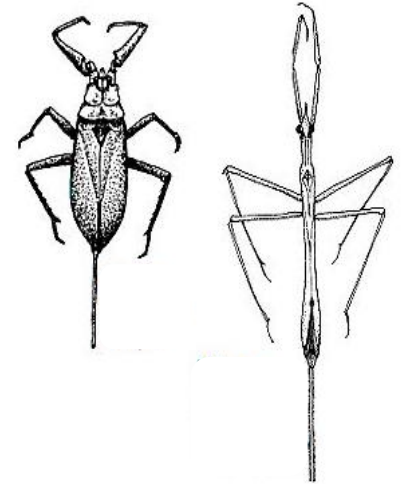




## 2021 LEBANON COUNTY ENVIROTHON ELEMENTARY & MIDDLE SCHOOL

### AQUATIC OBJECTIVES WETLANDS



#### ESSENTIAL TOPICS

- I. Understanding Physical & Chemical Properties of Water
  - a. Influence of water's chemical properties on aquatic organisms
  - b. Influence of water's physical properties on aquatic organisms
  - c. Influence of the water cycle on the aquatic ecosystem
- II. Reptiles & macros
  - a. Identification of PA **Aquatic Wetland Species**
  - b. Life cycles of PA Aquatic Wetland Species & their preferred habitats
  - c. Interactions among living and non-living organisms
  - d. Specific characteristics and adaptations (feeding, swimming, breathing, mating, etc.)
  - e. Habitat needs of PA Aquatic Wetland Species
- III. Aquatic Resource Issues
  - a. Human effects on the aquatic ecosystem
  - b. Impact of water pollution on aquatic communities
  - c. Functions of Wetlands

#### LEARNING OBJECTIVES

##### I. UNDERSTANDING WATER

Envirothon students will be able to:

- a. Explain how dissolved oxygen, pH, and/or alkalinity influence a particular aquatic organism or its habitat.
- b. Explain how stream velocity, water temperature, water turbidity and/or surface tension influence wetland species.

##### II. WETLAND AQUATIC SPECIES

Envirothon students will be able to:

- a. Identify various species commonly found in Pennsylvania by sight or use of a dichotomous key.
- b. Describe specific habitat requirements (food, water, shelter, surface, submerged, etc.) for those species listed in the "ID Study List".
- c. Describe the stages of complete & incomplete metamorphosis.
- d. Describe the life cycle of those species listed in the "Identification Study List."
- e. List three adaptations of wetland aquatic species and explain the advantage of each.

##### III. THREATS TO PA WETLANDS & THE SPECIES THAT LIVE THERE

Envirothon students will be able to:

- a. Describe a human activity & explain its effect on macros.
- b. List three types of water pollution, their sources, and explain how they impact fish & macros.
- c. Explain how a macro's extirpation or extinction could impact the aquatic ecosystem.

## WETLAND AQUATIC SPECIES IDENTIFICATION STUDY LIST

Amphibians	Reptiles	Invertebrates
Bullfrog* & **	Eastern Ribbon Snake	Dragonfly **
Fowler's Toad	Eastern Massasauga	Damselfly **
Northern Green Frog* & **	Common Garter Snake	Fairy Shrimp
Northern Leopard Frog*	Northern Water Snake	Mosquito**
Northern Spring Peeper *	Queen Snake	Copepods
Pickrel Frog*	Blandings Turtle	Water Strider
Wood Frog *	Bog Turtle	Water Scorpion
Red-Spotted Newt	Eastern Box Turtle	Zebra Mussel
Four-Toed Salamander	Midland turtle	Quagga Mussel
Jefferson Salamander	Red-Eared Slider	
Marbled Salamander	Spotted Turtle	* = Know Calls
Spotted Salamander		** = Adult & Immature

### TESTING RESOURCES:

Individual links to reference materials are provided below. PDFs of all links and materials have also been provided for your convenience (*excludes numbers 1 & 5 below, which are web sites to be reviewed, number 3, the Golden Guide, and the supplemental information*). If you download the 8 PDFs listed in pink font that I have provided, you will have all the study material except for the exclusions previously mentioned.

1. PA Fish & Boat Commission website: <http://www.fishandboat.com/Pages/default.aspx>
2. **Fish & Boat Commission- AMPHIBIANS & REPTILES BOOK** (ISBN 1-930369-00X)  
Hard copy, new schools should contact the Envirothon Coordinator to obtain a copy (if available).  
The entire book has been scanned and is on the LCCD website as 7 PDFs in the General Resources section:  
<https://www.lccd.org/envirothonobjectives/>
3. **Identification study list provided as three (3) PDF documents:**
  - 1) **ES & MS AQUATICS – IDENTIFICATION STUDY LIST – FROGS**
  - 2) **ES & MS AQUATICS – IDENTIFICATION STUDY LIST – NEWTS, SALAMANDERS, & SNAKES**
  - 3) **ES & MS AQUATICS – IDENTIFICATION STUDY LIST – TURTLES**
4. **GOLDEN GUIDE: POND LIFE** (ISBN 1-58238-130-5)  
Hard copy, new schools should contact the Envirothon Coordinator to obtain a copy (if available).
5. **A FIELD GUIDE TO THE ANIMALS OF VERNAL POOLS**  
Hard copy, new schools should contact the Envirothon Coordinator to obtain a copy (if available).  
**Identification study list provided as a PDF document:**  
**ES & MS AQUATICS – IDENTIFICATION STUDY LIST – INVERTEBRATES**

## 6. PA Fish &amp; Boat Commission Fact Sheets:

## A. Basics of Water Pollution

<https://www.fishandboat.com/Transact/AnglerBoater/AnglerBoater2001/JanuaryFebruary/Documents/waterpoll.pdf>

