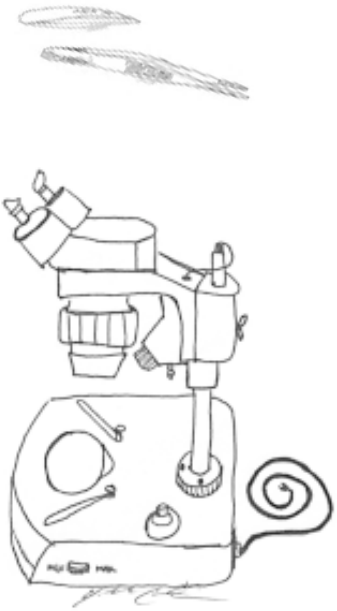
Resource Specialist

Equipment & Procedure Guide

1. **Review the "Tips and Tricks for Resource Specialists"** PDF document.

2. **Explore the Invert Investigator materials in the "Teachers" section** to become familiar with the pre-work. This will give you an idea as to what the student is expected to know. Always praise the classroom teacher for prepared and attentive students!

3. **A checklist of equipment necessary for this station:**
   - ❑ Kick net or D-frame net for collecting
   - ❑ Enamel or plexiglass shallow pan durable enough to sit on rocks; used for holding and sorting insects
   - ❑ Aluminum or plastic containers suitable for individual student insect collection
   - ❑ Forceps, tweezers, or plastic spoons for picking up invertebrates
   - ❑ Hand lenses or field hand microscopes
   - ❑ Larger lab microscope for outdoor use; magnifying boxes and Discover-scopes are also helpful
   - ❑ Petri dishes used with above microscope
   - ❑ Laminated copies of the *Key to Immature Aquatic Insect Invertebrates*.
   - ❑ Hip or chest waders for you and students (chest waders are preferred in the spring)
   - ❑ Table(s) for study equipment
   - ❑ Student Field Day Worksheets (teachers have been asked to provide these, but you might have some extra copies on write-in-the-rain or regular paper) and handouts showing: *The River Continuum*, *Aquatic Insect Life Cycle Stages*, and *Aquatic Invertebrates Tolerant and Sensitive of Water Pollution* (these can be found in the Teachers section).



4. **Procedure:**
   After your introduction, divide students into small groups each resource specialist takes one group.

   Distribute equipment. Each group should have a kick net, one large shallow pan to hold the group's insects and two smaller containers for individual collections from rocks/vegetation.

   If the habitat allows, one group should look for insects in a riffle, and the other explore a pool or glide to compare the richness of insects in each habitat.

   Get them in the water right away! This is student directed learning. The instructor becomes the guide rather than the informer. Be part of the experience to answer questions and keep students on the right track.

While in the water ask:

- ❑ In which habitat (pool, riffle, glide) will you find the most invertebrates?
- ❑ What will the differences be between the invertebrates found in each habitat?
- ❑ Where are you finding them (substrate, vegetation, woody debris)?
- ❑ What functions are the macroinvertebrates serving there?
- ❑ What is the connection between riparian vegetation and macro-invertebrates?
- ❑ What is the connection between stream size and channel type and macroinvertebrates?
- ❑ What role does poor water quality play in the number of species and number of macroinvertebrates you might observe?

- ❑ When enough aquatic invertebrates have been collected, take the specimens and students back to the tables.
- ❑ Pair up students, each pair with an insect key and student worksheet. Identify, quantify, and classify, using worksheet and Key to Immature Aquatic Insects, magnifying lenses and microscope.
- ❑ Students divide macroinvertebrates into functional feeding and water quality tolerant/intolerant groupings.

In the final 15 minutes, reconvene and discuss findings.

- ✓ Where were most insects found?
- ✓ What functional feeding group was most represented?
- ✓ How many insects fell into each tolerance level group?
- ✓ From what channel type were most of the aquatic insects found?
- ✓ What living conditions do sensitive macroinvertebrates require?
- ✓ How would you rate the water quality of this stream from 1-10?
- ✓ What fish and other wildlife prey on them?
- ✓ What stage of development was most prevalent?
- ✓ What role do aquatic insects play and how do they contribute to the ecosystem?
- ✓ How will warm water or highly sedimented streams affect the variety of species and their populations?
- ✓ What is the role of geomorphology in aquatic habitat (see Habitat Sense, What's in that H20?, and Riparian Rx)?