five pairs of light spots between front and back legs. The underside of the tail is diffusely blotched with pigment (Petranka 1998).

Eggs

On average, a female lays 15 to 40 eggs in or near running water and attaches them singly to the underside of a rock or other support structure to form a single layer, or in some instances a loose group that may be two to three egg layers thick. Each egg is attached by an elastic stalk so that movements of the attending female or water currents rock the eggs back and forth. Eggs can be found during June through September (Petranka 1998).

Photos, from top:
Juvenile - Jay Kilian
Adult - Jay Kilian
Adult - David Kazyak



Distribution and Habitat
Seal salamanders are found almost exclusively on the Allegheny Plateau (Harris 1975). They are usually found in and along small streams under rocks, logs, or other substrates.

Photos from left:
Adult - Lori Erb
Habitat - Matt Kline

Long-tailed Salamander

Eurycea longicauda longicauda

Identification

The dorsal coloration of the long-tailed salamander is typically yellowish, although orangish and brown are also common. Fifty Maryland specimens ranged in length from 5.1-17.0 cm (Appendix A). As the name implies, the tail is greater than half the total length and is often 60 to 65 percent of the total length of adults. They have black spots on the dorsum that are often arranged in irregular or discontinuous lines (Ireland 1979). The tail has two rows of herring bone shaped markings along the sides. Long-tailed salamanders typically have 13-14 costal grooves (Petranka 1998).

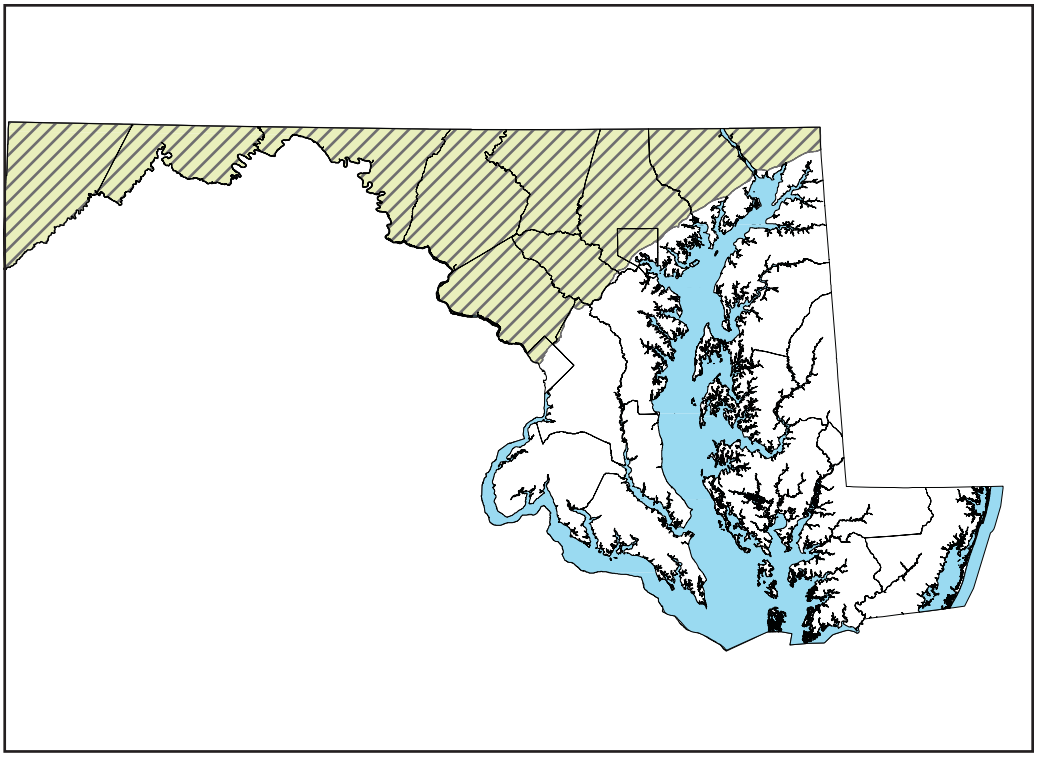
Young

The dorsum of larval long-tailed salamanders lacks pairs of light spots like those found on northern two-lined salamanders. The underside of the throat often has patches of melanophores. The larvae also develop heavy, dark mottling on either side of the body about two months after hatching (Petranka 1998).

Eggs

The eggs of long-tailed salamanders are rarely seen. Most are laid underground in caves, mine shafts, or cisterns. However, Franz and Harris (1965) found larvae in a lake in Maryland. Egg laying most likely occurs between November and March. Eggs have been found attached singly to the undersurface of rocks, boards, cave walls, and other substrates. Mature ova are 2.5 to 3.0 mm (1.0 -1.2 in.) in diameter, yellowish in color, and surrounded by two jelly envelopes (Petranka 1998).

Photos, clockwise from top:
Adult - Mark Tegges
Adult - Rebecca Chalmers
Closeup - Rebecca Chalmers



Distribution and Habitat

Long-tailed salamanders are not found on the Coastal Plain, but are found throughout the Piedmont and western Maryland (Harris 1975). Adults are usually found under rocks, logs and other cover near shaded streams, but are occasionally found far from water in forested habitats (Ireland 1979).

Photos, from left:
Adult - Rebecca Chalmers
Habitat - Rebecca Chalmers

Northern Two-lined Salamander

Eurycea bislineata

Identification

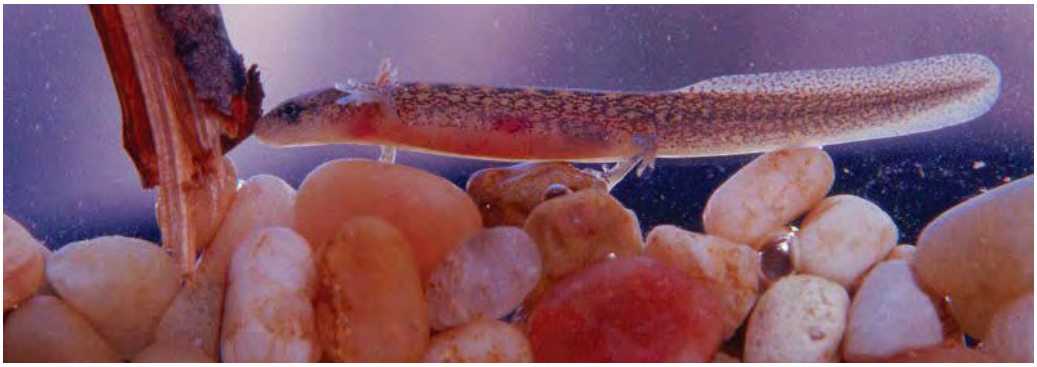
The northern two-lined salamander is the most common stream salamander in Maryland. It is a relatively small (4.4 - 8.3 cm long; Appendix A), slender salamander with a yellowish- brown or tan dorsum bordered by two solid, broad , parallel bands that extend from the eye well onto the tail. The venter is bright yellow. There are typically 13-16 costal grooves (Petranka 1998).

Young

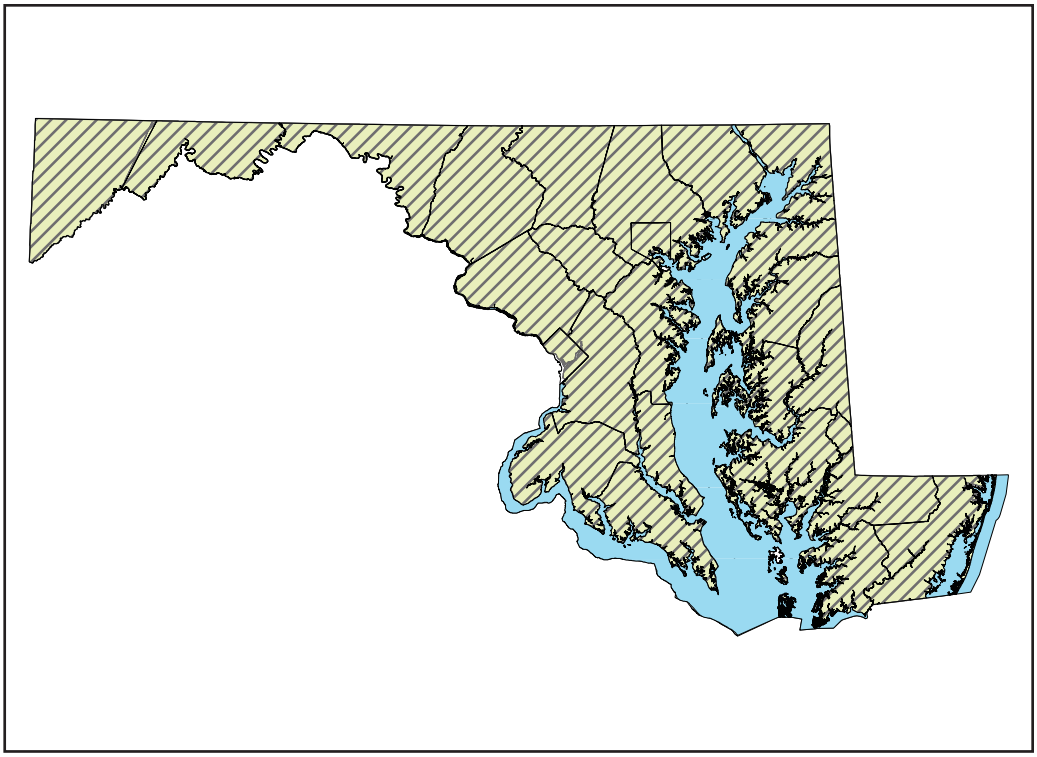
Larval northern two-lined salamanders have six to nine pairs of light spots on their dorsum. The dorsal fin terminates on the tail (does not extend onto body) and the venter has a margin of dark pigmentation with abundant wavy iridophores. The gills have well-developed rachises (Petranka 1998).

Eggs

Eggs are typically found in tight groups attached singly to the underside of submerged rocks, or other suitable substrate, with each egg suspended by a short, broad stalk from a support structure (Baumann and Huels 1982). Over time, the stalk and egg membrane become flimsy, and the eggs dangle freely in the water. Eggs are laid sometime from late January to May and hatch sometime from May to August (Petranka 1998).



Photos, from top:
Adult - Mark Tegges
Eggs - Steven Hammond
Adult - David Kazyak
Larval - John White



Distribution and Habitat
Northern two-lined salamanders are stream-dwelling species and are found throughout Maryland in every type of stream. Adults typical are found under rocks and other debris along the edge of streams and sometimes several meters from water.

Photos from left:
Adult - Linh Phu
Habitat - Matt Kline

Northern Spring Salamander

Gyrinophilus porphyriticus porphyriticus

Identification

The dorsal coloration of the northern spring salamander is red, salmon, or orangish with dark spots or faint reticulations (may be rusty red to reddish brown in old animals). Although it may be difficult to see in some specimens, a light line bordered by gray or black extends from the eye to nostril, and is called the canthus rostralis. The snout is prominent and squarish compared to the short rounded snouts of red and mud salamanders (*Pseudotriton* spp.). Northern spring salamanders also tend to have more costal grooves than the Pseudotriton species (17-19 compared to 16-17; Petranka 1998).

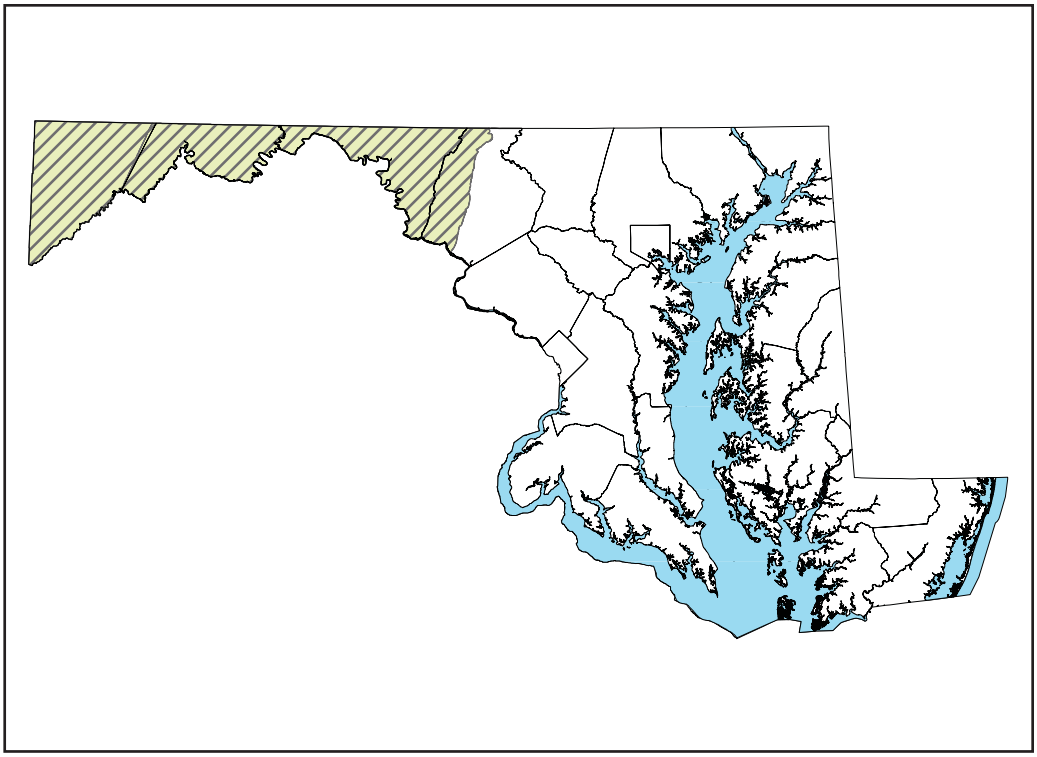
Young

The larval northern spring salamander has a stout body with a light brown to flesh-colored dorsum. Older larvae are often marked with dark spots or faint reticulations. The venter is typically whitish. The supra-otic lateral line pores are arranged in an ellipse compared to those of the *Pseudotriton* species, which are arranged in a circle (Petranka 1998).

Eggs

Very few northern spring salamander nests have ever been found. The eggs are probably laid in deep underground recesses in streams or seeps. Eggs are attached singly in monolayers to the undersides of rocks or other objects. Mature ova are light yellow, about 3.5 to 4.0 mm (1.4-1.6 in.) in diameter and surrounded by three jelly coats. Most females oviposit during summer, and hatching occurs in late summer or autumn (Petranka 1998).

Photos, clockwise from top:
Adult - Lori Erb
Larval - Mark Tegges
Rostrum - Lori Erb



Distribution and Habitat
Northern spring salamanders appear to prefer relatively high-elevation streams in Maryland. They are found in western Maryland and along the Blue Ridge, and usually occur in and along small streams under rocks and other substrates (Harris 1975).

Photos clockwise from left:
Closeup - David Kazyak
Adult - David Kazyak
Habitat - Matt Kline

Eastern Mud Salamander

Pseudotriton montanus montanus

Identification

The dorsal coloration of the eastern mud salamander is similar to that of the northern spring salamander and tends to be red, salmon, or orangish with dark spots or faint reticulations. The body is stout with 16-17 costal grooves. There is no canthus rostralis as in the northern spring salamander. The eyes tend to be brown compared to the yellow eyes of the northern red salamander. The coloration on the sides and belly sharply contrasts, and the black spots on the dorsum are usually widely scattered (Petranka 1998). The snout tends to be short compared to the northern red salamander (White and White 2007).

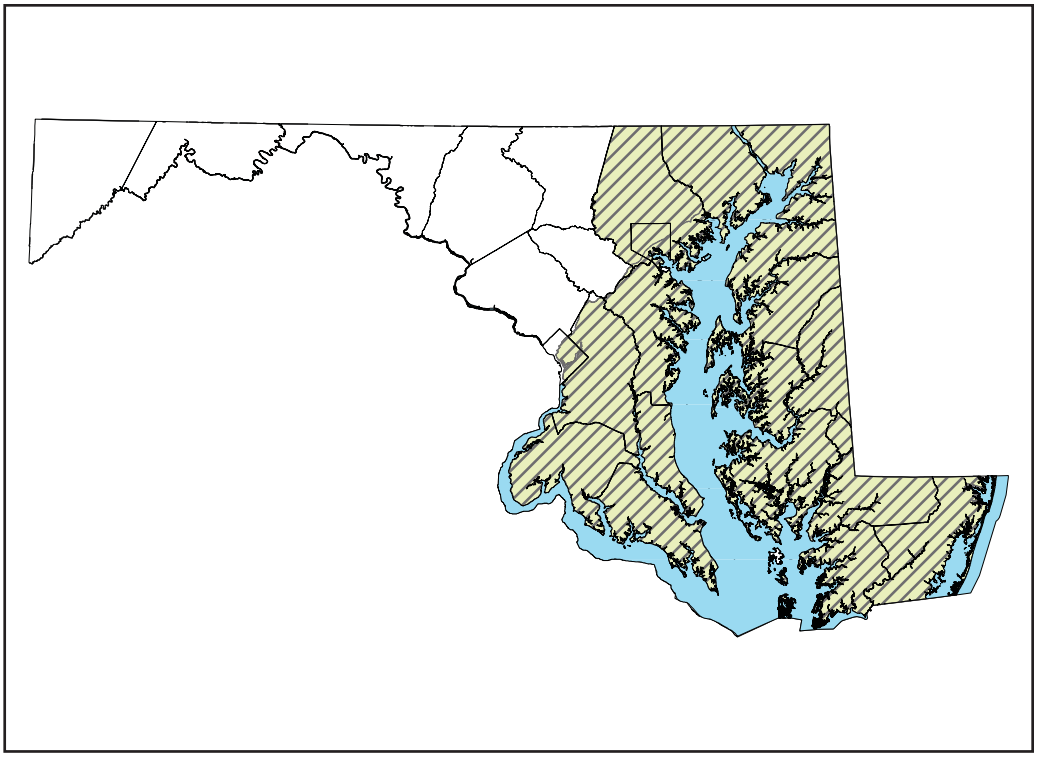
Young

The dorsum of larval eastern mud salamanders is light brown to flesh-colored. Older larvae begin to exhibit markings much like the adults and are often marked with widely-scattered, distinct dark spots. As in the northern red salamander, the supra-otic lateral line pores are arranged in a circle (Petranka 1998).

Eggs

Eastern mud salamander eggs have rarely been found. They are most likely laid in autumn or early winter and hatch during winter. Females nest in cryptic underground sites in or near aquatic habitats. Freshly laid eggs are about 3.5 mm (1.4 in.) in diameter (Bruce 1975) and have no dark pigment. Fowler (1946) observed eggs in Maryland in late December at the base of a hillside in a small cavity in a seep at the base of a hillside. The eggs were attached singly or in groups of up to six, to rootlets that formed the wet walls of the cavity. The eastern mud salamander has one of the highest numbers of eggs per female for any North American Plethodontid, at 77-192 (Bruce 1975).

Photos, clockwise from top:
Larval - John White
Adult - Rebecca Chalmers
Rostrum - Rebecca Chalmers
Adult - John White



Distribution and Habitat
Juvenile and adult eastern mud salamanders typically live in muddy habitats next to springs, streams, and swamps in bottomland forests. They are usually very close to water, but have been found up to 20 m (21.9 yards) away (Petranka 1998). In Maryland, they live almost exclusively on the Coastal Plain (Harris 1975).

Photos, from left:
Adult - Mark Tegges
Habitat - Rebecca Chalmers

Northern Red Salamander

Pseudotriton ruber ruber

Identification

The dorsal coloration of the northern red salamander is similar to that of the northern spring and eastern mud salamander. They are red, salmon, or orangish in color and usually have numerous dark spots on the dorsum. This species is approximately 12.3-13.5 cm long and stout. There are 16-17 costal grooves. There is no canthus rostralis as in the northern spring salamander. The eyes are typically yellow or gold compared to the brown eyes of the eastern mud salamander. The coloration on the sides and belly do not sharply contrast (Petranka 1998). The snout tends to be rounded and relatively long compared to the eastern mud salamander (White and White 2007).

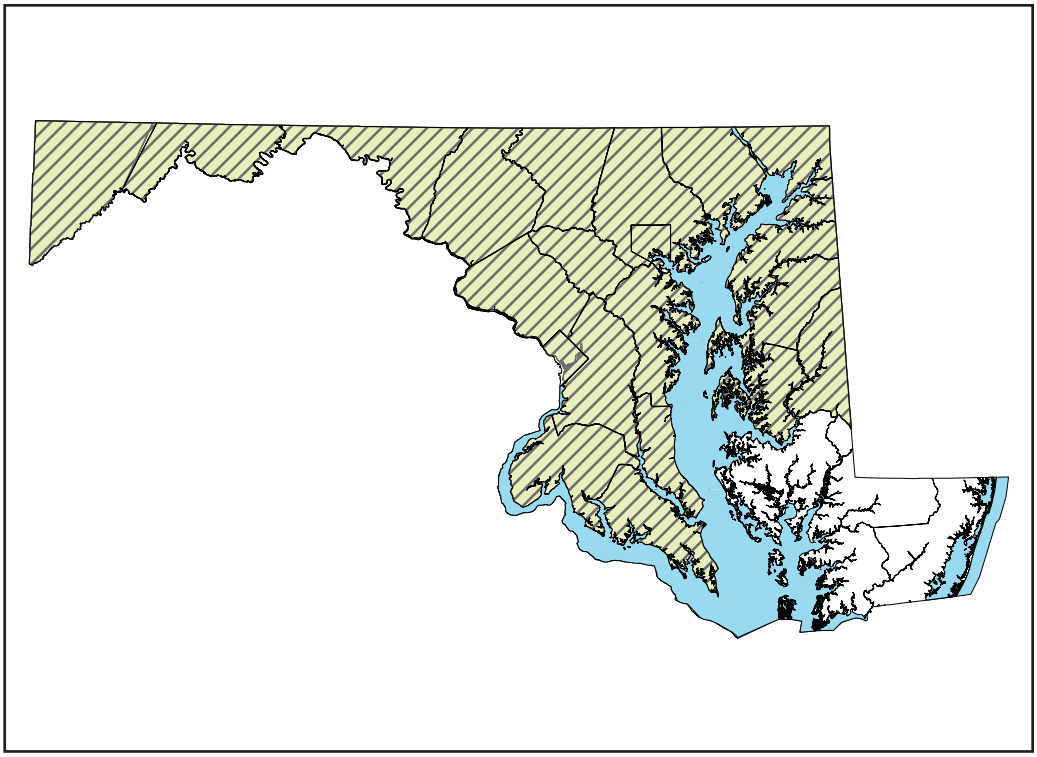
Young

Larval northern red salamanders are extremely difficult to distinguish from larval eastern mud salamanders. However, they may be distinguished by the dorsal color pattern and the habitat where they are collected. Older red salamander larvae usually do not have distinct spots, but have black streaks or weak mottling. They are usually found in small clear rocky-bottomed streams. As in the eastern mud salamander, the supra-otic lateral line pores are arranged in a circle (Petranka 1998).

Eggs

Northern red salamander eggs have rarely been found. They are laid during autumn or early winter in springs, headwater streams, seepage-fed mountain bogs, and other habitats. Eggs are attached singly by gelatinous stalks to the underside of a rock or other substrate, and are often submerged in water. Freshly laid eggs are about 4mm (1.6 in.) in diameter (Bishop 1941).

Photos, from top:
Larval - John White
Older Individual - Linh Phu
Adult - Mark Tegges



Distribution and Habitat

Northern red salamanders are found in streams throughout much of Maryland, with the exception of the lower eastern shore (Harris 1975). They can be found in and along streams and often burrow in soft sediments alongside streams. They can also be found congregating in springs and streams during late fall (Bishop 1941).

Photos, from left:
Closeup - John White
Habitat - Rebecca Chalmers

Four-toed Salamander

Hemidactylium scutatum

Identification

Three characteristics easily distinguish the four-toed salamander from any other Maryland salamander. As the name implies, there are only four toes on each hind foot. The belly is milky white with conspicuous black spots, and there is a conspicuous constriction near the base of the tail (Petranka 1998). This species is 2.0-8.5 cm long and has 13-14 costal grooves.

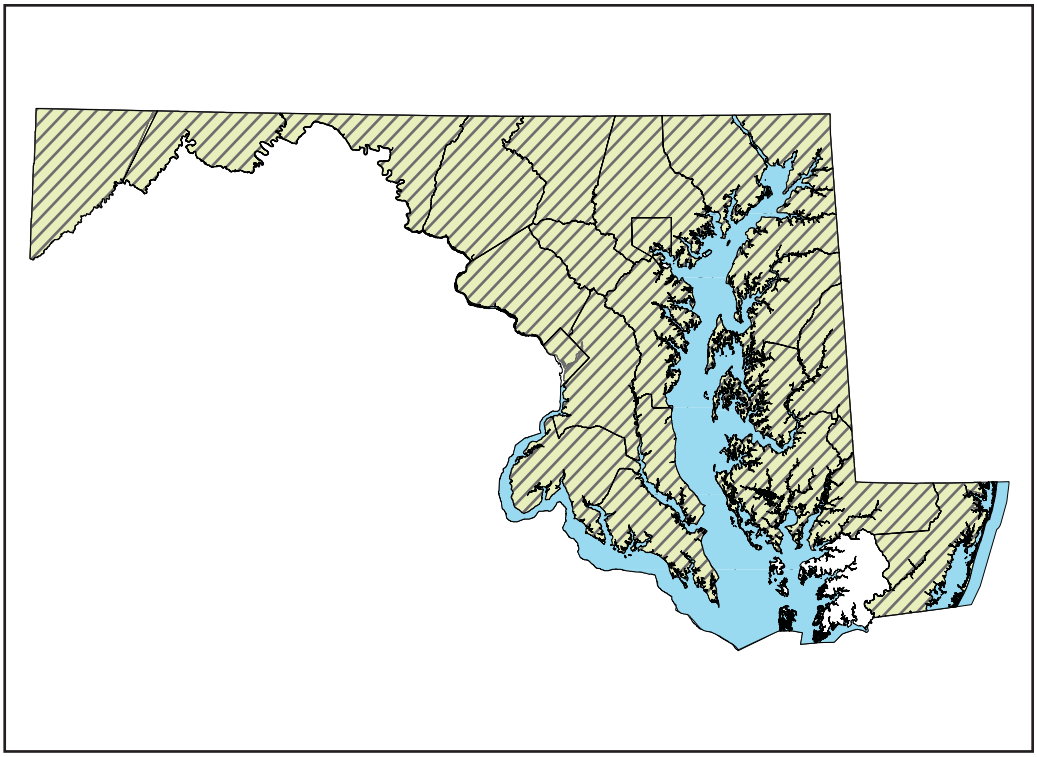
Young

The dorsal fin of larval four-toed salamanders extends well on to the body, nearly to the head, unlike the fins of stream-dwelling salamanders that are limited to the tail. The snout is relatively short and rounded. There are 13-14 costal grooves and four digits on each rear foot (Petranka 1998).

Eggs

Four-toed salamander eggs may be found from mid-February to mid-May in Maryland. They are usually associated with clumps of mosses at the margins of swamps, bogs, vernal ponds, or sluggish streams. Raised moss mats (especially sphagnum) are common in nesting sites. The female lays a clutch of 12-80 eggs. Each egg in the clutch is attached singly to rootlets, strands of moss, or other substrates. The eggs have sticky outer coats and readily adhere to debris or other eggs within the nest (Petranka 1998).

Photos, clockwise from top:
Adult - Mark Tegges
Adult - William Harbold
Ventral - Mark Tegges
Eggs - Rebecca Chalmers
Foot detail - John White



Distribution and Habitat
Although the distribution is spotty, four-toed salamanders can be found in, and in the vicinity of, permanent and ephemeral lentic (usually fishless) habitats throughout Maryland. Sphagnum or other mosses are typically present. Larvae are associated with lentic habitats, while adults are terrestrial (Petranka 1998).

Photos, from left:
Nest - Rebecca Chalmers
Habitat - Rebecca Chalmers

Green Salamander

Aneides aeneus

Identification

The green salamander is relatively easy to distinguish from other Maryland salamanders. It is the only Maryland salamander with conspicuous green or yellowish-green lichen-like blotches on the dorsum. The digits are also conspicuously square-tipped and expanded, and the body is dorsoventrally flattened to facilitate living in rock crevices (Petranka 1998). The adult snout to vent length of 85 Maryland specimens was 1.3-6.9 cm (total lengths were not available for Maryland specimens) and there are 14-15 costal grooves (Petranka 1998).

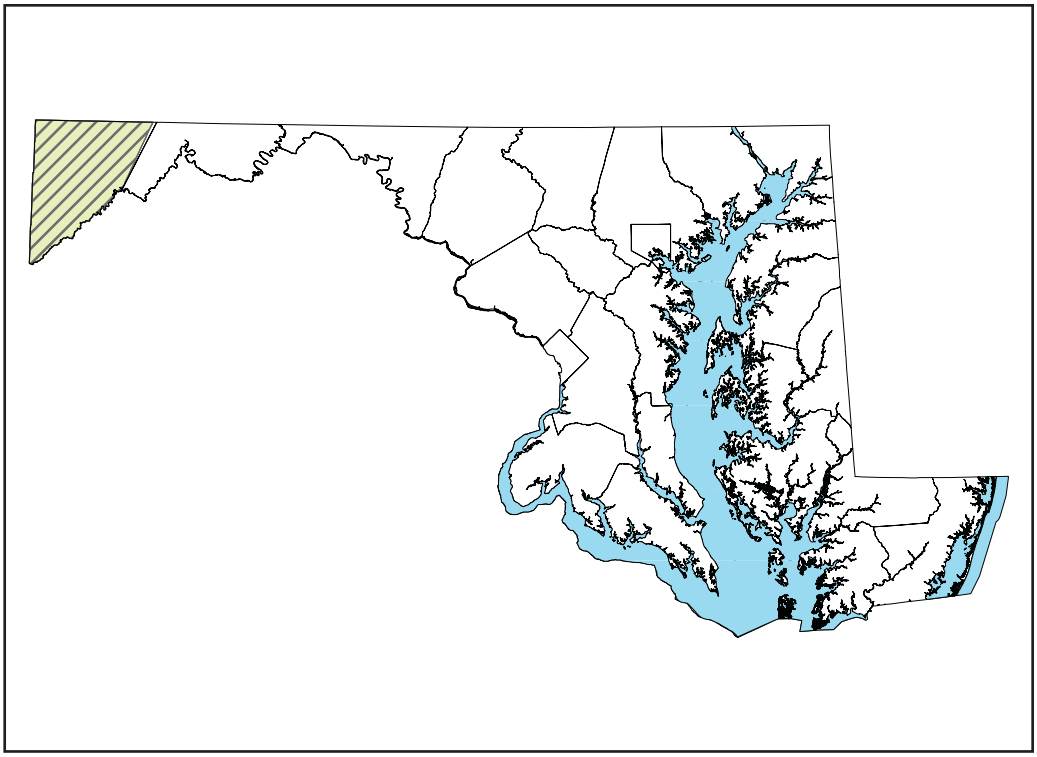
Young

There is no aquatic larval stage. Young resemble adults.

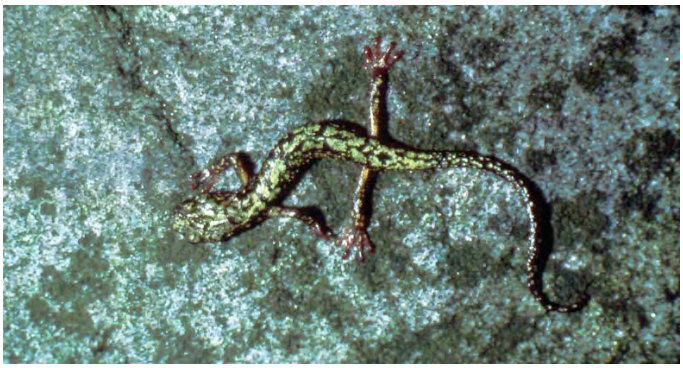
Eggs

Green salamander eggs are deposited in secluded damp rock crevices. They are attached to the roof of horizontal crevices or to the sides of verticle crevices. Eggs are laid in small clusters that are suspended by several mucus strands. Females remain with their eggs through incubation (Gordon 1952).

Photos, clockwise from top:
Adult - Mark Tegges
Juvenile - Scott Smith
Adult - David Kazyak



Distribution and Habitat
Found in the damp crevices of sandstone outcrops on the Allegheny Plateau of Maryland (Thompson 1984b). This species has also been found using arboreal habitats in South Carolina (Waldron and Humphries 2005), they have never been reported in trees in Maryland.



Photos, from left:
Adult - David Kazyak
Habitat - Scott Smith

Eastern Red-Backed Salamander

Plethodon cinereus

Identification

The eastern red-backed salamander is the most common terrestrial salamander in Maryland. It is relatively small (1.4-10.6 cm) with short limbs and a large number of costal grooves (18-20) compared to most other salamanders. The belly is mottled to produce a salt and pepper pattern. There are two dorsal color phases. The striped morph has a primarily straight, broad, orangish-red stripe on the dorsum that extends from the head to the tail. The lead-back morph lacks the stripe, and the dorsum is a uniform dark black or grayish black (Petranka 1998).

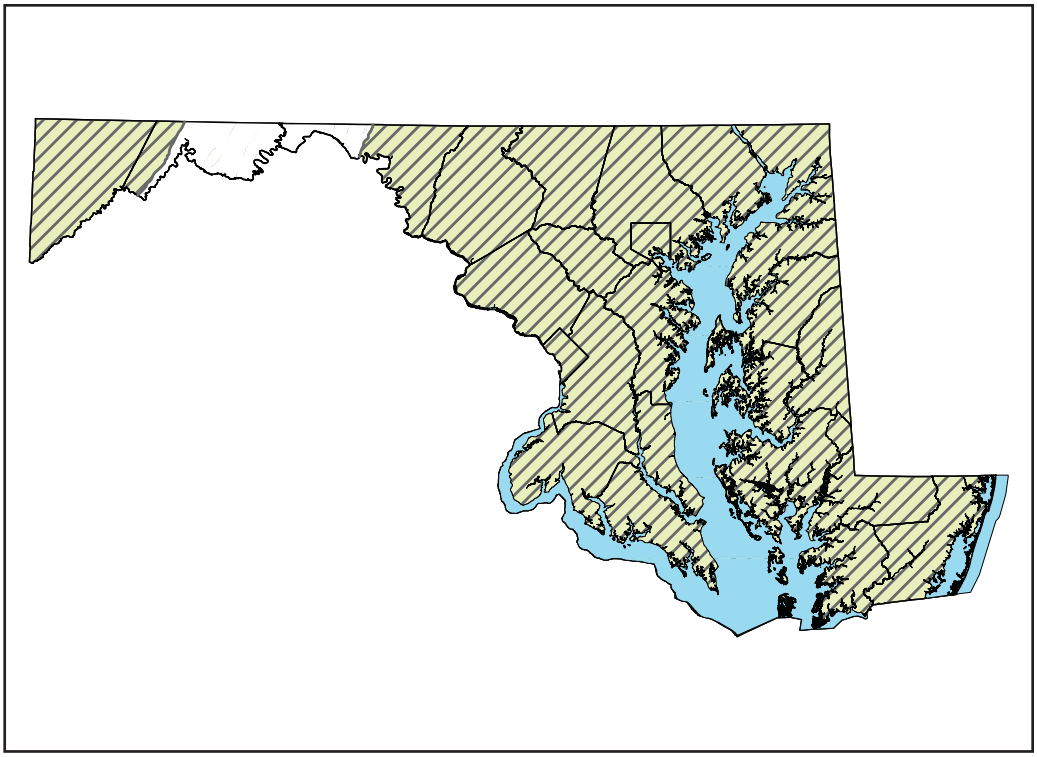
Young

The eastern red-backed salamander does not have an aquatic larval stage. Hatchlings resemble adults, except that the tail is conspicuously shorter relative to the body size, and the head is proportionately broader (Petranka 1998).

Eggs

Eastern red-backed salamander eggs are laid in grapelike clusters in natural cavities or crevices. They are usually suspended from the cavity by a short pedicel. Eggs are pale yellow to yellowish-white and 3-4 mm (1.4-1.6 in.) in diameter. Clutch sizes are small and consist of only 6-9 eggs on average. Eastern red-backed salamanders usually oviposit in late spring or early summer, but may occasionally lay eggs in early fall. Incubation is about six weeks (Petranka 1998).

Photos, from top:
Lead-back and Red-back morphs - Mark Tegges
Adult - Matt Sell
Ventral - David Kazyak
Female with eggs - Mark Tegges



Distribution and Habitat

The eastern red-backed salamander resides in forested habitats throughout Maryland, with the exception of the western part of the Ridge and Valley physiographic province where it is replaced by the valley and ridge salamander (Harris 1975). Eastern red-backed salamanders can be found under many different substrates including rocks and coarse woody debris.

Photos, from left:
Adult - Corey Wickliffe
Adult - Lori Erb
Habitat - Rebecca Chalmers

Valley and Ridge Salamander

Plethodon hoffmani

Identification

The valley and ridge salamander can be easily confused with the northern red-backed salamander but differs in appearance in a number of ways. The valley and ridge salamander has a larger number of costal grooves (typically 20-21) than the eastern red-backed salamander. Adults measure 8-13.5 cm (Petranka 1998). The dorsum is usually covered with conspicuous brassy flecks. The belly is dark with brown and white mottling, and does not have a salt and pepper appearance. The throat is mostly white. The tail makes up at least 50 percent of the total length (Highton 1972).

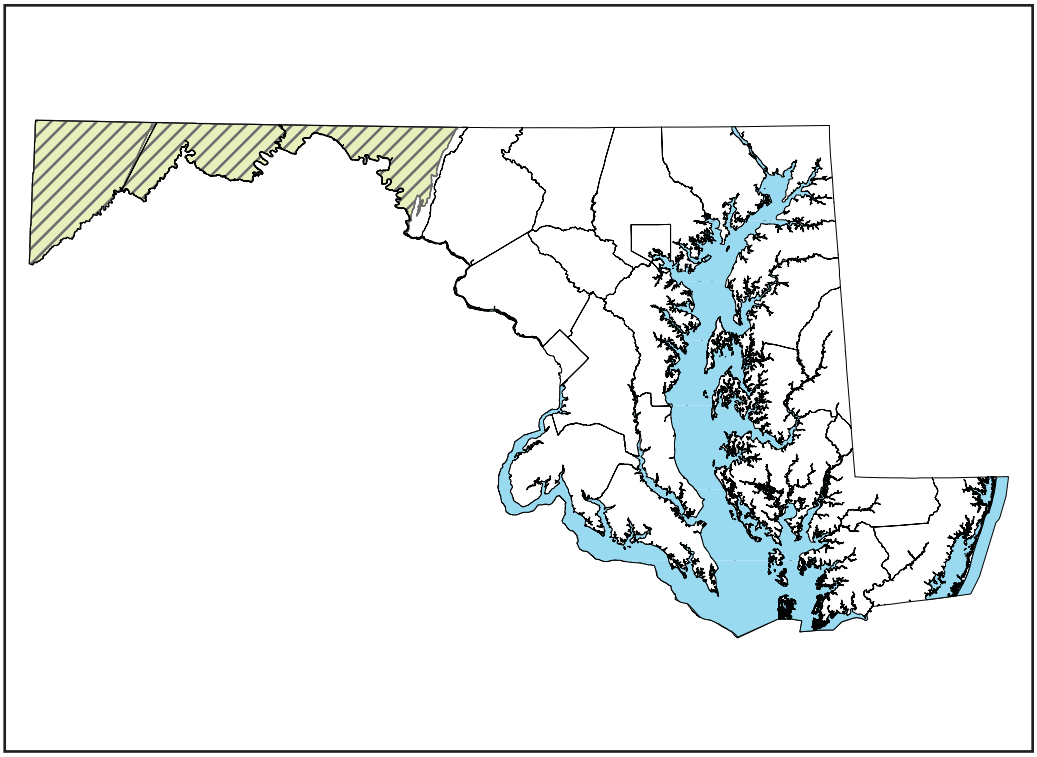
Young

There is no aquatic larval stage. Juveniles resemble adults and, although hatchlings have never been described, they probably look like adults.

Eggs

Nesting female valley and ridge salamanders have never been found. Females probably lay eggs in underground retreats. Eggs are probably laid late May or early June (Hulse et al. 2001).

Photos, from top:
Adult - Ed Thompson
Adult - Mark Tegges



Distribution and Habitat

The long tail is used for fat storage, enabling valley and ridge salamanders to spend little time above ground foraging. They are on the surface only during spring and fall, and can be found under substrates during this time. Even during optimal foraging times, only a small portion of the population is likely to be above ground (Fraser 1976). They are usually found in mature woods with well-drained soils in the Ridge and Valley and the eastern edge of the Allegheny Plateau in Maryland (Harris 1975).

Photo:
Habitat - Matt Kline

Northern Slimy Salamander

Plethodon glutinonsus

Identification

The northern slimy salamander is a relatively large *Plethodon* species ranging in Maryland from 1.9- 16.2 cm total length. The dorsum is dark black or bluish black with numerous conspicuous silvery-white spots or brassy flecks. The throat is dark and similar in color to the belly (Petranka 1998). This salamander has 15-17 costal grooves (Conant and Collins 1998).

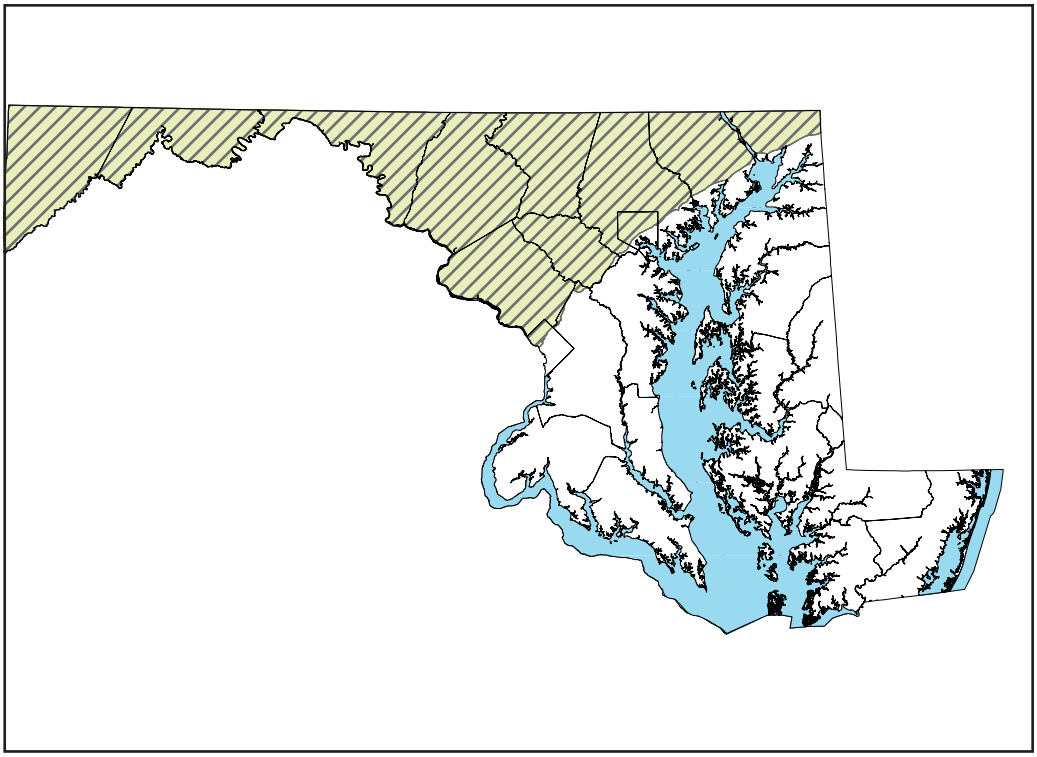
Young

There is no aquatic larval stage. Hatchlings resemble adults, except that the underside of the body lacks pigmentation and the dorsum is uniformly gray to black, with pigment-free areas that appear as scattered light spots (Wells and Gordon 1958).

Eggs

Northern slimy salamander eggs are laid in globular clusters that are usually suspended from the ceiling of a natural cavity. Freshly laid eggs average 3.5 to 5.5 mm (1.4-2.2 in.) in diameter and are creamy white in color. The outer envelopes of adjoining eggs tend to stick together and may sometimes fuse partially after oviposition (Noble and Marshall 1929; Wood and Rageot 1955).

Photos, from top:
Adult - Linh Phu
Adult - Matt Kline
Adult - Matt Sell
Adult - Lori Erb



Distribution and Habitat

The northern slimy salamander may be locally common. It is found in all of the physiographic provinces in Maryland except the Coastal Plain (Harris 1975). It can be found in forested habitats, under suitable substrates such as rocks and coarse woody debris, and in rock crevices and leaf litter.

Photos, from top:
Adult - Matt Sell
Habitat - Scott Smith

Wehrle's Salamander

Plethodon wehrlei

Identification

The dorsum of the Wehrle's salamander is dark brown to brownish-black with widely scattered brassy spots or fine white spots. Adults measure 10-17 cm total length (Petranka 1998) with 16-18 costal grooves (Conant and Collins 1998). Occasionally, red spots are also present on the dorsum. The sides of the body are heavily marked with bluish-white to yellow spots that may fuse to form blotches or irregular bands. The throat is white or blotched with white and lighter in color than the belly (Petranka 1998).

Young

There is no aquatic larval stage. Hatchlings resemble adults, except that hatchlings and small juveniles often have paired red spots on the dorsum compared with numerous brassy flecks on the adults (Petranka 1998).

Eggs

Female Wehrle's salamanders presumably oviposit in deep underground cavities, since no nest has ever been found on the surface (Green and Pauley 1987). Only one nest has ever been found. It was found in a cave in Virginia, during August (Fowler 1952). The eggs appear to be laid in grapelike clusters, and adjoining eggs may be loosely fused together by tubular extensions of the outer envelope.

Photos, from top:
Adult - Ed Thompson
Adult - Mark Tegges

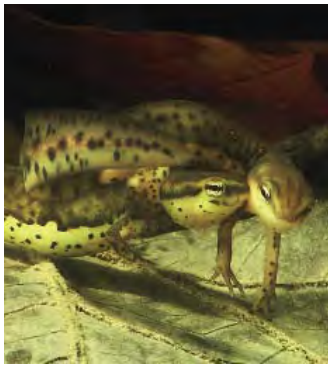
Distribution and Habitat

Wehrle's salamander is rare and is listed as in need of conservation by the Maryland Department of Natural Resources, Natural Heritage Division. It has been found exclusively on the Allegheny Plateau in Maryland (Harris 1975; Thompson 1984c). This species prefers hardwood forests and lives under rocks, coarse woody debris, damp crevices in sandstone outcrops (Thompson 1984c), and caves (Conant and Collins 1998).

Photo:
Habitat - Scott Smith

Newts
(Family Salamandridae)

Red Spotted Newt
Notophthalmus viridescens viridescens

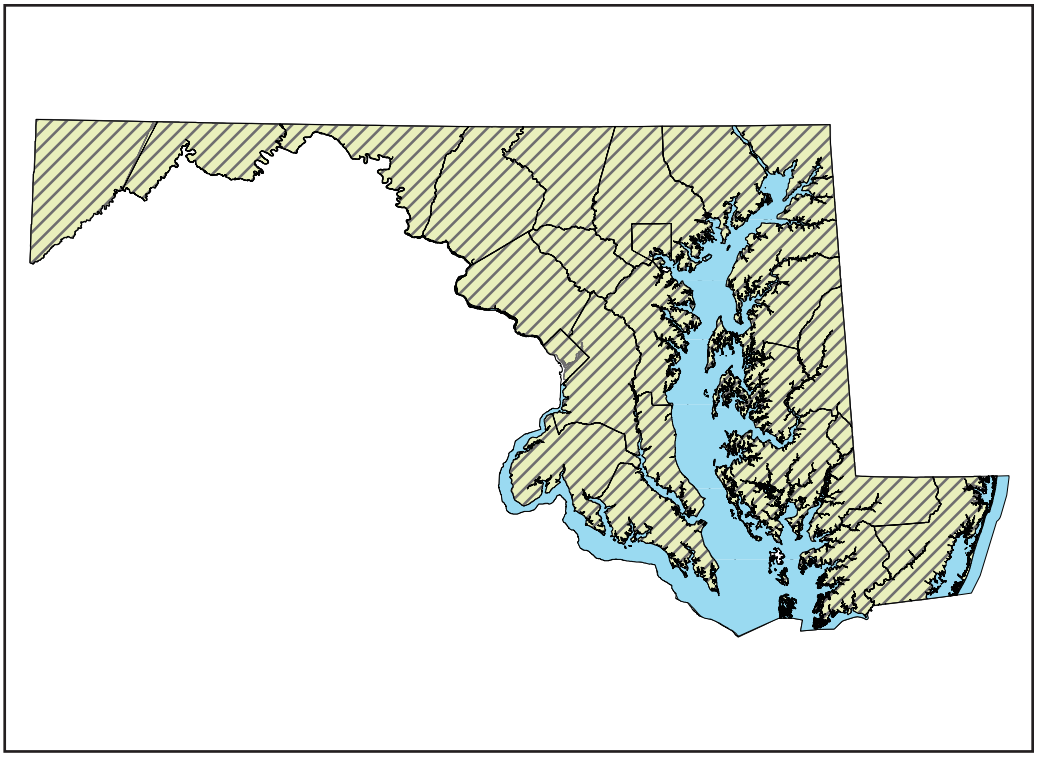


Photos, from left:
Larval - John White
Mating Pair - Mark Tegges
Adult - Paul Kazyak

Identification
The red-spotted newt is easily distinguished from other Maryland salamanders because of its rough, granular skin. In Maryland it ranges in length from 1.5-10.5 cm. They do not have conspicuous costal grooves. Most populations have four distinct life history stages including the egg, aquatic larva, terrestrial red eft, and aquatic adult. The aquatic adult has a greenish dorsum with red spots or broken lines. The belly is light yellow with fine black spotting. The tail is vertically flattened and rudder-like. The red eft stage is bright orange to dull redish-orange, with black-bordered spots occurring in two rows along the sides (Petranka 1998). Rear legs are dramatically larger than forelegs, particularly in males during the breeding season.

