

Name : _____ Date: _____

Ecological Succession Lab

In this lab you will apply what you have learned about succession to the ecological changes that occur in an abandoned hay field. After only 5 years, several types of trees have begun to grow where there was once only hay. You will observe, by counting, the number and types of trees that grow in this field 5, 20, 50 and 100 years after abandonment, in both the understory and the canopy.

Procedure A:

For each figure 1-6, count how many of each species of tree are found in the field, using the key as a guide. Add up all of the trees to find the total number of trees present in the field. You will now calculate the percentage of each tree species at each observed time period. Use the following formula:

Number of specific tree ÷ TOTAL number of trees = _____ X 100 = _____%

Figure 1 (Understory and Canopy after 5 years)

Tree species	Number of Trees	% of Total
Yellow birch ○		
Aspen ▲		
Pin cherry ■		
Blackberry ●		
Sugar Maple □		
Beech ◇		
TOTAL		

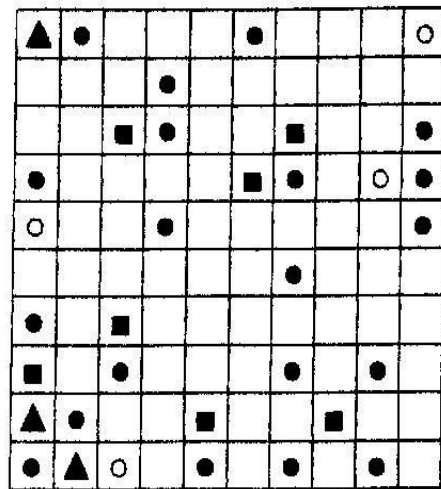
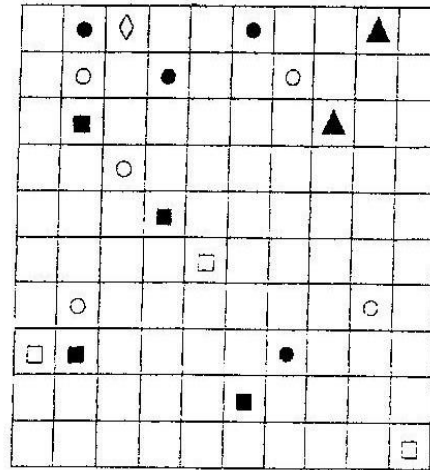


Figure 2 (Understory after 20 Years)

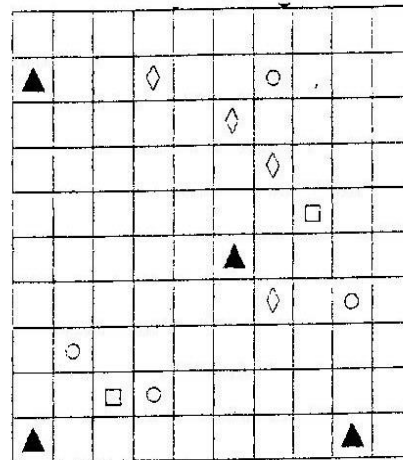
Tree species	Number of Trees	% of Total
Yellow birch ○		
Aspen ▲		
Pin cherry ■		
Blackberry ●		
Sugar Maple □		
Beech ◇		
TOTAL		



July 1, Noon – air temperature: 75°F, soil surface temperature: 84°F

Figure 3 (Understory after 50 Years)

Tree species	Number of Trees	% of Total
Yellow birch ○		
Aspen ▲		
Pin cherry ■		
Blackberry ●		
Sugar Maple □		
Beech ◇		
TOTAL		



July 1, Noon – air temperature: 70°F, soil surface temperature: 68°F

Figure 4 (Canopy after 20 Years)

Tree species	Number of Trees	% of Total
Yellow birch ○		
Aspen ▲		
Pin cherry ■		
Blackberry ●		
Sugar Maple □		
Beech ◇		
TOTAL		

