

Modeling Activity: Mutualism

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BIO534: Fundamentals of Ecological Modelling

1 Introduction

Like interspecific competition and predation, mutualism is another possible relationships among two populations. Thus, we can start to model mutualism using a two state-variable model. The possible importance of mutualisms was long ignored by ecologists, so there are no “classic” models like there are for competition and predation. This provides us with the perfect opportunity to practice the conceptualization and quantification of a simple ecological model.

Learning Objectives

Through this activity (and associated discussion) you should be able to:

- Characterize alternative types of mutualistic interactions and provide examples from the literature;
- Practice model conceptualization and quantification;
- Practice searching the ecological literature for examples;
- Apply modeling tools and techniques previously introduced in class;
- Evaluate alternative model formulations; and
- Describe several alternative model ways of modeling two mutualist populations.

2 Homework Preparation

In preparation for this activity, team members should search the ecology literature for an example of a mutualistic relationship between two species. Consider the nature of the mutualism, and when and how it operates. What issues do you need to consider to model this relationship?

3 In Class Activity

In class, each team will modify one of our existing models – or create *de novo* formulation – to model the mutualism described in the paper you identified. As time allows, students will analyze (e.g., equilibrium, sensitivity of mutualism functions) and/or simulate their initial model to evaluate their construction. The teams will have time to present their work in class.