

section ③ Conserving Biodiversity

● Before You Read

On the lines below, list some activities that you could do in your home or school to use fewer natural resources. Then read to learn about ways people are preserving biodiversity.

MAIN Idea

People are working to preserve biodiversity.

What You'll Learn

- two classes of natural resources
- how biodiversity can be conserved
- two methods used to restore biodiversity

● Read to Learn

Natural Resources

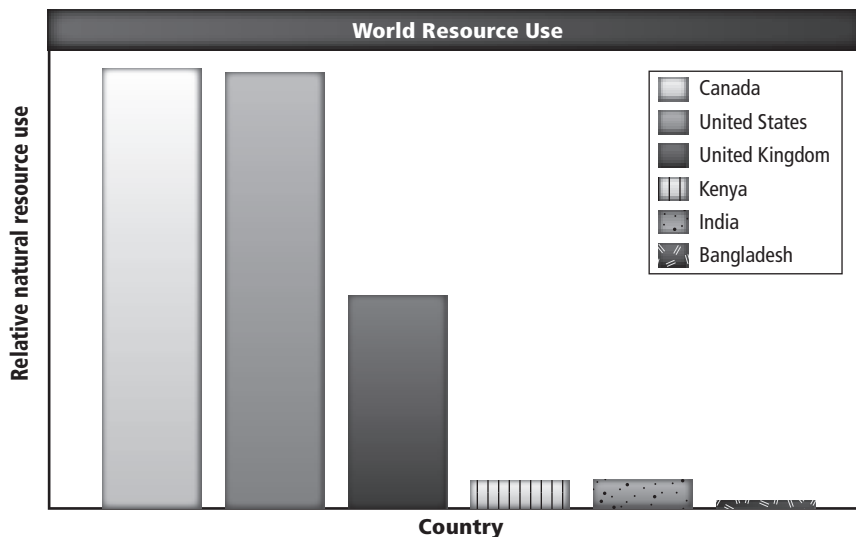
There are more than six billion people living in the world today, and the number keeps growing. As the human population grows, the need for natural resources also grows.

The figure below shows the natural resources used by people in different parts of the world. Notice that people in some countries, like the United States and Canada, use more resources, while people in other countries use fewer resources. As countries become industrialized, people living there consume more resources.

Mark the Text

Locate Information

Underline every heading in the reading that asks a question. Then highlight or underline the answers to those questions as you find them.



Picture This

1. **Name** two countries with high consumption and two countries with low consumption.



Think it Over

- 2. Identify** Which of these energy resources is a nonrenewable resource? (Circle your answer.)
- a. wind
 - b. gasoline
 - c. solar

✓ Reading Check

- 3. Identify** two ways people can sustainably use resources.

What are examples of renewable resources?

The two types of natural resources are renewable resources and nonrenewable resources. **Renewable resources** are resources that are replaced by natural processes faster than they are consumed. Solar energy is a renewable resource. Other renewable resources include plants used for food, animals, clean water, and clean air. It is important to remember that the supply of these resources is not endless. These resources might run out if we do not manage them carefully.

Why are some resources nonrenewable?

Nonrenewable resources are resources that are replaced by natural processes slower than they are consumed. Fossil fuels and minerals are nonrenewable resources. Species are considered to be nonrenewable resources because an extinct species cannot be replaced.

A small group of trees in a large forest ecosystem is renewable because replacement trees can be grown from seeds in the soil. Enough of the forest is still intact to be the habitat for the organisms that live there. When an entire forest is cleared of many of its trees, it is not a renewable resource. The organisms that lived in the forest have lost their habitat and might die.

How can natural resources be managed?

Sustainable use means using resources at a rate in which they can be replaced or recycled while preserving the long-term environmental health of the biosphere. Sustainable use includes reducing the amount of resources that are used, recycling, and using resources responsibly. ✓

Protecting Biodiversity

In Section 2, you learned how human activity has affected ecosystems. Now you will learn about efforts to preserve biodiversity. Many people around the world are involved in efforts to protect biodiversity and use resources in a sustainable way.

