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ECo 602: Michael France Nelson

Week 4 Reading Questions

1. The predictor variable for the brown creeper abundance study is the ecological succession of forest by percentage. It is continuous and on an interval scale. In the second study on brown creeper presence/absence, the predictor variable is the total basal area of trees. This predictor variable is continuous and on a ratio scale.

2. The response variable for the abundance study is the brown creeper abundance. It is a continuous data type and on a ratio scale. The response variable for the second study is the presence/absence of brown creepers. The data type is discrete and ordinal.

3. In the first model, the continuous nature of the brown creeper abundance and the forest succession influences the model by showing a positive linear relationship with a significant amount of stochasticity. The continuity of the data makes it difficult to use another model because other appropriate models do not display each data point. In the second model, the response variable is binary, so the y-axis is (for lack of a better term) one-dimensional in the sense that there are only two locations where there are data. The limitation of having a discrete response variable is that there is no clarity on how many brown creepers there are depending on the total basal area.

4. The pros of the Ricker model are an explicit mechanistic explanation and a direct environmental interpretation, but the cons of the Ricker model are it doesn't describe the pattern phenomenologically and a mechanistic model for the data a priori is not typically necessary with environmental data. The pros of the quadratic model are it's easy to read and highly flexible for describing linear and curvilinear patterns and they describe the data very well phenomenologically, but the cons are they do not describe the underlying mechanisms of the data and it is easy to overfit data with higher-order polynomials due to the model's flexibility.