Wetlands of the Smokies Lesson Plan

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Less than 1% of the Great Smoky Mountains National Park (GSMNP) is considered wetland; however, these areas are known to support over a quarter of the park's plant diversity. They are known to provide habitat for many rare amphibians, macroinvertebrates, birds, and mammals. There are several types of wetlands in GSMNP, including seeps, sinkholes, floodplains, forested wetlands, and open marshes.[17, 18]

This is an observational activity to guide students (grades 6-12) to explore a wetland and the characteristics that support such an ecosystem. By the end of the activity, students will understand that soil, hydrology, and plants are the three characteristics of wetlands, and that these three characteristics are interrelated.

- Items for students: notebook, something to write with, water, proper clothing, guiding questions worksheet, and wetland plant ID key or field guide.
- Items for teacher: Whiteboard, marker

Before Field Exploration

Find a location in the wetland that is accessible with clear boundaries for students. This area should exhibit multiple states and types of wetland vegetation, succession, and hydraulic aspects. Be sure to include an area of upland as well. You may also optionally set numbered cones in areas where you would like students to observe.

Part 1: Observation Exploration with Guided Questions

Separate students into groups of 3-4 to explore the set boundaries or designated path and have each group answer the following questions together. (See printout on next page.) As the groups go out to observe the wetland, instruct students to use one side of paper to create a wetland map and the other side to keep track of observations. For the map, suggest using symbols, shapes, or colors to represent things such as water, types of plants, soils, smells, or other observations. Stress that this map is a tool to keep track of thoughts, so it does not have to be perfect! If you set cones out, you may instruct students to notice vegetation, soils, and water patterns in those areas.

Part 2: Investigation as a Whole Class

After group investigations, gather everyone together to talk about what they found. As the class shares observations, create a visual map of the wetland on the top of a whiteboard with a list of observations under.

After hearing the observations, discuss the following questions using the observations the students found prior to making inferences. Here are some ideas of questions to guide group discussion:

- Where does upland end and wetland begin? Why?
  Observe the change in vegetation, water, and soil. There is a noticeable transition of trees and shrub-like upland plants to hydrophytic vegetation. In some wetland types, you may also have to observe the soils, presence of water, or signs of water in the past.
- Does the wetland have another boundary? What are they?
  There may be a waterway that serves as another boundary. Discuss other boundaries you see.
- What conditions seem to be necessary for wetlands to thrive?
  Look at where the students think the upper limit of the wetland is and what conditions (water, soil, and vegetation) are necessary for it to survive.
- Where might the wetland change or experience destruction by nature or humans?
  Look for signs of erosion, sediment buildup, litter, or other aspects unique to your area.
- What indicates that the wetland might be part of an aquatic food web?
  Dead plant material (detritus) is important for the base of a food chain. Students may have also observed aquatic life, eaten vegetation, or seen scat.
- What indicates that the wetland is important to terrestrial and aquatic animals?
  Evidence may be found by spotting wildlife, wildlife prints, and habitat alteration (such as beaver dam), or proxies such as what wildlife eats.

This activity was adapted and modified off a Kesselheim A, Slattery B, Higgins S, and Schilling M. *WOW! The Wonders of Wetlands*. 2003. Environmental Concern Inc, St. Michaels, MD. This book offers a variety of ways to explore the properties of wetlands both in and outside of the k-12 classroom.

Map Your Wetland Observations

Welcome to a wetland! As you explore and begin to answer the questions below, use the back of this paper to create a map of the wetland. Use symbols, shapes, or colors to represent water, types of plants, soils, smells, or other observations you find notable. This map is a tool to keep track of thoughts, so it does not have to be perfect!

What do you notice about the plants that make them unique?
Sketch unique plants and note physical features, what the area was like around them, and other unique characteristics you notice.

How are plants distributed within the area? (Draw vegetation on map)
Possibly assign a symbol with a type of plant and place symbol on map.
Are some types of plants usually found together?
Are some types of plants never found together?

What is the water like where you found the unique plant? (Draw water on map)
Is there standing water?
Is the soil damp?
Is there water nearby?
Is water the same everywhere?

Are there any patterns between plants, water, and possibly soil?
Are some types of plants usually found close to the water or in the dampest soil?
Are some types of plants never found close to the water, or found only in driest soil?