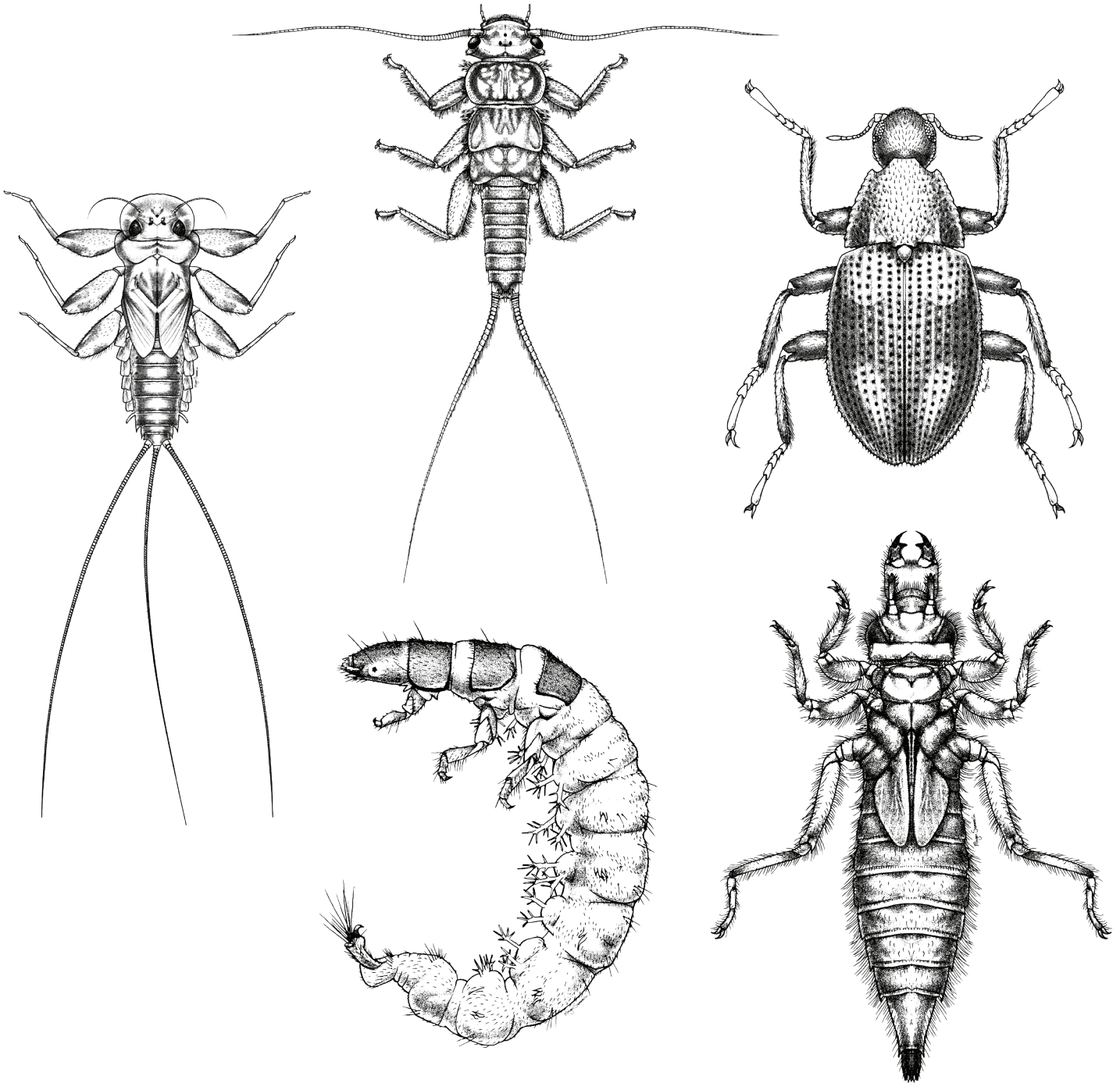


# Trainer Guide

Using **Macroinvertebrates.org** in your  
Aquatic Macroinvertebrate ID Workshops



Atlas of Common Freshwater  
[www.Macroinvertebrates.org](http://www.Macroinvertebrates.org)  
of Eastern North America

This guide gives suggestions on when and how to use [the site](#) with additional tips on helping attendees to 'learn how to see' and 'see to learn' for improving identification skills. This is most appropriate for Identification levels of Phylum to some Families.

