



Select a riffle typical of the stream, that is, a shallow, fast-moving area with a depth of 3 to 12 inches (8 to 30 cm) and stones which are cobble-sized (2 to 12 inches) or larger. Stone size is important since the macroinvertebrates surveyed prefer these stones for protection and food supply. In addition, the bubbling of the water over the rocks provides needed oxygen for healthy growth.

1. Place the kick seine perpendicular to the flow of water immediately downstream of the 1x1 foot area in the riffle you have selected to sample. The bottom, weighted edge of the net should fit tightly against the stream bottom. You may wish to use cleaned rocks from outside your sampling area to hold the net firmly to the bottom. This will prevent insects from escaping under the net. Tilt the net back, so the water flowing through the net covers a large portion of the net, however, be careful not to tilt the net so much that water flows over the top, allowing organisms to escape.
2. Quickly sample the targeted area for 20 seconds. To sample, lift and rub underwater all large rocks in the sample area to dislodge any clinging organisms. Rub all exposed surfaces of rocks in the sampling area that are too large to lift – do the rock-rubbing for about 15 seconds. For the final 5 seconds, dig around in the small rocks and sediments on the streambed in order to dislodge any burrowing macroinvertebrates.
3. After sampling for 20 seconds, carefully rub off any rocks used to anchor the net. Then remove the seine with an upstream scooping motion to keep all the macroinvertebrates in the net.
4. Place the net on a flat, light colored surface, such as a white sheet, table, or piece of plastic. This makes the organisms easier to see. Using tweezers or your fingers, gently pick all the macroinvertebrates from the net and place them in your collecting container. Carefully look on both sides of any debris in the sample, as many insects will cling to any available litter. Any moving creature is considered a part of the sample. Look closely for very small organisms and take your time. It is important to thoroughly pick all the organisms from the net. Once you have sorted all the organisms off the net, lift the net and examine the underlying area. Collect any organisms that have crawled through the net. Again, it is important to collect all these organisms to have an accurate sample.
5. Once all the macroinvertebrates are removed from the seine, count the number of organisms in the sample. If at least 200 organisms have not been sampled, another net must be collected from a different area in the same riffle. The organisms from the second net will be added to the first. The length of sampling time can be adjusted depending on the number of organisms collected in the first, with the maximum sampling time per net being 90 seconds. For subsequent nets, do the rock rubbing for about $\frac{3}{4}$ of the time you are sampling and substrate disturbing (scraping) for $\frac{1}{4}$ of the

time. The second net and area beneath are again sorted in their entirety. Again the organisms are counted, and a third net will be collected if 200 organisms have not been obtained. This process is repeated until at least 200 organisms are found or 4 nets are collected, whichever is first. Each net collected must be sorted in its entirety, even if that leads to a sample of well over 200 organisms.

6. Once at least 200 organisms have been obtained, separate the organisms into look-alike groups. Use primarily body shape and number of legs and tails, since the same family or order can vary considerably in size and color. Use the tally sheet and macroinvertebrate key to aid in the identification process. Record the number of individuals you find in each taxonomic group on the tally sheet. Include the total number of organisms in the sample on the lower right corner of the tally sheet. Follow the tables attached to the tally sheet to calculate the individual metrics and the final ecological condition score.

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

Virginia Save Our Streams Program

P.O. Box 8297

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Virginia

Save Our Streams

Stream Quality Survey

For Office Use Only

Name of Reviewer _____

Date Reviewed _____

Data sent to _____

VA SOS Data Entry Date _____

The purpose of this form is to aid you in gathering and recording important data about the health of your stream. By keeping accurate and consistent records of your observations and data from your macroinvertebrate count, you can document changes in ecological condition. *Please note, this method was designed and tested for conditions in the state of Virginia and may not be appropriate in other areas.*

Date _____

Stream _____ Station _____ # of participants _____

Group or individual _____

Name of certified* monitor _____

County _____ Latitude _____ Longitude _____

Location (please be specific) _____

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)

Collection Time:

Net 1: _____ sec

Net 2: _____ sec











Net 3: _____ sec










Net 4: _____ sec

Other comments:

Please send data sheets to your regional coordinator or to VA SOS, P.O. Box 8297, Richmond, Va 23226. If you have any questions about the modified method or this particular collection, please call 804-615-5036 or e-mail stacey@vasos.org

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

Macroinvertebrate	Tally	Count
Worms 		
Flat Worms 		
Leeches 		
Crayfish 		
Sowbugs 		
Scuds 		
Stoneflies 		
Mayflies 		
Damselflies and Dragonflies 		
Helgrammites, Fishflies, and Alderflies 		

Macroinvertebrate	Tally	Count
Common Netspinner 		
Most Caddisfly 		
Beetles 		
Midges 		
Blackflies 		
Most True Fly 		
Gilled Snail 		
Lunged Snail 		
Clams 		
Other Subsurface Invertebrates		
TOTAL NUMBER OF ORGANISMS IN SAMPLE		

