

Reptiles & Amphibians

Natural History & Identification



Fall 2016

Overview

Background & natural history of “herps”

Identification of the 25 species reptiles and amphibians

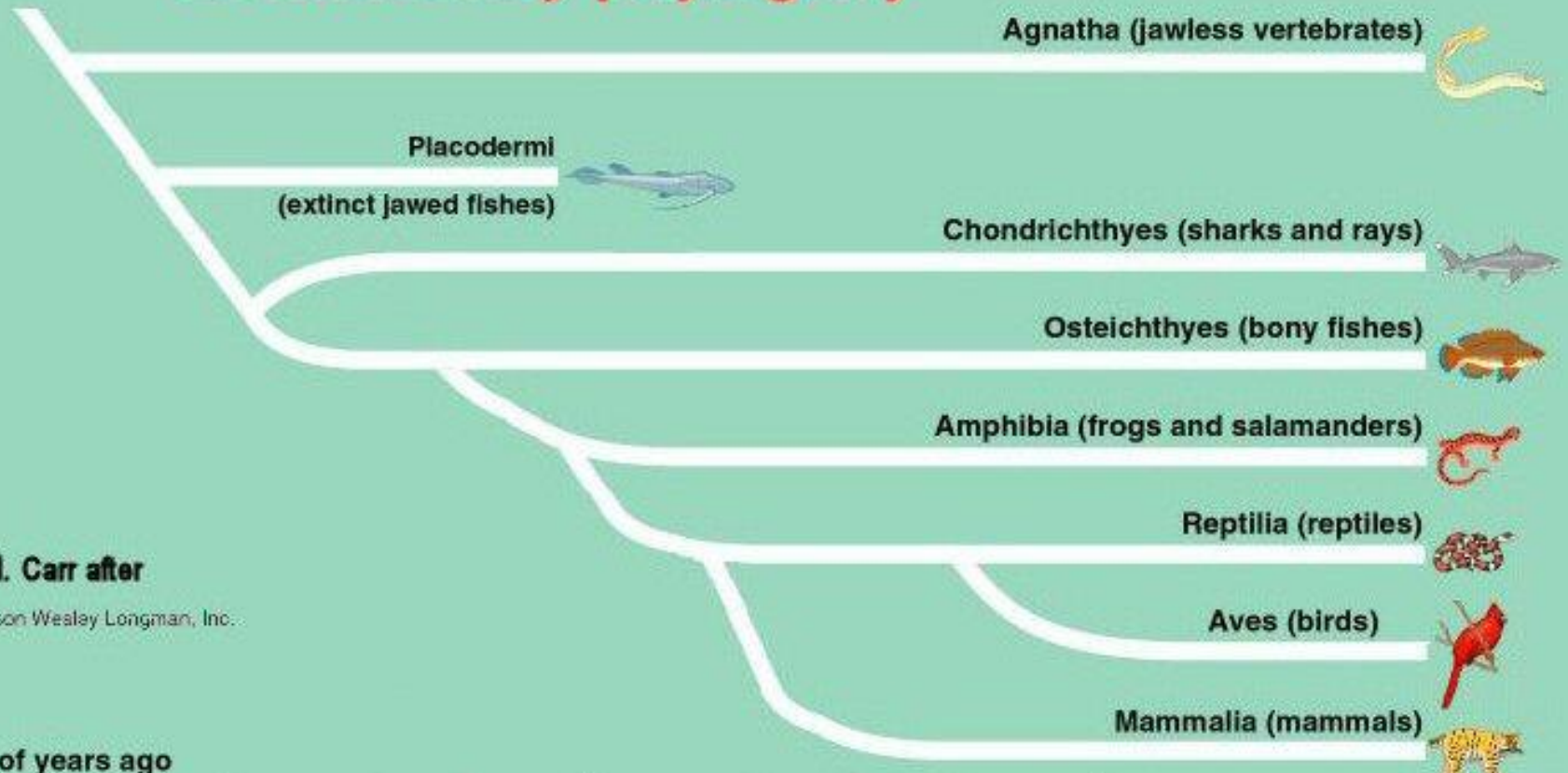


Spotted Salamander



Spring Peeper

Evolutionary phylogeny



Steven M. Carr after

© 1999 Addison Wesley Longman, Inc.

