

## section 1 Biodiversity

### ● Before You Read

Think about the different organisms that live in your area. On the lines below, list as many of them as you can. Then read about the importance of biological diversity.

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### MAIN Idea

**Biodiversity maintains a healthy biosphere.**

### What You'll Learn

- the three types of diversity
- why biodiversity is important
- the direct and indirect value of biodiversity

### ● Read to Learn

#### What is biodiversity?

**Biodiversity** is the variety of life in one area that is determined by the number of different species in that area. The variety of species in the biosphere decreases as species become extinct. **Extinction** occurs when the last member of a species dies.

Biodiversity increases the health and stability of an ecosystem. Three important types of biodiversity are genetic diversity, species diversity, and ecosystem diversity.

#### Why is genetic diversity important?

Two individuals of the same species will show differences. For instance, two ladybird beetles might differ in color, their ability to resist disease, or their ability to obtain nutrients from a new food source should the old food source disappear. These differences come from differences in the beetles' genes.

**Genetic diversity** is the variety of genes present in a population. Some populations of a species have a lot of genetic diversity. Other populations have little. A population with more genetic diversity is more likely to survive during environmental changes, an outbreak of disease, or the disappearance of a food source.

### Mark the Text

#### Restate Main Ideas

Underline or highlight the main ideas in each paragraph. Stop after every paragraph and state what you just read in your own words.

### FOLDABLES™

**Compare** Make a folded table Foldable to compare the three types of biodiversity. Include a description and explain the importance of each type.

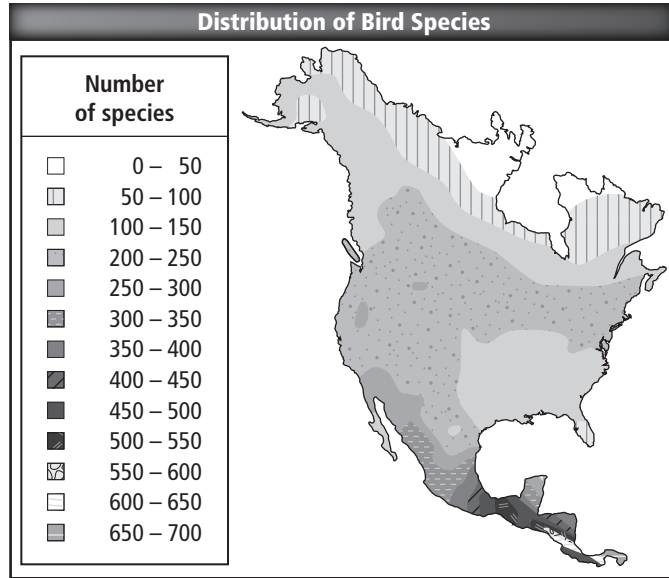
Biodiversity	Genetic Diversity	Species Diversity	Ecosystem Diversity
Description			
Importance			

## How does species diversity contribute to biodiversity?

**Species diversity** is the number of different species and the abundance of each species in a biological community. Areas with many species have a high level of species diversity. Species diversity is higher in tropical regions near the equator and lower in polar regions. This can be seen in the figure below.

### Picture This

- 1. Identify** Circle the areas with the lowest and highest amounts of species diversity.



## What is ecosystem diversity?

**Ecosystem diversity** is the variety of ecosystems that are present in the biosphere. Recall that an ecosystem includes all populations that interact and the abiotic, or non-living, factors that support them. The interactions among organisms are important to developing stable ecosystems. Different locations have different abiotic factors that support different types of life.

## The Importance of Biodiversity

Many people work to preserve biodiversity for economic and scientific reasons. Other people work to preserve species that are beautiful.

## Why is biodiversity valuable to humans?

People depend on other living things for food, clothing, energy, medicine, and shelter. Preserving the genetic diversity of species that people use directly is important. It is also important to preserve the genetic diversity of species that are not used directly. These species are possible sources of desirable genes that might be needed in the future.

### Reading Check

- 2. Name** three things people need that come from ecosystems.

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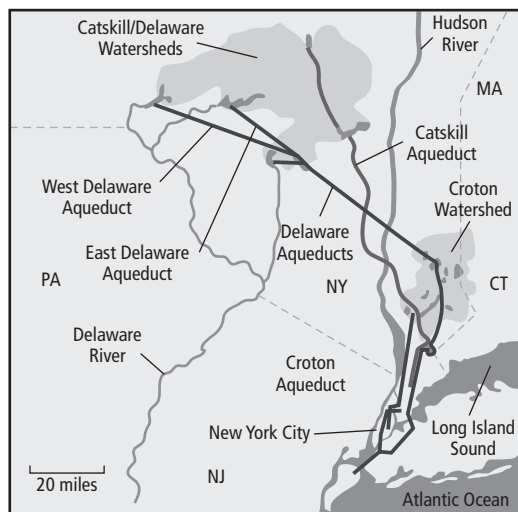
## Why might a species be valuable someday?

One reason to preserve biodiversity is that wild species might someday be used to create better crops for growing food. Biologists are beginning to learn how to transfer genes that control inherited characteristics from one species to another. Another reason is that scientists continue to find new medicines in nature. Many medicines were first identified in living things. Aspirin was discovered in willow, and penicillin was discovered in bread mold. In remote regions, many plants and other organisms have not been identified. These unknown species offer the promise of new medicines. ✓

## What are the indirect values of biodiversity?

People, like all living things, benefit from a healthy biosphere. Scientists have begun to team up with economists to understand the dollar value of healthy ecosystems.

In the 1990s, New York City needed to clean up its drinking water. Much of the water for the city came from watersheds. Watersheds are land areas where the water on or underneath them drains to the same place. Two of the city's watersheds were not clean enough to supply drinking water. The city faced a choice: build a water-filtration system, which would cost 6 billion dollars, or clean up the watersheds, which would cost 1.5 billion dollars. The city found that cleaning up the ecosystem was a less expensive solution than using technology.



## Are there other values to biodiversity?

Many people work to preserve ecosystems for scientific reasons and also because ecosystems are beautiful. These factors are important and worthwhile, although it is difficult to attach a dollar value to them.

### ✓ Reading Check

**3. Name** one medicine that was discovered in nature.

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### Picture This

**4. Explain** Highlight the watersheds that supply New York's drinking water.