Evolution and Biodiversity Laboratory
Collection and Sampling Techniques: Transects

This section of the manual provides some background regarding the methods you will use.

I. Collection Techniques

You will be collecting samples from aquatic (or terrestrial) habitats on or near campus.
Be sure not to introduce unwanted variables that could be controlled.

A. Recording Data

Whenever you collect a sample, record pertinent all information, such as
Locality (**GPS Logger** is an excellent, free app for your phone)

- Time of day collected
- Habitat type
- Weather conditions
- Temperatures (air, water)
- Sample type (water column? sediment? soil? moss?)
- Other relevant details (depth of sample, volume of sample, etc.)

Use a **field notebook** (spiral notebook) to record information about your sites and your samples. Since field sites can be damp, **pencil** is often better than pen for field recording data. (If you feel confident that you won't drop it in the water, you could use the notes function on your phone.)
Each team should assign a member to record all data in its notebook.
Each team member should receive a copy of all data, once all samples are collected.

B. Sampling Techniques: Transects

Unlike research projects you may have done in the past, your survey of biodiversity will *not* involve comparing treatment and control samples or manipulating a variable. Instead, you will be performing a pilot study comparing the biodiversity of two naturally occurring ecosystems that you predict could differ for a stated, logical reason.

A **transect** is a straight line (or narrow section) through a habitat, along which observations are made or measurements taken. Ecologists commonly employ transects to randomly sample diversity in natural habitats. **At set intervals along the transect, a sample is taken at a measured distance from the center of the path.**

If you know the length of your transect line and the distance away from the line each sample is taken, you can calculate the total area sampled. This information should be included in your final report.

There are several different types of transects, but a **line transect** is appropriate for our purposes. A line transect (Figure 1) is a (usually) straight line marked by a measuring tape or string, along which the investigator moves and samples data at known, set intervals. Because you will be counting organisms that may not be readily visible to the naked eye, you will collect samples and bring them back to the lab for analysis.

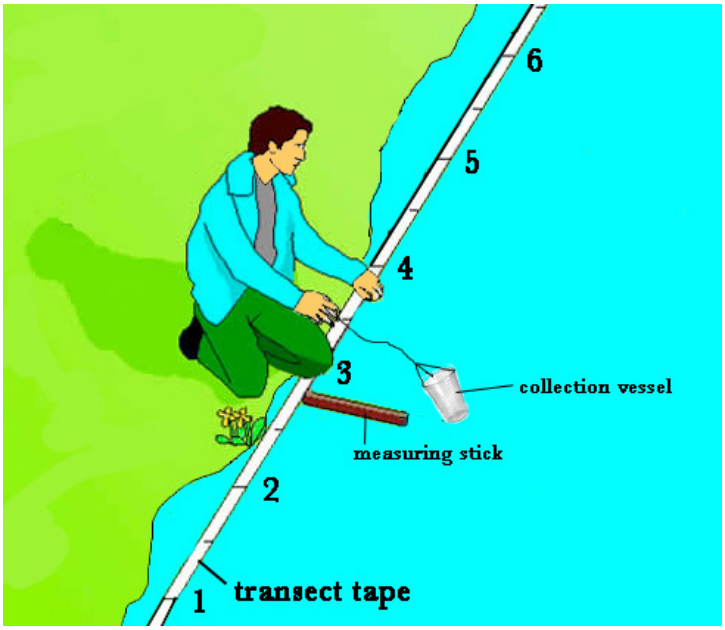

Figure 1. A transect line. Samples are taken at set intervals and known distance from the line. This allows the investigator to calculate the total area randomly sampled.

A transect line doesn't have to be high tech. A length of strong twine, marked with distance increments in indelible ink, serves as well as a measuring tape. A ruler can be used to measure distance sampled from the transect line by placing it perpendicular to the transect line. Your team will choose a constant distance from transect line, then collect either a water, sediment, or soil sample at each interval.

C. Your Team's Transects

For this project, all teams will use the same sampling procedure and collect the same volumes of water, sediment, or soil (the nature of your project will determine which of these you collect.) along their transects. Here's how.

When you arrive at your first habitat, select **three collection sites**, making sure their physical features are relatively uniform and representative of the site. They should not be too distant from each other, but far enough apart to be representative of the habitat type.

1. Select a specific area in your first collection site.
2. Lay your transect cord along the area to be sampled, and pull it straight
3. As described above, choose a set distance from the line with a ruler.
4. **At that distance, at five different 20cm marks along your transect, collect**
   - **~6mL (water or sediment) if your habitat is aquatic**
   - **~1cc (soil or other solid) if your habitat is aquatic**
5. ***Place all five 6mL (or 1cc) samples from one transect into the same sample cup*.**
6. *Total*: 30mL (aquatic) or 5cc (terrestrial) per sample cup
7. **This is your first sample/replicate.** (The five contributions are subreplicates.)
8. Label the cup and its lid appropriately (locality, transect #, date, time, etc.)

Perform the above procedure three times in each of your habitats.
Select a new location for each of the three transects you sample in each habitat.

Water/Soil Chemistry Analysis

If you want to be sure to have enough extra water/sediment/soil for performing chemical analysis, then collect additional water/sediment/soil from any point along the transect and place in a separate lidded container. Label it appropriately, so you know which transect it came from.

If you want to be sure to have enough extra water/sediment/soil for performing chemical analysis, then collect ~ 30mL additional water/sediment (aquatic habitat) or ~10cc soil (terrestrial habitat) from any point along each transect and place in a separate lidded container. *Label the extra appropriately, so you know which transect it came from*.

In the lab, you will have resources available to test such abiotic parameters as

- pH
- nitrite
- nitrate
- ammonia
- phosphorus
- etc.

At the site, record relevant environmental variables, such as

- air temperature
- water temperature
- weather conditions
- pH (strip kits available with sampling kits)
- light condition/quality
- etc.

Note whether these are different from one week (or one locality) to the next.

Note whether these are different from one week (or one locality) to the next.

Remember that these abiotic variables will NOT necessarily allow you to pinpoint a cause for any differences in biodiversity you see between your habitats. But it may give you a starting point to generate ideas for further research.

Your team will repeat this procedure three times in each habitat.
You will do this for two weeks in a row on your lab session day.
When you have completed both weeks' data collection, you will have collected and analyzed a total TWELVE replicates, SIX from each locality.