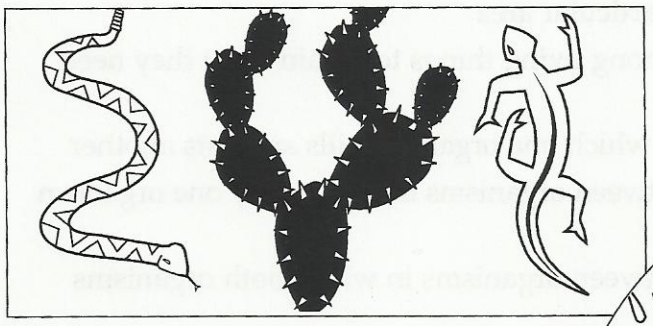
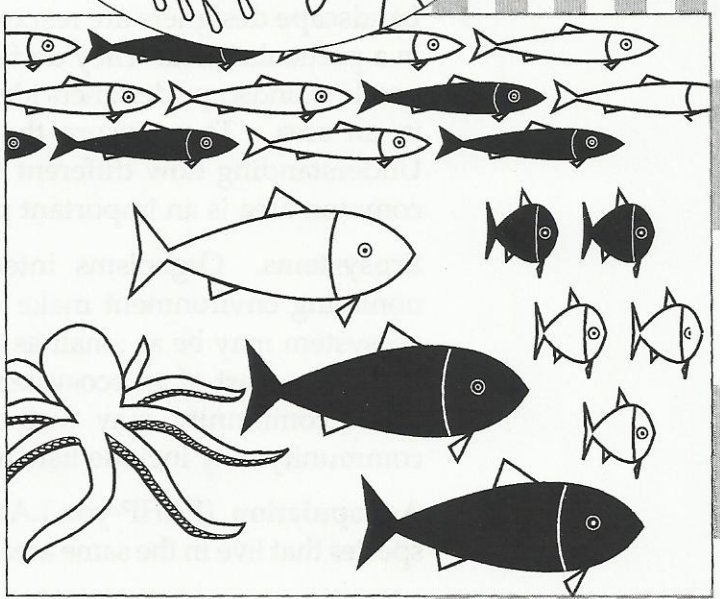
Ecology

UNIT 8





During the 1950's and 1960's, populations of ospreys, bald eagles, and other large fish-eating birds fell drastically. Scientists noticed that large amounts of a pesticide, DDT, were present in the birds' bodies. They decided to study the feeding relationships in the birds' environment to find out why.

Scientists found that the DDT sprayed on crops would run off into lakes and streams. Tiny organisms in the water absorbed the DDT. Small fish ate the tiny organisms. Larger fish ate the small fish. Birds ate the large fish.

Each time one organism ate another, the DDT was passed on. The DDT that the birds were eating had made them ill. The DDT made the shells of their eggs thinner, too. The thin shells broke easily, and the chicks died. Once the scientists knew what was harming the birds, they could fix the problem. The use of DDT was banned in the United States. This is just one example of why it's important to understand the relationships between all the organisms in a single environment.

Lesson 39 Ecosystem Interactions

Key Words

ecosystem: organisms that interact with one another and with their nonliving environment

community: the living part of an ecosystem

population: group of the same type of organism, or species, living together in a particular area

competition: the struggle among living things to obtain what they need to survive

predation: relationship in which one organism kills and eats another

commensalism: relationship between organisms in which only one organism benefits

mutualism: relationship between organisms in which both organisms benefit

Key Ideas

An ecosystem is made up of all the living and nonliving things in an area that interact with one another. Some relationships in an ecosystem help an organism. Other relationships may harm it. A change in one relationship can affect other parts of the ecosystem. By studying the relationships in an ecosystem, we can predict how a change will affect the ecosystem.

Landscape designers are responsible for the health of the plant life growing in a particular area. They do far more than make the plants and trees "look good." Landscape designers identify the specific needs of every plant growing in an area. They ensure that the plants are able to meet their needs. Understanding how different types of organisms interact while sharing a common area is an important part of a landscape designer's job.

Ecosystems. Organisms interacting with one another and with their nonliving environment make up an **ecosystem** (EE-koh-SIHS-tuhm). An ecosystem may be as small as a drop of pond water or as large as a forest. The living part of an ecosystem is a **community** (kuh-MYOO-nuh-tee). A forest community may include deer, trees, and mushrooms. A pond community may include fish, insects, and plants.

A **population** (PAHP-yoo-LAY-shun) is all the members of a particular species that live in the same area. The members of a population can reproduce

among themselves. One population of a forest community might be all the oak trees that grow there. Another population in the same forest community could be all the termites that live on the trees.

