

Activity #8: Stream Safari

Materials

Different sampling techniques are appropriate for different parts of the watershed. Essential equipment for an insect inventory includes:

- **Waders** or high boots
- **White capture buckets, trays and coolers** for holding the collection. White bottoms make it easy to see the animals, and some insulation will keep them alive and well longer.
- **White trays, yogurt cups, or ice cube trays** for sorting collections
- **Hand lenses, jewelers loupes, or magnifying glasses**
- **Collecting Permits:** If your class plans to collect invertebrates and keep them, make sure to get the proper permits before you do so. If you want to collect in a state or national park, begin by calling that park's office. The state Department of Environment and Conservation might be another good place to start asking for permits. If the organisms you want to collect are fairly common and you are collecting for research or education purposes, government agencies usually just ask that you collect only the organisms listed on your permit and that you submit a report of what you found when you have finished collecting.
- Not absolutely essential, but HIGHLY recommended equipment includes
 - **Nets:** you can use several different types of nets. Each is good for sampling a different niche in the stream. The handouts provided contain instructions for making some of the following types of nets.
 - **Dip nets** can be found at pet or aquarium stores, or from entomological supply houses like BioQuip. They are used for catching things you can see, but there's lots one will miss upon first glance...
 - A **kick seine** or **kick net** consists of mesh strung between two vertical poles. Seines can be set up and left to collect freeswimmers, like minnows, and certain types of mayflies. Instructions are on the **Make Your Own Kick Net** handout, p. 37.
 - **Beat sheets** are held underneath trees, grass, or shrubs while somebody beats on the vegetation. Insects fall out of the vegetation and are collected on the beat sheet. Move fast to pick them up! You could also just use a light-colored umbrella held upside-down.
 - **Dissecting microscope** for close observation and identification
 - **Tweezers** and **small brushes** for handling small or delicate creatures

Procedure

The first part of your stream safari should be a quiet session of careful observations that students write down. Information that everybody should collect includes:

- A physical description of the stream. How fast is the water moving, and how turbulent is it? How many riffles are there? Estimate its width and depth. Is it a straight channel, or does it meander in **S**-curves?
- What is the bottom like? Is it cobbled, sandy, or bedrock? Are there algae or weeds? Concrete or sediment?
- What kind of cover is available for animals? Are there permanent snags or rocks that slow currents and provide a place to hide from predators?
- What is the stream bank like? Is it sandy or rocky? Does it appear to be eroding? Is there a vegetated overhang to hold insects or provide cover? Are there shading trees on the bank? Is it artificial, like concrete riff raff?
- What, if any, evidence of human activity do you see? Can you see trash or fishing tackle? Can you hear a highway? Do you see erosion that might be evidence of grazing cattle? How wide a buffer of vegetation does the stream have outside the banks?
- Does the stream smell clean or stagnant? Note any "off" or sulfurous odors.

It is important to have a safety talk before kids begin wading into a stream.

Now it's time to begin collecting. If the stretch of water that you're looking at has a number of different habitats, make sure to sample from each of them. Send one group to use a kick-net under a riffle, another to turn rocks over in the shallows, and another to beat the streamside vegetation to collect adults. Also, in general, it is preferable to start downstream and work upwards to avoid sending sediments and organisms downstream to locations that you will later want to sample. Students should work in groups of three or more, especially if they are wading into riffles or swift water. Invertebrates can be collected with any of the net-based techniques described in "**Materials**," or by simply reaching into the water to grab what they can and turning rocks over to find nymphs, water pennies, and scuds.

Discussion Questions

- How have different insects adapted for life in the water?
- What is the advantage of being flat if you live in fast water?
- Would you be able to guess what different animals ate without being told?
- What do their mouth parts tell you about their diets?
- How do some insects use surface tension? (Look at water boatmen.)



Adapted from The Stream Study, 1999