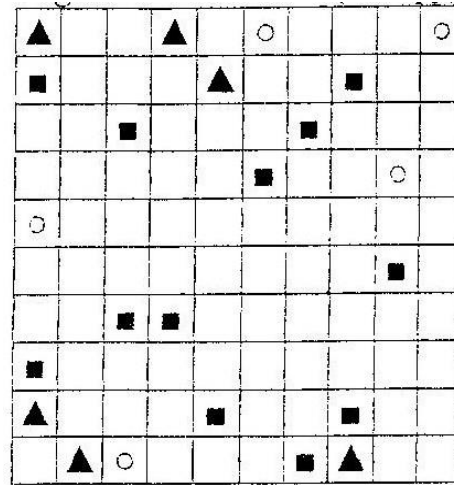


Figure 5 (Canopy after 50 Years)

Tree species	Number of Trees	% of Total
Yellow birch ○		
Aspen ▲		
Pin cherry ■		
Blackberry ●		
Sugar Maple □		
Beech ◇		
TOTAL		

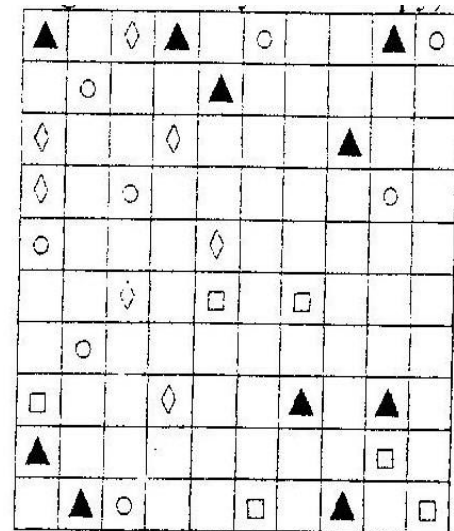
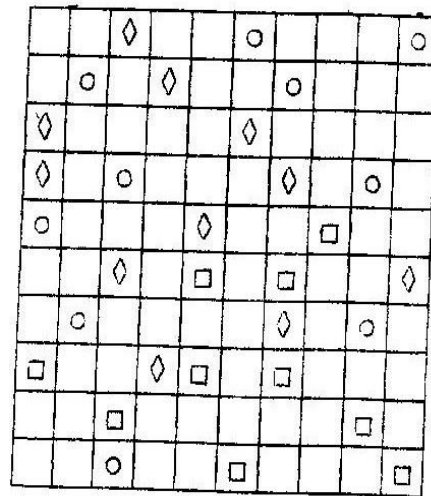


Figure 6 (Canopy after 100 Years)

Tree species	Number of Trees	% of Total
Yellow birch ○		
Aspen ▲		
Pin cherry ■		
Blackberry ●		
Sugar Maple □		
Beech ◇		
TOTAL		

