Create Your Own Food Web Answer Key

Please note that the answers to these questions should serve as a guide that suggests ways in which the questions could be answered. Please note that answers will depend on design of the food web you have developed.

1. The organisms at lower trophic levels in your food web should be more abundant than those at higher levels. Energy is lost at each trophic level, so it takes a larger number of prey animals to support a smaller population of predators. Similarly, it takes a larger amount of your primary producer (phytoplankton, macroalgae, chemosynthetic bacteria—whatever you chose) to support a smaller number of your primary consumers.

2. If each of your species only eats one other kind of species, then your organisms are mainly specialists; if they eat more than one kind of species, then they are generalists.

3. Here are some examples of types of species whose population changes can have strong effects on other organisms in the food web: 1. Species that are the only prey source/source of food for specialist species (e.g., if a fish only eats one kind of algae and that algae species starts to die off, the fish population will decline as well). 2. Species that control the populations of other species—for example, by preying on them. If you have a predator that eats a lot of several kinds of other species, then if its population drops, it might no longer be able to control the populations of its prey, and one prey species might be able to outcompete the others. A “keystone” species like this is the starfish in west-coast tidepools: when it is present, tidepools have greater biodiversity, because the starfish preys on animals that would otherwise take over the tidepool. Remove the starfish, and one prey species will outcompete most of the others. 3. Species that are the food source of a variety of other animals. If one species is eaten by a number of other species, then changes in its population may have an effect on a number of others—both its predators and whatever other prey the predators switch to or focus on.

4. If you have more generalist species, then the population changes of a single prey species/food source will not have as much direct effect on its predator/consumer. However, as mentioned above in the sample answer to question 3, you might see less dramatic but wider-ranging effects on the overall food web with generalists. If one prey species becomes rare, they will eat more of a different prey species, and thus will affect the population of that species and everything

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that it eats or that eats it. If you have more specialist species, then their populations will be directly tied to changes in the populations of their sole prey species, and they can run a greater risk of local extinction if the population of their prey gets very low.

5. Certainly the populations of these hunted organisms’ prey will increase (because there will no longer be predators to eat them), which could mean that whatever the prey eats will decrease, because there will be more of them. But these relationships become more complex depending on how many species you have at each trophic level and whether those organisms are generalists or specialists. For example, if a shark species is hunted to near extinction, then the large fish it eats will become more abundant. This could result in a decrease in the number of minnows that the large fish eats—or it could mean that the large fish simply outcompetes a turtle species that also eats minnows, thus the turtle species declines while the minnow species’ numbers stay about the same.

6. This depends on what kind of species you have chosen as your primary producers. If the producer, or one of them, is a seaweed (macroalgae), then the invasion of its habitat by this non-native species will have an effect on your entire food web (a smaller effect if you have more than one kind of primary producer, a larger effect if this is your only primary producer). If, however, you chose phytoplankton or chemo-synthesizing bacteria as your primary producer, this invasive seaweed should have very little effect on your food web. (Although it could still have indirect effects! How? Think of what kind of habitat or space your primary producer requires.)

7. This depends both on the species in your food web and on the length of time you are considering when you answer. Very quickly, there will be an increase in the population of your primary consumers, which will probably lead to an increase in the population of your secondary consumers, etc. unless other factors—i.e. overcrowding, competition, or really fast consumption by multiple predators—return the populations to normal. In the long-term, if the upwelling shift is just a one-time event, the populations should return to their pre-upwelling sizes within one generation cycle or season.