

Lab 7 Synopsis

Lab 7 is designed to get you thinking about trophic levels, the interaction between different trophic systems, and to see if there is a change in behavior due to the presence of a predator.

First one must understand the basic concepts of trophic systems. Be sure you can answer the following questions: What are the different trophic levels? What is a food chain? A food web? Where do photosynthetic organisms fit in? Herbivores? Predators? Large predators and small predators? What is a trophic cascade? If we affect the primary producer, what effect can we see at the level of the secondary consumer? How can we apply principles of population growth to trophic cascades? Principles of natural selection (e.g., How can predation affect selection?)

For a three hour lab it is virtually impossible to see a trophic cascade (this takes time), but we can observe a behavioral cascade, or the changes in behavior of a focal organism. For lab 7 our focal organism was the mosquito larvae—this is an herbivorous aquatic animal. It can only breathe by sticking its posterior snorkel out of the water, and so it spends a lot of time at the water's surface. It is a filter feeder that will feed primarily on tiny bits of algae. Mosquitoes, in turn, are a food source for many fishes, and some fish are specialists on eating mosquito larvae (we used one of those—*Gambusia*, or mosquito fish).

For lab 7, you were tasked to see if mosquito behavior changes in the presence of a predator. You were asked to develop baseline data for mosquito behavior and then see if that behavior deviated in the presence of a predator. Then you were allowed to be a bit more creative—what happens in the presence of a different predator? Were there still changes in mosquito behavior?

In general, the presence of a predator can affect the behavior of a potential prey, and thus affect the population growth rates of the primary producer (see the text on what happened when wolves were reintroduced to Yellowstone National Park). Again, for our lab, our primary producer was ground up rabbit food (which is made from plants—but, in effect, already dead so there would be no changes in population growth), and in order to see an effect on the primary producer, we would need a lot more time. But I do hope you did see a change in mosquito behavior in the presence of the mosquito fish. Imagine what would then happen to the primary producer in a natural system.

The threat of being eaten, either by a predator or an herbivore are strong drivers of natural selection. Behaviors and other mechanisms have evolved to try to minimize predation risk (see the pre-lab for some examples—what are some refuges listed?) If one can avoid being eaten long enough to reproduce, how might this affect their fitness and the frequency of their genes in the next generation?