Young
The aquatic larval stage of the red-spotted newt has dorsal fins that extend well onto the body, and is found in lentic water bodies. It has four gill slits, lacks a keratinized jaw sheath, as is found in the Ambystomids, and the head is somewhat pointed in dorsal view. The body is slender, and the skin of large specimens may begin to exhibit the rough granular characteristics of the adult and eft stages (Petranka 1998).

Eggs
Red-spotted newt eggs are attached singly to the leaves and stems of aquatic plants, decaying leaves, or other detritus. Eggs are often concealed by portions of vegetation wrapped around the sticky outer envelopes, resembling a taco. They are usually scattered widely about the aquatic, lentic habitat. Oviposition typically begins in March and may continue through July (Petranka 1998).



Distribution and Habitat

Red-spotted newts can be found throughout Maryland. Aquatic adults are found in vernal pools, ponds, small lakes, marshes and the quiet portions of streams. Forested habitats must be adjacent or nearby, as the red eft juvenile stage is found in moist deciduous forests. Red efts wander far from water within deciduous forests, and are often in the open during the day. Few records exist for the red eft on the eastern shore. This life stage may not be part of the life cycle for red-spotted newts in this area due to the sandy,dry soil conditions.

Photos,
Clockwise, from left:
Larval - Rebecca Chalmers
Red Eft Stage - Rebecca Chalmers
Habitat - Rebecca Chalmers

Key to the Adult Frogs and Toads of Maryland

1a. Narrow pointed head; a distinct fold of skin present across the back of the head.

Eastern Narrow-mouthed Toad
(*Gastrophryne carolinensis*) p. 114

1b. Head not narrow and pointed, usually rounded; no fold of skin present across the back of the head.

2

2a. A single, sickle shaped spade on the inside of each hind foot; eyes with vertical, elliptical pupils; a pair of yellowish lines start behind the eye and meet at the rump; relatively smooth skin with numerous small tubercles.

Eastern Spadefoot
(*Scaphiopus holbrookii*) p. 116

2b. Hind foot either without spade or, if spade is present, skin is warty; pupils are round, not vertical or elliptical.

3

3a. Thick, dry glandular skin with well-defined warts; parotoid glands may be present at the back of the head (they may be absent or indistinct in small individuals).

True Toads
(Bufonidae)
4

3b. Skin moist and usually smooth, but may have small warts or tubercles; parotoid glands absent.

5

3a. Well-defined warts, paratoid glands may be present.

3b. Skin moist and usually smooth, paratoid glands absent.

3a.

3b.

4a. Dorsal spots contain 1-2 warts; parotoid gland separate from cranial crest or connected by a spur; greatly enlarged warts on tibia; chest and forward part of belly are usually darkly mottled.

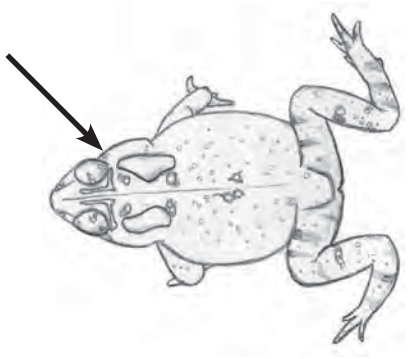
Eastern American Toad
(*Anaxyrus americanus americanus*) p. 110

4b. Generally three or more warts per spot; parotoid gland is connected directly to the cranial crest; no greatly enlarged warts on tibia (they may be slightly larger than those on the upper leg); belly is usually white, often with a single dark breast spot.

Fowler's Toad
(*Anaxyrus fowleri*) p. 112

4a. Paratoid gland separate from cranial crest

4a.



5a. Long powerful hind legs with webbed feet; stout waist; large broad mouths; toes do not have discs or pads at the tips; smooth skin with no bumps or tubercles.

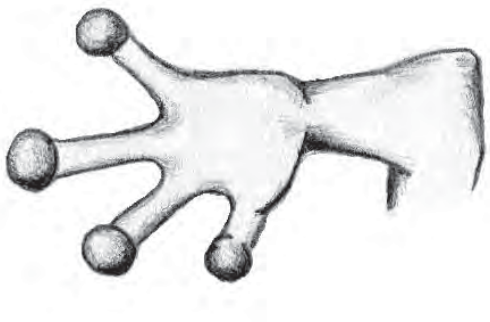
True Frogs
(Ranidae)
6

5b. Long thin hind legs; slim waist; most (but not all) have toes that terminate in discs or pads.

Tree Frogs
(Hylidae)
12

5b. Toes terminating in discs or pads

5b.



6a. Dorsolateral ridges absent.

7

6b. Dorsolateral ridges present.

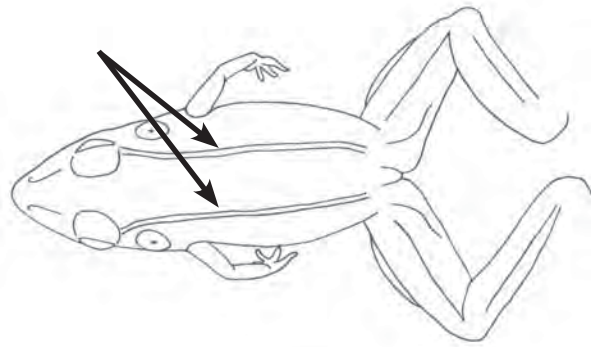
8

6a. Dorsolateral ridges absent.

6b. Dorsolateral ridges present.

6a.

6b.



7a. Pair of golden brown dorsolateral stripes present along the back and could be mistaken for ridges if the frog is not examined closely.

Carpenter Frog
(*Lithobates virgatipes*) p. 90

7b. No dorsolateral ridges or golden brown stripes along the back.

American Bullfrog
(*Lithobates catesbeianus*) p. 78

8. Usually no spots on the body; a dark mask on the side of the head running through the eye.

Wood Frog
(*Lithobates sylvaticus*) p. 88

8b. No dark mask on the side of the head; at least some spots usually present on the body.

9

9a. Dorsolateral ridges on trunk of body ending on body and not reaching to or near the groin; no light line on upper jaw; hind legs with a pattern of dark cross bands.

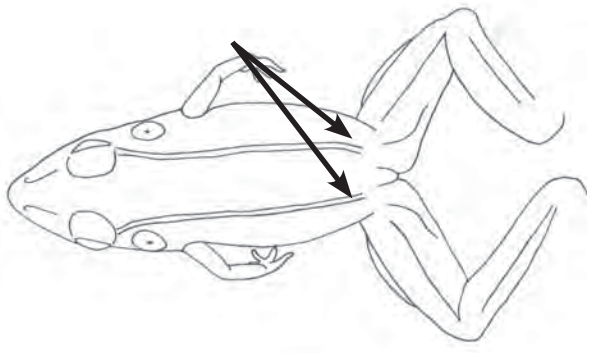
Northern Green Frog
(*Lithobates clamitans melanota*) p. 80

9b. Dorsolateral ridges reach the end of the body to or near the groin; light line present along the upper jaw; dorsum usually covered with large distinct spots.

10

9b. Dorsolateral ridges reach the end of the body to or near the groin.

9b.



10a. Dorsal spots squarish and arranged in two paired rows; inside of the thighs is bright yellow.

Pickerel Frog
(*Lithobates palustris*) p. 82

10b. Dorsal spots rounded, not arranged in definite rows; inside of thighs cream-colored.

11

11a. Tympanum with a distinctive white spot.

Southern Leopard Frog
(*Lithobates sphenocephala utricularia*) p. 86

11b. Tympanum without a distinctive white spot.

Northern Leopard Frog
(*Lithobates pipiens*) p. 84

12a. Short hind legs, when extended forward the heel fails to reach the snout; toe pads virtually absent; a rough-edged dark stripe extends along the inside of the thigh; rough skin with fine warts.

Eastern Cricket Frog
(*Acris crepitans crepitans*) p. 106

12b. Hind legs long, when extended forward the heel reaches at least to the snout; toe pads well developed; no rough edged dark stripe along inside of thigh.

13

13a. Dark X mark on the back; no light line along upper lip; no dark triangle between the eyes; (caution: the reverse parentheses on the mountain chorus frog can sometimes resemble an X).

Northern Spring Peeper
(*Pseudacris crucifer crucifer*) p. 104

13b. No dark X mark on back.

14

14a. A squarish white spot is located below each eye; the inner surfaces of the hind legs are bright orange or yellow with dark mottling; a dark irregular blotch is located on the center of the back; numerous small warts all over the body.

*Gray Treefrog and Cope's Gray Treefrog
(*Hyla versicolor and Hyla chrysoscelis*) p. 96

***Note:** *Hyla versicolor* and *Hyla chrysoscelis* cannot be distinguished by appearance. They can only be distinguished by their calls or by genetic testing as Hyla versicolor is tetraploid and Hyla chrysoscelis is diploid.

14b. No white spot below each eye; the inner surface of the hind legs not bright orange or yellow.

15

15a. Longitudinal, dark stripes are present on the back; a light (but not white) line is present and is restricted to the upper jaw; a dark triangle is almost always visible between the eyes on the back of the head.

16

15b. No dark stripes on the dorsum; there is often a white stripe along the side of the body and upper lip; no dark triangle visible between the eyes on the back of the head.

18

16a. Stripes on back form a pattern that resembles a reverse parentheses; found on the Allegheny Plateau and the extreme western part of the valley and ridge in Garrett and Alleghany counties.

Mountain Chorus Frog
(*Pseudacris brachyphona*) p. 160

16b. Dark stripes are present from the snout to the groin and pass through the eye; (the lines occasionally may be broken); smooth non-warty skin.

17

17a. Lines on back are relatively thick; found east of the Susquehanna River and throughout the Delmarva Peninsula.

New Jersey Chorus Frog
(*Pseudacris feriarum kalmi*) p. 102

17b. Lines on back are relatively thin; found west of the Susquehanna River to the eastern edge of the Valley and Ridge.

Upland Chorus Frog
(*Pseudacris feriarum feriarum*) p. 102

18a. Smooth skin and no dark spots on the back (there may be small golden spots); often a straight edged white stripe along the side of the body; but it may be absent in some individuals.

Green Treefrog
(*Hyla cinerea*) p. 98

18b. Dorsal surface has a rough appearance; usually dark, circular spots on back (not always); a white stripe originates on the upper lip and extends jaggedly down each side of the body.

Barking Treefrog
(*Hyla gratiosa*) p. 94

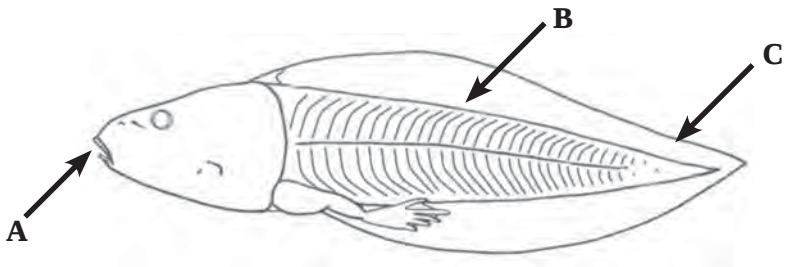
Key to the Larval Frogs and Toads of Maryland

Tadpole Anatomy

A. Oral Disc

B. Tail Musculature

C. Tail Fin



1a. Mouth parts soft, labial flaps replace an oral disc found in most other Ranids; large light blotches on sides and belly, extending onto tail; body noticeably dorsoventrally flattened.

Eastern Narrow-mouthed Toad
(*Gastrophryne carolinensis*) p. 114

1b. Mouth parts consist of a horny oral disc; no large light blotches on sides, belly, or tail; body may be moderately flattened, but not conspicuously so.

2

2a. Anal opening located near tail, along ventral midline.

3

2b. Anal opening located near tail, but to right side of ventral midline.

4

3a. Body black, somewhat flattened, with some bright metallic spots; short rounded caudal with translucent fins that are free from pigment.

Eastern American Toad
(*Anaxyrus americanus americanus*) p. 110
and
Fowler's Toad
(*Anaxyrus fowleri*) p. 112

3b. Body dark brown or bronze; small, seldom > 30mm TL; eyes are on top of the head and close together.

Eastern Spadefoot
(*Scaphiopus holbrookii*) p. 116

4a. Tip of tail (up to one third of total tail length) black.

Eastern Cricket Frog
(*Acris crepitans crepitans*) p. 106

4b. Tail not tipped with black.

5

5a. Tail ends in a well-developed flagellum.

6

5b. Tail does not end in a well-developed flagellum.

7

6a. Middle of tail fin high (1.5 times the depth of the tail muscle) and heavily mottled with black and often washed with red or orange.

Gray Treefrog and Cope's Gray Treefrog
(*Hyla versicolor* and *Hyla chrysoscelis*) p. 96

6b. Middle of tail fin moderate in height (less than 1.5 times the depth of the tail muscle), translucent and may be amber in color with dark brown flecking; musculature of tail dark brown.

Barking Treefrog
(*Hyla gratiosa*) p. 94

7a. Tail fin distinctly marked with longitudinal rows of dark spots that often fuse to create dark stripes; the tail has a dark stripe through the middle of the musculature.

Carpenter Frog
(*Lithobates virgatipes*) p. 90

7b. Tail fin not distinctly marked with longitudinal rows of dark spots; no dark stripe through the middle of the tail musculature.

8

8a. Pale line present from the eyes to the nostrils.

Green Treefrog
(*Hyla cinerea*) p. 98

8b. No pale line present from the eyes to the nostrils.

9

9a. Dorsum brownish and may be flecked with metallic bronze; venter iridescent bronze; small, seldom exceeding 30 mm TL;

**Mountain Chorus Frog
(*Pseudacris brachyphona*) p. 100
and
**New Jersey Chorus Frog
(*Pseudacris feriarum kalmi*) p. 102
and
**Upland Chorus Frog
(*Pseudacris feriarum feriarum*) p. 102

****Note:** Chorus frogs are virtually indistinguishable as tadpoles but can be distinguished by their distribution as described in the adult portion of the key.

9b. Dorsum usually some shade of green or, if brownish then the venter is iridescent white; usually much larger than 30 mm TL.

10

10a. Dorsum brown to brownish green; venter iridescent white; up to about 85 mm TL; muscular portion of tail slightly lighter in color than the rest of the body.

Northern Leopard Frog [in part]
(*Lithobates pipiens*) p. 84

10b. Dorsum some shade of green.

11

11a. Ventral surface pigmented with yellow

12

11b. Ventral surface pigmented with white or cream color

13

12a. Dorsal tail crests moderate (height equal to tail muscle depth); dorsal surfaces green with diffuse dark spots; both tail muscle and tail crest densely covered with dark spots and blotches.

Northern Green Frog
(*Lithobates clamitans melanota*) p. 80

12b. Dorsal tail crests low (height of crest less than depth of tail muscle); dorsal surfaces green with sharply defined dark spots; tail crests translucent or cloudy, lacking sharply defined dark spots.

American Bullfrog
(*Lithobates catesbeianus*) p. 78

13a. Eyes on the side of the head.

14

13b. Eyes on the top of the head

15

14a. Eyes high but on the side of the head; throat immaculate; tail fin rounded dorsally, tapering to a fine point; dorsum and sides of body dark green and flecked with fine gold spots; muscular portion of tail lighter in color than body and flecked with black; up to about 50 mm TL.

Wood Frog
(*Lithobates sylvaticus*) p. 88

14b. Eyes located distinctly on the side of the head; throat mottled with diffuse dark pigment; tail fin translucent and patterned with dark maculations, especially along the dorsal margin, near the tip; dorsum and sides of the body are greenish and may exhibit gold flecks; less than 35 mm TL.

Northern Spring Peeper
(*Pseudacris crucifer crucifer*) p. 104

15a. Dorsal coloration varies from green to olive green and is covered with numerous small black dots on the dorsum; muscular portion of the tail is similar in color to the body; muscular portion of the tail and fin often have large dark blotches or are pigmented uniformly dark.

Pickerel Frog
(*Lithobates palustris*) p. 82

15b. Dorsal coloration yellowish green; muscular portion of tail is slightly lighter in color than the rest of the body; tail cloudy or translucent but lacking large dark blotches.

Southern Leopard Frog
(*Lithobates sphenocephala utricularia*) p. 86
or
Northern Leopard Frog
(*Lithobates pipiens*) p. 84

Frogs and Toads (Order Anura)

Cope's Gray Treefrog
Photo: Corey Wickliffe

Frogs and toads are amphibians that do not typically have a tail as adults. The hind legs are longer than the front legs and are modified for jumping. The body is relatively short and the head is not separated from the body by a discernable neck. The larval or tadpole stage of most frogs and toads are entirely aquatic, possess a tail, and do not have legs until late in development, just prior to metamorphosis to the adult form. Frog and toad tadpoles with legs can be distinguished from aquatic salamander larvae by the lack of a discernable neck and the presence of distinctly longer back limbs compared to the front limbs.

There are five families and twenty species of anurans that can be found in Maryland.

Spotting, striping, mottling, and the color pattern on the dorsum, along with roughness of the skin, relative limb length, the color of the underside of the legs and venter are some of the most common characteristics used to distinguish families and species of adult anurans. Most adult anurans can also be identified by the distinct sound of their mating call. Tadpole identification can be difficult and often requires inspection of mouthparts under a microscope. However, identification of many tadpole species is possible using other characters including the height of the tail fin, coloration, and spotting or mottling on the dorsum (Hulse et al. 2001; White and White 2007). The most easily recognizable features for identifying adults, larvae, and eggs of each species of Anuran that could be encountered in Maryland are included in the descriptions that follow in this document. Distinguishing characteristics of the true frog, tree frog, and true toad families are also included. The distinguishing characteristics of the other two families are not included because, there is only one species in each family in Maryland. A description of the sound of the call for each species is also included because in many cases anurans can be easily heard but may be difficult to locate for capture and inspection of physical characteristics.

In addition to physical descriptions of the anurans found in Maryland, maps depicting the distribution of each species in Maryland are also included. The distribution maps include historical distribution information that was compiled by Harris (1975). White and White (2007) also provided a great deal of the historical and recent distributional information for frogs and toads on Maryland's eastern shore. Additional recent distribution information was provided by the Maryland Department of Natural Resources, Maryland Biological Stream Survey and Natural Heritage Program, and from additional literature where appropriate.

Eastern Spadefoot Toads
Photo: Corey Wickliffe

Listing Status of the Frogs and Toads of Maryland

	Common Name	Scientific Name	State Status
True Frogs (Ranidae)	American Bullfrog	*Lithobates catesbeianus*	
	Northern Green Frog	*Lithobates clamitans melanota*	
	Pickerel Frog	*Lithobates palustris*	
	Northern Leopard Frog	*Lithobates pipiens*	
	Southern Leopard Frog	*Lithobates sphenocephala utricularia*	
	Wood Frog	*Lithobates sylvaticus*	
	Carpenter Frog	*Lithobates virgatipes*	In Need of Conservation
Treefrogs (Hylidae)	Barking Treefrog	*Hyla gratiosa*	Endangered
	Gray Treefrog	*Hyla versicolor*	
	Cope's Gray Treefrog	*Hyla chysoscelis*	
	Green Treefrog	*Hyla cinerea*	
	Mountain Chorus Frog	*Pseudacris brachyphona*	Threatened
	New Jersey Chorus Frog	*Pseudacris feriarum kalmi*	
	Upland Chorus Frog	*Pseudacris feriarum feriarum*	
	Northern Spring Peeper	*Pseudacris crucifer crucifer*	
	Eastern Cricket Frog	*Acris crepitans crepitans*	

	Common Name	Scientific Name	Listing Status
True Toads (Bufonidae)	Eastern American Toad	*Anaxyrus americanus americanus*	
	Fowler's Toad	*Anaxyrus fowleri*	
Narrow-mouthed Toads (Microhylidae)	Eastern Narrow-mouthed Toad	*Gastrophryne carolinensis*	Endangered
Spadefoot Toads (Pelobatidae)	Eastern Spadefoot	*Scaphiopus holbrookii*	

True Frogs (Family Ranidae)

True frogs have long powerful hind legs with webbed feet. They have relatively stout waists and large broad mouths. The toes do not have discs or pads at the tips as in the treefrogs (Hylidae). All of the true frogs found in Maryland have smooth skin with no bumps or tubercles, and most have ridges that run along the sides of the back (dorsolateral ridges). All Maryland frogs in Family Ranidae are in the genus *Lithobates*.

Many true frog tadpoles grow relatively large and may have an extended larval stage (up to three years). They can be found in many types of water bodies from ephemeral pools to permanent lakes, ponds, and flowing streams.

The seven species of true frogs that can be found in Maryland include the American bullfrog (*Lithobates catesbeianus*), northern green frog (*Lithobates clamitans melanota*), pickerel frog (*Lithobates palustris*), northern leopard frog (*Lithobates pipiens*), southern leopard frog (*Lithobates sphenocephala utricularia*), wood frog (*Lithobates sylvaticus*), and carpenter frog (*Lithobates virgatipes*).

Wood Frog
Photo: William Harbold

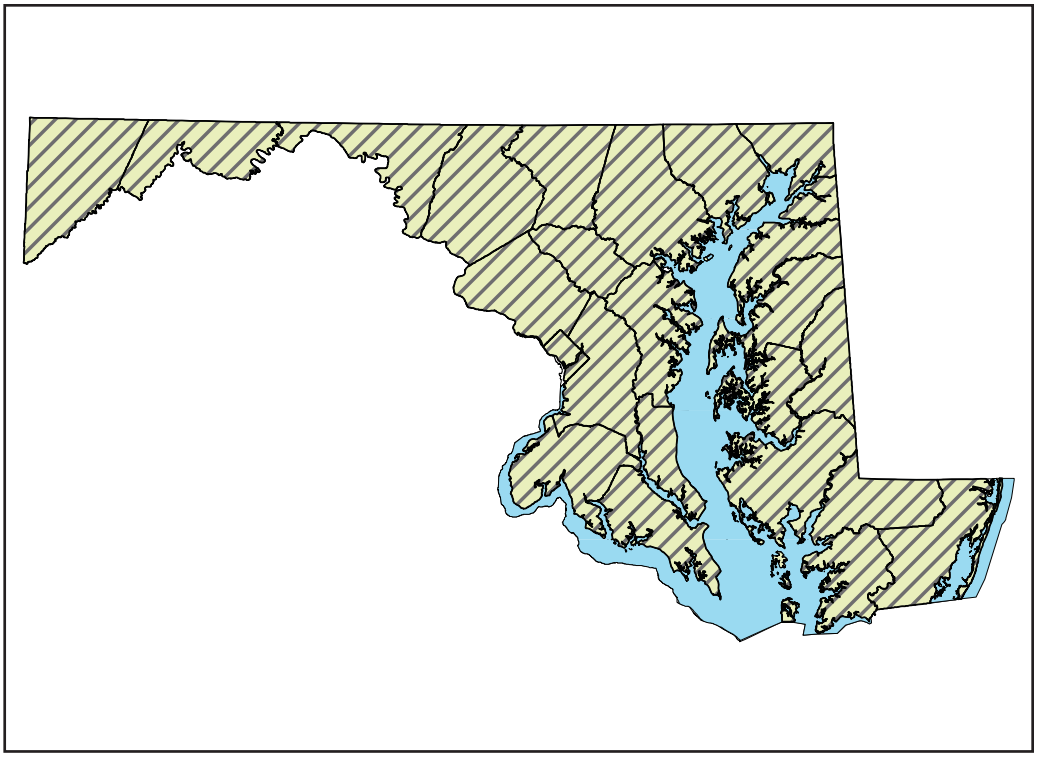
American Bullfrog
Lithobates catesbeianus

Identification
The American bullfrog is the largest anuran found in Maryland. It is one of two ranid frogs found in Maryland that lacks dorsolateral ridges. However, a distinct fold of skin begins behind the eye and curves around the back of the tympanum. The dorsal coloration of the bullfrog can be many shades of green or brown. The front of the head is almost always bright green (White and White 2002). Any spotting on the dorsum is typically darker than the ground color and never consists of a pair of golden brown dorsolateral stripes, as in the carpenter frog.

Young
American bullfrog tadpoles attain greater lengths than any other tadpoles found in Maryland (130-140 mm). The eyes are positioned high on the head. The dorsum of the body and head is dark green or greenish brown (White and White 2007) with numerous dark, well-defined spots and dots on the back and upper half of the tail. The dorsal color lightens laterally and the ventral surfaces are yellowish. The tail crest is relatively low (less than the depth of the tail muscle) and lighter in color than the body. The tail fins are translucent and patterned with numerous small black dots (Hulse et al. 2001).

Eggs
American bullfrog eggs are relatively small (1.3 mm on average). Clutch size varies from about 6,000 eggs to over 20,000 eggs. Eggs are laid in a large floating raft that is a single egg layer deep. The rafts are roughly circular and may be as much as 60 cm in diameter (Hulse et al. 2001). Mating typically occurs from April through July.

Photos, from top:
Adult - David Kazyak
Tadpole - Ronn Altig
Juvenile - Corey Wickliffe
Adult - Mark Tegges



Distribution and Habitat
The American bullfrog is common in many types of permanent and semi-permanent water bodies throughout Maryland. It is also found in a range of water quality conditions from relatively undisturbed to highly degraded waters.

Call
The American bullfrog call is a distinct, deep-throated “jug-o-rum”.

Photos, from left:
Tadpole - Corey Wickliffe
Habitat - Rebecca Chalmers

Northern Green Frog

Lithobates clamitans melanota

Identification

The northern green frog is a moderately large anuran. It resembles the american bullfrog in many ways, but can easily be distinguished by the presence of distinct dorsolateral ridges. The dorsolateral ridges end on the body and do not reach the groin. There is also no light line on the upper jaw, as in pickerel and leopard frogs (Conant and Collins 1998). The hind legs have a pattern of dark cross bands (Hulse et al. 2001).

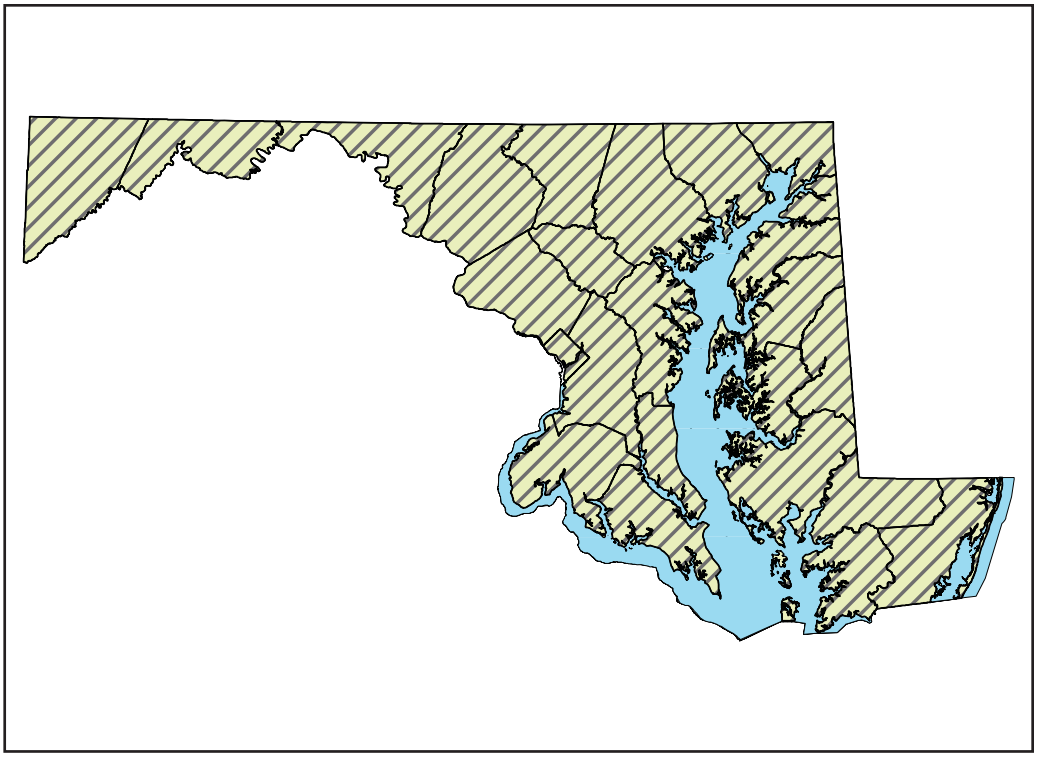
Young

Northern green frog tadpoles can be up to 100 mm (3.9 in.) long. They look very similar to American bullfrog tadpoles. However, the tail fins of northern green frog tadpoles are covered with more dark blotches and mottling. The dorsum of the northern green frog tadpole is covered with diffuse, dark spots compared to the distinct, sharply defined, spots found on the American bullfrog. The dorsal fin crest is also different. The crest of the northern green frog tadpole is approximately equal in height to the depth of the tail muscular. Comparatively, the american bullfrog has a low crest, the height is less than the depth of the tail muscle (Hulse et al. 2001).

Eggs

Northern green frog eggs appear very similar to American bullfrog eggs. They are laid in a broad, shallow raft that is usually one egg layer thick. The masses may contain 3,000 to 5,000 eggs and can cover 15 to 20 cm on a side. Northern green frogs seem to prefer shallow backwater areas for laying eggs. They breed from April through August (Hulse et al. 2001).

Photos, top to bottom, left to right:
Adult - Matt Sell
Tadpole - Ronn Altig
Adult - Corey Wickliffe
Eggs - Corey Wickliffe
Adult - Paul Kazyak



Distribution and Habitat
The northern green frog is found in every type of freshwater habitat found in Maryland. They are also found in a range of water quality conditions from relatively undisturbed systems to highly degraded waters, and commonly co-exist with other anurans.

Call
The northern green frog call is an explosive note that sounds similar to the plucking of a banjo (White and White 2007).

Photos, clockwise from left:
Adult - Corey Wickliffe
Tadpole - Andy Becker
Habitat - Rebecca Chalmers

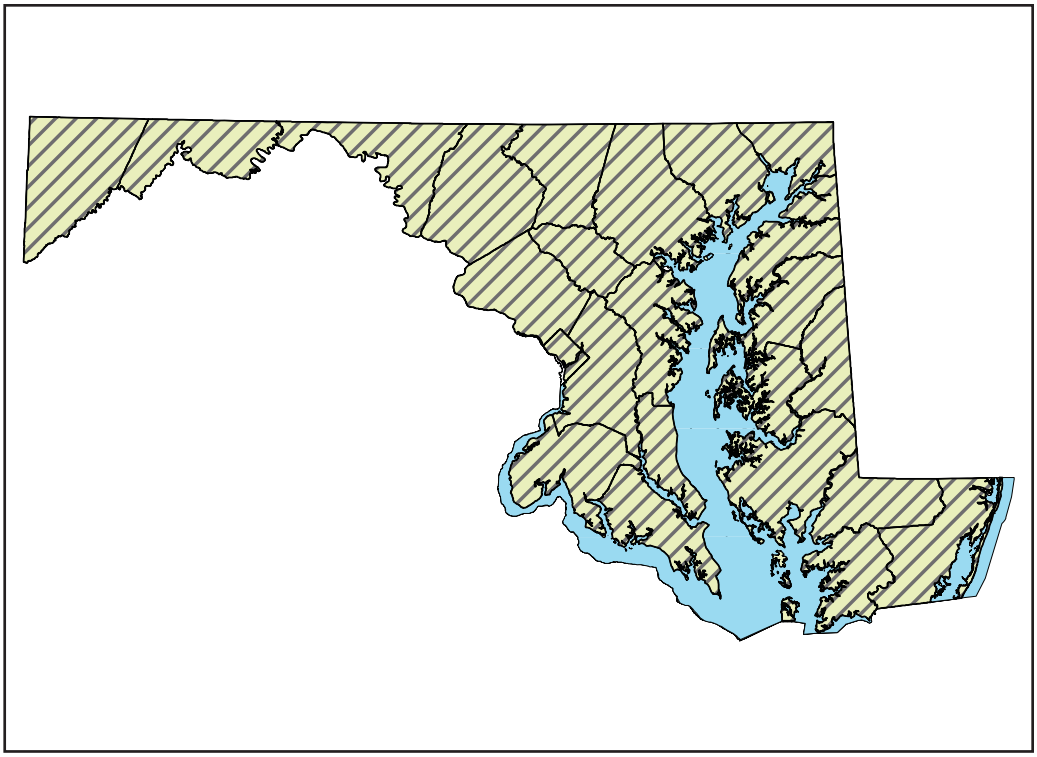
Pickerel Frog
Lithobates palustris

Identification
The dorsal spots of the pickerel frog are squarish and arranged in two rows, unlike leopard frog spots which tend to be round and not in rows. The inside of the thighs has a distinctive bright yellow color.

Young
Pickerel frog tadpoles reach lengths of up to about 80 mm (3.15 in.). The eyes are on top of the head and the body color varies from green to olive green, and is covered with numerous small black dots on the dorsum. The ventral surface is white and shiny and the muscular portion of the tail is similar in color to the rest of the body (Hulse et al. 2001).

Eggs
Pickerel frog eggs are usually laid in shallow water (<30 cm deep). They are attached to submerged or emergent vegetation. Masses may be laid singly or communally. Masses are almost spherical, rather than flattened. They resemble the masses of wood frogs but are laid later in the season (April to early June). Egg masses typically contain from 2,000 to 3,000 eggs. The eggs are distinctly bi-colored, with the dorsal surface dark brown and the ventral surface yellow (Hulse et al. 2001).

Photos, from top:
Mating Pair - Mark Tegges,
Tadpole - Ronn Altig
Adult - John White
Adult - Jay Kilian



Distribution and Habitat
Pickerel frogs are common throughout Maryland and can be found in or near any freshwater habitats.

Call
The pickerel frog call is a slow, raspy, low pitched snore lasting up to two seconds. (White and White 2007)

Photos, clockwise from from left:
Adult - Jay Kilian
Adult - Andy Becker
Habitat - Rebecca Bourquin

Northern Leopard Frog

Lithobates pipiens

Identification

The northern leopard frog is one of three frogs found in Maryland that has distinct spots on the dorsum and dorsolateral ridges that extend all the way to the groin. The spots are not arranged in definite rows as they are in the pickerel frog. The insides of the thighs are cream colored. The northern leopard frog and southern leopard frog are very similar in appearance, but can be easily distinguished by a white spot in the tympanum of the southern leopard frog, which is not present on the northern leopard frog (Hulse et al. 2001).

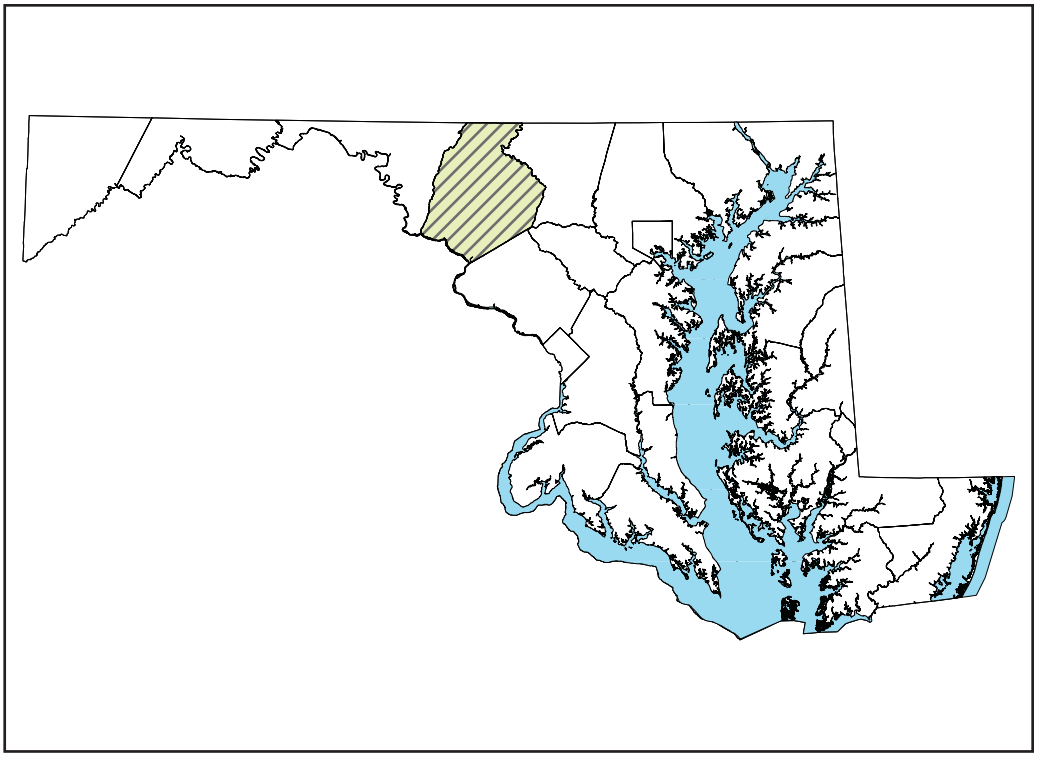
Young

Northern leopard frog tadpoles reach lengths of up to 85 mm (3.35 in.). The dorsum is typically brown to brownish or yellowish-green. Yellowish-green individuals are indistinguishable from southern leopard frog tadpoles. The venter is iridescent white. The intestinal coil is visible through the skin on the belly and the muscular portion of the tail is slightly lighter in color than the rest of the body. The tail fins and the muscular portion of the tail are profusely covered with spots and lines of dark pigment (Hulse et al. 2001).

Eggs

Northern leopard frog eggs are laid in flattened masses and are oval rather than spherical. They are generally attached to submerged vegetation, but may lie freely on the bottom. Masses contain from 2,000 to 6,000 eggs. Eggs are darkly pigmented and average 1.7mm (0.07 in.) in diameter (Walker 1946).

Photos, from top:
Adult - William Harbold
Tadpole - Ronn Altig



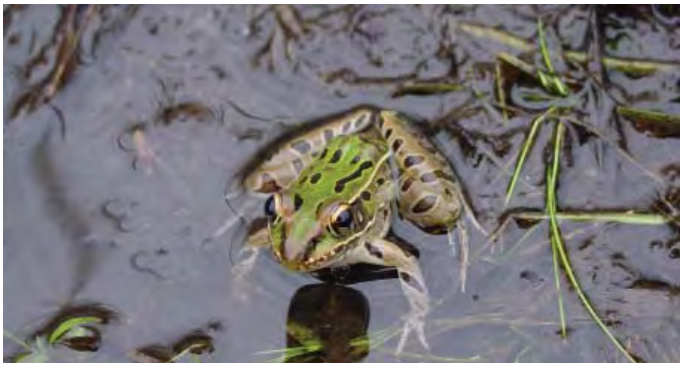
Distribution and Habitat
The northern leopard frog is rarely found in Maryland and is restricted to areas west of the Fall Line (Harris 1975). It is found in nearly every type of freshwater habitat in parts of its range.

Call
The call of the northern leopard frog is a low growl that sounds like two balloons being rubbed together (White and White 2007). A series of clucks may often follow. The clucks sound like the creaking of a door being slowly opened.

Photo:
Habitat - Rebecca Chalmers

Southern Leopard Frog

Lithobates sphenocephalus utricularius



Identification

The southern leopard frog is almost identical in appearance to the northern leopard frog except for the presence of a distinctive white spot in the tympanum.

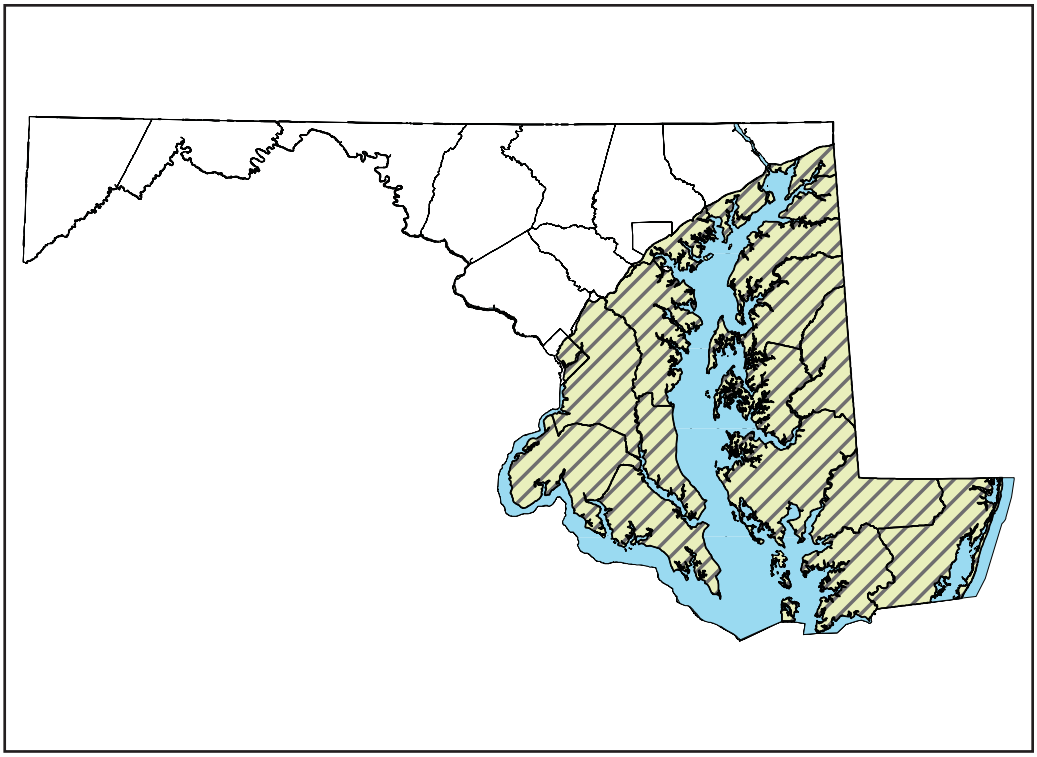
Young

Southern leopard frog tadpoles are typically green or yellowish green in color and are indistinguishable from northern leopard frog tadpoles except for differences in geographic distribution.

Eggs

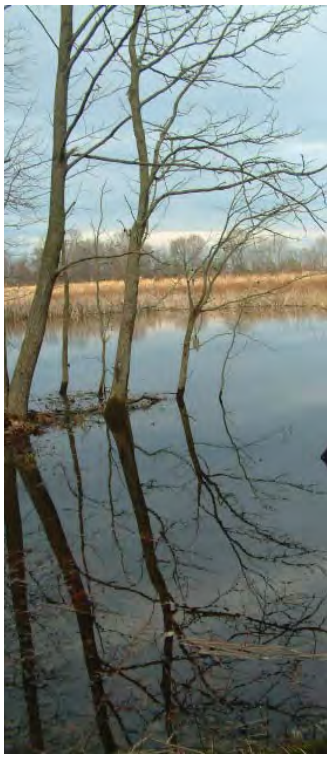
Southern leopard frog eggs are laid during April in flattened masses about 40 mm (1.57 in.) thick and 100 mm (3.94 in.) wide. Masses are usually attached to aquatic vegetation at varying depths, and may be laid singly or communally. Single masses may contain as many as 1,500 eggs (Hulse et al. 2001).

Photos, from top:
Adult - Corey Wickliffe
Adult - Corey Wickliffe
Adult - Mark Tegges



Distribution and Habitat
Southern leopard frogs are restricted almost exclusively to the Coastal Plain of Maryland. They are common and can be found in and near freshwater and even brackish habitats (White and White 2007).

Call
The southern leopard frog call typically consists of three to five loud clucks or chuckles that may be followed by a low growl that sounds like two balloons being rubbed together (White and White 2007). The clucks tend to be repeated in more rapid succession compared to the clucks of the northern leopard frog.



Photos, from left:
Adult - Corey Wickliffe
Adult - Corey Wickliffe
Habitat - Rebecca Chalmers

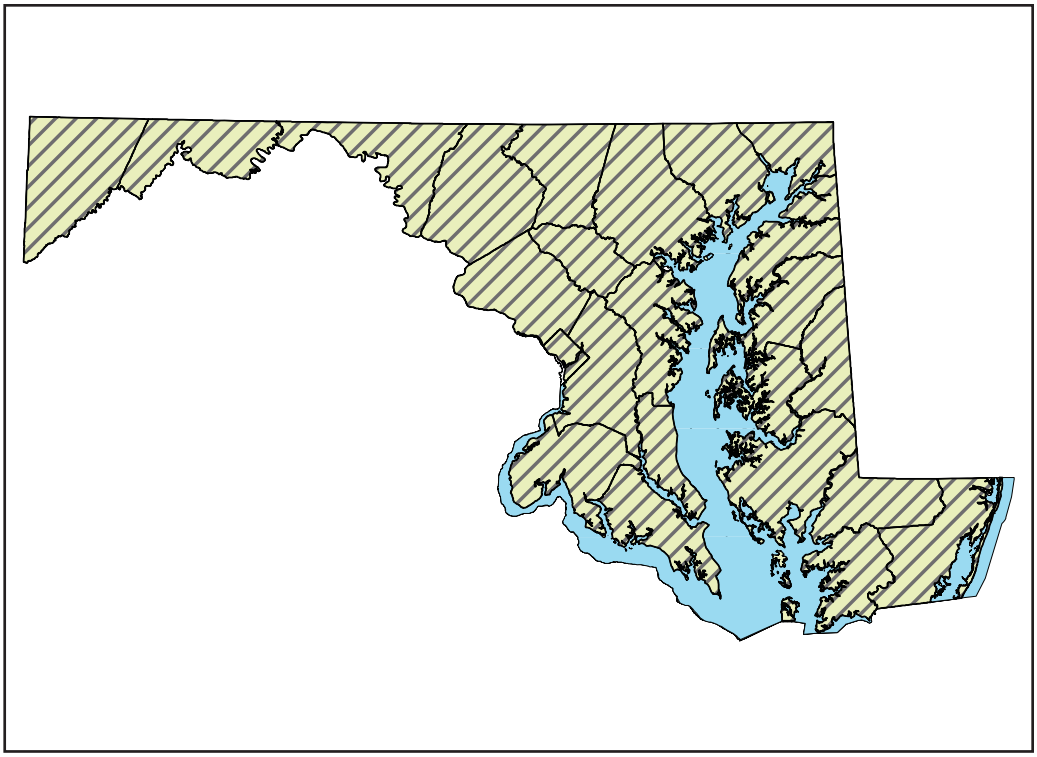
Wood Frog
Lithobates sylvaticus

Identification
The wood frog can be easily distinguished from other ranids by the presence of a dark mask on the side of the head that runs through the eye. Dorsolateral ridges are present on the back and typically there are no spots on the body.

Young
The dorsum and sides of body are dark green and flecked with fine gold spots. Other wise, there are no distinct markings on the body of wood frog tadpoles. The intestinal coil is partially visible from underneath. The tail fin tends to be rounded dorsally and tapering to a fine point. There are often faint, small markings on tail fin. Unlike most other ranids, the eyes are clearly on sides of head. The belly is pale and iridescent and the muscular portion of tail is lighter than the body (Hulse et al. 2001).

Eggs
Wood frog eggs are laid in temporary pools, often early in spring (February through April). The eggs are embedded in spherical masses of crystal-clear jelly. The masses vary in size from 75 to 100mm (in.). The average clutch size in MD contains about 745 eggs (Berven 1988).

Photos, from top:
Adult - Corey Wickliffe
Tadpole - Ronn Altig
Adult - Corey Wickliffe
Mating Pair - Mark Tegges



Distribution and Habitat

Wood frogs are common in Maryland and can be found in moist deciduous or mixed deciduous-coniferous woodlands with associated vernal pools or freshwater marshes (White and White 2007). They can also be found a long way from water.

Call

The call of the wood frog is an abrupt repeated “cluck” that sounds like the quacking of a duck.

