June 2007

Wetland "Space" Invaders

Developed by: Steve Jang
Grade Level: Grades 5-7
Adapted from:
National Geographic Xpeditions. Lesson Plans: Invasive Species.
http://www.nationalgeographic.com/xpeditions/lessons/14/g68/newsinvasive.html

Project Learning Tree. *Exploring Environmental Issues*: Biodiversity, "Global Invaders."

Willamette Resources and Educational Network, West Eugene Wetlands Lesson Plan. "Invasion of the Habitat Snatchers."

Time: 45 minutes

Overview

This activity introduces participants to the fundamental concept of invasive species and their detrimental effects to their introduced habitats. Using active discussion and a hands-on identification activity, students are introduced to the effects that invasive species have on native species.

Oregon Standards and Benchmarks Addressed

1A. Life Science: Organisms
1C. Life Science: Diversity/Interdependence
Life Science Benchmark 2: Invasive Species (Grade 5)

This lesson plan satisfies Oregon State Standards for science in areas 1A and 1C; Life Sciences Organisms and Diversity/Interdependence. This plan also correlates with Oregon State Life Science Benchmark 2 for grade 5. When used in conjunction with the existing curriculum, students can be expected to demonstrate scientific aptitude on par with state standards.

Learning Objectives

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

1. Define and differentiate between invasive/introduced species, and understand the problems associated with them.
2. Identify invasive species commonly found in the West Eugene Wetlands (WEW).
3. Describe the ecological effects that invasive species have on the wetlands.

Required Reading

- □ None for today.

Materials Needed

- ❑ Flipchart paper, pens, masking tape
- ❑ Prepared display board with images and text
- ❑ Prepared handout cards with photos of invasive and native species (20)
- ❑ 40 pieces of colored papers that denotes wetland resources (food, air, ect.)

Background Material

-Look at the accompanying display board to get comfortable with some native and invasive species existing in the West Eugene Wetlands.

-Background information on non-native species and introduced species of the West Eugene Wetlands. Differentiate between non-native and invasive species.

Key Terms:
Non-native species: any species that has been taken from its native habitat and transplanted to a new environment; not necessarily destructive, but has the potential for problems.

Invasive species: a non-native species (relative to its current habitat) whose presence causes or potentially causes economic and/or ecological harm. Invasive species can be plants, animals, or other biological organisms and are typically introduced by humans, although accidental introduction of species occurs as well (ex: Zebra mussel and bilge water from sea-going vessels).

Habitat: The area or environment where an organism, animal, or plant normally lives. A habitat can include the food, water, shelter, and space that an organism uses in the area that it lives.

Ecosystem: The habitat and all the organisms that are within that habitat and how they interact.

Invasive species (macro species) are typically introduced by humans. Reasons such as game potential (hunting), visual appeal (Queen Anne's lace), or as a remedial option (in other pest control) are all real world examples of why non-native species are introduced in new areas.

Effects of invasive species:
-Reduction in diversity.
-Competition over resources between native and non-native species leads to a reduction in native species.
-No natural predators or natural regulatory mechanism in place within the introduced habitat allows invasive species populations to skyrocket.
-Because of the interconnectedness of native species within their ecosystem and food web, other species and ecological components are negatively affected.

Activity Description

Step 1. Getting Started: Introductions (10 minutes)

Take 10 minutes to introduce the general idea of native species using basic concepts to help reinforce what occurs "naturally," and what doesn't. Explain to the student group that one of the most ecologically severe threats to ecosystems and habitats today is the introduction of non-native plants and species by humans. When certain non-native species are introduced into areas where they are exotic, the results are often disastrous for native populations. Presenting the idea of a local habitat as "home" and the species inhabiting the area as locals is important. The distinction between a "native habitat" and the concept of introduced environments can be confusing, so try to use examples that the audience can understand. The concept of "invaders" is an easy way to explain to the students the threat that invasive/introduced species have on natural ecosystems. When certain exotic species are brought into environments where they are not commonly found, there becomes a competition over resources, as well as the possibility that the ecosystem does not have the ability to deter these species (either lacking predators or population preventions). The facilitator should occasionally ask information reaffirming questions throughout the introduction to gauge group understanding.

Step 2. Discussion and Overview of the Prepared Display Board (10 minutes)

a) This activity provides a visual supplement to the discussion, meant to explain real examples of invasive/introduced species in the West Eugene Wetlands. Be sure to use examples that the audience can understand!

b) The facilitator should utilize the display board that contains photographs, text boxes explaining the photos, and yarn connecting the species that are native to the area and those that have been introduced. ***(Prior to the lesson, the facilitator is responsible for going over the background information and all of the poster board content!)***
c) Explain the main animal species that have been introduced into the wetlands. How do they alter the balance of an ecosystem? Examples of invasive species in the WEW include nutria, European starling, among others (*see display board). It is important in this step that the facilitator makes it clear that there are real world disadvantages to the ecosystem when invasive species are introduced to new habitats.
d) Begin asking mentally stimulating questions to the class. What happens when too many animals live in a small area or space? What is diversity and how does the introduction of invasive species hurt diversity?
e) Wrap up the discussion by telling the student group that there are things that people can do to help!
f) Learn to identify local invasive species. Don't plant species that are not native to your area. Be sure to report sightings of invasive species to the proper authorities.

Step 3. Invasive Species Identification Activity (15 minutes)

a) Begin by having each student number off by one's and two's to divide the group evenly.
b) Designate one area of the classroom or outside area as the wetlands. In this area, place the "resource tokens" on the ground.
c) Pass out the picture cards containing a specific species (native or invasive, common to the West Eugene wetlands).
d) Place all of the native wetland students in the designated area.
e) Have the students first identify whether or not their species is native to the area and those that are should make their way over to the designated area. Next, have the "native species" each pick up one of the "resource tokens."
f) Slowly, with the facilitator acting as the human introducer, begin moving "invasive species" one or two at a time into the designated area. Each of these "invasive species" should pick up one "resource token" as they enter the area.
g) Each time the invasive species picks up a resource token, the native species should also pick up 1 additional token.
h) Eventually, the facilitator should move all of the "invasive species" into the area with the "native species." After both groups of students are together in the designated area, have them take note of how little resources are left over. Also, explain to them the reduction in living space/ecological footprint that each student has after the transfer.

Step 4. Gauging Understanding (5 minutes)

After finishing the Species Identification activity, bring the group back together for an evaluative question and answer session in order to determine information exchange and understanding. Any questions can be gone over again using the display board.

Some questions to ask the students:

1) Q: What are two negative affects that invasive species have on a habitat?
A: Invasive species populations displace native populations as well as compete for the same resources, causing a reduction in the native species.

2) Q: Name 3 invasive species found in the West Eugene Wetlands?

A: Nutria, European Starling, and Queen Anne's Lace are all invasive species found in the West Eugene Wetlands.

3) Q: What is the difference between introduced (non-native) species and invasive species?

A: Non-native/introduced species refers to an organism that is not indigenous to a given area or habitat. Species become invasive if it fulfills three basic requirements: first the species must be introduced into an area where it had not existed before (usually by human means), second the population must become capable of establishing a breeding population without any other intervention (human or otherwise), and finally the species spreads rapidly through the new habitat.

Step 5. Wrap Up (5 minutes)

This section allows the facilitator to go over any additional information and/or allow the students to voice their opinions. Once more, basic terms and ideas will be explained.