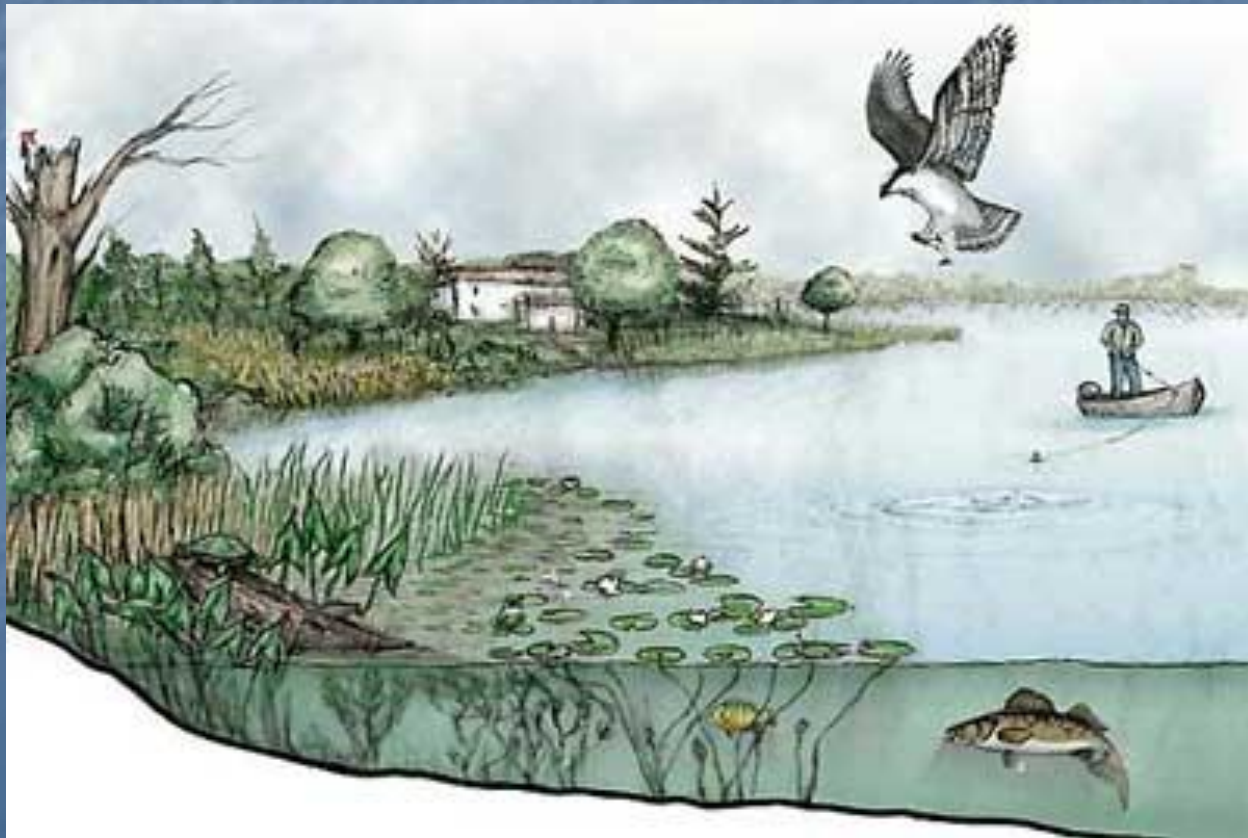


# What Shapes an Ecosystem?

## Chapter 4 Section 2



# Review: What is an ecosystem?

An ecosystem is:

- A collection of all the organisms that live in a particular place, together with their nonliving, or physical, environment.

# Ecological Factors

Ecosystems are influenced by a combination of biological and physical factors.

- Biotic Factors - the biological influences on organisms within an ecosystems
  - Ex. Birds, trees, mushrooms, and bacteria
- Abiotic Factors - the nonliving factors that shape ecosystems.
  - Ex. Temperature, precipitation, and humidity.
- Habitat - the area where an organism lives.
  - Includes both biotic and abiotic factors.

