

Warren County School District
PLANNED INSTRUCTION

COURSE DESCRIPTION

Course Title: PA Habitat Ecology

Course Number: 00373

Course Prerequisites: None

Course Description:

This course focuses on Pennsylvania habitats, their biotic and abiotic parts, their identification, taxonomy, anatomy, physiology, growth and reproduction. The basic principles of forest habitats, habitat management, and environmental protection are discussed. Students will develop skills in making informed decisions and taking constructive actions dealing with habitat management and mediation. Relevant lab activities will be incorporated throughout, utilizing scientific inquiry and appropriate technology. Classroom studies are combined with field exercise.

Fall Semester Only

Suggested Grade Level: Grades 9-12

Length of Course: ☒ One Semester ☐ Two Semesters ☐ Other (Describe)

Units of Credit: .5 (Insert *None* if appropriate)

PDE Certification and Staffing Policies and Guidelines (CSPG) Required Teacher Certifications:
CSPG 32 - Biology

Certification verified by WCSD Human Resources Department: ☒ Yes ☐ No

TEXTBOOK AND SUPPLEMENTAL MATERIALS

Continue using Board approved textbook? ☐ Yes ☒ No (*If yes, then complete the information below.*)

Board Approved Textbooks, Software, Supplemental Materials:

Title:

Publisher:

ISBN #:

Copyright Date:

Date of WCSD Board Approval: May 14, 2018

<http://www.envirothonpa.org/station/forestry/>

Most of these materials are excerpted from publications produced by the Pennsylvania State University or from the USDA Forest Service. Many topics are covered more than once in different ways. So the volume of material is not as overwhelming as it might appear at first glance.

1. Trees

- 1.1 Common Trees of Pennsylvania
- 1.2 From the Woods Series: Ten Important Hardwoods
- 1.3 Penn State School of Forest Resources: Identifying PA Trees Program
- 1.4 Tree Rings
- 1.5 Anatomy of a Tree
- 1.6 Key to Some Common Trees of Pennsylvania

2. Forest Ecology

- 2.1 Forest Types of Pennsylvania
- 2.2 Land cover map 11×17
- 2.3 Forest Succession and Wildlife
- 2.4 Habitat Adaptations of Some Common Trees of Pennsylvania
- 2.5 Pennsylvania Woodlands: #6 Woodland Wildlife Management
- 2.6 Forest Stewardship Bulletin #9: Understanding Biological Wealth in Our Forests
- 2.7 Pennsylvania Wildlife No. 6 – Penn State Extension Publication

3. Forest Resources, Management and Protection

- 3.1 PA Forests 2014
- 3.2 Basic Forest Management
- 3.3 Forests and Waters
- 3.4 Forest Measurement
- 3.5 Insect Threats
 - Asian Longhorn beetle
 - Emerald Ash Borer
 - Gypsy Moth Control
 - Hemlock Woolly Adelgid

3.6 What is an Invasive Plant?

- Autumn-olive
- Bush honeysuckle
- Garlic mustard
- Japanese barberry
- Japanese knotweed
- Multiflora rose
- Tree-of-heaven

3.7 Wildfire and Prescribed Fire in Pennsylvania

3.8 Forest Stewardship Bulletin #4: Forestry Terminology.

4. Community Forestry

- 4.1 Sustaining Americas Urban Trees & Forests

Review updated information with these on-line resources.

Information on Pennsylvania native wild plants, invasive exotic plant problems and ginseng can be found at www.dcnr.state.pa.us/forestry/plants/index.htm.

Check recent developments in the fight against invasive plant species on the internet at www.invasivespeciesinfo.gov/ under the navigation titles – “Plants” and “Species Profiles”.

Get updated information about the Asian long-horned beetle, emerald ash borer, gypsy moth and other insect pests on the DCNR-Bureau of Forestry-Forest Pest Management website www.dcnr.state.pa.us/forestry/insectsdisease/index.htm and the US Forest Service web site at <http://www.emeraldashboorer.info/>

The Penn State College of Agricultural Sciences – School of Forest Resources provides a Sustainable Forestry Teacher Resource Center which includes lesson plans in sustainable forestry, natural resources, water, and wildlife. The lesson plans have been designed by teachers for actual use in the classroom and meet Pennsylvania’s environment and ecology education standards. Each lesson plan indicates subject matter, grade level, and regional applicability. The lesson plans can be adapted to fit your location. These resources can be found at <http://sftfc.cas.psu.edu/>.

