Appendix A

KICK-SEINING TECHNIQUE

The kick-seining method is a simple procedure for collecting stream-dwelling macroinvertebrates. It is used in riffle areas where the majority of the organisms live. For stream quality assessment we examine the variety of macroinvertebrates in the collected sample.

The following is a detailed description of the kick-seining method. This technique can be quite effective in determining relative stream health. However, it is only as good as the sampler. Therefore, **please follow the procedures as closely as possible**.

SAMPLING PROCEDURE

1) Locate a "typical riffle". Such a riffle would have a stream bed uniformly composed of rocks, ranging in size from 10-inch cobbles down to ¼-inch gravel. The water will range in depth from approximately 2 inches to a foot, with a moderate swift flow. Avoid riffles located in an area of a stream that has been recently disturbed, such as any type of nearby construction.
2) Once the riffle has been located, select an area measuring 3 feet by 3 feet which is typical of the riffle as a whole. Avoid disturbing the stream bed above this area, so as not to alter the sample.
3) Prior to entering the stream, examine the net closely. Remove any organisms that might remain from the last time the net was used.
4) APPROACH THE SAMPLING AREA FROM DOWNSTREAM!
5) Have one person place the net at the downstream end of the sampling area. The net should be held perpendicular to the flow, but at a slight downstream angle. Stretch the net to approximately 3 feet, but be certain that the bottom edge is lying firmly against the bed. If water washes beneath or over the net you will lose organisms. You can place rocks along the bottom edge of the net to anchor it down.
6) Stand beside, not within the sampling area: place one foot at the upstream end of the area as a marker. Remove all stones and other objects 2 inches or more in diameter from the sampling area. Hold each one in front of the net and below the water surface as you brush or scrub all organisms from the rock surface. Before placing each rock outside the sampling area, examine the surface to be certain you have not missed any organisms.
7) When all materials, 2 inches or larger, have been brushed, step into the upstream end of the sampling area and kick the stream bed vigorously until you have disturbed the entire sampling area. Kick from the upstream end towards the net. Try to disturb the bed to a depth of at least 2 inches.
8) Once step 7 is completed, carefully remove the net with a forward scooping motion. DO NOT allow water to flow over the top of the net or you may lose organisms.
9) Carry the seine to a flat and clean area on the stream bank. Remove leaves, rocks, and other debris, examining each for any attached organisms. Using fingers or

forceps, remove the larger organisms from the net and place in the plastic container with water for later identification. Examine the smaller organisms that remain on the net.

10) Record the presence of each type of organism collected and give an estimate of the number of each type using the appropriate letter code on the stream quality assessment form.
11) Determine the stream quality assessment using the instructions for filling out the form.

Appendix B

STREAM QUALITY MONITORING
ASSESSMENT FORM INSTRUCTIONS

1) Enter the station number (given to you at beginning of monitoring season), the sample number (May is sample #1, June is #2, etc.), the names of the sample crew, Metro Park and stream name, the date, the time, and location on the stream (describe in relation to nearest landmark such as a bridge, trail, etc.).

2) Check the box that most describes the last time it rained.

3) Describe the water conditions (color, odor, vegetation or fungus growth, surface scum, rate of water flow, etc.).

4) Estimate the width and measure the depth (using the yard stick) of the stream at the sample site.

5) Measure the water temperature with the thermometer. Keep the thermometer under water for at least 1 minute.

6) Check the boxes that most describe the rate of stream flow and the clarity of the water.

7) Estimate the substrate composition of the stream bed. Write the percentage of silt, sand, gravel, cobbles, and boulders in the boxes. These percentages should add up to 100%. Silt is very fine-grained sediment usually composed of clay or mud, sand is composed of tiny rock particles <¼" in diameter, gravel is rock particles ¼"-2" in diameter, cobbles are 2"-10" in diameter, and boulders are >10" in diameter.

8) After you place the macroinvertebrates in the sorting trays (filled with water), count the number of each type of organism that you found. If you have from 1-9 individuals of the organism type, place a letter "A" next to the name of that organism on the data sheet. If you have from 10-99 individuals, place a letter "B" next to the name of the organism. If you have >100 individuals, place a letter "C" next to the name of the organism. These letters will not make a difference in the cumulative index value.

9) Macroinvertebrates are grouped into 3 categories:

    Group 1 (sensitive to pollution or good water quality indicators)
    Group 2 (organisms that are moderately tolerant to pollution)
    Group 3 (pollution-tolerant or poor water quality indicators)

Appendix B

10) Count up the number of types of organisms in each group (column) and put this number in the "Number of taxa" row of each column. The organisms in the 3 groups are assigned a group index value.

Group 1 = 3 points Group 2 = 2 points Group 3 = 1 point

In each column, multiply the number of taxa by the number of points for that group (group index value) and place these values in the "index value" row.

Example:	**Group 1 Taxa**	**Group 2 Taxa**	**Group 3 Taxa**
	Caddisfly(s)	Dragonfly(s)	Blackfly(s)
	Stonefly(s)	Crayfish	midge(s)
	Mayfly(s)	Clam(s)	
		Damselfly(s)	
	3 taxa x 3 = 9	4 taxa x 2 = 8	2 taxa x 1 = 2

Cumulative index value = 9 + 8 + 2 = 19

11) The respective group index values are then added together to find the cumulative index value. By referring to the following chart, the stream quality assessment can thus be determined.

Stream Quality Assessment	Cumulative Index Value
Excellent	23 and above
Good	17 - 22
Fair	11-16
Poor	10 or less

Metro Parks
SERVING SUMMIT COUNTY

Submit data to:
Marlo Perdicas
Metro Parks, Serving Summit County
975 Treaty Line Road
Akron, Ohio 44313
330-865-8057
Fax: 330-865-8068

Appendix C

Station:_____ Sample #:_____
Individuals:_____

Metro
Park/Stream:_____Date:_____Time:_____

Location:_____

Rainfall: ☐ today ☐ yesterday ☐ days ago > ☐ ays ago

Describe Water Conditions (Color, Odor, Bedgrowths, Surface Scum, Etc..:_____

_____

_____

Width at Site (Feet):_____ Depth at Site (in):_____ Water Temp. (°F):_____

Stream Flow Rate: high ☐ normal ☐ low ☐ Stream Appears: clear ☐ cloudy ☐ muddy

Bed Composition of Riffle (%): Silt_____ Sand_____ Gravel (1/4"-2")_____

Cobbles (2"-10")_____ Boulders (>10")_____

MACROINVERTEBRATE COUNT			ESTIMATED COUNT LETTER CODE A = 1 to 9 B = 10 to 99 C = 100 or more		
Sensitive (Group 1)	Letter code	Somewhat Sensitive (Group 2)	Letter code	Pollution Tolerant (Group 3)	Letter code
Water penny larvae		Damselfly nymphs		Blackfly larvae	
Mayfly nymphs		Dragonfly nymphs		Aquatic worms	
Stonefly nymphs		Crane fly larvae		Midge larvae	
Dobsonfly larvae		Beetle larvae		Pouch snails	
Caddisfly larvae		Crayfish		leeches	
Riffle beetle adult		Scuds		planaria	
Other snails		Clams			
		Sowbugs			
		Alderfly larvae			
		Watersnipe larvae			
		Fishfly larvae			
Number of taxa		Number of taxa		Number of taxa	
(*times*) Index Value 3		(*times*) Index Value 2		(*times*) Index Value 1	

Cumulative Index Value = ☐

Stream Quality Assessment:

Excellent (>22) ☐ Good (17-22) ☐
Fair (11-16) ☐ Poor (<11) ☐