Quantitative Analysis

BIOL 414/514 · Hocking

Abundance and Occupancy Across the Landscape

In-class activity to work on in groups and then discuss as a whole class. Each group will be assigned one scenario to discuss in detail but be sure to read through and at least briefly consider all scenarios.

Objectives

* Improve your understanding of study design to answer questions about species abundances and distributions across landscapes when detection is imperfect.
* Help connect sampling design and hierarchical models to distinguish ecological processes and observational process



Scenario 1

You want to know the abundance of Common Yellowthroat across Maryland. You also want to know what habitat characteristics, landscape features, and environmental conditions affect their abundance. How would you design a study to answer these questions? Describe the type of surveys, study unit, number of study units, when you would conduct your surveys. Also describe the model you would use to analyze the resulting data.

Scenario 2

The National Park Service is concerned about climate change affecting the distribution of the Shenandoah Salamander (*Plethodon shenandoah*), which is endemic to the park and endangered under the Endangered Species Act. Imagine you are tasked with determining the current distribution of the salamanders and the factors limiting their distribution. Describe the study you would design including number of samples, types of sampling, environmental variables you would measure, and the analysis you would use.

Scenario 3

You’ve been hired by Virginia DNR as the state Mammologist. Assume the state already has a good handle on the primary game species. Design a study to understand the abundance or distribution of one mammal species (your choice) within the state. Describe the type of surveys, study unit, number of study units, when you would conduct your surveys. Also describe the model you would use to analyze the resulting data. Be prepared to discuss why you chose abundance or occupancy and your study methods.