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.

Two major ways that biodiversity is affected are
• habitat loss
• invasive species

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

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>
<thead>
<tr>
<th>Invasive species</th>
<th>Native species</th>
</tr>
</thead>
<tbody>
<tr>
<td>do not normally live in the area</td>
<td>have lived in the area for a long time</td>
</tr>
<tr>
<td>are not part of the existing food chain</td>
<td>are part of the existing food chain</td>
</tr>
<tr>
<td>have very few natural predators</td>
<td>have natural predators</td>
</tr>
</tbody>
</table>

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**

<table>
<thead>
<tr>
<th>Invasive species</th>
<th>Effects on ecosystems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asian longhorn beetle</td>
<td>• came on ships carrying wood from China</td>
</tr>
<tr>
<td></td>
<td>• attacks healthy hardwood trees</td>
</tr>
<tr>
<td>Garlic mustard</td>
<td>• takes sunlight, soil, and space from native wildflowers</td>
</tr>
<tr>
<td></td>
<td>• causes organisms that eat these wildflowers to disappear</td>
</tr>
<tr>
<td>Zebra mussels</td>
<td>• came on ocean ships</td>
</tr>
<tr>
<td></td>
<td>• blocks pipes at water-treatment centres</td>
</tr>
<tr>
<td></td>
<td>• takes food from native mussels, clams, and small fish</td>
</tr>
<tr>
<td>Purple loosestrife</td>
<td>• came on ships from Europe</td>
</tr>
<tr>
<td></td>
<td>• blocks pipes</td>
</tr>
<tr>
<td></td>
<td>• takes resources from native wetland plants</td>
</tr>
</tbody>
</table>

Many people try to control the spread of invasive species. They protect sensitive habitats so that native species get enough resources.
1. Explain biodiversity in your own words.

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2. What are some things that cause habitat loss?

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3. How do invasive species harm ecosystems?

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

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