Field Trip to the Watsonville Wetlands

Summer Field Trip #1

Summary

Students are introduced to the concept of a food web and accompanying ecological vocabulary. Then they explore West Struve Slough in small groups using binoculars, bird and plant guides, and the food web concept as tools to complete a wetland scavenger hunt.

The Basics:

Grade Level:
6 - 8

Subject areas:
life sciences

Duration
2-3 hours (Depending on transportation and teacher availability)

Number of Docents Needed: 4
(with docent training prior to field trip)

Objectives

Students will:

- know the difference between food webs and food chains
- understand the interrelationship and importance of all forms of wetland life

California Content Standards Addressed:

Grade Six- *Science 5.a:* Students know energy entering ecosystems as sunlight is transferred by producers into chemical energy through photosynthesis and then from organism to organism through food webs."
Grade Six- *Visual and Performing Arts 2.1*: "Use various arts and observational drawing skills to depict a variety of subject matter."

Outline

There are four pieces to this lesson:

1) Introduction (15 minutes)
2) Food Web Game and Discussion (25 minutes)
3) Scavenger Hunt and Drawing on Wetlands (1 hour or more)
4) Closing Circle and Snack (20 minutes)

This time break-down is for a 2 hour field trip. If you have more time, expand any or all sections as you see fit.

Materials and Handouts

All handouts referred to in this section can be found in the Summer Program Field Trip #1 folder at the WERC. Or, you may print out the .pdf files from the website.

1) Weed-whacked trails and open area near entrance on Department of Fish and Game property at West Struve Slough. (Note: a weed whacked area and hay bales are not necessary but do make the field trip more comfortable.)
2) Hay bales in a circle in the weed-whacked area.
3) Plant guides for each docent/group leader. The Watsonville Wetlands Watch plant guides are preferable but any plant guide that includes local, wetland plants will do.
4) Scotch tape for each docent/group leader.
5) Food Web Game. This includes plant, animal, and abiotic factor card necklaces and a spool of yarn. This game may be found in the food web themed Wetlands Stewards Program kit at the WERC. Or, you may make your own by finding pictures on the internet of plants, animals, and abiotic factors (sun, soil, water, air). Print out each picture with the name of each under the picture. Make sure that you find examples of each category of animal, such as, herbivores, omnivores, carnivores (including top predators), and decomposers. Try to find only plants and animals that are local to the area. Laminate each picture, hole-punch them, and make necklaces out of them with equal lengths of string. You will need lots of yarn on a spool or a ball of yarn to make the web. Directions for game are found below in text.
6) Key to Department of Fish and Game gate. (Note: this is also not necessary because it is possible to climb over the gate but it does make the field trip more comfortable.)

for each student:

1) clipboard
2) Copy of "Wetland Scavenger Hunt" Handout.
3) A couple of blank sheets of paper
4) A pencil
5) Bird guides (any bird guide is fine)
6) Pack of Colored pencils (kept by the docent/group leader)
7) Snack with a drink

Background Material

Excerpted from "Interesting facts about food chains" by Jacobo Bulaevsky.

In an ecosystem, plants capture the sun's energy and use it to convert inorganic compounds into energy-rich organic compounds. This process of using the sun's energy to convert minerals (such as magnesium or nitrogen) in the soil into green leaves, or carrots, or strawberries, is called photosynthesis.

Photosynthesis is only the beginning of a chain of energy conversions. There are many types of animals that will eat the products of the photosynthesis process.
Examples are deer eating shrub leaves, rabbits eating carrots, or worms eating grass. When these animals eat these plant products, food energy and organic compounds are transferred from the plants to the animals. These animals are in turn eaten by other animals, again transferring energy and organic compounds from one animal to another.
Examples would be lions eating deer, foxes eating rabbits, or birds eating worms.

This chain of energy transferring from one species to another can continue several more times, but it eventually ends. It ends with the dead animals that are broken down and used as food or nutrition by bacteria and fungi. As these organisms, referred to as decomposers, feed from the dead animals, they break down the complex organic compounds into simple nutrients.

Decomposers play a very important role in this world because they take care of breaking down (cleaning) many dead material. There are more than 100,000 different types of decomposer organisms! These simpler nutrients are returned to the soil and can be used again by the plants. The energy transformation chain starts all over again.

Food web and food chain vocabulary:

Producers. Organisms, such as plants, that produce their own food.
Consumers. All the organisms that can not make their own food (and need producers). They obtain food by eating other organisms. There are different levels of consumers.
Those that feed directly from producers, i.e. organisms that eat plant or plant products are called *primary consumers*.
Organisms that feed on primary consumers are called *secondary consumers*.
Those who feed on secondary consumers are *tertiary consumers*.
Herbivores are those that eat only plants or plant products. Example are grasshoppers, mice, rabbits, deer, beavers, moose, cows, sheep, goats and groundhogs.

Carnivores, on the other hand, are those that eat only other animals. Examples of carnivores are foxes, frogs, snakes, hawks, and spiders.

