Week 2 Reading Assignment

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602 Lecture

Choose one of the modeling dichotomies that Bolker writes about in sections 1.1 - 1.3 (summarized in table 1.1 on page 6).

1. Choose one of the modeling dichotomies that Bolker writes about in sections 1.1 - 1.3 (summarized in table 1.1 on page 6). In 1 - 2 short paragraphs, explain the dichotomy in your own words and briefly describe how you might approach one of your research interests from each of the dichotomy endpoints

The modeling dichotomies that I chose are descriptive and predictive. Both dichotomies look at the data that was collected in the past, but they apply it in different ways. A descriptive model will show you what is going on. It will look at the patterns and data and breaks it down into a way that is easy to understand. A predictive model will look at the data and use it to make predictions. It will show the possibilities of the data in the future and how it might change. One of my research interests is endangered species conservation. I would use a descriptive model to show the stakeholders the conservation status of the species. Including information on where they are located, the threats to the animal and the advantages of that species and the role they play in that specific habitat. I would then discuss the conservation efforts that are in effect for the species or if I have any ideas to help protect the species. Then I would use a predictive model to show how those conservation efforts can benefit the species in the future. By showing if the population increases in the area and if the local peoples attitude towards the animal changed.

2. Identify at least one source of bias or assumption (cultural, scientific, other). Hypothesize a practical impact these biases or assumptions might have on scientific communication and the effectiveness of management efforts? (1 - 3 paragraphs)

The one source of bias that I will be discussing is cultural bias. This can shape how we look at certain issue. Here in the United States, the only time one sees lions is when they visit their local zoo. But in some countries in Africa, it can be normal to see a lion on your way to the store or right outside your front door. This will obviously create two different attitudes towards these animals based on the person culture and where they are from. The African lion is listed as Vulnerable in some countries and critically endangered in others. I used to look at these types of situations like “Why would they kill such a beautiful animal. They know their populations are declining. This is not right.” I am an American, who has never had to deal with lions in my day-to-day life. It is easy for me to not harm a lion and when I have never encountered one.

In Africa, it is common for lions to fall victim to revenge killings. This can be a result of the lion killing a farmer’s livestock whether it be goat, cattle etc. To the local people this can be devastating. This can cause them to lose income and food that they would have used to provide for their family. It will not be enough to tell these people to not kill the lions. To increase the effectiveness of management efforts they must both communicate with the people and work with them. You must communicate the importance of the species while also helping protect the local people’s livestock from the lions by installing alarm systems, gates etc. You have to look at the

issue from the other groups point of view. Once the local people feel safe and protected it will be easier for them to help in conservation efforts and help others in the community protect themselves and their livestock. This can shift their attitudes towards the lions and have a positive impact on the lion's population

3. Identify and briefly the two primary components of a model constructed in the dual model paradigm? Give an example of the two components in the context of a system you are interested in studying.

   The two primary components of a model constructed in the dual model paradigm are deterministic and stochastic. With a deterministic model there is an absence of random variation while a stochastic model incorporates randomness into the system. An example of stochasticity when you are doing research in the Sahara studying the movements of the African Lion and there is a downpour of rain. It was unexpected and seems to cause the lions to deviate from their usual patterns of movement. That rain add variability to the study. An example of deterministic component is if you have been following the lions for years and have a route mapped out that the pride usually takes. Their usual water source hunting habits on a day where the conditions are met and there is no unusual weather or danger.

4. In 1 - 2 short paragraphs, describe the difference between a statistical and biological or ecological population. Which of these populations may vary depending on the spatial or temporal scale of the research question?

   A statistical population is the target population that we wish to study. Our sample size comes from this population. The statistical population may vary depending on the spatial/temporal scale of the research question. We take sampling units from the statistical population to either manipulate or observe to collect data. The biological population is the entire population. Not just individuals in a specific place. Ecological population is a population that is the same species that are living and can breed in an area.

5. Consider the scenario your group chose to use in the model thinking in-class activity:

- Cascades snow pack
- White pine blister rust
- Cattails

Choose 2 of the of the following data types and scales.

1. A continuous variable on an ratio scale

2. A categorical, nominal variable
3. A discrete variable
4. A numerical variable on an interval scale

For each of your chosen variable type/scale types:

- Propose an entity and/or variable in your scenario that you could measure using the data type/scale.
- Explain why the data type or scale is appropriate for the entity/variable you chose.

The scenario my group chose was the invasive Cattails in Chesapeake Bay area. A question that can be proposed is how many invasive cattails are in a specific area. I would map out the range I want to study and start collecting data. The data types/scales I would use are ratio and ordinal. Since an invasive species has been introduced to a native population, I could use a quadrate to test an area and see what is the ratio of native species to invasive species. I would also then use ordinal to document the size and age of the invasive species. To determine how often the invasive species are spreading. Are the plants young or they seem to mostly be matured? These scales of data can help researchers determine the next step in controlling the invasive species population to benefit the native species.