Learning Targets

- Discuss the impact of biotic and abiotic factors on their environment and the significant ecological levels of organization.
- Explain the difference between an organism's habitat and niche and how these are determined by the characteristics of an ecosystem.
- Describe how species interact with one another in biological communities, such as competition, predation, and symbiotic relationships.

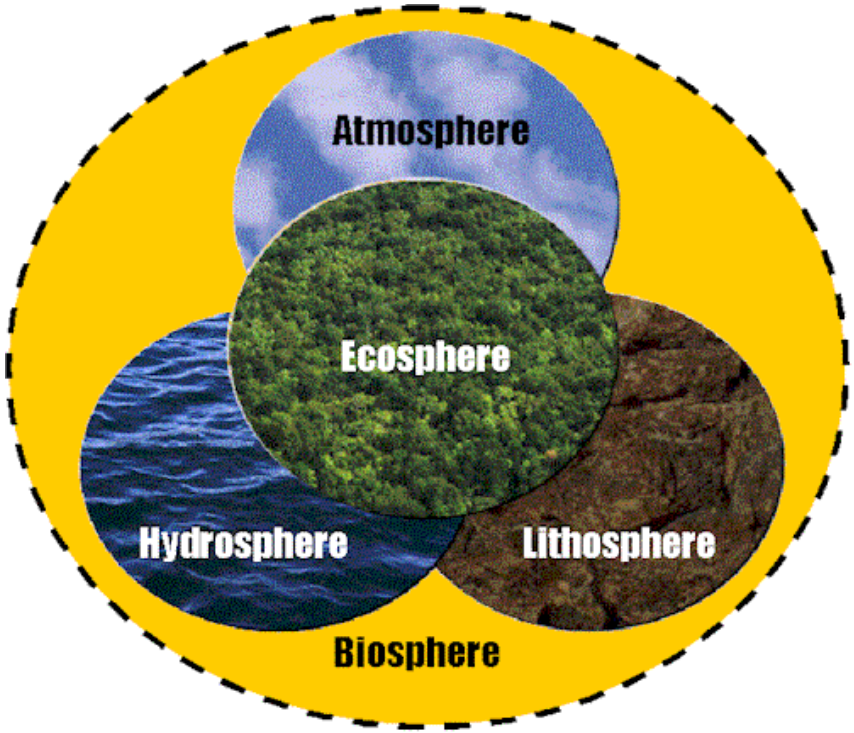
Introduction to Ecology

What is Ecology?

- Ecology- the study of interactions between:
  - organisms and organisms
  - organisms and their environment

Where do we fit in?

(What is our environment?)



The Biosphere: Water, Land, Air, and Rock!

Factors that effect us:

1. Abiotic Factors

Moisture

Wind/Air currents

Soil

Light

Temperature

- A- stands for non
- Bio- stands for living

- Abiotic Factors- nonliving factors

2. Biotic Factors:

- Biotic- Living factors

What is the organization of Ecological Study?

