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Week 4 Reading Questions

I did not work on these questions with anyone else

Q1 (2pts.): For both models (abundance and presence/absence) identify:

a. The predictor variable(s).
b. The data type/scale used for the *predictor* variable.

For abundance models, the predictor variable is something that generally forms a linear relationship with the abundance of something. In the McGarigal example, as the forested extent increases, so too does the abundance of brown creepers. The predictor variable in this case ranges from 0 to 100 on a continuous, ratio scale, as it's a percentage of late-successional forest. For presence/absence models, the predictor variable tends to form a logistic relationship with the response variable. In the McGarigal example that takes the form of the relationship between basal area and presence/absence, which shows the trend that while there are both presence and absence at low basal area, there are only presence at higher basal areas. This doesn't scale on a range of 0-100, as it's not showing a percentage in the predictor variable, it's a raw measurement of area, but it remains a continuous, ratio scale.

Q2 (2 pts.): For both models (abundance and presence/absence) identify:

a. The response variable.
b. The data type/scale used for the response variable.

For Abundance models, the response variable is the abundance of whatever you're measuring, and it scales from 0 to 1 on a continuous, ratio scale. For presence/absence, the response variable is the thing being measured is either present or absent, and so while it also scales from 0 to 1 on a nominal scale, it is discrete rather than continuous. It can only be present or absent, 0 or 1, not anything in between.

Q3 (4 pts.): For both models: How did the data type or scale influence or constrain the choice of model?

Since presence/absence can only be shown on a discrete, nominal scale, it constrains the choice of model to a logistic model, as it's the only model that can fit with the discrete data on the response variable. The abundance model does not as heavily constrain the model choice, as it could also result in a logistic model, or a linear model, or even a ricker model. Since the data is continuous, it is less rigid along the scale than that of the presence/absence models.

Q4 (1 pt.): What are the pros and cons of the Ricker model? What are the pros and cons of the quadratic model?

The Ricker model allows one to describe the underlying environmental theory in the predator-prey model as well as the pattern to a lesser extent than the quadratic. The quadratic, while it is able to better fit the data and most accurately describe the pattern, it tells us nothing about the mechanism because there is no underlying environmental theory tied to that model. In this case, which model you would pick would depend on what your goal is. If your goal is only to describe the pattern, the quadratic model does so the best, but if you want any understanding of the mechanism behind it, you would need to use the Ricker model.