Photos, from top:
Adult - Mark Tegges
Habitat - Rebecca Chalmers

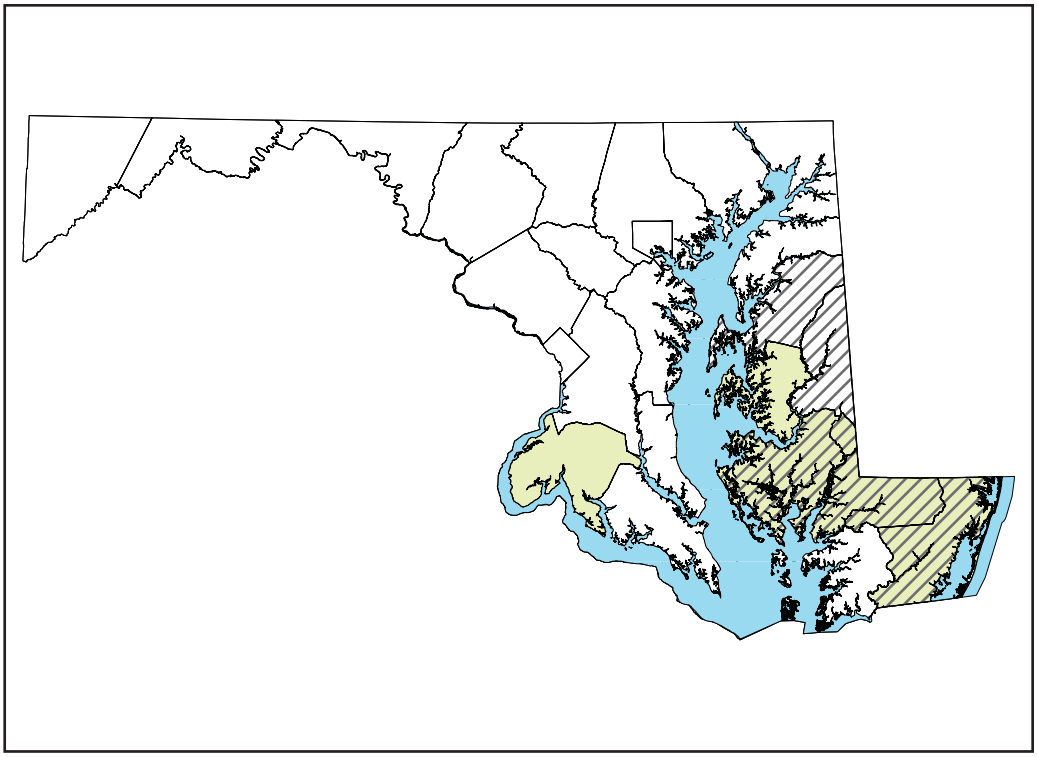
Carpenter Frog
Lithobates virgatipes

Identification
The carpenter frog superficially resembles the northern green frog and American bullfrog. It is the only ranid species other than the American bullfrog, which lacks dorsolateral ridges. A pair of distinct golden brown dorsolateral stripes are present in the same location where dorsolateral ridges are found on the northern green frog. These stripes distinguish the carpenter frog from other ranid species. However, the stripes could be mistaken for ridges if the frog is not inspected closely.

Young
Carpenter frog tadpoles are relatively large (up to 92 mm long). They tend to be dark brown with some darker spotting. The tail has a dark stripe through the middle of the musculature and translucent fins that are distinctly marked with longitudinal rows of dark spots that often fuse to create dark stripes (White and White 2007).

Eggs
Carpenter frog eggs are attached to underwater vegetation. They are laid in spherical or elongate globular masses that may be as large as 65 X 100 mm (Gosner and Black 1968). Clutches can contain 200 to 600 eggs. Breeding usually begins in April and may continue through July (Hulse et al. 2001).

Photos, from top:
Adult - Mark Tegges
Tadpole - Ronn Altig
Ventral - Corey Wickliffe
Ventral - Corey Wickliffe



Distribution and Habitat
The carpenter frog inhabits acidic bogs, Delmarva bays, sphagnum bogs, and grassy freshwater wetlands. It is rare and is currently found in only a few places on the eastern shore of Maryland (White and White 2007). It is listed by the Maryland Department of Natural Resources, Natural Heritage Division, as in need of conservation.

Call
The call resembles the sound of a hammer striking a board and may be repeated up to ten times in succession.

Photos, from top:
Adult - Corey Wickliffe
Habitat - Jay Kilian

Northern Green Frog
Photo: Luke Roberson

Treefrogs (Family Hylidae)

Treefrogs are relatively small anurans. They have a slim waist, long thin limbs and most (except for the eastern cricket frog in Maryland) have toes that terminate in distinctly enlarged discs or pads. Treefrogs are distinguished from one another by a number of characteristics including, the type of dorsal markings they possess, the length of the back limbs, the presence or absence of light spots under the eye and along the upper lip, and by the size of the toepads.

There are a total of nine species of treefrogs in three genera that can be found in Maryland. Members of the three genera (*Hyla* spp., *Pseudacris* spp., and *Acris* spp.) can be distinguished from one another using fairly obvious physical characteristics.

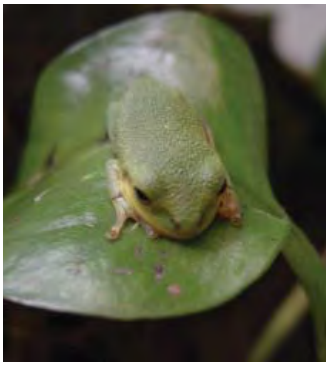
1. *Hyla* spp. are primarily arboreal and have greatly enlarged pads at the terminal ends of the digits to facilitate climbing. They lack dark longitudinal lines or "X" shaped markings on the dorsum. *Hyla* spp. include the barking treefrog (*Hyla gratiosa*), gray treefrog (*Hyla versicolor*), Cope's gray treefrog (*Hyla chysoscelis*), and green treefrog (*Hyla cinerea*).

2. *Pseudacris* spp. are small and have longitudinal lines or an "X" shaped mark on the dorsum. Although the toepads are distinct, they are not as large as the toepads of *Hyla* spp.. *Pseudacris* spp. include the mountain chorus frog (*Pseudacris brachyphona*), New Jersey chorus frog (*Pseudacris feriarum kalmi*), upland chorus frog (*Pseudacris feriarum feriarum*), and northern spring peeper (*Pseudacris crucifer crucifer*).

3. *Acris* spp. are represented by one species in Maryland; the eastern cricket frog (*Acris crepitans crepitans*). *Acris* spp. are characterized by a longitudinal dark stripe on the rear surface of the thigh and toepads that are so small and indistinct that they are virtually absent.

Barking Treefrog
Hyla gratiosa

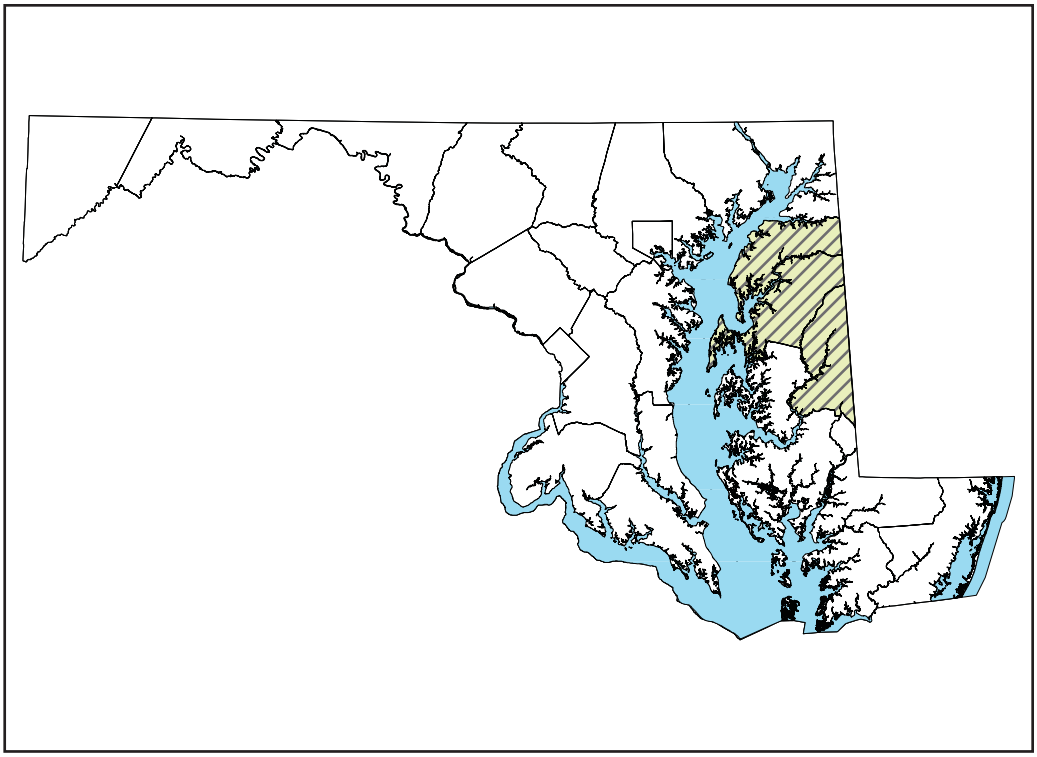
Identificaiton
The barking treefrog is Maryland's largest treefrog. The general color pattern and body form resemble the green treefrog (*Hyla cinerea*). Both are green and often have white stripes along the sides of the body. However, several barking treefrog characteristics distinguish it from the green treefrog. There are usually (but not always) dark circular spots on the back of the barking treefrog. The white stripes along the sides have a jagged edge as opposed to the straight-edged stripe found on the green treefrog. The skin on the dorsal surface of the barking treefrog appears rough compared to the smooth skin of the green treefrog (Conant and Collins 1998; White and White 2007).



Young
Barking treefrog tadpoles are large for a treefrog (up to 70 mm). The body is generally dark brown with a light, unmarked throat. The tail has a well-developed flagellum, dark brown musculature, and translucent fins. The fins are sometimes amber in color with dark brown flecking (White and White 2007).

Eggs
The eggs are laid singly on the bottom of usually temporary pools. Each egg has a single envelope and is loose, glutinous with an obscure outline. The vitelline membrane resembles an inner envelope. Eggs are 1-1.6 mm in diameter (Wright and Wright 1949).

Photos, from top:
Adult - Scott Smith
Tadpole - Ronn Altig
Adult - Corey Wickliffe
Tadpole - Corey Wickliffe



Distribution and Habitat

The barking treefrog is very rare and is listed as endangered in Maryland by the Maryland Department of Natural Resources, Natural Heritage Division. It can be found in moist Coastal Plain woodlands of the eastern shore. During the spring it is often associated with fishless vernal pools or borrow pits. During the summer it spends its time underground or in other moist retreats (White and White 2007).

Call

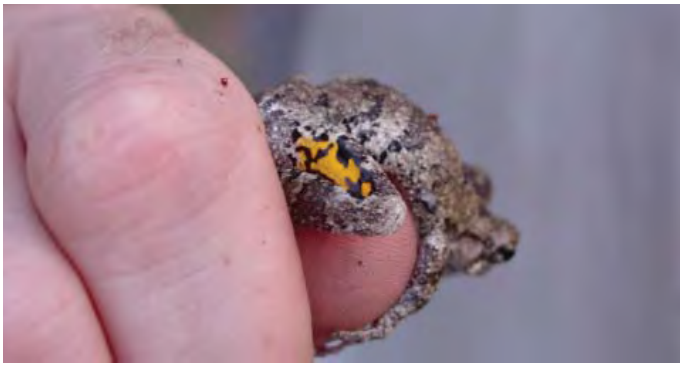
The namesake call of the barking treefrog sounds like hounds barking.

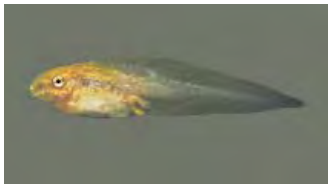
Photos, from top:
Adult - Mark Tegges
Adult - Mark Tegges
Calling Adult - Corey Wickliffe

Gray Treefrog
Hyla versicolor

and

Cope's Gray Treefrog
Hyla chrysoscelis





Photos, from top :
Detail - Corey Wickliffe
Tadpole - Ronn Altig
Adult - Corey Wickliffe

Identification
The two species of gray treefrogs found in Maryland are identical in their physical appearance. They are light gray with a dark irregular blotch located on the center of the back. They have numerous small warts all over the body. A white, squarish spot is located below each eye and the inner surfaces of the hind legs are bright orange or yellow with dark mottling (White and White 2007). The two species can be distinguished from one another by their call or by genetic testing as *Hyla versicolor* is a tetraploid (has four sets of chromosomes) and *Hyla chrysoscelis* is a diploid (has two sets of chromosomes).

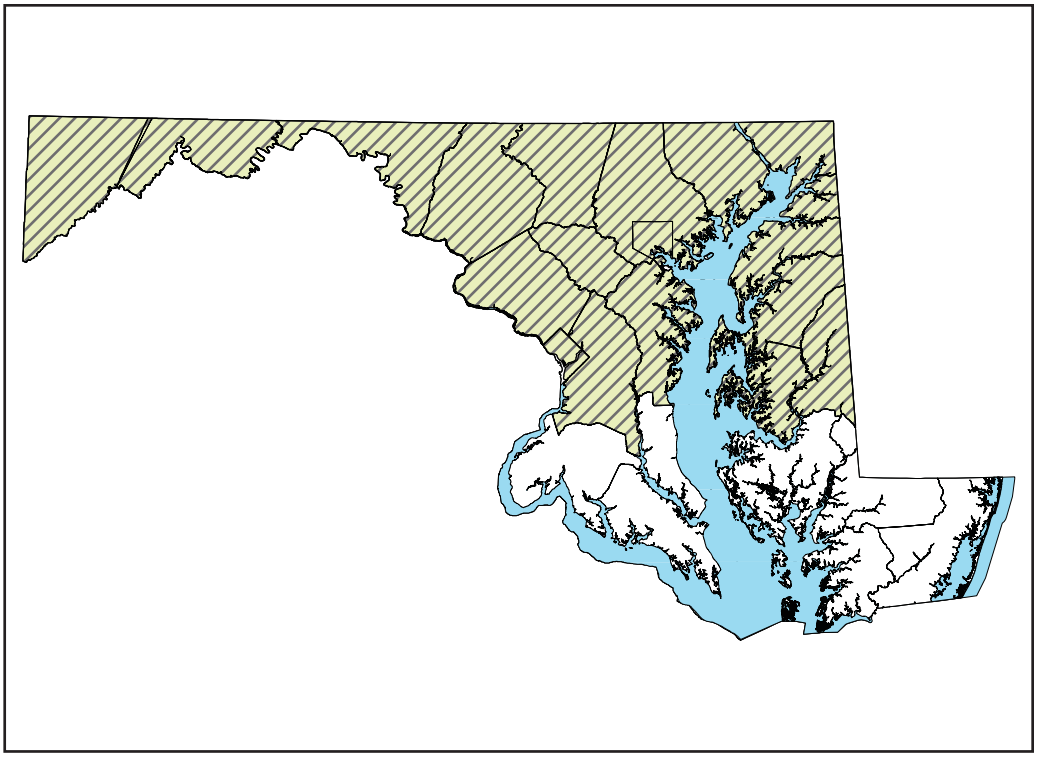
Young
The tadpoles of *H. versicolor* and *H. chrysoscelis* are also identical in appearance and cannot be distinguished accept by examination of their genes. They reach lengths of about 50 mm (2.0 in.). The middle of the tail fin is high and heavily mottled with black. The muscular portion of the tail is often washed with red or orange and the tail ends in a well-developed flagellum. The body is greenish and flecked with gold and the eyes are on the sides of the head rather than on top (Hulse et al. 2001).

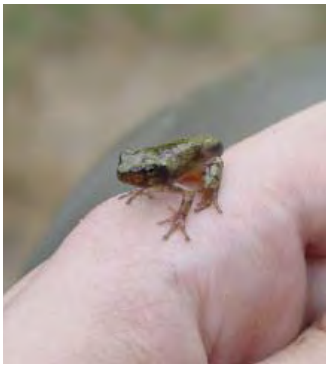
Eggs
A female may lay as many as 2,000 eggs in small masses of less than 50 eggs, each of which is about 1.2 mm (0.5 in.) in diameter (Wright and Wright 1949). Masses may be free-floating or attached to vegetation, and are usually spread widely throughout the breeding pond.

Distribution and Habitat
Gray treefrogs are primarily arboreal. They are found in or near deciduous, mixed deciduous, and coniferous forests that have vernal pools or nearby ditches for breeding (White and White 2007). *Hyla versicolor* is typically found from the western portion of Maryland to just east of the Fall Line and onto the northern part of the eastern shore. *Hyla chrysoscelis* is the more eastern species with the exception of a single population found in far western Maryland. However, there is a great deal of overlap in the distribution of these species in central Maryland, including the Piedmont and northern and western portions of the Coastal Plain.

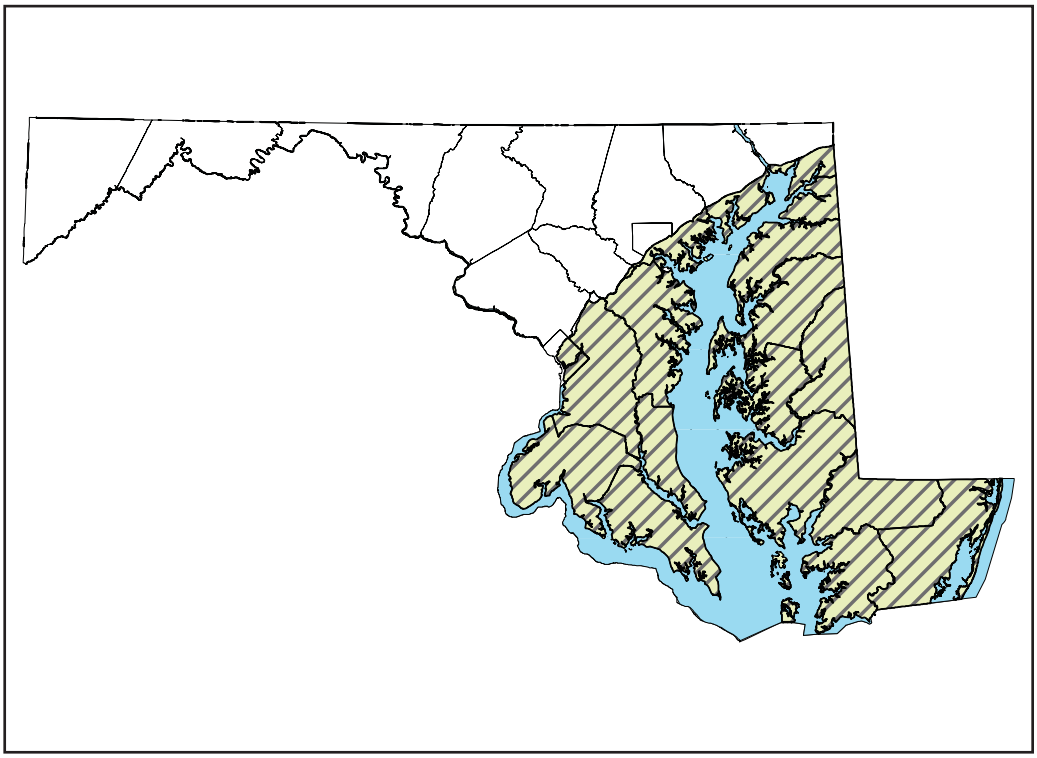
Call
The call of both species is a flutelike trill. *Hyla versicolor* is typically more melodious, lower pitched, shorter in duration and slower than *H. chrysoscelis*, given the same temperature (White and White 2007).

Distribution Map for Gray Treefrog
Hyla versicolor





Distribution Map for Cope's Gray Treefrog
Hyla chrysoscelis



Photos, top to bottom, left to right:
Adult - Mark Tegges
Juvenile - Corey Wickliffe
Adult - Corey Wickliffe
Habitat - Rebecca Chalmers

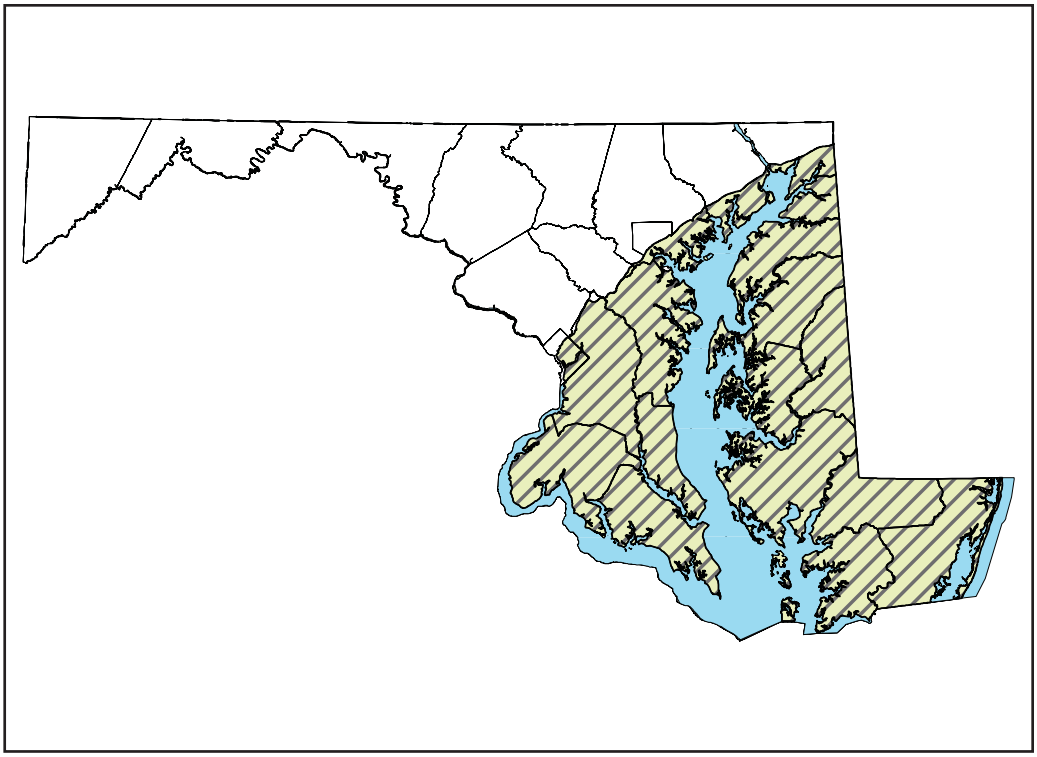
Green Treefrog
Hyla cinerea

Identification
The green treefrog is a slender green frog that often has a light stripe with a straight edge along the side of the body. However, some individuals lack the stripe altogether (Conant and Collins 1998). The green treefrog has smooth skin and no dark spots on the back, although small golden spots may occasionally be present (White and White 2002).

Young
Green treefrog tadpoles are small (up to about 40 mm). They are dark greenish with a slight yellowish tinge. They have speckled throats and pale lines from the eyes to the nostrils (White and White 2002).

Eggs
Green treefrog breeding occurs from March to October. Eggs are attached to floating plants. Each female lays about 400 eggs. They are in small packets or films at or near the surface, and attached to floating vegetation. The outer envelope is poorly defined, becoming part of the mass.

Photos, from top:
Calling Adult - Mark Tegges
Adult - Corey Wickliffe
Tadpole - Corey Wickliffe



Distribution and Habitat

The green treefrog inhabits freshwater marshes, usually near tidal rivers and swamps, and can be found near brackish water. They are also found around man-made impoundments, and along the perimeter of ponds, especially where cattails are present (White and White 2007). They are restricted to the Coastal Plain of Maryland and can be found on the eastern and western shores (Harris 1975).

Call

The green treefrog has been called the cow-bell frog because the call sounds somewhat like the sound of a cow-bell from a distance. It sounds like a loud "queenk queenk" that is repeated as many as 75 times per minute (White and White 2007).

Photos, from left:
Adult - Corey Wickliffe
Adult - Corey Wickliffe
Eggs - Corey Wickliffe

Mountain Chorus Frog

Pseudacris brachyphona

Identification

The mountain chorus frog is a very small frog with a light brown, tan, or yellowish background coloration. It has a distinctive pair of long stripes on the back that form a pattern, which resembles a reverse parentheses. In some specimens the stripes may be so close together that they touch in the middle giving them the appearance of an "X" mark as is found in the spring peeper, *H. crucifer crucifer*. The northern spring peeper, however, lacks the light line on the upper lip, which distinguishes it from the mountain chorus frog. A dark triangle is also usually (but not always) present between the eyes of the mountain chorus frog and is lacking on the northern spring peeper (Hulse et al. 2001).

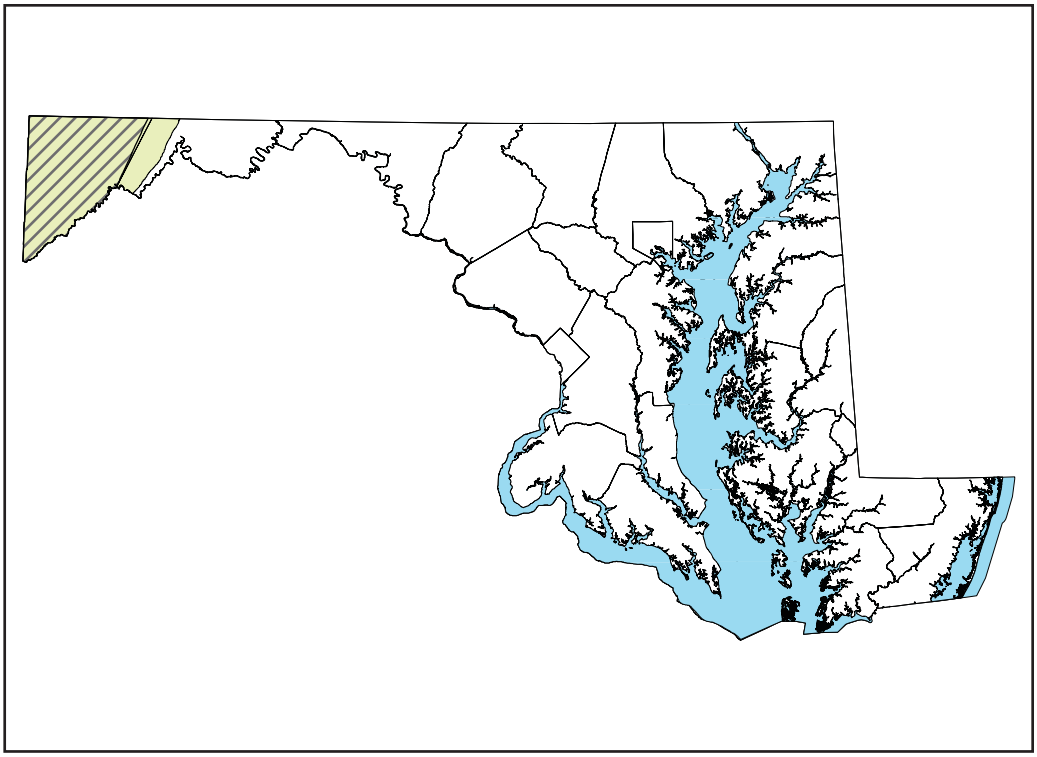
Young

Mountain chorus frog tadpoles are identical in appearance to New Jersey and upland chorus frog tadpoles. They are small, usually less than 30 mm (1.2 in.) long. The dorsum and sides of the body are dark brown and may be flecked with metallic bronze. The ventral surfaces are bronze and iridescent. The tail crest is translucent, with a pattern of small dark spots and flecks (Hulse et al. 2001).

Eggs

Mountain chorus frogs lay small egg masses containing 10 to 50 eggs. The masses are attached at midwater to vegetation. They are about 1.5 mm (0.6 in.) in diameter and with associated membranes and jelly envelopes range in size from about 6.0 to 8.5 mm (0.25 – 0.39 in.). A single female will lay numerous egg masses with the total number of eggs ranging from about 300 to 1,500 (Hulse et al. 2001). They are laid during February to May depending on temperature and rainfall.

Photo:
Tadpole - Ronn Altig
Adult - Don Forester



Distribution and Habitat

The mountain chorus frog is found on the Allegheny Plateau in Garrett county and the extreme western part of the Valley and Ridge in Alleghany counties (Harris 1975). It can be found in a variety of moist habitats, including floodplains and wet forests that have an abundance of ephemeral pools, where they breed (Hulse et al. 2001).

Call

The mountain chorus frog call is a ratchety trill that rises in pitch, similar to the sound produced by running a finger along the teeth of a comb from the coarse to the fine teeth. The call is difficult to distinguish from the call of the upland and New Jersey chorus frogs. The distribution of the mountain chorus frog is, however, distinct from the other chorus frogs found in Maryland.

Photos, from top:
Habitat - Rebecca Chalmers
Adult - Tom Diez

New Jersey Chorus Frog
Pseudacris kalmi

and

Upland Chorus Frog
Pseudacris feriarum

Identification

The New Jersey and upland chorus frogs are described together here because they are very difficult to distinguish from one another based on their physical appearance. However, their geographic distributions in Maryland are distinct. Both species have a light line along the upper lip, usually a dark triangle between the eyes, on the back of the head, and dark stripes from the snout to the groin that pass through the eye. The dark dorsal stripes may be broken on some individuals. The lines tend to be slightly thicker on the New Jersey chorus frog than they are on the upland chorus frog.

Young

Tadpoles of these two species are indistinguishable from each other and from mountain chorus frog tadpoles.

Eggs

Eggs of these two species are indistinguishable from each other, but may be slightly different than mountain chorus frog eggs. Similar to the mountain chorus frog, eggs are laid in small groups. However, masses can be larger and contain more eggs. They tend to be irregular clusters generally less than 2.5 cm in diameter and containing 12 to 245 eggs. They are found at a depth of 50 to 200 mm, usually attached to submerged vegetation (Hulse et al. 2001).

Photos, top and bottom:
Adults - Mark Tegges

Upland Chorus Frog

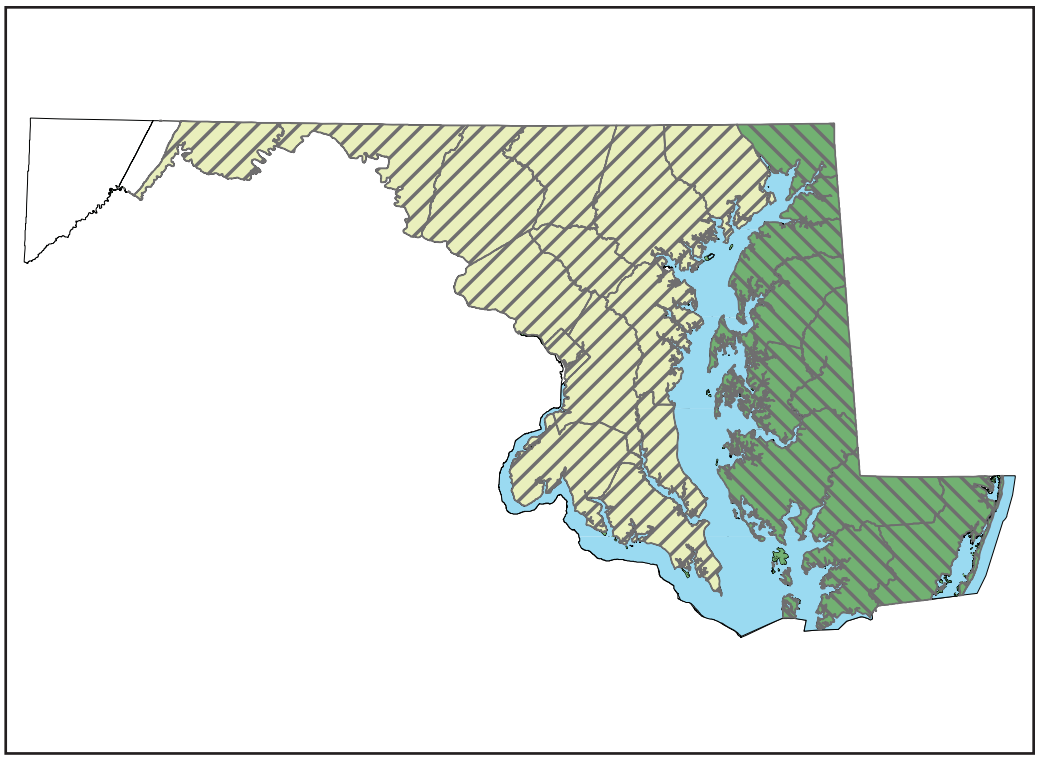
Current Distribution

Historic Distribution

New Jersey Chorus Frog

Current Distribution

Historic Distribution



Distribution and Habitat

The New Jersey chorus frog is found east of the Susquehanna River and throughout the Delmarva Peninsula. The upland chorus frog is found west of the Susquehanna River to the eastern edge of the Valley and Ridge. The two species prefer essentially the same type of habitat for breeding, which consists of grassy floodplains and wet woodlands that have shallow, usually vernal, pools (White and White 2007).

Call

The calls of the New Jersey chorus frog and the upland chorus frog are virtually indistinguishable from one another. They sound similar to the mountain chorus frog call (like the sound produced by running a finger along the teeth of a comb, from the coarse to the fine teeth). However, the mountain chorus frog call is usually shorter and it is more difficult to make out each individual note of the call.

Photo:
Habitat - Rebecca Chalmers

Northern Spring Peeper

Pseudacris crucifer

Identification

The northern spring peeper is a small light brown, tan, yellowish, or pinkish frog with a distinctive dark "X" mark on the back. The reverse parentheses on the mountain chorus frog *Pseudacris brachyfona* can sometimes resemble an "X". However, the chorus frogs have a light line along the upper lip and almost always have a dark triangle between the eyes, which is lacking in the northern spring peeper (Conant and Collins 1998).

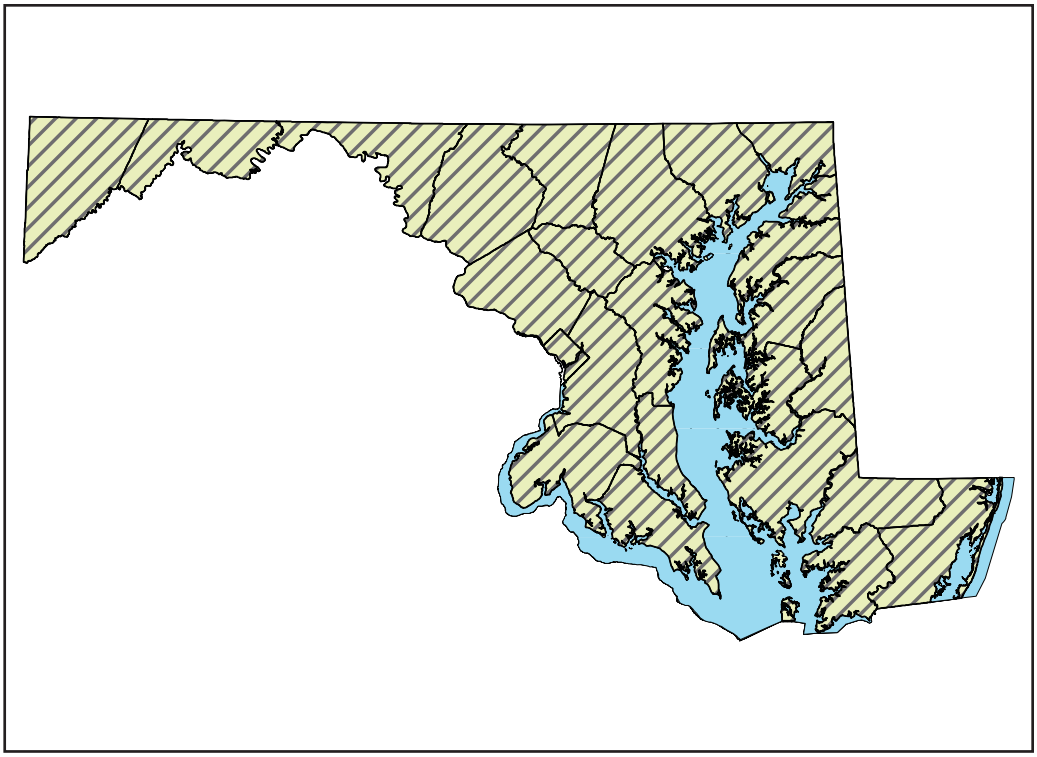
Young

Tadpoles of the northern spring peeper are small (less than 35 mm). The eyes are located on the side of the head, rather than on top. The dorsum and sides of the body are greenish and may exhibit gold flecks. The belly is immaculate white or cream-colored and is iridescent. The tail crests are translucent and spotted, with the greatest concentration of pigment along the dorsal margin and near the tip (Hulse et al. 2001).

Eggs

Unlike any other Maryland anuran, the northern spring peeper always lays its eggs singly rather than in masses or strands. The eggs are attached to submergent vegetation in the water. Egg size is variable, and ranges from 1.0 to 1.5 mm (0.4-0.6 in.; Crump 1984). The number of eggs laid per female is also variable, and ranges from 200 to 1,200 (Hulse et al. 2001).

Photos, from top:
Calling Adult - Mark Tegges
Adult - William Harbold



Distribution and Habitat
Northern spring peepers are common throughout Maryland and are typically found in association with vernal pools. Outside of the early spring breeding period they can be found in forested areas sometimes far from water (White and White 2007).

Call
The call is a loud high-pitched “peep” that ends with an upward slur (White and White 2007).

Photos, from left:
Adult - John White
Habitat - Rebecca Chalmers

Eastern Cricket Frog

Acris crepitans crepitans

Identification

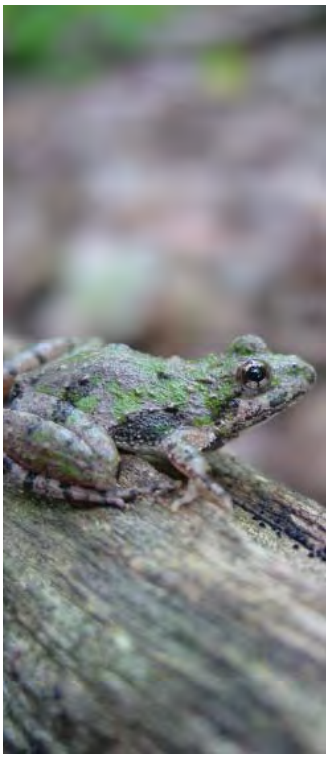
The eastern cricket frog can be easily distinguished from other treefrogs because the toe pads are virtually absent. Another distinguishing characteristic is the the rough-edged dark stripe that extends along the inside of the thigh (Hulse et al. 2001). It also has rough skin with fine warts and, as in the chorus frogs, there is usually a dark triangle discernible between the eyes on the back of the head (White and White 2007).

Young

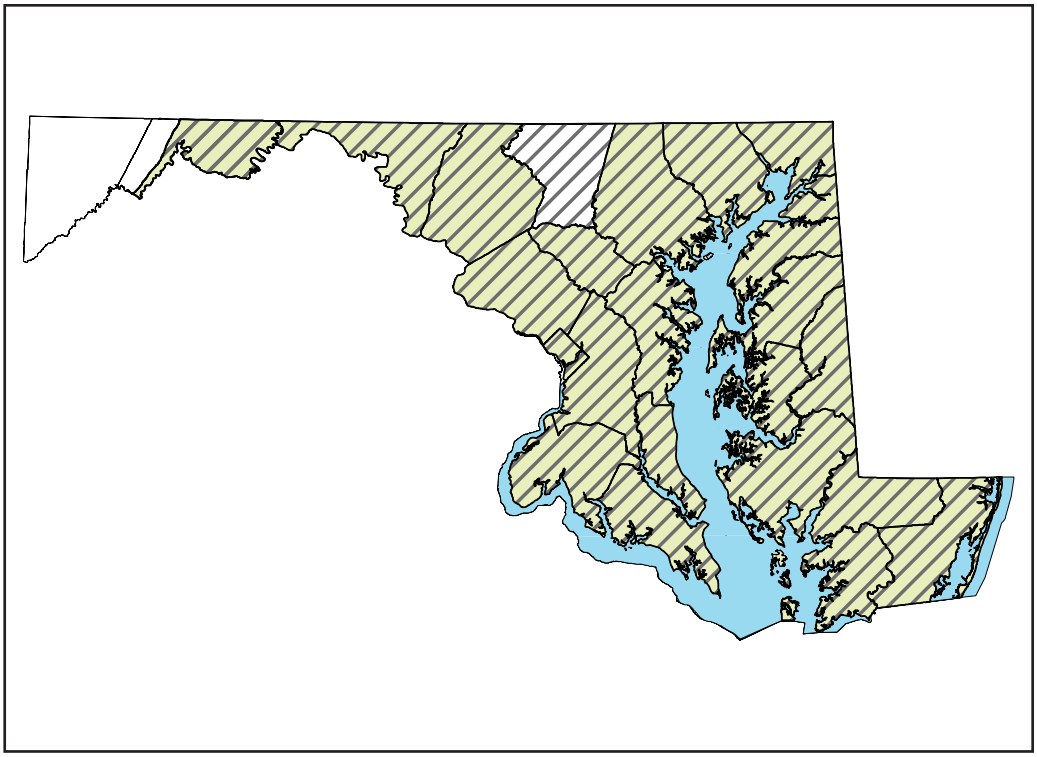
Eastern cricket frog tadpoles are relatively large for a Hylid (up to about 50 mm long). The dorsal surface is olive green, and mottled with black. The ventral surface is much lighter and somewhat iridescent in appearance. The muscular portion of the tail is similar in color to the body and the end of the tail is tipped with black. The tail crests are relatively low and translucent with scattered dark spots (Hulse et al. 2001, White and White 2007).

Eggs

Eastern cricket frog eggs are laid singly and are attached to vegetation or in small masses on the bottom of vernal pools. They tend to be larger than spring peeper eggs (up to 5mm with envelopes and jelly). Females lay on average about 250 eggs (Hulse et al. 2001). Eggs can be found from April through July.



Photos, top to bottom, left to right:
Calling Adult - Mark Tegges
Tadpole - Ronn Altig
Adult - Corey Wickliffe
Adult - Corey Wickliffe
Ventral - Corey Wickliffe



Distribution and Habitat

The eastern cricket frog prefers moist, grassy, or sedge covered areas along the edges of permanent or ephemeral pools, swamps, fresh and slightly brackish marshes, and slow moving streams. It may be quite common where suitable habitat exists (Conant and Collins 1998). It can be found throughout Maryland, but is more often found on the Coastal Plain (Harris 1975).

Call

The call of the eastern cricket frog consists of a loud sharp clicking, repeated in rapid succession. The call is similar to the sound of hitting two stones or glass marbles together (White and White 2007).

Photos, from top:
Adult - Corey Wickliffe
Adult - Corey Wickliffe
Habitat - Rebecca Chalmers
Adult - Corey Wickliffe

Eastern American Toad
Photo: William Harbold

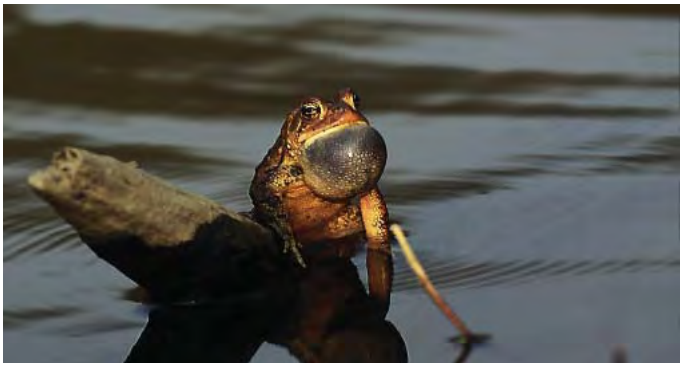
True Toads (Family Bufonidae)

True toads have thick, dry, warty skin and have enlarged, warty glands in the shoulder region called parotoid glands. Unlike most frogs, true toads tend to produce short hops to escape danger rather than long leaps (Conant and Collins 1998).

There are only two species of true toads found in Maryland. They include the eastern American toad (*Anaxyrus americanus americanus*) and the Fowler's toad (*Anaxyrus fowleri*). The two species can be distinguished from each other based on the number of warts in each spot on the dorsum, the presence or absence of conspicuously enlarged warts on the tibia, spotting on the chest, and the amount of separation between the cranial ridge and the parotoid glands (Conant and Collins 1998).

Eastern American Toad

Anaxyrus americanus americanus



Identification

The eastern American toad has one or two warts in each dorsal spot. The chest and forward part of belly are usually darkly mottled and the parotoid gland is either completely separate from the cranial crest or connected by a spur (White and White 2007). The warts on the tibia are greatly enlarged compared to those on other *Anaxyrus* species.

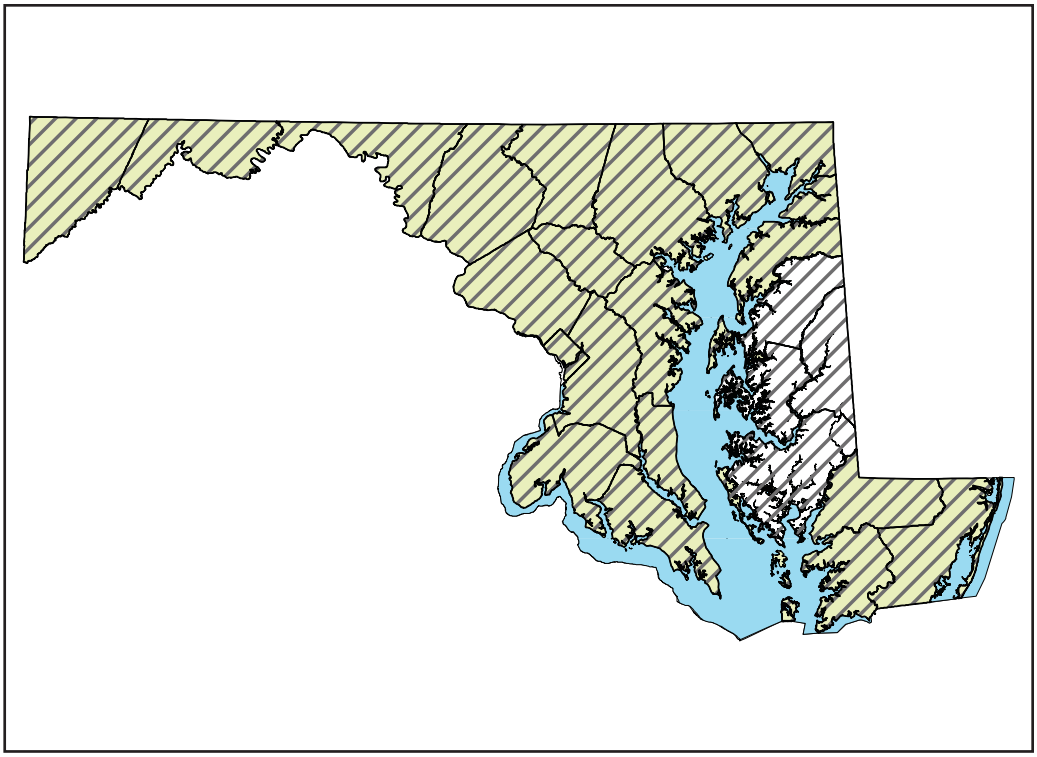
Young

The eastern American toad tadpole is dark colored (dark brown to black) with a body that is somewhat flattened. The eyes are small and dorsal and the nostrils are small compared to most other tadpoles. The tail fin is low, without pigment, and rounded at the tip. The tail musculature is without pigment along its ventral edge (Conant and Collins 1998; White and White 2007). Eastern American toad tadpoles are virtually indistinguishable from the tadpoles of the Fowler's toad.

Eggs

The eastern American toad lays a long double strand of small black eggs during March through May, usually in shallow water. Eggs are difficult to distinguish from Fowler's toad eggs except that eastern American toad eggs have inner envelopes that separate individual eggs from each other.

Photos, from top:
Calling Adult - Mark Tegges
Amplexing Couple - Mark Tegges



Distribution and Habitat
The eastern American toad is common in Maryland and inhabits a variety of habitats including deciduous and mixed deciduous/coniferous forests. It also can be found in more disturbed areas such as agricultural fields and residential areas (White and White 2007).

Call
The eastern American toad call is a long musical high-pitched trill that usually lasts 5 to 30 seconds.

Photo:
Habitat - Jay Kilian

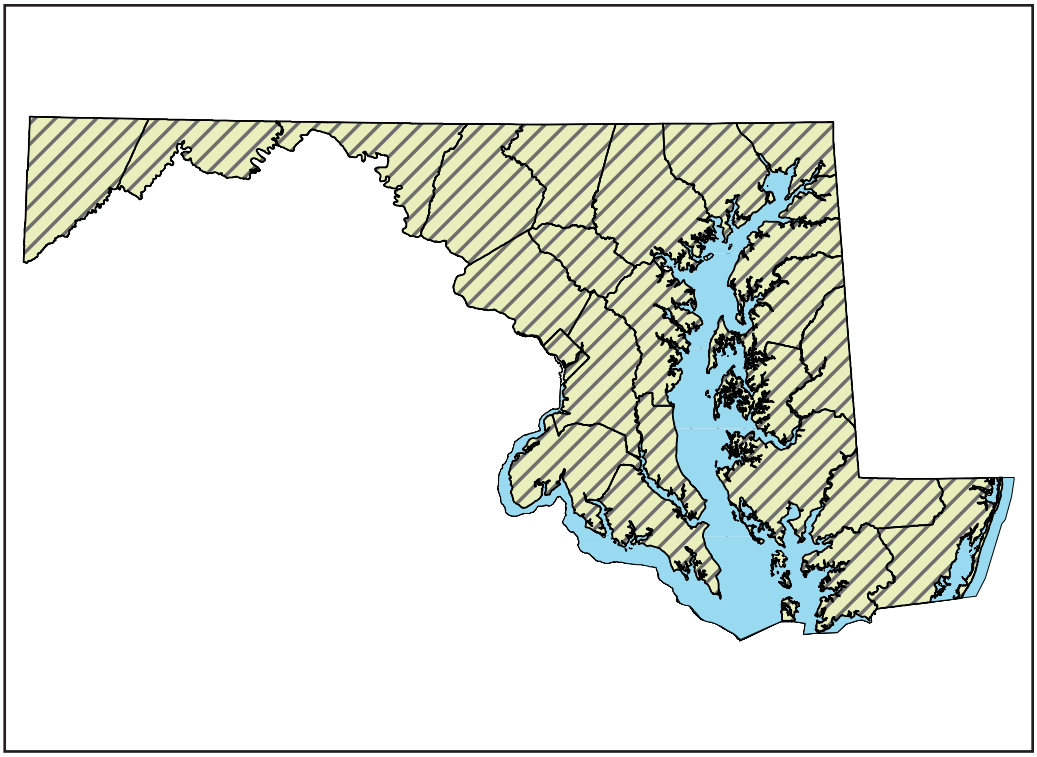
Fowler's Toad
Anaxyrus fowleri

Identification
Fowler's toad generally has three or more warts per spot on its dorsum (White and White 2007). The parotoid gland is connected directly to the cranial crests and there are no greatly enlarged warts on tibia. The belly is usually white, often with a single dark breast spot (Conant and Collins 1998).

