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What is a Wetland Worth?

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Adapted From:

Council for Environmental Education. Oregon Project WILD Aquatic. K-12 Curriculum and Activity Guide. 2004.

Mitsch, William J. and James G. Gosselink. Wetlands. John Wiley & Sons, 2000.

Grade Level: 4th-6th grades

Time: One hour

Overview: This activity introduces participants to the functions and values of wetlands, emphasizing the diversity of human environmental values that ultimately shape our actions. Wetland functions will first be introduced through a hands-on activity involving metaphoric objects. Different human values will be addressed through a role-playing activity where participants assume the values and outlook of different individuals or groups and debate issues.

Oregon State Benchmarks Addressed:

SC.03.2.A1(2), Describe the basic needs of living things.

SC.05.2.C.1(1), Describe the relationship between characteristics of specific habitats and the organisms that live there.

SC.08.2.C.1(1), Identify and describe the factors that influence or change the balance of populations in their environment.

SS.05.5.0.3(1), Identify and study two or more points of view of an event, issue, or problem.

SS.08.5.0.3(1), Examine a controversial event, issue, or problem from more than one perspective.

Learning Objective:

By the end of this activity, participants will be able to:

1. Discuss wetland functions and values.
2. Describe how different individuals and groups value wetlands.
3. Discuss the relationship between environmental values and actions.

Materials Needed:

- Pillow
- Sponge
- Mixer
- Strainer
- Coffee Filter
- Rice
- Soap
- Toy cradle

- Role-playing persona cards (one card per student, with five different roles possible: “Farmer,” “Wetlander,” “Developer,” “Canadian Goose,” and “Recreational Wetland Visitor”).
- Scenario cards (one card per scenario, with three possible scenarios: “The Highway,” “The Farmland,” and “The Bird Bill.” Each group of students should receive one card for every scenario being used.
- “Function” definition card, “value” definition card, and “metaphor” definition card (one each).
- World map with optional photographs of roles, including Marsh Arab culture, Canadian geese, etc.

Background Material:

Functions and Values

Different types of wetlands perform unique functions that are valued in diverse ways depending on the population. Generally, the function of a wetland describes an ecological property or process performed within the landscape. A value is the human appreciation of this function. For example, wetlands serve as retainers of excess water. Certain populations living in areas that are at risk of flooding value this function as flood control, which creates a safer living situation.

Diversity in values

Although some functions may be performed by many different types of wetlands, some are unique to type. Freshwater and saltwater marshes, wet meadows, swamps, lagoons, bogs, and prairie potholes are all types of wetlands with similar and differing functions. Corresponding to the functions, each have unique values. Human values rely on the lifestyle and degree of understanding of the individual doing the evaluating. A developer may see the economic value of the piece of land itself, while a “wetlander,” or person living in direct and every day contact with the wetland may value it in more holistic terms. An example of wetlanders are the Marsh Arabs of southern Iraq, who live on artificial islands in marshes near the Tigris and Euphrates rivers.

The different ways that people interact with wetlands correspond to the degree and type of value that they possess. In other words, the actions that affect wetlands negatively and positively hinge on these values. Although wetlands were, until fairly recently, regularly drained and converted, these practices have slowed due to the better understanding of functions, and therefore greater relative values, of wetlands.

Pre-Class Preparation (30 minutes)

1. Gather and place the “metaphoric objects,” which include the pillow, sponge, mixer, strainer, coffee filter, rice, and soap, in a paper bag.
2. Create the role-playing persona cards and scenario cards.

Activity 1. Wetland Functions Through Metaphors (15 minutes)

Introduction

1. Introduce the upcoming activity as a way of understanding wetland functions. Wetland functions are “natural properties or processes in a wetland.” Give an example of the nursery-like functions that wetlands serve, housing baby animals like birds and fish. Display “function” definition card.
2. Explain that to discuss these functions, you will be using metaphors. Metaphors are “words or sentences used to describe or represent something else, or a comparison of two seemingly unlike things.” Show students the toy cradle, and explain that this is a metaphoric object representing the previously discussed function. Display “metaphor” definition card.

Activity

1. Pass out objects, giving one object to each student.
2. Allow three to five minutes for students to brainstorm with each other about the corresponding functions to their objects.
3. Focus the attention to the group, and go through each individual object. Allow the student to first share his or her idea, then clarify the appropriate function. Adjust metaphors as needed—for example, if the student doesn't understand how a coffee filter works, and therefore doesn't comprehend the metaphor, describe a pool filter or another metaphor that the child might better understand.

Objects and corresponding functions:

Pillow: wetlands are resting places for migratory birds

Sponge: wetlands retain excess water caused by runoff

Mixer: wetlands mix nutrients and oxygen in to the water

Strainer: wetlands strain silt, debris, etc, from water

Coffee Filter: wetlands filter smaller impurities from water

Rice: wetlands provide nutrient-rich foods (rice and cranberries are two wetland-grown foods consumed by humans)

Soap: wetlands help cleanse the environment

Activity 2. Wetland Values, a Role-Play

Introduction

1. Draw a delineation between the concepts of functions and values by displaying the “value” definition card. A value is “the human appreciation or importance placed upon a wetland function.” Describe that many humans like to recreate in wetlands in order to see wildlife. They value wetlands as nurseries because wildlife is pleasing to see, hear, and photograph.
2. Describe the diversity of wetland values that exist. Explain that someone from the Marsh Arab culture, a group living in Southern Iraq, would value the nursery-like function of the wetlands as a source of nourishment, as they live within the alluvial salt marshes and use its resources in order to live.
3. Show participants the world map, highlighting where Iraq is compared to your location.
4. Add in the element of action, and state that as Marsh Arabs value wetlands as a source of food, they will use a portion of the animal resources at a given time and perhaps work for the conservation of the animal population by maintaining the “nursery” to ensure a food source for the future. A farmer that valued a wetland for its fertile soil but not its nursery-like functions would act differently, perhaps draining it in order to convert the wetland to agricultural land.

