

# Biodiversity

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## WHAT'S COVERED

In this lesson, we will cover the topic of biodiversity. We will discuss the benefits of biodiversity, explore what ecosystem services are, and learn about the potential sixth major extinction. Specifically, this lesson will cover the following:

## 1. What Is Biodiversity?

Before we can begin to discuss biodiversity, we first need to define what an **ecosystem** is, which is the living and nonliving components that interact in a given area.

**Biodiversity** is the number and relative abundance of a species in a given area. The concept of biodiversity can also be extended to include the entirety of global biodiversity, or the number and relative abundance of species worldwide.

Biodiversity is important because, on a large scale, it supports and increases stability across ecosystems. Each species plays a different role in an ecosystem, and all are interdependent on each other for the healthy functioning of the whole. A loss of species diversity would weaken us. Even the loss of a single species in an ecosystem could have unforeseen widespread consequences, including the loss of other species.

### IN CONTEXT

An example of such a scenario is the disappearance of coral reefs. Across the world, coral reefs are disappearing because of global warming faster than forests are disappearing because of deforestation. If they were to go completely extinct, it would have widespread effects. Thousands of aquatic species make their homes in and around coral reef systems. Without the coral reef systems, those species will be threatened, and entire ecosystems will be weakened, essentially creating a ripple effect of damages. The result will impact fisheries and reduce human economic and food sources.



### TERMS TO KNOW

#### Ecosystem

The living and nonliving components that interact in a given area.

#### Biodiversity

## 2. Ecosystem Services

As mentioned, biodiversity is key to maintaining the health of an ecosystem. Ecosystems themselves provide many benefits to humans, which are called ecosystem services. The following are four main categories of ecosystem services.

- Provisioning services, such as providing food, fiber, fuels, fresh water, and medicines
- Regulating services, such as climate regulation, water purification, and pollination
- Cultural services, such as being of religious or spiritual value and aesthetic value and having recreational or educational use
- Supporting services, such as nutrient cycling, soil formation, and production of energy from sunlight

### IN CONTEXT

Different parts of ecosystems provide different types of services. An example of an ecosystem service would be what plant species provide through photosynthesis: oxygen. Without this service, the atmosphere's mixture of different gases would become imbalanced. Humans require a certain mix of oxygen in the air to breathe and perform respiration. Without plants, there wouldn't be enough. The free oxygen that plants produce also eventually turns into atmospheric ozone, which is necessary to protect humans from UV radiation. Plants also absorb carbon dioxide, which buffers against the greenhouse effect and global climate change.

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## 3. Sixth Major Extinction

Many scientists are considering the current era of human population growth to be the sixth major extinction, or the Holocene extinction. This era includes the last 12,000 years to the present. In that time, it is estimated that somewhere between 500,000 and one million species of birds, mammals, reptiles, amphibians, plants, and insects have gone extinct from overharvesting, habitat degradation, and pollution from human population growth and activities.



### DID YOU KNOW

Scientists currently estimate that 140,000 species per year are going extinct because of human activities. By 2050, it is estimated that approximately 30–50% of human-era species will have gone extinct. These numbers become even more impressive when you consider that the recovery of biodiversity from previous mass extinctions took millions of years.



### SUMMARY

In this lesson, we learned about the benefits and importance of **biodiversity** to ecosystem health. We discussed various **ecosystem services** that humans use, and what scientists are calling the **sixth major**

**extinction**, or the Holocene extinction, resulting from human activities. Don't forget our key terms for today: ecosystem and biodiversity. Ecosystem is the living and nonliving components that interact in a given area, and biodiversity is the number and relative abundance of species in a given area.

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## TERMS TO KNOW

### **Biodiversity**

The number and relative abundance of a species in a given area.

### **Ecosystem**

The living and nonliving components that interact in a given area.