

Analysis of Environmental Data – Reading Questions 4

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

The predictor variable(s).

The predictor variable is (1) “extent of late successional forest” and (2) “total basal area”.

The data type/scale used for the *predictor* variable.

(1) It's continuous, ratio, numeric \diamond (2) It's continuous, ratio, numeric

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

The response variable.

The response variables are (1) “brown creeper abundance” and (2) “occurrence”.

The data type/scale used for the *response* variable.

(1) It's discrete, numeric, ratio \diamond (2) Data scale is discrete, categorical and nominal (1 and 0 only say if it is present or not > could also be presence and absence > not ordinal)

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

1. Linear model: Since the abundance increases linearly with increasing percentage of the landscape comprised of late-successional forest a linear model makes sense.

2. Logistic model: Since the response is binary (either 0 or 1), in this case presence/absence, a logistic model makes sense. The model must honor the 0-1 bound of the response variable (occurrence).

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

Ricker model (per capita fecundity exponentially decreases with density> start at zero, increases to peak and decreases gradually back to zero):

- It is a mechanistic and phenomenological model
- It is very flexible > fits the data well
- It has a finite limit
- It is a complex function
- Fits data not as well as quadratic model

Quadratic model:

- Is only a phenomenological model > Can describe pattern well, but nt the environmental theory/phenomenon tied to model
- Fits data the best
- Also highly flexible