Additional sources: The following books contain helpful information, illustrations and background materials. They are available in libraries and bookstores.

Peterson Field Guide Series, Published by Houghton Mifflin Company

A Field Guide to Eastern Forests, by John C. Kricher and Gordon Morrison. Good coverage of several complex topics. The most pertinent sections are:

Chapter 2: *Forestry Field Marks for Stratification; Predicting a Forest’s Future; The Forest Food Chain and Ecological Pyramid*

Chapter 4: *Disturbance and Pioneer Plants covers “Ecological Succession: The process of Vegetation Development Over Time”*

Chapter 8. *Autumn and Winter* has a few paragraphs on “*Tree Trunks and Growth Rings*” that may be helpful.

For help with tree identification try these titles also from the Peterson Field Guides series:

- *A Field Guide to Trees and Shrubs*, by George A. Petrides
- *A Field Guide to Eastern Trees* by George A. Petrides/Janet Wehr

Bureau of Forestry Service Foresters can help teacher/advisers prepare for local Envirothon events. See the Bureau’s web site for the service forester assigned to your county at: <http://www.dcnr.state.pa.us/forestry/yourwoods/serviceforesters/index.htm>

Learning Enhancements:

I-Tree – I-Tree is a state-of-the-art, peer-reviewed software suite from the USDA Forest Service that provides urban forestry analysis and benefits assessment tools.

leafsnap – Leafsnap is a series of electronic field guides being developed by researchers from Columbia University, the University of Maryland, and the Smithsonian Institution. The free mobile apps use visual recognition software to help identify tree species from photographs of their leaves.

BOARD APPROVAL:

Date Written: 2/28/18

Date Approved: May 14, 2018 (November 5, 2018)

Implementation Date: 2018-2019

SPECIAL EDUCATION AND GIFTED REQUIREMENTS

The teacher shall make appropriate modification to instruction and assessment based on a student's Individual Education Plan (IEP) or Gifted Individual Education Plan (GIEP).

COURSE OVERVIEW

(List the content to be taught)

- I. Trees
- II. Forest Habitat Ecology
- III. Forest Habitat Resource Management and Protection
- IV. Community Forestry

ANCHORS AND STANDARDS

**Correlations with the Academic Standards for Environment and Ecology are provided.*

After completing study on this issue, students will:

1.
 1. **Trees**
 - a. Identify common species without a key and specific or unusual species of trees or shrubs using a botanical key. (Use of a botanical key is an important skill in many environmental professions. Practice with the Key to Some Common Trees of Pennsylvania.) Pay special attention to shade tolerance and soil moisture requirements of each tree species studied. Understand their timber and wildlife values.
**4.3 Natural Resources – 4.3.10.Ab.* Explain typical tree growth and life cycle. Be able to describe the parts and tissues of a tree and their arrangements and functions. Recognize defects that effect a tree's health, quality and resource potential.
**4.3 Natural Resources.* Explain the cause and effect relationships between environmental factors (light, soil and moisture), and tree growth. Be able to interpret these effects in the growth rings of a sample of wood (either a "tree cookie" or "core" taken with an increment borer).
**4.3 Natural Resources*
 2. **Forest Habitat Ecology**
 - a. Explain general habitat typing based on the dominant tree species. Describe major forests types found in Pennsylvania. Analyze and type a specific forest site.
**4.3 Natural Resources – 4.3.10.A, b.* Explain typical forest structure (canopy, understory and ground layers) and crown classes.c. Explain typical forest succession from open areas to closed canopy and

back again. Analyze the successional stage of a specific forest site.

**4.1 Ecology – 4.1.10.E*

**4.3 Natural Resources – 4.3.10.Cd.* Explain how wildlife habitat relates to the forest plant community (i.e. tree species present, age structure, snags and dead-and-down trees, availability of food, and riparian zones).