1. **What is the difference between a community and a population?**

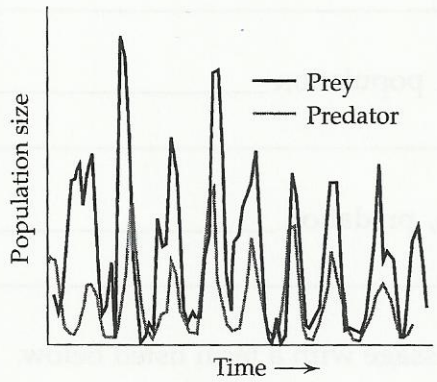
_____

_____

Ecosystem Relationships. Each organism in a community carries out its own unique role. A large part of an organism's role is obtaining resources, or the things it needs to survive. Often, the amounts of these resources are limited. As a result, competition occurs. **Competition** (KAM-puh-TISH-uhn) is a relationship in which living things struggle with each another to obtain limited resources.

Another type of limiting relationship in an ecosystem is predation. **Predation** (preh-DAY-shun) occurs when one organism kills and eats another. A predator is the organism that eats another. The prey is the organism that is eaten. The graph in Fig. 39-1 shows the connection between populations of predators and prey.

Fig. 39-1



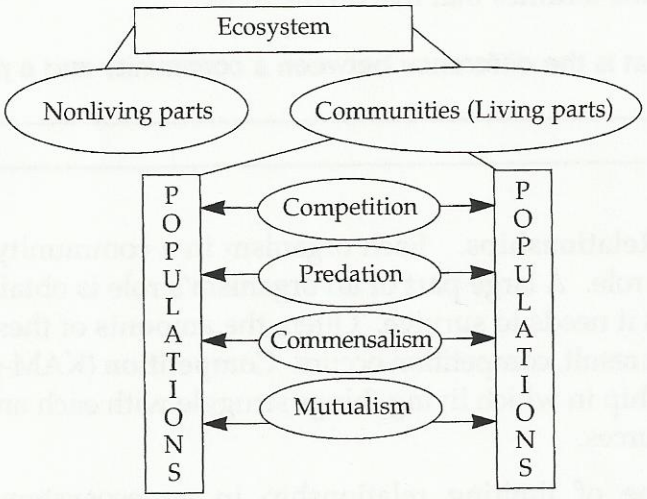
Some relationships in an ecosystem are helpful to one or both organisms involved. **Commensalism** (kuh-MEHN-suhl-izm) is a relationship in which one organism benefits. The other organism in the partnership is unaffected. An example of commensalism exists between tropical orchid plants and the trees on which they grow. By resting in the tree's branches, the orchids obtain the sunlight they need to survive. The tree is unaffected by the presence of the plants.

Mutualism is another helpful relationship between organisms. In **mutualism** (MYOO-chu-wuhl-ihsm), both organisms benefit. The relationship of hummingbirds and flowers is an example of mutualism. When the hummingbird drinks nectar from a flower, it obtains nutrients it needs to live. As the bird moves from flower to flower, it transfers pollen. By pollinating the flowers, the hummingbird makes it possible for the plants to reproduce.

TAKE ANOTHER LOOK

Fig. 39-2 shows the various types of relationships that exist in communities of an ecosystem.

Fig. 39-2



Check Your Understanding

Write a sentence explaining the connection between each pair of words.

2. ecosystem, community _____

_____

3. community, population _____

_____

4. competition, predation _____

_____

Complete the passage with a term listed below.

commensalism	*community*	*competition*	*ecosystem*
mutualism	*populations*	*predation*	

All the living and nonliving things with which an organism interacts make up a(n) **(5)**_____. The living part of an ecosystem is a(n) **(6)**_____. A community may contain many different **(7)**_____. They interact, or have relationships, with one another. **(8)**_____ is a relationship in which one organism kills and eats another. **(9)**_____ is a relationship in which organisms struggle with each other to meet their needs. **(10)**_____ is a relationship in which one organism benefits while the other is unaffected. **(11)**_____ is a relationship which benefits both organisms.

12. What is an ecosystem? _____

13. What is predation? _____

14. What is competition? _____

15. Compare commensalism and mutualism. _____

16. Two hawks notice a rabbit on the ground below them. Both swoop down to grab the rabbit. Only one hawk catches and eats the rabbit. Explain how this situation is an example of competition and predation.

17. The relationship that exists between the lynx and the snowshoe hare is an example of predation. Lynx are predators that feed on snowshoe hares. Explain what might happen to a lynx population if there was a sudden drop in a snowshoe hare population.