

BIO 111 - Laboratory #13: Lime Hollow Field Trip

- **Assigned pages:** Mader, S., et al. 2008. *Inquiry of Life*. pp. C81-82
- ✓ **Bring pp.C81-C82 and a pen/pencil WITH YOU ON THE TRIP**
 - ✓ **PRACTICAL #2: You are responsible for plant identifications and the GOALS listed below**

I. As we hike, keep the following in mind.....

1. **GOALS:**

Objectives - at the end of laboratory #13 you should be able to:

1.) identify the trees, shrubs, herbs, mosses, lichens and aquatic vascular plants seen during our trip

Key terms - you should be able to define:

kame: a low, long, steep-sided mound of glacial debris deposited as an alluvial fan or delta at the terminal margin of a melting glacier. These mounds often show layers (strata) of sand and gravel.

kettle hole (aka "kettle basin", "kettle"): a "bowl shaped" depression with steep sides formed in glacial debris formed by glacial ice left behind and buried in the debris. The depression forms when all the ice has melted.

marl pond: A pond with marl sediments. Marl is composed of clay containing magnesium and calcium carbonate; consequently, it is very basic (high pH) and the water of the pond will be basic.

succession: the gradual change in the number of individuals of each species of a community and the establishment of new species populations which may gradually replace the existing inhabitants. Over time this change can lead to a "climax community" ("self-perpetuating" community).

bog: a plant community that develops and grows in areas with permanently waterlogged peat substrates.

spring ephemerals: short-lived plant species that flourish for a short time in spring. They have less competition for water, light, and nutrients but they run the risk of dying from late snows and frost before they can reproduce. Often, they lack pollinators.....Why would they lack pollinators? (Hint: When do pollinating insect occur?)

2. **Species and Species Diversity:**

- 1.) **Species (text, 302) :** "A species is one or more populations of individuals that share at least one structural, functional, or behavioral trait - the legacy of a common ancestor - that sets them apart from other species [populations]."
- 2.) **Speciation or how species develop (text, pp. 302-307):** Speciation begins when the gene flow (movement of alleles into and out of a population) stops. Once it stops, the gene pools of these populations start to change and the populations undergo genetic divergence because of mutation, natural selection, and a change in the frequency of the alleles in the population. As a consequence, the populations become 'reproductively isolated' from one another; interbreeding between the populations is blocked. Some of the ways of blocking interbreeding between populations include:

(1.) **mechanical isolation** (e.g., pollinators are specific for certain shapes of flowers and not others)

Question: What types of flower shapes have you observed? Which would have specific pollinators?

(2.) **temporal isolation** (reproductive cycles are not synchronized from one population to the next)

Question: Are red and white trillium temporally isolated? What would keep these species separate?

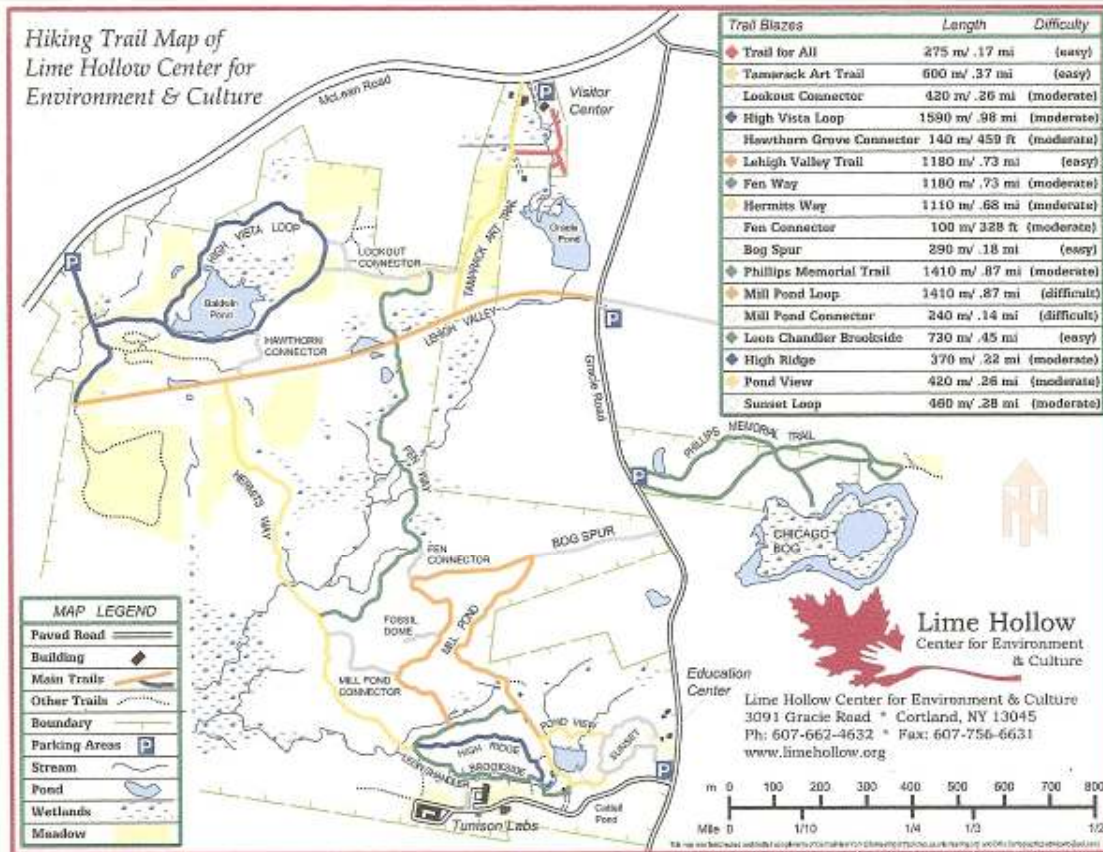
(3.) **ecological isolation** (populations occupy different microenvironments (e.g., dry vs. wet, diff. elevations))

Question: See if you observe violets in different locations. If so, are these locations different?

(4.) **gamete mortality** (gametes of one species population are incompatible with gametes of another (e.g., pollen from one species will not produce sperm that will fertilize the egg of another species))

Question: Many trees have airborne pollen at this time; some trees of the same genus, such as poplars (genus, *Populus*) have several species producing pollen. Can you think of an example where this mechanism has not been 100% effective in blocking interbreeding?

Lime Hollow - Trail Map:



Lime Hollow - Topographic Map:



We will start at the marl pond and hike along an old railroad track bed through a highly disturbed landscape. In these disturbed soils, shrubs such as staghorn sumac, honeysuckle thrive. You will see various species of maple, as we walk on. As we walk deeper into the woods, you will see spring ephemerals (April-May) and longer-lived wildflowers. Take note of where you see the different plant species.

As we pass through the "cattle gate", we enter an old cow pasture that has not been used for grazing for at least 10 years. In this "old field", you will see how secondary succession has changed the field from grass species to wildflower, shrub and tree species.

As we leave the old field, we will pass by a bog which has formed in a depression formed thousands of years ago by water plunging off a glacier's edge, a "plunge pool". Note the larger trees, as we leave.