**4.1 Ecology – 4.1.10.C, De.* Explain what effects a specific species increase or decrease might have on the forest ecosystem.

**4.1 Ecology – 4.1.10.E, 4.1.12.Ef.* Evaluate species diversity and its importance. Explain biological diversity as an indicator of a healthy environment as well as analyze the effects of species extinction on the health of an ecosystem.

**4.1 Ecology – 4.1.10.A, 4.1.12.A*

3. **Forest Habitat Resource Management and Protection**

a. Study The State of the Forest 2009. This is a summary of the most current data available describing Pennsylvania's forest resources. Particularly note the patterns of forestland ownership, area of forests, distribution of age and size classes and of tree species, wood volume statistics and regeneration issues. Describe the distribution of forest land ownership in Pennsylvania as cited in the "Forest Features" section of this report.b. Describe values and benefits of forests for recreation, wildlife and watershed quality.

**4.1.Ecology – 4.1.10.Ac.* Explain the uses of silviculture techniques in even-aged and uneven-aged forest management: thinning, clear-cutting, seed-tree method, shelter wood method, and selection method. Describe the practices of "high grading" and "diameter limit" cutting.

**4.3 Natural Resources – 4.3.10.A, C, 4.3.12.Cd.* Summarize State and local regulations and programs pertaining to timber management including PA Code Chapter 102 Erosion & Sedimentation Control regulations, waterways management regulations – PA Code Chapter 105.

**4.2 Watersheds and Wetlands – 4.1.12.A*

**4.3 Natural Resources – 4.3.10.Be.* List products and uses of the 10 important hardwoods grown in Pennsylvania cited in From the Wood Series: Ten Important Hardwoods resource and of the important conifers – White pine and Eastern Hemlock – described in The Common Trees of Pennsylvania.

**4.3. Natural Resources – 4.3.10.Af.* Explain the value of forestlands as community water sources. Describe the potential for pollution from timber harvesting and the practices used to minimize erosion and sedimentation.

**4.2 Watersheds and Wetlands – 4.2.10.A*

**4.Natural Resources – 4.3.10.A*

**4.5 Humans and the Environment – 4.5.10.C, 4.5.12.Cg.* Demonstrate the use of common forestry equipment (Biltmore stick, diameter tape, and clinometer), to measure tree diameter and height. Be able to calculate wood volume.h. Identify and describe the life cycle and impacts of common forest pests and invasive plants listed in the resources. Research integrated pest management strategies for selected pests.

**4.5 Humans and the Environment – 4.5.10.B, 4.5.12.Bi.* Predict how human or natural action can produce change to which an organism cannot adapt (Gypsy Moth, Chestnut blight, invasive species, etc.)

**4.1 Ecology – 4.1.10.A., 4.1.12.Aj.* Explain the role of fire in forest ecosystems. Describe the basic principles of wildfire prevention and control. Explain the use of prescribed fire.

**4.1 Ecology – 4.1.10.E*

4. **Community Forestry**

a. Describe the benefits of maintaining trees in urban and suburban communities and factors affecting their health and survival.

**4.1 Ecology – 4.1.10.A*

CC.3.5.9-12 Reading informational Text

CC.3.6.9-12 Writing

ASSESSMENT

Portfolio Assessment: ☐ Yes ☒ No

District-Wide Common Final Examination Required: ☒ Yes ☐ No

Course Challenge Assessment (Describe): Must pass the final examination with a minimum of an 80%.

WRITING TEAM: Warren County School District Teachers

WCSD STUDENT DATA SYSTEM INFORMATION

1. Is there a required final examination? ☒ Yes ☐ No

**Warren County School District Policy 9741 and 9744 state, "All classes in grades 9-12 shall have a final exam."*

2. Does this course issue a mark/grade for the report card? ☒ Yes ☐ No

3. Does this course issue a Pass/Fail mark? ☐ Yes ☒ No

4. Is the course mark/grade part of the GPA calculation? ☒ Yes ☐ No

5. Is the course eligible for Honor Roll calculation? ☒ Yes ☐ No

6. What is the academic weight of the course?

☐ No weight/Non credit

☒ Standard weight

☐ Enhanced weight