Unit D Lesson 1.4 Field Study

Purpose: Students will use a baseline and transects to estimate the population of organisms in an ecosystem.

Background Information:
Populations can be sampled in various ways depending on the situation. For ecosystems that change, like the sand dune system in figure 1, **the baseline and transect method is a reliable way to systematically measure populations.**

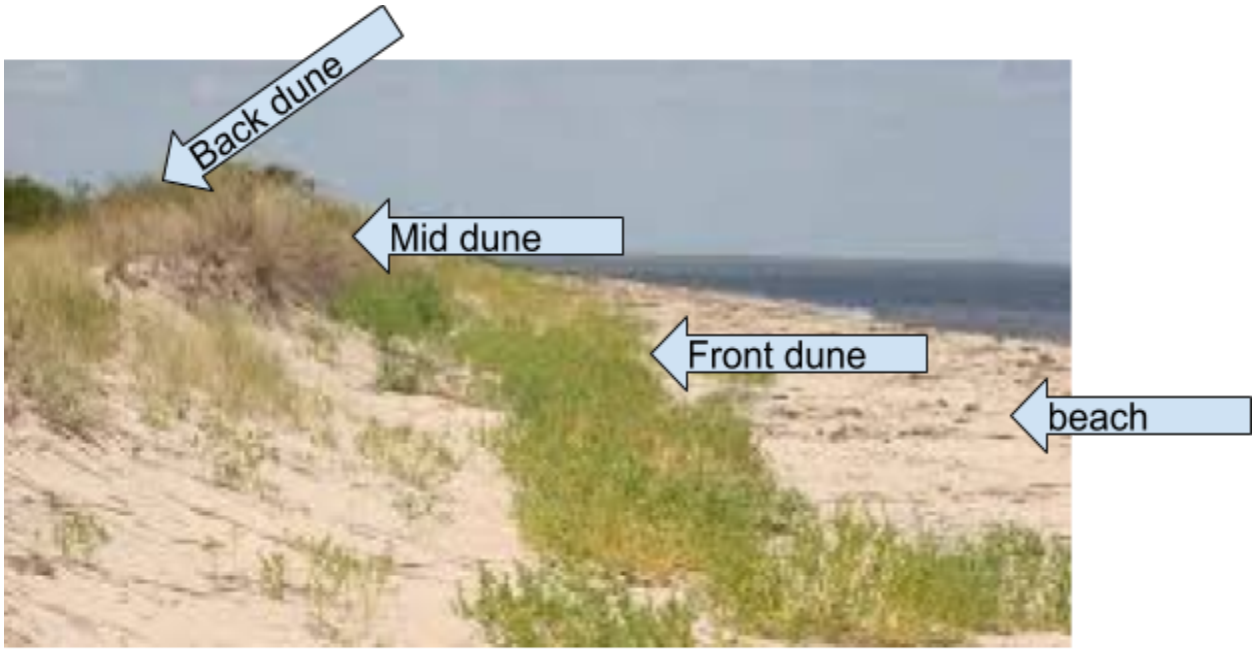


Figure 1: Sand dune profile

Figure 1

For this ecosystem, a baseline might be made parallel to the beach. Then transects would cross the dune. Plants would be sampled at equal distances along the transects and the data recorded.

View this video.

