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ECO 602

Week 4 Reading Questions

1. A model of Brown creeper abundance explained by late-successional forest percent. Consider what types of data were collected in each study: Are they continuous, discrete, categorical? What is the data scale? What kind of deterministic function is used.

Relative of abundance of brown creepers in relation to percent of late-successional forest (both discrete data). The scale is 0 to 1 and 0 to 100. Simple linear function.

1. A model of Brown creeper presence/absence explained total basal area (a measure of tree cover). Consider what types of data were collected in each study: Are they continuous, discrete, categorical? What is the data scale? What kind of deterministic function is used.

Presence/absence of brown creepers (categorical) and total basal area in m^2 per ha (continuous). The scale is 0 or 1 and 0 to ~250. Logistic function.

1. What are the response variables in each model?

The response variables are the abundance and presence of brown creepers.

1. How did the data type or scale influence or constrain the choice of model in each of the two studies?

In the presence absence example there are only 2 possible outcomes for the response variable, they’re either present or they’re not, no values can fall in between 0 and 1. So it would make sense to use a logistic function. In the abundance example, we see that there can be values between 0 and 1 and since there is an increase, or any pattern of some sort, then a linear model makes sense.

1. What were the pros and cons of each of the two models?

All of the mechanistic models do a good job of fitting the data. Any one would work as well as the other.

The mechanistic models all work well because they tell us explicitly what’s going on in the environment.

However many times the mechanistic model doesn’t fit the data a priori. When a mechanistic model doesn’t work, then a deterministic function often times will. The quadratic polynomial function fits the data better than any of the mechanistic models. The downside is that while it may describe the pattern well, but there is no underlying environmental drivers tied to the model. So it can describe the relationship well, but not the underlying mechanism.