Omnivores are the last type and eat both plants (acting a primary consumers) and meat (acting as secondary or tertiary consumers). Examples of omnivores are:

Bears --They eat insects, fish, moose, elk, deer, sheep as well as honey, grass, and sedges.

Turtles -- They eat snails, crayfish, crickets, earthworms, but also lettuce, small plants, and algae.

Monkeys -- They eat frogs and lizards as well as fruits, flowers, and leaves.

Squirrels -- They eat insects, moths, bird eggs and nestling birds and also seeds, fruits, acorns, and nuts.

Decomposers are those animals, bacteria, and fungi that get their energy from eating and breaking down dead plants and animals.

Procedure

Have the students and teacher chaperones meet you and the docents at the Department of Fish and Game property. The entrance area and trails should be weed-whacked prior to their arrival. A circle of hay-bails serves as an outdoor classroom.

1) Introduction (15 minutes)

- Re- introduce yourself and all the docents that are there to help.
- Ask the students if they can tell what ecosystem they are in. (Wetland) Introduce the preserve as an area that cannot be built on or destroyed and is a good home for animals.
- Go over rules and how to respect the wetlands, docents, and others. Explain the agenda for the day.
- Note: the "Wetland Scavenger Hunt" file accompanies this field trip.

2) Food Web Game (25 minutes)

Vocabulary: Food web, herbivore, carnivore, decomposer, omnivore, producer, consumer

1) Ask the students if they know what a food chain is. What is a food web and how is it different from a food web. Tell them that they are going to create a large food web and each student will be an animal, plant, or element of an ecosystem.
2) Have docents pass out food web card necklaces so that each student has one. Ask them to wear it with the picture facing outward. Ask the students to stand and form a tight circle.

3) Pass the spool of yarn to whoever is the sun. Tell the students that all food webs on earth start with the sun. Why is that? Who transforms energy from the sun into food? (plants) Have the sun hold the end of the string and ask, "who depends on the sun"? Have the person who is the sun pass the spool someone that depends on the sun. (start with a plant) Have that person hold on to the string and then ask again, "who depends on this person"? Pass the spool onto someone else. Continue this way until every plant, animal, and element are holding a corner of the food web a.k.a. the string. There should be a web-like structure created in the middle of the circle.
4) During the creation of the web, introduce the vocabulary above. It is easiest to do this by discussing the roles of the different plants and animals in the food web as the spool is passed around. Ask the kids if they know a word for an animal that only eats plants when you are connecting a plant to an animal. Introduce "Decomposer" when you have reached a top predator and explain that there are certain little animals like bacteria, worms, and insects that depend on animals once they are dead. When an animal is dead it decomposes. The idea is to get the students thinking about the roles of each animals and plants.
5) When everyone in the circle is connected into the food web, give them this hypothetical situation; "the wetland becomes extremely polluted and all of the fish die off", or "a city cuts down all the trees in the wetlands and all the hawks move out of the area", or any other scenario where there is some destruction and one of the animals is removed from the ecosystem. Tell the animal/student who has been removed to start tugging gently on their end of the string. Tell the students that if they feel the tugging to tug back and if more students feel THAT tugging to tug back, and so on until the entire food web is moving. Tell the kids to stop tugging and ask them what the tugging represented. When one animal went extinct, did the whole food web feel it? Is one animal or plant interconnected to every other plant and animal?

3) Scavenger Hunt and Drawing on the Wetlands (an hour or more)

1) After the Food Web Game, have the kids sit back down. Explain that know they are going to explore the wetlands in small groups. Handout clipboards with the scavenger hunt sheet, blank drawing sheets, and a bird guide to each student. Explain what the sheets are for. Ask the students if anyone has used binoculars. Give a 2 minute

binocular training BEFORE handing out a pair of binoculars to each student. Make sure that each docent/group leader has a backpack with plant guides, coloring pencils, and tape.

2) Break the students up into four or five small groups and assign a docent or teacher chaperone to each group. Now they may explore the DFG property for an hour or more on the trails. Encourage docents to explore most of the area and have the kids identify plants and animals using guides. At some point they should stop and sit down to do some free nature drawing with the colored pencils. Most importantly, this should be FUN exploration time. It is not necessary for the students to finish the Wetland Scavenger Hunt sheet or drawing. Docents are encouraged to tie in vocabulary from the food web game.

4) Closing Circle and Snack (20 minutes)

When there is about 15 to 20 minutes left before the students have to leave, round up the groups and bring them back to the outdoor classroom area by the entrance gate. Have them sit down and collect binoculars, clipboards, pencils, and bird guides. Students should keep their sheets and drawings. Pass out snack (which should include something to drink). Ask them a closing question of your choice and have them answer it one at a time going around in the circle. When they are done have them thank the docents and explain what you will do in your next classroom visit.

Bibliography and Resources

Bulaevsky, Jacobo. "Interesting facts about food chains." Retrieved September 14, 2007 from http://www.arcytech.org/java/population/facts_foodchain.html.