Exam: Population Ecology

Develop a 4-year long PhD project on the topic of: habitat restoration and reptile populations. The populations of almost all reptile species in Germany has declined over the past century and habitat loss is the greatest threat. Consider a study that aims to understand the features of the habitat that are important to a reptile population, and how you would use that information to plan a large-scale habitat restoration.

Specifically, consider one or more reptile species that you would focus on. This can be hypothetical (don’t get too distracted by picking the perfect species- you can instead think about what features you would be looking for in the ideal study system). I want to see that you understand the population models well enough to justify decisions you make in how you design your data collection and create your population model.

What is your study species and why did you choose it (them)?

How do you design your research to address your question? For example, will you study natural populations, or work in the field or in a greenhouse/laboratory? What treatments will have? Will these be natural or experimental treatments? What will you measure?

How will you design your population model to test your question? I assume you will use a structured population model, as most animal populations have some sort of age/stage/or size structure. Will you use a matrix population model or an integral projection model? Why? Will you incorporate environmental stochasticity or density dependence into your model? Explain and justify your choices.