Amphibians and Reptiles in Your Woods

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About Me

BS Biochemistry, 
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MS Animal Science
PhD Neurobiology & Behavior
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Webinar Goals

After this presentation you will know:

1. Some **basic biology** of amphibians and reptiles and how many are native to Pennsylvania;

2. Which amphibians and reptiles are most likely to be found in **forest habitats** and common **sampling methods**; and

3. How **forest management** may affect amphibian and reptile populations.

What Is an Amphibian?

- A vertebrate animal

- **Salamanders**

- **Frogs**

- **Caecilians**
What Is an Amphibian?

• A tetrapod ectotherm

What Is an Amphibian?

• An animal with few protective membranes around the embryo

• Increases reliance on environmental moisture
What is an Amphibian?

• An animal with permeable skin
  – Sometimes feels moist
  – Sometimes feels dry
Amphibian Skin

- Cutaneous breathing
- Cutaneous water absorption
  - Pelvic patch

Relative Numbers in PA

Amphibians: 36 species

- Salamanders
  - 22 species

- Frogs (& toads)
  - 14 species

http://www.paherps.com/
What Is a Reptile?

• A **vertebrate** animal

What Is a Reptile?

• A **tetrapod ectotherm**
What Is a Reptile?

- An animal with several protective membranes around the embryo
- Decreased reliance on environmental moisture

Relative Numbers in PA

Reptiles: 39 species

- Snakes
  - 21 species

- Turtles
  - 14 species

- Lizards
  - 4 species

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Forest Amphibians: Frogs

Wood frog
- *Lithobates sylvaticus*
  - Vernal pools
  - Permanent pond edges
  - Forested pools & near forest
Forest Amphibians: Frogs

Pickerel frog
• *Lithobates palustris*
  – Vernal pools
  – Permanent pond edges
  – Forested pools & near forest

Forest Amphibians: Frogs

Gray treefrog
• *Hyla versicolor*
  – Vernal pools
  – Permanent pond edges
  – Forest clearings & near forest
Forest Amphibians: Frogs

Spring peeper
• *Pseudacris crucifer*
  – Vernal pools
  – Permanent pond edges
  – Forested & near forest

Forest Amphibians: Frogs

Mountain chorus frog
• *Pseudacris brachyphona*
  – Vernal pools
  – Permanent pond edges
  – Forested pools & near forest
Forest Amphibians: Frogs

Striped chorus frog
• *Pseudacris triseriata*
  – Vernal pools
  – Permanent pond edges
  – Forested pools & near forest

Photo by Don Becker

Forest Amphibians: Salamanders

Jefferson’s salamander
• *Ambystoma jeffersonianum*
  – Vernal pools
  – Permanent pond edges
  – Forested pools & near forest
Forest Amphibians: Salamanders

Spotted salamander
- *Ambystoma maculatum*
- Vernal pools
- Permanent pond edges
- Forested pools & near forest

Marbled salamander
- *Ambystoma opacum*
- Vernal pools
- Permanent pond edges
- Forested pools
**Forest Amphibians: Salamanders**

**Eastern red spotted newt**
- *Notophthalmus viridescens*
  - Vernal pools
  - Permanent ponds
  - Forested pools & near forest

**Redbacked salamander**
- *Plethodon cinereus*
  - Rely on natural cover objects
  - Lungless
Forest Amphibians: Salamanders

Northern slimy salamander
• *Plethodon glutinosus*
• Rely on natural cover objects
• Lungless

Northern dusky & mountain dusky salamanders
• *Desmognathus fuscus & D. ochrophaeus*
• Rely on natural cover objects
Forest Reptiles: Lizards

Broadhead skink
• *Eumeces laticeps*
  • Forest clearings

Forest Reptiles: Lizards

Eastern fence lizard
• *Sceloporus undulatus*
  • Open habitats within forests
Forest Reptiles: Turtles

Wood turtle
• *Clemmys insculpta*
  • Wet forests
  • Tree climbers

Forest Reptiles: Turtles

Eastern box turtle
• *Terrapene carolina*
  • Deciduous forest
Forest Reptiles: Snakes

Eastern garter snake
• *Thamnophis sirtalis*
  • Ubiquitous, but commonly encountered in forests

Northern red belly snake
• *Storeria occipitomaculata*
  • Edge habitat
  • Upland forest
  • Open canopy forest
  • Wet areas
  • Natural cover
  • slugs
### Forest Reptiles: Snakes

**Northern ringneck snake**
- *Diadophis punctatus*
- Damp hardwood forests
- Natural cover
  - Downed wood, rocks
  - Salamanders & worms

### Forest Reptiles: Snakes

**Timber rattlesnake**
- *Crotalus horridus*
- Forests with south facing slopes, rocky outcrops
Sampling

Time-Constrained Area Search

- Defined area

- Searched for defined time period
  - 4 person-hours is typical
  - 4 person-hours = 4 people each searching for 1 hour

Sampling

Pitfall-drift fence arrays

- Buckets, cans, plastic tubes, cups

Placement

- DIAMETER & DEPTH
  - Consistent
  - Effects catch
Sampling

• Artificial cover objects (ACO)
  – Wood or metal
  – Stand behind ACO
  – Use snake hook
  – Gloves recommended

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Clearcuts Effects: Gray Treefrogs

- Tadpoles **metamorphose more quickly** in clearcut ponds than in forest pond

![Graph showing mean days to metamorphosis](image)

D. J. Hocking and R. D. Semlitsch, 2008

Clearcuts Effects: Gray Treefrogs

- Tadpoles **weigh less** at metamorphosis in clearcut ponds than in forest ponds

![Graph showing mean mass at metamorphosis](image)

D. J. Hocking and R. D. Semlitsch, 2008
Clearcuts Effects: Gray Treefrogs

- More tadpoles survive to metamorphosis in clearcut ponds than in forest ponds

D. J. Hocking and R. D. Semlitsch, 2008

Basal Area: Salamander Effect

Ross et al. 2000
Ross et al. 2000

Forest Harvesting: Snake Effects

- Snake diversity is higher in thinned forests than in clearcuts
- Retention of coarse woody debris has an ameliorative effect

Todd and Andrews, 2008
Forest Harvesting: Snake Effects

- Individual species abundance is higher in thinned forests than in clearcuts.
- Retention of coarse woody debris has an ameliorative effect.

Webinar Summary

You have learned about:
1. some basic biology of amphibians and reptiles and how many are native to Pennsylvania;

2. which amphibians and reptiles are most likely to be found in forest habitats and common sampling methods; and

3. how forest management may affect amphibian and reptile populations.