Frogs and Turtles of Connecticut

May 10th 2017

Announcements!

- I should have everyone's research questions in my inbox
  - I'll have returned feedback for your research questions before or around 2:30 today
  - Once you have your feedback in hand, proceed with assignment #2, making hypotheses!
  - Overall patterns I see in your research questions:
    - Great ideas, but some are going to be way more feasible to test than others (what can you both measure *and* accomplish?)
    - The more specific you can get, *the better*

Assignment #2: **5 Testable Hypotheses**

- In a **Word document**, send me 5 testable hypotheses based on your observations in the field, or just your curiosity
  - Name your file: LastName_ResearchQuestions.docx
  - Email it to me with subject line: Field Herpetology Hypotheses
- Due by 9am on Thursday May 10th
- Expect feedback Thursday afternoon
- Example...

Assignment #2: **5 Testable Hypotheses**

"What determines how often a frog calls?"

- Focus on specificity…
- Make an "if...then…" statement if all else fails
  - (science is often much more complicated than testing these statements, but it's a good framework)

Version 1: "The frequency of the call from an individual *Rana clamitans* at night changes with water temperature."

Version 2: "If the frequency of the call from an individual *Rana clamitans* at night changes with water temperature, then water temperature likely affects how often frogs call."

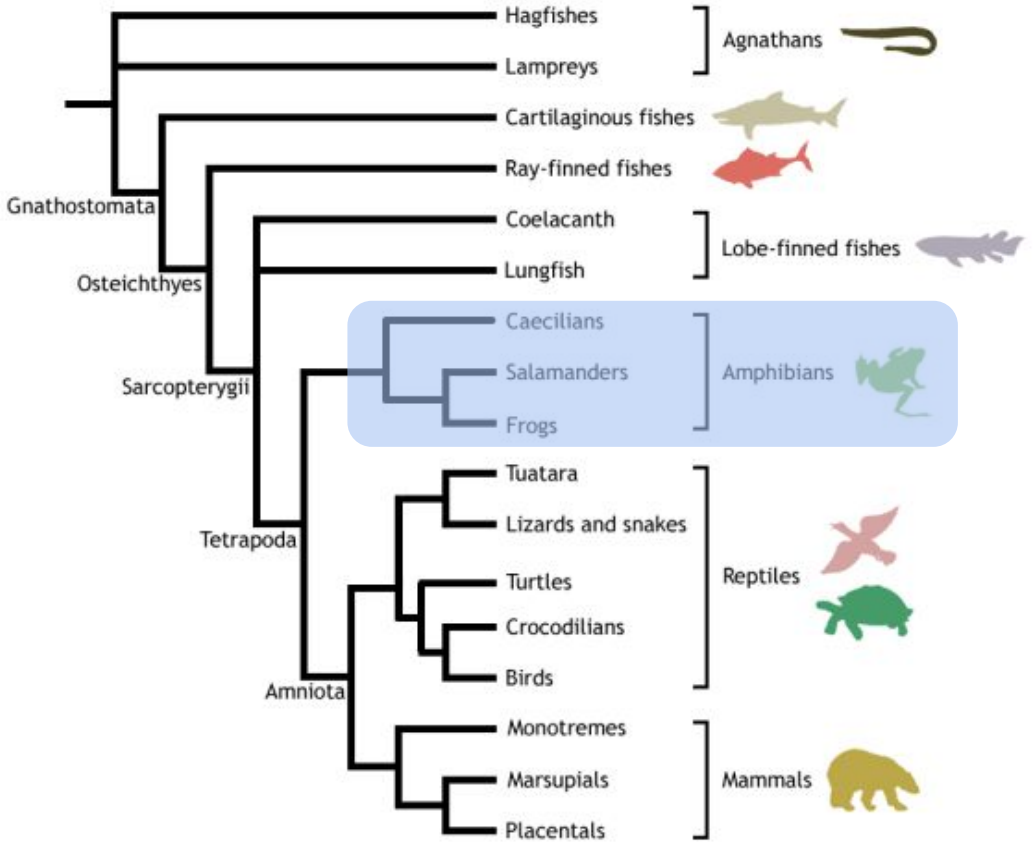
Class Lissamphibia: **Extant Amphibians**

Three major **orders**:

Gymnophiona
(caecilians)

Caudata
(salamanders)

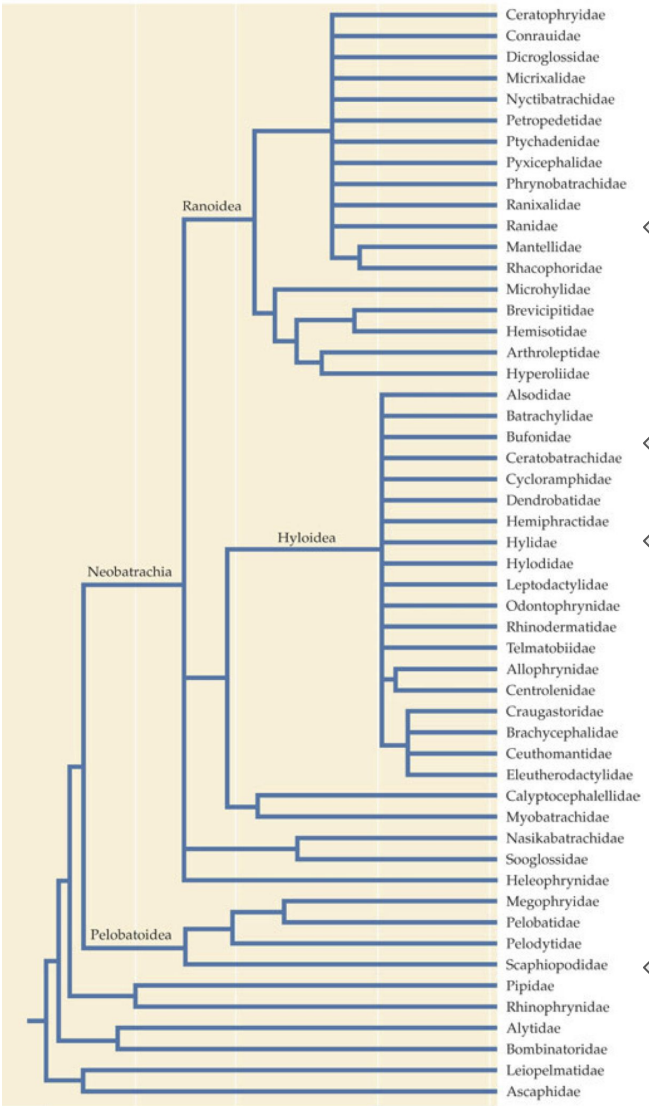
Anura
(frogs)



Order Anura: **Frogs**

- “Without tail”
- ~ 6000 species worldwide, hyper-diverse clade
- 4 families with 10 species in Connecticut
    - In Connecticut, males make advertisement calls
- Shared characteristics:
    - Radical metamorphosis from tadpole to adult
    - Elongated hind limbs
    - Lack of tail

Order Anura: **Frogs**



Ranidae

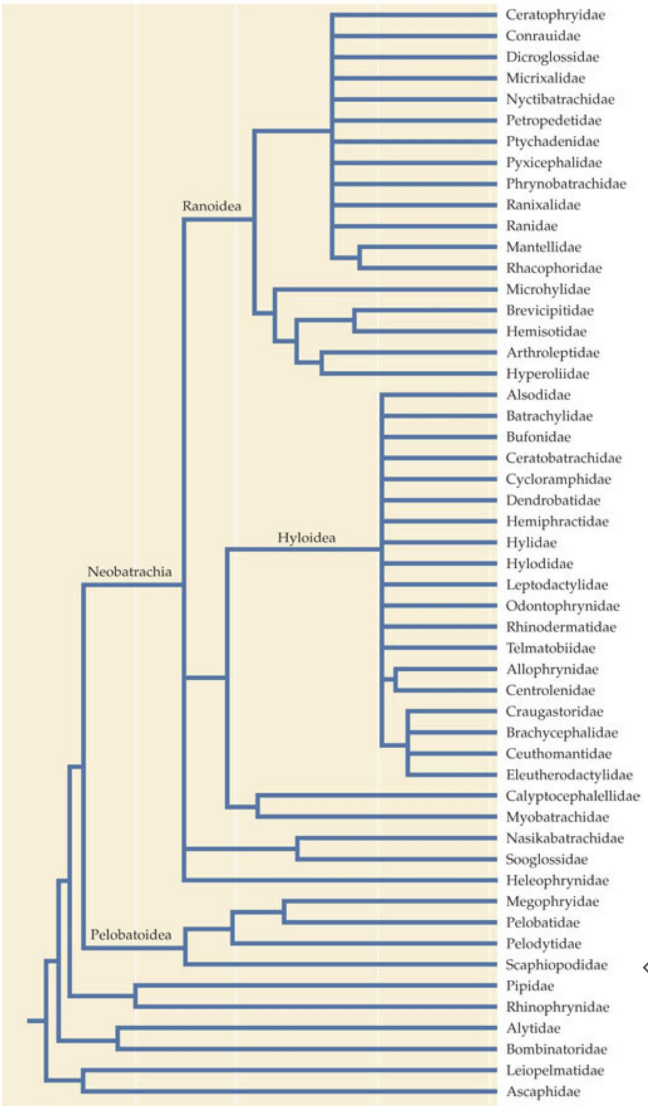
Bufonidae

Hylidae

Scaphiopodidae

Connecticut families

Order Anura: **Frogs**



Scaphiopodidae

Family Scaphiopodidae: **North American Spadefoots**

(A)

