Random Sampling Procedures

Introduction

Scientists often want to know how many of a particular plant or animal are found in a certain place, and how the numbers of these plants or animals changes over time. Because it is normally impossible to count every fish in the stream or every plant in the forest, scientists must make estimates of some kind to know more about a population and to make estimates of its size. To do this it is important to obtain an unbiased estimate of a population by sampling randomly.

Random sampling means that any sampling unit, or insect being collected, has an equal chance of being selected. In other words, there is an equal chance of collecting any individual insect in the stream when we collect population data on these insects.

Random sampling is one of the most important considerations in any scientific research project because a study or population estimates will not be valid unless samples are randomly collected. Because this study is related to streams and water, we will be randomly sampling within the stream itself. Random numbers can be generated from a computer, such as an Excel spreadsheet and tables of random numbers can be made. An easier way in the field is to use your digital wristwatch and start and stop it without looking at it.

Random Sampling Procedures for Aquatic Insects

1. The starting point is usually the access point or beginning of the section of stream that will be sampled.
2. Using your digital stopwatch, use the last two digits (the tenths and hundredths) and write them down for your two random numbers, write the number down on the data sheet
3. We will multiply each random number in our head by ten. If your two random numbers were 6 and 8, they will now be 60 and 80.
4. Next pace upstream using the first random number. That means we would pace upstream 60 paces.
5. The second random number is the place in the stream where you will sample, over from the left bank. So, because our number is 80, that means our sample site is 80% over from the left bank of the stream (as you are looking upstream).
6. Estimate where 80% from the left bank in the stream is located, along an imaginary line across the stream where you ended your 60 paces upstream, this is where the sample area is located.

7. We now must record data onto the data sheet. Important things to remember will be habitat type, and water depth, and GPS points.

8. Next, we will sample for aquatic insects using a bottom sampler. Stir up the substrate vigorously into the bottom sampler for at least 2-3 minutes. The insects will become dislodged and the water current will carry them into the net.

9. We will count the number of caddisfly larvae we collect in each sample, and also will keep all insects including caddis flies for later analysis. Your accompanying Bishop Museum scientist will assist you in identifying caddisflies and other aquatic biota in your sample.

10. Insects will be placed in vials containing alcohol to preserve them.

11. MOST IMPORTANT: Do not forget to put a label in your vial! Include site information and very importantly, do not forget to put in a GPS reading on your label.