Name:_____ Date_____

Macroinvertebrate Collection Sheet

Macroinvertebrates are collected from a riffle site using an 18"x8"rectangular net, mesh size 800-900 microns (0.8 -0.9 mm). Sample a diagonal transect of the stream bottom in the riffle, kicking by foot along the transect, for 5 meters in 5 minutes. Collect at least two samples.

Decide how you will analyze your collection of macroinvertebrates. There are three main ways to do this, according to the Hudson Basin River Watch Guidance Document, which is based on New York State Department of Environmental Conservation protocols. For more detail about the following protocols, and to get complete data sheets, go to: http://bit.ly/14TZwiR.

1. ***Live samples are assessed for the presence of four orders of relatively pollution -sensitive stream organisms, and the absence (or sparseness) of worms, which tend to be very pollution tolerant.*** The four pollution-sensitive orders are mayflies, stoneflies, caddisflies and beetles. There is a caveat that netspinner caddisflies (a relatively pollution tolerant family) do not dominate the sample, and dobsonflies or fishflies may be substituted for beetles. The presence of the four orders, with an absence or scarcity of worms, indicates a non-impacted stream. This method is not for quantitative analysis.

2. ***A sub-sample of 100 organisms (or the entire sample) is picked and sorted into major groups. These are identified and counted to calculate certain metrics, which are values that can be compared on a numerical scale to determine a corresponding level of impact to stream health.***
    a. Organism Density Per Sample (preserved samples only): An estimate of the total number of individuals in the entire sample (not just the sub-sample) based on the number of organisms picked from a certain number of squares in a tray marked with a grid.
    b. EPT Richness Estimate: An estimate of the number of different kinds of mayfly (**E**phemeroptera), stonefly (**P**lecoptera), and caddisfly (**T**richoptera) The EPT's tend to be particularly sensitive to pollution.
    c. Major Group Biotic Index: This metric takes into account pollution tolerance values that are specifically assigned to each major group of organisms, along with the number, or density of organisms found in each major group. Different types of macroinvertebrates have a different tolerance to pollution.
    d. Major Group Percent Composition: Percent Composition is not a single metric that refers to a certain level of impact. It is calculated for each major group by dividing the number or density of organisms in each major group by the total number of organisms in the sub-sample and then multiplying by 100 to convert to percentage. Calculating Percent Composition gives you a good

picture of the community at a particular site. You can use this to compare two different sites or to see how the community at a site changes over time.

e. Major Group Percent Model Affinity: Percent Composition values are compared to a model community established by the NYSDEC for an un-impacted stream. The model is based on a typical summertime community, so this metric will probably not be useful if you sample in the early spring or late fall.

3. Quantitative survey of preserved samples using identification to family level of the mayfly, stonefly and caddisfly orders. Used to evaluate the degree to which a waterbody is able or unable to support aquatic life. May be able to document "suspected" or "known" impacts.

a. Samples **MUST BE PRESERVED**.
b. In addition to the "Physical Survey/Habitat Assessment," a separate "Stream Bottom Survey" is also used.
c. All organisms are identified to family level (not just sorted as like/different).
d. The metrics recommended are listed below (choose ones that fit your needs):
    i. Organism Density Per Sample
    ii. Family EPT Richness: Similar to 2, but no longer an estimate because organisms are identified to the family level.
    iii. Total Family Richness: An actual count of the number of families in the sample. It is a rough measure of the diversity of the macroinvertebrate community. In general, the greater the number of families (higher richness), the less impacted the stream.
    iv. Family Biotic Index: The biotic index can be calculated more accurately using family values. Within the mayfly, stonefly and caddisfly orders, there is large variation of pollution tolerance values.
    v. Major Group Percent Composition (same as Tier 2).
    vi. Major Group Percent Model Affinity (same as Tier 2).
    vii. EPT/ EPT+Chironomidae Ratio: This is a measure of the ratio of the number of intolerant EPT orders to the generally tolerant Diptera family Chironomidae (midges). The closer this ratio is to a value of 1, the less impacted the stream.
    viii. Percent Contribution of the Dominant Family: This is the percentage of the sample made up of the most abundant family. A sample dominated (>50%) by one family may indicate an environmental impact.

Type	**Number Collected**	**Brief Description**
Type 1		