# Bullfrog Example

Biotic factors that influence a bullfrog might include:

- Tiny plants and algae it eats as a tadpole
- The herons that eat the adult bullfrog
- The other species that compete with the bullfrog for food or space.

Abiotic factors that influence a bullfrog might include:

- The availability of water
- The temperature of the air



# Key Point

Together, **biotic** and **abiotic** factors determine the survival and growth of an organism and the productivity of the ecosystem in which the organism lives.

- Ecological Productivity – the rate at which organic matter is created by producers.
  - Think of this as how “healthy” an ecosystem is.

# The Niche

The full range of physical and biological conditions in which an organism lives and the way the organism uses those conditions.

- If an organisms habitat is its address, its niche is its occupation.



# The Niche and the Food Web

- The type of food the organisms eats
- How it obtains this food
- Which other species use the organism as food.
  - Ex. A mature bullfrog catches insects, worms, spider, small fish, or even mice. Predators such as herons, raccoons, and snakes prey on bullfrogs.

# The Niche and the non-living Environment

The physical (non-living) conditions that an organism requires to survive are part of its niche.

- The bullfrog needs the water of ponds, lakes, and slow-moving streams to survive.





# Community Interactions

Organisms that live together in ecological communities interact together and shape their ecosystem.

There are several types of interactions:

- Competition
- Predation
- Symbiosis

# Competition

Competition occurs when organisms of the same or different species attempt to use an ecological resource in the same place at the same time.

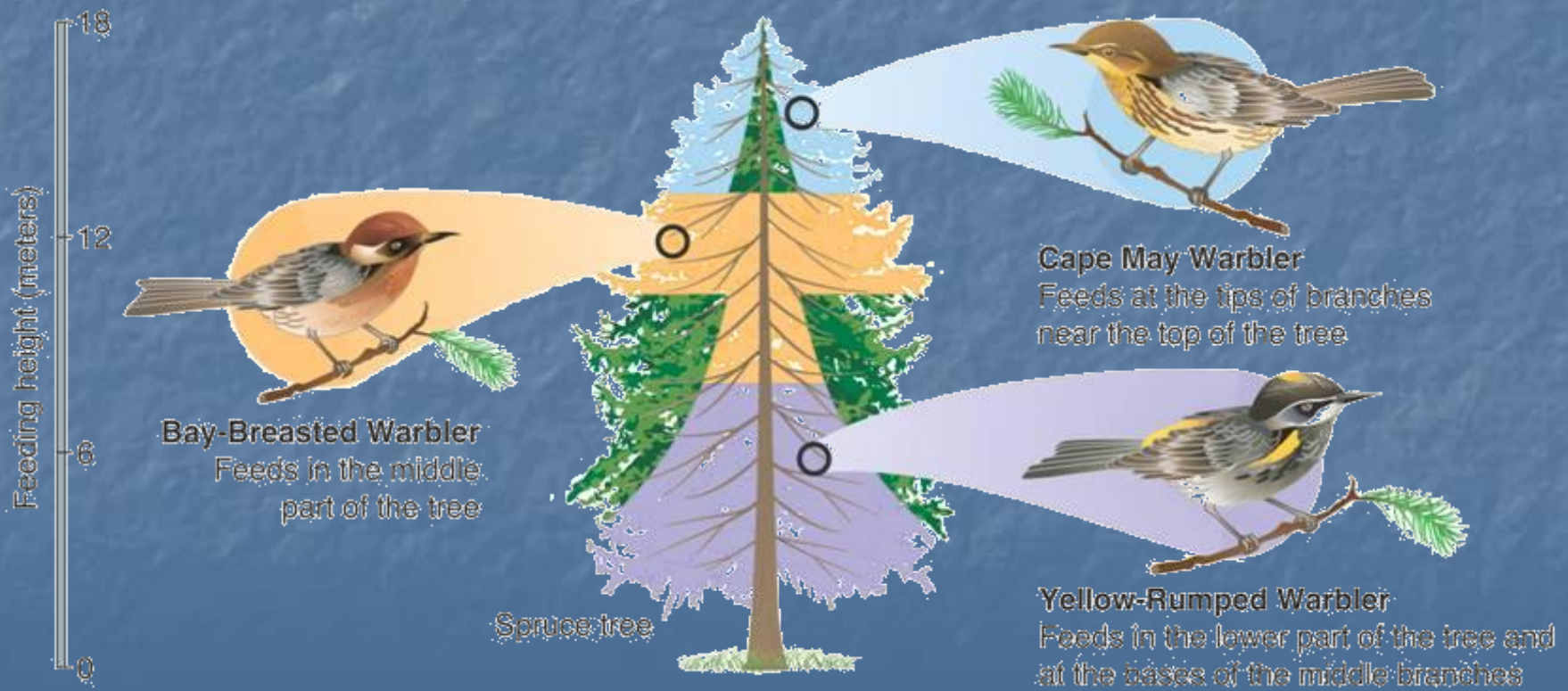
- Direct competition in nature often results in a winner and a loser—with the losing organism failing to survive.



