

**For Office Use Only**

Name of Reviewer \_\_\_\_\_

Date Reviewed \_\_\_\_\_

Data sent to \_\_\_\_\_

VA SOS Data Entry Date \_\_\_\_\_

**Virginia Save Our Streams  
Eastern Biomonitoring Method  
for Muddy Bottom Streams**

Date \_\_\_\_\_

Stream \_\_\_\_\_ Station \_\_\_\_\_ # of participants \_\_\_\_\_

Collected By: \_\_\_\_\_

County \_\_\_\_\_ Latitude \_\_\_\_\_ Longitude \_\_\_\_\_

Location (please be specific, use road intersections and other features that can be identified on a map) \_\_\_\_\_

Average stream width \_\_\_\_\_ ft Average stream depth \_\_\_\_\_ in

Flow rate: High  Normal  Low  Negligible

Weather last 72 hours \_\_\_\_\_

Water Temperature \_\_\_\_\_ F (please specify if reporting temperature in Celsius)

Stream Assessment area 100 meters (please specify if modified) \_\_\_\_\_

**Sampling Site Habitat Percentages**

Habitat Area	Percent of Habitat in Stream Assessment Area (as determined by persons conducting collection)	Number of Jabs taken in Habitat Area (multiply percent of habitat in stream assessment area by 20 jabs in sample)
Woody Snags		
Submerged Aquatic Vegetation		
Banks		
Cobble areas		













Other notes about sampling: \_\_\_\_\_


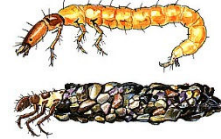

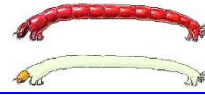






Please send data sheets to your regional coordinator or to VA SOS, Izaak Watlon League of America, 707 Conservation Lane, Gaithersburg, MD 20878. If you have any questions about the modified method or this particular collection, please call Leah Miller at 301-548-0150 x. 219 or e-mail [vasos@iwla.org](mailto:vasos@iwla.org).

You may also submit data online at [www.vasos.org](http://www.vasos.org)

\* Your data is most useful when you pass your certification. Please contact VA SOS to schedule your certification!

## Macroinvertebrate Tally Sheet

Macroinvertebrates	Tally	Count
<b>Worms</b> 		
<b>Flat Worms</b> 		
<b>Leeches</b> 		
<b>Crayfishes</b> 		
<b>Sowbugs</b> 		
<b>Scuds</b> 		
<b>Freshwater Shrimp</b> 		
<b>Stoneflies</b> 		
<b>Mayflies</b> 		
<b>Dragonflies and Damselflies (not Gomphidae)</b> 		
<b>Gomphidae Dragonflies</b> 		
<b>Hellgrammites, Fishflies, and Alderflies</b> 		

Macroinvertebrates	Tally	Count
<b>Common Netspinners</b> 		
<b>Most Caddisflies</b> 		
<b>Beetles</b> 		
<b>Midges</b> 		
<b>Black Flies</b> 		
<b>True Bugs</b> 		
<b>Most True Flies</b> 		
<b>Gilled Snails</b> 		
<b>Lunged Snails</b> 		
<b>Clams</b> 		
<b>Other Subsurface macroinvertebrates</b>		
<b>Total number of organisms in the sample (include other category)</b>		

## Metric Calculations

### Individual Metrics

Metric Number	Metric Organism Group	Number of metric organism		Total number of organisms in the sample		Percent (This is your value for this metric)
1	Mayflies + Stoneflies + Most Caddisflies		÷		Multiply by 100	%
2	Gomphidae		÷		Multiply by 100	%

### Metric 3 - % Tolerant

Taxon	Number
Worms	
Flatworms	
Leeches	
Sowbugs	
Scuds	
Dragonflies and Damselflies (not Gomphidae)	
Midges	
Black Flies	
Lunged Snails	
Clams	
<b>Total Tolerant</b>	
Total number of organisms in sample	
Total Tolerant divided by the total number of organisms in the sample	
Multiply by 100	
<b>This is your Value for Metric 3</b>	