Activity

1. Explain that students will be placed in to groups, or communities, where they will be playing a role as if they were in theater. Introduce each role, and go through each scenario that will be used. Explain that the communities will be voting on these scenarios in the end. Stress that they be respectful of these different roles and opinions that will surface.
2. Count of students by five, creating groups of five students.
3. Hand out role-playing cards. Distribute these so each group has one of every role.
4. Distribute scenario cards. Hand out one at a time.
5. Allow students to debate amongst themselves.
6. Enrich the debate with questions from the list of considerations, below.

7. Prompt students to take a vote.
8. Discuss the outcomes of the voting with the entire group.

The roles:

1. **The Farmer** is a rural individual who generates economic income through growing crops in order to support his or her family. This individual appreciates conservation, but sees great potential in fertile wetland soils.
2. **The Wetlander** is a member of a group similar to the Marsh Arab culture. This group lives directly in a wetland area, and generates small amounts of income weaving mats out of reeds found in the wetlands. The majority of resources, like food and shelter, are from the wetland.
3. **The Developer** is a business-oriented person who lives 10 miles from the wetlands. This person is interested in new building projects, such as a highway that would increase local tourism and shopping.
4. **The Canadian Goose** is a frequent member of the wetland fauna. This migratory bird relies on wetlands as stops along migratory paths. This creature needs the wetlands as a habitat and source of nourishment. He or she may not survive drastic changes to wetland environments.
5. **The Recreational Wetland Visitor** is a member of the community that enjoys being outdoors and bird watching. While this individual understands some of the functions of wetlands, he or she also believes that sometimes it's necessary to destroy wetlands in order to better the community. Sometimes this person sides with development, while other times votes for the conservation of wetlands, depending on the individual issue.

The scenarios to be voted on:

1. **The Highway:** A group invested in the development of roads in the community wants to build a new superhighway through town. The superhighway would alleviate traffic problems and create opportunities for more development of businesses including malls. This could spike tourism and the overall economy of the community. At the same time, this would disrupt the adjacent wetlands, potentially destroying them all together. Pollutants from cars and road-building materials would damage the plants, and the noise would surely scare away any animals. The groups of people living on the wetlands would have to move to a very small area that could be at risk of pollution and disruption.
2. **The Farmland:** A group of farmers in the community want to convert a large wetland in to agricultural land. This would help the agricultural economy and provide job opportunities. It could also lower the cost of food for the rest of the community because of the productivity of the land. These jobs and lowered food costs could eliminate some of the poverty that this population faces. This would include draining the area and displacing a large portion of the native plants and animals. Those that are not displaced would have a fragmented habitat. The wetlanders could still live on a substantial area, but would have decreased food sources and increased risk of pollution by fertilizers and pesticides.
3. **The Bird Bill:** Because of an invasive plant species that is out competing a major food source, the population of a migratory bird is dwindling. The invasive species was accidentally brought by tourists boating in lakes near the wetlands. While the bird species is not yet endangered, it soon will be if no actions are taken to prevent further population decline. A conservation group has put forth a proposal that would have community members paying a high tax when doing any recreational water activities to offset the costs of removing the invasive plants. While it could save the bird population, it could cost the city income from tourism services.

Note: The three scenarios can be used individually or all together depending on time. An in-depth discussion of the scenario could take 10-15 minutes, while a 5 minute discussion might suffice if the students are younger.

Considerations (points to bring up in debate):

- Would mitigation be appropriate or effective? Mitigation could be defined as the lessening of or compensation for wetland losses through restoration and creation of wetlands.
- Is there a way to compromise between the needs of both parties? For example, could the location or size of the highway be scaled down and adjusted so that the majority of the wetland could be preserved?
- Who is responsible for the health of the wetland? Is it the entire community or just those creating the damage that should have to pay?
- Are the costs of not having a wetland worth the benefits of destroying it? Take into consideration the many functions of wetlands, such as flood control and pollution and sediment filtration. Would the absence of this wetland create more costs in the future?
- Is there an intrinsic or aesthetic value in a healthy wetland that outweighs the extrinsic (such as economic or material) values of creating a highway or farmland?
- Are there other consequences that might not have been articulated? For example, in the Bird Bill, the majority of boaters might be avid fisherman that fight for local conservation of fish habitat. Would the tax on water activities lessen their dedication or interest in this issue?

Step 4. Gauging Understanding

Q: What is a function of a wetland?

A: A natural properties of processes in a wetland

Q: What is a value of a wetland?

A: The human appreciation or importance placed upon a wetland function.

Q: Describe how your role valued the wetlands, and because of this, how you voted.

A: Example: The farmer values the wetlands as potentially fertile soil that would increase crop productivity. For this reason, the farmer voted against the highway bill that would damage this important soil. The farmer voted, however, to convert that wetland to agricultural land (Answers will vary).

Step 5. Wrap Up (5 minutes)

1. Reiterate, repeat, and clarify the answers to the questions that the participants just demonstrated.
2. Stress that everyone values the wetlands in a different way, but that because they have special functions, we need to think very critically about our actions that might affect the wetlands. Explain that if we make others aware of these functions, perhaps they will begin to value wetlands in new ways that support conservation and healthy wetland landscapes.