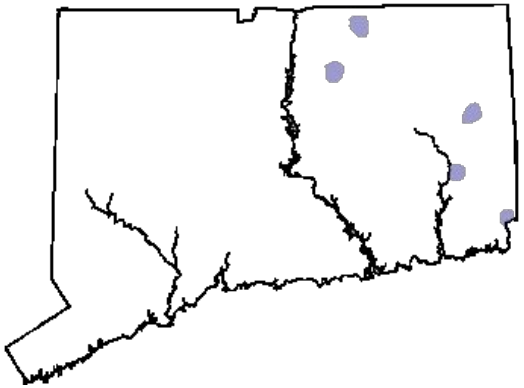
(B)

***HERPETOLOGY 4e*, Figure 3.28**

- The only group of “primitive frogs” found in CT
- Most well known for the desert species in the American Southwest
- Go from egg hatching to adult frog in just 8 days

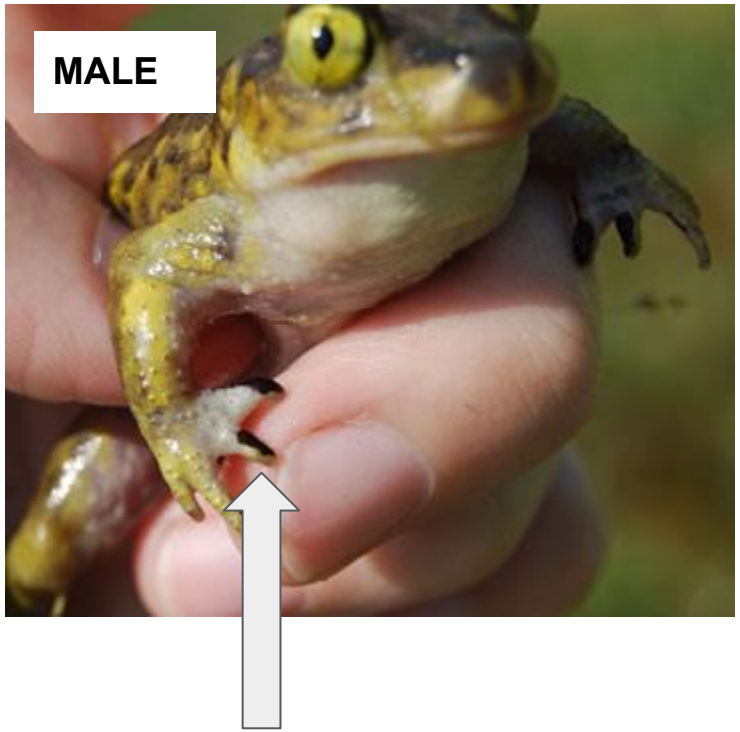
Scaphiopus holbrookii: **Eastern Spadefoot Toad**

- DEEP Status: **HIGHLY ENDANGERED**
- “The species was only seen 8 times at various locations throughout the state from 1970 to 1989.”
- Nocturnal, burrowing toad (spends the year underground)
- Prefers sandy / loose soil
- Vertical pupils
- Digging structures on back legs
- Single day explosive breeder, triggered by first major fall in barometric pressure in the spring



Scaphiopus holbrookii: **Eastern Spadefoot Toad Call**

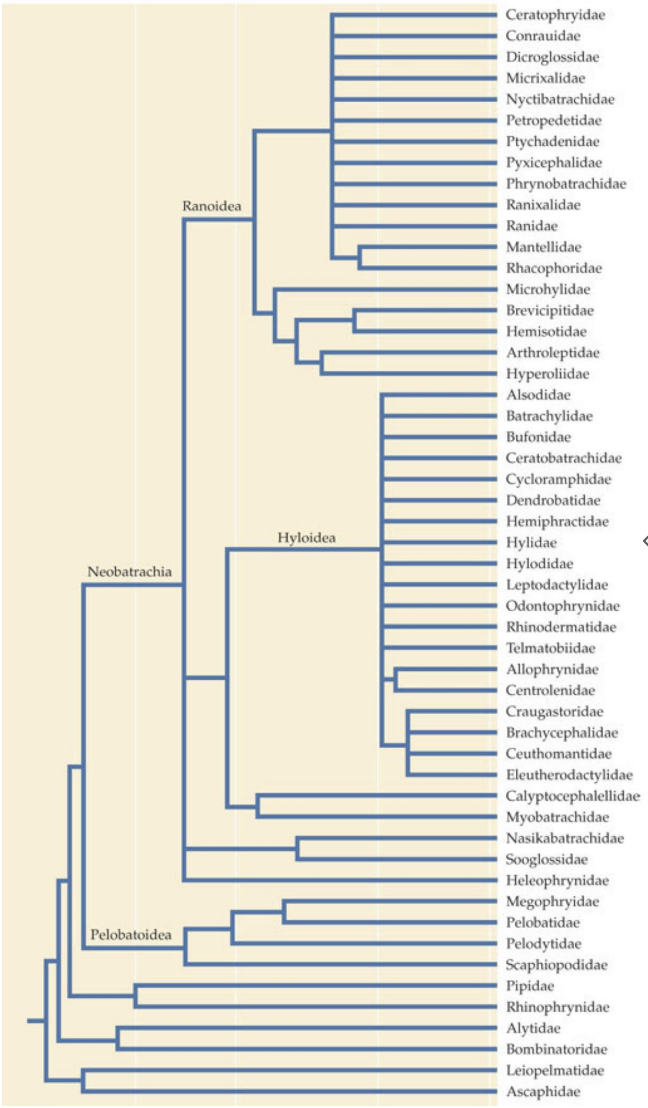
Scaphiopus holbrookii: **Eastern Spadefoot Toad Male & Female**



Males: Nuptial pads on forelimbs

Females: No nuptial pads

Order Anura: **Frogs**



Hylidae

Family Hylidae: **Tree Frogs**

(A) Hylinae

(B) Phyllomedusinae

(C) Pelodryadinae

***HERPETOLOGY 4e*, Figure 3.42**

- Primarily an arboreal group
- Well developed toe discs (pads)

Pseudacris crucifer: **Spring Peeper**

- Tiny frog!
- One of the first to call every **spring** (from first warm spring night until ~end of April)
- Dark “X” on the back is prominent
- Sexing:
  - **Males:** darker throat pouches

Pseudacris crucifer: **Spring Peeper Call**

Hyla versicolor: **Gray Tree Frog**

- DEEP Status: **DECLINING**
- Only true tree frog in CT
- Enlarged toepads for climbing
- Undersides of legs are very yellow
- Can change color, gray to light green
- **Long breeding season**, slowly descend trees through April-May, breed from June-July

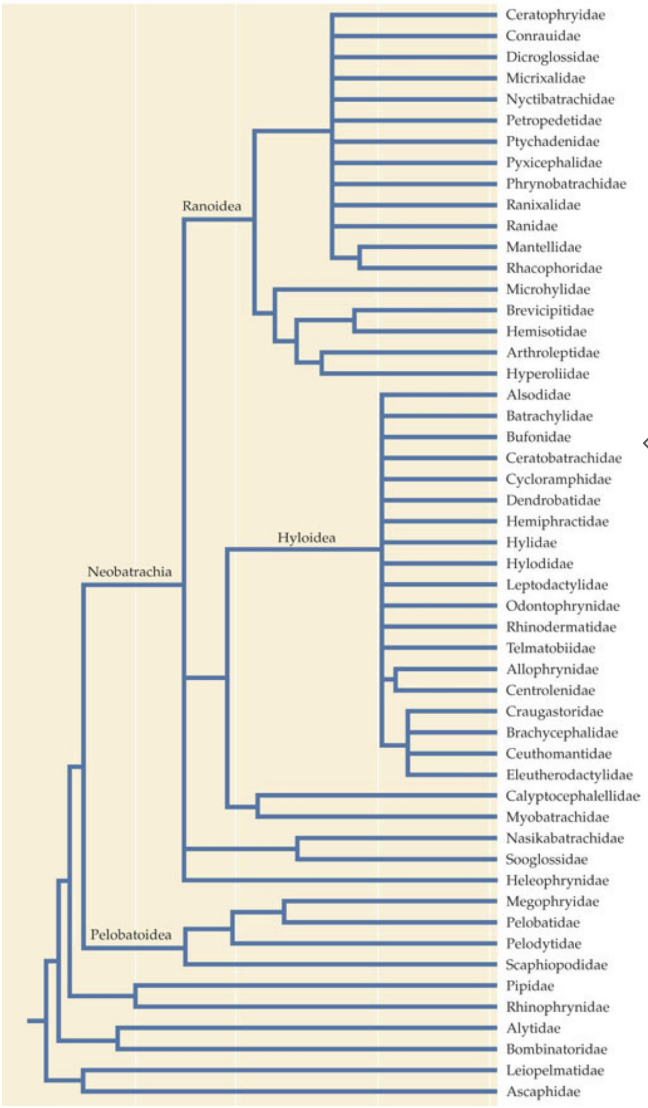
Hyla versicolor: **Gray Tree Frog Call**

