

Community Ecology: Species Interactions

by Sophia



WHAT'S COVERED

In this lesson, we'll discuss the important properties of community ecology, the different types of species interactions, and the concept of ecological succession. Specifically, this lesson will cover the following:

1. Properties of Community Ecology

Community ecology is the study of interactions between multiple species in a given time and area.

The following are the four main properties community ecologists study, along with what they mean:

- Species abundance: The number and relative abundance of each species in a community
- Species composition: The different species that exist in a community
- Species distribution: The way species are distributed relative to each other
- Species interactions: How species impact each other

Let's put these properties to use by considering a fictional forest community.

IN CONTEXT

Let's say the community spans 1 square mile in the year 2015. A community ecologist observes and records the different species in the forest community, such as squirrels, birds, trees, and shrub species. This is species composition.

The ecologist then measures species abundance and calculates the abundance of each species in relation to each other. The ecologist might discover that there are large populations of squirrels nut-bearing trees but a small population of swallows.

The ecologist also observes the species distribution, and perhaps discovers that there is a sparse but even distribution of oak trees; however, the population of a specific shrub seems to live only in one small portion of the community.

Finally, the ecologist studies the different types of relationships that the species are having, such as the competition between different bird species or the symbiotic relationships between

2. Species Interactions

We'll now delve a little deeper into the types of interactions that species can have.

The following are the three types of interactions:

- Competition
- Predation
- Symbiosis

However, in terms of interaction outcomes, there are also three possible endings for an interaction, and they are as follows:

- Positive
- Negative
- Neutral

Interaction	Description	Outcome	Example
Competition	Two species compete for the same food or resources	Negative– Negative: This always has a negative outcome for each species.	Two bird species compete for available materials to build their nests or for food for their young.
Predation	One species preys on or consumes another. Predation includes carnivores eating other species, herbivores consuming plants, or species laying eggs on or in another species.	Positive– Negative: This is positive for the predator and negative for the prey.	An eagle catches and eats a snake, which is good for the eagle and bad for the snake.
Symbiosis	Two species have a mutually beneficial interaction. Symbiosis is much more common in nature than people realize. Many species, including humans, rely on symbiotic relationships to help digest their food.	Positive– Positive: This is positive on both sides.	Humans have bacteria in their digestive tract, which allows them to digest their food better. Cows also have a symbiotic digestive relationship with bacteria.

3. Ecological Succession

Ecological succession is the process of the creation of a new community either on barren land or on highly disrupted environments.

The following are two different types of ecological succession:

- Primary succession: When species begin inhabiting and establishing themselves in an environment that has never been inhabited before.

➞ **EXAMPLE** Land created from an oceanic volcano is inhabited first by pioneer species like moss and algae and eventually by shrubs, trees, and animals.

➞ **EXAMPLE** When glaciers receded because of historic planetary warming, the lichen that began to form on the boulders left behind had started primary succession.
- Secondary succession: This is the most common form of succession. It occurs when a disturbance damages communities or organisms in an already established community to such an extent that there is a vacuum. New species can then move into this vacuum and establish themselves.

➞ **EXAMPLE** If a forest fire burned a large swath of forest, and over time, new species moved in and began growing (thus modifying the environment), this would be secondary succession. Other disturbances that can cause secondary succession are floods, fires, volcanoes, droughts, overgrazing, and human activity, such as deforestation and overharvesting.



TERM TO KNOW

Ecological Succession

The process of the creation of a new community either on barren land or in highly disrupted environments.



SUMMARY

In this lesson, you learned the important **properties of community ecology**, as well as the different types of **species interactions**: competition, predation, and symbiosis. Competition has a negative outcome for both species involved; predation has a positive outcome for the predator and a negative outcome for the prey; symbiosis is positive for both species. You now understand that **ecological succession** is the process of the creation of a new community either on barren land or in highly disrupted environments. There are two types of ecological succession: primary succession and secondary succession. And the most common type is secondary succession.

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Ecological Succession

The process of the creation of a new community either on barren land or in highly disrupted environments.