

Costa Rica's Sustainable Coffee

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Course: Honors Field Ecology

Lesson Plan #1

Food Choice in Migrating and/or Resident Birds

Objective: to test if birds will choose food with additives vs. bird seed with no additives

Procedure:

1. Add similar amounts of birdseed into 12 weighing boats.
2. Add 1 spoonful of coconut oil to each of 3 samples; add 1 spoonful of olive oil to each of 3 samples; add 1 spoonful of Calcium Diphosphate to each of 3 samples and 3 samples will not receive any additive.
3. Mix additives equally.
4. Record the mass of each of the samples as initial mass on data page.
5. Place the seed samples outside in 3 different spots where birds will easily find the food. Each feeding location should have 1 of each of the 4 treatments, arranged in random order.
6. Over time, record the mass of each sample.

Other considerations:

- A. It would be interesting to compare this experiment in the spring when birds are laying eggs and Calcium might be a limiting resource compared to in the fall when eggs are not being produced.
- B. The 3 locations could be very similar to get replication of the experiment or the 3 locations could be quite different, such as on the ground vs. 4 feet off the ground in the open vs. 4 feet off the ground in a tree.
- C. Identify the types of birds coming to each feeding station. Time how long each bird spends eating at each type of food sample.
- D. Conduct the experiment during early fall when migration is in progress and then again during winter when only resident birds are in vicinity.

Analysis:

1. What conclusions can be drawn from the data?
2. Was the type of lipid significant in bird choice of food? How do birds use lipids from their diet?
3. Why would birds need additional calcium in their diet? List at least 3 different uses for that mineral.
4. How could you redesign this experiment? What additional questions could be asked?
5. What types of birds ate these food samples?

Lesson Plan #2

Lepidopteron and Bird Woods

Archmere Community Project

Phase 1:

Step A: Remove invasive plants from the Archmere Woods.

This could be a Saturday work effort for students and faculty. Mothers Guild and Fathers Guild could also be invited to participate. There is poison ivy in the woods along with rose, English ivy, and hostas. Although these are the most obvious invasive plants, they undoubtedly are not the only ones.

Step B: Identify the tree species in the Archmere Woods.

This could be a project for the Honors Field Ecology class in the fall semester and the Honors Botany class in the spring semester. Identification tags will include the family name, common and technical names. Students can also research how local fauna uses different species of trees.

Step C: Target species list for Archmere Woods

Students will research which tree and shrub species are most important for local birds and lepidopteron. A list of those species will be compiled, plans made for where each new tree and shrub can be planted in the existing area. The best time of year to put in trees is the fall.

Phase 2:

Step D: Walkway and Benches

In one section of the Archmere Woods, I would like to make a horseshoe path from the existing path that goes to a lower athletic field. Students and alumnae/I can walk along this path and see the identified individual trees and shrubs. Also in the woods, I would like to have a square of 4 benches so that teachers that want to meet outdoors can hold their class in a quiet area that will not distract other classes being held inside buildings on campus.

The materials needed and the labor involved will make this Phase much more expensive than Phase 1. Funds will be requested from a combination of grant proposals, requests of the Mothers Guild and/or Fathers Guild of Archmere Academy, and as Class Gifts from graduating classes. These benches can be inscribed with "Class of 2008" for example.