

Assignment 3 (Weeks 5 and 6)

INTRODUCTION

In this assignment you will be exploring practical use of the essential skills that have been covered in this course to date. These skills include:

- Essential Skill #9: Tree and Plant Identification
- Essential Skill #10: Ecosystem Classification
- Essential Skill #11: Forest Measurements
- Essential Skill #12: Avian Surveys and Identification

The assignment is laid out as a series of tasks below, these will increase in complexity as you progress. Students are encouraged to complete as far as possible given their availability of time and access to sites to do the work.

This assignment is not mandatory to complete the program and will not be given a grade, but we invite you to submit for comment and suggestions from an experienced environmental professional.

TASKS

1. Tree and Plant Identification

Task 1: Twig and leaf sketch

Twig

- Choose a twig with multiple leaves to observe.
- Sketch the twig with leaves on it.
- Make notes of how the leaves are arranged (alternate, opposite, whorled?).

Leaf

- Now sketch a single leaf.
- Label the following parts on your leaf sketch: Blade, petiole, veins.
- Make notes on the leaf:

Shape (linear, elliptic, lanceolate, etc):

Margin (entire, serrated, lobed):

Is it simple or compound:

Task 2: Plant collection and photo documentation

We do not expect you to collect and press and dry plants to create a plant collection as this can be done simply with your cell phone. Take your phone or camera outside in an area where you will find different species of plants and look around for a while. Select ten plants (5 trees, 5 non-trees) that you think you can identify with a bit of work but are not too difficult. To start with plant identification, some hints are:

- Look for and start with common and abundant species.
- Select plants with very distinctive features (leaf shape, bark, branching patterns, colour, etc.)
- Select plants with only a few species in a family. For example there are only a small number of species of pine in the pine family, but there are many very similar appearing species in the willow family. In this case, start with the pines.

While in the field, photograph five different tree species and five different non-tree species. These non-tree species can be shrubs, flowers, grasses, aquatic plants... whatever you wish. But, **please make sure you select easy to identify plants.**

While in the field record information on each plant photograph. What is the soil like? Are you on a slope? Where? Close to water or far away from it? On disturbed ground or deep in a forest, etc. These location and habitat considerations can help us identify plants as they can be quite specific in where they grow.

Back at home, then identify the plants. There are many online guides and resources to help in plant identification. You will need to do a bit of a search for keys, guides, and resources to your region.

Select three of your best photos for each of the categories tree and non-tree for which you have identified. Copy and paste (or import) the images into a word document and include with each of the six plant images the following information:

1. Date photo was taken:
2. Location of plant
3. Common name:
4. Scientific name
5. Collector:
6. Comments on habitat in which it was growing;

2. Ecosystem Classification

Task 3: Determine the ecological classification of your area

Determine the bioregional and ecological classification of your area. You can use the maps within the student portal to determine first the bioregional classification, and then nested within that the ecological region. Complete the data table below by filling in these classifications.

Once you have identified your ecological region, determine the typical or common plants in the region (that is, the indicator species). To do this, Google "*List of ecoregions in Europe*". You should find a Wikipedia page that describes each ecological region. Describe your region in the table below.

Data Table 1: Ecological classification of my home area.

Country: _____

Site location (UTM coordinates): _____

Classification Level	Name of Level
Biogeographical Region	
Ecological Region	
Description of Ecological Region	

Task 4: Indicator species

Provide a list of 10 common species, or indicator species, in your ecological zone.

3. Forest Measurements

Task 5: Forest fixed radius plot

For this task you will need to go outside to a space where you have a patch of trees and you will complete a fixed-radius plot to assess the trees. Once on site the first thing you need to do is determine the appropriate radius for the plot. To determine this use the following table.

Plot Radius (ft)	Plot Radius (m)	Assessed Area (ft ²)	Assessed Area (m ²)	Where used
13.1	3.99	540	50	Forest regeneration plots, silvicultural surveys, high density stands
18.5	5.64	1,075	100	Young forest plots, understory surveys
26.2	7.98	2,160	200	Mature forest stand of medium density
37.0	11.28	4,300	400	Mature forest stands of low density

Note from this table that:

- If your trees are far apart (usually also bigger) you need a bigger circle.
- If your trees are close together (usually also smaller) you need a smaller circle.

Fixed radius plot sampling – field survey

To assist you in your field sampling we encourage you to copy Data Table 2 (below) into your field notebook so you can fill it out in the field.