Millions of years ago



Class Amphibia

Features:

- ectothermic – body temp not maintained by physiological processes
- low metabolic rate (low food /E reqs.)
- moist, scale-less skin
- most species with lungs, but also exchange gases via skin



Common Reed Frog

Class Amphibia

Features (cont.)

- most species require water for reproduction (larval stage), but some with strategies to bypass larval stage
- incredible diversity in modes of reproduction



Class Amphibia

Order Gymnophiona – caecilians

Order Caudata – salamanders, newts

Order Anura – frogs and toads



Red-eyed Tree Frog



Boettger's Caecilian



Blue-spotted Salamander

Amphibian Diversity

Caecilians - ~200 species
Salamanders – 655 species
Frogs & toads – 6350 species!!

~7,205 Amphibians (Nov 2014)



Mantella madagascariensis



Yellow-striped Caecilian



Yonahlossee salamander

Amphibian Diversity

In 1 year, 260 newly described amphibian species

- mean of ~160/year for last 12 yrs
- over 60% increase in total over last 25 years
- <http://amphibiaweb.org/amphibian/newspecies.html>



Cocoa Frog (2013 – Suriname)

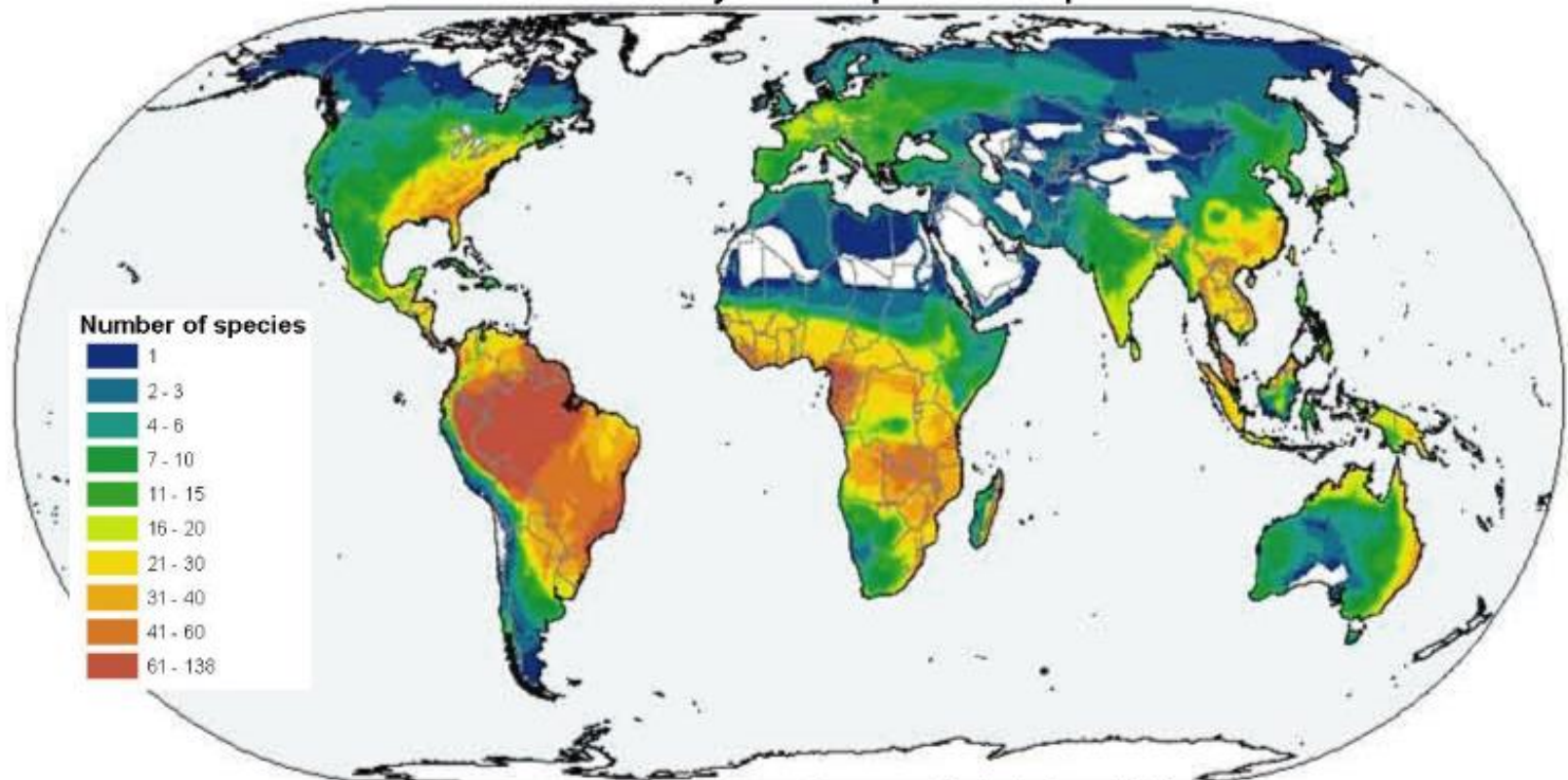


World's smallest vertebrate!
2012 – Papua New Guinea

Amphibian Diversity

- Most diverse in tropical countries
(Brazil with ~950 species, only ~295 species in U.S.)

Global Diversity of Amphibian Species



Source: Global Amphibian Assessment

Order Anura – frogs and toads

Family Bufonidae (American Toad) **

- Drier, bumpy skin (not contagious!)
- Parotoid glands behind eye excrete bufotoxin (distasteful to predators, toxic to some)
- Woodlands and open habitats; Diet: small invertebrates
- Call: a long, rapid, simple musical trill

http://www.naturenorth.com/spring/sound/American_Toad.mp3



Singing male



**** = seen Arnot Forest trip!**

Order Anura – frogs and toads

Family Bufonidae - American Toad**

- long strings of eggs laid in puddles