## B. Dragons &amp; Damsels

<https://www.fishandboat.com/LearningCenter/ActivitiesAndEducationPortal/Critters/Documents/dragonsanddamsels.pdf>

## C. ENA/ELPA

<https://www.fishandboat.com/LearningCenter/ActivitiesAndEducationPortal/Critters/Documents/ena.pdf>

## D. Wetlands: The Vital Link

<http://www.fishandboat.com/Transact/AnglerBoater/AnglerBoater2001/MayJune/Documents/vitalink.pdf>

## E. Introduction to Reptiles – PLAY

<http://www.fishandboat.com/Transact/PennsylvaniaLeagueofAnglingYouthPLAY/PLAY2002/Documents/introreptiles.pdf>

<http://www.fishandboat.com/Transact/PennsylvaniaLeagueofAnglingYouthPLAY/PLAY2002/Documents/reptiletree.pdf>

<http://www.fishandboat.com/Transact/PennsylvaniaLeagueofAnglingYouthPLAY/PLAY2002/Documents/whatreptile.pdf>

<http://www.fishandboat.com/Transact/PennsylvaniaLeagueofAnglingYouthPLAY/PLAY2002/Documents/turtletrick.pdf>

<http://www.fishandboat.com/Transact/PennsylvaniaLeagueofAnglingYouthPLAY/PLAY2002/Documents/ectoexp.pdf>

<http://www.fishandboat.com/Transact/PennsylvaniaLeagueofAnglingYouthPLAY/PLAY2002/Documents/basement.pdf>

<http://www.fishandboat.com/Transact/PennsylvaniaLeagueofAnglingYouthPLAY/PLAY2002/Documents/lawyou.pdf>

## F. Those other turtles

<https://www.fishandboat.com/LearningCenter/ActivitiesAndEducationPortal/AmphibiansReptiles/Documents/otherturtles.pdf>

## G. Turtles of PA poster

<https://www.fishandboat.com/LearningCenter/ActivitiesAndEducationPortal/AmphibiansReptiles/Documents/turtlesofpa.jpg>

## H. Pennsylvania Turtles – PLAY

<http://www.fishandboat.com/Transact/PennsylvaniaLeagueofAnglingYouthPLAY/PLAY2006/Documents/play1turtle.pdf>

<http://www.fishandboat.com/Transact/PennsylvaniaLeagueofAnglingYouthPLAY/PLAY2006/Documents/play2facts.pdf>

<http://www.fishandboat.com/Transact/PennsylvaniaLeagueofAnglingYouthPLAY/PLAY2006/Documents/play3common.pdf>

<http://www.fishandboat.com/Transact/PennsylvaniaLeagueofAnglingYouthPLAY/PLAY2006/Documents/play5te.pdf>

<http://www.fishandboat.com/Transact/PennsylvaniaLeagueofAnglingYouthPLAY/PLAY2006/Documents/play6word.pdf>

## I. Snakes in Pennsylvania

<http://www.fishandboat.com/Resource/AmphibiansandReptiles/Documents/factsnake.pdf>

## J. Bog Turtles Slipping Away

<https://www.fishandboat.com/LearningCenter/ActivitiesAndEducationPortal/AmphibiansReptiles/Documents/bogturtle.pdf>

## K. Portrait of a Painted Turtle

<http://www.fishandboat.com/Transact/AnglerBoater/AnglerBoater2000/JanuaryFebruary/Documents/pictathousand.pdf>

## L. Birth of a snake

<https://www.fishandboat.com/LearningCenter/ActivitiesAndEducationPortal/AmphibiansReptiles/Documents/birthofsnake.pdf>

## 7. Invertebrate Links: Creek Connections, Allegheny College

Following links provided as a PDF document- included in the:

**ES & MS AQUATICS – IDENTIFICATION STUDY LIST – INVERTEBRATES** (Same PDF provided for number 5).

Dragonfly: <http://sitesmedia.s3.amazonaws.com/creekconnections/files/2013/12/dragonfly.pdf>

Damselfly: <http://sitesmedia.s3.amazonaws.com/creekconnections/files/2013/12/damselfly.pdf>

Fairy Shrimp: Resource pages included in “MS AQUATICS – IDENTIFICATION STUDY LIST – INVERTEBRATES”

Mosquito: <http://sitesmedia.s3.amazonaws.com/creekconnections/files/2013/12/mosquito.pdf>

Copepods: Resource pages included in “MS AQUATICS – IDENTIFICATION STUDY LIST – INVERTEBRATES”

Water Strider: <http://sitesmedia.s3.amazonaws.com/creekconnections/files/2013/12/waterstrider.pdf>

Water Scorpion: <http://sitesmedia.s3.amazonaws.com/creekconnections/files/2013/12/water-scorpion.pdf>

Zebra Mussel: [http://seagrant.psu.edu/sites/default/files/AIS%20Field%20Guide\\_Finalweb\\_0.pdf](http://seagrant.psu.edu/sites/default/files/AIS%20Field%20Guide_Finalweb_0.pdf) (pages 84-85)

Quagga Mussel: [http://seagrant.psu.edu/sites/default/files/AIS%20Field%20Guide\\_Finalweb\\_0.pdf](http://seagrant.psu.edu/sites/default/files/AIS%20Field%20Guide_Finalweb_0.pdf) (pages 82-83)

## 8. May supplement with any field guide on PA Wetland Species

9. May supplement with related materials from the PA Envirothon Aquatics Station Materials **MIDDLE SCHOOL ONLY**

<http://www.envirothonpa.org/station-training/>

Supplemental material is only to enrich your knowledge and will not specifically be tested.