Hyla versicolor: **Gray Tree Frog Call Male & Female**

Males: Black/brown throat

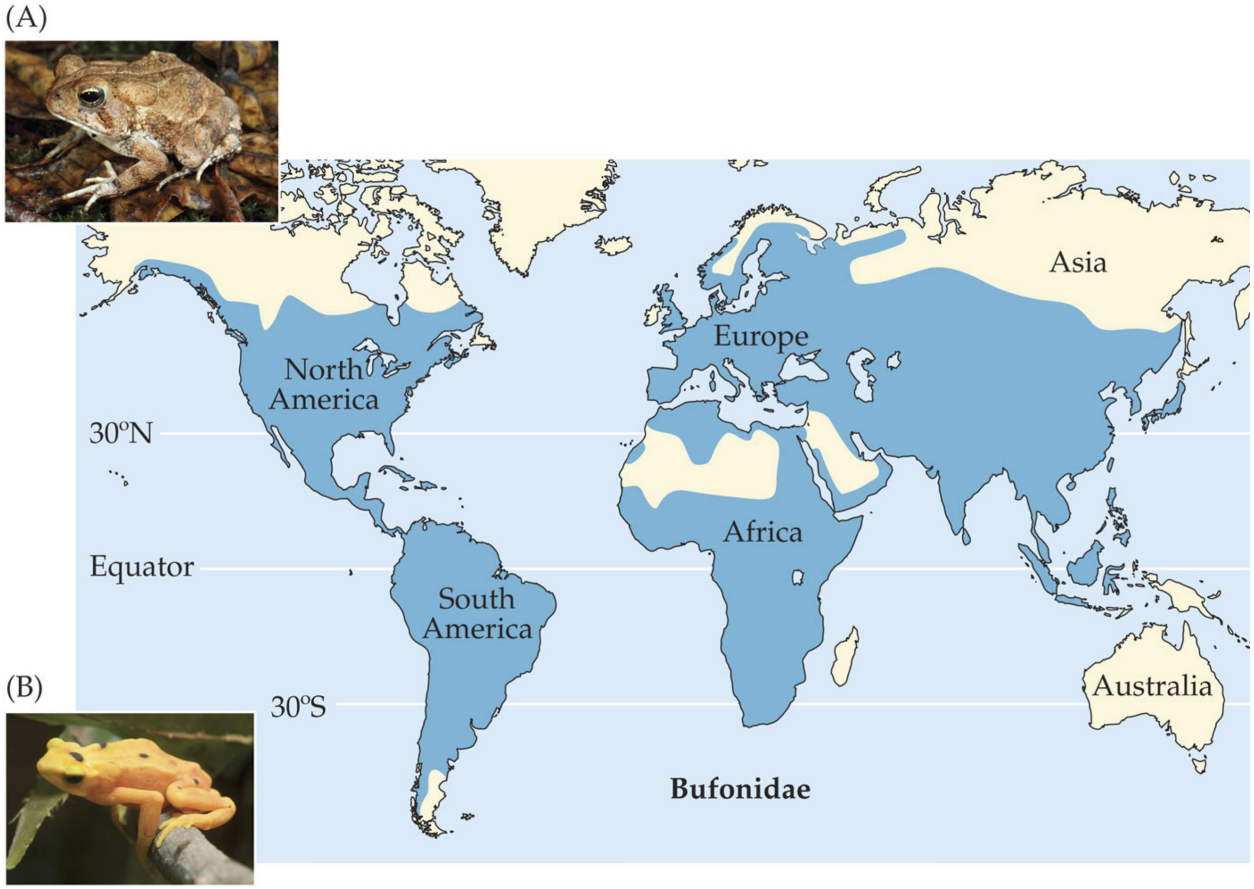
Females: White throat

Order Anura: **Frogs**



Bufonidae

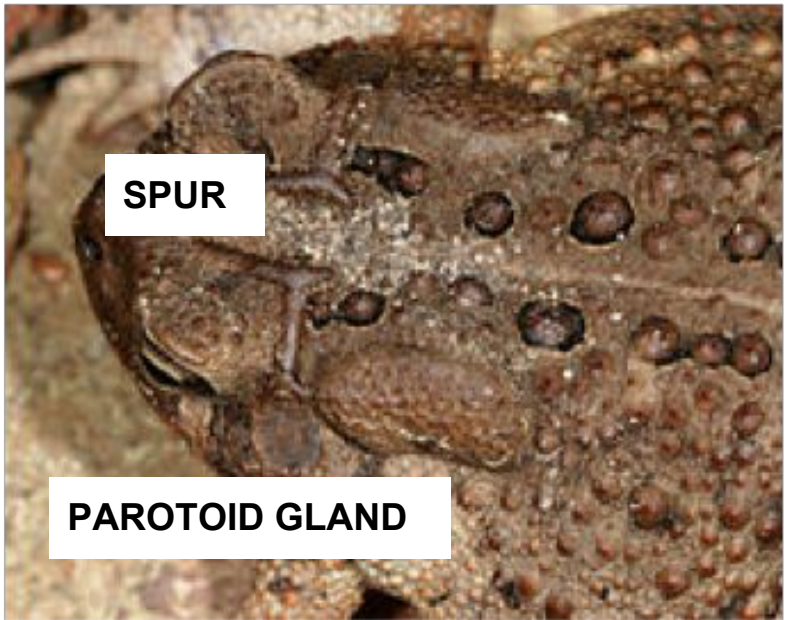
Family Bufonidae: **True Toads**



***HERPETOLOGY 4e*, Figure 3.47**

- Extremely diverse family of frogs
- Known for their conspicuous cutaneous glands
  - **Parotoid gland** secretes **bufotoxin**
- Difficult time classifying groups within Bufonidae

Bufo (Anaxyrus) americanus: **American Toad**

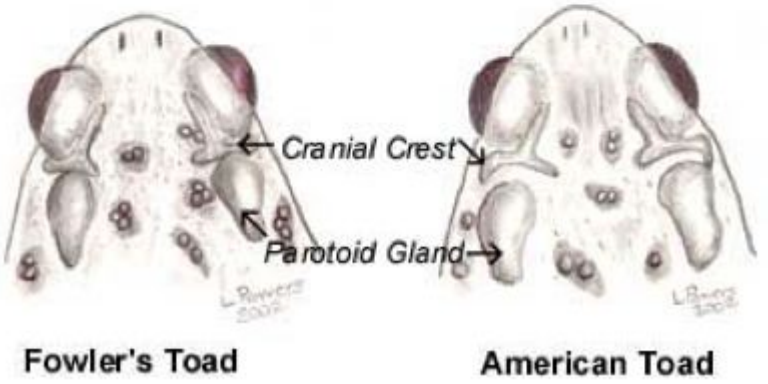


- Large, warted frog
- Large parotoid glands behind the eyes
- Common in CT
- Found in forests and fields
- Explosive breeder in temporary ponds in **late April**
- Sexing:
  - **Males:** presence of nuptial pad on forelimbs

Bufo (Anaxyrus) americanus: **American Toad Call**

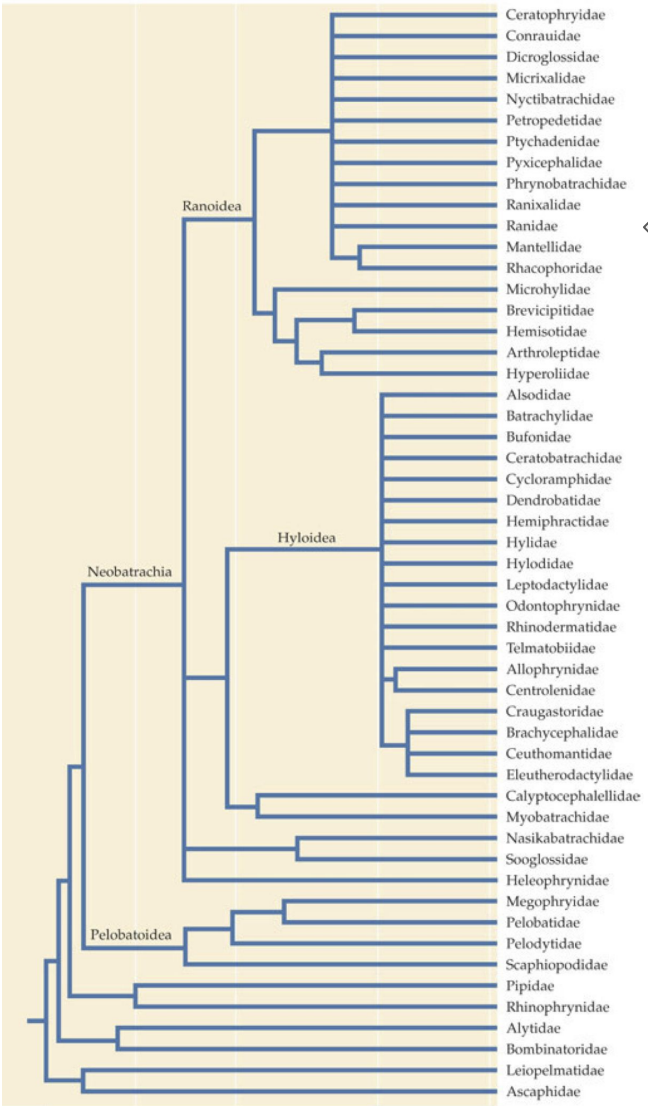
Bufo (Anaxyrus) fowleri: **Fowler's Toad**

