

# **Multivariate Statistics for Wildlife and Ecology Research**

## **NRC 797S&T**

### **Project #3 Assignment: Unconstrained Ordination**

The purpose of this project is to give you hands-on experience using R to conduct unconstrained ordination of a multivariate data set using common ordination procedures. As such, you will not be expected to analyze the data set from every possible angle and using every possible analytical procedure discussed in class. Rather, the purpose of this project is to give you some basic experience in how unconstrained ordination works and how R can be used to do the analysis. The specific assignment, corresponding to the provided birdhab data set evaluated in the previous lab, is as follows:

- (1) Use PCA, CA(or DCA), and NMDS to extract (if possible) major gradients in streamside breeding bird communities in several Oregon Coast Range third- and fourth-order watersheds based on the provided multivariate data set. Describe these gradients in ecological terms! That is, to the extent possible given your understanding of the system, explain the gradients in terms of the breeding bird community (i.e., species variables) and the measured environment associated with valley floor morphology and vegetation patchiness (or heterogeneity).
- (2) Identify the limitations in this data set pertaining to the use and/or misuse of each ordination procedure for meeting objective 1. For example, evaluate this data set for adherence to model assumptions and sample size requirements, and suggest possible solutions or strategies that might be employed to counter or deal with any violations of assumptions.
- (3) Evaluate the overall performance of each technique in meeting objective 1. For example, evaluate the relative importance of each gradient extracted using the appropriate criteria.

Prepare a 20-30 minute oral or 3-4 page written (to be determined in class) presentation of your findings. Be concise in your reporting and be sure to address each of the questions above. The quality of visual aids (e.g., tables and figures) will not be a consideration in your grade, so focus on the content. All members of the group must participate equally in the report and a single grade will be assigned to all members in a group.