Young
Fowler's toad tadpoles are virtually indistinguishable from the tadpoles of the eastern American toad (Hulse et al. 2001).

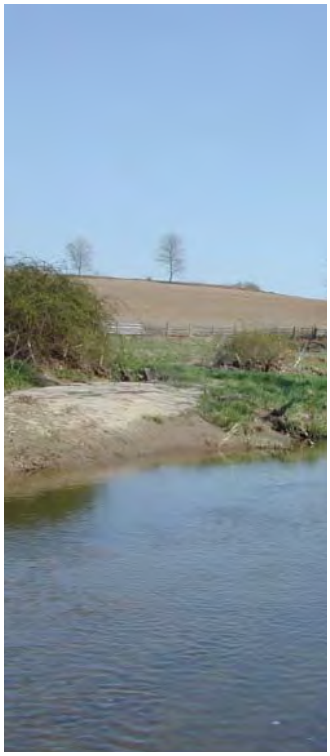
Eggs
Fowler's toad lays a long double strand of small black eggs during April through July, usually in shallow water. Eggs are difficult to distinguish from eastern American toad eggs except that Fowler's toad eggs lack inner envelopes that separate individual eggs from each other.

Photos, from top:
Adult - Mark Tegges
Adult - John White
Calling Adult - Mark Tegges



Distribution and Habitat
Fowler's toad is common on the Coastal Plain, especially on the eastern shore and may also be found in other parts of Maryland. It can be found in a wide variety of habitats from forests to fields and residential areas. It seems to prefer sandy habitats (White and White 2007).

Call
The call of Fowler's toad is a nasal "w-a-a-a-h", lasting one to four seconds (White and White 2007). The call can be difficult to distinguish from the eastern American toad, but is usually shorter and more shrill.



Photos, from left:
Adult - Matt Sell
Habitat - Andy Becker

Narrow-mouthed Toads (Family Microhylidae)

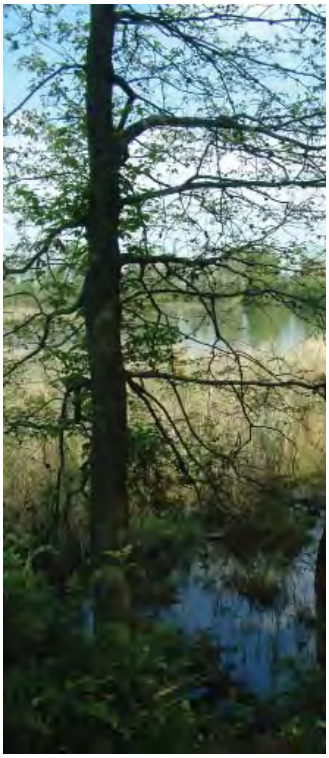
Eastern Narrow-mouthed Toad
Gastrophryne carolinensis

Photos, from top:
Adult - Mark Tegges
Tadpole - Ronn Altig
Adult - John White

Identification
The eastern narrow-mouthed toad is difficult to confuse with any other amphibian found in Maryland. It is the only anuran that has a narrow pointed head with a distinct fold of skin across the back of the head. It is small and stout with short legs and a gray, brown, or reddish dorsum. Some individuals may have a broad dark area on the back that is flanked by wide lighter colored stripes (White and White 2007).

Young
The body of the eastern narrow-mouthed toad tadpole is noticeably flattened. The eyes are on the sides of the head. The oral disc (which is a hard, pointed structure in other Maryland anurans) is replaced by labial flaps with a median notch. Nostrils are not present until late in development. A single spiracle is present and is located ventral to the anus. The tail fin is low and is pigmented along dorsal and ventral edges of the musculature. There are large, light blotches on the sides and belly, extending onto the tail (Conant and Collins 1998).

Eggs
Eastern narrow-mouthed toad eggs occur in small masses that are often in a surface film or irregularly shaped packet. Several masses laid communally may include as many as 850 eggs. The eggs are black and white in color and are firm and distinct. The shape and pattern of the eggs resembles a fine mosaic (Wright and Wright 1949).



Distribution and Habitat

The eastern narrow-mouthed toad is extremely rare and is listed as endangered by the Maryland Department of Natural Resources, Natural Heritage Division. It can be found in a variety of open forested habitats associated with freshwater wetlands, such as floodplains, marshes, cypress swamps, and vernal pools. It is primarily fossorial, spends most of its time underground, or under logs, burrows, or other debris.

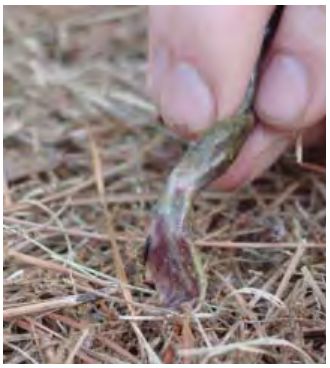
Call

The call of the eastern narrow-mouthed toad is like the bleat of a lamb and lasts one half to three seconds.

Photos from top:
Habitat - Rebecca Chalmers
Adult - John White

Spadefoot Toads (Family Pelobatidae)

Eastern Spadefoot
Scaphiopus holbrookii

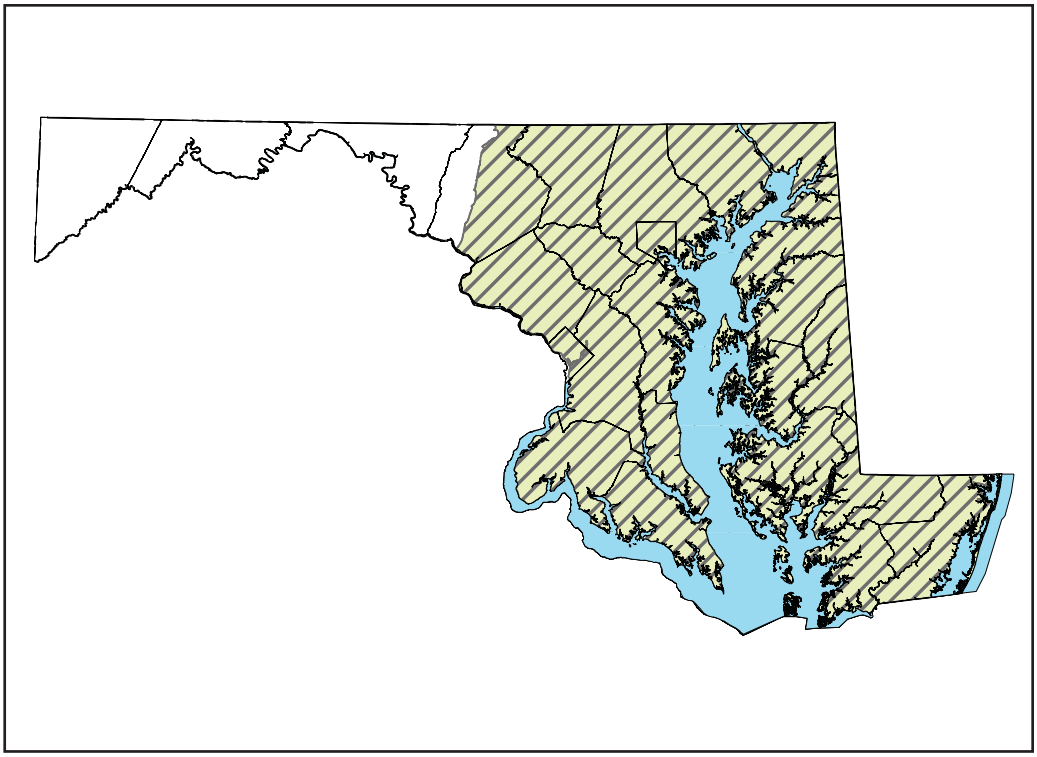


Photos, from top:
Hind Foot - Corey Wickliffe
Adult - Tony Prochaska
Adult - Corey Wickliffe
Tadpole - Ronn Altig

Identification
The eastern spadefoot is the only member of the family Pelobatidae found in Maryland. It is a stout anuran with a broad mouth and relatively short legs. The common name, spadefoot, comes from a sickle shaped spade on the inside of each hind foot. The eyes have vertical, elliptical pupils and a pair of yellowish lines start behind each eye and meet at the rump. The skin is smooth with numerous small tubercles. (White and White 2007; Conant and Collins 1998; Hulse et al. 2001).

Young
Tadpoles are small, usually less than 30 mm total length. Eyes are on top of the head and close together. Coloration varies from brown to bronze. The non-muscular parts of the tail (fin) are translucent and moderately well-developed. The anal opening is located near the tail, along the ventral midline (Hulse et al. 2001).

Eggs
The eggs of spadefoot toads are laid in shallow water and are usually attached to vegetation. They are small (only 1.4-2.0 mm in diameter) and are laid in bands 25-50 mm wide and 300 mm long (Wright and Wright 1949). Spadefoots are very opportunistic and explosive breeders and will mate after heavy rains during the spring, summer, or fall (White and White 2007). Therefore, it is difficult to predict exactly when egg laying will occur.



Distribution and Habitat
The eastern spadefoot is fossorial and spends most of its time underground in loose, sandy soil, relatively close to ephemeral wetlands or vernal pools. They seem to prefer poorly drained, often man made, depressions and degraded Delmarva bays for breeding (White and White 2007).

Call
The call is a loud abrupt nasal snore or grunt that is repeated frequently (White and White 2007).

Photos, clockwise from top left:
Adult - Mark Tegges
Amplexing Adults - Mark Tegges
Habitat - Rebecca Chalmers

Key to the Reptiles of Maryland (Class Reptilia)

A. With a shell that covers at least part of the dorsum and venter; cloacal opening is longitudinal.

Turtles
(Order Testudines)
Page 119

B. Without a shell; scales usually overlap; male with paired copulatory organs called hemipenes; cloacal opening is transverse.

Snakes and Lizards
(Order Squamata)
2

C. No limbs; no external ears or eyelids; most have only one lung; the bones of the lower jaw are not fused so that the gape can be extended to swallow large prey.

Snakes
(Suborder Serpentes)
Page 158

D. Moveable eyelids; an external ear opening; two well-developed lungs; a fused lower jaw, restricting the gape and limiting the size of prey that can be swallowed; all (found in Maryland) with legs.

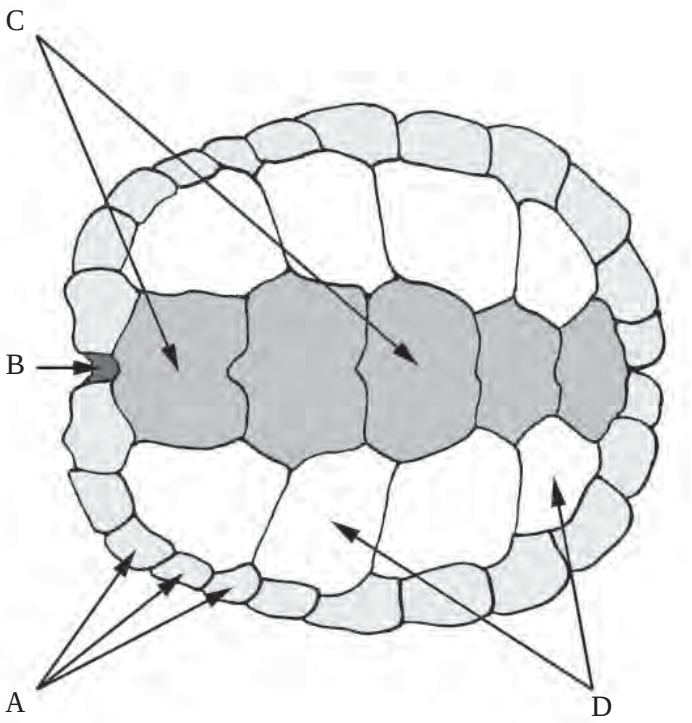
Lizards
(Suborder Lacertilia)
Page 228

Key to the Adult and Juvenile Turtles of Maryland (Order Testudines)*

***Except Sea Turtles (Family Cheloniidae)**

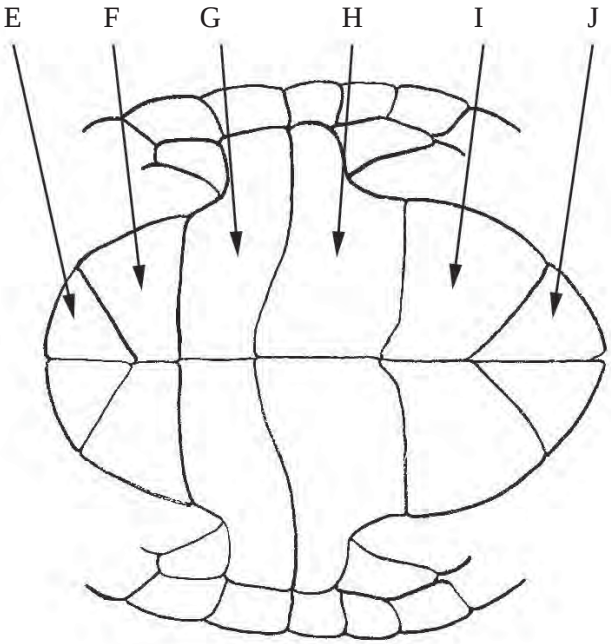
Scutes of a Turtle Carapace

A. Marginals
B. Nuchal
C. Vertebrals
D. Pleural (or Costals)



Scutes of a Turtle Plastron

E. Gular
F. Humeral
G. Pectoral
H. Abdominal
I. Femoral
J. Anal



1a. Flattened reduced carapace covered with a flexible leathery skin; surface texture of carapace is rough, sandpaper-like; an elongated snout (proboscis); spines and tubercles on anterior of carapace; nasal septa with a distinct ridge projecting from the septum; three claws on forefeet and four on back; juveniles look like adults except they are strongly patterned, with small black dots and hollow black circles on a light tan or olive carapace; the inside carapacial margin yellow and bordered by a single thin black line in juveniles, and reduced spines on anterior of carapace (smoother than adults).

Eastern Spiny Softshell
(*Apalone spinifera spinifera*) p. 156

1b. Carapace covered with epidermal scutes rather than flexible leathery skin; surface texture of carapace hard and not sand paper-like; without an elongated snout; without spines and tubercles on the anterior of the carapace.

2

2a. Gular scute of plastron undivided longitudinally.

Musk and Mud Turtles
(Kinosternidae)
3

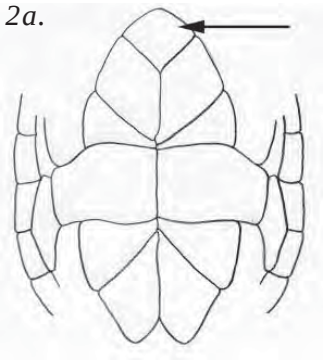
2b. Gular scute of plastron divided.

5

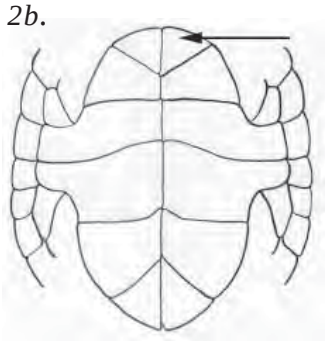
2a. Undivided gular scute

2b. Divided gular scute

2a.



2b.



3a. Plastron small relative to the size of the turtle, not covering appendages; pectoral scute squarish or rectangular; a single hinge on the plastron; two distinct light stripes on each side of the head that extend from the eye to the tip of the snout; barbels on chin and throat; male with large areas of skin showing between scutes of plastron, female with much less skin visible; juveniles resemble adults.

Stinkpot
(*Stenothernus odoratus*) p. 150

3b. Plastron large and hinged, covering most of the body; pectoral scute triangular; double hinged plastron; head spotted, mottled, or streaked with yellow; if a yellow line is present on the head, not extending from the eye to the tip of the snout.

Eastern Mud Turtle Adult and Juvenile
(*Kinosternon subrubrum subrubrum*)
4

4a. Typically less than five cm carapace length; carapace with three indistinct keels; the skin and carapace are black; each marginal scute with an orange spot. The plastron is reddish with an irregular black figure that may cover nearly the entire surface or be narrow with black lines along the plastral seams; the head may have light stripes or mottling.

Juvenile Eastern Mud Turtle
(*Kinosternon subrubrum subrubrum*) p. 152

4b. Greater than seven cm carapace length; carapace without keels; no orange spots on marginal scutes; the plastron is brown or yellow and may have black or brown smudges, but with no irregular black figure; head is spotted, mottled, or irregularly streaked with yellow but without paired yellow lines on each side as in the stinkpot.

Adult Eastern Mud Turtle
(*Kinosternon subrubrum subrubrum*) p. 152

5a. Large head with powerful jaws and a hooked beak; the tail is long (greater than 50% the shell length) and saw-toothed along the upper side; plastron reduced and shaped like a cross; limbs massive; juveniles resemble adults.

Eastern Snapping Turtle
(*Chelydra serpentina serpentina*) p. 154

5b. Small heads that can retract into the shell; beak not hooked; tail not saw-toothed along the upper side; plastron covers the majority of the venter and is not shaped like a cross; rigid, somewhat domed shells, covered with epidermal scutes; 24 marginal scutes around the carapace; 12 scutes on the palastron; usually some webbing between the toes.

Box and Water Turtles
(Emydidae)
6

6a. Each large scute of the carapace in the form of an irregular pyramid rising up in a series of concentric grooves and ridges which gives the appearance that the carapace was carved from wood; the underside of the chin and legs are bright orange in individuals greater than 14 cm carapace length (individuals less than 14 cm carapace length lack orange pigment on the head and legs); black blotches present on the posteriolateral corners of the plasteral scutes.

Wood Turtle
(*Glyptemys insculpta*) p. 134

6b. Large scutes of the carapace not in the form of an irregular pyramid rising up in a series of concentric grooves and ridges. The underside of the chin and legs not bright orange; plastron lacking black blotches on the corners of the scutes.

7

7a. Two hinges present on plastron, forming moveable anterior and posterior lobes, so that it can be closed completely; feet elephant-like and without webbing.

Eastern Box Turtle Adult and Juvenile (*Terrapene carolina carolina*) p. 136

8

7b. Plastron not hinged so that it can not be closed completely; feet not elephant-like and with webbing between the toes.

9

8a. Greater than 11.5 cm carapace length; carapace with a high dome shape; coloration highly variable and usually consisting of yellow, orange, or olive on black or brown.

Eastern Box Turtle Adult (*Terrapene carolina carolina*) p. 136

8b. Less than 11.5 cm carapace length; carapace much flatter than adult; typically a brown carapace with a prominent yellowish keel in vertebrals 2-4; each pleural scute has a yellowish spot and each marginal is tipped in yellow; the plastron is yellowish with an irregular brown blotch in the center.

Eastern Box Turtle Juvenile (*Terrapene carolina carolina*) p. 136

9a. Carapace with concentric rings or ridges; dark spots on a gray background on head and limbs; juveniles are patterned as adults; found exclusively in brackish water.

Northern Diamond-backed Terrapin (*Malaclemys terrapin terrapin*) p. 148

9b. Carapace not patterned with concentric rings or ridges and head and limbs not gray with dark spots.

10

10a. Carapace not keeled and jet black, usually with one or two distinct, yellow or white spots per scute (a rare individual lacks spots); there may be small patches of yellow or orange on the side of the head, but they are usually much smaller and more numerous than the bog turtle's larger, and blotch-like rather than circular head patch; the distinguishing characteristics described apply to adults and juveniles.

Spotted Turtle (*Clemmys guttata*) p. 132

10b. Carapace without one or two spots per scute and may be keeled or unkeeled.

11

11a. Carapace slightly keeled (although it may be smooth in some older specimens); a conspicuous blotch is present behind each eye that is usually bright orange in color (although it may appear white, yellow or reddish); sometimes the patch is divided into two parts; no light lines, or patterning other than the blotches present on the head or limbs; the large scutes of the carapace may have irregular yellow, orange, or reddish radiations or light markings but each scute does not have one or two distinct spots as in the spotted turtle; the carapace is usually black to brown in color; the distinguishing characteristics described apply to adults and juveniles.

Bog Turtle
(*Glyptemys muhlenburgii*) p. 130

11b. Longitudinal yellow, white, or reddish lines usually present on the head and limbs; yellow or red spots or blotches may be present behind the eye, but they are smaller and more circluar or oval in shape than the blotches that are characteristic of the bog turtle and are not bright orange.

12

12a. Carapace has yellow reticulated lines that loosely resemble a topographic map; one yellow, triangular shaped patch is present behind each eye; jaw surfaces are wide and light colored giving the appearance of big lips; although characteristics may vary, the distinguishing features described apply to adults and juveniles.

Northern Map Turtle
(*Graptemys geographica*) p. 146

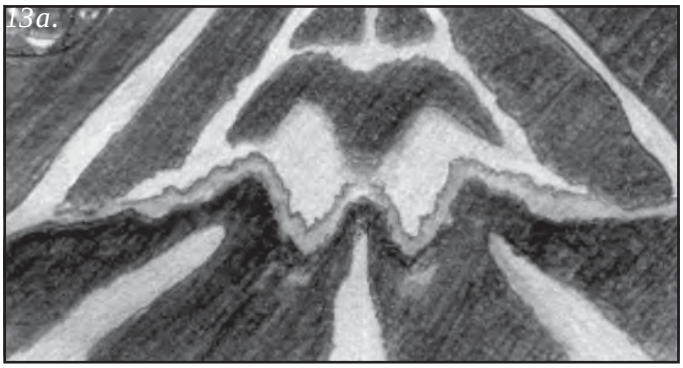
12b. Pattern on carapace not resembling a topographic map; jaw surfaces not wide and light colored.

13

13a. Plastron usually red, orange or coral (at least around the edges); sharp notch at tip of upper jaw, bordered on each side by a pronounced cusp; cutting edges of jaws saw-toothed; cusps are weaker in juveniles (less than about 25 cm carapace length) and lines on head may be indistinct or absent in old males.

Northern Red-bellied Cooter
(*Pseudemys rubriventris*) p. 144

13a. Pronounced cusps of upper jaw.



13b. Plastron usually not red, orange or coral; upper jaw cusps small or weak; cutting edges of jaws not saw-toothed.

14

14a. A light letter “C” shape present on the second costal scute; thin yellow lines on the back of the head form a violin pattern; concentric circles are generally well-developed on the carapace; all or almost all of the marginal scutes have dark spots under them that are usually donut-shaped; plastron usually yellowish and with a highly variable, narrow, dark figure mostly on the anterior portion of the plastron, that follows seams; the letter “C” may be indistinct or absent on juveniles (less than about 23 cm carapace length).

Eastern River Cooter
(*Pseudemys concinna*) p. 142

14b. Light letter “C” shape absent; thin lines on the back of the head not forming a violin pattern; dark, donut-shaped spots not present on the underside of the marginal scutes; plastron not marked with a narrow, dark figure that follows the seams.

15

15a. Head with two bright yellow elongated spots on each side behind the eyes; the carapace has a red margin and there are distinct red ocelli on the plastral side of the marginal scutes; carapace without serrations along the posterior margin; red lines are present on the limbs and tail; the plastron is either immaculate or has a large, dark, central blotch.

16

15b. Usually a single prominent patch of red or rarely yellow on the side of the head (rarely lacking) the margin of the lower jaw is rounded; the margin of the carapace is not red; the plastral side of the marginal scutes lacks red markings; posterior portion of the carapace serrated (the posterior margins of posterior scutes of carapace each with two blunt, rounded projections); red lines are not present on the limbs and tail.

17

16a. Vertebral and pleural scutes arranged in straight rows across the back and have prominent yellowish borders along the transverse seam; plastron is usually immaculate; juveniles resemble adults.

Eastern Painted Turtle
(*Chrysemys picta picta*) p. 140

16b. Large scutes of the carapace alternating instead of running in straight rows; a dark plastral blotch that is variable in size, shape, and intensity is present and typically it is oval, involves all or nearly all of the scutes, is half or nearly half the width of the plastron; juveniles resemble adults.

Midland Painted Turtle
(*Chrysemys picta marginata*) p. 140

17a. Greater than 12.5 cm carapace length; some large specimens may lack the prominent red or yellow patch on the side of the head and instead may have very dark or uniformly black coloration.

Red-eared Slider Adult
(*Trachemys scripta elegans*) p. 138

17b. Usually much less than 12.5 cm carapace length (hatchlings are less than 3.5 cm carapace length); prominent patch of red or rarely yellow on the side of the head well-developed; carapace green with a low keel; plastron profusely marked with dark, eyelike spots.

Red-eared Slider Juvenile
(*Trachemys scripta elegans*) p. 138

Turtles (Order Testudines)

Turtles are reptiles with a shell that covers at least part of the dorsum and venter. Most species can be identified by the shape, patterning, and the presence or absence of a keel on the carapace (dorsal portion of the shell). The size, color, patterning, and shape of scutes making up the plastron (ventral portion of the shell) and whether or not it is hinged are also important. Coloration and patterning on the back and sides of the head can be important in identifying many species.

There are four families and fourteen species of turtles (excluding sea turtles) that can be found in Maryland.

The most easily recognizable features for identifying adults (and young when they look different than adults) of each species of turtle that could be encountered in Maryland are included in the descriptions that follow. Distinguishing characteristics of the Emydidae and Kinosternidae are also included. The distinguishing characteristics of the other two families are not included because, in Maryland, there is only one species in each family.

In addition to physical descriptions of turtles, maps depicting the distribution of each species in Maryland are also included. The distribution maps include historical distributional information that was compiled by Harris (1975). White and White (2007) also provided a great deal of distributional information for turtles on Maryland's eastern shore. Additional recent distribution information was provided by the Maryland Department of Natural Resources, Maryland Biological Stream Survey and Natural Heritage Program, and from additional literature where appropriate.

Listing Status of the Turtles of Maryland

	Common Name	Scientific Name	State Status
Box and Water Turtles (Emydidae)	Bog Turtle	*Glyptemys muhlenbergii*	Threatened
	Spotted Turtle	*Clemmys guttata*	
	Wood Turtle	*Glyptemys insculpta*	
	Eastern Box Turtle	*Terrapene carolina carolina*	
	Red-eared Slider	*Trachemys scripta elegans*	Introduced
	Painted Turtle	*Chrysemys picta*	
	Eastern River Cooter	*Psuedemys concinna*	
	Northern Red-bellied Turtle	*Psuedemys rubriventris*	
	Northern Map Turtle	*Graptemys geographica*	Endangered
	Northern Diamond-backed terrapin	*Malaclemys terrapin terrapin*	
Musk and Mud Turtles (Kinosternidae)	Stinkpot	*Sternothernus odoratus*	
	Eastern Mud Turtle	*Kinosternon subrubrum*	
Snapping Turtles (Chelydridae)	Eastern Snapping Turtle	*Chelydra serpentina serpentina*	
Softshell Turtles (Trionychidae)	Eastern Spiny Softshell	*Apalone spinifera spinifera*	In Need of Conservation

Eastern Painted Turtle
Photo: John White

Box and Water Turtles (Family Emydidae)

The box and water turtle family is the largest family of turtles found in Maryland. A total of ten of the fourteen Maryland species are in this family. The carapace forms a low arch in most species, but it may be considerably domed in some species (Ernst et al. 1994). The plastron is hinged in many species and may close completely or partially.

The ten species of turtles in this family that can be found in Maryland include: bog turtle (*Glyptemys muhlenbergii)*, spotted turtle (*Clemmys guttata*), wood turtle (*Glyptemys insculpta*), eastern box turtle (*Terrapene carolina carolina*), red-eared slider (*Trachemys scripta elegans*), painted turtle (*Chrysemys picta*), eastern river cooter (*Pseudemys concinna*), northern red-bellied turtle (*Psuedemys rubriventris*), northern map turtle (*Graptemys geographica*), and the northern diamond-backed terrapin (*Malaclemys terrapin terrapin*).

Bog Turtle

Glyptemys muhlenbergii

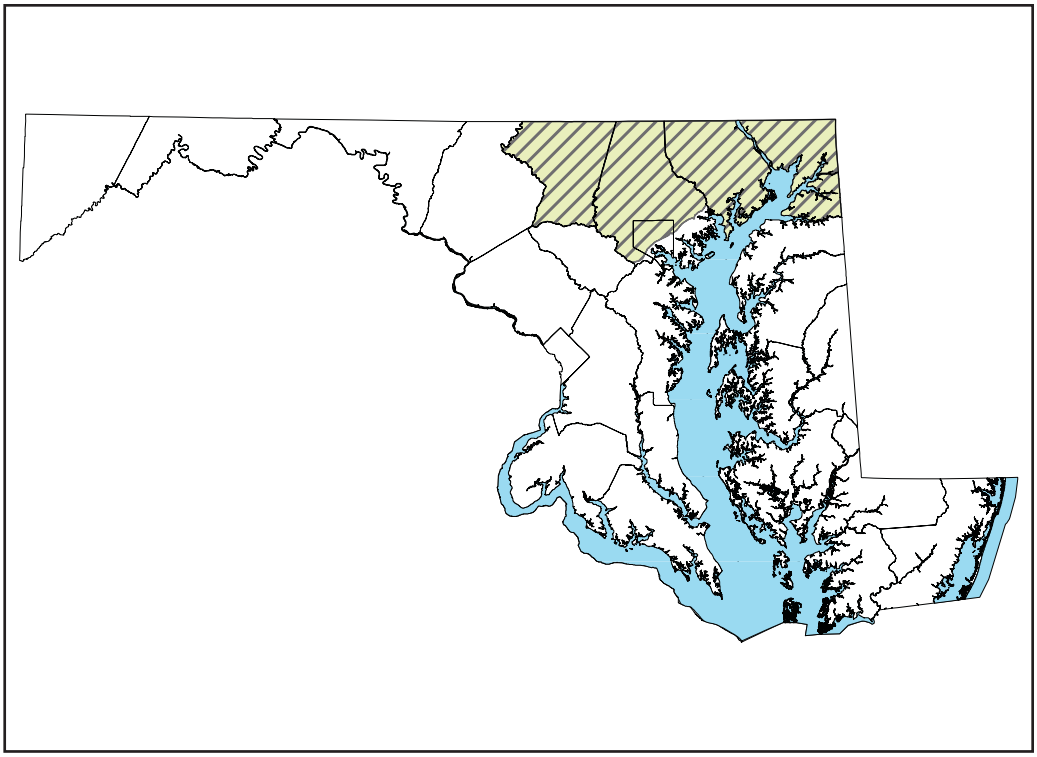
Identification

The bog turtle is characterized by a yellow, orange, red, or rarely white patch on each side of the head behind the eye that sometimes is divided into two parts. With the exception of old individuals, which have a smooth shell, the carapace is usually keeled and growth annuli produce a rough appearance (Ernst et al 1994, Hulse et al 2001). The carapace of adults is usually longer than it is wide and the centers of the large scutes may, in some cases, have a radiating yellowish or reddish star burst pattern in the center (White and White 2007).

Young

Juvenile bog turtles differ slightly from adults. The carapace is round and dark brown in color, and usually has a conspicuous keel. The plastron is yellow with a large black blotch in the center. The bright orange patch behind the eye is present at hatching (Mitchell 1994).

Photos, from top:
Detail - Scott Smith
Juvenile - Mark Tegges
Adult - Lori Erb
Hatchling - Mark Tegges



Distribution and Habitat

The bog turtle is federally threatened and is only found in small portions of Carroll, Baltimore, Harford, and Cecil Counties in Maryland (Lee and Norden 1996). It lives in spring-fed wetlands with soft, highly organic substrates (Pitts, 1978; Chase et al. 1998).

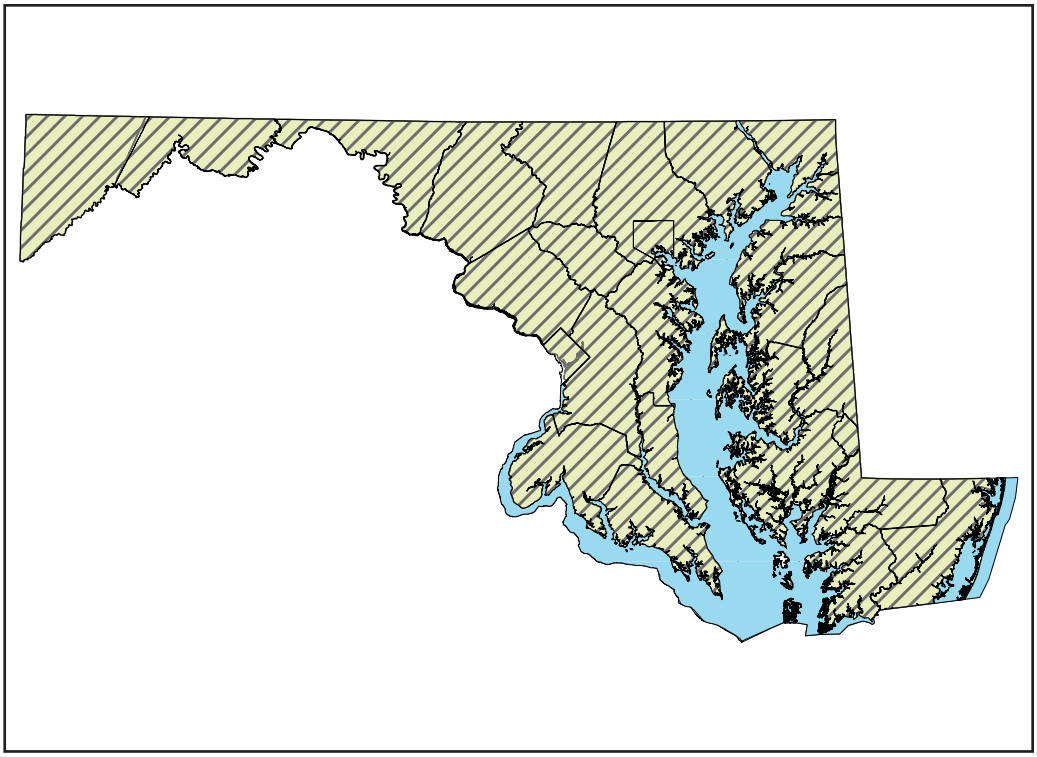
Photos, from left:
Adult - Scott Smith
Habitat - Rebecca Chalmers

Spotted Turtle
Clemmys guttata

Identification
The carapace of the spotted turtle is jet black with a few scattered yellow spots per scute (Hulse et al. 2001). Occasionally, an individual is found that lacks spots. There may be small patches of yellow on the side of the head, but they are usually much smaller and more numerous than the bog turtle's head patch (Conant and Collins 1998).

Young
Young spotted turtles are patterned as adults, but with one spot in most pleural and vertebral scutes. A broad, irregularly shaped black blotch is located in the center of the plastron (Ernst et al 1994, Mitchell 1994).

Photos, from top:
Adult - Tony Prochaska
Adult - Scott Smith
Hatchling - Andy Becker



Distribution and Habitat
Spotted turtles are found throughout Maryland in shallow wetland habitats (Harris 1975; Ernst et al. 1994).

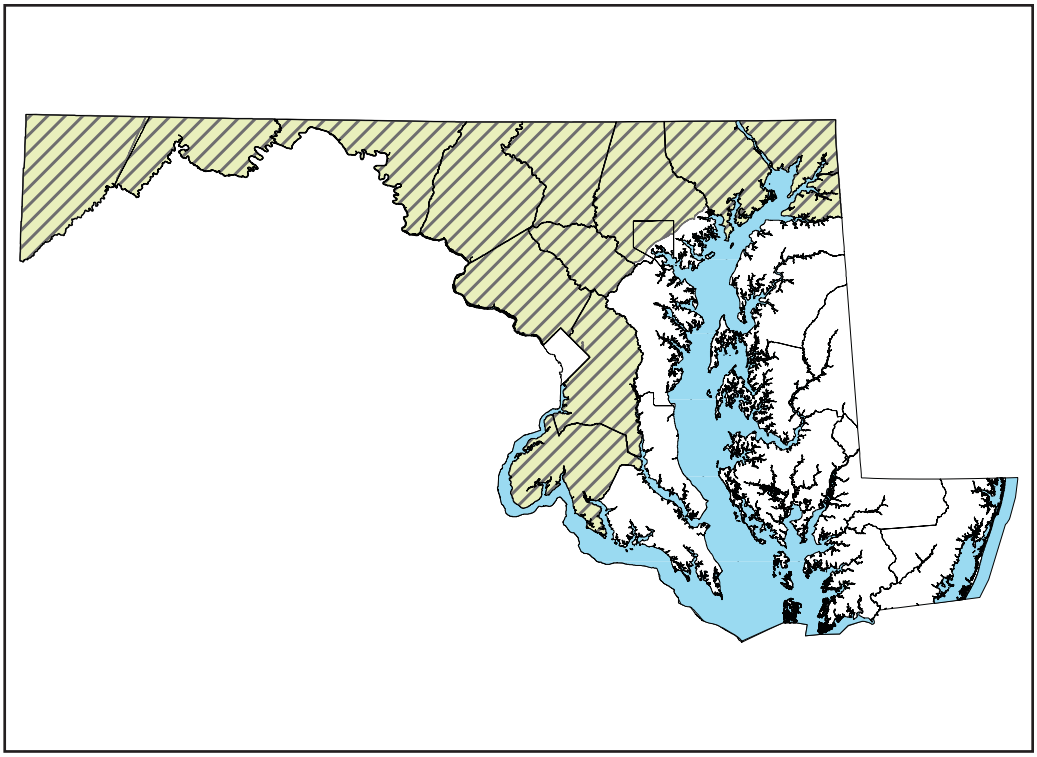
Photos, from left:
Adult - Lori Erb
Habitat - Jay Kilian

Wood Turtle
Glyptemys insculpta

Identification
The wood turtle carapace is very rough and appears to have been carved from wood. The growth annuli are conspicuous and give the scutes a raised, irregular pyramidal appearance in some individuals. The underside of the chin and legs are conspicuously colored with bright orange, yellow, or red. The plastron is hingeless and commonly has dark blotches along the posterior, outer corner of each scute (Ernst et al 1994).

Young
Hatchling wood turtles are gray to brown and lack red or orange pigment on the head and legs. The tail is long (about as long as the carapace) and there is no keel on the carapace.

Photos, from top:
Hatchling - Mark Tegges
Adult - Scott Smith
Adult - Mark Tegges



Distribution and Habitat
The wood turtle can be found from the Fall Line west into the Piedmont and western Maryland (Harris 1975). It is always found in close association with water and usually is found in forested areas (Ernst et al. 1994).

Photos, from left:
Plastron - Scott Smith
Habitat - Rebecca Chalmers

Eastern Box Turtle

Terrapene carolina carolina

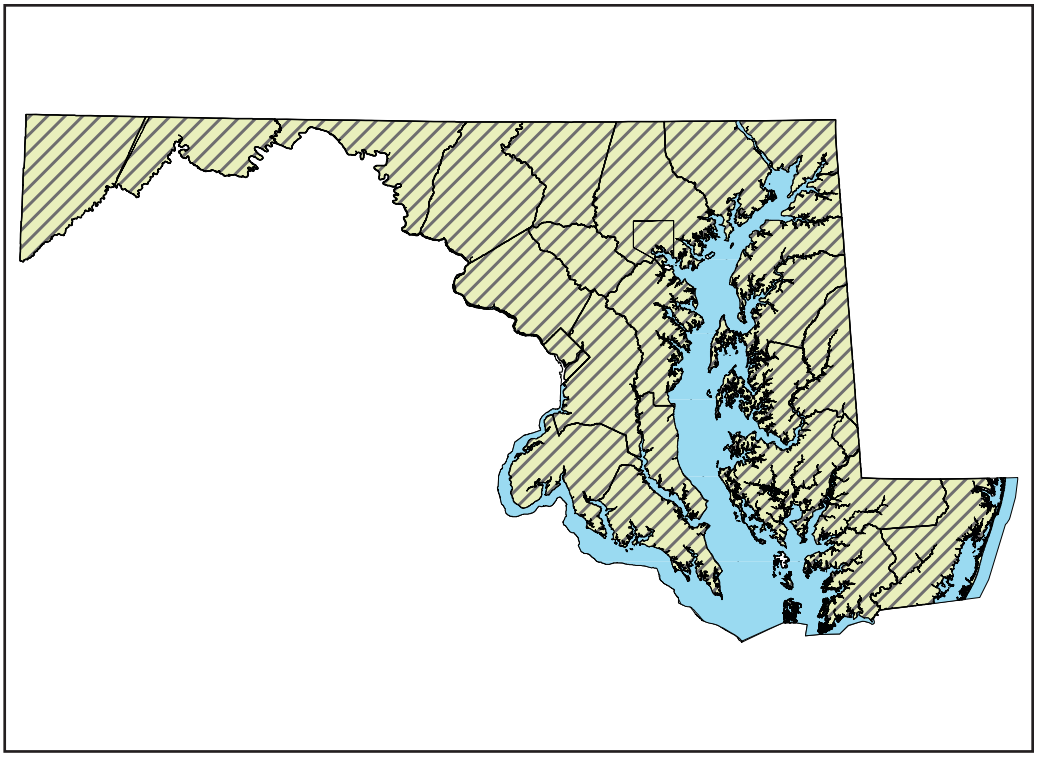
Identification

The eastern box turtle is easily distinguished from other Maryland turtles. The carapace has a high dome shape and the plastron is hinged so that it can be closed completely. The color pattern of the carapace is highly variable, but usually consists of a yellow, orange or red pattern on a dark background. The iris of males is typically (although not always) red and the female's is yellowish-brown (Ernst et al. 1994).

Young

The young box turtle typically has a brown carapace with a prominent yellowish keel in vertebrals two through four. Each pleural scute has a yellowish spot and each marginal scute is tipped in yellow. The plastron is yellowish with an irregular brown blotch in the center (Mitchell 1994).

Photos, from top:
Adult - Mark Tegges
Hatchling Carapace - Lori Erb
Hatchling Plastron - Lori Erb
Adult - Scott Smith



Distribution and Habitat
The eastern box turtle is found commonly throughout Maryland (Harris 1975). Although it can be found in fields on occasion, it is primarily a woodland species (Ernst et al. 1994).

Photos, from left:
Hatchling - Mark Tegges
Habitat - Rebecca Chalmers

Red-eared Slider

Trachemys scripta elegans

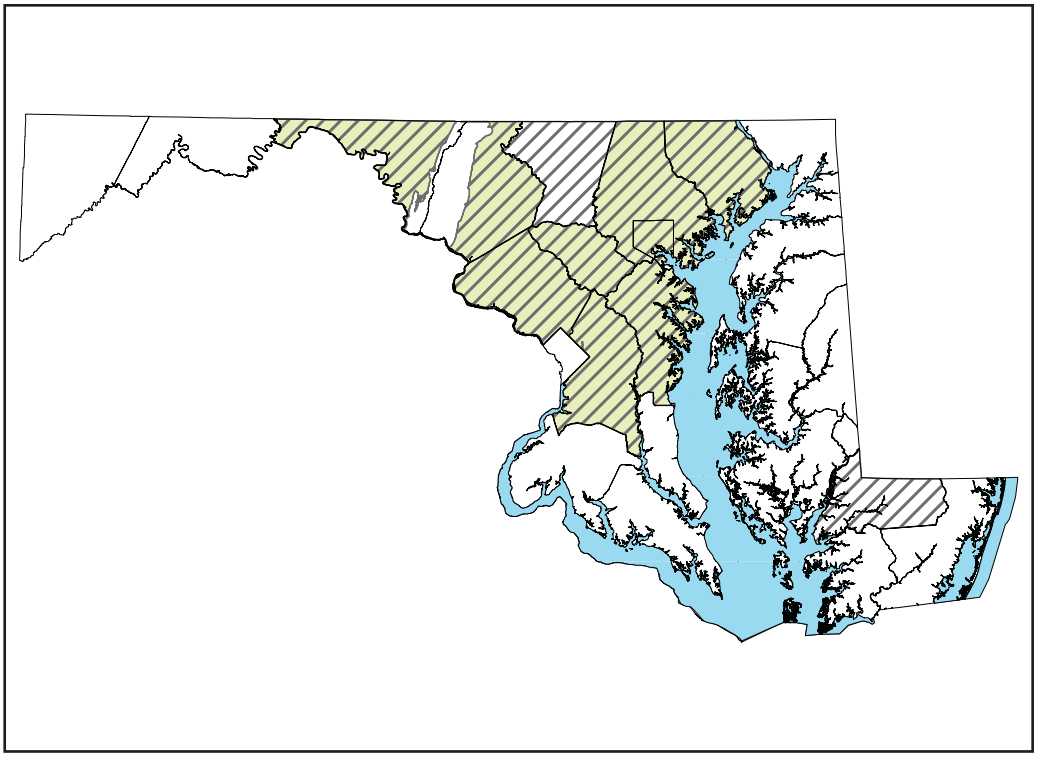
Identification

As the name implies, the red-eared slider usually has a prominent patch of red or yellow on the side of the head. The lower jaw is rounded at the bottom, as opposed to other wading turtles, which usually have flat margins to the lower jaw (Conant and Collins 1998). The carapace has a slightly serrated posterior margin and is brown with yellow stripes. The plastron is not hinged and is yellow with either a central dark blotch or several blotches. Rarely, a specimen is seen with no blotches on the plastron. The skin is green to olive brown with yellow stripes. The stripes typically form an arrowhead shaped pattern on the top the head (Enst et al. 1994).

Young

Hatchling red-eared sliders have a green carapace with yellow markings and the plastron is yellow with a number of spots. The head markings are the same as in adults (Hulse et al. 2001).

Photos, from top:
Adult - Lori Erb
Plastron - Lori Erb
Carapace - Scott Smith



Distribution and Habitat

The red-eared slider has been introduced into several parts of Maryland where it has become established in many areas (Harris 1975). It can be found in most freshwater habitats with soft bottoms and abundant plants (Ernst et al. 1994).

Photos, from left:
Detail - Scott Smith
Habitat - Rebecca Chalmers

Eastern Painted Turtle
Chrysemys picta picta

and

Midland Painted Turtle
Chrysemys picta marginata

Identification

The two subspecies of painted turtle found in Maryland are characterized by a black head with bright yellow elongated spots on each side behind the eyes, prominent yellowish borders along the transverse seam of the pleural scutes, and marginal scutes with red ocelli on the plastral side (White and White 2007; Ernst et al. 1994). The carapace is smooth (keelless) and flattened with no serrations on the posterior margin. The plastron does not have a hinge and is typically yellow (Ernst et al. 1994). The eastern painted turtle typically has the vertebral and pleural scutes arranged in straight rows across the back. The vertebral and pleural scutes of the midland painted turtle typically alternate. There is also a dark plastral blotch on the midland painted turtle that is variable in size, shape, and intensity. Typically the plastral blotch is oval, involves all or nearly all of the scutes, and is half or nearly half the width of the plastron. The eastern painted turtle may have a small dark plastral blotch or two, but does not typically have a blotch as described above for the midland painted turtle (Conant and Collins 1998). Some specimens may show characteristics of both subspecies as intergrades may exist in Maryland (Harris 1975).

Young

The color and pattern of young painted turtles are the same as adults.