- poss. symbiotic relationship with a green algae that grows on skin of tadpoles
- algae allows them to utilize hotter breeding puddles
- toad may gain O₂ via algal photosynthesis and algae may benefit from metabolic CO₂ from tadpoles

American Toad eggs



Tadpoles



Order Anura – frogs and toads

Family Hylidae - Treefrogs

Gray Treefrog (1.3-2 in; 3-5 cm)

- woodlands; arboreal (note toe pads)
- capable of changing color (*Hyla versicolor*)
- Call: a short, musical trill

http://www.naturenorth.com/spring/sound/Gray_Treefrog.mp3



Family Hylidae – Treefrogs

Spring Peeper** (~1 in.; 2.5 cm)

- very small, plain gray/brown, faint “X” mark on back
- Not very arboreal, usually in low vegetation/forest leaf litter near wetlands
- Call: a loud peeping note; often many calling at once

http://www.naturenorth.com/spring/sound/Spring_Peeper.mp3



Spring Peeper



...very small size

Order Anura – frogs and toads

Family Ranidae

Bull Frog (4-6 in; 10-15 cm)**

- green or brownish green above
- often with dark speckling
- no dorsolateral line
- ponds, lakes, marshes, swamps
- Call: a low-pitched "Jug-o-rum,"

http://animaldiversity.org/collections/frog_calls/



Order Anura – frogs and toads

Family Ranidae

Green Frog (2.5-3.5 in.; 6-9 cm)**

- green or brownish green above with black speckling
- dorsolateral line extends from behind tympanic membrane
- streams, ponds, lakes & uplands



- Call: a twang like that of a plucked banjo string

http://www.naturenorth.com/spring/sound/Green_Frog.mp3

Order Anura – frogs and toads

Family Ranidae

Leopard Frog (2-3.5 in.; 5-9 cm)**

- spot patterned upperparts
- bronzy dorsolateral line
- often in wet meadows

- Call: a slow, rising snore



http://www.naturenorth.com/spring/sound/Leopard_Frog.mp3

** New species of Leopard Frog was described from Staten Island, NY in 2012. Call of male was very distinctive and turned out to be genetically different.