- DEEP Status: **SECURED**
- Very similar to *B. americanus*, but rarer in CT
  - Species hybridize as *B. fowleri* move northward
- Also prefers sandy / loose soil
- No spur connecting crests to parotoid glands
- Sexing:
  - **Males:** presence of nuptial pad on forelimbs



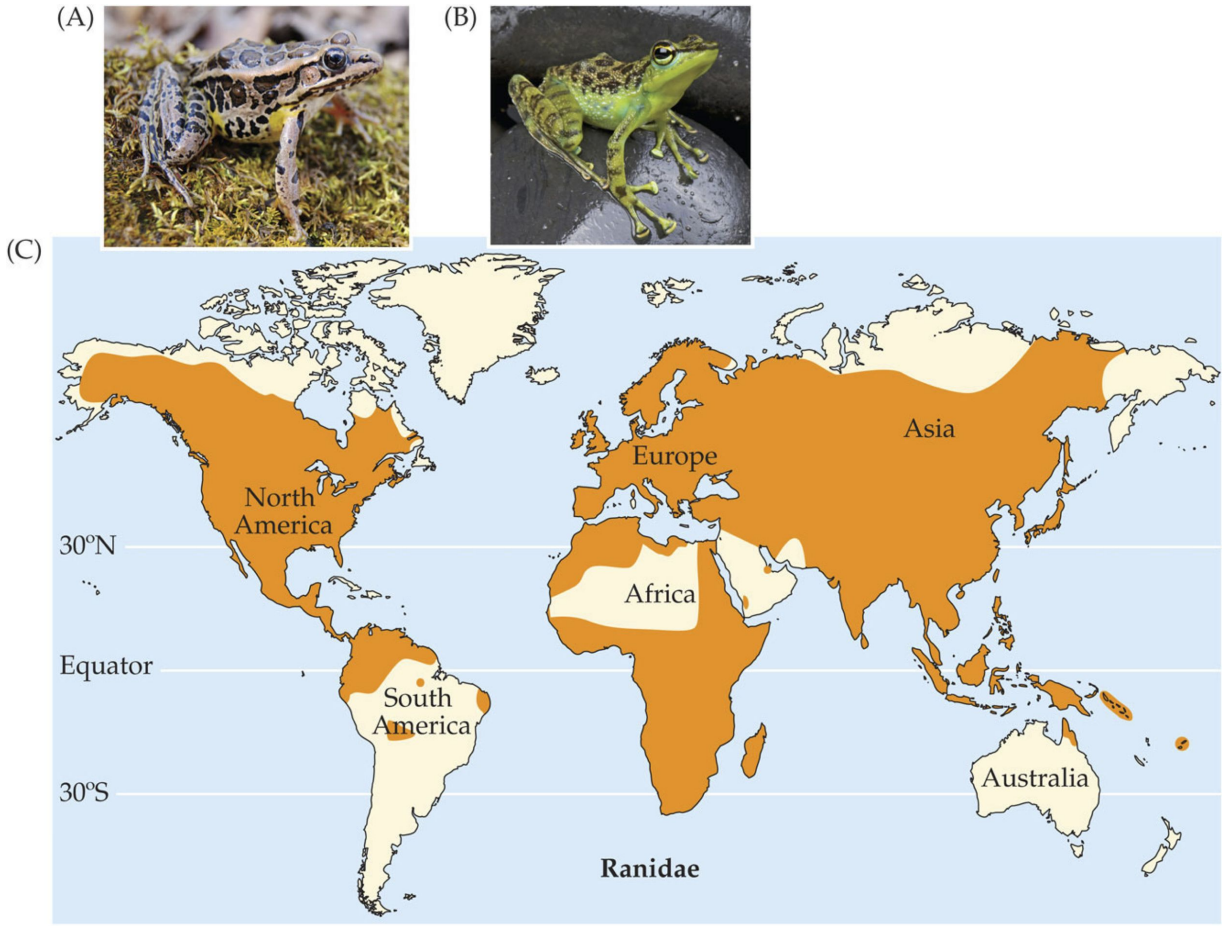
Bufo (Anaxyrus) fowleri: **Fowler's Toad Call**

Order Anura: **Frogs**



Ranidae

Family Ranidae: **True Frogs**



***HERPETOLOGY 4e*, Figure 3.56**

- Highly aquatic frogs with large hindlimb and toe webbing
- Also considerable debate about classifying groups within Ranidae (like Bufonidae)

Rana (Lithobates) pipiens: **Leopard Frog**

- DEEP Status: **SPECIAL CONCERN**
- One of the most common frogs in the US, but in decline
- Uncommon in eastern CT
- Found in floodplain forests and meadows in CT River Valley
- Similar to *Rana palustris*
- Spots on back arranged in no particular pattern, more rounded
- Legs have spots, not stripes
- Sexing:
  - **Males:** nuptial pad presence

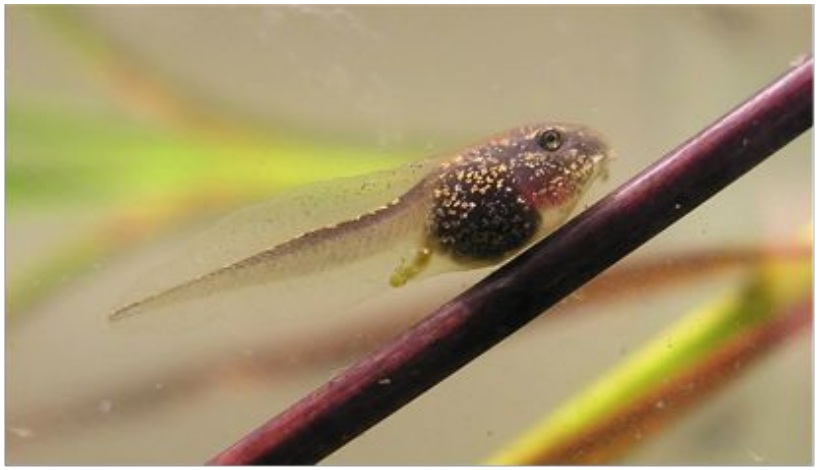
Rana (Lithobates) pipiens: **Leopard Frog Call**

Rana (Lithobates) palustris: **Pickerel Frog**

- Similar in appearance to *Rana pipiens*, but much more common
- More squarish spots
  - Spots in distinct rows
- Found in a variety of temporary and permanent ponds and streams
- Breeds in **late spring** to **early summer**
- Sexing:
  - **Males:** nuptial pad presence

Rana (Lithobates) palustris: **Pickerel Frog Call**

Rana (Lithobates) sylvatica: **Wood Frog**



- One of the first frogs to emerge after winter (as soon as surface ice on ponds melt)
- Explosive **early spring** breeding (first warm night in April)
    - Freeze tolerant
- Light tan, with a brown “mask”
- After breeding, distributed widely in forests
- Sexing:
    - **Males:** nuptial pad presence

Rana (Lithobates) sylvatica: **Wood Frog Call**

Rana (Lithobates) catesbeiana: **Bull Frog**

- Largest frog in CT
- Ridges end after tympanum
- Tadpoles may overwinter, spend several years as tadpoles before metamorphosing

Rana (Lithobates) catesbeiana: **Bull Frog Call**

Rana (Lithobates) catesbeiana: **Bull Frog Male & Female**

Females: Tympanum the size of the eye or smaller

Males: Tympanum larger than the eye

Rana (Lithobates) clamitans: **Green Frog**

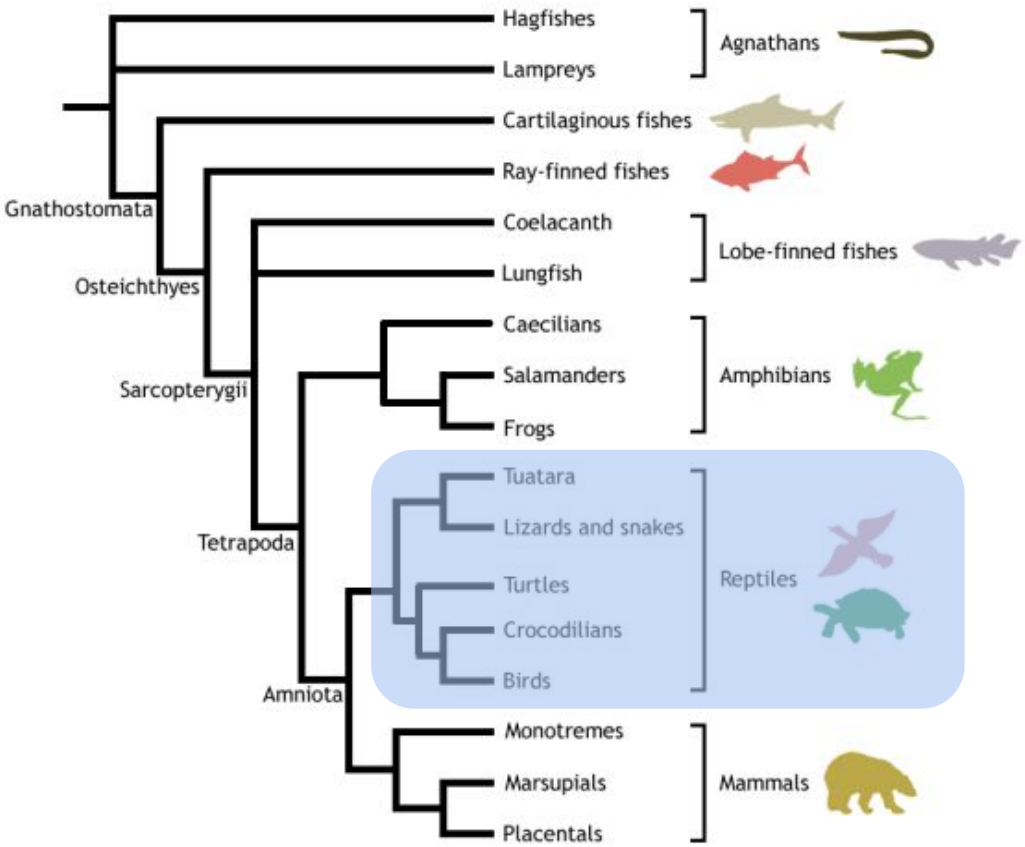
- Similar to *Rana catesbeiana*
  - Smaller
  - Not always green! Sometimes fully or partially bronze
- Common in CT
- Dorsal ridges run the whole length of the body
- Sexing:
  - Same rule as *R. catesbeiana*, males have tympanums larger than their eyes

