Please fill in your name, save this document as lastname\_lab1.doc, complete the questions in the file, and upload it to your dropbox in Sakai when you are done. Use set1\_script.R to help you.

Adapted from Quinn & Keough (2002), and Whitlock & Schluter (2015), and McGarigal (2014). If you are struggling with these questions, or need additional practice, try the review questions at the end of each chapter in W&S.

Name: \_\_\_\_\_\_\_\_\_\_\_\_

**ES5190 - Biostatistics**

**Problem Set 1 – Populations, sampling, and variable types**

1. Statistical Populations. For each of the following research questions, define a statistical population and sampling unit (note that there may be more than one alternative).
2. How does invertebrate community diversity (e.g., # taxa) vary with soil pH?

c. What is the relationship between the amount of impervious surface cover in a watershed and in-stream mussel diversity?

e. What is the relationship between number of annual visitors to state parks and carnivore abundance in those parks?

1. Choose a research question within your area of interest (ideally, one associated with your dissertation/capstone and define the relevant statistical population). Clearly define the statistical population and the experimental or observation units (i.e., sampling units).
2. For each of the following, identify the types of variables described (continuous, categorical, binary, etc.), and whether they are dependent (response) or independent (predictor).
3. Is attitude towards motorized recreation independent of education level among users of New Hampshire Stake Parks? Data include attitude class (3 classes: favor motorized use, opposed to motorized use, neutral to motorized use) and education level (high school, BS, MS, or PhD) for each of 100 randomly surveyed visitors to New Hampshire State Parks.
4. Do street trees confer greater home energy efficiency in Keene, NH? Data include presence/absence of street trees and a quantitative measure of home energy efficiency for each of 100 homes in Keene, NH, controlling for home age, size and construction.
5. How do climate and land cover influence Golden Eagle nesting habitat? Data include presence/absence of a Gold Eagle nest at 200 sites in Arizona, average July temperature at each site, and landcover type (forest, desert, shrubland, developed land) at each site.