BLACK RIVER FIRST NATION
FORESTRY PLOT STUDY PROTOCOLS

HOW TO SET UP YOUR OWN FORESTRY PLOT

OBJECTIVES:

- Students will work as a team to establish a forestry plot on school grounds or in a local forest.
- The teacher will guide students through the plot set-up, and help them to learn and apply forestry skills. Teacher oversight will ensure quality data collection and monitoring efforts.
- In the first year, students will establish a baseline dataset for their plot. The data set will include tree species, diameter at breast height (DBH), and tree status. In subsequent years, students will monitor these indicators annually or biannually, and note any changes.

BACKGROUND:

Trees grow by taking in carbon dioxide from the atmosphere during photosynthesis and converting it into structural material (biomass) such as leaves, flowers, fruit, limbs, and trunks. Scientists and foresters can quantitatively measure this growth by setting up study plots within a forest to monitor trees and the larger forest. The plot can be re-measured every year to determine the amount of carbon taken in, or sequestered, annually and over longer periods of time. This can help us to understand how forests help to mitigate the effects of increasing levels of carbon dioxide in our atmospheres and the impacts of climate change. In this activity, participants will learn how to establish a study plot, identify trees, collect data on tree species, and analyze the data for forest growth and productivity and carbon sequestration over time.

WHAT IS A FOREST PLOT?

It is an area of land, representative of larger area of land, in which trees or other features are measured.

Remember, to get meaningful information for a forest, we need to scale up from individual trees. Sample plots help us take the step from tree to stand to forest. Plots must be representative of the area to which results are applied.

How is it used?

Our area of interest is a stand 1 ha in size.
How many trees does it contain? We establish a plot
10 m X 10 m = 100 m^2 = 0.01 ha
We count 15 trees in the 0.01 ha plot 10 m X 10 m. How many trees in the 1 ha stand?
15 trees = x trees

0,01 ha 1.0 ha
Time: 30 minutes in field; 45 minutes in classroom

MATERIALS:

- 50 meter transect tape
- 2 – 4 DBH tapes (a DBH or 'diameter at breast height' tape is designed for forestry applications and directly measures the diameter of a tree)
- Compass
- Tree identification book
- Pen(s) or pencil(s)
- Data sheet or notebook to record data
- Aluminum tree tags
- Aluminum nails (used to secure tree tags)
- Hammer
- 5–10 Survey or pin flags
- GPS unit or GPS cell phone app

For each plot:

1. Locate the plot center and mark it with a stake.
2. Lay out the plot boundaries. For circular plots this involves marking trees at near the circular boundary that are in the plot. For square plots, first lay out one complete diagonal, lining up the three stakes, then locate the other two corners, checking side and diagonal distances.
3. Measure DBH and record comments about defects of all trees in the plot. A tree is in if its centerline is within the plot boundary.
4. Choose the largest and smallest diameter trees, and measure their heights.
5. Select four other trees within the plot for height measurement, ensuring that pairs of DBH and height measurements can be matched on your field sheet.
6. Mark the plot as measured on your map.
7. Tagging, identifying, and measuring a tree: On the side of the tree facing the center of the plot, nail an aluminum tree tag into the tree between 0.5 and 1 m off the ground. Be sure to use an aluminum nail. Do not drive the nail all the way into the tree so that the nail head is flat against the tree trunk, as the tree will grow around it and cover it up.

8. Place all tree tags on the side of the tree facing the center of the plot. This will help in finding all of the tags in the future and will speed up resurveys. Record the ID tag number in your data sheet or notebook. Identify the species of tree and record it on your sheet. Use your tree identification book(s) or guide(s and the leaves, bark, twigs, fruit, etc. to identify the tree species. Binoculars may be helpful to identify leaves on high branches. Fallen leaves in the leaf litter below the canopy may also help. Measure the DBH or diameter of the tree (1.4 m above the ground or ~4 ft) and record on the data sheet. In the status column of your data sheet, record the status of each tree using one of these the three status options:

    a. Healthy – A healthy tree is a live tree with no apparent damage from wind, fire, insects etc.
    b. Damaged – A damaged tree is one that has some type of notable damage to it from wind, fire, insects, or other source. Examples would include a tree with significant damage to the crown from a wind or ice storm.
    c. Dead – A dead tree is a tree that is no longer producing new growth. In the notes section, you may want to indicate if the tree is standing or fallen.

9. Observe the amount of coarse woody debris on the site. Is it:
    a. light
    b. moderate
    c. heavy?

10. Now take note of the ground vegetation. Is it covered with:
    a. moss
    b. small plants such as grasses and forbs
    c. shrubs?

11. Now take a small spade and dig a soil pit about 2 feet by 2 feet and at least one foot deep. Identify the soil horizons and the humus or partially decayed plant matter. Take a reading of the soil temperature and soil moisture.