AQUATIC INVERTEBRATES SAMPLING

GOALS:
- To introduce students to the Watsonville Wetlands water system
- To introduce students to animals that live in the wetlands and what this indicates about the health of the wetlands
- To show the importance of aquatic invertebrates in wetland food webs
- To help students identify sources of water pollution and learn how they can avoid polluting the environment

MATERIALS (for each station):

Part 1:
2 water dippers
1 meter stick
2 Dishpans
Hand lenses and magnifying glasses
Petri Dishes
1 thermometer
Boots (depending on season)
Rubber gloves
Pond Life book
Data sheet
Clipboard

Part 2:
Rubber gloves
Data sheet
3-5 Aquatic invertebrate identification keys
Clipboard
Pencils
2 turkey basters
3 disposable pipets
Tweezers
2 Dish pans

BACKGROUND:

Aquatic invertebrates are small animals that live in the water (aquatic) that do not have a backbone (invertebrate). These animals such as aquatic insects and worms are extremely important in wetland food webs. Without these aquatic invertebrates,

organisms such as fish, frogs, ducks, and birds would not be able to live in the wetlands.

Aquatic invertebrates are also important because they are bioindicators. This means some of them are sensitive to pollution so their presence or absence can indicate if a wetland is healthy. For instance, mayfly larva, gilled snails, and stone fly larva are sensitive to pollution. If some of these organisms are found in a wetland, the water quality may be excellent or good. If none of these organisms can be found in a water body, chances are there is some form of pollution entering the wetlands and affecting water quality. Other aquatic invertebrates such as dragonfly larva and copepods are only somewhat sensitive to pollution. If these aquatic invertebrates are found in a wetland, the water may only be receiving small amounts of pollution. The water quality may be good or fair. If, however, only organisms such as aquatic worms, leeches, and water fleas are found in a wetland, this wetland would be considered unhealthy and is probably impacted by pollution from runoff. This water quality would most likely be poor.

Sampling aquatic invertebrates is an easy, quick, cost effective way to measure wetland health. Water quality tests can be expensive and take time to receive results from lab tests. People can easily sample and identify aquatic invertebrates in the wetlands to get a measure of wetland health at the time of sampling.

INSTRUCTIONS:

Some field trips will do Part one in the field and Part two in the field or in the classroom.

Part 1- Collection

Staff will introduce the concept of aquatic invertebrates, why they are important, and what they can tell us about the wetlands. The class will then separate into small groups led by docents, teachers, and staff.

1. Walk students to the water sampling station. Go over materials in your kit

2. Before sampling or giving out equipment, ask students:

- Where might be the best place to sample for aquatic invertebrates? Why? (In the vegetation because this is where the food and shelter are)
- What are some ideas to sample the most aquatic invertebrates? (Scoop quickly to surprise them, take multiple samples, don't sample from the same spot continuously)

3. Demonstrate how to sample: using a scooper, take a quick sample in an area with plants. Show students what you organisms you have collected. Pour into a white tub (Part 2 in field) or closable container (Part 2 in classroom).

4. Have students take turns sampling for aquatic invertebrates. If necessary, have students wear boots.

5. Collect data on weather, temperature, depth of sample site, and site condition. Try to involve as many students as possible in the data collection. Discuss how these variables may affect aquatic invertebrates.

If Part 2 is in the classroom, store collection containers in refrigerator.

Part 2- Identification

1. Demonstrate for students how to sample an aquatic invertebrate using a pipet or turkey baster. Be sure to show how you need to squeeze the dropper before entering the water. Put the aquatic invertebrate into a small drop of water so it doesn't move around a lot and is easy to observe.

2. Using a magnifying lens or dissecting scope (classroom), have the student look at the organism closely and use the Aquatic Invertebrate Key to identify it. Pass around each type of organism to give other students a chance to look at it.

3. Have students check off each type of aquatic invertebrate on the data sheet once they identify it. They only need to record an organism once. The goal is to identify as many different types of organisms they can find, rather than the same type over and over.

4. Continue to identify until you think your group has found all the types of aquatic invertebrates in your sample. If you have extra time, you can do follow the calculations on the data sheet to determine the water quality for your group.

Closing led by staff. Each group will share the types of aquatic invertebrates that they sampled. Staff member will record the students data lead them through the calculations on the data sheet to determine the water quality. Staff will lead discussion about what the results say about the wetland health and how students can get involved to protect the wetlands.