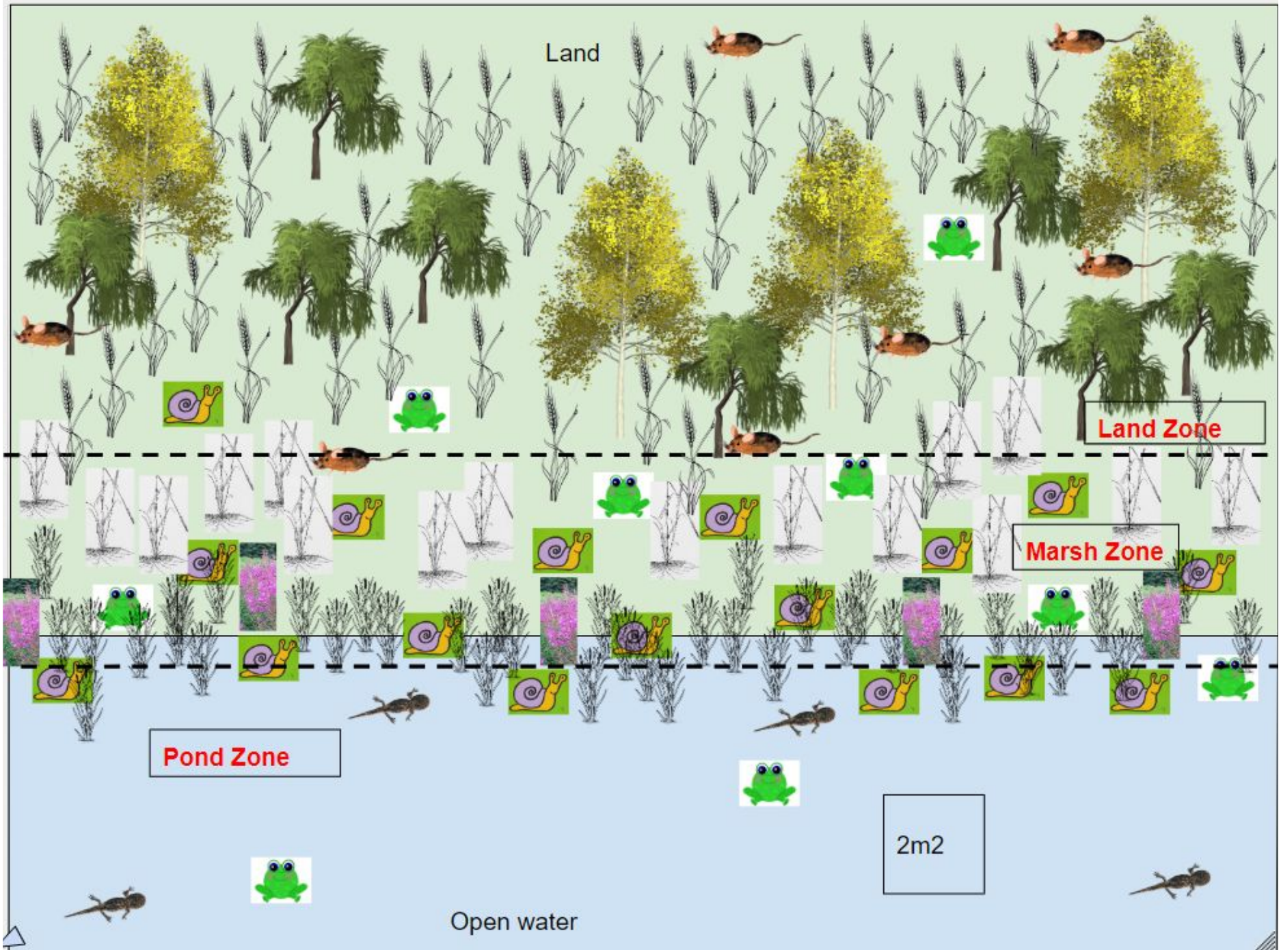
Investigation Design:
In this investigation, a simplified field study will be conducted to determine population changes in an ecosystem changing from a pond to a terrestrial environment. Students will draw a baseline a transect system on a map and sample a small number of species. Determine the population of some species in each zone.

Procedure:

1. Print the Population Map
2. Draw a baseline parallel to the shore and label it. Make it on shore!
3. Draw 3 transects perpendicular to the baseline
4. Using the 2m2 box at the bottom of the map as a scale(1 side represents 2 meters), mark the transect every 3 m
5. Use a 2m2 box to count the species present in each sample space . Refer to the Species Key to identify species. Record on the tables provided. (you might want to cut a small plastic square, or put a square hole in cardboard, and use that as a frame for your sample space)
6. When you are done, answer the analysis questions, and compare your answers to the answers given.

NOTE: This investigation requires you to make some decisions. For example, do you count organisms that are not entirely in the sample area? The assumptions that you make to make your decisions become part of your analysis.

Species Key	
Willow	
Tamarack	
sedge	
cattail	
Purple loosestrife	
grass	
frog	
salamander	
snail	


Land
Land Zone
Marsh Zone
Pond Zone
2m2
Open water

Data Tables

Species Key		Pond zone	Marsh Zone	Land Zone
Willow				
Tamarack				
sedge				
cattail				
Purple loosestrife				
grass				
frog				
salamander				
snail				
mouse				

Analysis Questions

1. Looking at your data, what plants and animals seem to characterize each of the three zones? (Which plants and animals are most present in each zone?)

2. Compare your results to the results shown in the key. Were they similar?

3. Plants were partially inside and partially outside the sample space, so how did you decide to count them. Would you have this problem counting real plants?

4. Purple looseleaf is an invasive species in Alberta, that means it is not native to Alberta. Was an invasive species found in your survey?

5. How would you count animals in a real field study? Most animals would run away or hide. Would the baseline and transect method work well counting animal populations?

6. Did each of the three transects give similar results? If you chose different transects do you think you would get similar results?

7. If 5 different people used the baseline and transect method to survey populations, would they get similar results?

8. Was the baseline and transect method a systematic way to measure populations?