Photos, from top:
Adult - Scott Smith
Hatchling Carapace - Lori Erb
Hatchling Plastron - Lori Erb
Adult - John White

Eastern Painted Turtle

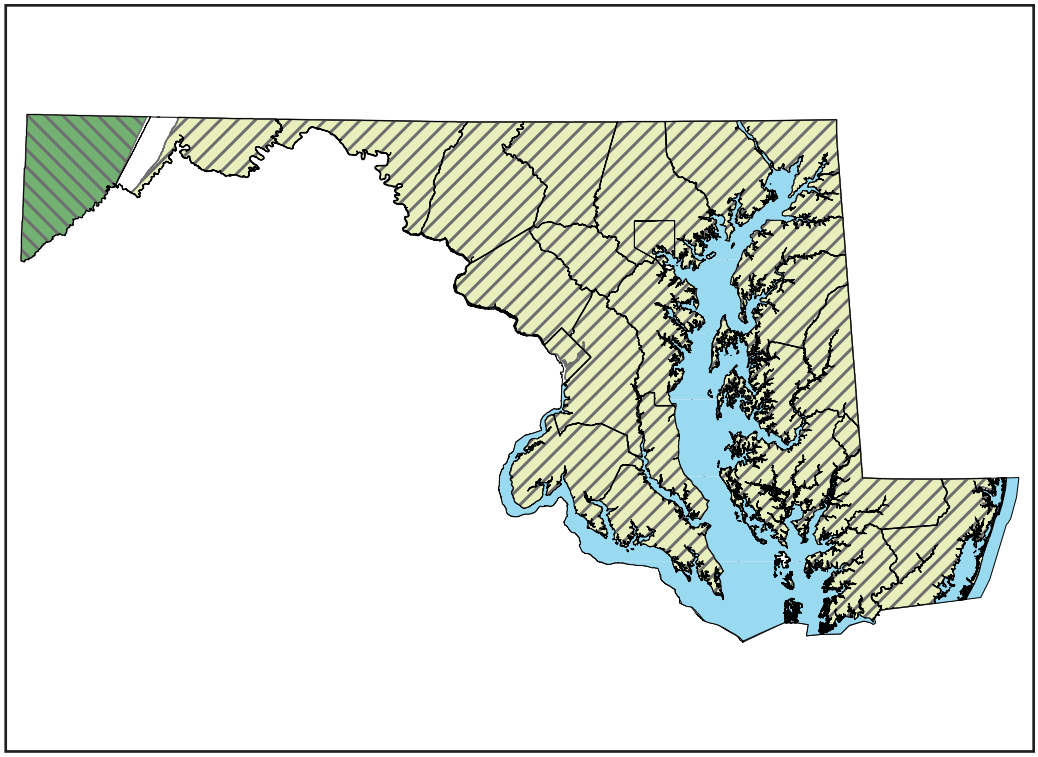
Current Distribution

Historic Distribution

Midland Painted Turtle

Current Distribution

Historic Distribution



Distribution and Habitat

Painted turtles are found throughout Maryland. The midland painted turtle occurs to the north and west, while the eastern painted turtle occurs more south and east. Intergrades may be present in central Maryland (Harris 1975). Painted turtles prefer slow moving, shallow water with a soft bottom and aquatic vegetation (Ernst et al. 1994).

Photos, from left:
Plastron - Scott Stranko
Habitat - Rebecca Chalmers

Eastern River Cooter

Pseudemys concinna concinna

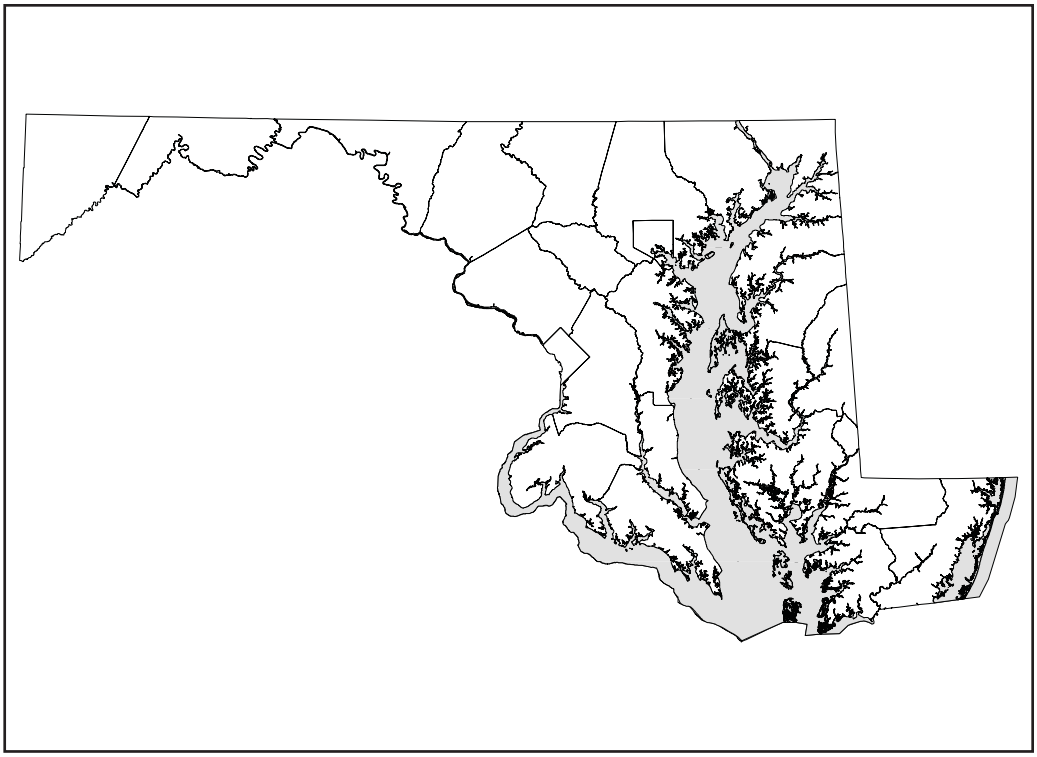
Identification

The eastern river cooter is distinguished from other aquatic turtles in Maryland by a backward-facing light letter "C" shape on the second pleural scute. All or almost all of the marginals have dark spots under them that are usually donut-shaped (Conant and Collins 1998; Ernst et al. 1994). There are five thin yellow stripes between the eyes that come together to form a violin pattern on the back of the head. The plastron is usually yellowish and with a highly variable, narrow, dark figure that follows the seams. Most of the figure is on the anterior portion of the plastron in adults (Mitchell 1994).

Young

Young eastern river cooters may not have the "C" shape on the carapace. The dark pattern along the seams of the plastron is the best characteristic for identifying young eastern river cooter.

Photos, from top:
Adult - John White
Adult - Paul Sattler



Distribution and Habitat
This species has not been collected in Maryland. However, it has been found in tributaries of the Potomac River in Virginia (Mitchell 1994). It is included in this document because it could be found in the Potomac River. It prefers rivers with slow to medium current and abundant vegetation (Ernst et al. 1994).

Photo:
Typical Habitat - Matt Sell

Northern Red-bellied Cooter

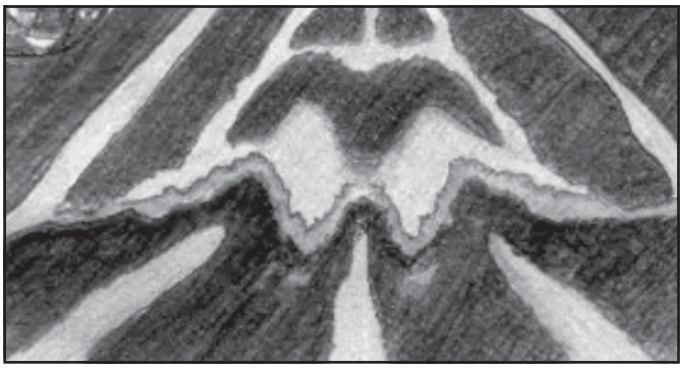
Psuedemys rubriventris

Identification

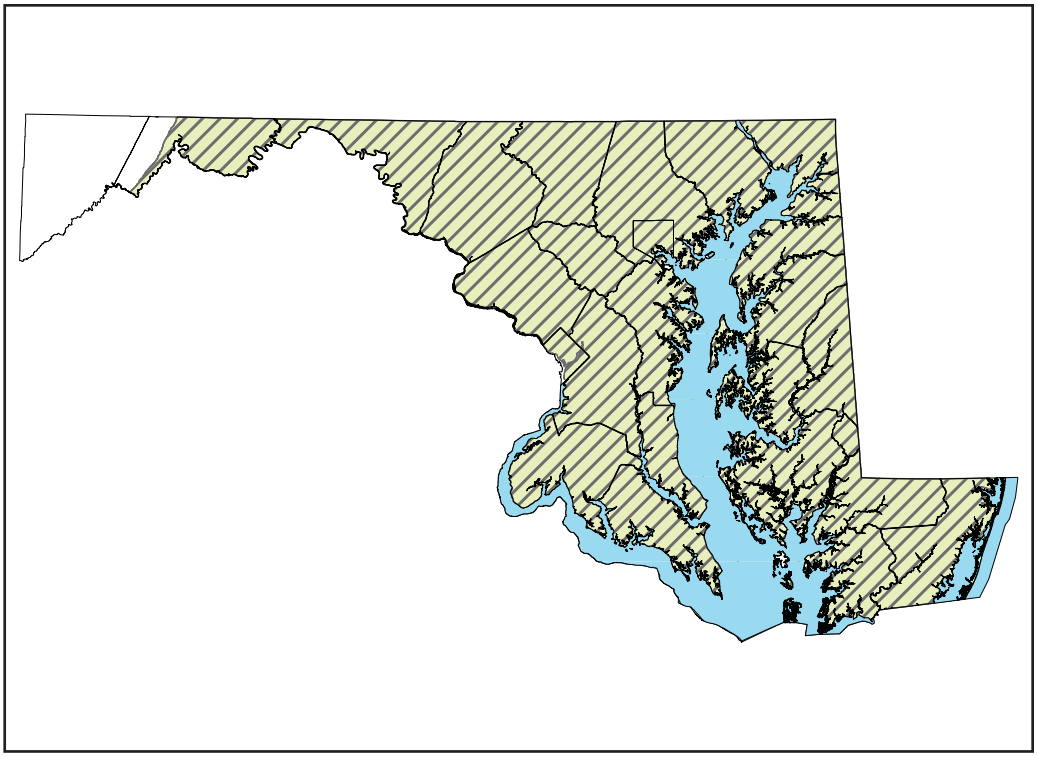
The northern red-bellied cooter usually has a red, orange or coral plastron (at least around the edges). There is a distinctive, sharp notch at the tip of the upper jaw, bordered on each side by a pronounced cusp and the cutting edges of the jaws are saw-toothed (Conant and Collins 1998, Mitchell 1994). Older specimens often have little to no patterning on the carapace.

Young

Young northern red-bellied cooters look different than adults. At hatching, the carapace is green and the verticle lines on the pleural scutes are yellow. The plastron is red to yellow and bears an irregular black figure that follows the seams of the plastral scutes. This figure consists of asymmetrically placed spots and broad bands along the seams. The figure fades with age and the yellow markings on the carapace change to red (Mitchell 1994).



Photos, clockwise from top:
Carapace - Andrea M. Teti
Illustration showing detail of sharp notch at tip of upper jaw - David Kazyak
Detail Photo of notch - Jay Kilian
Hatchling Plastron - Andrea M. Teti
Hatchling Carapace - Andrea M. Teti
Adult Plastron - Andrea M. Teti



Distribution and Habitat

The northern red-bellied cooter is usually found in deep water habitats including large, slow-moving rivers and ponds, but can also be found in marshes and floodplains (Ernst et al. 1994). It is primarily a Coastal Plain species in Maryland, but can be found west of the Fall Line (Harris 1975).

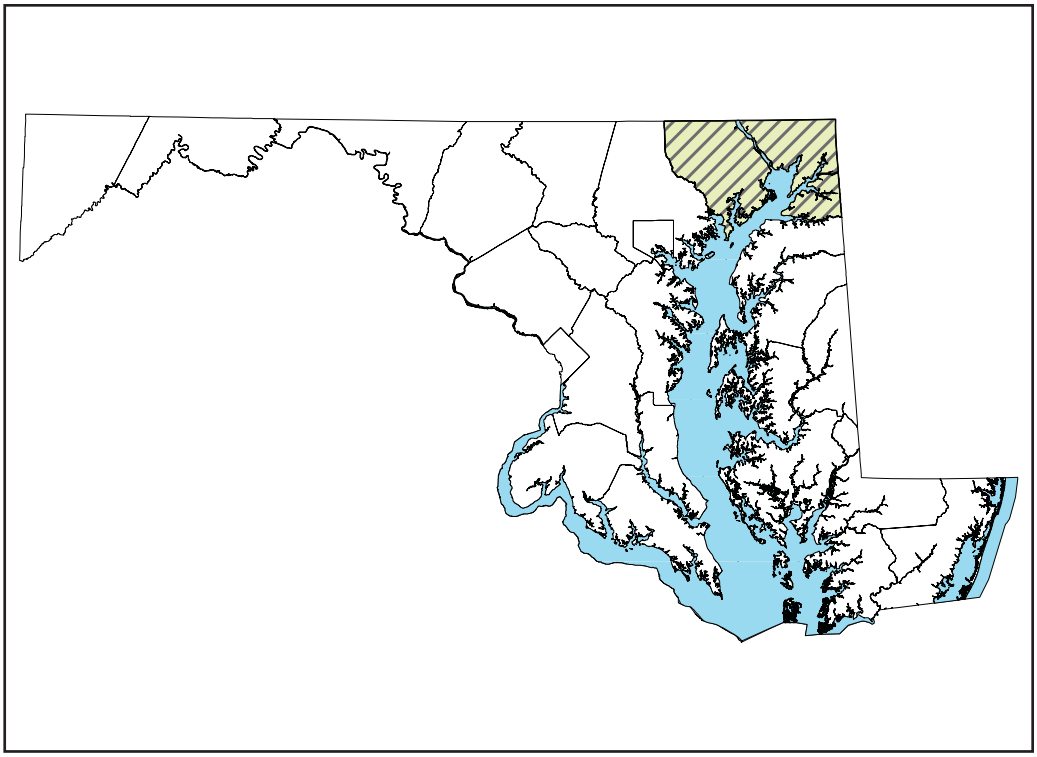
Photos, from top:
Plastron - Andrea M. Teti
Carapace - Mark Tegges
Habitat - Rebecca Chalmers

Northern Map Turtle
Graptemys geographica

Identification
The carapace of the northern map turtle is moderately keeled and the posterior edge is serrated. The carapace also has yellow reticulated lines that loosely resemble a topographic map. There is one yellow spot behind each eye. The jaw surfaces are wide and light colored giving the appearance of big lips (Conant and Collins 1998).

Young
Young northern map turtles resemble adults.

Photos, from top:
Adult - Jay Kilian
Plastron - Jay Kilian
Adult - Jim Harding
Hatchling - Jim Harding
Adult - William Gates



Distribution and Habitat

The northern map turtle is state endangered and is found in both deep and shallow parts of large streams and rivers. It is seldom seen far from water (Mitchell 1994). It has been found in Harford and Cecil Counties along the Susquehanna River (Harris 1975).

Photos, from left:
Adult Head - Jay Kilian
Hatchling Head - Jim Harding
Habitat - Sara Weglein

Northern Diamond-backed Terrapin

Malaclemys terrapin terrapin

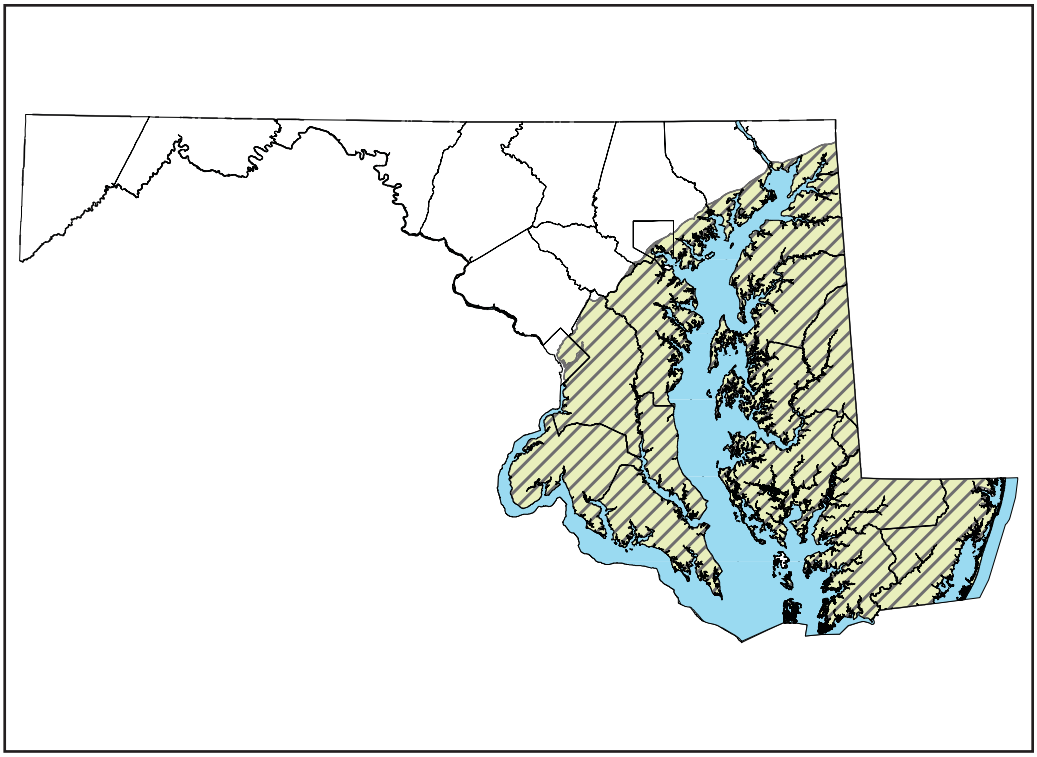
Identification

The northern diamond-backed terrapin is characterized by concentric markings and grooves on the vertebral and pleural scutes. The skin is usually light-colored with dark flecks, spots, and other markings. There is often a vertebral keel on the carapace, but it may be inconspicuous. The plastron is not hinged and is usually yellow to green or black and is marked with dark specks, blotches, or stripes. The jaws are light-colored and a dark mustache-like marking may be present on the upper jaw (Ernst et al. 1994).

Young

Young diamond-backed terrapins are patterned as adults, but are light gray with yellow plastrons (Mitchell 1994).

Photos, from top:
Detail of Head - Mark Tegges
Carapace - Lori Erb

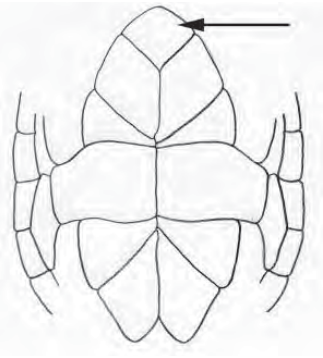


Distribution and Habitat

The northern diamond-backed terrapin is found exclusively in estuarine habitats. It inhabits coastal, brackish marshes and their tributaries, coastal bays, inlets, tidal portions of rivers, and sometimes the Atlantic Ocean (Ernst et al. 1994; Mitchell 1994; Harris 1975).

Photos, from top:
Adult - Ed Thompson
Habitat - Rebecca Chalmers

Musk and Mud Turtles (Family Kinosternidae)



The gular scute of the plastron is undivided longitudinally in musk and mud turtles. In most other turtles it is divided. The members of this family also produce malodorous secretions (musk) when disturbed (Ernst et al. 1994).

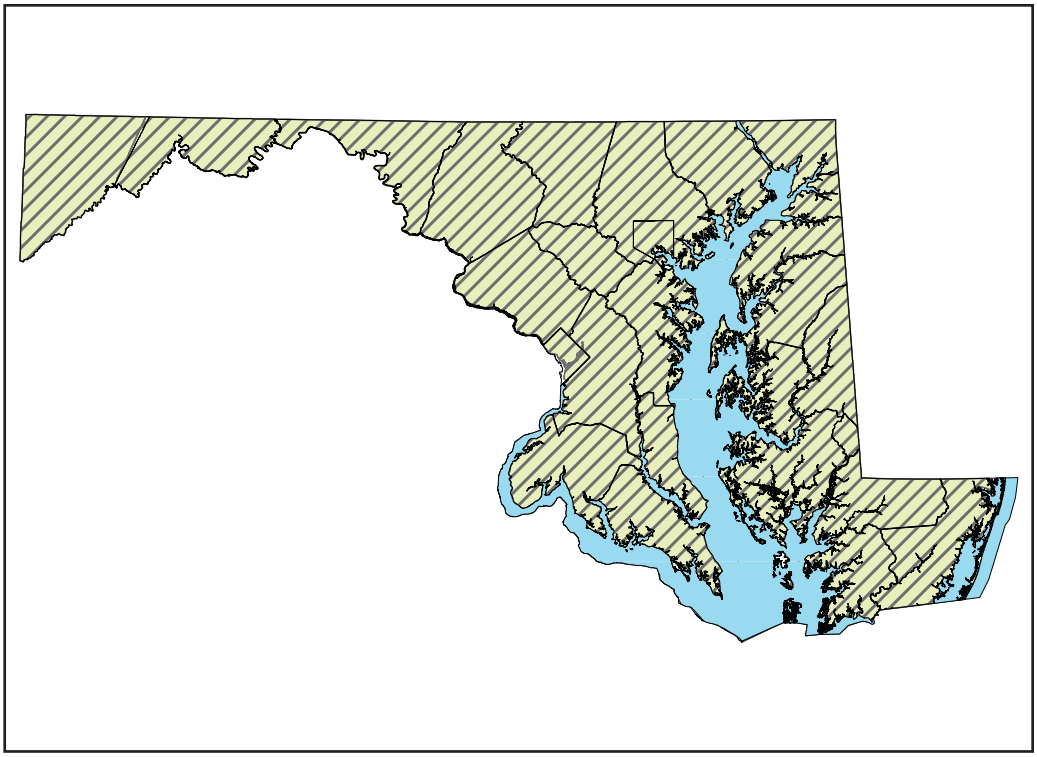
One species of musk turtle, the stinkpot (*Stenothernus odoratus*), and one species of mud turtle, the eastern mud turtle (*Kinosternon subrubrum subrubrum*), are found in Maryland.

Stinkpot Turtle
Stenothernus odoratus

Identification
The plastron of the stinkpot turtle (sometimes called the musk turtle) is small and does not cover the appendages. The pectoral scute is squarish or rectangular. There are two light stripes on the head, barbels on the chin and throat, and a single hinge on the plastron. The male has large areas of skin showing between the scutes of the plastron, while the female has much less skin visible (Conant and Collins 1998; Hulse et al. 2001; Ernst et al. 1994).

Young
Young stinkpot turtles look like adults.

Photos, clockwise from left:
Swimming - John White
Plastron - Linh Phu
Detail of Head - Lori Erb



Distribution and Habitat

The stinkpot turtle has been found throughout Maryland. However, it is much more common on the Coastal Plain (Harris 1975). It can be found in any freshwater habitat that has slow current and a soft bottom (Ernst et al. 1994).

Photos, from left:
Plastron - Lori Erb
Adult - Lori Erb
Habitat - Rebecca Chalmers

Eastern Mud Turtle

Kinosternon subrubrum subrubrum

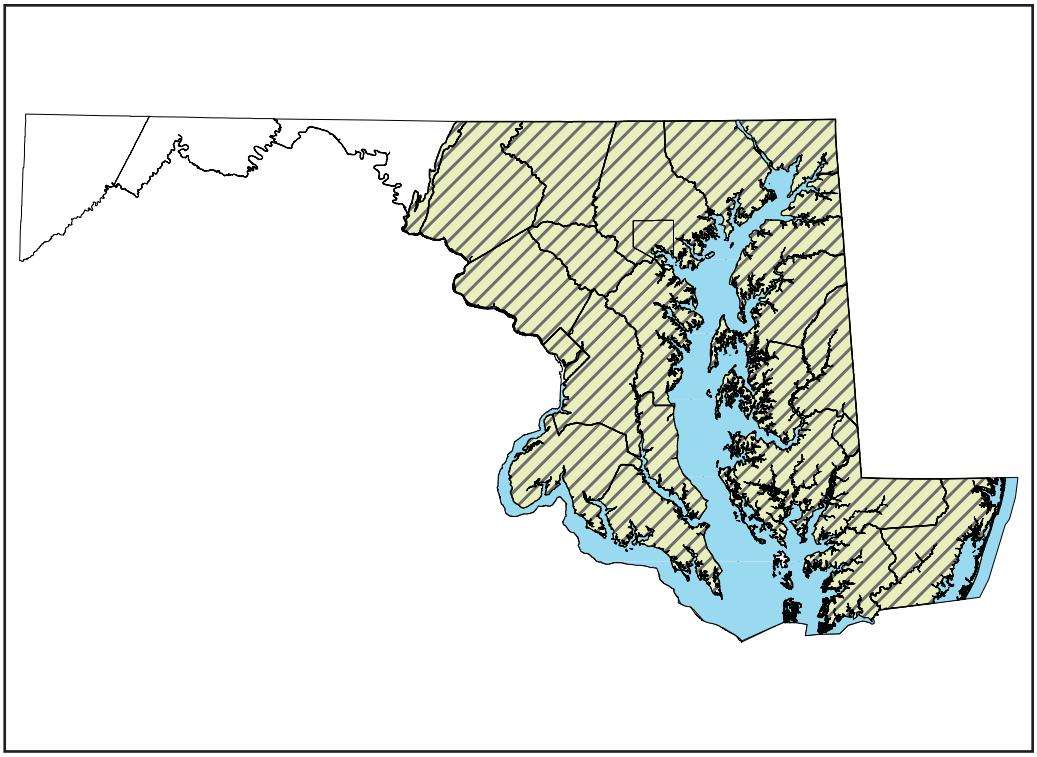
Identification

The plastron of the eastern mud turtle is large and double hinged, covering most of the body. The pectoral scutes are triangular. The head is spotted, mottled, or irregularly streaked with yellow, but does not have yellow lines as in the stinkpot turtle (Conant and Collins 1998; Ernst et al. 1994).

Young

Young eastern mud turtles look different than adults. The carapace has three indistinct keels. The skin and carapace are black and each marginal scute has an orange spot. The plastron is reddish with an irregular black figure that may cover nearly the entire surface or may be narrow with black lines along the plastral seams. The black head has light stripes, or is mottled and the snout is blunt (Mitchell 1994).

Photo:
Adult - Mark Tegges



Distribution and Habitat

The eastern mud turtle can be found in a wide variety of aquatic habitats including ponds, lakes, creeks, swamps, freshwater and brackish marshes, ditches, and bogs. It appears to avoid deep, fast-moving water and prefers shallow, slow-moving water with aquatic vegetation and a soft organic substrate. Occasionally an eastern mud turtle may be seen on land, sometimes a long way from water, especially after rainstorms (Mitchell 1994). It is primarily a Coastal Plain species that encroaches onto the Piedmont and into Frederick and Washington Counties along the Potomac River valley (Harris 1975).

Photos, from left:
Plastron - Mark Tegges
Habitat - Tony Prochaska

Snapping Turtles (Family Chelydridae)

Eastern Snapping Turtle
Chelydra serpentina serpentina

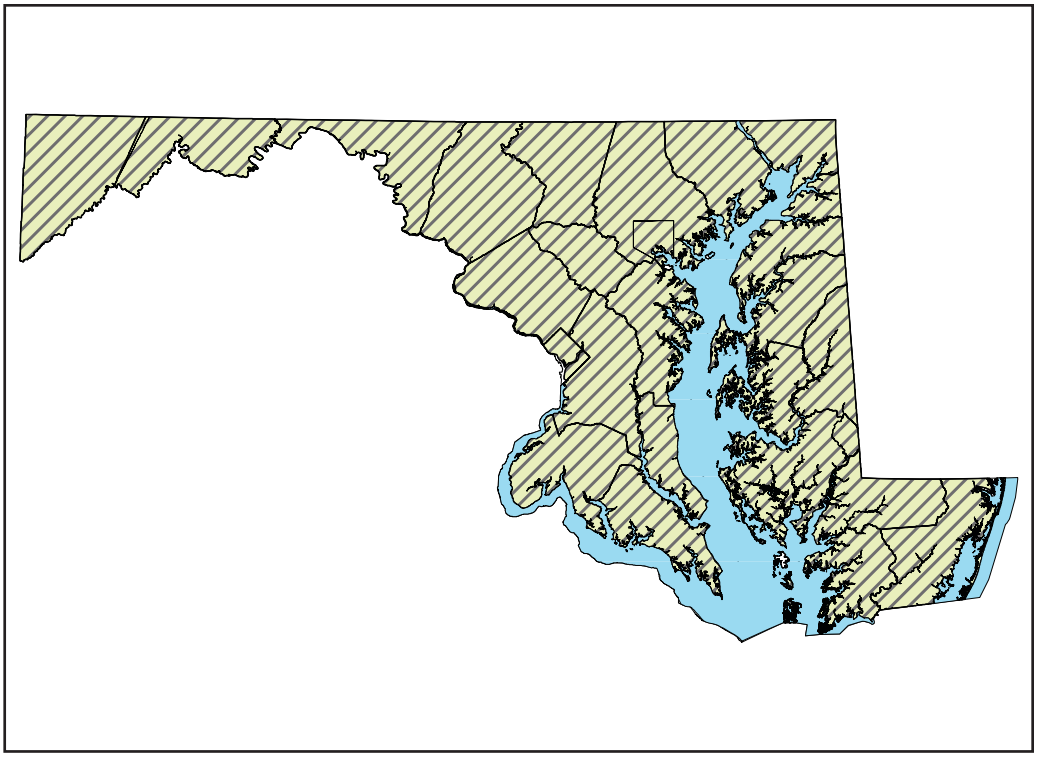
Identification

The eastern snapping turtle has a large head with powerful jaws, a long tail that is saw-toothed along the upper side, and a cross-shaped plastron that does not cover much of the venter (Ernst et al. 1994; Conant and Collins 1998). This species can also be identified by its nasty disposition when encountered on land. Whether in the water or on land, this species should be approached with caution, as bites can cause serious injury.

Young

Young eastern snapping turtles resemble adults.

Photos, from top:
Adult - Mark Tegges
Digging Nest - Scott Smith



Distribution and Habitat

Eastern snapping turtles are common throughout Maryland. They can be found in just about every type of freshwater habitat and brackish marshes (Harris 1975).

Photos, from left:
Ventral - Scott Smith
Adult - Linh Phu
Habitat - Scott Smith

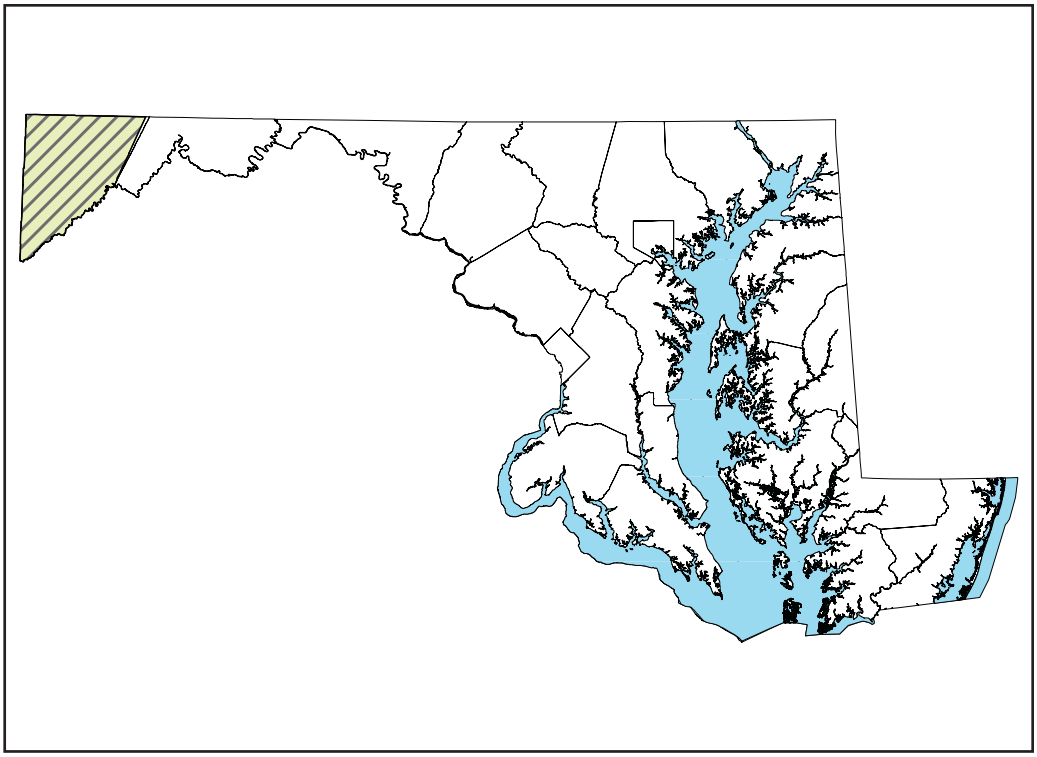
Softshell Turtles (Family Trionychidae)

Eastern Spiny Softshell
Apalone spinifera spinifera

Photo:
Adult - Linh Phu

Identification
The eastern spiny softshell has a flat, round, keelless, leathery carapace. Conical spiny projections are present along the anterior edge of the carapace and the surface is roughened like sandpaper. The dorsal color tends to be olive to tan with a pattern of dark ocelli or blotches and a dark marginal line. The head and limbs are olive to gray, with a pattern of dark spots and streaks. The eastern spiny softshell also has a long tubular snout with large nostrils, each with a septal ridge (Ernst et al. 1994).

Young
Young eastern spiny softshells look like adults except they are strongly patterned, with small black dots and hollow black circles on a light tan or olive carapace. The inside carapacial margin is yellow and bordered by a single thin black line. The spines on the anterior of the carapace are reduced (Mitchell 1994).



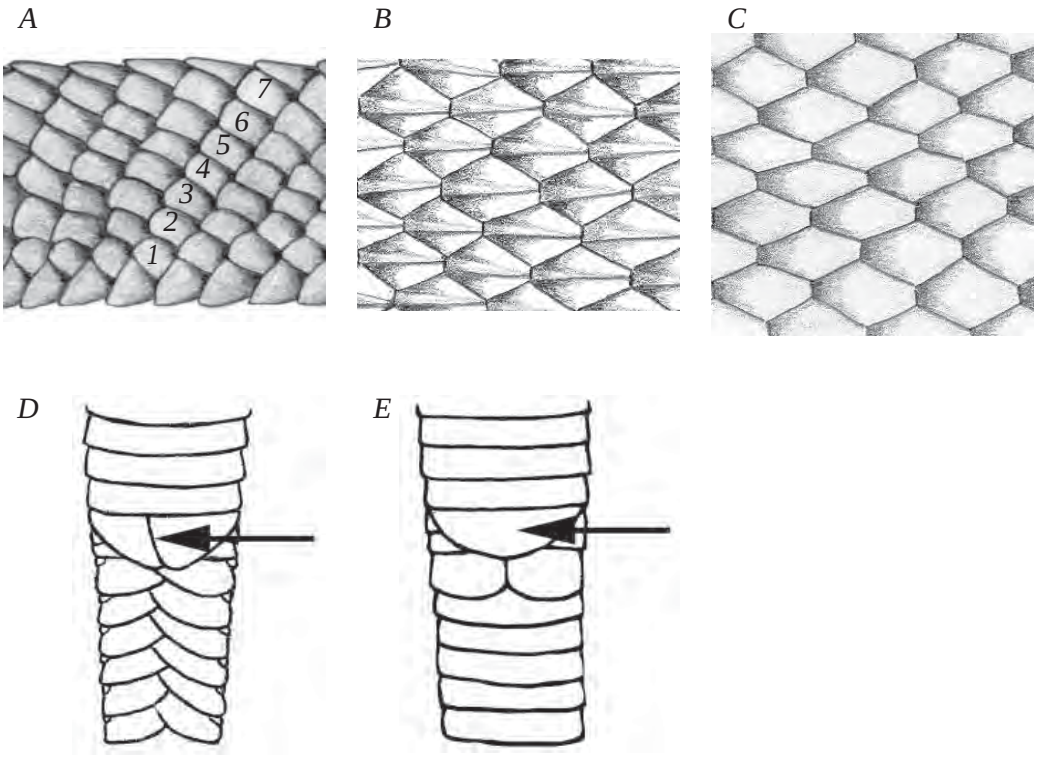
Distribution and Habitat

The eastern spiny softshell is seldom seen out of water. It is confined to rivers and some tributaries. It has been seen in ponds and prefers sandy to soft organic substrates and some aquatic vegetation. The presence of this species in Maryland is based on one historical sighting in the Youghiogheny River (Harris 1975).

Photo:
Ventral - Linh Phu
Detail - Scott Smith
Habitat - Matt Sell

Key to the Adult and Juvenile Snakes of Maryland

A. Counting Scales.
B. Keeled Scales.
C. Smooth Scales.
D. Divided Anal Plate.
E. Single Anal Plate.



1a. Round pupil in the eye; no heat seeking pit between each eye and nostril; usually a complete set of divided subcaudal scales.

2

1b. Pupils vertically elliptical; a heat seeking pit is present between each eye and nostril; a single row of subcaudal scales.

Pit Vipers
(Family Viperidae, Subfamily Crotalinae)
33

1a. Round pupil.

1b. Vertical pupil.

2a. Upturned, shovel-like snout; highly variable in color; most individuals have dark spots and blotches on a light background, but some individuals are completely black; the underside of the tail is usually lighter in color than the belly.

Eastern Hog-nosed Snake
(*Heterodon platirhinos*) p. 196

2b. Snout not upturned.

3

3a. Cream, golden, or yellow-colored ring around the neck that may be complete or interrupted.

4

3b. No ring around the neck.

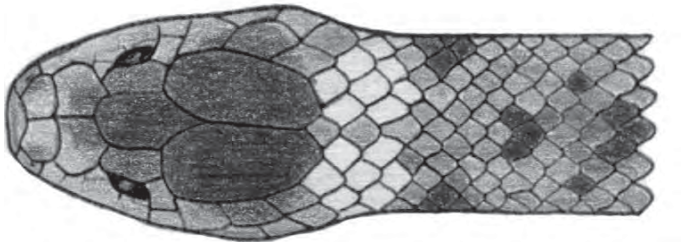
6

4a. Scales keeled; uniformly dark brown to black dorsally; less than 23 cm long.

Northern Brownsnake Juvenile
(*Storeria dekayi dekayi*)

4a. Ring around neck of juvenile Northern Brown Snake.

4a.



4b. Scales smooth; adults are greater than 23 cm long, but juveniles are shorter and resemble adults.

Ring-necked Snakes
(*Diadophis punctatus*) spp.
5

5a. Dorsal coloration variable, may be bluish, blackish, gray, slate, or brownish; belly uniform yellow or occasionally with a row or partial row of small black dots down the center; neck ring continuous (not interrupted by dark pigment).

*Northern Ring-necked Snake
(*Diadophis punctatus edwarsii*) p. 190

5b. Large, half moon shaped spots in the center of the ventral side of the body; neck ring normally interrupted by dark pigment; small black spots on chin and lower lips.

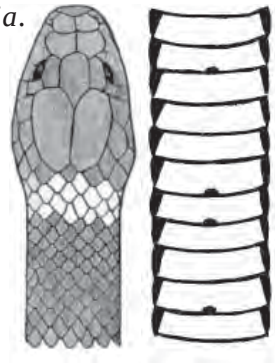
*Southern Ring-necked Snake
(*Diadophis punctatus punctatus*) p. 190

*Note that on the eastern shore of Maryland most of the ring-necked snakes are believed to be intergrades between the northern and southern ring-necked snakes. Intergrades (*Diadophis punctatus punctatus X edwarsii*) often show a mixture of traits.

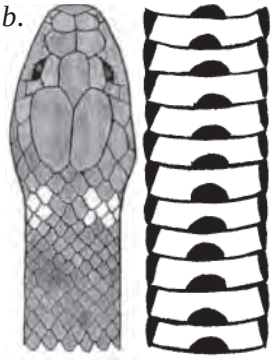
5a. Neck ring continous; belly with a row or partial row of small black dots.

5b. Belly with large half moon shaped spots.

5a.



5b.



6a. Plain green colored on the dorsal side (dead specimens are blue dorsally); venter is white, yellow, or pale green.

Green Snakes
(*Opheodrys spp.*)
7

6b. Dorsal coloration other than plain green.

8

7a. Scales keeled; tail is short, less than 40% of the snout to vent length.

Northern Rough Greensnake
(*Opheodrys aestivus aestivus*) p. 198

7b. Scales smooth; tail is long, at least 40% of snout to vent length.

Smooth Greensnake
(*Opheodrys vernalis*) p. 200

8a. Body is shaped like a bread loaf or mailbox, with a rounded dorsal and flat venter; scales weakly keeled.

9

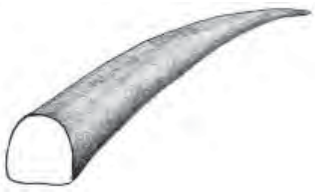
8b. Body round in cross section, not bread loaf or mailbox shaped; scales may be smooth or keeled.

11

8a. Body is shaped like a bread loaf or mailbox.

8b. Body round in cross section.

8a.



8b.

9a. Dorsum is black, sometimes with a faint trace of a spotting pattern, especially when the skin is distended; venter has varying amounts of white and usually has a hint of a checkerboard pattern on at least part of it; typically greater than 100 cm long.

Adult Eastern Ratsnake
(*Pantherophis alleghaniensis*) p. 204

9b. Dorsal background color gray, brown, or orangish brown with well defined red, black, dark gray or reddish brown blotches on the dorsal surface; smaller, more irregular blotches are on the sides.

10

10a. Blotches usually red to reddish brown and bordered with black on the dorsal surface; post ocular stripe extends below the mouth and often has a dark border; large, bold longitudinal stripes usually occur on the under side of the tail behind the vent; belly markings tend to be large and bold; the first dorsal blotch on the dorsum is divided into two branches that extend forward and meet in a spear point between the eyes; occasionally with four dusky longitudinal stripes.

Red Cornsnake
(*Pantherophis guttatus*) p. 206

10b. Dorsal pattern variable, but can be very similar to the red cornsnake; the post ocular stripe stops at the mouth and is entirely dark; the underside of the tail behind the vent is usually not striped; belly markings are usually small and often indistinct; typically less than 100 cm long.

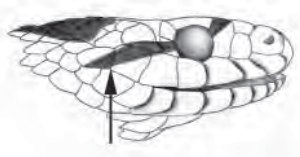
Juvenile Eastern Ratsnake
(*Pantherophis alleghaniensis*) p. 204

10a. Dorsum is divided into two branches that extend forward and meet in a spear point between the eyes.

10b. Post ocular stripe stops at the mouth and is entirely dark.

10a.

10b.



11a. Longitudinal stripes on back, sides, or belly.

12

11b. Color pattern does not consist of longitudinal stripes.

15

12a. Scales smooth (some specimens may have keels on the supra anal scales), appearing iridescent and glossy; three red stripes on a black dorsum; venter yellow with two primary rows of black spots; no difference in the width of the head and neck; the tail has a sharp spine.

Common Rainbowsnake
(*Farancia erytrogramma erytrogramma*) p. 218

12b. Scales keeled; pattern not typically consisting of three red stripes on a black dorsum; the head is wider than the neck; the tail lacks a sharp spine.

13

13a. Yellow stripe along lower side of body on second scale row and upper half of first; belly yellowish but boldly marked with four brown stripes; three additional dark stripes run down the back, but are difficult to see except in specimens that have recently shed.

Queen Snake
(*Regina septemvittata*) p. 178

13b. Belly not marked with four brown stripes; 3 bold, cream, yellow, or greenish longitudinal stripes that extend from the back of the head to near the tip of the tail; stripes do not occur on any part of the first scale row.

14

14a. Stripes are on the third and fourth scale rows; the tail is long (about one third the total length of the snake); there is a yellowish spot in front of each eye; belly is unmarked yellowish to bluish green.

Common Ribbonsnake
(*Thamnophis sauritus sauritus*) p. 192

14b. Highly variable; typically a bold mid-dorsal stripe, with less prominent pale lateral stripes on the second and third scale rows; some individuals have very obscure stripes; typically two rows of alternating dark spots between the stripes, which form a checkered pattern; the tail is less than one third the total length of the snake; the belly has small black spots along the edges that may be difficult to see.

Eastern Gartersnake
(*Thamnophis sirtalis sirtalis*) p. 194

15a. Black colored dorsum with smooth scales and may have white or cream colored crossbands or yellow spots that are restricted to the neck.

16

15b. Without a black dorsum; may be plain brown, gray, or other colors; may be patterned with blotches, spots, or bands; scales smooth or keeled.

18

16a. Plain black above and black or dark gray below; usually at least part of the underside of head and part of neck are white.

Northern Black Racer [Adult]
(*Coluber constrictor constrictor*) p. 202

16b. Dorsum consists of white or cream colored crossbands or yellow spots that are restricted to the neck

17

17a. Black with white or cream-colored crossbands that fork on the sides just above the belly and connect to form a chain-like pattern, or with small yellowish spots; belly, chin, and throat are irregularly checkered with black and white or yellow, otherwise venter is black; typically greater than 90 cm.

Eastern Kingsnake
(*Lampropeltis getula getula*) p. 210

17b. Less than 20 cm uniformly black with three cream to yellow spots on the neck and keeled scales.

Northern Red-bellied Snake Juvenile
(*Storeria occipitomaculata occipitomaculata*) p. 182

18a. Dorsum plain colored, without blotches, bands, or dark edged spots; may have tiny dark spots, or light spots on the nape.

19

18b. Dorsum covered with blotches, bands, or dark-edged spots.

25

19a. Single anal plate; smooth scales; usually light to dark brown, sometimes with a greenish tinge, but changing to yellowish on the sides of the body; belly white or yellowish and checkered, spotted or clouded with brown; typically greater than 30 cm, most specimens have dark-edged spots, but, since a rare individual may not have any spots at all, it is included here and in a later portion of the key.

Mole Kingsnake [in part]
(*Lampropeltis calligaster rhombomaculata*) p. 212

19b. Anal plate divided.

20

20a. Greater than 50 cm long; red to reddish orange belly; lower half of head is usually orange with a white or yellow patch on the throat; dorsum coloration is normally plain brown, but varies from pale reddish brown to rich chocolate brown with grayish or greenish on lower sides of body; scales are strongly-keeled.

Red-bellied Watersnake [Adult]
(*Nerodia erythrogaster erythrogaster*) p. 176

20b. Small, typically less than 30 cm.

21

21a. Head is small, pointed, and not distinct from the neck; the tail is short, ending in a short spine; scales smooth and iridescent; 13 scale rows at mid-body.

Eastern Wormsnake
(C*arphophis amoenus amoenus*) p. 188

21b. Head distinct from the neck; tail not ending in a short spine; more than 13 scale rows at mid-body.

22

22a. Three pale-colored nape spots usually present, otherwise highly variable; 17 scale rows at mid-body; belly color is normally bright red, but may be orange, pale yellow, or even blue-black; two pre-ocular scales; light spot on fifth upper labial; scales keeled.

Northern Red-bellied Snake Adult
(*Storeria occipitomaculata occipitomaculata*) p. 182

22b. Lacking pale-colored nape spots; belly may be pale yellowish, brownish, cream colored or pinkish, but is not red or orange.

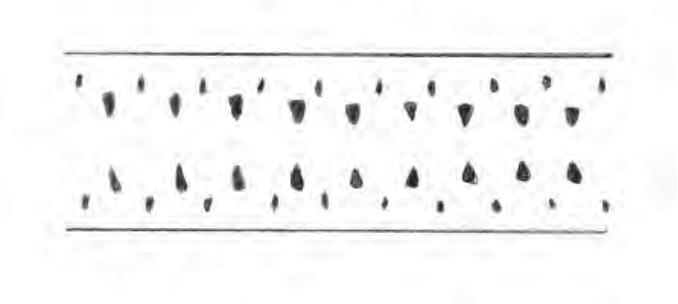
23

23a. Two parallel rows of blackish spots down the back, which may be in conspicuous unless skin is stretched; dark downward streak on side of head, behind the eye; may be yellowish, brown, gray, dark brown, or reddish brown; scales keeled; 15 scale rows at mid-body.

Northern Brownsnake
(*Storeria dekayi dekayi*) p. 180

23a. Two parallel rows of blackish spots down the back.

23a.



23b. No downward streak on side of head, behind the eye; blackish spots on the back, if present, are not in parallel rows.

24

24a. Uniformly dark gray or brownish above; the underside of the head, body, and tail are plain white, grayish, or yellowish; tiny dark spots may be present on the back, scales are smooth except for faint keels on the back above the cloacal region; 15 scale rows at mid-body.

Eastern Smooth Earthsnake
(*Virginia valeriae valeriae*) p. 184

24b. Weakly-keeled scales; 15 rows anteriorly and 17 at mid-body and posteriorly; dorsum reddish brown to dark gray with no spots.

Mountain Earthsnake
(*Virginia pulchra*) p. 186

25a. Scales keeled.

26

25b. Scales smooth.

28

26a. Undivided anal plate; white, yellow, or pale-gray background color with black or dark brown blotches from the head to the tip of the tail; belly is white with dark spots along each side.

Northern Pinesnake
(*Pituophis melanoleucus melanoleucus*) p. 220

26b. Divided anal plate; dorsum typically boldly patterned with bands and blotches; scales strongly-keeled.

27

27a. Eye diameter greater than or equal to the distance from the eye to the nostril; less than 76 cm long; the venter is uniformly cream to yellow; pinkish or pale orange without half moon-shaped spots; the dorsum is strongly patterned with a series of four to six dark crossbands anteriorly that change to mid-dorsal blotches with alternating dark lateral blotches at the mid-body region.

Red-bellied Watersnake Juvenile
(*Nerodia erythrogaster erythrogaster*) p. 176

27b. Eye diameter less than the distance from the eye to the nostril; a bold pattern of two irregular rows of half moon-shaped spots is usually present on a yellowish, cream-colored, or pinkish belly, or with spots or peppering concentrated along the borders of the venter; dorsum of body and tail with a variable number (often more than six) of complete, closely-spaced, anterior dark crossbands that break up about mid-body to form a series of rectangular, alternating, mid-dorsal and lateral blotches.