# Competitive Exclusion Principle

The **competitive exclusion principle** states that no two species can occupy the same niche in the same habitat at the same time.

The distribution of these warblers avoids direct competition, because each species feeds in a different part of the tree. (pg 92)



# Predation

One organism captures and feeds on another organism.

- Predator - organism that does the killing
- Prey - organism that is eaten
  - Ex. Wolves eat caribou



# Symbiosis

Any relationship in which two species live closely together.

There are three types of symbiosis:

- Mutualism
- Commensalism
- Parasitism

# Mutualism

Both species benefit from the relationship.

- Example: Honey bees help pollinate flowers and the pollen is used by the bees for honey.



# Commensalism

One member of the association (or pair) benefits and the other is neither helped nor harmed.

- Ex. Barnacles on a whales body do not benefit nor harm the whale; however, they get the benefit of water movement when the whale swims.





# Parasitism

One organism lives on or inside another organism and harms it.

- Ex. Fleas, ticks, and lice live on the bodies of mammals, feeding on the blood and skin of the host.



# Ecological Succession

- Ecosystems are constantly changing in response to natural and human disturbances.
- As an ecosystem changes, older inhabitants gradually die out and new organisms move in, causing further changes in the community.

# Primary Succession

Succession that occurs on surfaces where **NO** soil exists.

