

6.2

Human Impact on Ecosystems

▶ Key Question: How do humans affect biodiversity?

How many different types of organisms can you name? Scientists estimate that there are between 5 and 30 million different species of organisms on Earth!

Healthy ecosystems need many different species of plants, animals, and other organisms. The variety of organisms in an ecosystem is called **biodiversity**.

Earth's biodiversity gives humans things they want and need. For example, humans use many different plants for food.

Humans affect Earth's biodiversity. Sometimes human actions put other species in danger.

Endangered species are species that may soon become extinct (Figure 1). **Extinction** means that a species no longer lives anywhere on Earth.

biodiversity

the variety of plant and animal life in an ecosystem

endangered species

species that are at risk of becoming extinct due to either reduction in numbers or an environmental threat

extinction

the complete disappearance of a species from anywhere on Earth



Figure 1 The Eastern Massasauga rattlesnake had a large population in southern Ontario 50 years ago. Now the species is endangered.

Two major ways that biodiversity is affected are

- habitat loss
- invasive species

HABITAT LOSS

Humans use land in many ways. They use land for home, work, food, recreation, and to supply other resources. They farm, mine, build cities, and travel.

All of these activities can change environments and cause plants and animals to lose their habitats.

For example, think about shopping malls. Humans clear forests and fields to build stores and roads for shopping malls (Figure 2). The products in the malls may come from factories that pollute the environment. Humans pave and drive on roads. All these activities cause habitat loss.



Figure 2 Humans cause habitat loss when they clear land for shopping malls.

Many organisms die because of habitat loss. Plants die because they cannot move to a new area. Animals may die because they cannot find a new habitat. Animals may also die because they cannot compete in a new habitat.

When organisms leave an area, the biodiversity of the area decreases. Less biodiversity makes ecosystems less sustainable.

How can humans stop habitat loss? We must find a way to balance our needs and wants with the needs of ecosystems.

INVASIVE SPECIES

invasive species

a species that has been introduced into an area (accidentally or purposely) where it did not exist before; often reproduces so aggressively that it replaces some of the original species

native species

species that occur naturally in an area

Humans also affect biodiversity by bringing invasive species into an ecosystem. **Invasive species** are species that do not normally live in a certain area. Invasive species are usually introduced into an area by human activities.

Invasive species may be introduced accidentally or on purpose. Invasive species may arrive on ships, trucks, or even people's shoes! They may also escape from farms or pet collections.

Invasive species compete with native species for resources. **Native species** have lived in the area for a long time. Pigeons and house sparrows are native species in Europe. They were brought to North America on purpose. They are examples of common invasive species in North America.

Table 1 shows the differences between invasive species and native species.

Table 1 Characteristics of Invasive Species and Native Species

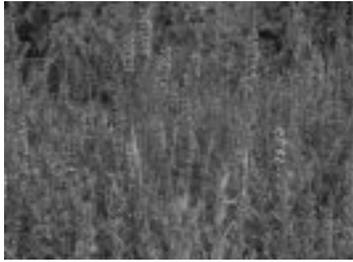
Invasive species	Native species
do not normally live in the area	have lived in the area for a long time
are not part of the existing food chain	are part of the existing food chain
have very few natural predators	have natural predators

Invasive species usually harm organisms in their new ecosystems. Invasive species are not part of the existing food chains. They compete with native species for resources. Invasive species have few natural predators, so their population increases. When the native species are pushed out, the biodiversity of the area decreases.

For example, settlers brought Kentucky bluegrass from Europe to North America. Kentucky bluegrass took resources from the other grasses in North America. Now Kentucky bluegrass is all over grasslands in North America. Many people believe that Kentucky bluegrass is native to North America. It is actually an invasive species.

Table 2 shows some common invasive species in Ontario. It also shows their effects on ecosystems.

Table 2 Some Invasive Species in Ontario and Their Effects on Ecosystems

Invasive species	Effects on ecosystems
 <p data-bbox="512 678 727 705">Asian longhorn beetle</p>	<ul data-bbox="927 352 1342 415" style="list-style-type: none"> • came on ships carrying wood from China • attacks healthy hardwood trees
 <p data-bbox="512 1003 655 1031">Garlic mustard</p>	<ul data-bbox="927 726 1366 842" style="list-style-type: none"> • takes sunlight, soil, and space from native wildflowers • causes organisms that eat these wildflowers to disappear
 <p data-bbox="512 1377 655 1404">Zebra mussels</p>	<ul data-bbox="927 1062 1334 1178" style="list-style-type: none"> • came on ocean ships • blocks pipes at water-treatment centres • takes food from native mussels, clams, and small fish
 <p data-bbox="512 1703 687 1730">Purple loosestrife</p>	<ul data-bbox="927 1434 1366 1528" style="list-style-type: none"> • came on ships from Europe • blocks pipes • takes resources from native wetland plants

Many people try to control the spread of invasive species. They protect sensitive habitats so that native species get enough resources.

Name: _____ Date: _____



CHECK YOUR UNDERSTANDING

1. Explain biodiversity in your own words.

2. What are some things that cause habitat loss?

3. How do invasive species harm ecosystems?

4. Think back to the Key Question. How are habitat loss and biodiversity connected?