Rana (Lithobates) catesbeiana: **Bull Frog Call**

Class Reptilia: **Extant Reptiles**

- “Non-avian reptiles”
  - Turtles
  - Lizards
  - Snakes
  - Crocodiles
- Shared characters:
  - Hard scales
  - All breathe air via lungs, **no cutaneous repiration**

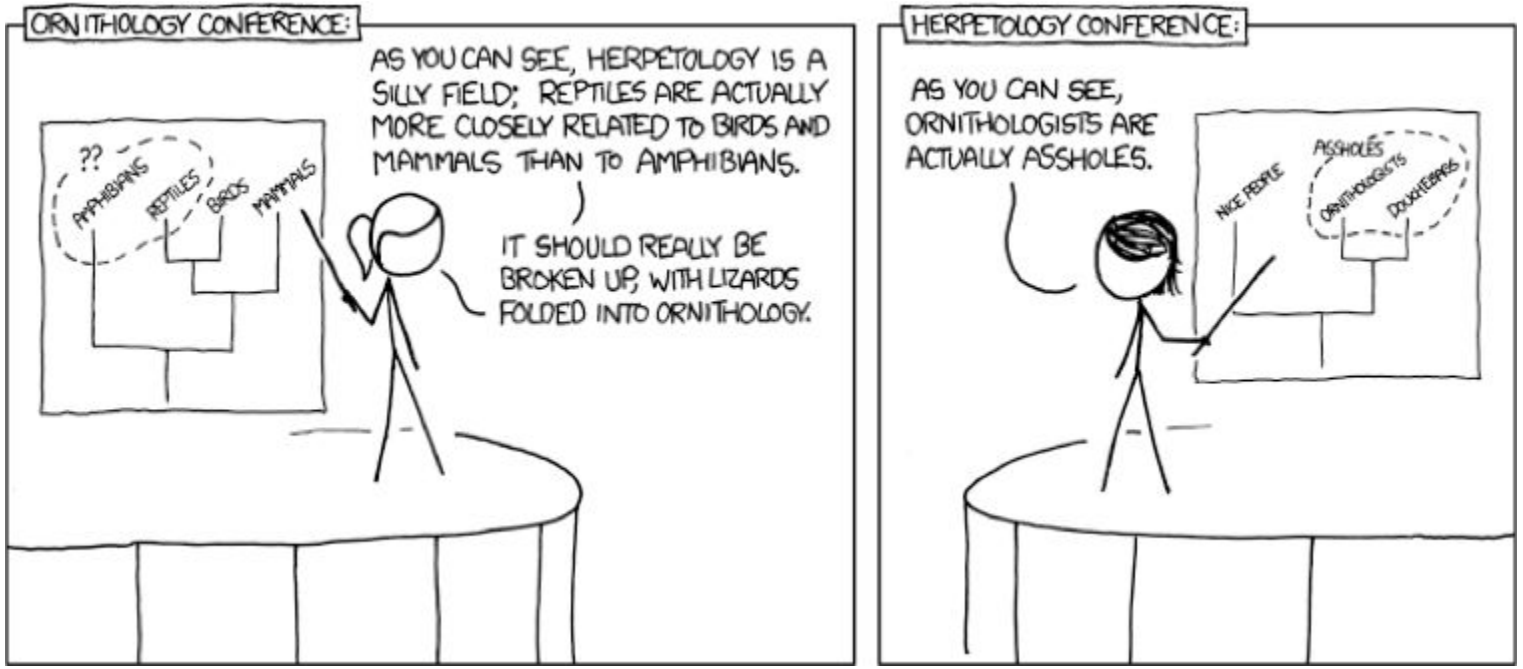
Class Reptilia: **Extant Reptiles**



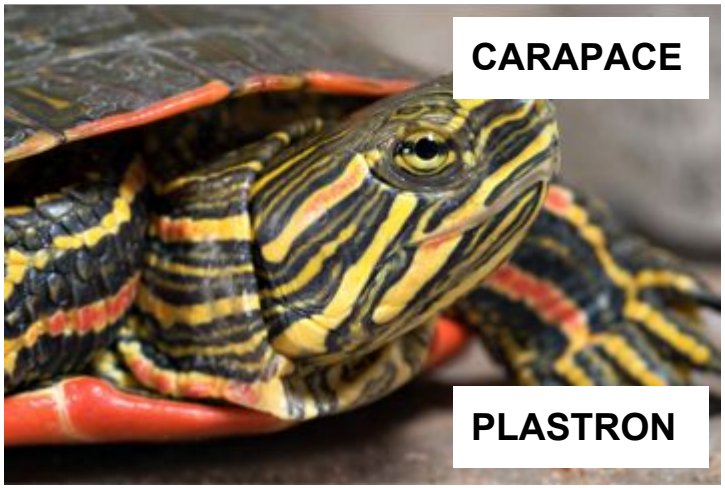
- Turtles are sisters to crocodiles and birds
  - Yeah, birds are reptiles, haven't you watched Jurassic Park yet?
- Lizards and snakes are part of one clade called the squamates (squamata)
  - Squamates are sister to a "living fossil" clade, made up of one species, the Tuatara of New Zealand

“Reptiles”: **Non-Avian Extant Reptiles**

- We’re really studying “reptiles”, not the entirety of Class Reptilia

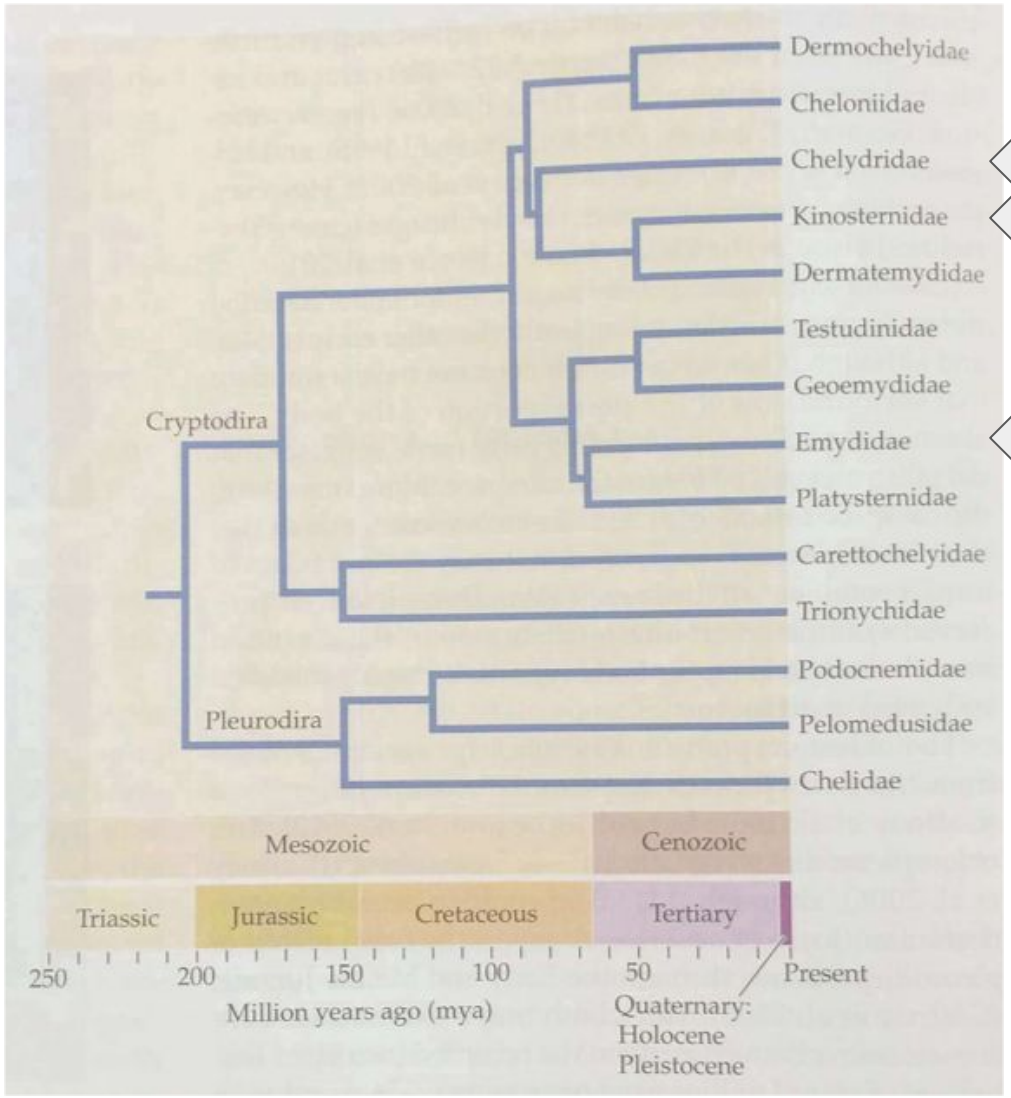


Order Testudinia: **Turtles**



- Closely related to alligators and birds
- Distinguishing characteristics:
  - Hard shell
    - Top of shell: Carapace
    - Bottom: Plastron
  - No teeth (hard beak)
- 300 species worldwide across 14 families
- 8 species in CT (not including marine visitors), with 3 families

