

# How Introduced Species Affect Ecosystems

Textbook pages 138–147

## Before You Read

Invasive species can dramatically change or destroy ecosystems. Do you think unwanted weeds, such as dandelions, are invasive species? Record your thoughts on the lines below.

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### Create an Outline

Create a quiz to help you learn the concepts introduced in this section. Answer your questions and share your quiz with your classmates.

### Reading Check

Are all introduced species invasive species?

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### Reading Check

Describe a way introduced invasive species may make natural habitats unsuitable for native species.

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## How can introduced species affect an ecosystem?

**Native species** are plants and animals that naturally inhabit an area. **Introduced species** or **foreign species** are species that have been introduced into an ecosystem by humans, either intentionally or accidentally. They do not naturally inhabit the ecosystem. Introduced species are usually beneficial or harmless. However, some introduced species, known as **invasive species**, can dramatically change or destroy ecosystems. With climate change and the expansion of international trade and travel, invasive species are entering new ecosystems at an increasing rate. This rapid spread of introduced invasive species is a major cause of global biodiversity loss. Introduced species can affect native species through competition, predation, disease, parasitism, and habitat alteration, as shown in the table on the next page. 

## Examples of the effects of introduced species include:

- ◆ Scotch broom was introduced to British Columbia as a garden plant. It has up to 18 000 seeds per plant, can survive drought, and fixes nitrogen in the soil, causing conditions that many native species have trouble growing in. Together with other introduced species, it is competing with the keystone species Garry oak on Vancouver Island.
- ◆ European starlings outcompete native birds for nesting sites, and cause decreases in their populations. Barn owls are able to keep the numbers of starlings low in some areas.

- ◆ Eurasian milfoil forms mats on the surface of waterways that decrease the amount of sunlight available to organisms lower down. It is spread by boat traffic since it can regrow from small pieces.
- ◆ Norway rats eat a wide variety of foods, including preying on native species.
- ◆ Blister rust grows on the native white whitebark pine, causing disease that kills the trees.
- ◆ Wild boars are considered one of the world's worst invasive species. Their behaviours spread weeds and interfere with natural succession, and they prey on native species.
- ◆ Purple loosestrife is an introduced species, and the introduced loosestrife-eating beetle is proving to be a good way to control its spread.

Effect	Harm to native species	Example
competition	Introduced invasive species reproduce rapidly and are often aggressive. Lacking natural predators, they easily outcompete native species for food and habitat.	Invasive carpet burweed from South America competes with rare native plants for habitat. Its spiny tips protect it from predators.
predation	Introduced predators can have more impact on a prey population than native predators, as prey may not have adaptations to escape or fight them.	Yellow crazy ants that escaped from cargo from West Africa have devastated the population of red crabs, a keystone species on Christmas Island, Australia.
disease and parasites	An invasion of parasites or disease-causing viruses and bacteria can weaken the immune responses of native plants and animals.	The sea lamprey, a parasitic fish that has invaded freshwater ecosystems in eastern Canada, sucks body fluids from its prey by attaching to it with a sucker-like mouth.
habitat alteration	Introduced invasive species can make a natural habitat unsuitable for native species by changing its structure or composition.	Wild boars damage ecosystems by rooting, wallowing, and spreading weeds that interfere with natural succession. ✓

Use with textbook pages 138–144.

## Introduced species

1. What are native species?

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2. What is an invasive species?

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3. What impact can an invasive species have on an ecosystem?

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4. List five ways an introduced species can affect a native species.

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5. List three examples of introduced invasive species that have had an impact on ecosystems in British Columbia.

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6. On Vancouver Island, three invasive species have dominated the plant cover. Which keystone species are they competing with?

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7. Why is Scotch broom such a tough species to control?

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Use with textbook pages 139–142.

## The impact of introduced invasive species

Give an example of how an invasive species has used each of the following methods to invade an ecosystem or destroy a species.

Method	Invasive species	Effect on ecosystem
competition		
predation		
disease and/or parasites		
habitat alteration		

Use with textbook pages 138–144.

## Invasive species in British Columbia

In British Columbia, many introduced invasive species are having an impact on ecosystems. Species such as purple loosestrife, Eurasian milfoil, Norway rat, American bullfrog, European starling, and Scotch broom are just some of the invasive species affecting British Columbia's ecosystems.

Select three of the above introduced invasive species. Draw a picture of the species. Explain how they were introduced and what effect they are having on the ecosystem.

Species	Method of introduction	Effect on environment

Use with textbook pages 138–144.

## How introduced species affect ecosystems

Match each Term on the left with the best Descriptor on the right. Each Descriptor may be used only once.	
Term	Descriptor
1. _____ biodiversity	<b>A.</b> a harmful interaction between two or more organisms that can occur when organisms compete for the same resource <b>B.</b> species that greatly affect population numbers and the health of an ecosystem <b>C.</b> predator-prey interactions in which one organism eats all or part of another organism <b>D.</b> introduced organisms that can take over the habitats of native species or invade their bodies <b>E.</b> the variety of all living species of plants, animals, and micro-organisms on Earth <b>F.</b> plants and animals that naturally inhabit an area <b>G.</b> plants, animals, or micro-organisms that are transported intentionally or by accident into regions in which they did not exist previously
2. _____ competition	
3. _____ introduced species	
4. _____ invasive species	
5. _____ keystone species	
6. _____ native species	
7. _____ predation	

Circle the letter of the best answer.

8. Which of the following introduced species has been found not to be harmful to its environment?
- A. loosestrife eating beetle  
 B. blister rust  
 C. zebra mussels  
 D. lamprey
9. Why do introduced predators have more of an impact on a prey population than native predators?
- A. prey lack adaptations to escape  
 B. prey populations increase  
 C. prey adapt to new predators  
 D. native predators' populations decrease
10. Which animal is considered the world's most invasive species?
- A. yellow stinging ant  
 B. maggot  
 C. rattle snake  
 D. wild boar
11. In some agricultural areas of British Columbia, how are the populations of European starlings being controlled?
- A. limiting planting of grain crops  
 B. introducing barn owls  
 C. removing European starlings' nests  
 D. releasing competitive species
12. An invader of the Garry Oak ecosystem is:
- A. red squirrel  
 B. Norway rat  
 C. Scotch broom  
 D. American bullfrog