

Rivanna Conservation Alliance Benthic Monitoring Instructions

Application of the VA Save Our Streams modified method & instructions for family-level collection and preservation (updated 9/14/2021).

Prior to sampling, be sure to check previous weather and rainfall data, and follow the Rain Rules document.

Identify the Reach: Feel free to move around the reach (relatively homogenous section of a stream having a sequence of repeating structural characteristics) during the sample, but ensure that you sample only in riffle habitat AND avoid crossing reach breaks. Examples of reach breaks include an incoming tributary, a pollution source (e.g. manure pile), or a large unstable stream bank that may deliver sediment when it erodes during high flow.

Choose the Riffle: Select a riffle typical of the stream: a shallow, fast-moving area with a depth of 3 - 12 inches (8 to 30 cm) with stones that are cobble-sized (2 to 12 inches).

Don't Disturb the Riffle: Approach the riffle from downstream, and walk carefully around the riffle area. When taking multiple nets, take the first net in the most downstream riffle and/or the riffle closest to you – and then work upstream and away from you. This will ensure that you will not disturb riffle areas that you will need for later nets. (Think about picking the berries closest to you so you don't crush the ones you want to come back to later.)

Strive for 200 Bugs in 3-4 Nets: A 3- or 4-net sample is more reliable than a 1- or 2-net sample. Always start with 1-second 'mini' net, and adjust time on following nets to get at least 200 organisms with 3 or more nets. ***Use the decision tree on the next page to help determine subsequent net times and sizes.***

Lift Net: After rubbing rocks and scraping substrate, leave the net in the water until the water clears. Remove the anchor rock(s) and rub off into the net, then discard. With each volunteer holding one end of the net, scoop the net out of the water to prevent anything from falling out of the net.

Restore the Riffle: If you displaced rocks and gravel during the sample, put them back into the stream. To the best of your ability, restore the riffle to its pre-sample state.

Pick, Sort, and Identify Bugs: All organisms must be picked from the net, even if you have already collected 200. When all bugs have been picked, sort them according to order/family. Monitors' family-level identification skills will vary. Please identify to the family level ONLY when you are absolutely confident.

Count: Count the organisms in each cube of the ice cube tray. Complete one cube at a time, rather than skipping around the tray to count particular bugs.

Record: Complete both slides of the RCA benthic field sheet, in pencil.

- When you are certain of a bug's family-level identity, write the family name in the "family" column of the data sheet.
- When you are uncertain of a bug's family identity, use the "family" column to give the bug a name (ex: "unknown mayflies", "unknown stoneflies", etc.) If the bugs are very small and you're not sure of the taxonomic order (mayfly, stonefly, etc.), it is okay to guess - or list them in the "other" section. Be sure to preserve these organisms for lab ID.
- Use the "tally" column during the counting/recording process. In the "total" column, enter the final number of bugs belonging to this family collected in this sample.
- NOTE: *When tallying, please use numerals followed by commas, not hash marks.*

Preserve Unknown Bugs: Preserve **ALL** unknown specimens in an alcohol-filled vial. Record the site name and date (in pencil) on a small label and place inside of vial. Submit vial(s) with data sheet.

*Always preserve: scuds, casemaking caddisflies, and any organisms that you cannot positively ID to the family level

For Preserve-All Samples: Preserve **ALL** known AND unknown specimens in 2 separate alcohol-filled vials. Record the site name and date (in pencil) on a small label and place inside of each vial (for the "unknown" vial, write "unknown" on the label that gets placed inside the vial. Submit vials with data sheets.

Blackflies: In early spring samples, you may encounter high abundances of blackflies (they might completely cover your net!). The genus *Prosimulium* tends to pop up in high numbers in spring in forested streams and should not be counted as an indicator of pollution. If you encounter this issue, please preserve at least 10 of the blackflies for genus-level ID and notify the Program Manager. Sampling again later in the spring season is recommended.

Method for positioning of net and net times

1. Hold net out and roll both handles inward so that only about 12 inches of net are exposed.
2. Place net in a position to catch maximum flow (approx. 45 degree angle), but avoid letting water flow over the top of the net. Use anchor rock(s) if needed to keep the bottom of the net sealed against the streambed. If anchor rocks are needed, select them from outside the riffle and clean well before placing in the net.
3. Use one motion to both **rub rocks and scrape substrate** for **no more than 1 second** for the first net.