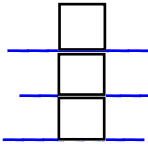
### Metric 4 - % Non-Insects

Taxon	Number
Worms	
Flatworms	
Leeches	
Crayfish	
Sowbugs	
Scuds	
Gilled Snails	
Lunged Snails	
Clams	
<b>Total Non-Insects</b>	
Total number of organisms in sample	
Total Non-Insects divided by the total number of organisms in the sample	
Multiply by 100	
<b>This is your Value for this Metric 4</b>	

## Metric Calculations

### Virginia Save Our Streams Eastern Multimetric Index

Write your metric value from the previous page in the 2<sup>nd</sup> column (Your Metric Value). Determine whether each metric should get a score of 6, 3, or 0 - depending upon the range of your metric value. Add all of the values in each column for subtotals. Then add the subtotals together into a final score to determine the Virginia Save Our Streams Eastern Multimetric score and determine whether the site has acceptable or unacceptable ecological condition.

Metric Number	Metric Organism	Your Metric Value	6	3	0
<b>1</b>	% Mayflies + Stoneflies + Most Caddisflies		> 7.8	0.85 - 7.8	< 0.85
<b>2</b>	% Gomphidae		> 0.5	> 0 - 0.5	0
<b>3</b>	% Tolerant		< 63	63 - 85	> 85
<b>4</b>	% Non-Insects		< 27	27 - 70	> 70
			Total # of 6s:	Total # of 3s:	Total # of 0s:
<b>SUBTOTALS</b>			Multiply by 6:	Multiply by 3:	Multiply by 0:
<p>Now add the 3 subtotals to get the Save Our Streams Multimetric Index score: _____</p> <div style="display: flex; align-items: center; justify-content: center;"> <div style="margin-right: 10px;">  </div> <div> <p>Acceptable Ecological Condition (&gt; 14)</p> <p>Partially Ecological Condition (8 - 14)</p> <p>Unacceptable Ecological Condition (&lt;8)</p> </div> </div>					

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## Physical characteristics of aquatic macroinvertebrates

**Aquatic Worm** – Looks very similar to a earthworm except lighter pink and smaller.

**Planaria or Flatworms** – These are different terms for the same organism. Gray to brown, unsegmented, soft, flat, eye spots on top of head. Undulating motion.

**Leeches** – Flattened body similar to Flatworms but segmented. No eye spots but suckers at both ends of underside.

**Crayfish** - Look like a small lobster with 10 legs. The front two legs have large claws or pinchers. They can range in size from ½ inch to 5 inches.

**Sowbug** – The Sowbug is an isopod and a crustacean. It is closely related to the terrestrial roly-poly bug or pill bug. It had many more than the six legs of the insects. It is often gray in color but that can vary.

**Scud** – The Scud is an amphipod and also a crustacean. It looks like a shrimp and swims sideways. In clear water the scud will often be translucent.

**Freshwater Shrimp** - Freshwater shrimp have five pairs of narrow walking legs, eyes that protrude from the body, and a clear, milky, or light brown color. They are most commonly found in slow-moving brackish or freshwater streams in coastal or lowland areas.

**Stoneflies** -- Have two wirelike tails. Never have gills on their abdomen. Will do “pushups” in the ice cube trays when oxygen levels fall. Some folks say that stoneflies look “Egyptian” (scarabs?).

**Mayflies** -- Have three wirelike tails. There are several exceptions that only have two but these are easy to detect because they have gills on their abdomen. The most common of these exceptions is the flatheaded mayfly, which has large eyes on the top of its head. This mayfly has prominent gills that flutter in the ice tray.

