

4.4

Interactions among Living Things

► Key Question: How do interactions affect populations in an ecosystem?

Remember that a population is all the members of one species found in a certain area. Populations can be large, such as an ant colony. Populations can also be small, such as a pair of woodpeckers (Figure 1).



Figure 1 The two woodpeckers shown here represent a small population.

Abiotic factors in an ecosystem limit the size of its populations. For example, if there is very little water in an area, only a few plants can grow.

How organisms interact in an ecosystem also affects the size of its populations. Three important biotic interactions are

- competition
- predation
- mutualism

COMPETITION

competition

occurs when more than one organism tries to obtain the same basic resources in the same habitat

When organisms in the same habitat try to get the same resources, there is **competition**. Competition limits the number of organisms that can survive on the resources in an area.

Plants that grow in the same area compete for water, sunlight, and nutrients. If these resources are limited, some plants may become small and thin. Some plants may die.

The remaining plants get the water, sunlight, and nutrients they need to survive and grow strong (Figure 2).



Figure 2 All these plants are competing for some of the same resources.

Animals also compete for resources. For example, frogs in a pond compete for food. If too many frogs live in the pond, some frogs may move to another pond. Some frogs may die.

Humans compete with other organisms for resources such as crops. Other organisms may be eating the crops that humans are growing. Farmers may spray pesticides on the crops to stop competing organisms.

predator

an animal that hunts other living things for food

prey

an animal that is hunted by a predator

PREDATION

An animal that hunts other animals for food is a **predator**. The animal that the predator hunts is the **prey**.

A wolf (predator) eating a moose (prey) is an example of a predator-prey relationship (Figure 3). A moose eating plants is not an example of a predator-prey relationship, because the moose does not hunt the plants.



Figure 3 These wolves are eating a moose they have hunted.

Predator and prey population sizes affect each other. Figure 4 shows how the predator-prey cycle works.

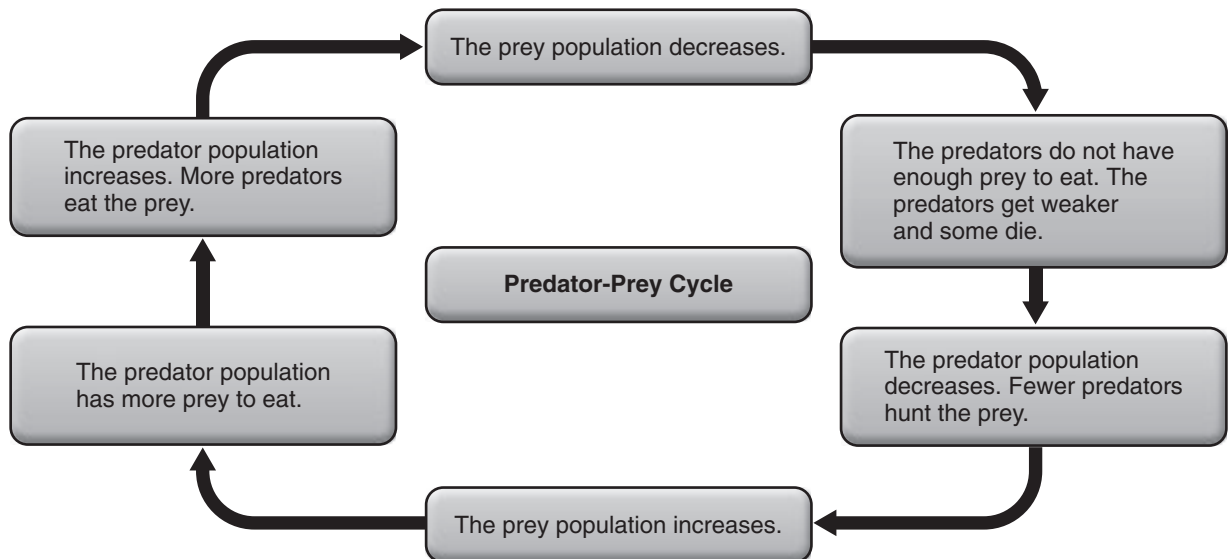


Figure 4 Predator-prey interactions affect the size of populations in an ecosystem.

Figure 5 shows the predator-prey cycle at work in the wolf (predator) and moose (prey) populations in an area.

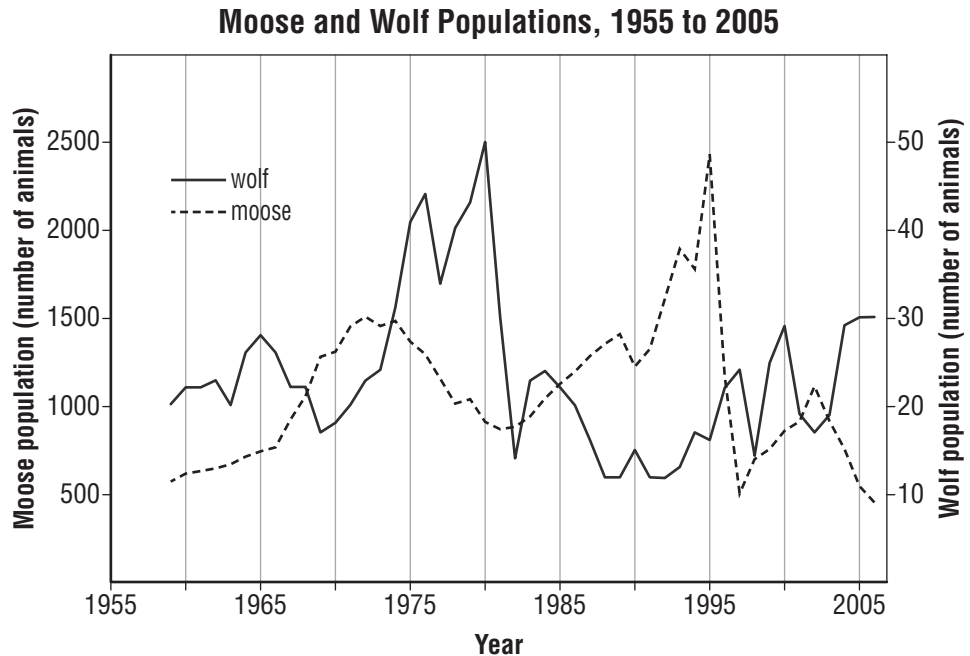


Figure 5 As the wolf population increased between 1970 and 1980, the moose population decreased. When the wolf population decreased, the moose population recovered. This is an example of a predator-prey cycle.

The predator-prey cycle also affects plant populations. Many prey animals, such as moose, feed on plants. When the prey population is large, the prey eat large numbers of plants in the area. When the prey population is small, the plant population recovers.

MUTUALISM

Organisms do not always compete with each other. Sometimes organisms from different species help each other survive. This type of interaction is called **mutualism**.

A bee visiting a flower is an example of mutualism. The bee takes nectar from the flower for food. Pollen from the flower sticks to the bee. The bee spreads the pollen, which allows the flower to reproduce. The bee and the flower both benefit from this interaction.

mutualism

an interaction between individuals of different species that benefits both individuals

Name: _____ Date: _____



CHECK YOUR UNDERSTANDING

1. Define competition in your own words.

2. In a certain forest ecosystem, owls hunt mice. In this ecosystem, which organism is the predator? Which organism is the prey? Explain.

3. What happens if the prey population in an area decreases? Use the ecosystem in question 2 to explain.

4. Define mutualism in your own words.

5. Think back to the Key Question. How does competition affect the number of organisms that can live in a habitat?
