

Section 1.2.

Ecosystems.

Textbook pages 34 to 51.

Before You Read.

How do you think ecosystems are related to the biomes you learned about in the previous section?

What is an ecosystem?

In an **ecosystem**, abiotic components, such as oxygen, water, nutrients, light, and soil, support the life functions of biotic components, such as plants, animals, and micro-organisms. Biomes contain many different ecosystems. Ecosystems can be small. Examples of small ecosystems include a tide pool and a rotting log. Ecosystems also can be large. Examples of large ecosystems include a coastal Douglas fir forest and a biome.

Ecosystems contain different habitats. A **habitat** is the place in which an organism lives. For example, a sculpin is a fish that makes its habitat between rocks at the bottom of a tide pool ecosystem.

How are biotic interactions in ecosystems structured?

Organisms within an ecosystem constantly interact to obtain resources, such as food, water, sunlight, or habitat. As a result of these interactions, organisms have special roles—or **niches**—in their ecosystems. An organism's niche includes the way in which it contributes to and fits into its environment. Many different organisms can live in the same habitat if they occupy different niches. Biotic interactions are structured from smallest to largest in an **ecological hierarchy**.

- A **species** is a group of closely related organisms that can reproduce with one another.
- All the members of a species within an ecosystem are referred to as a **population**.
- Populations of different species that interact in a specific ecosystem form a **community**.

Next Page.

What different biotic interactions occur in ecosystems?

Symbiosis refers to the interaction of two different organisms that live in close association. **Commensalism**, **mutualism**, and **parasitism** are types of symbiotic interactions. Other biotic interactions include **competition**, **predation**, and **mimicry**.

Commensalism.

One organism benefits and the other organism is neither helped nor harmed.

For example, barnacles attach to whales and are transported to new locations in the ocean.

Mutualism.

Both organisms benefit and sometimes neither species can survive without the other.

For example, in lichen, the alga produces sugars and oxygen for the fungus, which provides carbon dioxide and water for the alga.

Parasitism.

One species benefits and another is harmed.

For example, hookworms attach to the gut wall and obtain nourishment from their host's blood.

Competition.

Organisms require the same resource (such as food) in the same location at the same time.

For example, spotted knapweed releases chemicals into the soil, which prevents the growth of other plants.

Predation.

One organism (the predator) eats all or part of another organism (the prey).

For example, cougars have sharp, pointed teeth to catch prey.

Mimicry

Prey animal mimics another species that is dangerous or tastes bad to avoid being eaten.

For example, viceroy butterflies look like bitter-tasting monarch butterflies and are avoided by predators.

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