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	Common Netspinners		÷		Multiply by 100	%
3	Lunged Snails		÷		Multiply by 100	%
4	Beetles		÷		Multiply by 100	%

Metric 5 - % Tolerant

Taxon	Number
Worms	
Flatworms	
Leeches	
Sowbugs	
Scuds	
Dragonflies and Damselflies	
Midges	
Black Flies	
Lunged Snails	
Clams	
Total Tolerant	
Total Tolerant divided by the total number of organisms in the sample	
Multiply by 100	
This is your Value for Metric 5	

Metric 6 - % Non-Insects

Taxon	Number
Worms	
Flatworms	
Leeches	
Crayfish	
Sowbugs	
Scuds	
Gilled Snails	
Lunged Snails	
Clams	
Total Non-Insects	
Total Non-Insects divided by the total number of organisms in the sample	
Multiply by 100	
This is your Value for this Metric 6	

EXAMPLE

Metric	Metric Organism Group	Number of metric		Total number		Percent
1	Mayflies + Stoneflies +	80	÷	204	X 100	39.2%
2	Common Netspinners	40	÷	204	X 100	19.6%
3	Lunged Snails	0	÷	204	X 100	0%
4	Beetles	9	÷	204	X 100	4.4%

METRIC 5 - % Tolerant

Taxon	Number
Worms	10
Flatworms	0
Leeches	0
Sowbugs	5
Scuds	0
Dragonflies and Damselflies	5
Midges	20
Black Flies	10
Lunged Snails	0
Clams	10
Total Tolerant	40
Total Tolerant divided by the total number of organisms in the sample	204
Multiply by 100 - This is your Value	29.4

Metric 6 - % Non-Insects

Taxon	Number
Worms	10
Flatworms	0
Leeches	0
Crayfish	5
Sowbugs	5
Scuds	0
Gilled Snails	10
Lunged Snails	0
Clams	10
Total Non-Insects	40
Total Non-Insects divided by the total number of organisms in the sample	204
Multiply by 100 - This is your Value	19.6

Metric Number	Metric Organism	Your Metric Value	2	1	0
1	% Mayflies + Stoneflies + Beet	39.2	Greater than 32.2 ✓	16.1 - 32.2	Less than 16.1
2	% Common Netspinners	19.6	Less than 19.7 X	19.7 - 34.5	Greater than 34.5
3	% Lunged Snails	0	Less than 0.3 X	0.3 - 1.5	Greater than 1.5
4	% Beetles	4.4	Greater than 6.4	3.2 - 6.4 X	Less than 3.2
5	% Tolerant	29.4	Less than 46.7 X	46.7 - 61.5	Greater than 61.5
6	% Non-Insects	19.6	Less than 5.4	5.4 - 20.8 X	Greater than 20.8
Subtotals:			Total # of 2s: 4	Total # of 1s: 2	Total # of 0s: 6
			Multiply by 2: 8	Multiply by 1: 2	Multiply by 0: 0

Now add the 3 subtotals to get the Save Our Streams Multimetric Index score: 10

X Acceptable ecological condition (9 to 12)

_____ Ecological conditions cannot be determined at this time (Gray Zone) (8)

_____ Unacceptable ecological condition (0 to 7)

Virginia Save Our Streams Multimetric Index

Write your metric value from the previous page in the 2nd column (Your Metric Value). Determine whether each metric should get a score of 2,1, or 0 - depending upon the range of your metric value. Put a check in the appropriate box for your metric value under 2,1, or 0. Count the total number of 2's, 1's, and 0's. Follow the multiplication at the bottom of the chart to determine your Save Our Streams Multimetric Index score and determine whether the site has acceptable or unacceptable ecological condition.

Metric Number	Metric Organism	Your Metric Value	2	1	0
1	% Mayflies + Stoneflies + Most Caddisflies		Greater than 32.2	16.1 - 32.2	Less than 16.1
2	% Common Netspinners		Less than 19.7	19.7 - 34.5	Greater than 34.5
3	% Lunged Snails		Less than 0.3	0.3 - 1.5	Greater than 1.5
4	% Beetles		Greater than 6.4	3.2 - 6.4	Less than 3.2
5	% Tolerant		Less than 46.7	46.7 - 61.5	Greater than 61.5
6	% Non-Insects		Less than 5.4	5.4 - 20.8	Greater than 20.8
Subtotals:			Total # of 2s:	Total # of 1s:	Total # of 0s:
			Multiply by 2:	Multiply by 1:	Multiply by 0:

Now add the 3 subtotals to get the Virginia Save Our Streams Multimetric Index score: _____

_____ **Acceptable ecological condition (9 to 12)**

_____ **Ecological conditions cannot be determined at this time (Gray Zone) (8)**

_____ **Unacceptable ecological condition (0 to 7)**

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