**TIP #1:** Check out the [resources page](#) and become familiar with the site as trainer! Subsequent tips will guide you as to which resources to use and when, but here's a list of what's available so far:

**Identification Key** with two versions: interactive (found on the home page) or printable (found on the resources page as a pdf).

**Order Sheets:** These printable files show images, morphological character drawings and life history summaries of these three orders: Ephemeroptera (mayflies), Plecoptera (stoneflies), and Trichoptera (caddisflies).

**Poster:** This is a printable pdf of all the images in the website collection.

**Training Deck Templates** (presentations): These can be downloaded and customized for the particular taxa covered in your workshops. Great as an introduction and as a follow-up guide.

**Site Quick Start Guide:** Great reference for the beginner on site features and user tips.

**Site Rack Card:** Can be used to share and promote the site, or as a handout for the public or novice groups.

**Order Illustrations:** Download drawings of 13 orders!

**Macroinvertebrate Image Gallery:** Features a subset of images, ready to use!

**ID Practice Game:** A self-practice game for identification (to the common taxa used in volunteer monitoring programs).

**Site Tutorial Video:** Used as an introduction to site features and navigation.

**TIP #2:** Bring in the website before, during and after a workshop.

**PRE-WORKSHOP** Send emails to your workshop attendees to not only become familiar with the site, but also to catch a glimpse of the wide range of taxa, learn morphological characteristics and see the common and scientific names, etc. This is helpful for anyone, from the novice to the very experienced, and builds a stronger foundation for their learning. Plus, doing some pre-prep and foundation setting means more time at the workshop for ID confirmation and field time!

**Suggestions:**

- a. Email a link to the [site video tutorial](#) to give an overview of the site's capabilities. Suggest they review the [quick start guide](#) to navigating the site.
- b. Email an image (or two, or three) from the macroinvertebrate image gallery to practice ID with the [website's ID key](#) (include the answers).

- c. You can pick taxa they are most likely to see, which will help when they're in the field at your future workshop ('Hey, I remember that one from the quiz!').
- d. If it's already a very experienced group, email the website's [practice quiz](#) as a way to get started. Otherwise, save that for during or after the workshop.
- e. Start slow! Suggest they look over just the EPT orders (Mayflies, Stoneflies, Caddisflies) through this [first version](#) of the website.
- f. Send the 'tips for diving into ID' slide from the training deck presentation.

**DURING WORKSHOP** Using the [website](#) throughout the workshop can be more than physically getting onto an electronic device! You can also print helpful learning materials from the resources page, while also using the site's images, drawings, videos and the volunteer presentation to supplement your training.

**Suggestions:**

- a. If you are using the website during the training, there are a few things to check off the list and have in place:
  - i. Do you have wifi available or a hot spot?
  - ii. Are you providing electronic devices? If not, make sure you ask attendees ahead of time to bring their own.
  - iii. Smart Pads and laptops work best. The website is not smart-phone friendly.
  - iv. Make sure you provide tables for attendees to spread out and have space for using the devices.
- b. When should you have attendees use the site? This is a good logistical question and will depend on your own flow and sequence of topics during the training. Again, you'll need to be within range of wifi or a hot spot. **Recommended times to use the website:**
  - i. If doing live ID of macroinvertebrates, simply have attendees use the site during their identification process to help understand morphological characters and to 'see' features that might be a little tough without a hand lens or microscope.
  - ii. If you did not expose attendees to the site ahead of the workshop, look over those tips for how to get started in the 'Pre-workshop' section above.
  - iii. When teaching how to use a key, you can bring out preserved specimens to do some ID practice or have them use the quiz.
  - iv. Bring out the Order level sheets (printed and laminated) to have out for use during ID. Perhaps you may just focus on one order at a time with preserved specimens and have a 'station' where

attendees can go to the 'caddisfly' table and just focus on identifying that taxa group, etc.