Order Testudinia: **Turtles**

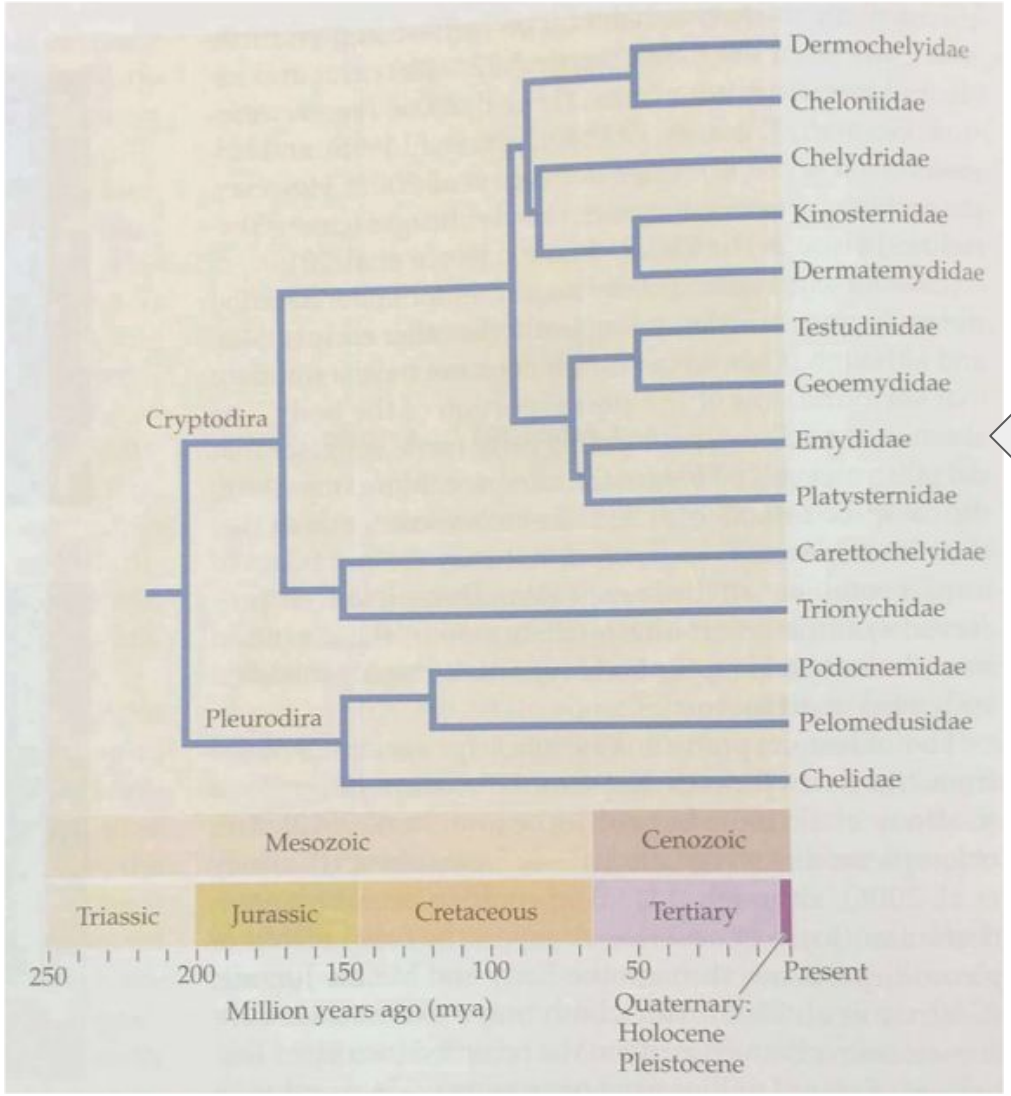


Chelydridae
Kinosternidae

Emydidae

Connecticut families

Order Testudinia: **Turtles**



Emydidae

Family Emydidae: **Pond Turtles**

Figure 4.83 Emydidae. (A) European pond turtle, *Emys orbicularis* (Emydinae). (B) Red-eared slider, *Trachemys scripta* (Deirochelyinae). (C) Distribution. (Photographs: A © Dennis Jacobsen/Shutterstock; B courtesy of Todd W. Pierson.)

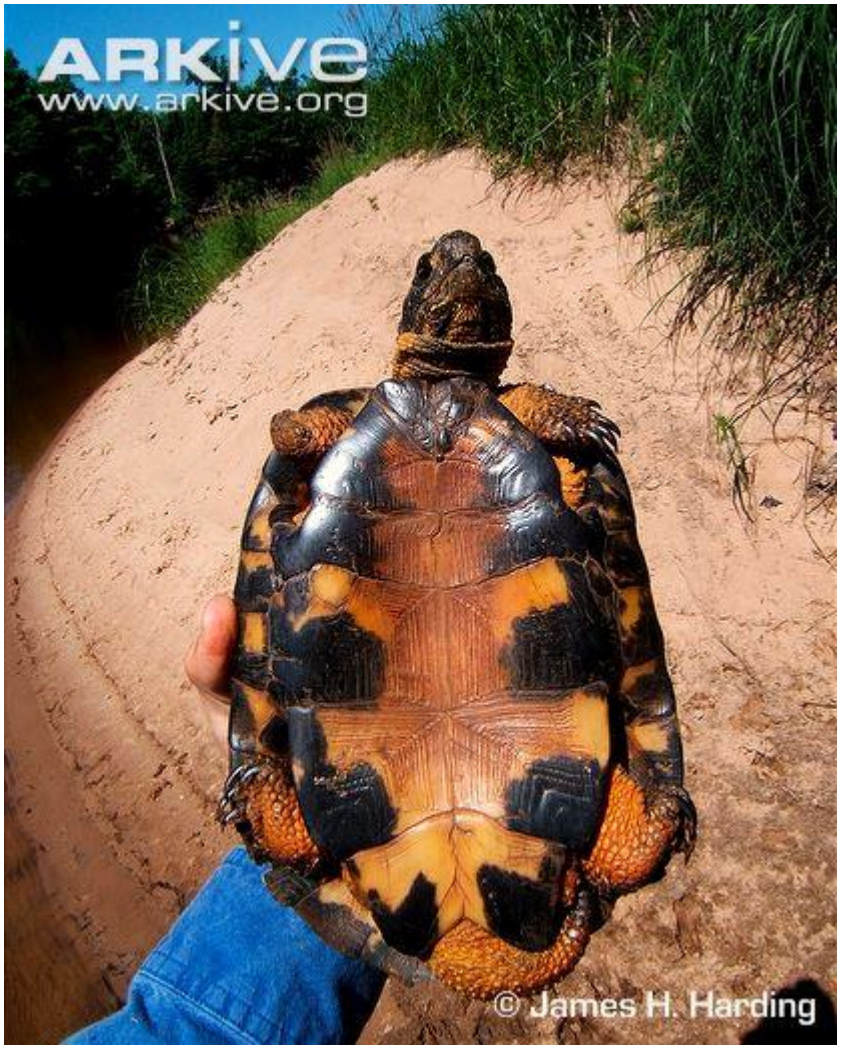
- Usually what you think of when you imagine a turtle
- Emydids are mostly small freshwater aquatic turtles, with a few exceptions
- Most turtles in CT are emydids

Glyptemys (Clemmys) insculpta: **Wood Turtle**

- DEEP Status: **SPECIAL CONCERN**
- “The White Whale of the Fenton”
- Bright orange legs
- Flattened shell, dull carapace with bright plastron
- Prefers rivers and large streams, but can still often be found terrestrially
  - With sandy bottoms
  - With surrounding riparian habitat

Glyptemys (Clemmys) insculpta: **Wood Turtle**

Males



Males: Concave plastron, longer and thicker tail

Glyptemys (Clemmys) muhlenbergii: **Bog Turtle**

- DEEP Status: **ENDANGERED**
  - Protected as a threatened species throughout the US
- Similar in appearance to the wood turtle
  - Has large orange spot on the neck
  - Shell has a higher dome
  - Much smaller
- Breed late April to early June
- Rarely seen due to habitat disturbance
- Only found in select western CT towns in limestone valleys
- Sexing: same as wood turtles

Clemmys guttata: **Spotted Turtle**

- Dark shell with orange/yellow spots
- At home in marshy meadows, swamps, and ditches
- A common resident of the Fenton meadow pools