Northern Watersnake
(*Nerodia sipedon sipedon*) p. 174

28a. Anal plate divided; strongly patterned with a mid-dorsal row of dark gray, brown, or reddish brown blotches on a ground color of gray or bluish gray; small dark spots on flanks and venter; less than 90 cm.

Northern Black Racer Juvenile
(*Coluber constrictor constrictor*) p. 202

28b. Anal plate undivided; dorsal pattern and color variable;

29

29a. Snout projects beyond the lower jaw; dorsal pattern consists of a series of 13-20 red blotches on the body and three to six on the tail; blotches are completely, and boldly, outlined in black; black band across the head behind the eyes.

Northern Scarletsnake
(*Cemophora coccinea copei*) p. 218

29b. Snout does not conspicuously project beyond the lower jaw.

30

30a. Dorsal pattern consists of a series of bands that continue completely across the belly; the bands are usually black, red, and some shade of yellow; the yellow rings are separated from the red rings by black rings.

Scarlet Kingsnake*
(*Lampropeltis triangulum elapsoides*)

*This species has not been found in Maryland. The northern extent of its range is North Carolina. It is included here as a comparison to the Coastal Plain milksnake (which is thought to be an intergrade between the eastern milksnake and this species).

30b. Dorsal pattern typically consists of blotches rather than bands and typically the pattern does not continue completely across the belly; the belly may have dark blotches that sometimes join with dorsal blotches and form nearly complete rings in some specimens.

31

31a. Thirty five to 71 well-separated reddish brown, dark-edged spots down the back; spots are typically narrow (one to two scales long); ground color is light to dark brown, sometimes with a greenish tinge, but changing to a more yellowish hue on the sides of the body; belly white or yellowish and checkered, spotted, or clouded with brown; young (less than less than 76 cm) also have two lengthwise dark streaks on the neck.

Mole Kingsnake [in part]
(*Lampropeltis calligaster rhombomaculata*) p. 212

31b. Up to 46 black-bordered blotches that are not typically well separated; a Y, U, or V- shaped mark or a full or partial neck collar that is the same color as the body's background color; if spots are present, they are typically more than three scales long.

32

32a. Three or five rows of 32 to 46 reddish brown, black-bordered blotches on the body; Y, U, or V shape that is the same color as the body's background and is within the large dorsal blotch on the nape; the dorsal blotches are much larger than, and alternate with, the lateral blotches; no neck collar.

Eastern Milksnake
(*Lampropeltis triangulum triangulum*) p. 208

32b. Thirty one or fewer blotches on the body; no Y, U, or V shaped light patch on the nape; blotches extend laterally down the body to give the appearance of rings when viewed from above or the side; the belly may have dark blotches that sometimes join with dorsal blotches (nearly complete rings in some specimens); a full or partial neck collar the same color as the background.

*Coastal Plain Milksnake
(*Lampropeltis triangulum temporalis*) p. 214

*This species is thought to be an intergrade between the eastern milksnake and the scarlet kingsnake (*Lampropeltis triangulum elapsoides*).

33a. With a rattle at the end of the tail; black or dark brown crossbands on a background of yellow or brown; at birth, only one basal segment of the rattle is present (the button) and the tail is not yellow tipped; top of head between eyes with several small scales.

Timber Rattlesnake
(*Crotalus horridus*) p. 224

33b. Without a rattle; approximately 15 hourglass-shaped bands on the sides, which are wide on the sides and narrow at the center of the back; dorsum of head tan to brick red and separated from the labial region by a thin, dark brown line; juveniles have a dark line on the head that separates the dark head from the pale “lips” and have a distinct yellow-tipped tail; top of head between eyes with enlarged plates. The northern copperhead is distributed throughout Maryland. However, specimens from the lower eastern shore exhibit some characteristics of the southern copperhead and are probably intergrades (Harris 1975; Conant and Collins 1998). There are two characteristics that differentate the northern copperhead (*Agkistrodon contortrix makasen*) and southern cooperhead (*Agkistrodon contortrix contortrix*). Southern copperheads have a paler, pinker color and narrower hour-glass markings that are often broken in the center (Conant and Collins 1998).

Northern Copperhead
(*Agkistrodon contortrix mokasen*) p. 226
or
Southern Copperhead
(*Agkistrodon contortrix contortrix*) p. 226

Snakes (Order Squamata, Sub-order Serpentes)

Snakes are limbless reptiles with elongate bodies that are covered with scales. All snakes lack external ear openings and eyelids and have long, forked tongues.

There are twenty-nine different varieties (species and sub-species) in two families of snakes that can be found in Maryland. Two Maryland species, the copperhead (*Agkistrodon contortrix*) and timber rattlesnake (*Crotalus horridus*) are in the viper family (Viperidae). The remaining species are in the family Colubridae, which is the largest snake family in the world.

The table on page 169 shows whether the scales of each snake species are keeled, weakly-keeled, or smooth and whether the anal plate is single or divided. These characteristics along with the number of dorsal scale rows at the mid-body and the overall coloration and patterning are important characteristics used to differentiate species of snakes (White and White 2007). With a few exceptions, most young snakes resemble adults (Mitchell 1994). Eggs of snakes can be differentiated by species. However, characteristics used to identify species of snakes based on examination of eggs are not discussed in this document.

In addition to physical descriptions of snakes, maps depicting the distribution of each snake species in Maryland are also included. The distribution maps include historic distributional information that was compiled by Harris (1975) and distributional surveys of select species by Thompson (1984). White and White (2007) provided a great deal of distributional information for snakes on Maryland's eastern shore. Addtional recent distribution information was provided by the Maryland Department of Natural Resources, Maryland Biological Stream Survey and Natural Heritage Program, and from additional literature where appropriate.

Scale and Anal Plate Characteristics for Maryland's Snakes

Species	Scales			Anal Plate	
	Smooth	Keeled	Weakly Keeled	Divided	Single
Northern Watersnake		X		X	
Red-bellied Watersnake		X		X	
Queen Snake		X		X	
Northern Brownsnake		X		X	
Common Ribbonsnake		X			X
Eastern Gartersnake		X			X
*Eastern Smooth Earthsnake	X			X	
Mountain Earthsnake			X	X	
Eastern Hog-nosed Snake		X		X	
Northern Ring-necked Snake	X			X	
Southern Ring-necked Snake	X			X	
Eastern Wormsnake	X			X	
**Common Rainbowsnake	X			X	X
Northern Black Racer	X			X	
Northern Rough Greensnake		X		X	
Smooth Greensnake	X			X	
Eastern Ratsnake			X	X	
Red Cornsnake			X	X	
Eastern Kingsnake	X				X
Eastern Milksnake	X				X
Coastal Plain Milksnake	X				X
Mole Kingsnake	X				X
Northern Scarletsnake	X				X
Northern Pinesnake	X				X
Northern Red-bellied Snake	X			X	
Timber Rattlesnake		X			X
Northern/Southern Copperhead		X			X

* Faint keels are present on the back above the cloacal region.
**Supra-anal scales may be keeled in some individuals. Anal plate is usually divided but may be single in some individuals.

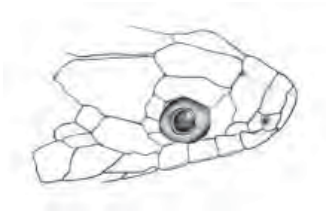
Listing Status of the Snakes of Maryland

	Common Name	Scientific Name	State Status
Colubrids (Family Colubridae)	Northern Watersnake	*Nerodia sipedon sipedon*	
	Red-bellied Watersnake	*Nerodia erythrogaster erythrogaster*	Watchlist
	Queen Snake	*Regina septemvittata*	
	Northern Brownsnake	*Storeria dekayi dekayi*	
	Northern Red-bellied Snake	*Storeria occipitomaculata occipitomaculata*	
	Eastern Smooth Earthsnake	*Virginia valeriae valeriae*	
	Mountain Earthsnake	*Virginia valeriae pulchra*	Endangered
	Eastern Wormsnake	*Carphophis amoenus amoenus*	
	Northern Ring-necked Snake	*Diadophis punctatus edwardsii*	
	Southern Ring-necked Snake	*Diadophis punctatus punctatus*	
	Common Ribbonsnake	*Thamnophis sauritus sauritus*	
	Eastern Gartersnake	*Thamnophis sirtalis sirtalis*	
	Eastern Hog-nosed Snake	*Heterodon platirhinos*	
	Northern Rough Greensnake	*Opheodrys aestivus aestivus*	
	Smooth Greensnake	*Opheodrys vernalis*	

	Common Name	Scientific Name	State Status
	Northern Black Racer	*Coluber constrictor constrictor*	
	Eastern Ratsnake	*Pantherophis alleghaniensis*	
	Red Cornsnake	*Pantherophis guttatus*	
	Eastern Milksnake	*Lampropeltis triangulum triangulum*	
	Eastern Kingsnake	*Lampropeltis getula getula*	
	Mole Kingsnake	*Lampropeltis calligaster rhombomaculata*	
	Coastal Plain Milksnake	*Lampropeltis triangulum temporalis*	Watchlist
	Northern Scarletsnake	*Cemophora coccinea copei*	Endangered
	Common Rainbowsnake	*Farancia erytrogramma erytrogramma*	Historical
	Northern Pinesnake	*Pituophis melanoleucus melanoleucus*	
Pit Vipers (Subfamily Crotalinae)	Timber Rattlesnake	*Crotalus horridus*	Watchlist
	Northern Copperhead	*Agkistrodon contortirx mokasen*	
	Southern Copperhead	*Agkistrodon contortrix contortrix*	

Northern Ring-necked Snake
Photo: Corey Wickliffe

Colubrids (Family Colubridae)



Maryland colubrids differ from vipers by having round pupils in the eyes, no heat seeking pit between each eye and nostril, a complete set of divided sub-caudal scales, and a series of large plates (scales) on the dorsum of the head.

There are 26 different snakes (including sub-species) from the family colubridae that can be found in Maryland. Due to the large number of genera (16) and the relatively few species within each genus (no more than two), identification of Maryland colubrids to genus is not discussed here. Species and sub-species descriptions follow.

Common Ribbonsnake
Photo: Scott Smith

Northern Watersnake

Nerodia sipedon sipedon

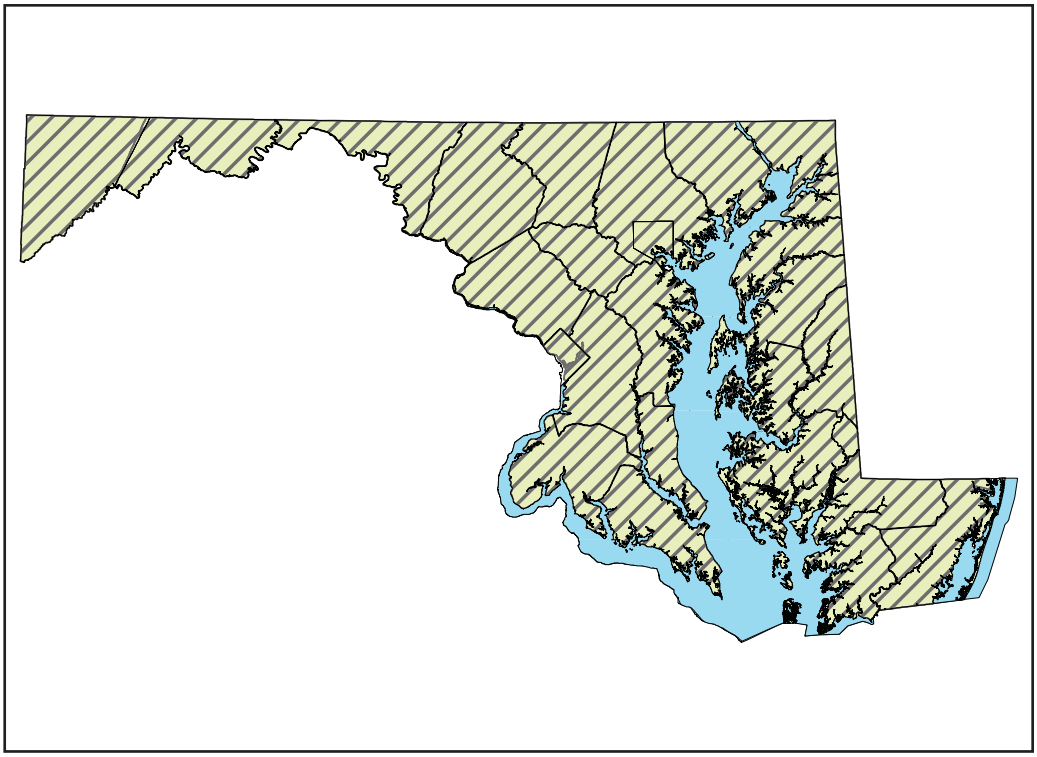
Identification

The northern watersnake has strongly-keeled scales and a divided anal plate. The coloration pattern is extremely variable. The venter has a bold pattern of two irregular rows of half moon-shaped spots that are usually present on a yellowish, cream-colored, or pinkish belly (Mitchell 1994; White and White 2007). The dorsum of the body and tail have a variable number of complete, closely-spaced, dark crossbands anteriorly that break up about mid-body to form a series of rectangular, alternating, middorsal and lateral blotches. Alternating blotches touch each other or are only separated by one scale (Mitchell 1994).

Young

Young northern watersnakes resemble adults, but usually with a bolder color pattern and markings.

Photos, from top:
Adult - Scott Smith
Medial - Mark Tegges
Juvenile - Mark Tegges



Distribution and Habitat
The northern watersnake is extremely common throughout Maryland and can be found in association with all lentic and lotic water body types.

Photos, from top:
Adult - John White
Habitat - Tony Prochaska

Red-bellied Watersnake

Nerodia erythrogaster erythrogaster

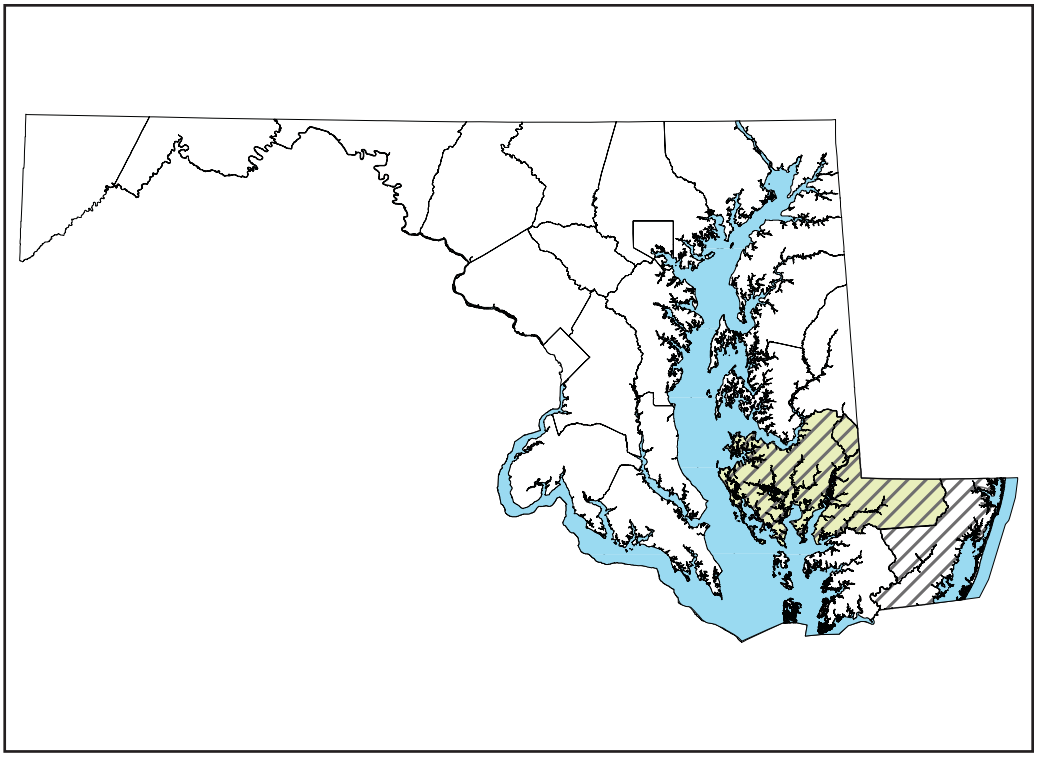
Identification

Like the northern watersnake, the red-bellied watersnake has strongly-keeled scales and a divided anal plate. The dorsal coloration pattern can be somewhat similar to the northern watersnake, but is usually less bold, giving the appearance of a uniform dark coloration. The venter is distinctly red to reddish orange. The lower half of the head is usually orange with a white or yellow patch on the throat (Conant and Collins 1998).

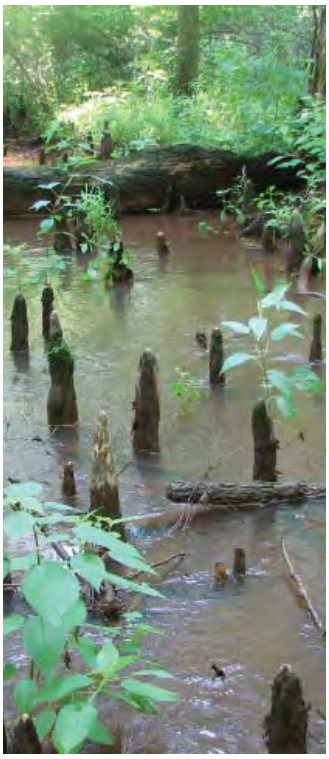
Young

The dorsal pattern on the juvenile red-bellied watersnake is bold-patterned with small lateral blotches on a pinkish ground color. The blotches often form four to six crossbands on the anterior part of the body. The juvenile's belly can be cream, yellow, pinkish, or pale orange (Mitchell 1994; White and White 2007).

Photos, from top:
Detail of Head - Mark Tegges
Adult - Dave Wilson



Distribution and Habitat
The red-bellied watersnake is found on the lower eastern shore of Maryland in Dorchester, Wicomico, and Worchester Counties. It is often associated with cypress and other swampy habitats and can often be seen out of, and sometimes, far from water. It is listed as rare in Maryland by the Maryland Department of Natural Resources, Natural Heritage Division.



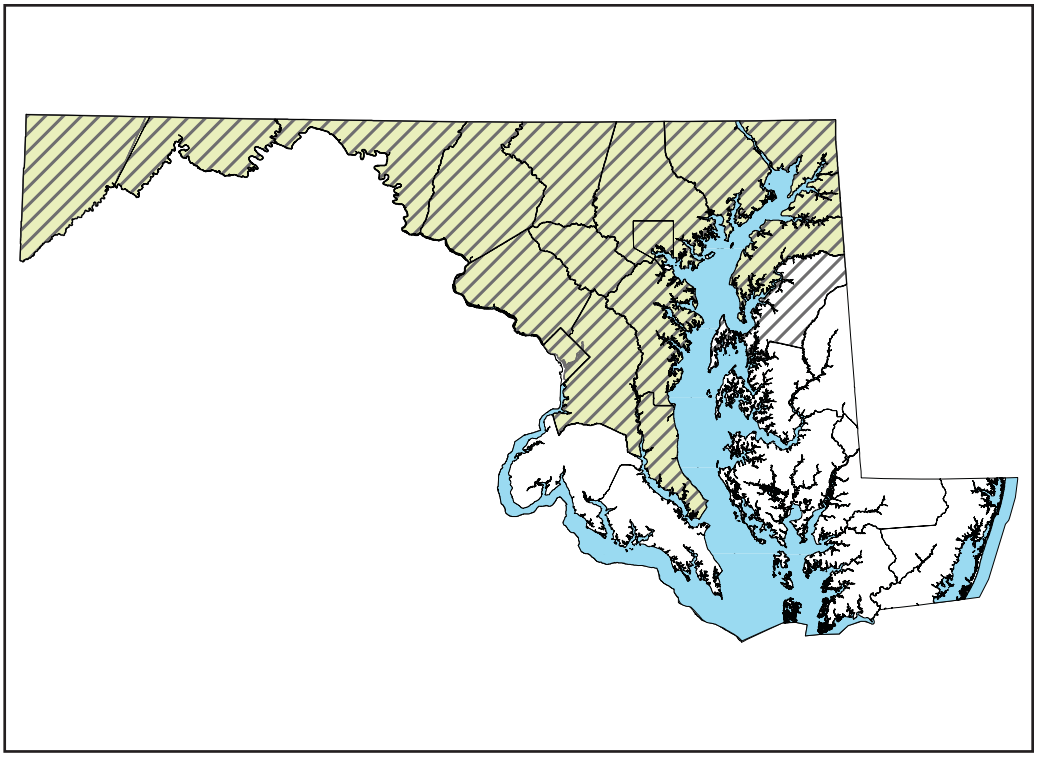
Photos, from left:
Habitat - Rebecca Chalmers
Adult - Mark Tegges

Queen Snake
Regina septemvittata

Identification
The scales of the queen snake are keeled and the anal plate is divided. The color pattern is characterized by a longitudinal yellow stripe along the lower side of the body on the second scale row and upper half of the first. The belly is yellow and boldly-marked with four, distinct brown stripes. Three additional dark stripes run down the back, but are difficult to see except in specimens that have recently shed (White and White 2007).

Young
Young queen snakes are patterned as adults, but with narrower bands, which widen with age (Mitchell 1994).

Photos:
Mark Tegges



Distribution and Habitat
The queen snake is most commonly found in the Piedmont and western Maryland, with a few historical sightings reported from the northern Coastal Plain. It is almost always found in or near water where it feeds primarily on soft-shelled crayfish.

Photos, from left:
Detail - Martin Hurd
Habitat - Jay Kilian

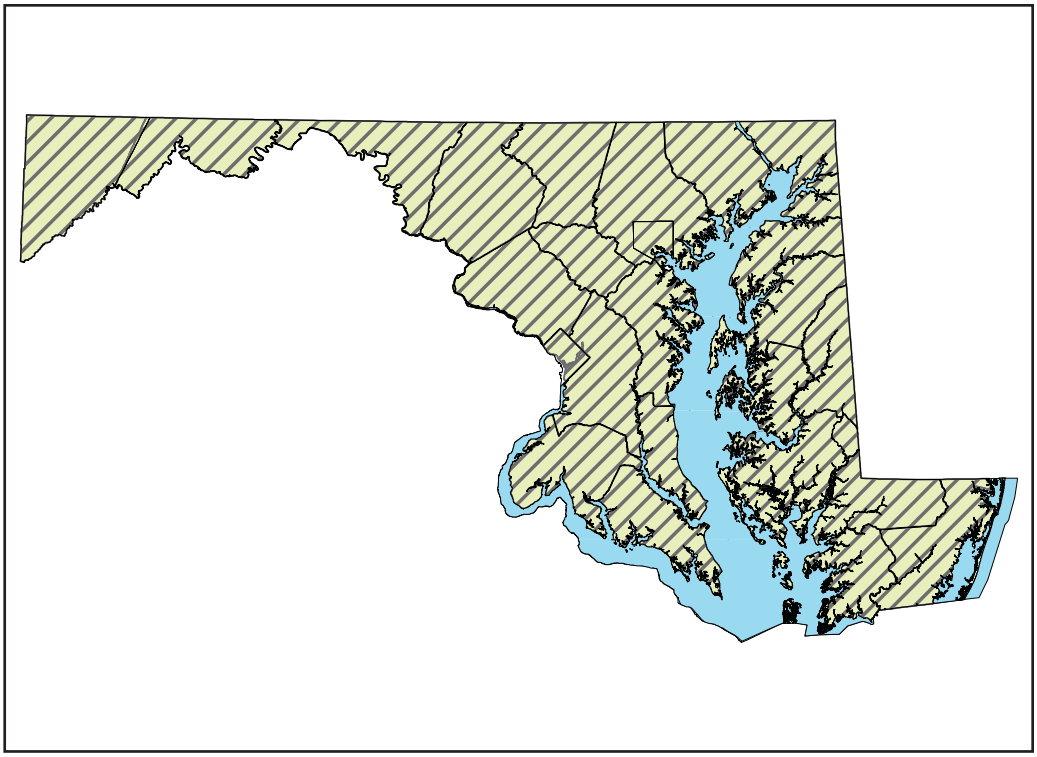
Northern Brownsnake
Storeria dekayi dekayi

Illustration showing the presence of an incomplete cream-colored collar on the juvenile northern brownsnake.

Identification
The northern brownsnake can be distinguished from other small snakes by the presence of two parallel rows of blackish spots down the back, which may be inconspicuous unless the skin is stretched, and dark downward streaks on the side of the head, behind the eye. The overall color of the northern brownsnake may be yellowish, brown, gray, dark brown, or reddish brown. The belly may be pale yellowish, brownish, cream-colored, or pinkish and is virtually unmarked. The dorsal scales are keeled and the anal plate is divided. There are 15 scale rows along the back, which help differentiate this snake from the northern red-bellied snake (17 scale rows).

Young
The young northern brownsnake has a yellow to cream-colored collar around its neck which could appear similar to the collar on the ringneck snake, except that it is almost never complete. The ringneck snake also has smooth scales as opposed to the keeled scales of the northern brownsnake (Conant and Collins 1998).

Photos, from top:
Adult - Scott Smith
Adult - John White
Adult - Matt Sell



Distribution and Habitat
The northern brownsnake can be found throughout Maryland and can be abundant, even in urban areas (Harris 1975).

Photos, from left:
Adult - Mark Tegges
Habitat - Andy Becker

Northern Red-bellied Snake

Storeria occipitomaculata occipitomaculata

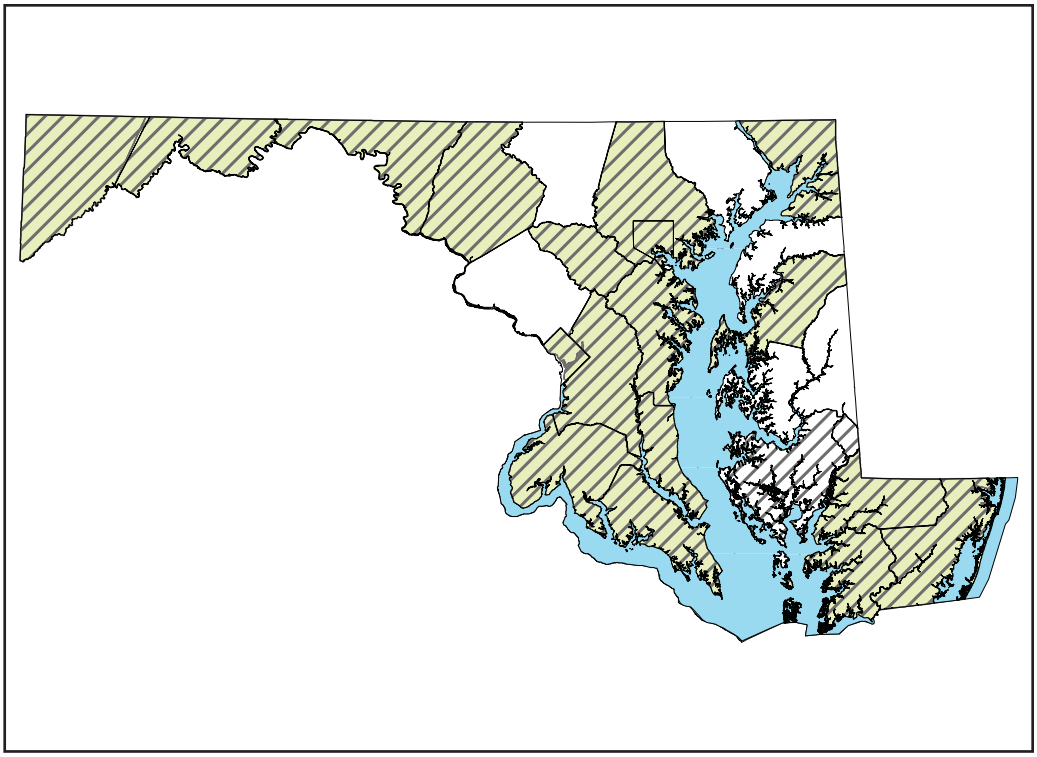
Identification

The northern red-bellied snake usually has a plain red belly, but it may be orange, pale yellow, or even blue-black. It also has two pre-ocular scales, a light spot on the fifth upper labial, and three pale-colored nape spots are usually present. Otherwise the coloration and patterning are highly variable. The dorsal scales are keeled, the anal plate is divided, and there are 17 dorsal scale rows (Mitchell 1994; White and White 2007).

Young

Young northern red-bellied snakes are uniformly black with three cream to yellow spots on the neck (Mitchell 1994).

Photos, from top:
Red Adult - Mark Tegges
Adult - Mark Tegges



Distribution and Habitat

Although it is rare on the Coastal Plain (White and White 2007), the northern red-bellied snake has a spotty statewide distribution (Harris 1975). It is typically found in wooded areas, especially near freshwater wetlands, where there is abundant cover (rocks and logs).

Photos, from left:
Adult with Black Venter - Mark Tegges
Habitat - Jay Kilian

Eastern Smooth Earthsnake

Virginia valeriae valeriae

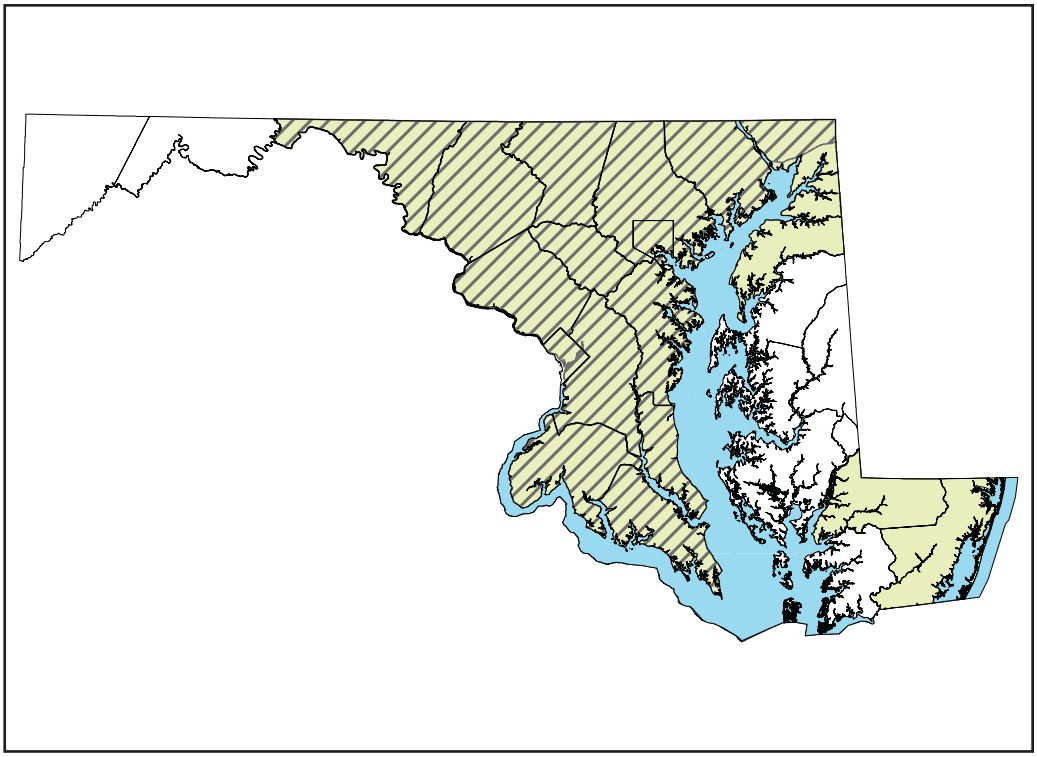
Identification

The eastern smooth earthsnake has a uniformly dark gray or brownish dorsum. Tiny dark spots are often present on the back. The underside of the head, body, and tail are plain white, grayish, or yellowish (White and White 2007). The scales are smooth except for faint keels on the back above the cloacal region. Like the northern brown snake, the eastern smooth earthsnake has 15 dorsal scale rows at mid-body (White and White 2007).

Young

Young eastern smooth earthsnakes resemble adults. There is no light-colored collar behind the head as in the northern brownsnake. A dark line in front of the eye is usually present (Mitchell 1994).

Photos, from top:
Adult - Jay Kilian
Juvenile - Mark Tegges
Adult - Corey Wickliffe



Distribution and Habitat
The eastern smooth earth snake has been found primarily in the Piedmont and Coastal Plain physiographic provinces (Harris 1975). It is usually found in forested areas with sandy soils where it can burrow (White and White 2007).

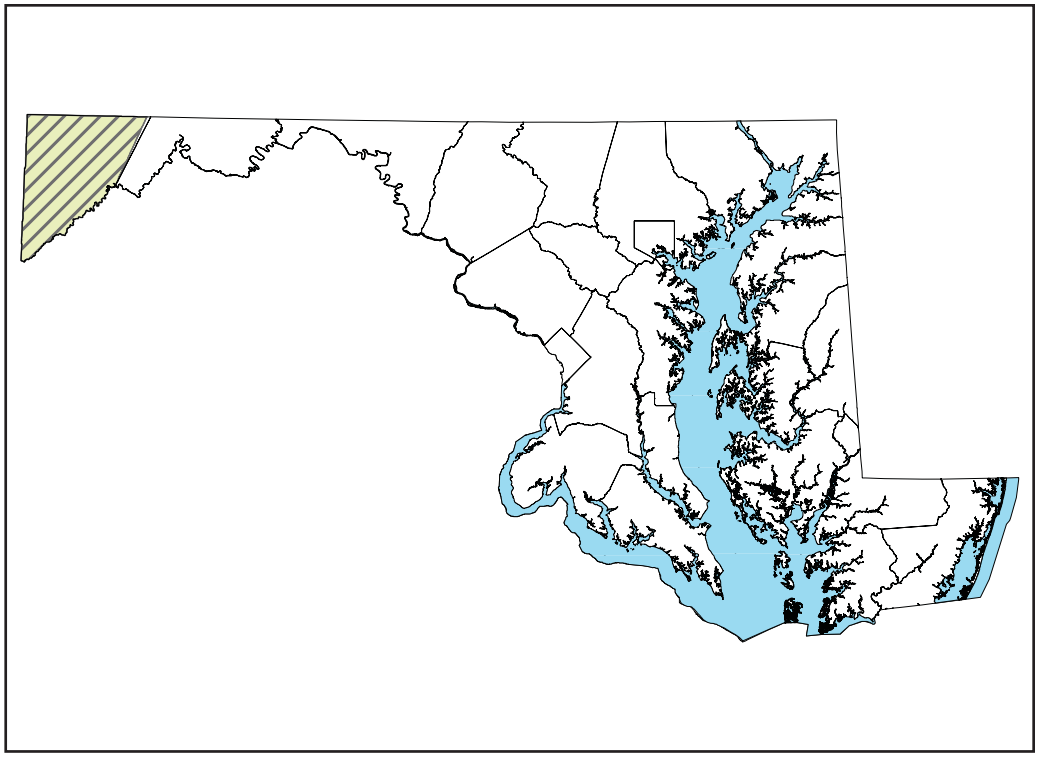
Photos, from left:
Habitat - Tony Prochaska
Adult - Scott Smith

Mountain Earthsnake
Virginia valeriae pulchra

Identification
The mountain earthsnake is a small snake (adults typically less than 390 cm long) with a head that is not distinct from the body. The dorsal coloration and pattern vary substantially, but usually is reddish-brown, brown, or gray and often has a series of small black dots in two parallel rows down the back. The venter is typically white or pale yellow and sometimes has pink around the edges. Unlike the eastern smooth earthsnake, the mountain earthsnake has weakly keeled scales. It is also differentiated from the smooth earthsnake by having 17 rows of scales at the mid-body to the end of the tail and 15 rows in the anterior portion of the body (Hulse et al. 2001; Mitchell 1994).

Young
Young mountain earthsnakes resemble adults.

Photos, from top:
Adult - Mark Tegges
Adult - Don Forester



Photos from top:
Habitat - Matt Sell
Adult - Mark Tegges

Distribution and Habitat

The mountain earthsnake seems to prefer wooded areas particularly near wetlands and in sandy substrates. It is listed as endangered by the Maryland Department of Natural Resources, Natural Heritage Division and is found only in western Garrett County.

Eastern Wormsnake

Carphophis amoenus amoenus

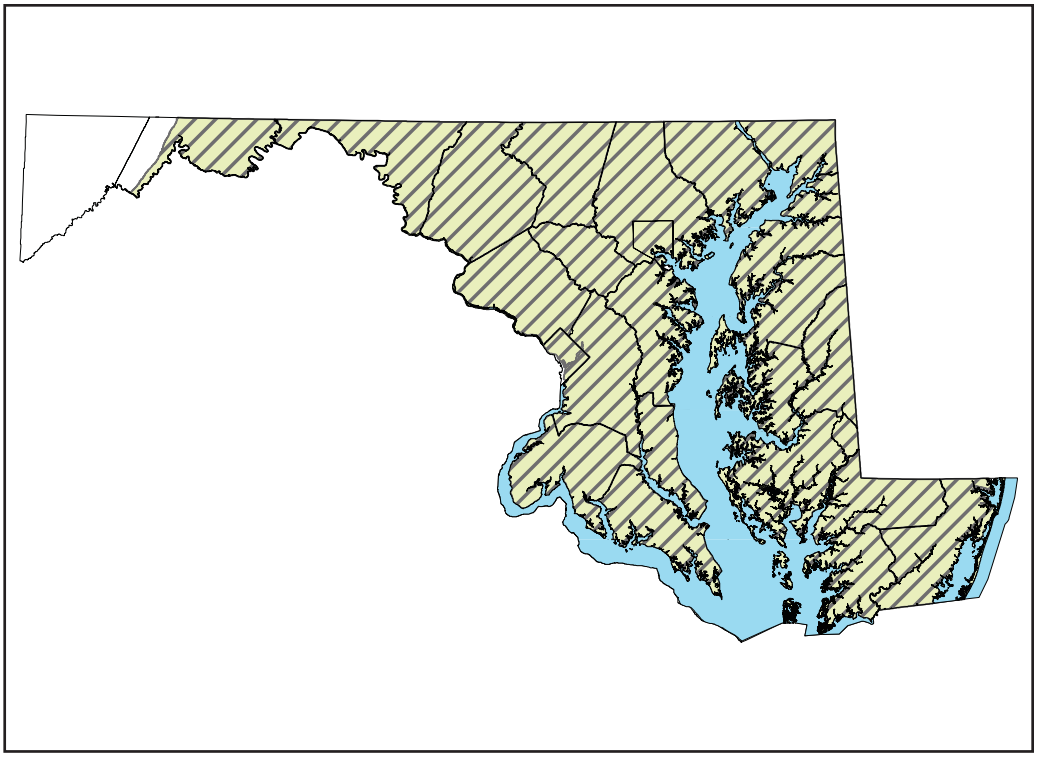
Identification

The eastern wormsnake has smooth, iridescent scales and a head that is small, pointed and not distinct from the neck. The tail is short and ends in a short spine. (White and White 2007). It has 13 dorsal scale rows at mid-body and the anal plate in divided. The dorsum tends to be brownish while the venter is typically pink (Mitchell 1994).

Young

Young eastern wormsnakes are patterned as adults, but with a darker brown dorsum and pinker venter (Mitchell 1994).

Photos, from top:
Adult - Corey Wickliffe



Distribution and Habitat
The eastern wormsnake is found statewide with the exception of far western Maryland (Harris 1975). They are found in forested or field habitats where the soil is suitable for burrowing (Mitchell 1994).

Photos from top:
Adult - Mark Tegges
Habitat - Rebecca Chalmers

Northern Ring-necked Snake
Diadophis punctatus edwardsii

and

Southern Ring-necked Snake
Diadophis punctatus punctatus

Photos, from top:
Adult - Corey Wickliffe
Ventral - Corey Wickliffe

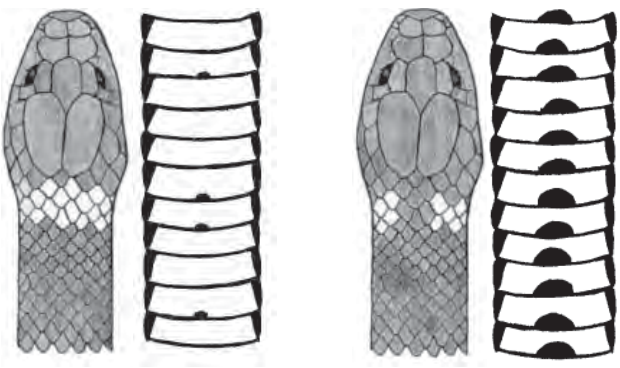
Identification
The northern and southern ring-necked snakes are characterized by having smooth scales, a divided anal plate, and a golden collar around the neck. The dorsal coloration may be bluish, blackish, gray, slate, or brownish. The venter is typically yellow (Mitchell 1994). The northern ring-necked snake has a uniform yellow venter with a row or partial row of small black dots down the center and a continuous collar around the neck. The southern ring-necked snake has large half moon-shaped spots in the center of the venter and the neck ring is normally interrupted by dark pigment. The southern ring-necked snake also has small black spots on the chin and lower lips, while the northern ring-necked snake typically lacks these spots (Mitchell 1994). Ring-necked snakes found on the eastern shore may show combinations of characteristics, as this is considered a zone of integration (Harris 1975; Conant and Collins 1998).

Young
Young ring-necked snakes resemble adults except that the venter is usually white (Mitchell 1994).

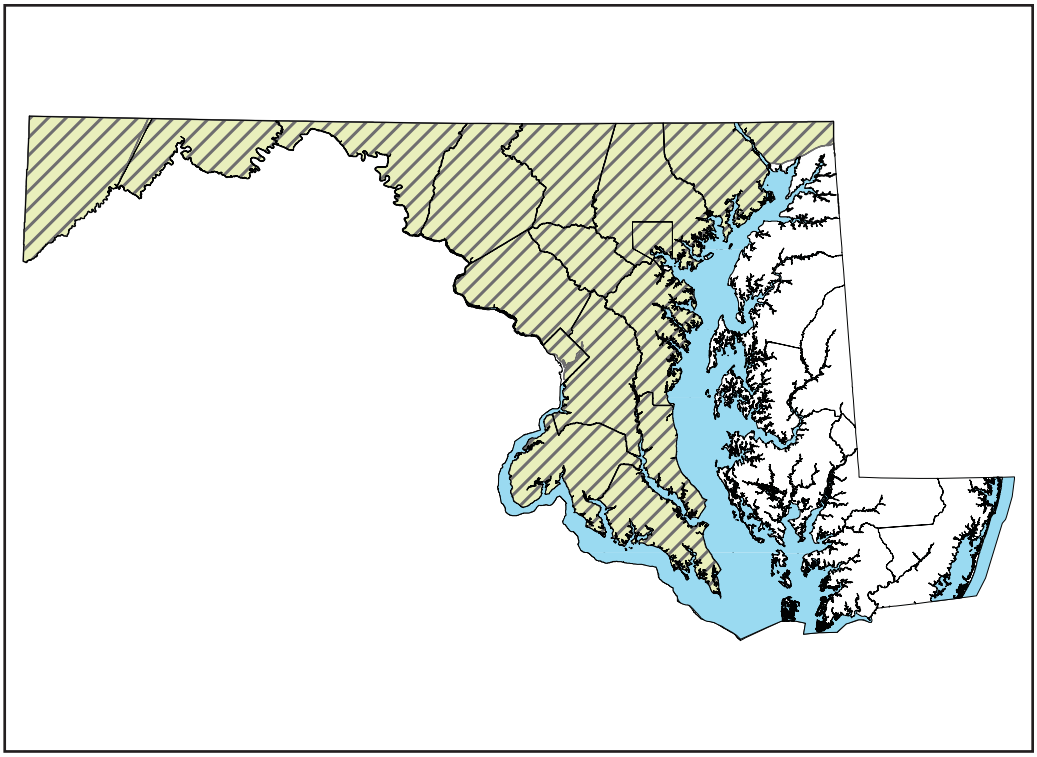
Distribution and Habitat
Ring-necked snake specimens from most of the eastern shore typically display characteristics of both northern and southern ring-necked snakes and are considered to be intergrades between the two subspecies (*Diadophis p. punctatus/edwardsii*). The northern ring-necked snake is found in Cecil County, and all of Maryland, west of the Susquehanna River (Harris 1975). Ring-necked snakes are found in wooded areas under rocks and logs and are seldom found out in the open (Mitchell 1994).

Northern Ring-necked Snake - Neck ring continous; belly with a row or partial row of small black dots.

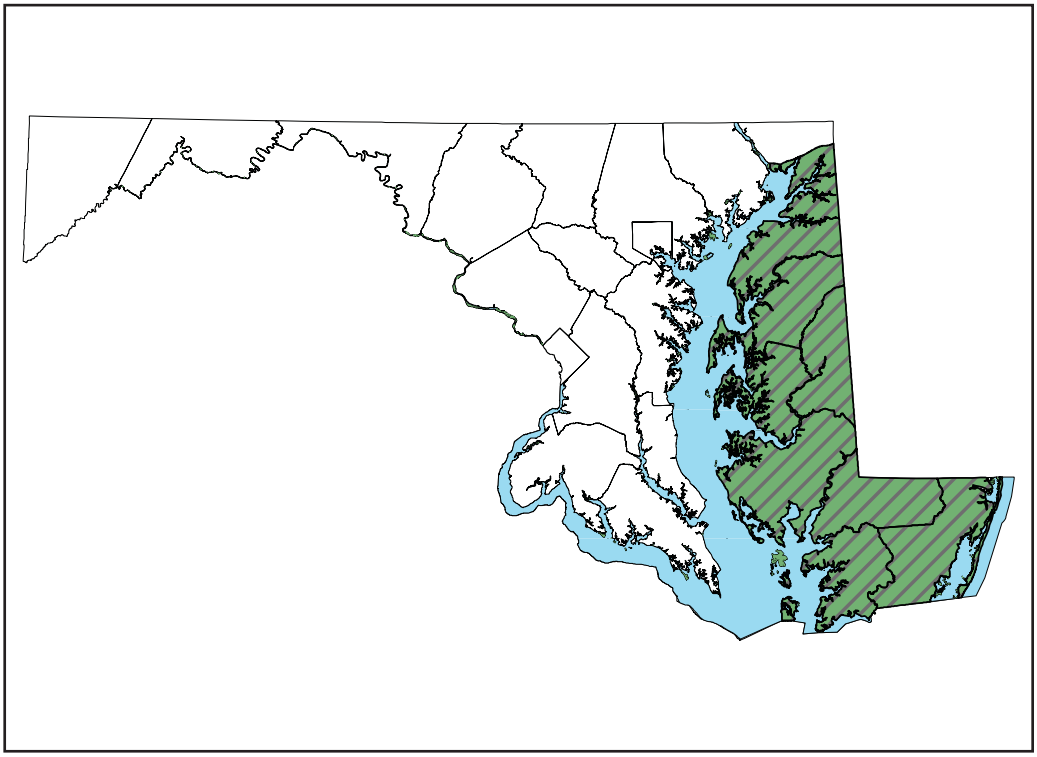
Southern Ring-necked Snake - Belly with large half moon shaped spots.



Distribution Map for Northern Ring-necked Snake
Diadophis punctuatus edwardsii



Distribution Map for Intergrade and Southern Ring-necked Snake
Diadophis punctuatus punctuatus x edwardsii



Photos, from left:
Ventral - Corey Wickliffe
Adult - Mark Tegges

Common Ribbonsnake

Thamnophis sauritus sauritus

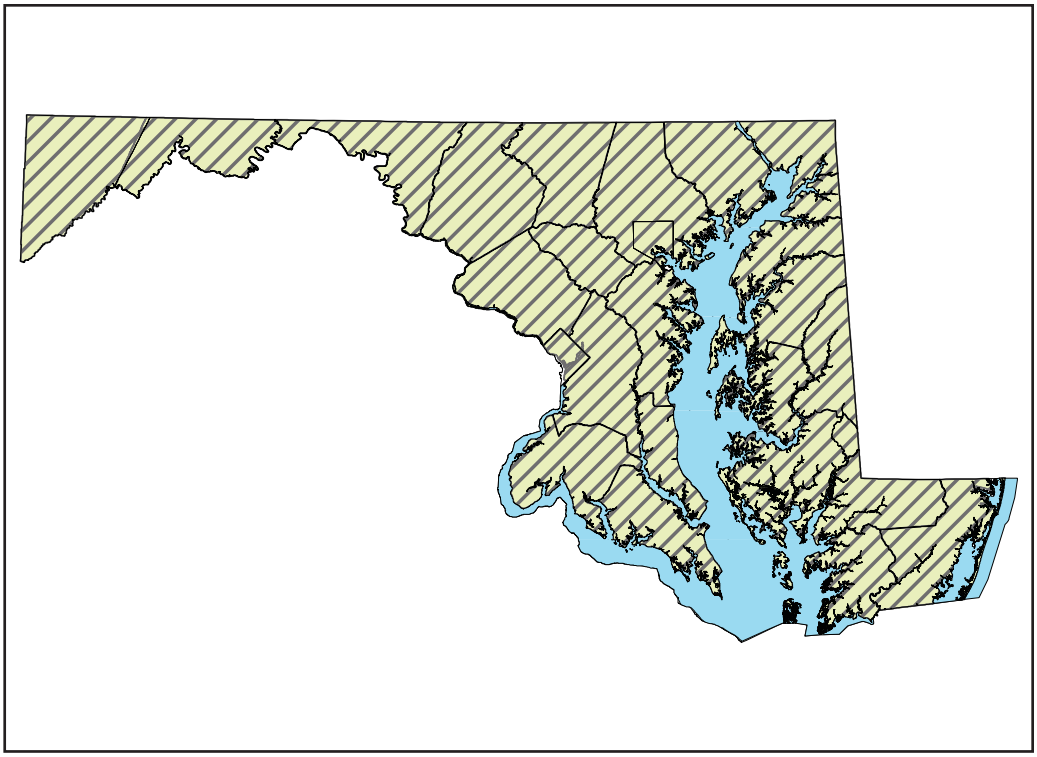
Identification

The common ribbonsnake has three bold cream, yellow, or greenish longitudinal stripes (located on the third and fourth scale rows) that extend from the back of the head to near the tip of the tail. The tail is long (about one third the total length of the snake) and there is a yellowish spot in front of each eye.