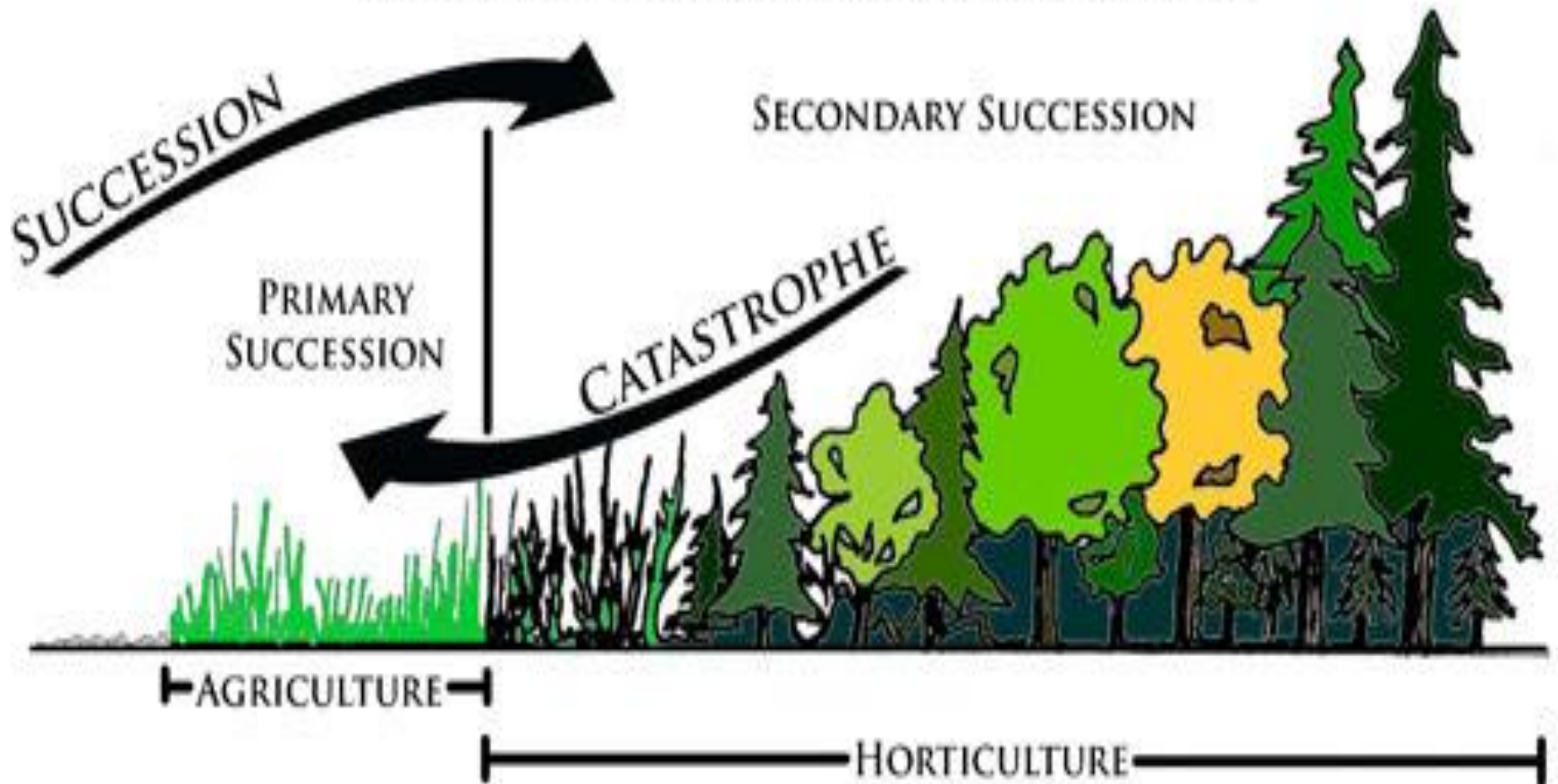
- Surfaces formed as volcanic eruptions build new islands or cover the land with lava rock or volcanic ash.
- The first species to populate an area during primary succession is the pioneer species.
  - Ex. Lichen - they break up the rocks and form new soil for plants to grow.

# Secondary Succession

- A process started by an event that reduces an already established ecosystem (organisms live there) to a smaller population of species.
  - Events - Fires, farming, hurricane, etc
- Secondary succession occurs where there is pre-existing soil.



# ECOLOGICAL SUCCESSION



SUBSISTANCE STRATEGIES

# Chapter 4: Section 2

## Self Quiz

1

Which of the following is a biotic factor in a bullfrog's niche?

- water
- a heron
- climate
- day length

A

2

An organism's niche is different from its habitat because

- The niche does not include the place where the organism lives.

A

- the niche includes all the conditions under which the organism lives.
- the niche includes only abiotic factors.
- the niche includes only biotic factors.



3

The attempt by organisms of the same or different species to use a resource at the same time in the same place is called

A

- competition.
- predation.
- symbiosis.
- cooperation.

4

An association between two species in which one species benefits and the other is neither helped nor harmed is called

- symbiosis.
- mutualism.
- commensalism.
- parasitism.

A

5

When a volcano erupts and completely destroys an ecosystem, the first species to populate the area are usually

- grasses and shrubs.
- pioneers such as lichens.
- small plants such as mosses.
- small animals such as rodents.

A

# LOL Cat

**I poop on your silly rules**