- v. ID Focus sheets: these are helpful to print out and give attendees (especially for some of the commonly misidentified taxa) or have them print these on their own to use while practicing ID. These sheets really drill into the morphological characters with space for their own notes, In their own language on ways to remember that taxa (e.g., I thought it looked roach-like, had large bumps, crunchy body not soft, etc.).
  - vi. Bring in a sharing time and discussion with your attendees of what they found useful in practicing with the site and any tips or questions they may have that will help the entire group!
- c. There is also a training deck/presentation created to use during workshops, which can be modified to meet your particular needs and interests! It is for training at the common volunteer level of ID (phylum to some families) and can be downloaded [here](#).

***This presentation reviews the following:***

- What are benthic freshwater macroinvertebrates?
  - Macroinvertebrate sensitivity groups (3 groupings)
  - What makes ID so difficult?
  - Tips for diving into ID
  - Working with a live insect
  - Morphological characteristics of insects
  - Commonly misidentified taxa
  - Review of each taxa within the 3 sensitivity groups
  - Compares commonly misidentified taxa and how to tell the difference
- d. Print a [poster](#) of all 150 specimens and have it laminated to use for reference during the workshop!

**POST-WORKSHOP** Now that your workshop is over, still encourage attendees to stay active with practice and repetition of their newly cultivated ID skills!

***Suggestions:***

- a. Send a follow-up email with more practice opportunities (here's the [practice quiz](#) again!) from this and potentially other websites you know of!
- b. Encourage them to stay active with their practice, go back to the ID focus sheets you have may have used, or dive deeper into learning more about the life history of the taxa, watch videos, etc.
- c. Send more practice images as in the 'pre-workshop' tips.
- d. Remind them that this knowledge can leave pretty fast unless it's put into use! So keep practicing often.

### **TIP #3**

Offer a visual and learning variety. During this NSF project, we nationally administered an online survey of citizen science training organizations in freshwater biomonitoring. You can access the technical report [here](#). We learned that trainers can use a LOT of different tools and techniques when teaching ID. In fact, from 101 responses, over 22 different resources and materials were brought into workshop environments from dichotomous keys to flashcards, and field scopes to hand lenses. But, many did not use outlets such as websites, videos, or mobile applications.

#### **Suggestions:**

Offer a variety of ways to help attendees 'learn to see and see to learn!' from preserved specimens, live specimens, websites, flash cards, books, keys, various lenses and scopes, and the ID focus sheets. Individuals all learn differently, and you never know which tool will click as the 'golden one' for getting it right! This website is a great way to fill that missing niche of digital and online outlets for learning.

### **TIP #4**

Confirm IDs as often as possible during your workshops & offer many practice opportunities for seeing. The more you can confirm IDs, the more you build confidence. If you can, open up large amounts of time for you as a trainer to have one-on-one time with attendees going over and confirming IDs. Workshops are typically the 'one big chance' for many to get assistance, and understand why they are misidentifying and how to get it right. If possible, visit with your attendees post-workshop to help identify taxa found specifically at their stream site.

#### **Suggestions:**

Make sure a large component of your ID workshop offers time for attendees to ask you questions and to see a variety of macroinvertebrates (preserved, live, flash cards, with or without legs and tails, small instars to large, etc.).

To help improve ID and In the training deck, there is a slide that shows commonly misidentified taxa which you can print off and have for attendees to use at workshops.

For practice opportunities, give quizzes during the workshop (or before, or after!).

### **TIP #5**

Dive Deeper. Ever have those volunteers that want more? Consider hosting or co-hosting a workshop that gets deeper into the EPT families (although we suggest, just one at a time!). If you don't know the families yourself, perhaps an entomologist at a local university, consulting group, or research center could assist.