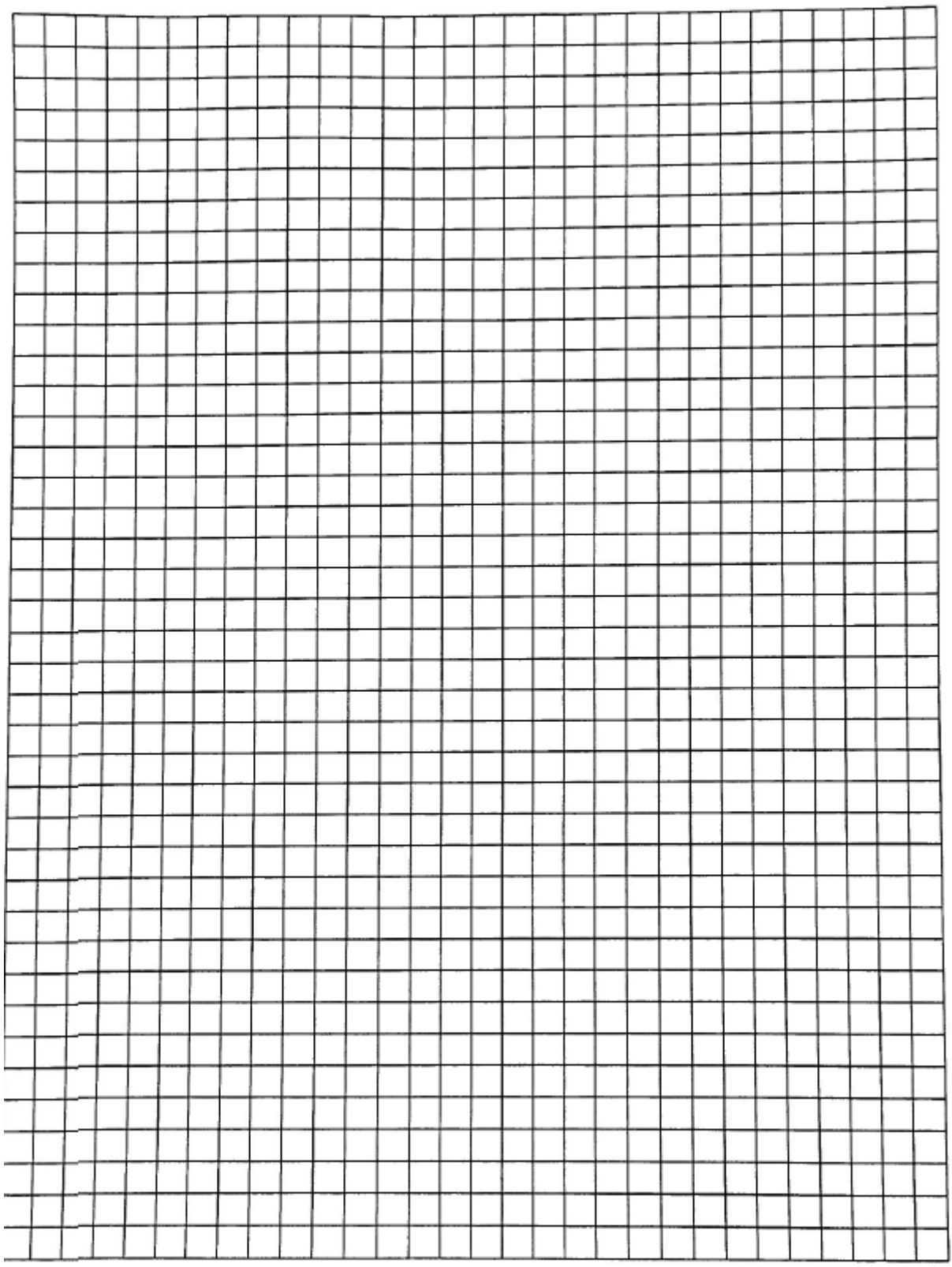


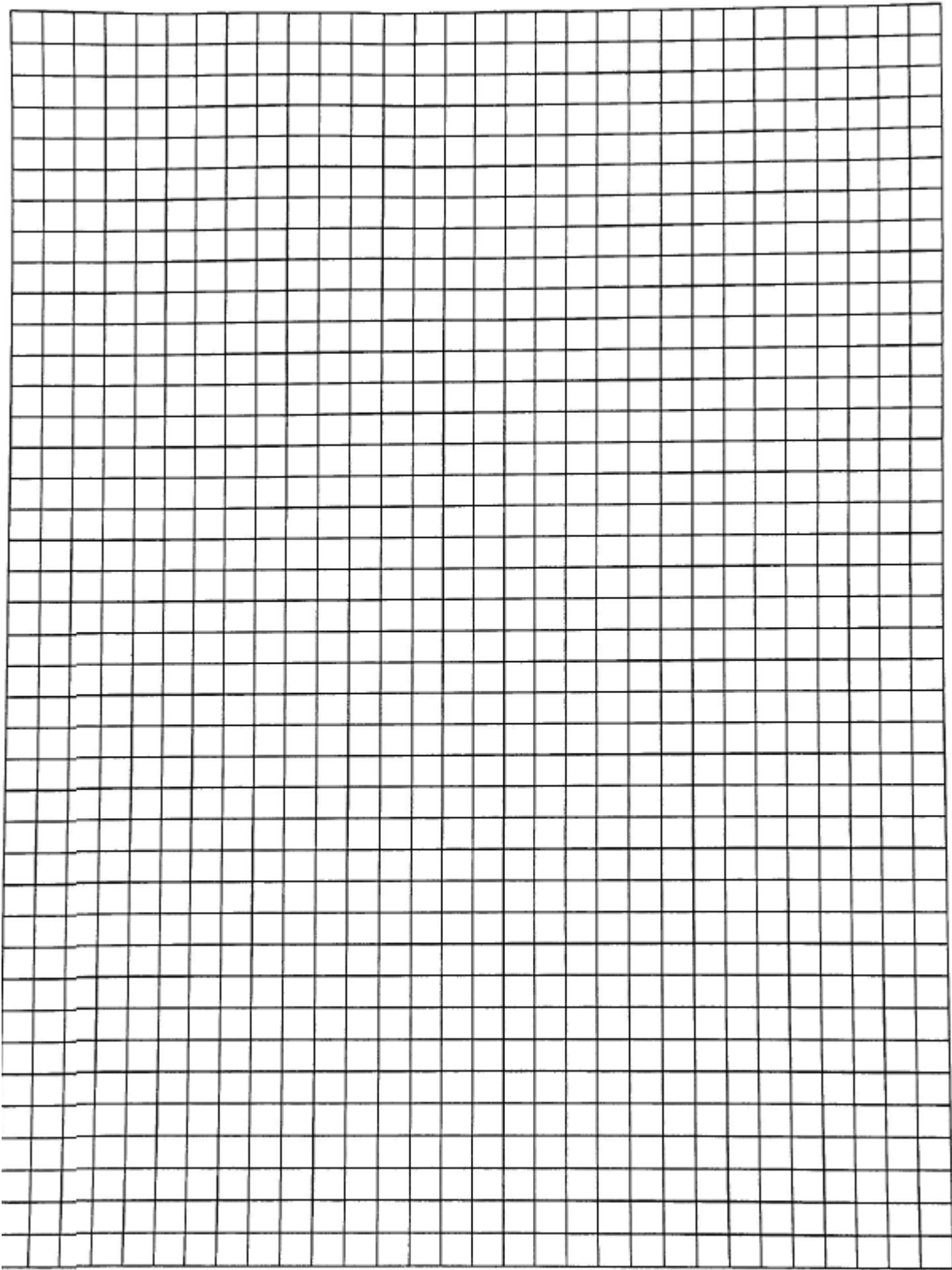
Procedure B:

Using the data in the tables you just completed, construct **two** graphs. The **first graph** will show the **changes in the percentage** of each tree species in the **understory** from 5 to 50 years after the hay field was abandoned. The **second graph** will show the **changes in the percentage** of each tree species in the **canopy** from 5 to 100 years after the hay field was abandoned.

Graph 1: Use the percentages of each tree species from figures 1, 2, and 3 to construct your graph of the understory changes.

Graph 2: Use the percentages of each tree species from figures 1, 4, 5 and 6 to construct your graph of the canopy changes.





After completing both graphs, answer the following analysis questions.

1. Describe, in terms of **decreasing or increasing** percentage, what happened to each of the following tree populations from 5 to 100 years after the field was abandoned:

- a. Yellow birch – US: _____ Canopy: _____
- b. Aspen - US: _____ Canopy: _____
- c. Pin cherry - US: _____ Canopy: _____
- d. Blackberry - US: _____ Canopy: _____
- e. Sugar maple - US: _____ Canopy: _____
- f. Beech - US: _____ Canopy: _____

2. Using the understory figures 2 and 3, which tree species disappeared between 20 and 50 years after the field was abandoned? (Note: do not include trees that had already disappeared after 20 years.)

3. Use the canopy figures 4, 5 and 6 to answer the following questions:

- a. Which tree species disappeared between 20 and 50 years after the field was abandoned?

- b. What tree species appeared between 20 and 50 years after the field was abandoned?

4. What happened to the air temperature and soil surface temperature in the understory between 20 and 50 years after the field was abandoned?

5. Think about the types of trees growing after 20 years in the understory. Are they tall or short species? _____ Now think about the types of trees growing after 50 years. Are they tall or short species? _____

6. Based on your answers to questions 4 and 5, what caused the change in the air and soil temperature between 20 and 50 years after the field was abandoned?

7. In this activity you have observed the changes that occurred in the types of plants that grew in an abandoned hay field over 100 years. What **other types** of organisms would be affected by the changes that occurred?
