# FIELD SAMPLING TECHNIQUES

Deciding which field sampling techniques to incorporate into your monitoring project can be a difficult task. There are an endless number of accepted methods for examining the biotic components of an ecosystem and determining which are the "best" techniques for your particular field study is dependent on the specific characteristic(s) you intend to investigate. The following are descriptions of the most widely used and most easily performed techniques.

## Plot Sampling

Plot sampling is a basic and commonly used procedure for sampling many types of organisms. This type of sampling is most widely used to analyze terrestrial plants, and may also be utilized to analyze slow-moving animals. A *plot* is a manageable area of known size within which all organisms can be identified, counted, and measured. The term *quadrat* is often used to describe square plots. Typically, data obtained through the use of this method is generated using two-dimensions (area) in which the same random procedure is replicated many times. One way the quadrat (Figure 1) can be used is by tossing over the study area at random and counting everything in a randomly selected square. Another way is by laying down the center of the quadrat over each point of a line transect and then counting everything inside the square. This would be known as a *point-intercept transect* (see Figure 2). When sampling sediments or aquatic organisms, volumetric (liters) analysis may replace area ($m^2$) through the use of a *coring tool* (see Figure 4). Quadrates and coring tools are easy to construct using PVC pipe found at many builders' supply stores.

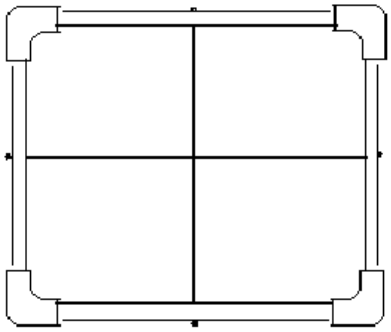

Figure 1. An example of a quadrat plotting tool.

## Transects

Transects are straight lines typically established through the use of a cord, wire or measuring tape. Transect sampling is used to determine the species composition of a given habitat. They are particularly useful when investigating ecological succession or transition. Direction or

orientation of the transect is important for the desired results. One way the transect should be oriented is by connecting two randomly selected points. Or, if a study of community transition or an ecological gradient is desired, the transect can be oriented across a specific ecological community progression. For instance, if one wants to study the plant delineation of a wetland, the transect should run from just below the water's edge to the upland area. One of the most widely used methods of transect analysis, and one that is regularly used to investigate the succession of plant communities is the line transect. Line transects are simple to establish by constructing a line of known length and identifying and counting the plants or organisms which occur under regularly placed intervals along the line. The following diagram (Figure 2) is an example of a simple transect line. Modifications can be made according to individual need.

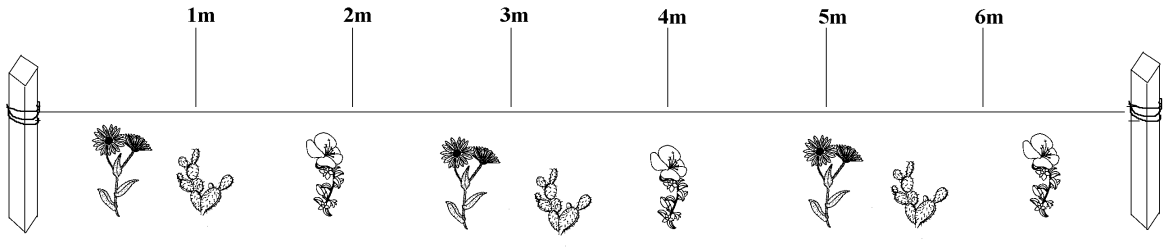


Figure 2. Example of a generalized line transect.

## Seining

Seines are large nets that can be obtained in a variety of lengths and mesh sizes. This net is stretched between two poles. Seines have a float line on top and lead line at the bottom to keep the net from collapsing when pulled through the water. One common modification to this type of net is the bag seine which has a large pocket sewn into the net, which aids in the retention of trapped organisms. Seining requires a minimum of two people. With one person at each pole, the net is pulled along in shallow water. It is important to remember to keep the poles on the top of the substrate, or the trapped organisms will escape. When sampling in streams, rivers or areas that have significant currents, it is important to pull the net against the direction of water flow to assure that the seine will open properly. When reaching the end of the pull, the shallow-end puller stops. The deep-end puller swings around, and the samplers move toward shore. Again, be careful not to lift the bottom of the net so the sample does not escape. At the shore, the net can be carefully lifted to a horizontal position along the ground and the collection identified and counted.

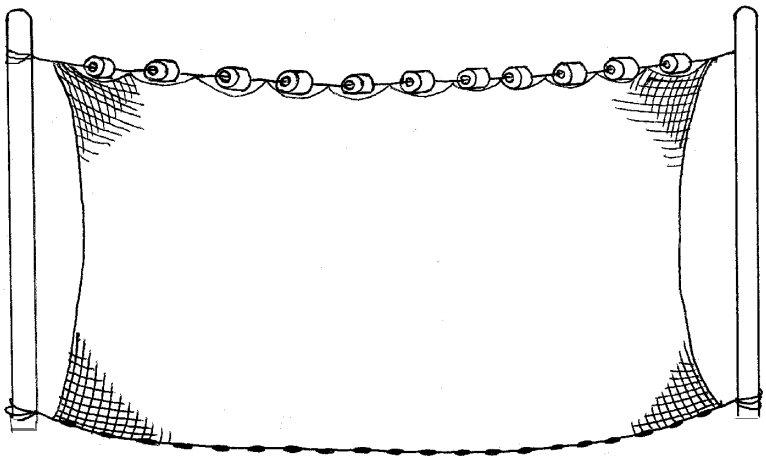

Figure 3. Example of a typical seine.