Order Anura – frogs and toads

Family Ranidae

Wood Frog** (1.5-2.7 in.; 4-7 cm)

- brown with darker brown face
- terrestrial, forest leaf litter
- Most northerly frog; Freeze tolerant!
- Call: a hoarse clacking sound; duck-like quack

http://www.naturenorth.com/spring/sound/Wood_Frog.mp3



Frozen Wood Frog

Order Caudata - Salamanders & Newts

Family Plethodontidae - Lungless salamanders

- “Breathe” through skin
- “Advanced” amphibians; less tied to water for reproduction, larval development, and adult life
- Eggs laid on land, tended by adult
- Development to adult form is direct (no larval stage)



Dusky Salamander tending eggs



Baby Red-backed Salamander

Order Caudata – salamanders and newts

Family Plethodontidae

Northern Dusky Salamander (2.5-4.5 in.; 6.4=11.4 cm)**

- dark gray or brown w/ darker speckles
- medium size; keeled tail
- under logs/debris in forest with good canopy cover
- streams, springs, seeps within forest



Order Caudata – salamanders and newts

Family Plethodontidae (lungless salamanders)

Red-backed Salamander** (2-4 in.; 5.0-10.2 cm)

- under logs/debris in forest with good canopy cover
- 2 color morphs (redback, leadback)
- often with dark speckling



Order Caudata – salamanders and newts

Family Plethodontidae

Spring Salamander** (5-7 in; 13-18 cm)

- variably reddish, with some dark speckling
- large size with vertically flattened tail (good swimmer)
- under logs/debris near streamsides, springs, and vernal pools within forest



Order Caudata – salamanders and newts

Family Plethodontidae

Two-lined Salamander (2.5-3.75 in.; 6.4-9.5 cm)**

- yellow-brown with dark lines on either side
- under rocks logs/debris in streambeds, streamsides, and seeps within forest
- wetter sites than other Plethodontids



Order Caudata – salamanders and newts

Family Salamandridae



Red-spotted Newt** (2-5 in; 5-13 cm)

- eggs laid in ponds, small lakes, streams usually near forest
- aquatic larvae metamorphose into red eft & become terrestrial
- skin secretes a toxin (all life stages)
- Red Eft returns to water & transforms into adult



Red Eft (Juvenile)



Aquatic adult stage

Order Caudata – salamanders and newts

Family Ambystomatidae

Spotted Salamander** (4.5-8 in; 11-20 cm)

- large size
- black with large yellow spots
- prominent 'coastal grooves'
- under logs/debris in mature forest



Order Caudata – salamanders and newts

Family Ambystomatidae

Spotted Salamander (4.5-8 in; 11-20cm)

- breed in vernal pools in mature forest
- ~mid March after warm rain, mass migration to breeding pools



Aquatic larval stage



Aquatic egg mass

Order Caudata – salamanders and newts

Family Ambystomatidae

Salamander migrations



Interested to learn more?

Cornell Herpetological Society

http://orgsync.rso.cornell.edu/show_profile/74437-herpetological-society-cornell

Class Reptilia

- ectothermic – body temp not maintained through physiological processes
- low metabolic rate (low food and energy requirements)
- skins is covered with scales or scutes
- no aquatic larval stage, most reptiles area oviparous (egg-laying), although several species of squamates are viviparous (give birth to live young)



Class Reptilia (total ~10,272 species)

