West Virginia’s Vernal Pool Amphibians

Kevin Oxenrider
Amphibian and Reptile Program Leader
West Virginia Division of Natural Resources
Wildlife Resources Section
Objectives

• What are vernal pools?
• Vernal pool amphibian life history
• Common vernal pool amphibian identification
• Disease risk at vernal pools
What is a vernal pool?

- Shallow depressions that usually contain water for only part of the year
  - Typically, Winter-Spring
- Often forested or associated with forested wetlands
- Pools range in size
- Lack fish
Amphibian Ecology at Vernal Pools

- Vernal pools are critical components of some amphibian life cycles
  - Serve as breeding sites
  - Tadpole/larvae and juvenile rearing
  - Adults typically do not disperse far from vernal pools

- Metamorphosis
  - Adults (amplexus/egg mass laying)
    - Tadpole/larvae
      - Metamorph/froglet
    - Adult
• Timing of breeding migrations vary by species
  • Jeffersons salamander
    • Wood frog
    • Spotted salamander
    • American toad
    • Gray treefrog
    • Marbled salamander
Wood Frog
*Lithobates sylvaticus*

- **Adult**
  - White upper lip
  - Black triangular “mask” behind eye
  - Dorsolateral ridges

- **Egg Mass**
  - Gelatinous
  - Grapes
  - Attached to sticks and vegetation in the water

- **Call**
  - Squeaky shoes or “wonky” duck
Spotted Salamander
*Ambystoma maculatum*

• Adult
  • Large, thick salamander
  • Black to gray overall
  • Yellow spots on back
  • Pale gray on belly
    • No spots on belly

• Egg Mass
  • Globular
  • Clear or white in color
  • Masses attached to submerged sticks, vegetation, or the pool bottom
Jeffersons Salamander
*Ambystoma jeffersonianum*

- **Adult**
  - Large salamander
  - Black to gray overall
  - Pale blue flecks may be on sides
  - Elongated toes
    - Especially hind feet

- **Egg Mass**
  - Globular
  - Clear in color
  - Masses typically attached to submerged sticks/twigs
Marbeled Salamander
*Ambystoma opacum*

• **Adult**
  • Large, thick salamander
  • Black with white netting/crossbands on back
  • Black or pale gray belly

• **Eggs**
  • Laid in dry vernal pools, under logs, leaves, or other structure, in Autumn (September/October)
  • Nests guarded by female
  • Eggs not contained in globular mass
American Toad
*Anaxyrus americanus*

- **Adult**
  - Typically, brown or gray in coloration
  - Dark patches on back contain bumps (warts)
  - Parotoid glands located behind eyes
    - Release toxin when touched

- **Egg Mass**
  - Laid in long, thin, often coiled masses

- **Call**
  - Long trill
American Toad

*Anaxyrus americanus*

- **Red**: Area of Occupancy
- **Gray**: County Record
Gray Treefrog/ Cope’s Gray Treefrog
*Hyla versicolor/ H. chrysoscelis*

- **Adult**
  - Vary in color from mottled gray to green
  - Large toepads
  - Yellow inner thighs

- **Egg Mass**
  - Eggs laid in thin film-like mass on water surface

- **Call**
  - Short, bird-like trill
Spring Peeper
*Pseudacris crucifer*

• Adult
  • Small frog
  • Light brown to pale olive coloration with darker brown markings on back
    • “X” marking on back

• Egg Mass
  • Eggs deposited singly or in small clumps on submerged vegetation

• Call
  • Bird-like “peep”
Amphibians Declining

- Leading cause is habitat destruction and emerging diseases.
  - What are Emerging Diseases?
    - A disease that has increased in the past 20 years and could increase in the near future.
- Emerging diseases impacting amphibians and reptiles
  - Ranaviruses
  - Chytrid fungus
- Vernal pools present an elevated risk due to concentrating animals.
Ranaviruses

• Viral disease that can impact amphibians, reptiles, and fishes.
• Very detrimental in ephemeral wetlands
• First isolated from northern leopard frogs in 1960
• Mass mortality events have occurred in over 20 US states
  • Mass mortality events can impact local populations, range-wide population impacts still unknown
• Routes of Transmission
  • Indirect contact (water or sediment contact with epithelial cells in the skin, gills, or intestines)
  • Direct contact (during breeding or other social interactions)
  • Ingestion (depredation)
Ranaviruses cont.

• Can cause 50%-99% mortality in larval amphibians.
• Wood frogs are thought to be most susceptible
• Has been detected in WV
Clinical Signs of Ranavirus

- Swelling of legs and body
- Internal hemorrhaging
- Redness of the legs and vent
- White plaque in the mouth, swollen eyes, and wheezing in reptiles
Chytrid Fungus

• Fungal disease only known to impact amphibians
  • Has caused large-scale population declines

• 2 species of chytrid fungus
  • Bd Bsal
Batrachochytrium dendrobatidis (Bd)

• Leading cause of amphibian decline worldwide
• Aquatic zoosporic fungi
  • Infects skin and causes skin lesions, anorexia, apathy, and death
• Routes of Transmission
  • Direct contact (social interactions; zoospore flagellum)
• Has been detected in WV
Clinical Signs of Bd

• Reddening of the skin
• Excessive shedding of the skin
• Unusual posturing
**Batrachochytrium salamandrivorans (Bsal)**

- Aquatic zoosporic fungi
- Discovered in 2013
  - Not in North America yet
- Only believed to impact salamanders, but other amphibians are carriers
- Routes of transmission same as Bd
10% BLEACH-WATER SOLUTION
1 Cup Bleach : 1
Questions?