## Benthic Coring

This method utilizes the corer and the sieve. The corer can be simply built by using a larger diameter pipe two or three feet long. The sieve is just a screen firmly attached to the bottom of a wooden square frame (see Figure 4). Sieves of different screen mesh sizes should be built so that different sizes of animals can be filtered out. To collect the sample, first push the pipe into the soft sediment by using a corkscrew type of motion while pushing down on the handles. Do not cover the small hole on the pipe cap or air cannot escape, which causes the corer to be very difficult to push into the sediment. Feel along the bottom of the corer for the groove, which indicates the 10 cm mark. Push the corer down so that the 10 cm groove is at the substrate level. Then, rock the pipe back and forth to loosen it from the sediment. Put a thumb over the small hole in the cap to create the vacuum. Next, pull back on the pipe enough to see the end and then reach down to cover the bottom with your hand. It is important to do this so that the sample will not come out the bottom. Finally, hold the pipe over the sieve, or over the collection container and allow the sample to come out of the pipe. The collector may decide to go ahead and "wash" the sample of mud while it is in the sieve, or pour the mud in a labeled container with preservative until a later time. Once the samples have been cleaned, the organisms that live in or on the mud collected will be left and are ready for identification or preservation. This method can also be used in terrestrial studies to look at the layers of soil or to collect soil invertebrates.

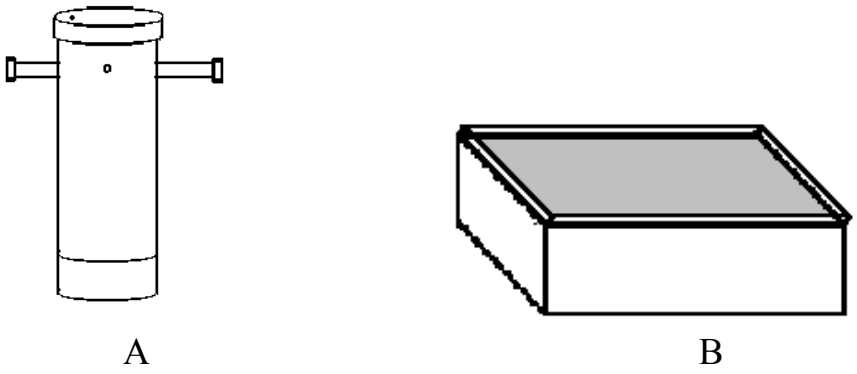


Figure 4. A. Corer B. Sieve.

## Landscape Profiling

To create a topographical map of an area, a profile of the landscape must be accomplished. This is done with the edge profiler (See Figure 5). This edge profiler has the dual purpose of a transect line. Not only landscape can be mapped, but vegetative and infaunal delineations can be mapped as well. To use the edge profile rig, at least three people are needed. With one person at each pole, stretch the line in the proper position until the line is VERY taut. In the center, place the hook-on level. Raise or lower the movable end of the line until level. Starting at the fixed end of the line, drop the plumb bob at the 0.5m mark (red). Each black mark is 0.1 m, each red mark is 0.5 m. With the plumb bob dropped down at the first mark, measure the distance from the line to the ground and note on the data sheet by number (point 1, 2, 3 etc). See Figure 6. The plumb bob line is marked in the same fashion as the rig line. One can also identify the plant or animal at the mark. Repeat for every 0.5 m mark. In areas of change (drop/raise in elevation, etc.), collect data at each 0.1 mark and label as a sub-point (1a, 1b, 1c, etc). In this manner, one will be sure to note all changes in the landscape and vegetation.

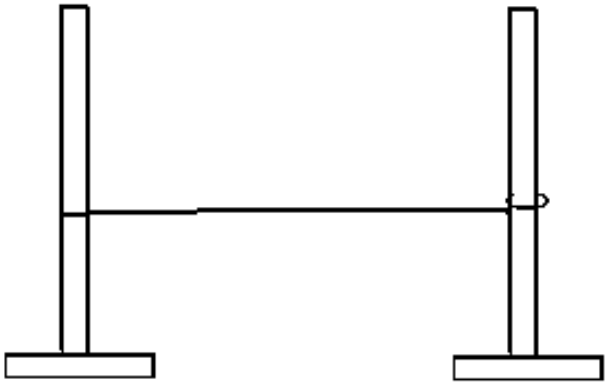

Figure 5. Example of an Edge Profiler

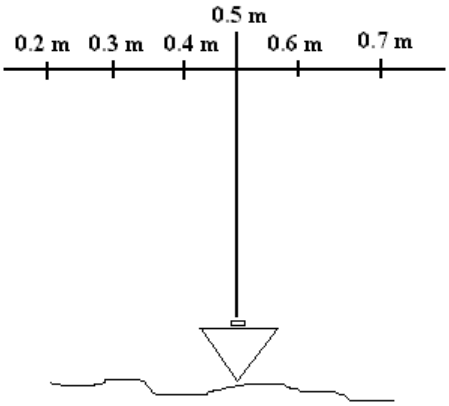


Figure 6. Example of measuring the distance from the profile line to the ground with a plumb bob.