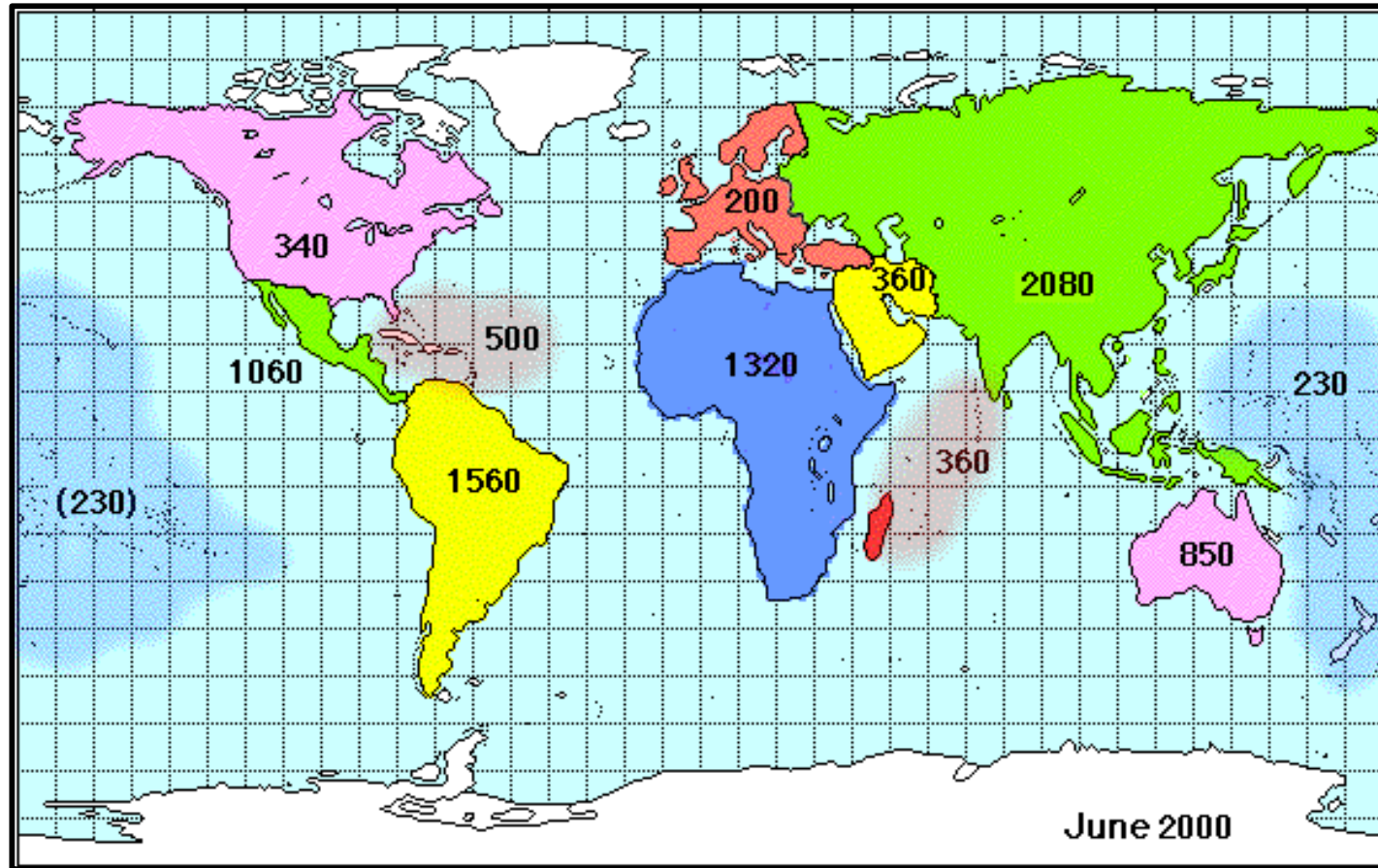
Order Squamata – lizards	6145
“ “ - snakes	3567
Order Testudines – turtles	341
Order Crocodylia – crocodilians	25
Order Rhynchocephalia – tuataras	1

* Approx 100 newly described species in each of the last 10 years; 180 in 2014 alone, a record year!