How do national parks protect biodiversity?

One way to protect biodiversity is to establish protected areas where biodiversity can succeed. The United States established its first national park—Yellowstone National Park—in 1872. Many more national parks and nature reserves have been established in the United States since then.

How much of the world's land is protected?

Many countries have established their own natural parks and nature reserves. Today about 7 percent of the world's land is protected for biodiversity.

Biodiversity in these areas can be threatened by the activity of people. Many of the protected areas are small and surrounded by areas of human activity. The human activity could damage the ecosystem in the protected areas.

Costa Rica has established megareserves in which one or more zones are surrounded by buffer zones. In a buffer zone, sustainable use of natural resources is permitted. ✓

What is a biodiversity hot spot?

Scientists have identified locations around the world that are characterized by many **endemic** species—species that are only found in that one location. These areas are called hot spots. To be called a hot spot, there must be at least 1500 species of vascular plants that are endemic and the area must have lost at least 70 percent of its original habitat.

About one-third of all plant and animal species are found in hot spots. These hot spots originally covered 15.7 percent of Earth's surface. Currently, about a tenth of that habitat remains. ✓

Biologists do not always agree about how to preserve biodiversity. Some biologists believe we should focus most of our efforts on hot spots in order to preserve the greatest number of species. Other biologists believe that while focusing on hot spots, other problems might be neglected.

How can corridors between habitats work?

One way biologists hope to improve biodiversity is by providing pathways, or corridors, between habitat fragments. Protected corridors connect small areas of land and give animals a way to move safely from one fragment of habitat to the next. One problem with this approach is that small fragments connected in this way are subject to edge effects.

Restoring Ecosystems

Sometimes, biodiversity in an ecosystem is destroyed. The ecosystem no longer has all the needed biotic and abiotic factors to maintain its health. When this happens, the ecosystem no longer functions properly. People have devised ways of restoring ecosystems.

✓ Reading Check

4. Explain What happens in a buffer zone?

✓ Reading Check

5. State What portion of the world's plant and animal species live in biodiversity hot spots?



Think it Over

6. Draw Conclusions

Why do larger disturbed areas take longer to recover?

Reading Check

7. Explain the purpose of the Endangered Species Act.

What kinds of ecosystems need to be restored?

Natural causes, such as volcanic eruptions or floods, can destroy biodiversity. People can destroy biodiversity when they do not use resources sustainably. Damaged ecosystems might take a long time to recover.

Think of what happens when a tropical rain forest is cleared for farmland. After a few years, people abandon the farmland because the soil is in poor condition. The ecosystem might take many years to recover. Another example of a damaged ecosystem that needs restoration occurs when an accidental oil spill or toxic chemical spill pollutes the area and kills native species.

Given time, ecosystems can recover. Typically, larger areas take longer to recover. Some types of disturbances recover more quickly than others. Ecologists use two methods to speed recovery—bioremediation and biological augmentation.

How does bioremediation clean up pollution?

Bioremediation is the use of living organisms to remove toxins from a polluted area. Bioremediation relies on bacteria, fungi, or plants to clean up pollutants in the soil.

Some species of plants can be used to remove toxic metals such as zinc, lead, and nickel. The plants are planted in contaminated soils. The plants grow and store the toxic metals in their tissues. People then harvest the plants, removing the metals from the ecosystem.

What is biological augmentation?

Biological augmentation involves adding essential items to a degraded ecosystem. For example, ladybugs are predators that eat other insects. Ladybugs can be introduced to help control insect populations.

Legally Protecting Biodiversity

During the 1970s, people’s awareness of environmental problems grew. In 1973 the Endangered Species Act was passed in the United States. It gives legal protection to species that are in danger of becoming extinct. In 1975 an international treaty was signed that outlawed the trade of endangered animals and animal parts, such as elephant tusks and rhinoceros horns. Since then, many more laws and treaties have been enacted with the purpose of preserving biodiversity and the health of the biosphere. 