Clemmys guttata: **Spotted Turtle Male & Female**

Males: Concave plastron, longer and thicker tail

Females: Thinner tail

Malaclemys terrapin: **Diamondback Terrapin**

- More common in estuaries and tidal marshes on the shore west of the CT river outlet
- Love unpolluted brackish water
- White face with sculpted shell
- Young have prominent spotted coloration and patterning on the shell
- Sexing:
    - **Males:** concave plastron, longer and thicker tail

Chrysemys picta: **Eastern Painted Turtle**

- Most common turtle in CT
- Nests made in sandy soils in early summer
- Often seen basking on rocks in large ponds

Chrysemys picta: **Eastern Painted Turtle Male & Female**

Males: Long claws (plus concave plastron, longer and thicker tail)

Females: Short claws

Terrapene carolina: **Eastern Box Turtle**

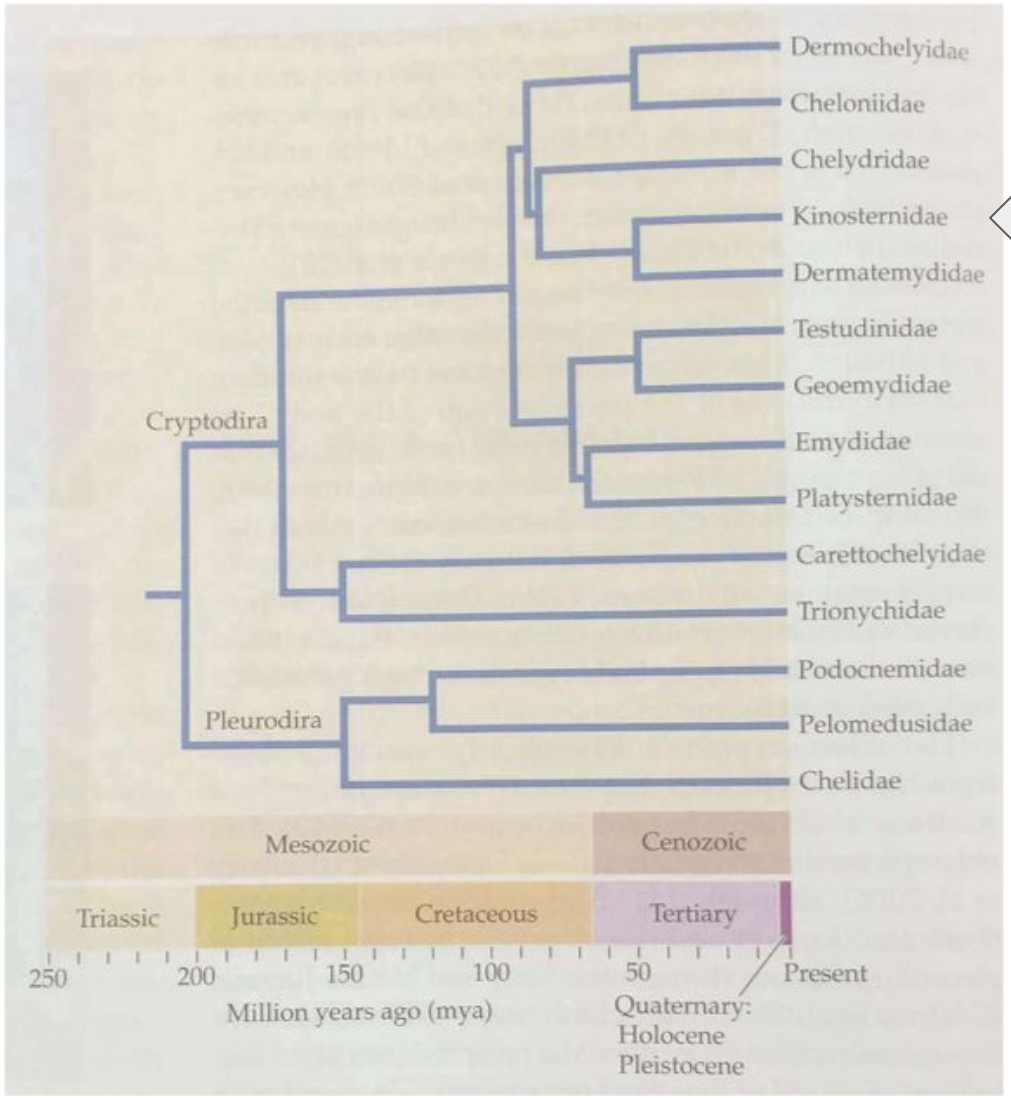
- DEEP Status: **SPECIAL CONCERN**
- Large domed shell
  - Brightly covered carapace
  - Shell can close completely
- Inhabits well-drained woodland areas, sometimes swamp-like areas, but mostly open forests
- More common in CT lowlands, rarer in NE and NW corners

Terrapene carolina: **Eastern Box Turtle Male & Female**

Males: Red eyes (plus concave plastron, longer and thicker tail)

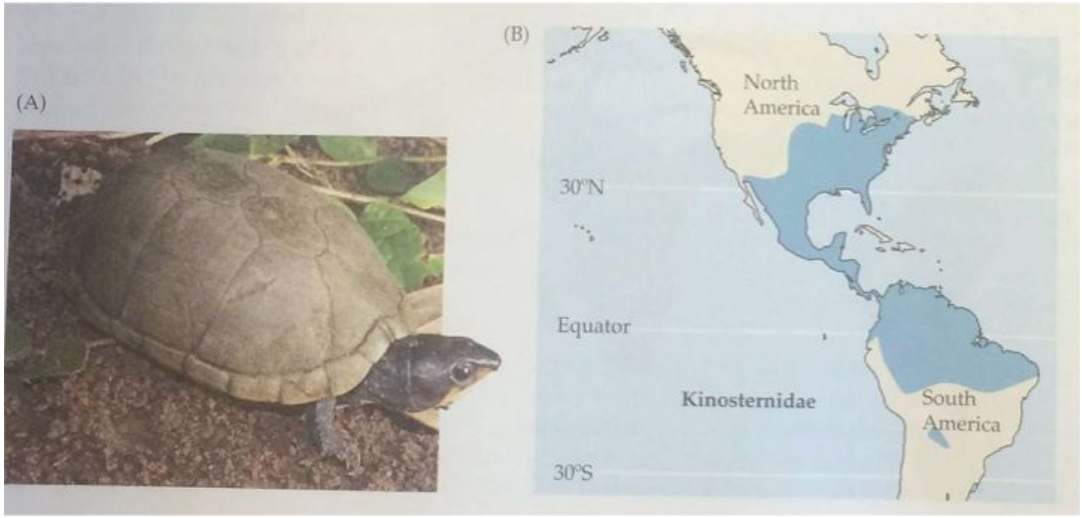
Females: Brown eyes

Order Testudinia: **Turtles**



Kinosternidae

Family Kinosternidae: **Mud and Musk Turtles**

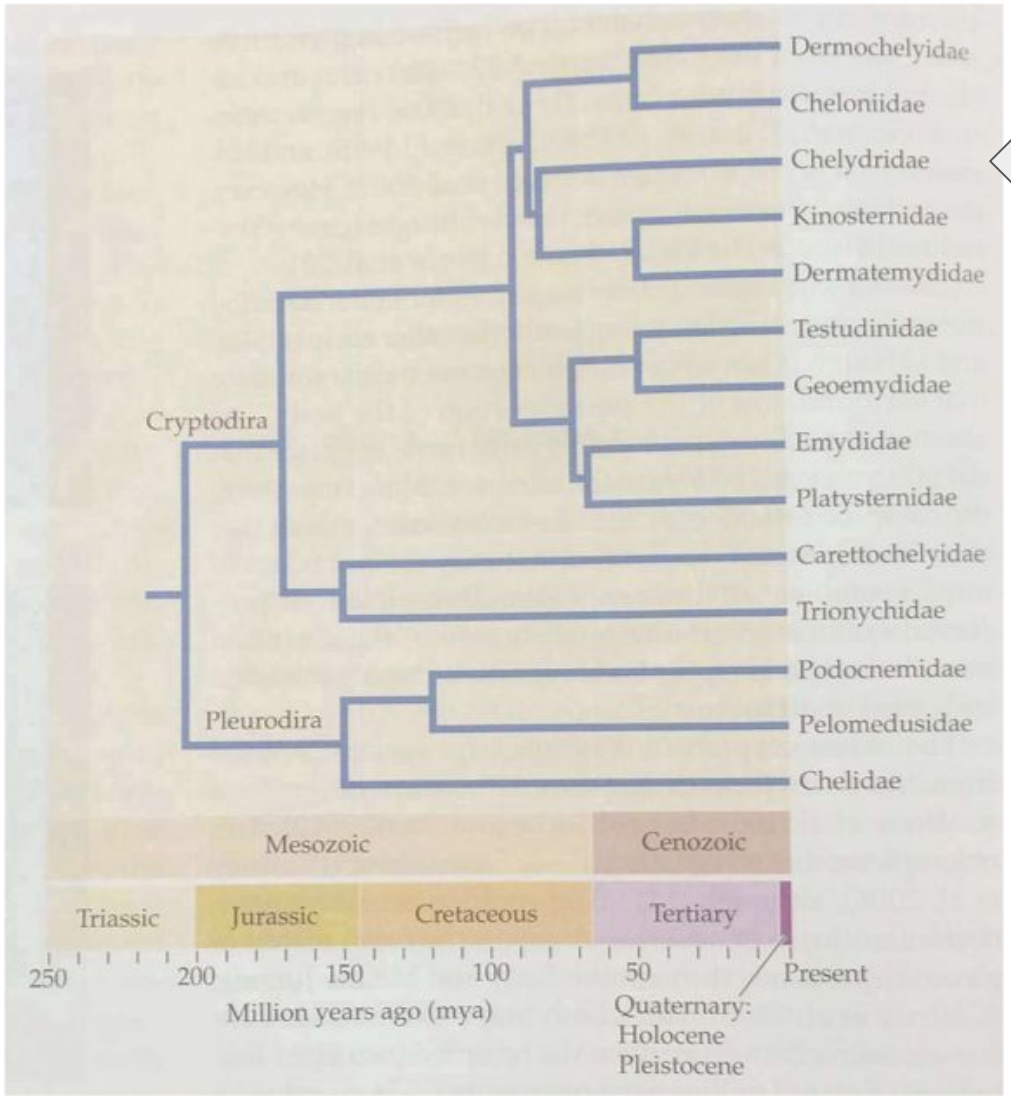


- Known for the foul-smell they emit from their cloaca
- Mostly bottom dwellers
- Carnivorous

