



## Science Lesson 12: Stream Ecology— Aquatic Invertebrate Quantitative Survey

### Hawaii DOE Content Standards:

Science Standards: 1, 2, 3

### Key concepts:

Biological habitat, community structure, diversity, health

**Performance indicators:** Students will use a Surber type sampler to survey a Hawaiian streambed for aquatic invertebrates.

### Note to the Student:

“When you have completed this activity you will be able to collect a quantitative aquatic invertebrate population sample from the stream.”

### Activity at a glance:

Students will take a random sample of the aquatic invertebrates in the stream.

**Time:** A single Surber survey will take a group of four fifteen minutes.

**Prerequisite skills:** None

**Skills to be introduced:** quantitative aquatic invertebrate sample

### Assessment:

Data sheets, data compilation, journal entry and observational data, insect collection

### Vocabulary:

aquatic invertebrate, Surber sampler, sieve size, quantitative sample, random sample

### Materials:

hundred meter tape, data sheet and clip board, Surber sampler net, sieve set, buckets, brushes, bug jars, Tweezers, gloves, waders

## Activity Overview

1. Lay a twenty meter transect along the streambed. Generate five sets of random number pairs and organize using the first number from lowest to highest. The first number is between zero and twenty and is the distance up the transect (starting down stream). The second number is from zero to 6 and is the distance from the left bank into the stream channel. This will give you five random sampling points in the stream transect.

2. At each point place the Surber sampler with the net downstream and the area rectangle firmly on the bottom. Disturb the stream bed by overturning and vigorously brushing the rock surfaces to dislodge any aquatic organisms that will then be carried by the stream flow into the net. Time the disturbance period to be consistent and through at each site.
3. Take the collected sample to the side and wash into jars for later observation.
4. Observation takes place on metal sieves. Continuously wash the sample, removing the larger vegetative mass and pulling out the invertebrates for storage in sample bottles. Count the different species collected at each site and record on a data sheet.

## **Cultural Values**

### **Pono**

Correct doing

### **Malama**

Respect, reciprocity, relationships, and responsibility

### **Laulima**

Working together

### **Kokua**

Taking initiative, doing service, clean up, maintenance

### **Lokahi**

Unity, harmony, leadership skills

## **Adaptations/ Extensions**

A qualitative survey of the aquatic invertebrate can be conducted with the D-net. A qualitative survey for other insects on the banks and in riparian vegetation will also give incite to the biological interactions of riparian food webs.

### **Connections to other curricula or lessons:**

Water quality, mapping, weather observation, stream habitat survey

## **Safety**

Hawaiian streams are prone to flash flooding. Check weather forecasts and exercise caution during rain events. If the stream is swollen with rain or discolored by runoff, postpone the stream survey activity. Hawaii streams are contaminated by leptospirosis bacteria; do not drink the stream water or expose a cut or skin abrasion to the stream water. Wash with antibacterial soap after contact with the stream water.

