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## Macroinvertebrate Survey<sup>2</sup>

Scientists also rely on some small aquatic creatures to tell them whether water is polluted. Macroinvertebrates are organisms that have no backbone, spend at least part of their life cycles in water, and can be seen without a microscope. Some macroinvertebrates are more sensitive to pollution than others. By tallying the types of macroinvertebrates in your stream, you and your team members can gain more information about the quality of the water in the zone. Use the “Macroinvertebrate Tally Sheet” to conduct your survey.

The “Macroinvertebrate Tally Sheet” separates organisms into four groups based on their sensitivity to pollution:

<b>Group 1</b> – These organisms are very sensitive; they can’t live in polluted water. If pollution increases, the number of these organisms will decrease.	<b>Group 2</b> – These organisms are somewhat sensitive; they can be found in either very clean or mildly polluted water.
<b>Group 3</b> – These creatures are fairly tolerant of pollution. Organisms in this group can be found in either clean or somewhat polluted water.	<b>Group 4</b> – These organisms are found in poor water quality. Organisms in this group are very tolerant of polluted water, but they can still be found in clean water. As pollution worsens, tolerant organisms become more abundant.

A healthy stream will have many different organisms—both pollution-tolerant and pollution-sensitive. Follow the steps below to complete the “Macroinvertebrate Tally Sheet” and give your stream a water quality score.

1. Choose a site for monitoring in an area near the 0 point of the transect line that has been set up for the other teams. You should choose a site with shallow water (8-30 cm) that is moving fast over a stony or gravelly bottom. Areas like this are called riffles. Remember, in the spring the water may be a bit deeper and faster than at other times of the year, so you should be especially careful working in the stream.
2. Before you begin, rinse the net and check that it doesn’t contain any debris from the last time it was used. Fill your basins or buckets with about 3 cm of clean stream water. If you find you have too much water or if the water is too muddy, pour the excess/muddy water through your net into another bucket so you don’t lose any organisms. If necessary, add some clean water to the original sample. Check the net and water in the second bucket for any organisms and return them to the first bucket.
3. At the riffle, place the net downstream from where you are standing so the water current passes you first and then flows into the net. Be sure that the bottom of the net fits tightly against the streambed so no water can flow underneath it.

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<sup>2</sup> From *Water Action Volunteers—Volunteer Monitoring Factsheet Series* (Univ. of Wisconsin—Extension and Wisconsin Dept. of Natural Resources, 2001)

# Water Ecologist Macroinvertebrate Tally Sheet

**Group 1: These are sensitive to pollutants. Circle each animal found.**



Stonefly Larva



Dobsonfly Larva



Alderfly Larva



Water Snipe Fly Larva

Relative Size Key:

= larger than picture      = smaller than picture

Number of group 1 animals circled:

**Group 2: These are semi-sensitive to pollutants. Circle each animal found.**



Caddisfly Larva\*



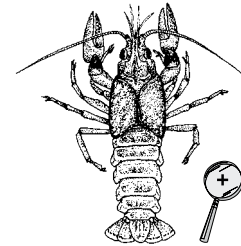
\* All Caddisfly Larva = 1



Dragonfly Larva



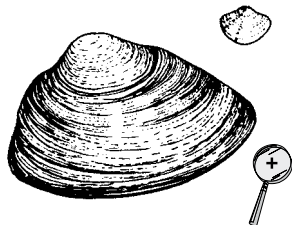
Water Penny



Crawfish



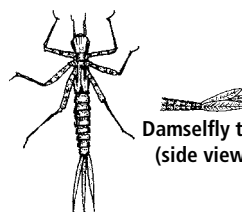
Crane Fly Larva



Freshwater Mussel or Fingernail clam



Mayfly Larva



Damselfly Larva

Damselfly tail (side view)



Riffle Beetle Larva\*



Riffle Beetle Adult\*

\* All Riffle Beetles = 1

Number of group 2 animals circled:

**Group 3: These are semi-tolerant of pollutants. Circle each animal found.**



Black Fly Larva



Non-Red Midge Larva



Snails: Orb or Gilled (right side opening)



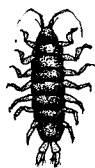
Amphipod or Scud

Number of group 3 animals circled:

**Group 4: These are tolerant of pollutants. Circle each animal found.**



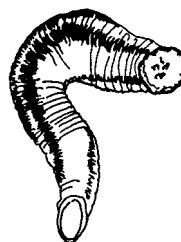
Pouch Snail (left side opening)



Isopod or Aquatic Sowbug



Bloodworm Midge Larva (red)



Leech



Tubiflex Worm

Number of group 4 animals circled:

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# Macroinvertebrate Tally Sheet <sup>2</sup>

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Stream Name: \_\_\_\_\_ Time: \_\_\_\_\_

Do not count individual animals. Instead, focus on the types of animals found in each group. The variety of animal types and their tolerance to pollution provide clues about the quality of the water you are testing.

Number of animals from Group 1: Sensitive \_\_\_\_\_ x 4 = \_\_\_\_\_

Number of animals from Group 2: Semi-sensitive \_\_\_\_\_ x 3 = \_\_\_\_\_

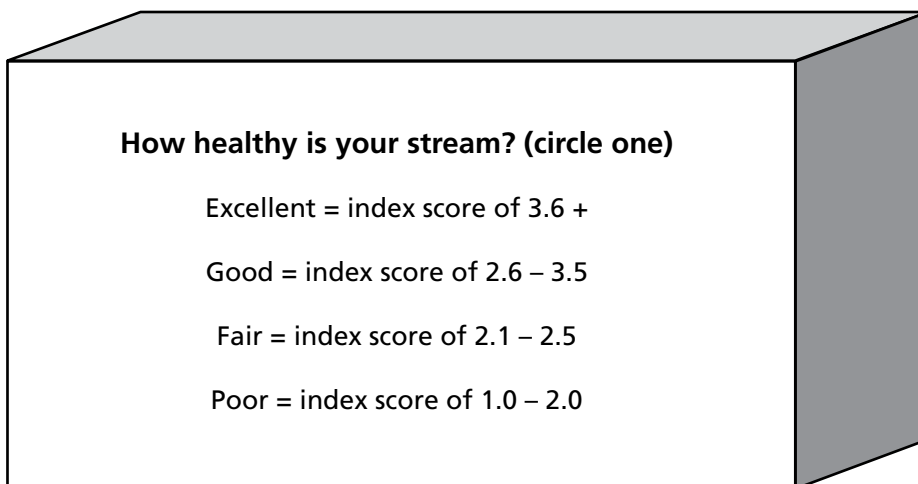
Number of animals from Group 3: Semi-tolerant \_\_\_\_\_ x 2 = \_\_\_\_\_

Number of animals from Group 4: Tolerant \_\_\_\_\_ x 1 = \_\_\_\_\_

TOTAL NUMBER OF ANIMALS (A) \_\_\_\_\_ TOTAL VALUE (B) \_\_\_\_\_

Index score (C) = The total value (B) divided by the total number of animals (A)  
(C = B / A)

My stream had an index score of: \_\_\_\_\_



**How healthy is your stream? (circle one)**

Excellent = index score of 3.6 +

Good = index score of 2.6 – 3.5

Fair = index score of 2.1 – 2.5

Poor = index score of 1.0 – 2.0

<sup>2</sup> Adapted from *Water Action Volunteers*, Univ. of Wisconsin - Extension and Wisconsin Dept. of Natural Resources, 2001.