

SECTION  
3

## Freshwater Ecosystems

**BEFORE YOU READ**

After you read this section, you should be able to answer these questions:

- What organisms live in stream and river ecosystems?
- What are the three zones in a pond or lake?
- What are two kinds of wetlands?

**National Science Education Standards**

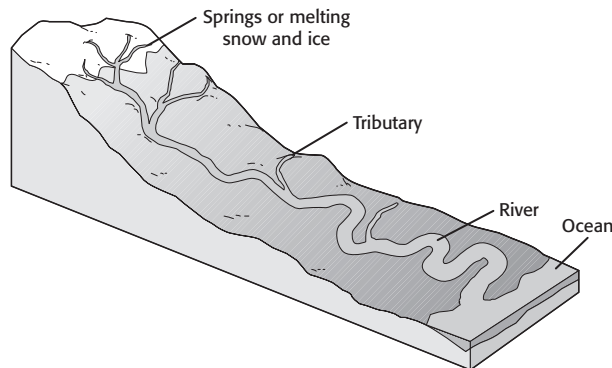
LS 1a, 3d, 4a, 4b, 4c, 4d

**What Are Stream and River Ecosystems?**

One important abiotic factor that affects freshwater ecosystems is how quickly the water is moving. In rivers and streams, the water is moving faster than in other freshwater ecosystems.

The water in streams may come from melted ice or snow. It may also come from a spring. A *spring* is a place where water from under the ground flows to the surface.

Each stream of water that joins a larger stream is called a *tributary*. As more tributaries join a stream, it becomes stronger and wider. A very strong, wide stream is called a *river*.



Stream and river ecosystems are full of life. Plants live along the edges of streams and rivers. Fish live in the open waters. Clams and snails live in the mud at the bottom.

Organisms that live in fast-moving water have to keep themselves from being washed away. Some producers, such as algae and moss, are attached to rocks. Consumers, such as tadpoles, use suction to hold themselves to rocks. Other consumers, such as crayfish, hide under rocks.

**STUDY TIP**

**Answer Questions** Before reading this section, write the three Before You Read questions on a piece of paper. As you read, write down the answers to the questions.

**TAKE A LOOK**

**1. Describe** What happens to the size of a stream when a tributary flows into it?

**SECTION 3** Freshwater Ecosystems *continued*

## What Are Pond and Lake Ecosystems?

The water in ponds and lakes is not moving very much compared with rivers and streams. As a result, they have different types of ecosystems. Like marine ecosystems, pond and lake ecosystems are affected by water depth, sunlight, and temperature.

### LIFE NEAR THE SHORE

The area of water near the edge of a pond or lake is called the **littoral zone**. Sunlight reaches the bottom, which allows producers such as algae to grow in this zone. Plants, such as cattails and rushes, grow here too, farther from shore.

Many consumers, such as tadpoles and some insects, eat the algae and plants. Some consumers, such as snails and insects, make their homes in plants. Consumers that live in the mud include clams and worms. Other consumers, such as fishes, also live in this zone. ✓

**READING CHECK**

**2. Identify** Which consumers of the littoral zone are herbivores?

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### LIFE AWAY FROM THE SHORE

The area of a lake or pond away from the littoral zone near the surface is called the **open-water zone**. This zone is as deep as sunlight can reach. Producers such as phytoplankton grow well here. This zone is home to bass, lake trout, and other consumers.

Beneath the open-water zone is the **deep-water zone**, where no sunlight reaches. Photosynthetic organisms cannot live in this zone. Scavengers, such as catfish and crabs, live here and feed on dead organisms that sink from above. Decomposers, such as fungi and bacteria, also help to break down dead organisms. ✓

