Stream Habitat Assessment Procedure Rocky Bottom Habitats

Each time you conduct macroinvertebrate sampling you will also assess the stream habitat. Just as with macro-invertebrate sampling the type of stream habitat affects your assessment procedures.
Conduct the habitat assessment twice a year, in the spring and in the fall, at the site that you used for your macroinvertebrate sampling.

1. Attachment sites for macroinvertebrates are essentially the amount of living space or hard substrates (rocks, snags, etc.) available for aquatic insects and snails. Many insects begin their life underwater in streams and need to attach themselves to rocks, logs, branches, or other submerged substrates. In streams unimpaired by pollution, the greater the variety and number of available living spaces or attachment sites, the greater the variety of insects the stream habitat could support. Optimally, cobble should predominate and boulders and gravel should be common. The availability of suitable living spaces for macroinvertebrates decreases as cobble becomes less abundant and boulders, gravel, or bedrock become more prevalent.

2. Embeddedness refers to the extent that rocks (gravel, cobble, and boulders) are surrounded by, covered, or sunken into the silt, sand, or mud of the stream bottom. As rocks become embedded, fewer living spaces are available to macroinvertebrates and fish for shelter, spawning and egg incubation. To estimate the percent of embeddedness, observe the amount of silt or finer sediments overlying and surrounding the rocks. If kicking does not dislodge the rocks or cobbles, they might be greatly embedded.

3. Shelter for fish and macroinvertebrates includes the relative quantity and variety of natural structures in the stream, such as fallen trees, logs, and branches; root wads; large cobble and boulders; and undercut banks that are available to fish for hiding, sleeping, or feeding. A wide variety of submerged structures means more living spaces in a stream and the more types of fish and other aquatic life the stream can support. Assess the stream as far as can be seen.

4. Channel alteration is a measure of large-scale changes in the shape of the stream channel. Many streams in urban and agricultural areas have been straightened, deepened, dredged, or diverted into concrete channels, often for flood control purposes. Such streams have far fewer natural habitats for fish, macroinvertebrates, and plants than do naturally meandering streams. Channel alteration is present when the stream runs through a concrete channel; when artificial embankments, riprap, and other forms of artificial bank stabilization or structures are present; when the stream is very straight for significant distances; when dams, bridges, and flow-altering structures such as storm water pipes are present; when the stream is of uniform depth due to dredging; and when other such changes have occurred. Signs that indicate the occurrence of dredging include straightened, deepened, and otherwise uniform stream channels, as well as the

removal of streamside vegetation to provide dredging equipment access to the stream. Assess channel alteration up and down the stream as far as you can.

5. Sediment deposition is a measure of the amount of sediment that has been deposited in the stream channel and the changes to the stream bottom that have occurred as a result of the deposition. High levels of sediment deposition create an unstable and continually changing environment that is unsuitable for many aquatic organisms. Sediments are naturally deposited in areas where the stream flow is reduced, such as pools and bends, or where flow is obstructed. These deposits can lead to the formation of islands, shoals, or point bars (sediments that build up in the stream, usually at the beginning of a meander) or can result in the complete filling of pools. To determine whether sediment deposits are new, look for vegetation growing on them: new sediments Will Not yet have been colonized by vegetation.

6. Stream velocity and depth combinations are important to the maintenance of healthy aquatic communities. Fast water increases the amount of dissolved oxygen in the water, keeps pools from being filled with sediment, and helps food items like leaves, twigs, and algae move more quickly through the aquatic system. Slow water provides spawning areas for fish and shelters macroinvertebrates that might be washed downstream in high stream velocities. Similarly, shallow water tends to be more easily aerated (i.e. holds more oxygen), but deeper water stays cooler longer. Thus the best stream habitat includes all of the following velocity/depth combinations and can maintain a wide variety of organisms.

* slow (<1 ft/sec or <0.3048 m/sec), shallow (0.4572 m or <1 .5 ft) * fast, deep

* slow, deep * fast, shallow

7. Channel flow status is the percentage of the existing channel that is filled with water. The flow status changes as the channel enlarges or as flow decreases as a result of dams and other obstructions, diversions for irrigation, or drought. When water does not cover much of the streambed, the living area for aquatic organisms is limited. For the next three parameters, evaluate the condition of the right and left stream banks separately. Define the “left” and “right” banks by standing at the downstream end of your study stretch and looking upstream. Each bank is evaluated on a scale of 0-10.

8. Bank vegetative protection measures the amount of the stream bank that is covered by vegetation. The root systems of plants growing on stream banks help hold soil in place, reducing erosion. Vegetation on banks provides shade for fish and macroinvertebrates and serves as a food source by dropping leaves and other organic matter into the stream. Ideally, a variety of vegetation should be present, including trees, shrubs, and grasses. Vegetative disruption can occur when the grasses and plants on the stream banks are mowed or grazed, or when the trees and shrubs are cut back or cleared.

9. Condition of banks measures erosion potential and whether the stream banks are eroded. Steep banks are more likely to collapse and suffer from erosion than are gently sloping banks and are therefore considered to have a high erosion potential. Signs of erosion include crumbling, unvegetated banks, exposed tree roots, and exposed soils.

10. Riparian vegetative zone width is defined as the width of vegetation from the edge of the stream bank. The riparian vegetative zone is a buffer to prevent pollutants from entering a stream. It also controls erosion and provides stream habitat and nutrient input to the stream. A wide, relatively undisturbed riparian vegetative zone helps maintain a healthy stream system; narrow, far less useful riparian zones occur when roads, parking lots, fields, lawns, and other cultivated areas, bare soil, rocks or buildings are near the stream bank. The presence of "old fields" (i.e. previously developed agricultural fields allowed to revert to natural conditions) should be rated higher than fields in continuous or periodic use. In arid areas, the riparian vegetative zone can be measured by observing the width of the area dominated by riparian or water-loving plants, such as willows, marsh grasses, and cotton wood trees.

The above document is take from the Citizens Volunteer Monitoring Program (CVMP), stream monitoring manual.