**Damselflies and Dragonflies (not Gomphidae)** – **Damselflies** have 3 characteristic paddle shaped “tails”. In other words their three “tails” are shaped like the blade of an oar. These are actually supplemental gills and not true tails. Damselflies are fragile or “spindly” looking and have large eyes. **Dragonflies** are mainly identified by the shape of their bodies. They range from slightly oval shapes to round. On close inspection you will notice a hinged lower jaw the projects back along the underside of the thorax.

**Gomphidae Dragonflies** – Same general characteristics listed above. Gomphidae are differentiated by their FLAT lower jaw and the short stubby antennae that are parallel to each other.

**Megaloptera** – That got your attention! This is the scientific name for the Order that includes **Hellgramites, Fishflies, and Alderflies**. Since they are all grouped together in the modified method you don’t really need to distinguish between. Just for your knowledge: The primary difference between **Hellgramites** and **Fishflies** is that the **Hellgramites** have cottony gills on their abdomen and **Fishflies** have a smooth abdomen. Also, a full grown Fishfly will never be as large as a full grown Hellgramite. Another common name for a Hellgramite is a Dobsonfly. **Alderflies** look similar to the others but they have a single spiky tail that looks like a stinger. **Alderflies** are less likely to be found than the other two families.

**Netspinning Caddisflies** -- Can be brown to green depending on what it has been eating. Has two “tufty” tails. Most importantly it is the only caddis to have significant gills on its abdomen (may require magnification). Does not make a case. Often this one will do the “caddisfly dance”. Ask your trainer to demonstrate.

**Most Caddisflies** -- Caddis are often fat and segmented. They often have a greenish color although this is often dependent on what they have been eating. There is one caddis that is bright orange or bright yellow. This one (I call it my “neon” caddis) is seldom as large as my other caddis and not fat. We differentiate the netspinning caddis because of its much higher tolerance for water pollution.

**Beetles** – **Adult riffle beetles** are the only one of the critters that we observe that spends its entire life cycle underwater. They are small black beetles usually found under the net. **Water pennies** are small and copper colored. They are unlike anything else you might find. **Beetle Larvae** “Elmidae” are what I call my apostrophe or comma bug. They often have the size and shape of these punctuation marks. Some folks say they look “crunchy” and if you look real close they have rings like a raccoon’s tail and a pulsating anal gill at the posterior end. **“Other” beetle larvae** are very diverse in appearance and less common. These are best determined by using your dichotomous key in the beginning of your monitors guide.

**Midges** – These are usually the very smallest of the critters. They do not vary in width from one end to the other. One type of midge can be coral red.

**Blackflies** – These are also mostly found under the net when present. Usually very small, they have a distinctive “bowling pin” or “club” shape. When they are placed in the ice cube tray they usually attach themselves to the wall of their space. They have suckers on both ends and can march along in the fashion of an inchworm. If populations increase significantly you should suspect a new source of nutrients to the stream.

**True Bugs** – This category includes water boatmen, backswimmers, water scorpions, giant water bugs, and water striders. True bugs have six legs and two claws on the ends of at least some of the legs. They have no gills and the body shape can be either oval or long and slender.

**Most True Flies** – These critters are characterized by having no legs in their juvenile form and being somewhat like a grub worm or maggot. **Atherix (Watersnipe)** come to a point at one end and have “feathery” projections on the posterior end (hairy antlers). **Craneflies** have a distinct maggot like appearance and can be almost as long as your index finger. There is one family that can pump one end of itself into a golfball shape. **Horseflies** are found less often and come to a point on both ends. There are other rare types that can be mistaken for large midges or small worms.

**Snails** – **Gilled snails** must filter their oxygen and food from the water. They require relatively good water quality. Holding one in front of your face with the pointed or helix end pointing upwards, the opening will be to the right. **Lunged or Pouch snails** will open to the left and can exist in poorer water quality. They don’t filter out food or oxygen.

**If you have questions about the stream survey instructions, contact:**

**Virginia Save Our Streams Program**

**707 Conservation Lane**

**Gaithersburg, MD 20878**

**301-548-0150 x. 219**

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