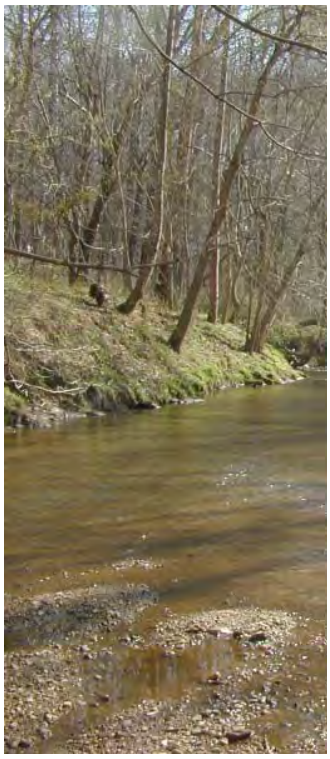
Young

Young common ribbonsnakes are patterned as adults, but the dorsal ground color is more brownish than black. The color darkens with age.

Photos, from top:
Adult - Keith Johnson
Adult - Scott Smith
Detail of Head - Corey Wickliffe
Adult - Mark Tegges



Distribution and Habitat
The common ribbonsnake is found statewide, but is uncommon in western Maryland (Harris 1975). Ribbon snakes are semi-aquatic and are usually found in close association with any water body type (Mitchell 1994).



Photos, from left:
Adult - Corey Wickliffe
Habitat - Tony Prochaska

Eastern Gartersnake

Thamnophis sirtalis sirtalis

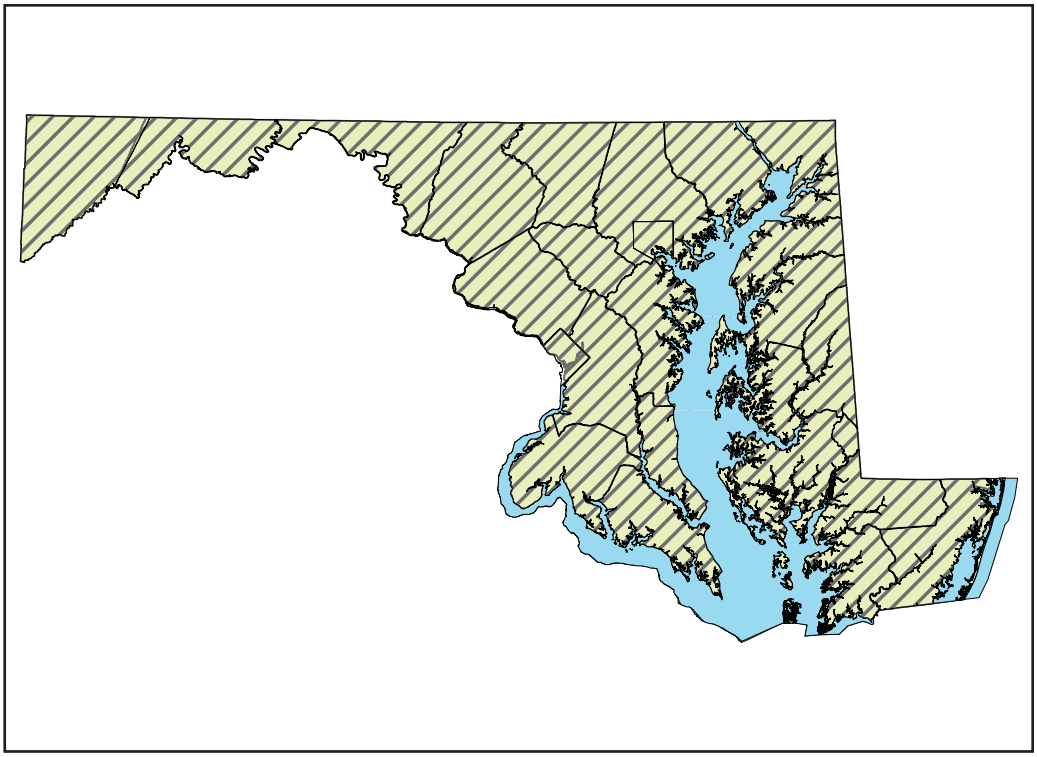
Identification

The dorsal color pattern and coloration of the eastern gartersnake is highly variable. Typically there is a bold mid-dorsal stripe, with less prominent pale lateral stripes on the second and third scale rows. There are usually two rows of alternating dark spots between the stripes, which form a checkered pattern (Conant and Collins 1998). The stripes may be very obscure on some specimens. Unlike the ribbon snake, the tail is less than one third the total length of the snake.

Young

Young eastern gartersnakes are patterned as adults, but are brown dorsally with cream venters. They usually have a checkerboard pattern of squarish black or dark brown and green blotches on the dorsum (Mitchell 1994).

Photos, from top:
Adult - Corey Wickliffe
Adult - Mark Tegges
Adult - Mark Tegges

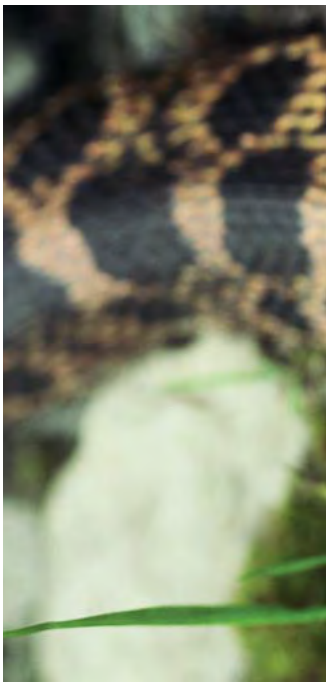


Distribution and Habitat
The eastern gartersnake is found throughout Maryland. It can be found in just about any type of habitat from forests and agricultural fields to suburban areas.

Photos from left:
Habitat - Rebecca Chalmers
Adult - Corey Wickliffe

Eastern Hog-nosed Snake

Heterodon platirhinos



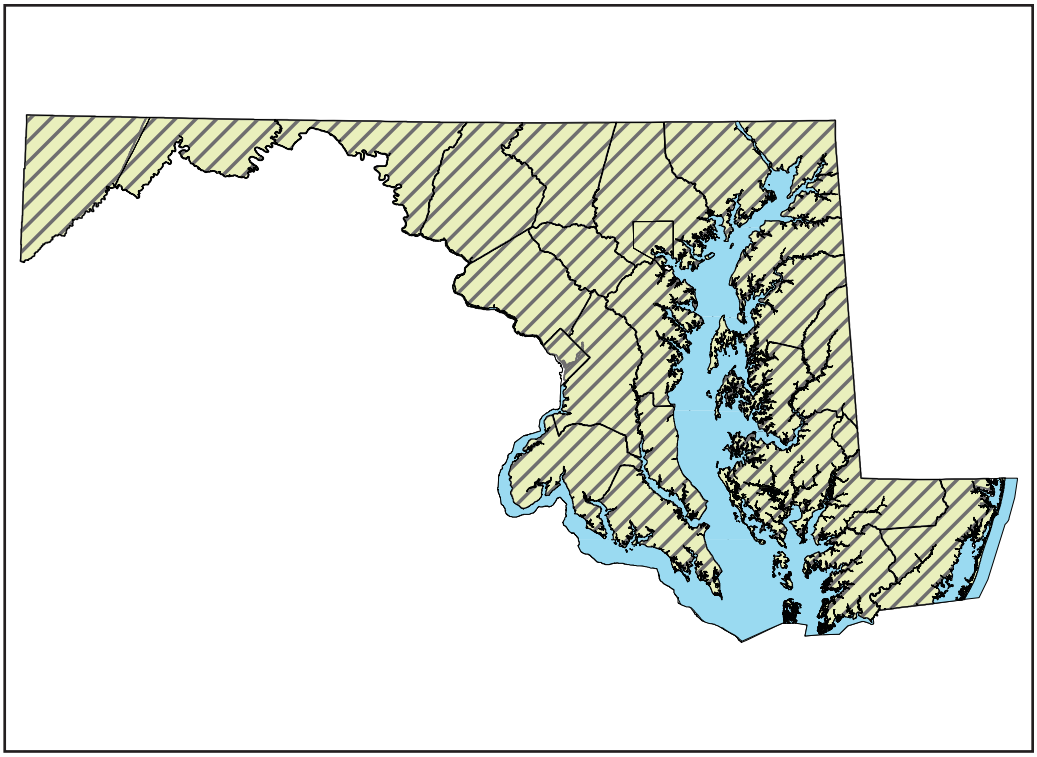
Identification

The eastern hog-nosed snake is easily distinguished from any other Maryland snakes by its distinctly upturned snout. The dorsal color pattern is highly variable and ranges from solid black to boldly-patterned with dark brown or black blotches. The ground color can include varying combinations of gray, tan, pink, yellow, and red. The scales are keeled and the anal plate is divided (Mitchell 1994). The eastern hog-nosed snake may be more easily identified by its behavior than its appearance, as it will often hiss loudly and flatten out its neck when approached, and will sometimes turn over onto its back to feign death. It may even resort to regurgitating its last meal to dissuade would be attackers (White and White 2007).

Young

Young eastern hog-nosed snakes resemble adults.

Photos, top to bottom, left to right:
Hatchling - Mark Tegges
Detail - Mark Tegges
Playing Dead - Corey Wickliffe
Playing Dead - Mark Tegges
Adult - Mark Tegges



Distribution and Habitat
Eastern hog-nosed snakes are distributed throughout Maryland, but are less common in western Maryland and are most abundant on the Coastal Plain (Harris 1975). Eastern hog-nosed snakes are typically found in sandy habitat in forests, fields, or dunes (White and White 2007).

Photos, from left:
Habitat - Rebecca Chalmers
Adult - Corey Wickliffe

Northern Rough Greensnake

Opheodrys aestivus aestivus

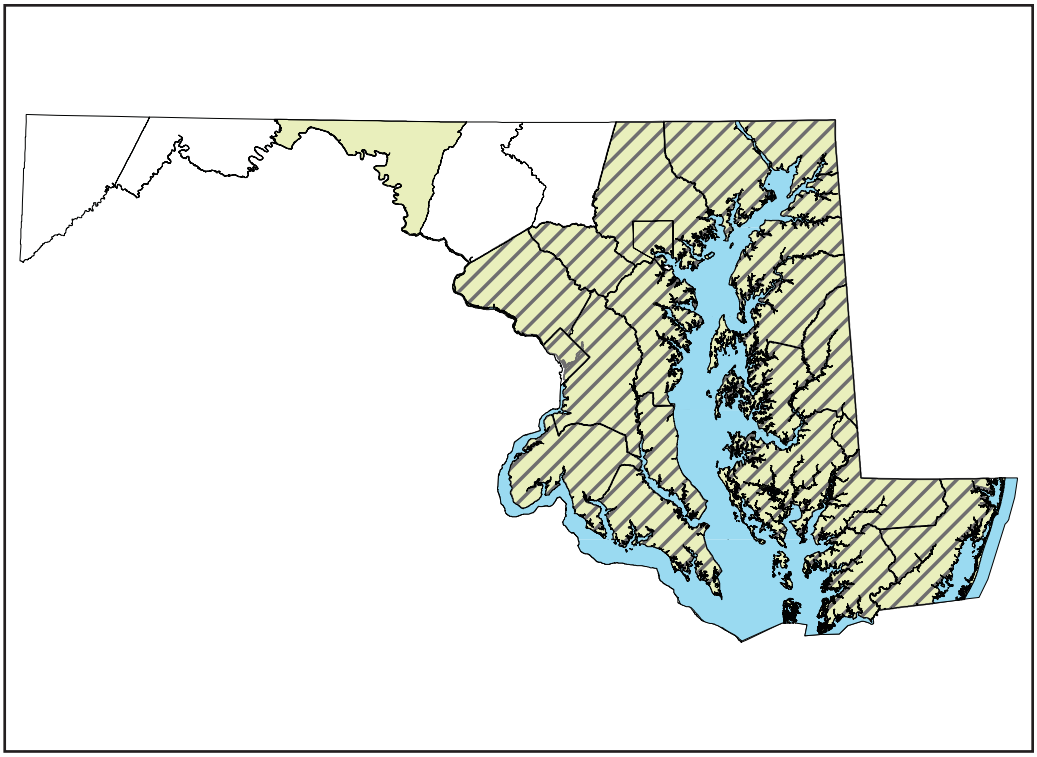
Identification

The northern rough greensnake is a slender snake that is green on the dorsal side and white, yellow, or pale green on the ventral side (White and White 2007). The dorsal scales are keeled, giving it a rough appearance compared to the smooth greensnake. The color of dead specimens rapidly fades to blue (Conant and Collins 1998; White and White 2007).

Young

Young northern rough greensnakes resemble adults.

Photos, top to bottom, left to right:
Adult - Mark Tegges
Adult - Linh Phu
Detail - John White



Distribution and Habitat

The northern rough greensnake is primarily a Coastal Plain species in Maryland, although it has been known to utilize lowland river valleys west of the Fall Line (Harris 1975). They are arboreal and can be found in forests and fields where trees or shrubs are available for climbing (Mitchell 1994).

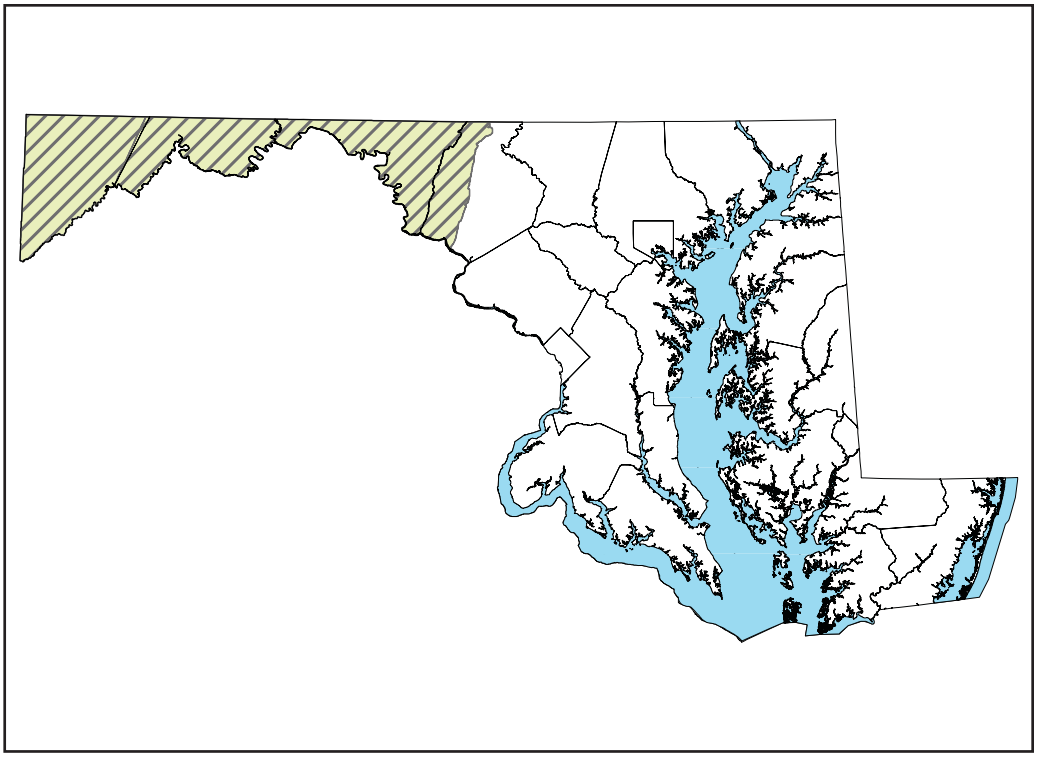
Photo:
Habitat - Rebecca Chalmers

Smooth Greensnake
Opheodrys vernalis

Identification
Like the northern rough greensnake, the smooth greensnake is a slender snake that is green on the dorsal side and white, yellow, or pale green on the ventral side. As the name implies, the dorsal scales are smooth and lack keels. The color of dead specimens rapidly fades to blue (Conant and Collins 1998; White and White 2007).

Young
Young smooth greensnakes resemble adults.

Photos, from top:
Adult - Mark Tegges
Adult - Scott Stranko
Adult - John White



Distribution and Habitat

The smooth greensnake can be found primarily in western Maryland eastward to the western edge of the Piedmont (Harris 1975). Smooth greensnake habitat most likely consists of fields and other open areas, usually at relatively high elevation (Mitchell 1994).

Photos, from left:
Adult - Matt Sell
Habitat - Rebecca Chalmers

Northern Black Racer

Coluber constrictor constrictor

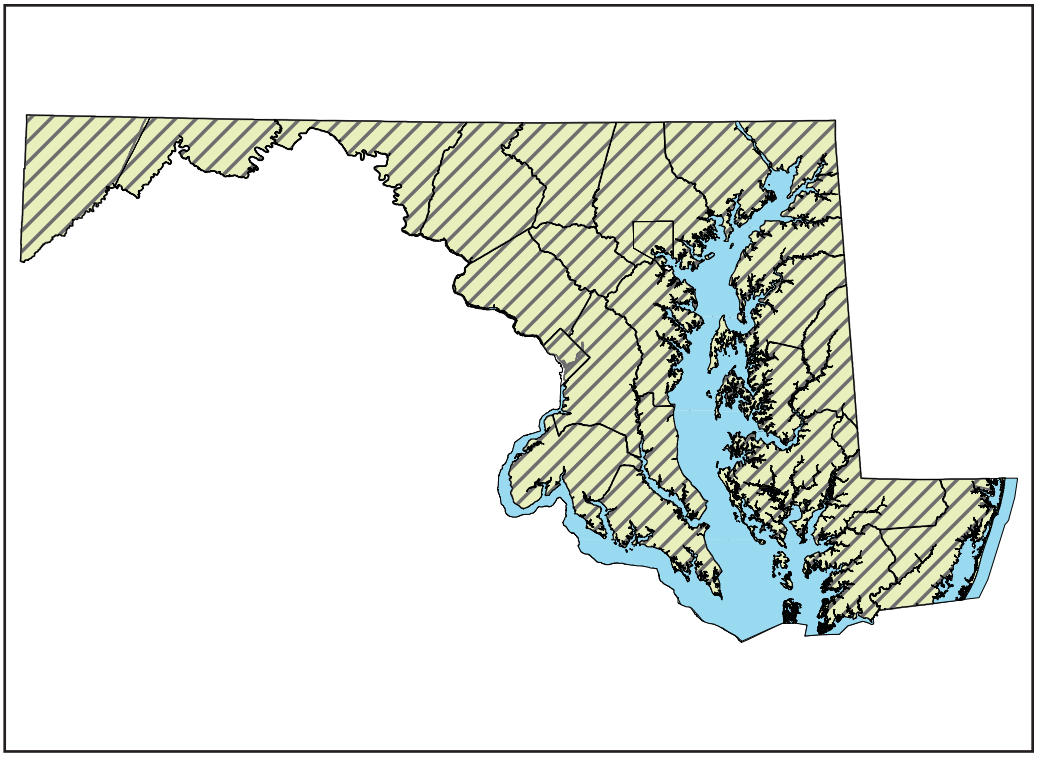
Identification

The northern black racer is plain black above and black or dark gray below (Conant and Collins 1998). At least part of the chin usually white (White and White 2007), and the body is round in cross section. The scales are smooth and the anal plate is divided.

Young

The young northern black racer is strongly-patterned with a mid-dorsal row of dark gray, brown, or reddish brown blotches on a ground color of gray or bluish gray. There also tend to be small dark spots on the flanks and venter (White and White 2007). Unlike the eastern ratsnake, there is no dorsal patterning on the posterior half of the tail.

Photos, from top:
Ventral - Corey Wickliffe
Adult - Mark Tegges
Adult - Corey Wickliffe



Distribution and Habitat
The northern black racer can be found statewide (Harris 1975). It can be found in dry habitats of any type from open woods, fields, and developed areas (Mitchell 1994).

Photos, clockwise from left:
Juvenile - Mark Tegges
Habitat - Rebecca Chalmers
Adult - Corey Wickliffe

Eastern Ratsnake
Pantherophis alleghaniensis

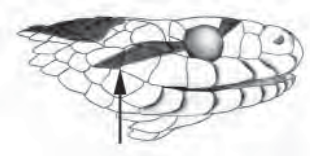
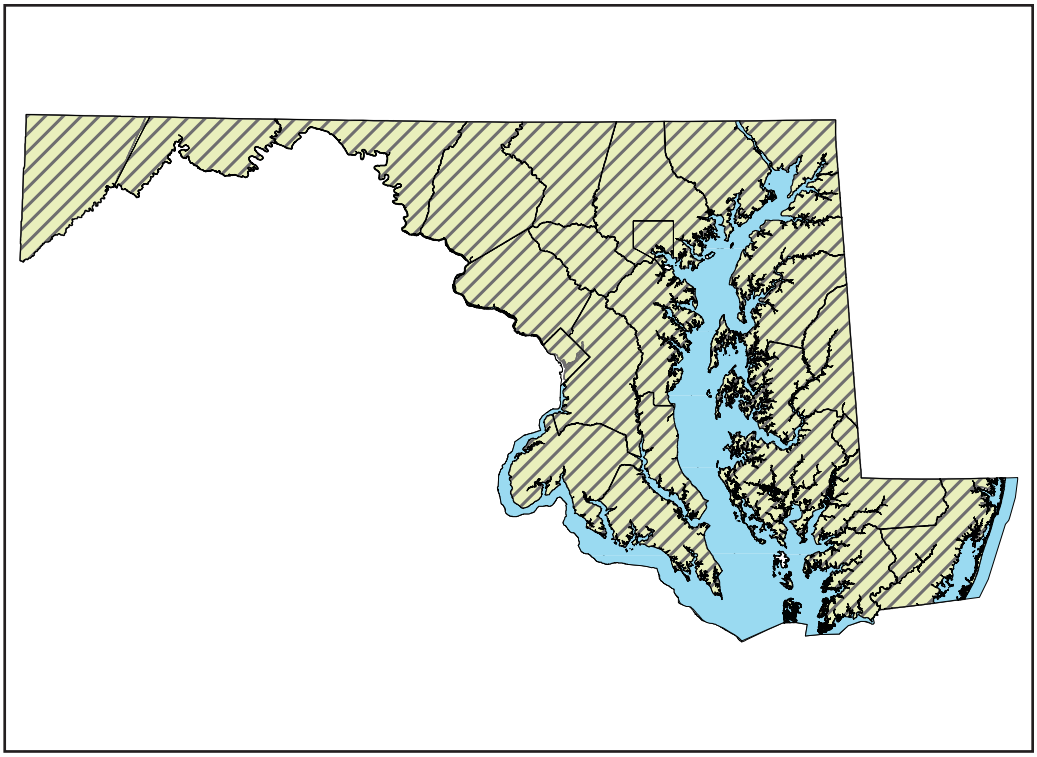


Illustration showing how the Juvenile Eastern Ratsnake has a post ocular stripe that stops at the mouth and is entirely dark.

Identification
Eastern ratsnake adults are black, sometimes with a faint trace of a spotting pattern, especially when the skin is distended. There is usually a hint of a checkerboard pattern somewhere on the venter. Unlike most snakes, the body is in the shape of a bread loaf or mailbox, and the underside of the head and neck is white. The scales are weakly keeled and the anal plate is divided (Conant and Collins 1998).

Young
Young eastern ratsnakes are sometimes difficult to distinguish from milksnakes, young northern black racers, and red cornsnakes. Eastern ratsnakes have a post-ocular stripe that stops at the mouth and patterning occurs that continues onto the posterior half of the tail (Mitchell 1994).

Photos, top to bottom, left to right:
Adult - Mark Tegges
Adult - John White
Adult - Jay Kilian
Juvenile - Mark Tegges



Distribution and Habitat
The eastern ratsnake is one of the most common and widespread snakes in Maryland. They are found in nearly every type of habitat from forests, agriculture, and urban areas.

Photos from top:
Habitat - Rebecca Chalmers
Juvenile - Luke Roberson

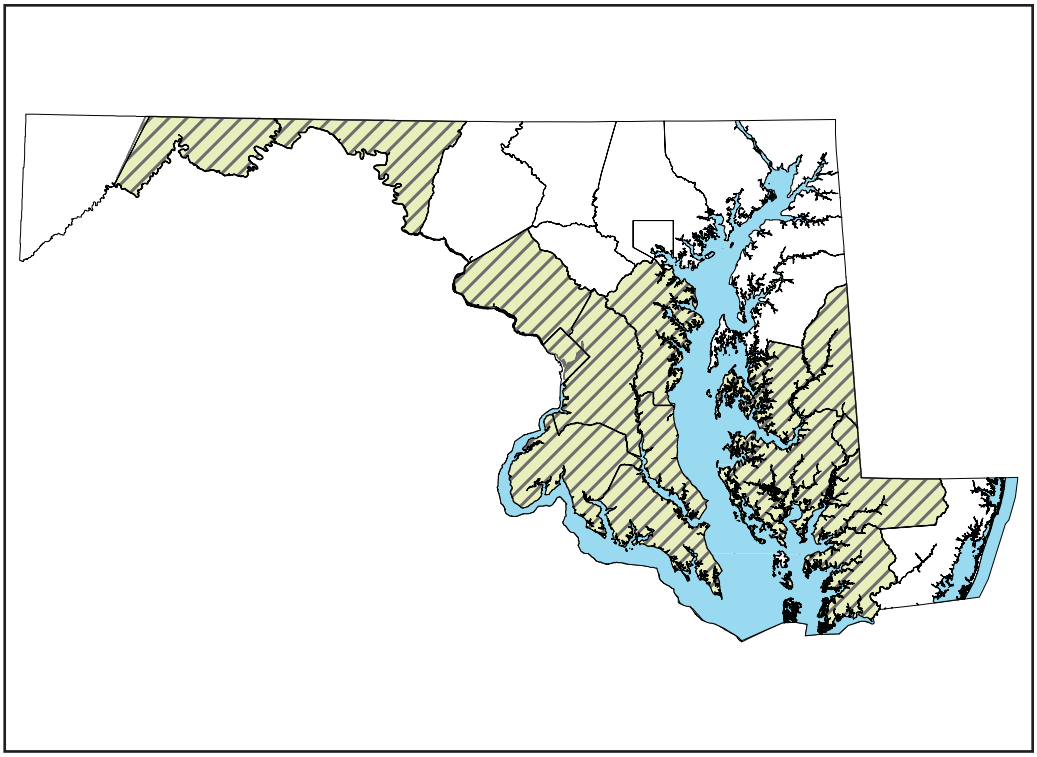
Red Cornsnake
Pantherophis guttatus

Illustration showing how the Red Cornsnake's dorsum patterning is divided into two branches that extend forward and meet in a spear point between the eyes.

Identification
Like the eastern ratsnake, the red cornsnake has a divided anal plate, weakly keeled scales (keels may be difficult to see without magnification), and the body has a mailbox or bread loaf shape (White and White 2007). The venter has a black and white checkered pattern. The dorsal background color is gray, brown, or orangish brown with irregularly shaped oval to rectangular red to reddish brown blotches that are usually bordered with black on the dorsal surface. Smaller more irregular blotches are on the sides. The first dorsal blotch is divided (Mitchell 1994; Conant and Collins 1998). Unlike the eastern ratsnake, the red cornsnake has a post ocular stripe that extends below the mouth and longitudinal stripes usually occur on the under side of the tail behind the vent (Conant and Collins 1998).

Young
Young red cornsnakes are patterned and colored the same as adults.

Photos, top to bottom, left to right:
Adult - Mark Tegges
Detail of Head - Luke Roberson
Adult - Mark Tegges



Distribution and Habitat

The red cornsnake is primarily found on the Coastal Plain of Maryland (Harris 1975). However, the Ridge and Valley region of the state is the northern limit of its geographic range. They are almost always found in close association with open forests, but can be found in fields and occasionally urban areas (Mitchell 1994).

Photos, clockwise from left:
Habitat - Rebecca Chalmers
Adult - Mark Tegges
Adult - Mark Tegges

Eastern Milksnake

Lampropeltis triangulum triangulum

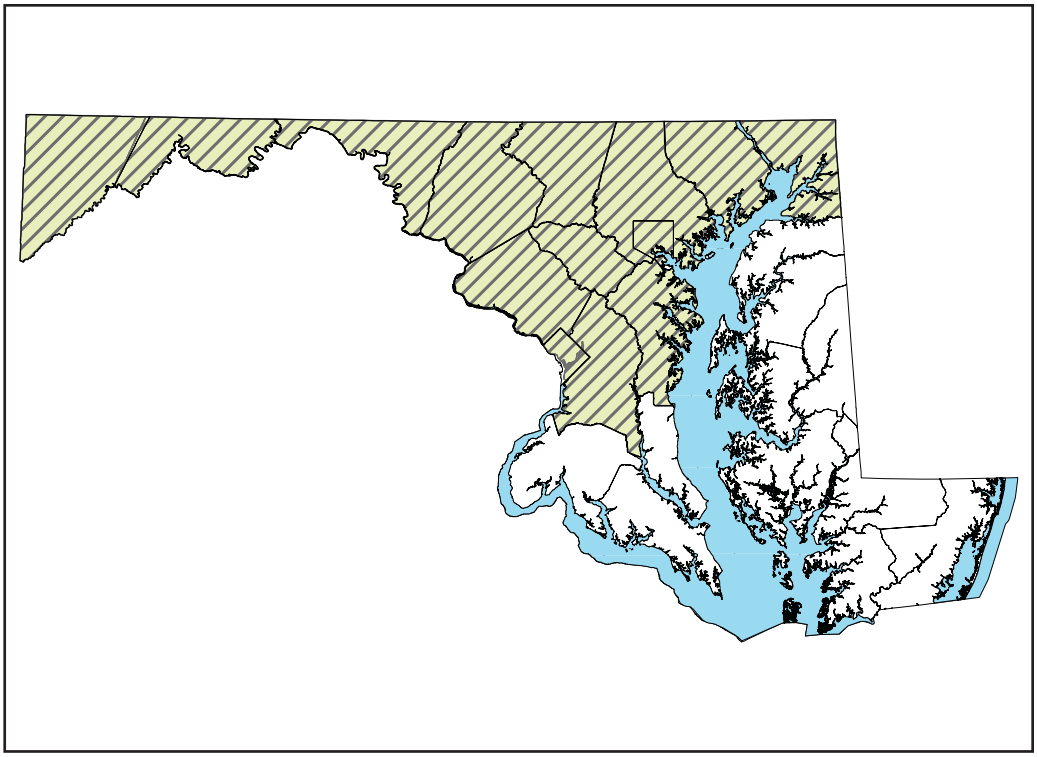
Identification

The eastern milksnake tends to be strongly-blotched, with 32 or more blotches on the body. There is an A, Y, U, or V-shaped light patch on the nape and three or five rows of reddish brown, black-bordered blotches down the body. The scales of the eastern milksnake are smooth and the anal plate is undivided (Mitchell 1994, Conant and Collins 1998, White and White 2007).

Young

Young eastern milksnakes are patterned and colored the same as adults.

Photos, from top:
Adult - Mark Tegges
Adult - Luke Roberson
Adult - Luke Roberson
Adult - John White



Distribution and Habitat

The eastern milksnake is found from the Fall Line through western Maryland (Harris 1975), and can be found in a variety of habitats including under logs, stones, and other substrates. They are also found frequently around barns and old buildings, where mice are common (Mitchell 1994).

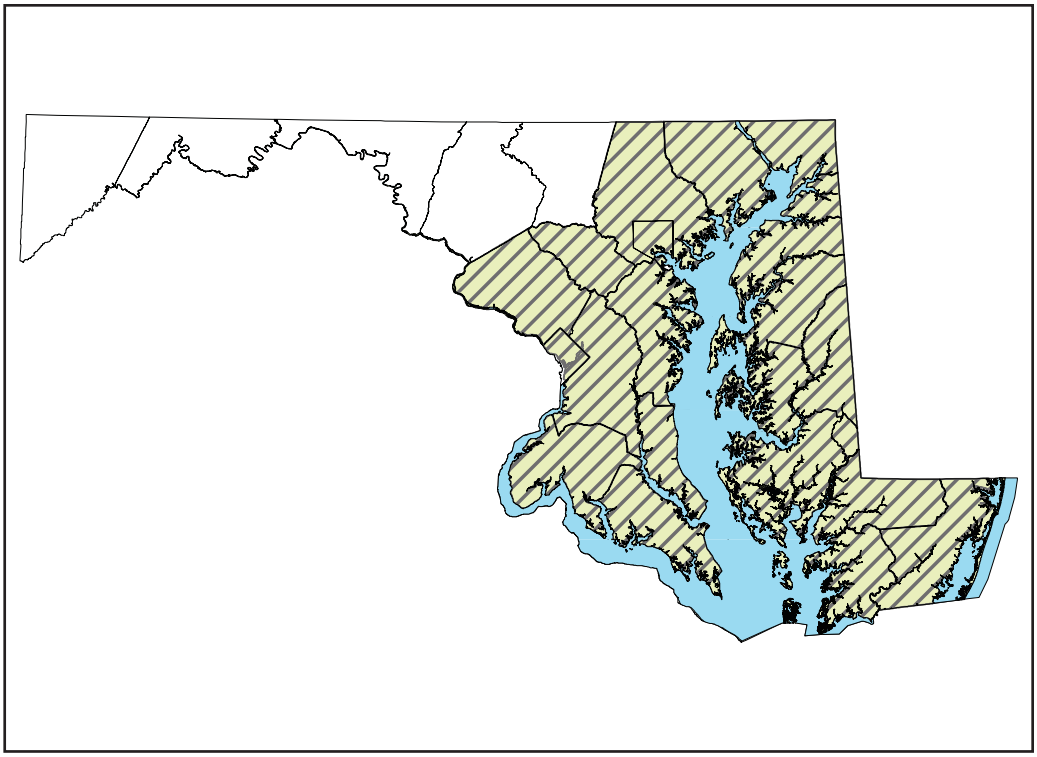
Photo, from left:
Detail - John White
Habitat - Rebecca Chalmers

Eastern Kingsnake
Lampropeltis getula getula

Identification
The eastern kingsnake is black with white or cream-colored crossbands that fork on the sides just above the belly and connect to form a chain-like pattern. The belly, chin and throat are irregularly checkered with black and white or yellow. The scales are smooth and the anal plate is undivided (Mitchell 1994; White and White 2007).

Young
Young eastern kingsnakes resemble adults.

Photos, from top:
Adult - Corey Wickliffe
Ventral - Corey Wickliffe
Adult - John White



Distribution and Habitat

The eastern kingsnake is primarlily a Coastal Plain species that encroaches onto the Piedmont using river valleys (Harris 1975). Individuals are associated with a variety of different types of habitats and are usually found under cover such as rocks, logs, and, many times, under human debris (Mitchell 1994).

Photos, from top:
Adult - Corey Wickliffe
Habitat - Rebecca Chalmers
Adult - Mark Tegges

Mole Kingsnake

Lampropeltis calligaster rhombomaculata

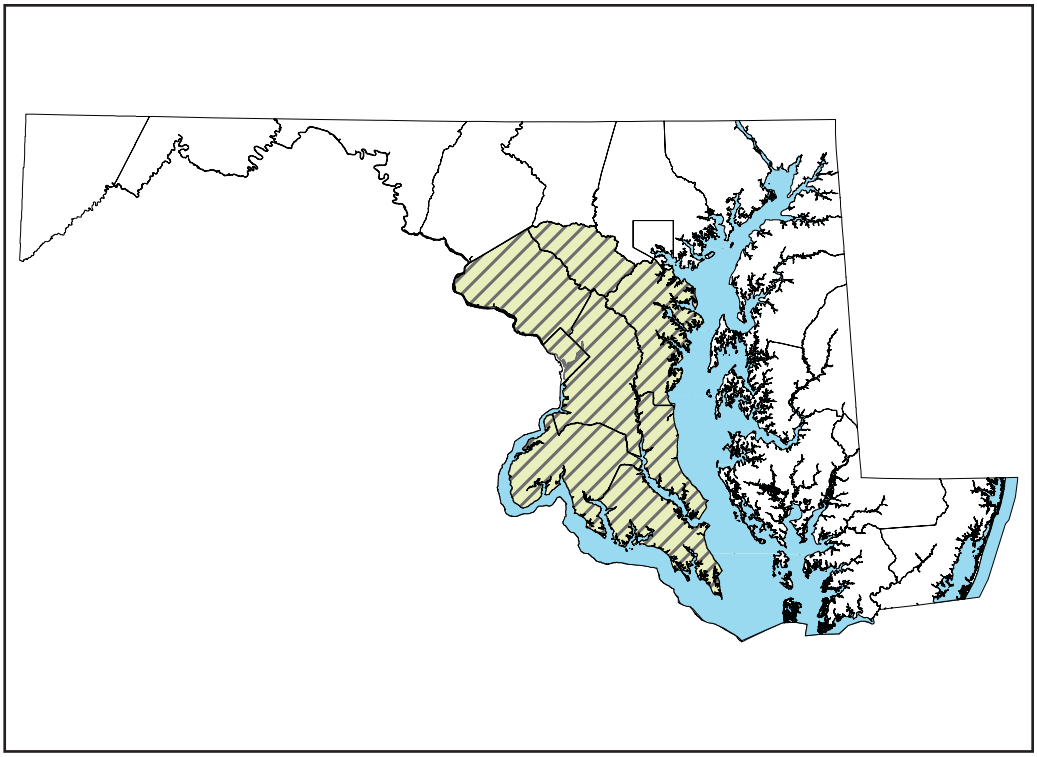
Identification

The mole kingsnake usually has up to 71 well-separated reddish brown, dark-edged spots down the back, although some specimens may have no spots at all. The ground color is light to dark brown, sometimes with a greenish tinge, but changing to a more yellowish hue on the sides of the body. Mole kingsnakes have small heads that are not distinct from the neck. The scales are smooth and the anal plate is undivided (Mitchell 1994; Conant and Collins 1998).

Young

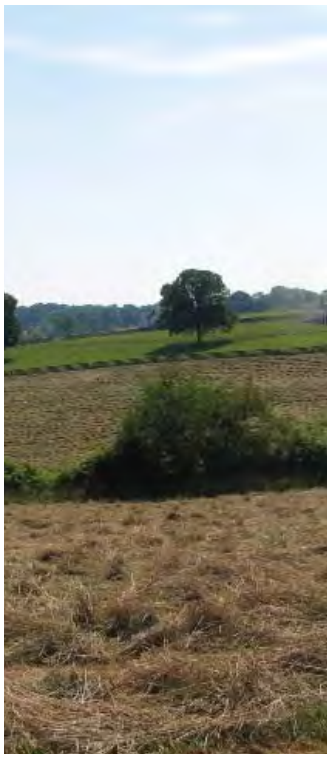
Young mole kingsnakes are boldly-patterned with well-separated spots that are bordered by black. A checkerboard pattern is evident on a cream to yellowish venter and two longitudinal stripes are present on the back of the head (Mitchell 1994; Conant and Collins 1998).

Photos, from top:
Adult - Mark Tegges
Adult - John White



Distribution and Habitat

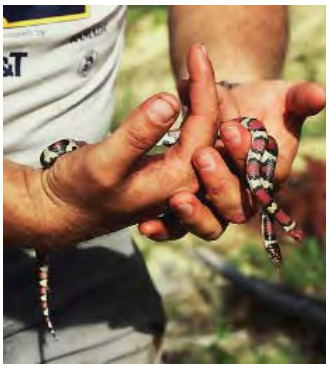
The mole kingsnake is found only on the Coastal Plain of the western shore and the nearby Piedmont (Harris 1975). It spends most of its time underground, but can be found above ground in fields or open forests most often following heavy rains. Because of its burrowing lifestyle, specimens have often been plowed up in farm fields (Mitchell 1994).



Photos, from left:
Adult - John White
Habitat - Rebecca Chalmers

Coastal Plain Milksnake

Lampropeltis triangulum temporalis



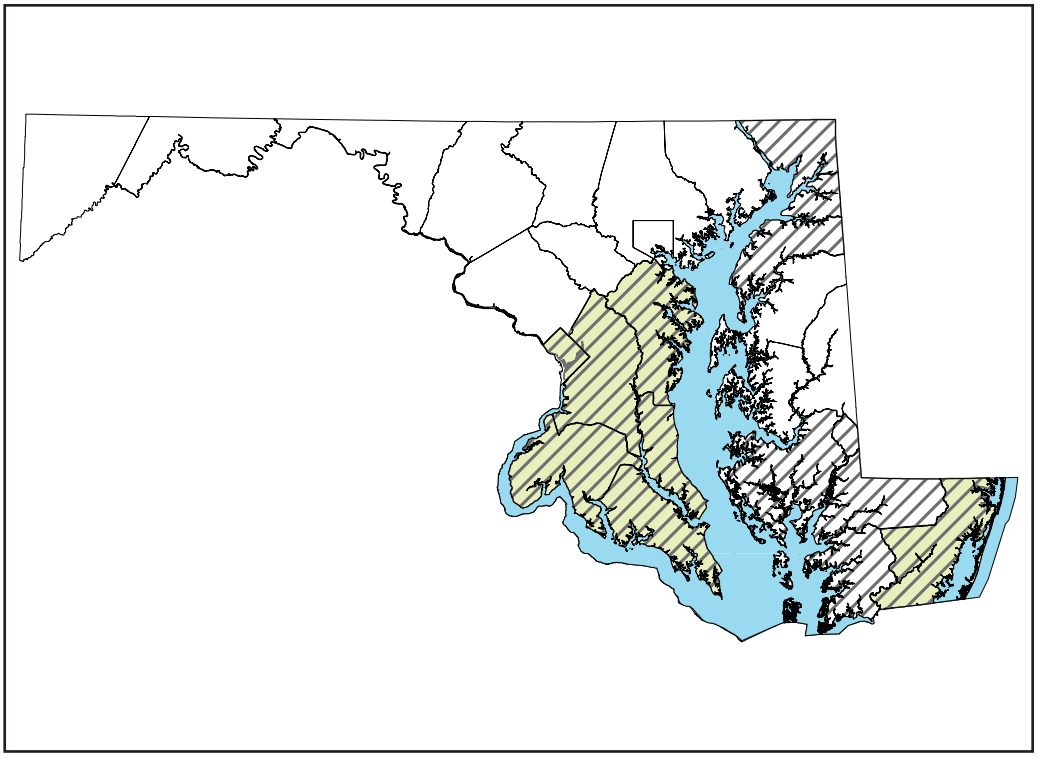
Identification

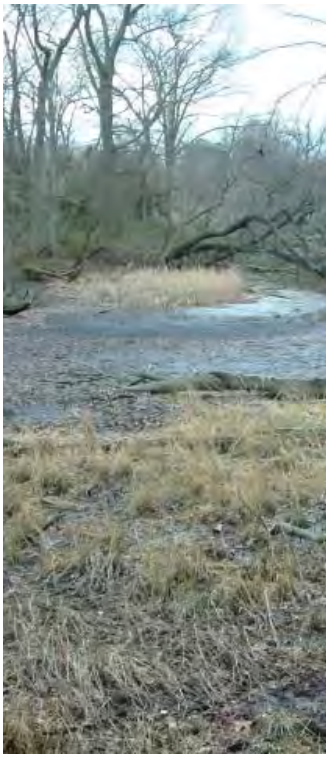
The Coastal Plain milksnake is thought to be an intergrade between the eastern milksnake, which is primarily found to the north and west, and the scarlet kingsnake, which resides to the south. It is differentiated from these by having 31 or fewer blotches that usually extend laterally down the body to give the appearance of bands when viewed from above or the side. There is also no Y, U, or V-shaped light patch on the nape. Most specimens also have a full or partial neck collar that is the same color as the background (White and White 2007).

Young

Young Coastal Plain milksnakes resemble adults.

Photos, from top:
Adult - Mark Tegges
Adult - Mark Tegges
Adult - Mark Tegges





Photos, from top:
Habitat - Rebecca Chalmers
Adult - Corey Wickliffe

Distribution and Habitat

The Coastal Plain milksnake is, as the name implies, a Coastal Plain species that is seldom seen above ground. It prefers sandy soil where it can burrow readily (White and White 2007).

Northern Scarletsnake

Cemophora coccinea copei

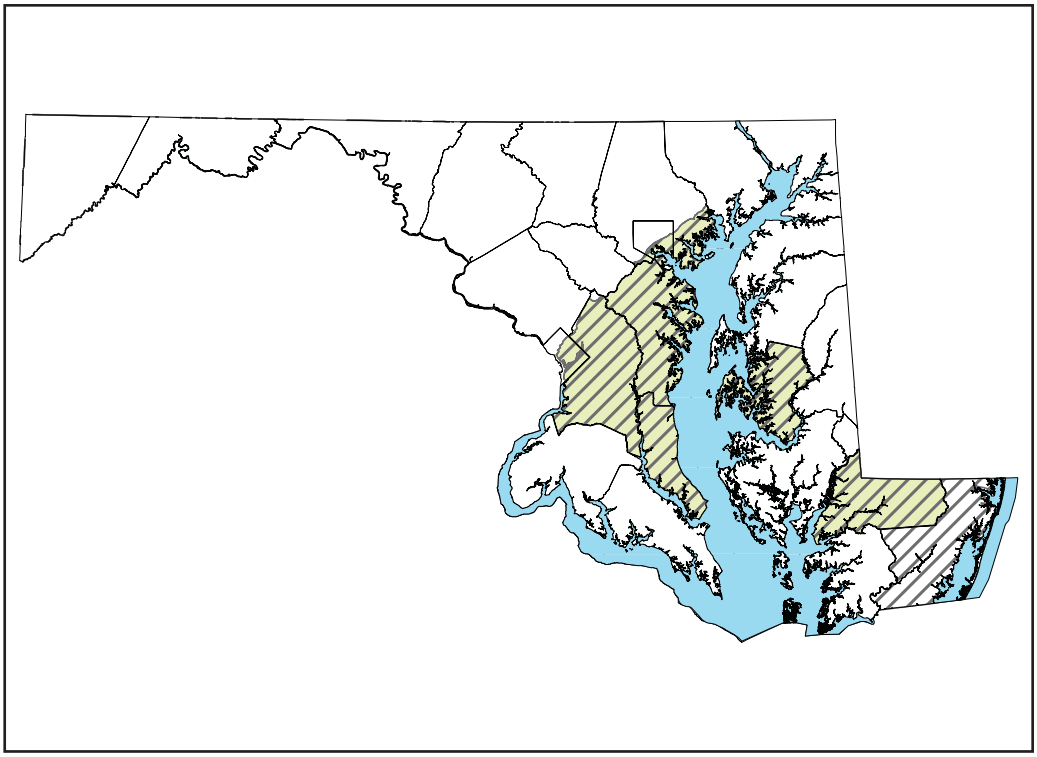
Identification

A distinguishing characteristic of the northern scarletsnake is that its upper jaw protrudes noticeably beyond its lower jaw. The dorsum consists of bold red, black-bordered blotches on a yellow, cream, or gray background. A distinct black band lies across the head behind the eyes. The venter is usually white or yellowish and is unpatterned (Mitchell 1994; Conant and Collins 1998; White and White 2007).

Young

Young northern scarletsnakes have a similar coloration and patterning to adults.

Photos, from top:
Adult - Andrea Teti
Adult - John White
Eggs - Andrea Teti



Photos, from left:
Habitat - Rebecca Chalmers
Adult - John White

Distribution and Habitat

The northern scarletsnake has rarely been seen in Maryland. It is on the Department of Natural Resources, Natural Heritage Division Watch list. It has been found only on the Coastal Plain in open areas next to forests where sandy soil suitable for burrowing is present (White and White 2007).