Sternotherus odoratus: **Musk Turtle / “Stinkpot”**

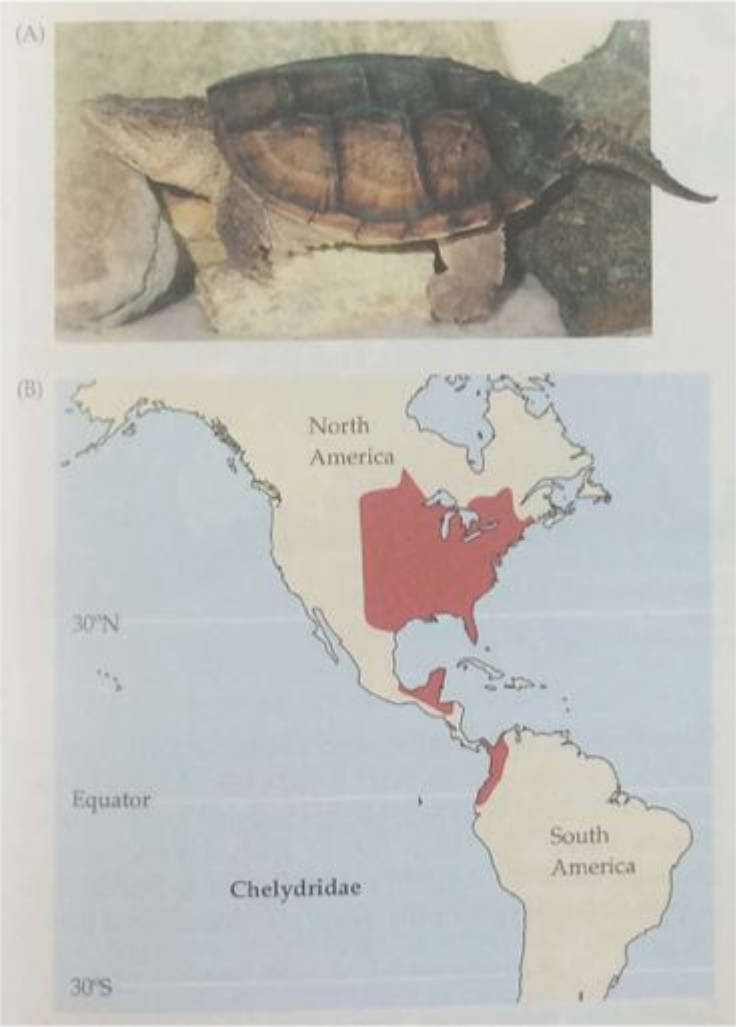
- Small turtle, with a dome shell
  - Three stripes along the head
- A bottom crawler in marshes, slow streams, and ponds
  - Typically covered in algae
- Emits a strong musk (duh)
- Much more common in the Housatonic and Thames river drainages, some very limited populations in the north
- Sexing:
  - **Males:** concave plastron, longer and thicker tail

Order Testudinia: **Turtles**



Chelydridae

Family Chelydridae: **Snapping Turtles**



- A small family of turtles with only 6 species, mostly known for common snapping turtles and alligator snapping turtles
- Grow to very large sizes, and are some of the largest freshwater turtles
- Very aquatic, but are poor swimmers: prefer to walk on the bottom

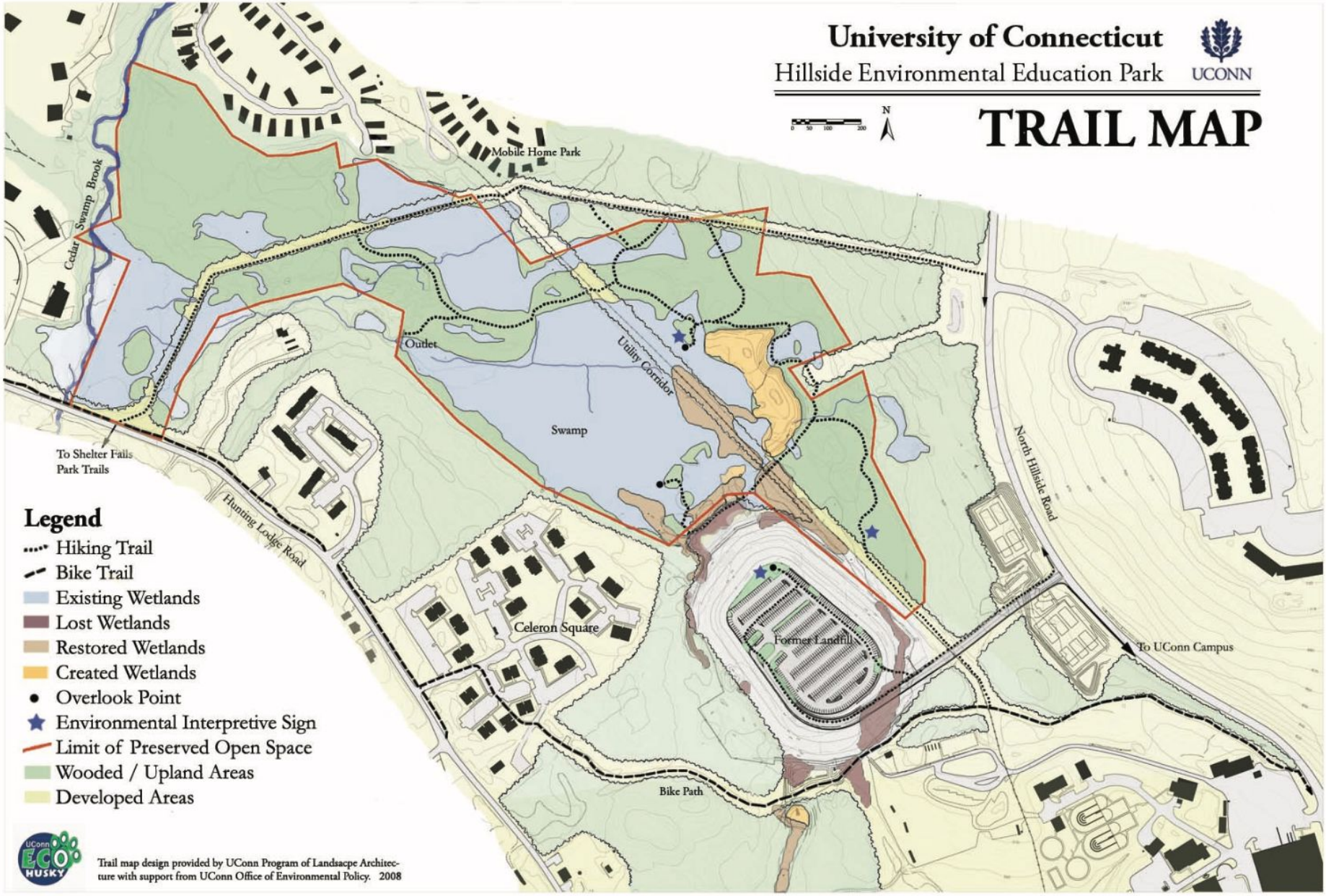
Chelydra serpentina: **Common Snapping Turtle**

- Largest freshwater turtle in CT
    - Permanent, large bodies of water
- Mates in early summer
    - Nests are in sandy river embankments
- >100 pounds as an adult in captivity
- Ambush predator

Chelydra serpentina: **Common Snapping Turtle**

Females: cloaca located closer to the plastron

Males: cloaca located farther away from the plastron


University of Connecticut
Hillside Environmental Education Park
UCONN
TRAIL MAP
N
Mobile Home Park
Cedar Swamp Brook
Outlet
Utility Corridor
Swamp
To Shelter Falls Park Trails
Hunting Lodge Road
North Hillside Road
Celeron Square
Former Landfill
To UConn Campus
Bike Path
Legend
Hiking Trail
Bike Trail
Existing Wetlands
Lost Wetlands
Restored Wetlands
Created Wetlands
Overlook Point
Environmental Interpretive Sign
Limit of Preserved Open Space
Wooded / Upland Areas
Developed Areas
UConn ECO HUSKY
Trail map design provided by UConn Program of Landsacpe Architecture with support from UConn Office of Environmental Policy. 2008