**READING CHECK**

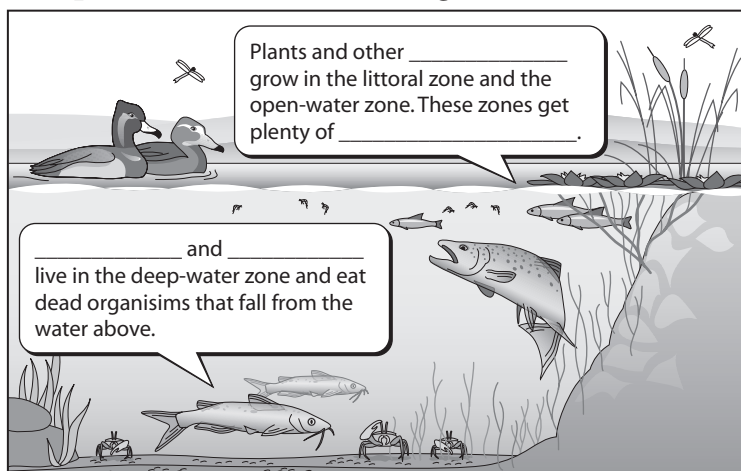
**3. Explain** Why can't producers live in the deep-water zone?

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## TAKE A LOOK

**4. Identify** Fill in the blank spaces in the figure with the correct words.



**SECTION 3** Freshwater Ecosystems *continued*

**What Is a Wetland?**

A **wetland** is an area of land that is sometimes under water or whose soil contains a lot of water. Wetlands help control floods. During heavy rains, wetlands soak up large amounts of water. This water sinks into the ground and helps refill underground water supplies. ✓

Wetlands contain many different plants and animals. There are two main types of wetlands: marshes and swamps.

A **marsh** is a treeless wetland. Marshes form along the shores of lakes, ponds, rivers, and streams.



Grasses and other small plants are the main producers in marsh ecosystems.

Consumers such as turtles, frogs, and birds live in marshes.

A **swamp** is a wetland in which trees and vines grow. Swamps form in low-lying areas and near slow-moving rivers.



Trees and vines are important producers in swamp ecosystems.

Birds, fishes, and snakes are consumers that live in swamps.

**READING CHECK**

**5. Define** What is a wetland?

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**TAKE A LOOK**

**6. Compare** What is a quick way to tell the difference between a marsh and a swamp?

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**How Can an Ecosystem Change?**

Did you know that a pond or lake can disappear? The water flowing into the lake carries sediment. The sediment, along with dead leaves and other materials, sinks to the bottom of the lake.

Bacteria decompose the material at the bottom of the lake. The decay process uses up some of the oxygen in the water. As the amount of oxygen in the water goes down, fewer fish and other organisms can live in it.

Over time, the pond or lake is filled with sediment. New kinds of plants grow in the new soil. Shallow places fill in first, so plants grow closer and closer to the center of the pond or lake. What is left of the pond or lake becomes a wetland. As the soils dry out and the oxygen levels increase, forest plants can grow. In this way, a pond or lake can become a forest.

*Critical Thinking*

**7. Apply Concepts** Why is the amount of oxygen in pond water an abiotic factor?

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# Section 3 Review

NSES LS 1a, 3d, 4a, 4b, 4c, 4d

## SECTION VOCABULARY

<p><b>deep-water zone</b> the zone of a lake or pond below the open-water zone, where no light reaches</p> <p><b>littoral zone</b> the shallow zone of a lake or pond where light reaches the bottom and nurtures plants</p> <p><b>marsh</b> a treeless wetland ecosystem where plants such as grasses grow</p>	<p><b>open-water zone</b> the zone of a pond or lake that extends from the littoral zone and that is only as deep as light can reach</p> <p><b>swamp</b> a wetland ecosystem in which shrubs and trees grow</p> <p><b>wetland</b> an area of land that is periodically under water or whose soil contains a great deal of moisture</p>
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**1. Compare** Why are the kinds of producers in the littoral zone of a lake different from the producers in the open-water zone?

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**2. Compare** How are the producers in a swamp different from those in a marsh?

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**3. Identify** Give two examples of consumers in wetlands.

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**4. Describe** What abiotic factors do organisms living in rivers and streams have to adapt to?

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**5. Describe** Fill in the blank spaces in the flow chart below to show how a pond can become a forest.