Common Rainbowsnake

Farancia erytrogramma erytrogramma

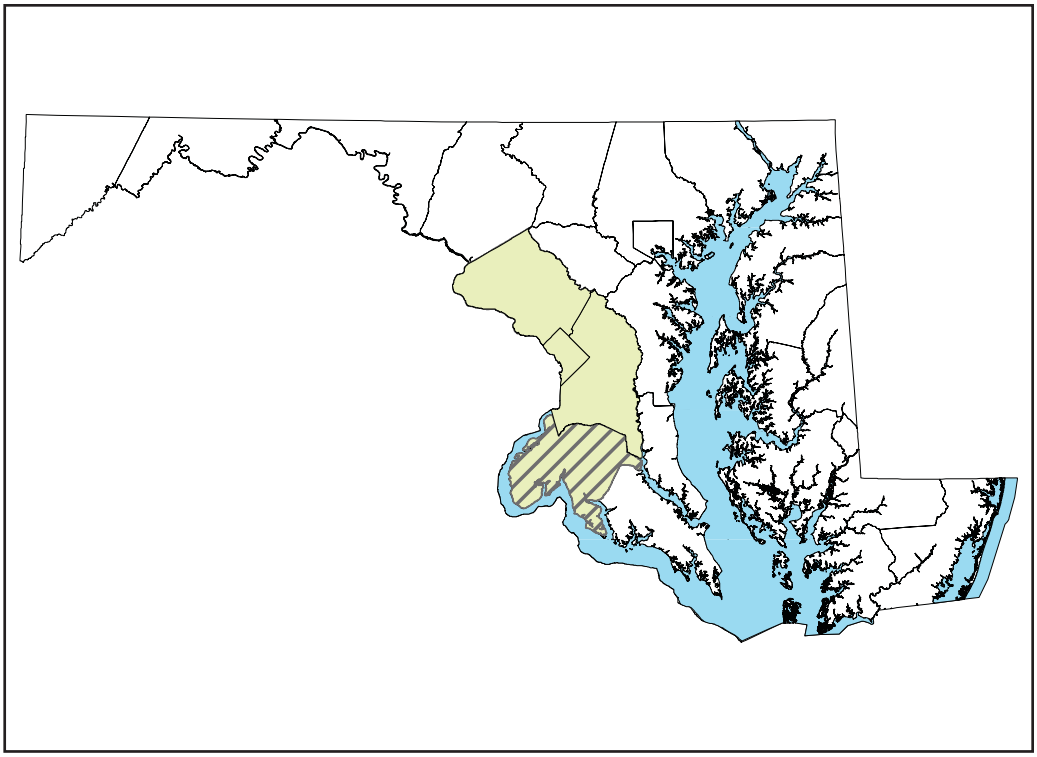
Identification

The common rainbowsnake is unlike any other snake in Maryland. It is an iridescent, glossy snake with red and black longitudinal stripes. There are often paired rows of small black spots on the venter. The scales are usually smooth, but some specimens may have supra-anal keels. The anal plate is normally divided, but sometimes it is single (Conant and Collins 1998).

Young

Young common rainbowsnakes resemble adults.

Photos, from top:
Detail - Scott Smith
Tail Barb - Scott Smith
Anal Plate - Scott Smith
Female - Scott Smith



Distribution and Habitat

The common rainbowsnake is listed as endangered by the Maryland Department of Natural Resources, Natural Heritage Division. It is highly aquatic, but can also occasionally be found in on land (Mitchell 1994). Very few records of this species exist for Maryland, but recent records from Charles County indicate that it persists there.

Photos, from top:
Adult - Mark Tegges
Habitat - Matt Sell

Northern Pinesnake

Pituophis melanoleucus melanoleucus

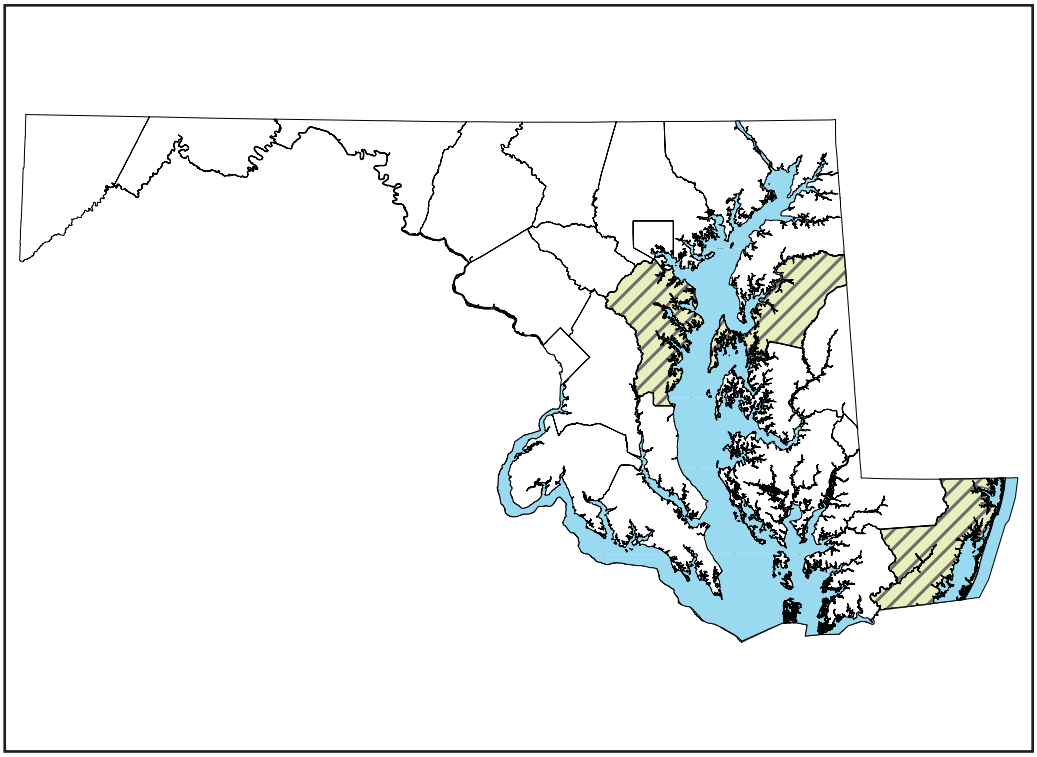
Identification

The northern pinesnake is easily distinguished from other Maryland snakes. It has a white, yellow, or pale-gray background color with black or dark brown blotches from the head to the tip of the tail (White and White 2007). The scales are keeled and the anal plate is divided.

Young

Young northern pinesnakes resemble adults, but with a paler ground color and often a pinkish or orange tinge (Conant and Collins 1998).

Photos, from top:
Adult - Andrea Teti
Eggs - Andrea Teti
Adult - Andrea Teti
Adult - Mark Tegges



Distribution and Habitat

There is some debate as to whether this species is native to Maryland. It is extremely secretive and spends most of its time underground in sandy, forested habitats. It has been found on the eastern shore of Maryland and Delaware, and is considered native to New Jersey and Virginia.

Photos from top:
Juvenile - Andrea Teti
Habitat - Rebecca Chalmers

Eastern Hog-nosed Snake
Photo: Corey Wickliffe

Pit Vipers (Subfamily Crotalinae)

There are two species of pit vipers found in Maryland, the timber rattlesnake (*Crotalus horridus*) and the copperhead, which includes the subspecies northern copperhead (*Agkistrodon contortrix mokasen*) and southern copperhead (*Agkistrodon contortrix contortrix*). Both of these species are dangerously venomous and should be treated with caution. Do not approach or handle these snakes as a bite could be fatal. As the name implies the pit vipers have a heat seeking pit between each eye and nostril. The pit vipers differ noticeably from the colubrids also by having vertical pupils and undivided subcaudal scales (Conant and Collins 1998).

Illustration showing pupils vertically elliptical, characteristic of pit vipers.

Northern Copperhead Snake
Photo: Mark Tegges

Timber Rattlesnake
Crotalus horridus

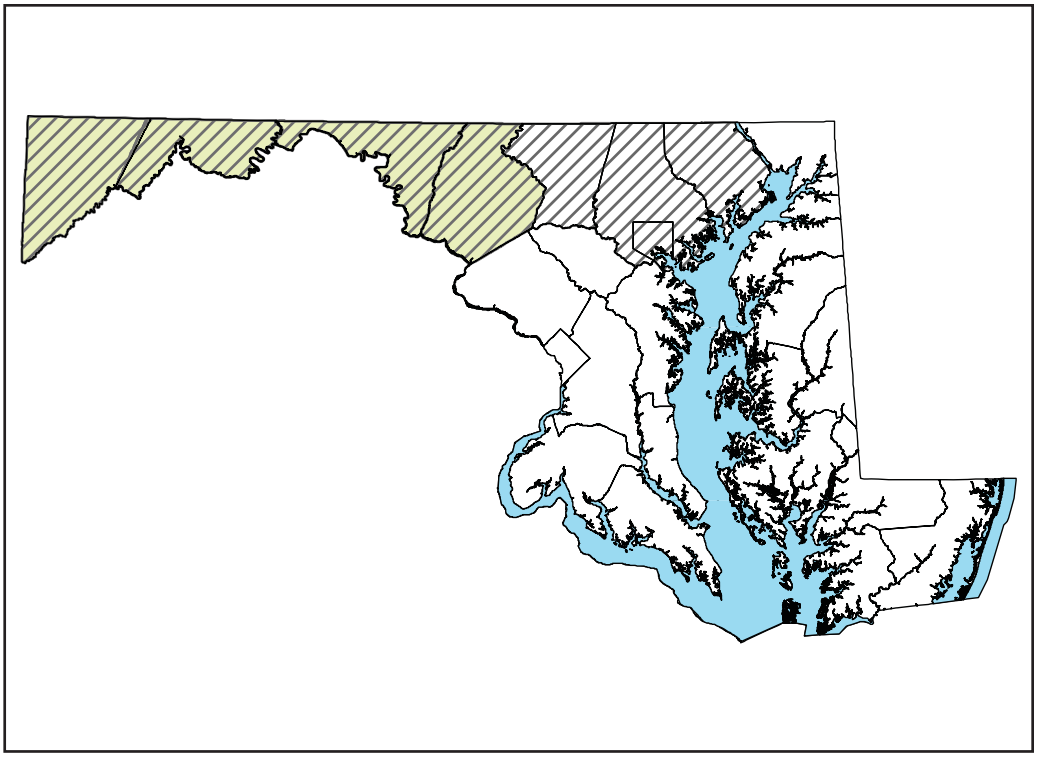
Identification

The timber rattlesnake is only snake found in Maryland with a rattle. The dorsal pattern consists of black or dark brown crossbands on a background of yellow or brown.

Young

The rattle is substantially smaller in younger specimens compared to older ones. At birth, only one basal segment of the rattle, which is called the button, is present. One segment is added after each time the snake sheds its skin, which could be several times per year. The tail of young timber rattlesnakes is not yellow-tipped, as it is in young copperheads.

Photos, from top:
Adult - Paul Kazyak
Adult - John White
Adult - John White
Adult - Mark Tegges



Distribution and Habitat

The timber rattlesnake is now found almost exclusively in western Maryland, but was thought to be much more widespread historically (White and White 2007). They can be found in upland forest habitat where rocky outcroppings and talus slopes occur. They are typically found in very remote areas, far from places that humans frequent (Hulse et al. 2001).

Photos, from left:
Adult - Mark Tegges
Habitat - Rebecca Chalmers

Northern Copperhead
Agkistrodon contortrix mokasen

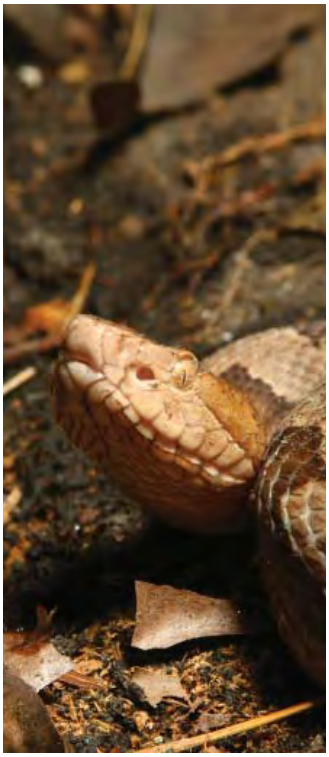
and

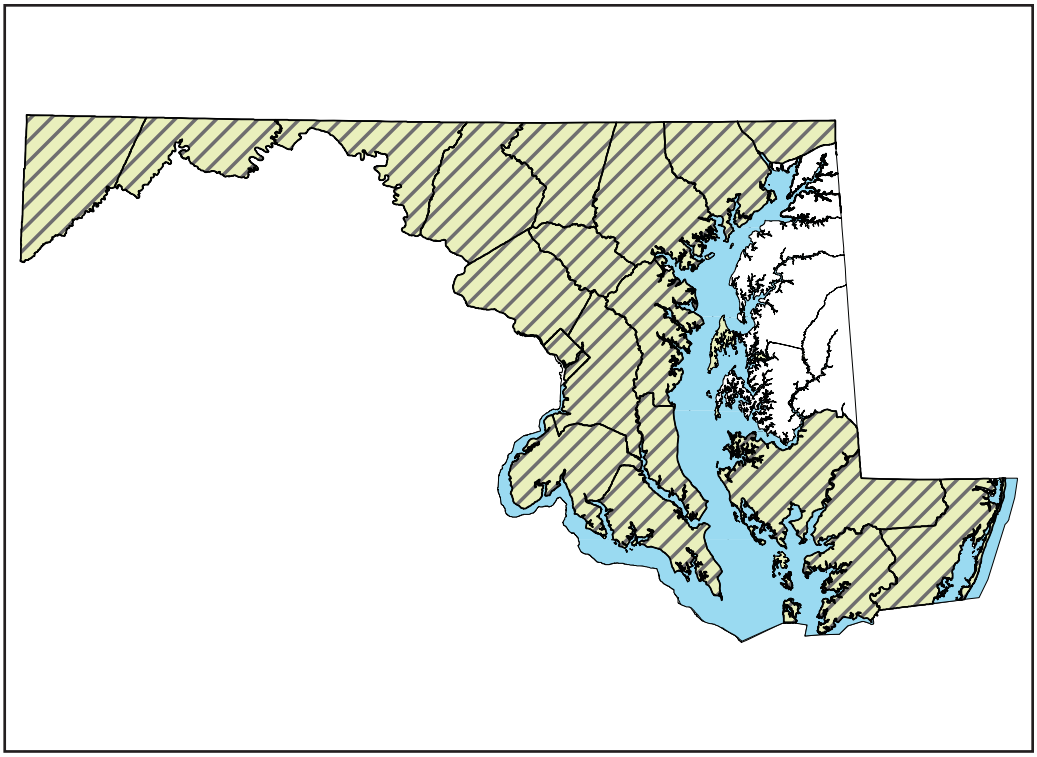
Southern Copperhead
Agkistrodon contortrix contortrix

Identification
The copperhead has a coppery-colored head and is the only snake in Maryland with approximately 15 hourglass-shaped bands on the sides, which are wide on the sides and narrow at the center of the back. Southern copperheads differ from northern copperheads by having a paler, pinker color and narrower hourglass markings that are often broken in the center (Conant and Collins 1998).

Young
Young copperheads differ from adults by having a bright yellow-tipped tail and a dark line on the head that separates the dark head from the pale "lips" (Conant and Collins 1998; White and White 2007).

Photos, from top:
Adult - Jim McGibney
Adult - Jay Kilian
Camouflage - William Harbold





Distribution and Habitat

The northern copperhead is apparently distributed throughout Maryland. However, specimens from the lower eastern shore exhibit some characteristics of the southern copperhead and are probably intergrades (Harris 1975; Conant and Collins 1998).

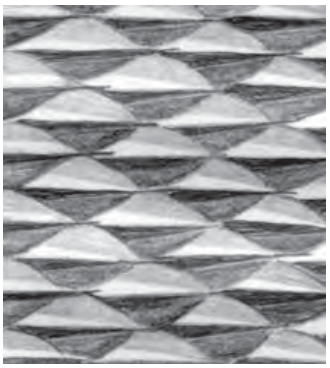
Photos, from top:
Detail - Eric Maxwell
Adult - William Harbold
Habitat - Rebecca Chalmers

Key to the Adult and Juvenile Lizards of Maryland

1a. Rough, keeled, overlapping scales, each with a backward pointing projection; females have dark brown or black crossbands on the back and may have a tinge of blue on the underside of the throat; males have bright greenish-blue on the throat and have less distinct crossbands on the back.

Eastern Fence Lizard
(*Sceloporus undulatus*) p. 242

1a. Scales with backward pointing projections.



1b. Scales on body without backward pointing projections

2

2a. Six light stripes; scales anterior to gular fold (underside of neck) conspicuously enlarged; very small scales on most of the body with enlarged rectangular scales arranged in 8 rows on the belly; tail scales are rough to the touch.

Eastern Six-lined Racerunner
(Aspidoscelis sexlineatus sexlineatus) p. 244

2b. Smooth, flat scales that make the lizard look shiny; no conspicuously enlarged or rectangular scales on the body; relatively short legs for a lizard; tail scales not rough.

Skinks
(Family Scincidae)
3

3a. Golden-brown to blackish-brown color; dorsum width with six scale rows; a dark dorsolateral stripe on each side of the body, which originates on the snout and passes above the eye and onto the tail; a transparent window in each eyelid.

Little Brown Skink
(*Scinella lateralis*) p. 240

3b. No dark dorsolateral stripe on each side of the body; no transparent window in each eyelid.

4

4a. One postmental scale; dorsum with four light stripes; no light lines on the top of the head.

Northern Coal Skink
(*Plestiodon anthracinus anthracinus*) p. 238

4b. Two postmental scales; 5-7 light stripes on dorsum, and 2 light lines on the head of striped individuals; females and young have 5-7 longitudinal stripes on the body, which may be faded in older specimens; tail is bright blue in very young specimens; male has a brown body that may show remnants of faded stripes and wide reddish or orangish head.

5

5a. All scales under the base of the tail are about the same size; dorsolateral stripe on striped individuals is on the 5th (or 4th and 5th) row of scales (counting from the modified belly scales up).

Southeastern Five-lined Skink
(*Plestiodon inexpectatus*) p. 236

5b. Middle row of scales under the tail is distinctly wider than other rows; dorsolateral stripe on striped individuals is on the 3rd and 4th (or 4th only) row of scales.

6

6a. Usually 5 (sometimes 4 on one side only) preorbital, supralabial scales; no enlarged postlabial scales;
28 - 32 scale rows at midbody.

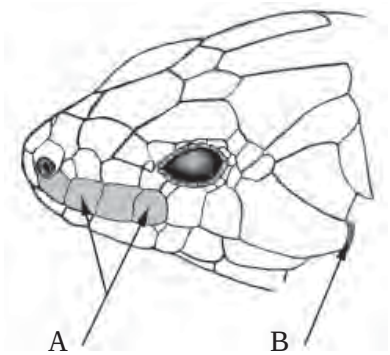
Broad-headed Skink
(*Plestiodon laticeps*) p. 232

6b. Usually 4 preorbital, supralabial scales; usually 2 enlarged postlabial scales; 26-33 scale rows at midbody.

Common Five-lined Skink
(*Plestiodon fasciatus*) p. 234

Scales of a Skink Head*

A. Preorbital Supralabials
B. Postlabial



**Scales are used to differentiate between the common five-lined skink and the broadhead skink.*

Lizards (Order Squamata, Sub-order Lacertilia)

Unlike snakes, lizards have moveable eyelids, an external ear opening, two well-developed lungs, and a lower jaw that is fused, restricting the gape and limiting the size of prey that can be swallowed (Mitchell 1994). Although legless forms do exist, all species of lizards found in Maryland have legs.

There are seven species of lizards that have been reported to occur in Maryland. A total of five species are in the skink family (Scincidae); including the broad-headed skink (*Plestiodon laticeps*), common five-lined skink (*Plestiodon fasciatus*), southeastern five-lined skink (*Plestiodon inexpectatus)*, northern coal skink (*Plestiodon anthracinus anthracinus*), and little brown skink (*Scinella lateralis*). As a group, the skinks are characterized by smooth, flat scales that make the lizard look shiny. They also have small, flat bones (osteoderms) under each of the scales on the head, body, and tail. The legs are relatively short for lizards. There are two other families of lizards that have been found in Maryland, and they are each represented by one species. The whiptails (Family Teiidae) are represented by the eastern six-lined racerunner (*Aspidoscelis sexlineatus sexlineatus*) and the spiny lizards (Family Phrynosomatidae) are represented by the eastern fence lizard (*Sceloporous undulatus*).

Listing Status of the Lizards of Maryland

	Common Name	Scientific Name	State Status
Skinks (Family Scincidae)	Broad-headed Skink	*Plestiodon laticeps*	
	Common Five-Lined Skink	*Plestiodon fasciatus*	
	Southeastern Five-lined Skink	*Plestiodon inexpectatus*	
	Northern Coal Skink	*Plestiodon anthracinus anthracinus*	Endangered
	Little Brown Skink	*Scinella lateralis*	
Spiny Lizards (Family Phrynosomatidae)	Eastern Fence Lizard	*Sceloporus undulatus*	
Whiptails and Racerunners (Family Teiidae)	Eastern Six-lined Racerunner	*Aspidocelis sexlineatus sexlineatus*	

Skinks
(Family Scincidae)

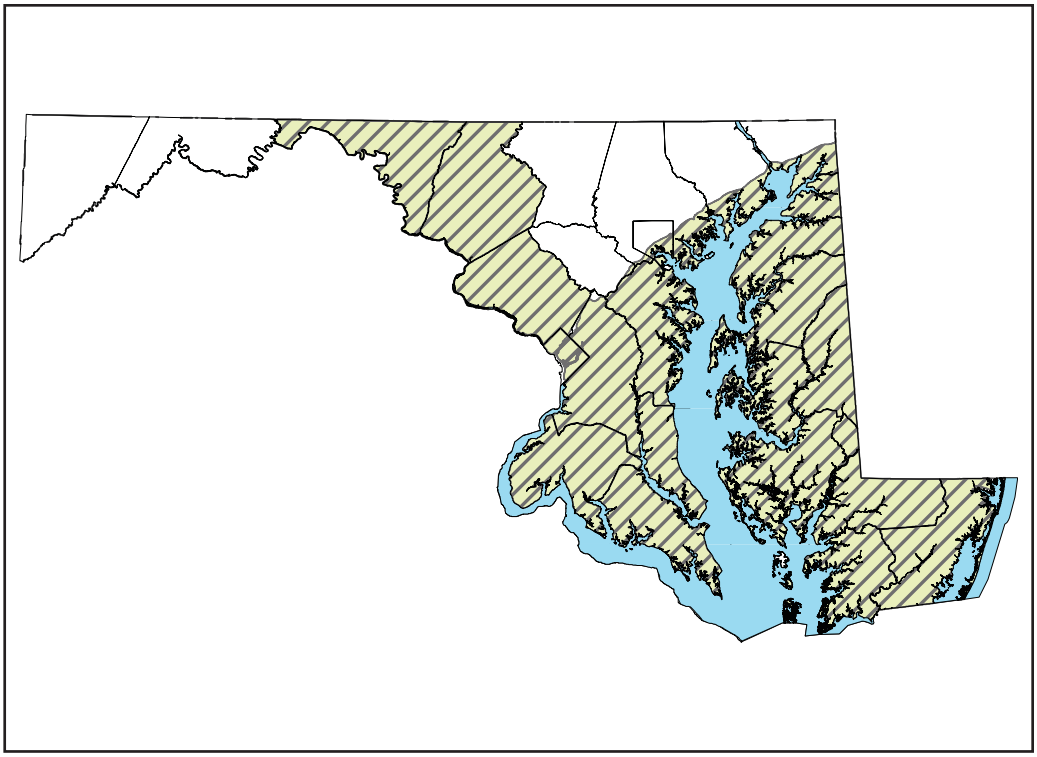
Broad-headed Skink
Plestiodon laticeps

Identification
The broad-headed skink resembles the common five-lined skink and the southeastern five-lined skink. It is differentiated from these species by having five upper labial scales (as opposed to four) in front of the sub-ocular scale and no enlarged post-labial scale. Both the broad-headed skink and the commmon five-lined skink are differentiated from the southeastern five-lined skink by having all scales under the base of the tail about the same size (Conant and Collins 1998).

The broad-headed skink exhibits strong sexual dimorphism. The male has a mostly brown body that may show remnants of faded stripes and a wide reddish or orangish head. The female has five to seven longitudinal light-colored stripes on a dark body. The stripes may be faded in older specimens.

Young
Young broad-headed skinks resemble adults, except that they have a bright blue tail. Males do not develop distinctive coloration until sexual maturity.

Photos, from top:
Female with Eggs - Mark Tegges
Detail - Kieth Johnson
Male Adult - Mark Tegges



Distribution and Habitat

The broad-headed skink is found primarily on the Coastal Plain in Maryland, but has followed the Potomac River valley into Montgomery and Frederick Counties (Harris 1975). It is arboreal, but can also be found foraging on the ground. They prefer dry portions of mixed hardwood forests. Tree species that the broad-headed skink is most commonly associated with include live oaks, turkey oaks, loblolly pines, and Virginia pines (Mitchell 1994).

Photos, from left:
Male Adult - Clint Otto
Habitat - Rebecca Chalmers

Common Five-lined Skink

Plestiodon fasciatus

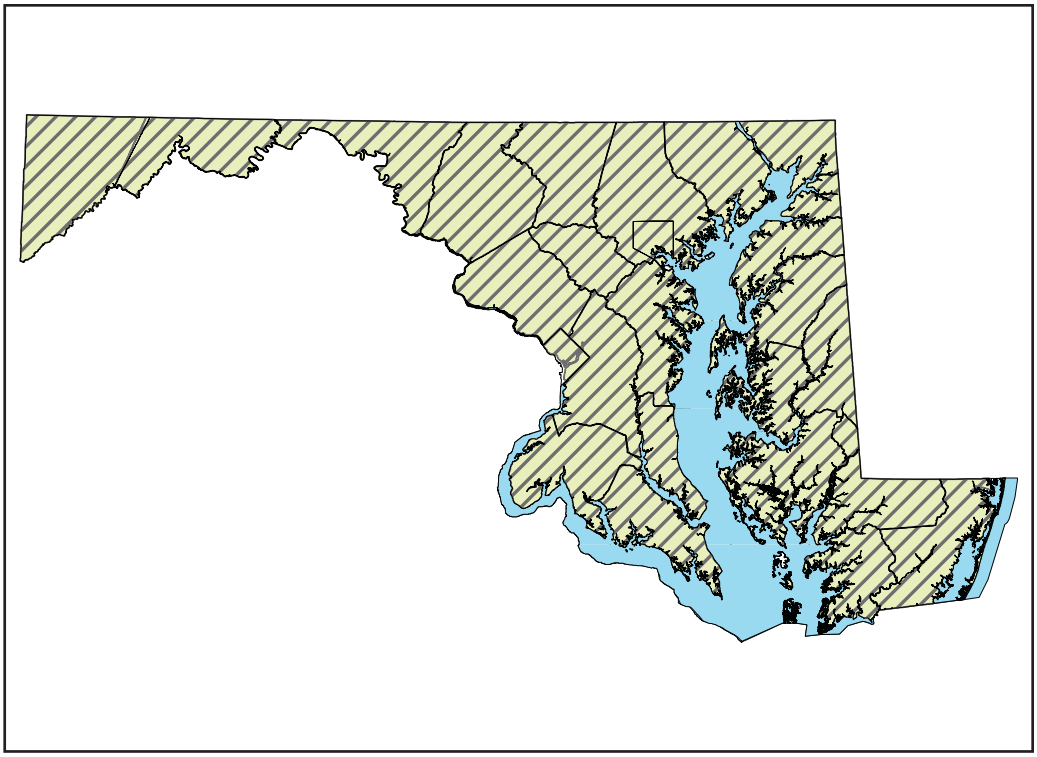
Identification

The common five-lined skink closely resembles the broad-headed skink and exhibits the same sexual dimorphism. Three characteristics can be used to differentiate the two species. The broad-headed skink can attain lengths in excess of 32 cm, while the common five-lined skink rarely exceeds 21 cm. The five-lined skink also has four upper labial scales in front of the sub-ocular scale, while the broad-headed has five. Unlike the broad-headed skink, the common five-lined skink has two enlarged post-labial scales (Conant and Collins 1998).

Young

Young common five-lined skinks resemble adults, except that they have a bright blue tail.

Photos, from top:
Juvenile - David Kazyak
Adult - Ed Thompson
Adult - Matt Sell



Distribution and Habitat
The common five-lined skink has been found throughout Maryland in many habitat types. It is rarely found in western Maryland and tends to be more common on the Coastal Plain. It is most often found near water (Harris 1975; Mitchell 1994).

Photos, from left:
Adult - Corey Wickliffe
Habitat - Rebecca Chalmers

Southeastern Five-lined Skink

Plestiodon inexpectatus

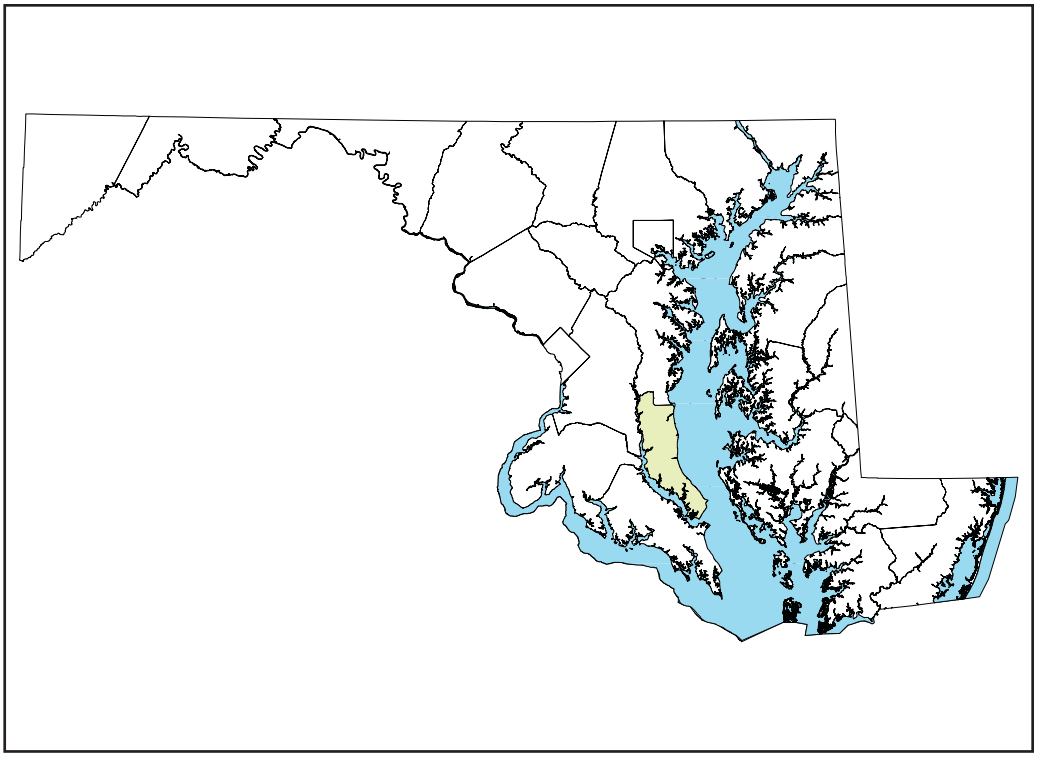
Identification

The southeastern five-lined skink closely resembles the common five-lined skink and broad-headed skink and exhibits the same sexual dimorphism. It tends to be similar in size to the common five-lined skink and also has four upper labial scales in front of the sub-ocular scale. There is one main morphological difference between the southeastern five-lined skink and both the common five-lined skink and the broad-headed skink. All of the scales on the underside of the tail are about the same size in the southeastern common five-lined skink, as opposed to having an enlarged middle row like the other species (Conant and Collins 1998).

Young

Young southeastern five-lined skinks resemble adults, except that they have a bright blue tail.

Photo:
Juvenile - Mark Tegges



Distribution and Habitat
A single southeastern five-lined skink specimen was found in a sample from Cove Point that included several common five-lined skinks. The prevailing thought is that this specimen was erroneously included in the wrong collection (Harris 1975). However, skink specimens from southern Maryland, especially in the Cove Point area, should be examined closely.

Photo:
Habitat - Rebecca Chalmers

Northern Coal Skink

Plestiodon anthracinus anthracinus

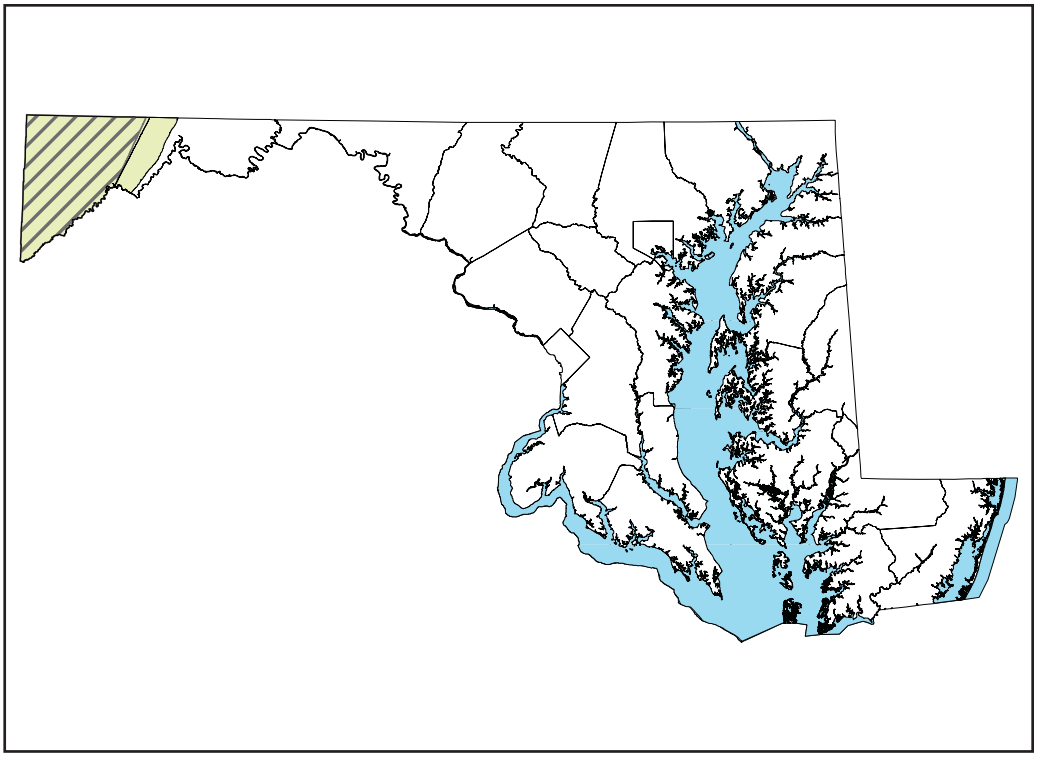
Identification

The northern coal skink has four light dorsal stripes that extend onto the tail and a broad, dark, lateral stripe that is 2.5 to 4 scales wide. There are no light lines on top of head, as are present in the common five-lined skink, southeastern five-lined skink, and broad-headed skink (Conant and Collins 1998). Red or orange coloration is restricted to the sides of the head in the male northern coal skink.

Young

Young northern coal skinks are colored and patterned as adults, except for the presence of a blue tail.

Photos, from top:
Adult - Mark Tegges
Adult - Charlie Stine



Distribution and Habitat
The northern coal skink is historically found in Alleghany and Garrett Counties. It has not been recorded in Maryland since 1977, despite extensive searching (Thompson 1984a).

Photo:
Habitat - Rebecca Chalmers

Little Brown Skink

Scinella lateralis

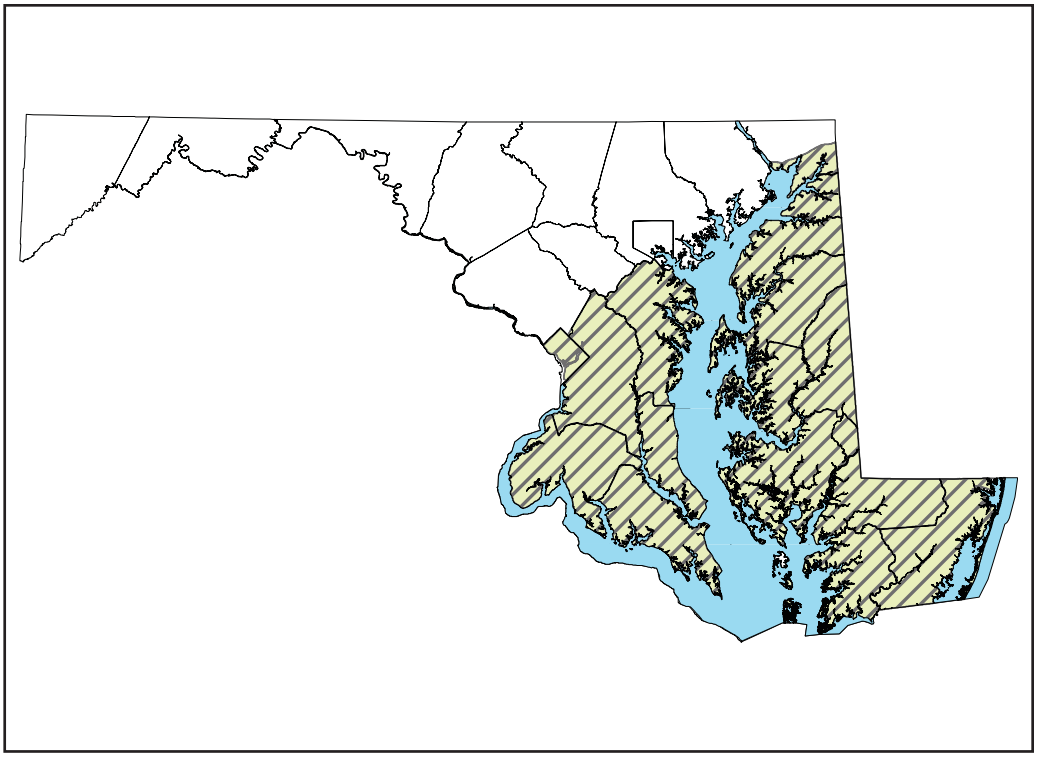
Identification

The little brown skink is easily distinguished from other skinks because it is small, golden brown to blackish-brown and has a dark dorsolateral stripe on each side of the body (Conant and Collins 1998). There is also a transparent window in each eyelid (Mitchell 1994).

Young

Young little brown skinks resemble adults except that small black dots are usually present on the dorsum. The tail is not blue as in many other skink species (Mitchell 1994).

Photos, from top:
Adult - David Kazyak
Adult - David Kazyak
Adult - Mark Tegges



Distribution and Habitat
The little brown skink can be found foraging under leaf litter in forested areas of the Coastal Plain (Mitchell 1994).

Photos from left:
Adult - Matt Close
Habitat - Rebecca Chalmers

Spiny Lizards (Family Phrynosomatidae)

Eastern Fence Lizard
Sceloporus undulatus

Identification

The eastern fence lizard is easily distinguished from other Maryland lizards by having rough, keeled, overlapping scales, each with a backward pointing projection. It is typically brown with a primarily white venter. Females have dark brown or black crossbands on the back and may have a tinge of blue on the underside of the throat. Males have a bright greenish-blue throat and sides of the sides of the belly, and have less distinct crossbands on the back (Mitchell 1994).

Young

Young eastern fence lizards resemble adults, except that the crossbands are often indistinct.

Photos, from top:
Adult - Linh Phu
Ventral - Linh Phu
Medial - Mark Tegges

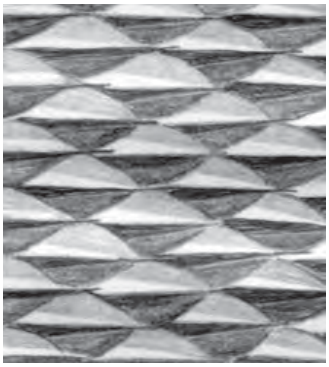
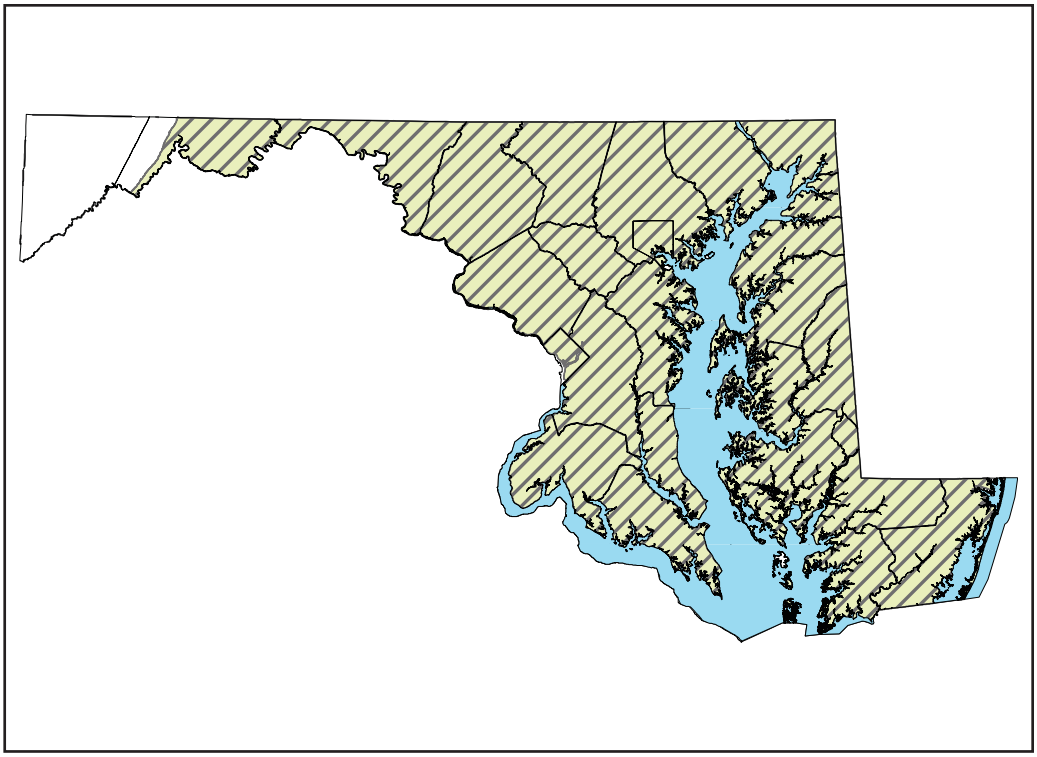


Illustration showing scales with backward pointing projections.



Photos:
Ventral Male - Paul Kazyak
Habitat - Rebecca Chalmers

Distribution and Habitat

Eastern fence lizards are distributed throughout Maryland, except for Garrett County (Harris 1975). They are excellent climbers and are usually found in heavily forested areas and forest edges (Mitchell 1994).

Whiptails and Racerunners (Family Teiidae)

Eastern Six-lined Racerunner

Aspidoscelis sexlineatus sexlineatus

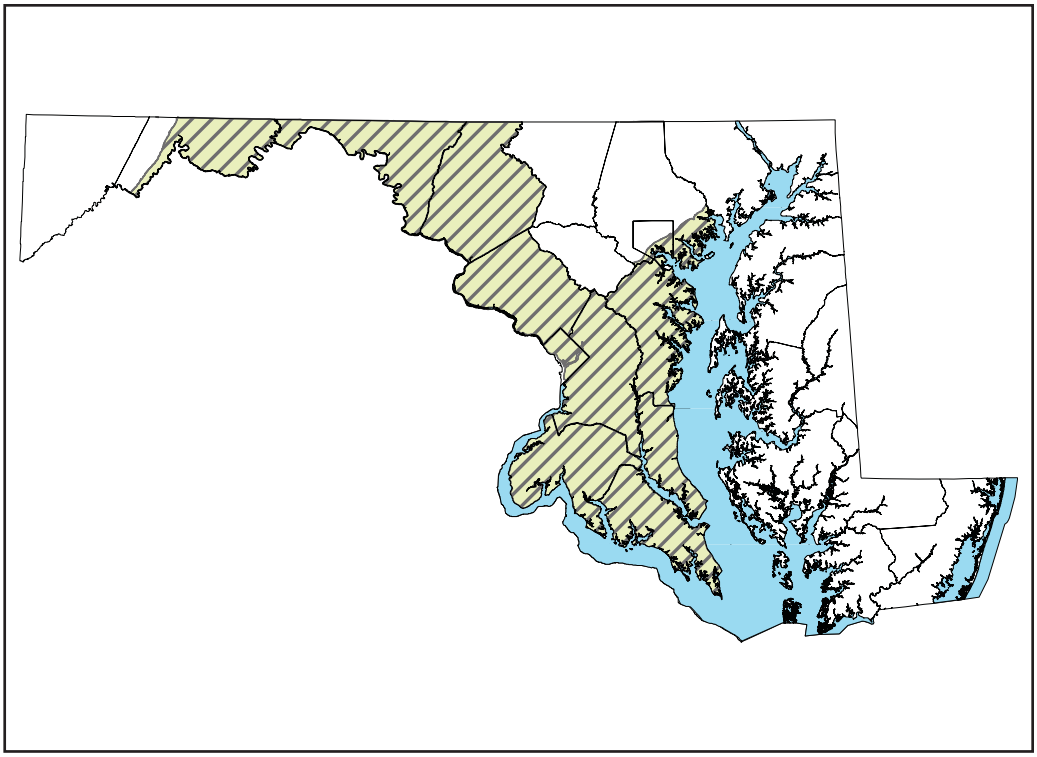
Identification

The eastern six-lined racerunner is unlike any other Maryland lizard. As the name implies, there are six light stripes along the dorsum. The scales anterior to the gular fold (underside of neck) are conspicuously enlarged. Unlike skinks, they have very small scales on most of the body with enlarged rectangular scales arranged in eight rows on the belly. The tale scales also have large keels that are rough to the touch (Mitchell 1994).

Young

Young eastern six-lined racerunners resemble adults except they have bright blue tails.

Photos from top:
Adult - John White
Adult - Mark Tegges



Distribution and Habitat
Eastern six-lined racerunners are found on the Coastal Plain, Ridge and Valley, and the western shore of the Chesapeake Bay (Harris 1975). They prefer hot, sandy habitats with bushes or grasses for cover (Mitchell 1994).

Photos from left:
Detail - John White
Habitat - Rebecca Chalmers

Glossary

Anal plate – On reptiles, the large scale immediately anterior to and covering the vent that marks the beginning of the tail. It is present in some lizards and all snakes, and may be divided or undivided by a diagonal suture.

Anterior – Toward the head or front end of an animal.

Barbels – Small, fleshy projections of skin on the chin or throat.

Blotch – A large, usually rounded or squarish spot.

Canthus rostralis- The ridge from the eye to the tip of the snout that separates the top of the muzzle from the side.

Carapace – The upper shell of a turtle.

Cloaca – The chamber into which the urinary, digestive, and reproductive canals discharge their contents. It opens to the exterior through the anus.

Costal grooves – Vertical folds on the flanks of salamanders.

Cranial crest – Raised ridges on the heads of toads. Typically behind the eyes (post-orbital) in Maryland toads.

Crossband – A transverse band of color differing from the background color that is oriented with its long axis perpendicular to the animal's body axis.

Dorsal – referring to the upper surface of an animal.

Dorsolateral – Between the center of the back and the side of the body.

Dorsum – The entire upper surface of an animal.

Epidermal – Pertaining to the outer layer of skin on an animal.

Fimbriae – Hairlike extensions on the surfaces of gills that facilitate gas exchange.

Flagellum – A narrow projection at the terminal end of the tail in some tadpoles, that is capable of moving independently from the rest of the tail.

Fossorial – Adapted for digging or burrowing and usually living underground.

Gill rakers – Extensions near the base of the gill arch or gill rachis.

Groin – Where the lower abdomen and the inner part of the thigh come together.

Gular – On or pertaining to the throat.

Hemipenes – The copulatory organs of males. Snakes and lizards have two hemipines and turtles have one hemipinis.

Immaculate – Without any dark pigment, spots, blotches, stripes, streaks, or any other markings.

Iridophores – Cells that contain light pigments and produce brassy, silvery, golden, or whitish coloration on the body.

Keel – A raised ridge.

Labial – Pertaining to the lip.

Lentic – Standing water. Usually includes lakes, ponds, bogs, and swamps.

Lotic – Running water. Usually includes springs, streams, and rivers.

Melanophore – Cells that contain dark pigment (melanin).

Middorsal - Pertaining to the center of the back.

Nasolabial groove – A groove extending downward from the nostril and across the lip in lungless salamanders.

Oral disc – Fleshy parts of a tadpole's mouth.

Paratoid glands – A pair of (typically enlarged) external, wart-like glands on the shoulder, neck, or back of the eye in toads.

Plastral – Referring to the chest wall or the lungs.

Plastron – The lower shell of a turtle.

Postocular – behind the eye.

Postocular stripe – A stripe that is behind the eye.

Postlabial scales – The scales lying immediately in front of the ear openings and in line with the scales on the upper lip in lizards.

Rachis – The central portion of a gill that supports the gill fimbriae.

Scale rows – The longitudinal rows of dorsal scales around the bodies of lizards and snakes. They should be counted just anterior to the middle of the body.

Scutes – Any enlarged, platelike scale on a reptile, typically referring to the large scales on the shell of a turtle.

Spade – A horny projection on the inside of the hind foot (found in some toad species).

Subcaudal – Beneath the tail.

Supralabial scales – Any scale bordering the lateral margins of the upper lip.

Tibia – The leg from heel to knee.

Tympanum – The eardrum. It is external and often conspicuous in most frogs.

Vent – The cloacal opening.

Venter – The entire undersurface of an animal.

Vernal pool – a seasonally flooded depression that usually dries up during summer.

Vitelline membrane – The inner most protective membrane that surrounds a developing embryo.

Wart – A hard projection on the skin.

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