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ECo 602
Week 4 Reading Questions

1. For both models identify the predictor variable(s) and the data type/scale used for the predictor variable.
 - a. Abundance: the predictor variable in this model is the extent of late-successional forest, which is a continuous ratio variable (i.e., the value can fall anywhere on the scale depending on the sensitivity of measurement equipment, and there is a “true zero,” where the extent of late-successional forest is 0)
 - b. Presence/absence: the predictor variable here is total basal area, which is also a continuous ratio variable (i.e., the value can fall anywhere on the scale depending on the sensitivity of measurement equipment, and there is a “true zero,” where there is no basal area).
2. For both models identify the response variable(s) and the data type/scale used for the response variable.
 - a. Abundance: the response variable in this model is the number of brown creepers observed, which is a discrete simple count.
 - b. Presence/absence: the response variable here is presence/absence of brown creepers, which is discrete binary data.
3. For both models: How did the data type or scale influence or constrain the choice of model?
 - a. Abundance: Because abundance is discrete count data, the options for what type of model to use are quite open. Depending on factors like the observed shape of the plot, any number of linear, rational, exponential, or power functions could theoretically be fit to the data.
 - b. Presence/absence: because presence/absence is a binary variable, the choice of functions for this model was severely limited. Unless the binary data fell into a very specific pattern, or there was a known biological process being mechanistically modeled, I find it hard to imagine that anything other than a logistic model, or a very complicated polynomial function, would fit the data.
4.
 - a. What are the pros and cons of the Ricker model?
 - i. Pros: Mechanistic in the predator-prey examples given (aka tied to underlying ecological processes), pretty good fit, model makes sense given dynamics of known predator-prey systems
 - ii. Cons: not as good a fit as other phenomenological models, makes a little less sense ecologically than an option like Holling type II though the fit is very similar
 - b. What are the pros and cons of the quadratic model?
 - i. Pros: able to get a much closer fit than mechanistic models like Ricker and Holling II
 - ii. Cons: phenomenological model means that it doesn't tie directly to the underlying environmental theory/mechanism behind the observations.