Now, to conduct the plot sampling:

1. Record in your note the plot radius you are using.
2. Mark the center of your plot (can use a shovel stuck in the ground, flagging tape tied to a bush, a shrub, lay your jacket on the ground...)
3. Measure out the radius from your plot center. Stretch your tape out from the plot centre in various directions to find the edge of your circle plot. As you walk out each distance, flag or put masking tape on each tree that is at the outer edge of the plot. If you do this in 5-8 directions, you can then mark those trees that are along the outer edge of your plot. You will be assessing all the trees that fall within the plot, including these ones that represent the outer edge or circumference.
4. Stand back at the centre of your plot and count the number of trees in your plot. Identify each tree to species to the best of your ability. Complete the first two columns of Data Table 2 below for those trees.

Data Table 2: Forest measurements: Fixed-radius plot surveying

Radius of plot = _____ (include units, whether in m or ft)

Area of plot = _____ (include whether in m² or ft²)

(Remember: to find the area of a circle use the formula: Area = 3.14 x radius squared)

Tree number sampled	Tree species	Circumference at breast height	Diameter at breast height (DBH)	Estimated tree height
1				
2				
3				
4				
5 (etc)				

For the following measurements of DBH and height, select the five most typical appearing trees to conduct these measurements. In a paid position you would do every tree in the plot, but for a learning experience, five trees will be sufficient.

- For each of the five selected trees, measure DBH for each tree in your plot. Since we do not have DBH tapes a simpler method is to use a measuring tape that you can wrap around the tree. This will give you the circumference of the tree at breast height and you will see how to convert this to diameter below under *Fixed radius plot sampling – office work*. Record each of the tree circumference you measure in column 3 of Data Table 2
- For each of the five selected trees, estimate the height of the tree. This can be done visually rather than using a measuring device for the purpose of this exercise. Record each of the tree circumference you measure in column 4 of Data Table 2

Before you leave site, pick up and flagging tape or masking tape you may have used to mark trees.

Fixed radius plot sampling – office work

Now for the office work, the “data crunching”. This is where we actually learn something about the site we sampled.

To summarize your data complete the following calculations.

Step 1: Density and tree species:

Calculate the density of trees in your plot: This is done by dividing the number of trees in your plot by the area of the plot. **Be sure to include units** (# trees /m²? ft², yards², ha, acre?)

Tree density of my plot is: _____

Were all of the species of tree in your plot the same species? Or were there two or three (or more) species growing together?

The number of species in my plot was: _____

The identified tree species in my plot were: _____

Step 2: Diameter at breast height:

To convert circumference at breast height to diameter at breast height use the following from the geometry of a circle.

$$\text{Diameter of circle} = \text{circumference}/\pi$$

That is, divide your measured circumference by pi (3.14). This will give you the diameter of your measured circle (tree circumference). Once having done that, determine the mean and median DBH and the range between the minimum and maximum DBH. Record these below. **Be sure to include units.**

Summary of Diameter at Breast Height

Mean Diameter at Breast Height: _____

Median Diameter at Breast Height: _____

Range (minimum and maximum) Diameter at Breast Height: _____

Step 3: Tree heights

For your five estimated tree heights determine the mean and median heights and the range between the minimum and maximum. Record these below. **Be sure to include units**

Summary of Trees Heights

Mean tree height: _____

Median tree height: _____

Range (minimum and maximum) tree height: _____

4. Avian Surveys and Identification

Task 6: Bird survey

Go outside for a walk or sit in one spot and look for birds and sign of birds. Set a timer for 45 minutes and look for birds. Identify those that you can and for those that you cannot note things such as size, colour, field marks, bird family, and number (approximate only if it is a large flock) if you can get it to that. As this is a survey, ensure that you record location, start time, and end time.

Location: _____

Start time: _____

End time: _____

Bird species (if known)	Description of bird if species unknown (Colour, size, markings, sounds)	Number seen

While on your survey keep an eye out and describe (or photograph) any sign seen (nests, cavities in trees, feathers on the ground, carcasses, etc.).

Use your description to identify to the best of your ability your unknown species when back at home. If you enjoy birding you will likely pick up a field guide or two to the birds; if you do not have those there are many excellent online resources to help you identify birds.

ASSIGNMENT SUBMISSION

Please submit those tasks that you have chosen to complete. We will accept submissions:

- As hand written notes and documents, or typed in a word processing program, whichever you prefer.
- photo submissions taken using a camera or phone.

You may send these as a word document or take photos of your assignment to submit. Please attach to an email and send to: amazon@nrtraininggroup.com

In the email subject line please include course name and assignment number.

For Example: **EFS Assignment 3**

Please send in your work in **one email only** with as few attachments as possible.

End of Assignment 3