<http://www.reptile-database.org/>



Reptile Diversity



Order Squamata – snakes and lizards

Family Colubridae

Garter Snake** (1.5-3 ft; 45-90 cm)

- variable; brown or black above with pale dorsal and lateral stripes OR more checkered/spotted
- common in a wide variety of habitats; often basking at trail edges
- diet: wide variety of small animal prey



Order Squamata – snakes and lizards

Family Colubridae

Northern Watersnake (2-3.5 ft; 60-105 cm)

- large, highly aquatic snake; very common, occurring in almost every wetland throughout range
- highly variable; black to brown above with paler cross bands
- diet: usually fish, but other aquatic species taken



Order Squamata – snakes and lizards

Family Colubridae

Milksnake (2-3 ft; 60-90 cm)

- variable; reddish brown black-bordered blotches on back; separated by gray to tan background color
- black-checked undersides; pale “Y” or “V” mark on head
- fields, woodlands, often around habitations
- found under logs/debris
- diet: mostly small mammals



Order Squamata – snakes and lizards

Family Colubridae

Ring-necked Snake (1-1.5 ft; 30-45 cm)

- small snake, uniform dark color above with yellow neck collar
- underside bright yellow; shown in a warning display
- under logs/debris in woodlands
- diet: diverse, but salamanders and earthworms are important



Order Squamata – snakes and lizards

Family Colubridae

Red-bellied Snake (8-12 in; 20-30 cm)

- all have reddish belly and 3 pale spots around neck
- coloration of upperparts highly variable
- found in or near woodlands, also near bogs
- diet: small prey items



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Order Squamata – snakes and lizards

Family Colubridae

Smooth Greensnake (1-1.75 ft; 30-53 cm)

- uniform bright green above, and white/yellowish below
- small, gentle snake found in openings, grassy areas
- diet: insects/spiders



Order Squamata – snakes and lizards

Family Viperidae (Venomous)

Copperhead (2-3 ft; 60-90 cm)

- viewed from above, head coppery red and hourglass pattern on back
- triangle-shaped head as most vipers
- diet: small mammals, birds, other vertebrates; large insects
- rocky, wooded hillsides in mountainous areas (southeastern NY)
- communal dens in winter



Order Squamata – snakes and lizards

Family Viperidae (Venomous)

Timber Rattlesnake (3-5 ft; 90-150 cm)

- blackish crossbands on a background of brown, often blackish tail
- # rattles doesn't indicate age (one bead added when skin is shed)
- small mammals, birds, other vertebrates
- communal dens with rattlesnakes and other species
- heavily forested areas, rocky areas (lives in our area)



Order Squamata – snakes and lizards

Family Scincidae

Coal Skink (5-7 in; 13-18 cm)

- a four-lined skink; light stripes extend onto tail
- a broad dark lateral stripe
- sides of head on males are reddish during breeding season
- humid wooded hillsides with abundant leaf litter or loose stones; also, springs and rocky bluffs overlooking creek valleys



Order Testudines – turtles

Family Chelidridae

Snapping Turtle (10-16 in; 25-40 cm & 10-35 lbs; 4.5-16 kg)**

- very large size, large head; armored legs and tail
- diverse diet: birds, reptiles, fish, etc. but also plant matter
- ponds, lakes, swamps , rivers ; rarely bask in sun

** Like other turtles, lays leathery eggs in sandy/soft ground



Order Testudines – turtles

Family Emydidae

Painted Turtle (4.5-6 in; 11-15 cm)

- common, highly aquatic turtle of ponds, lakes, swamps, marshes
- social species, sunning in groups on floating logs
- striped yellow on head
- bright red/black pattern at edge of shell
- omnivorous: vegetation, small fish, crustaceans, snails, etc



Order Testudines – turtles

Family Emydidae

Wood Turtle (5.5-8 in; 14-20 cm)

- terrestrial turtle of forested landscapes ; omnivorous
- dark above, rough, sculpted shell
- orange color around legs and neck
- checkered pattern on underside (plastron)
- locally threatened to endangered