Organism

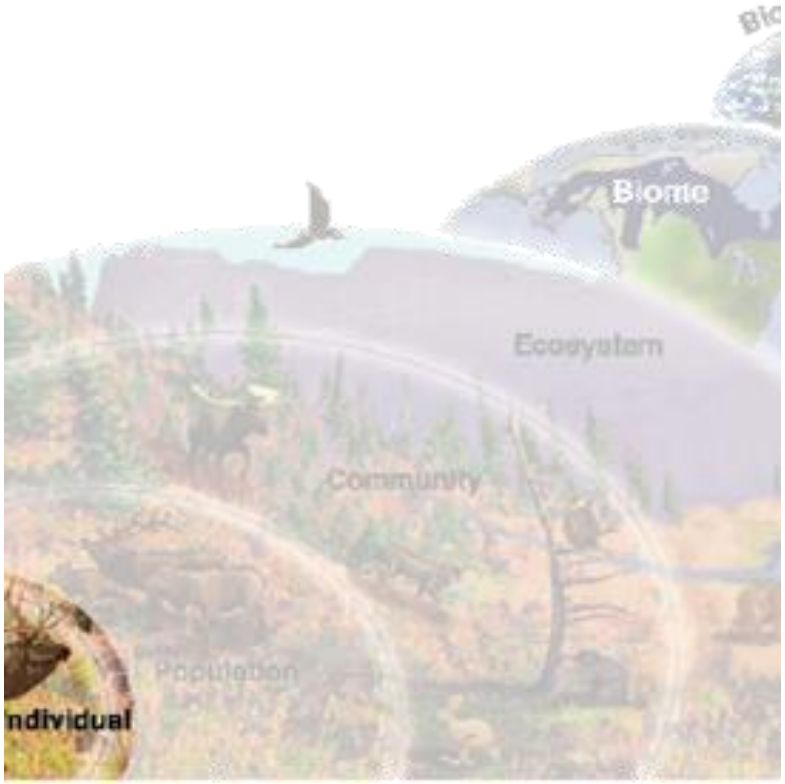
Population

Community

Ecosystem

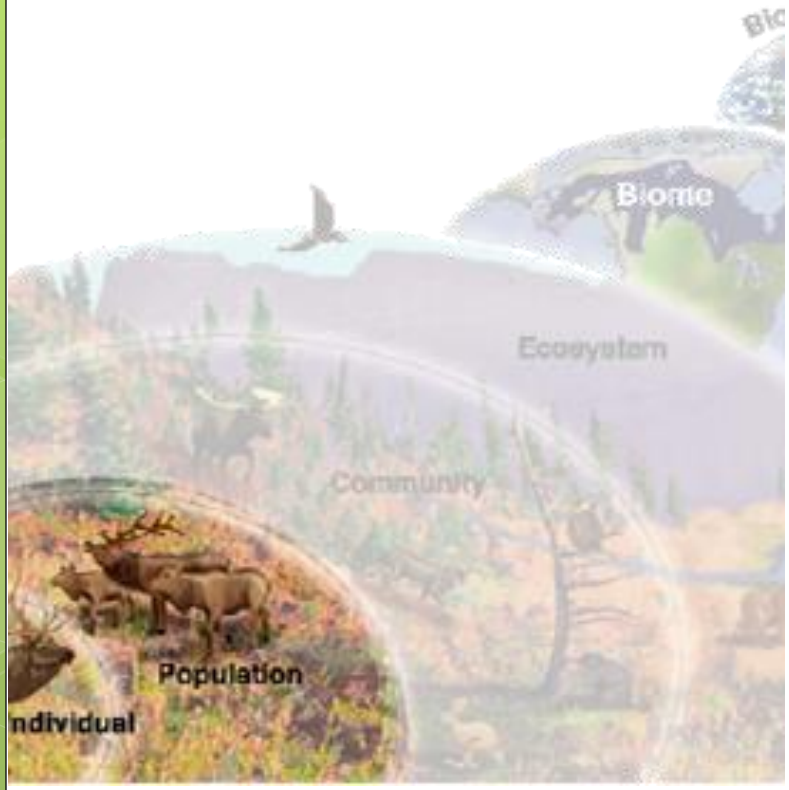
Biosphere

Levels of Organization



- **Individual**- one organism (living)
- Ex. a moose

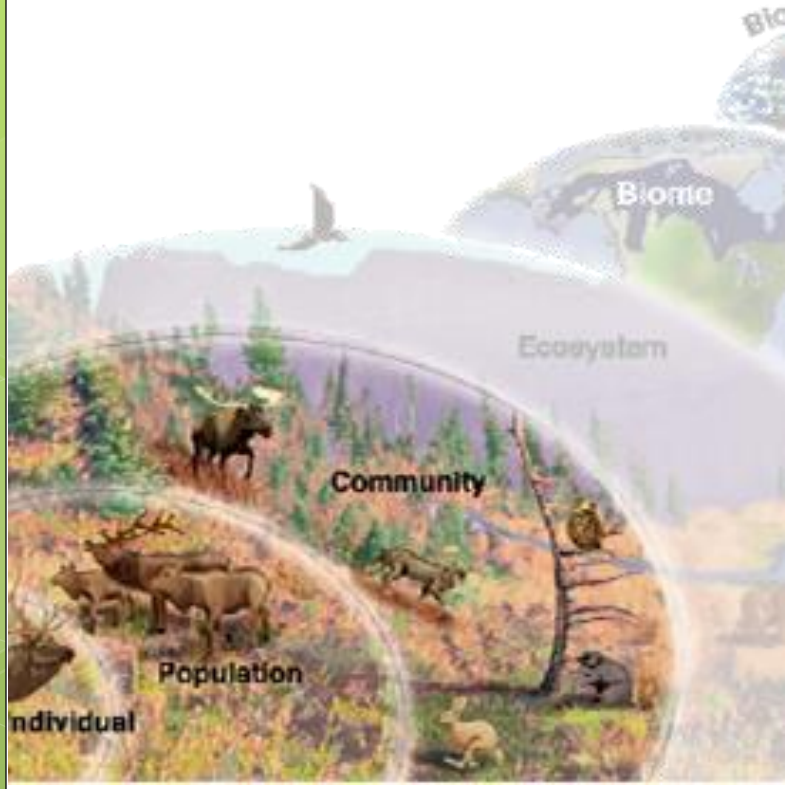
Levels of Organization



- **Population**- groups of individuals that belong to the species and live in the same area. (living-living same species)

- Ex. many moose

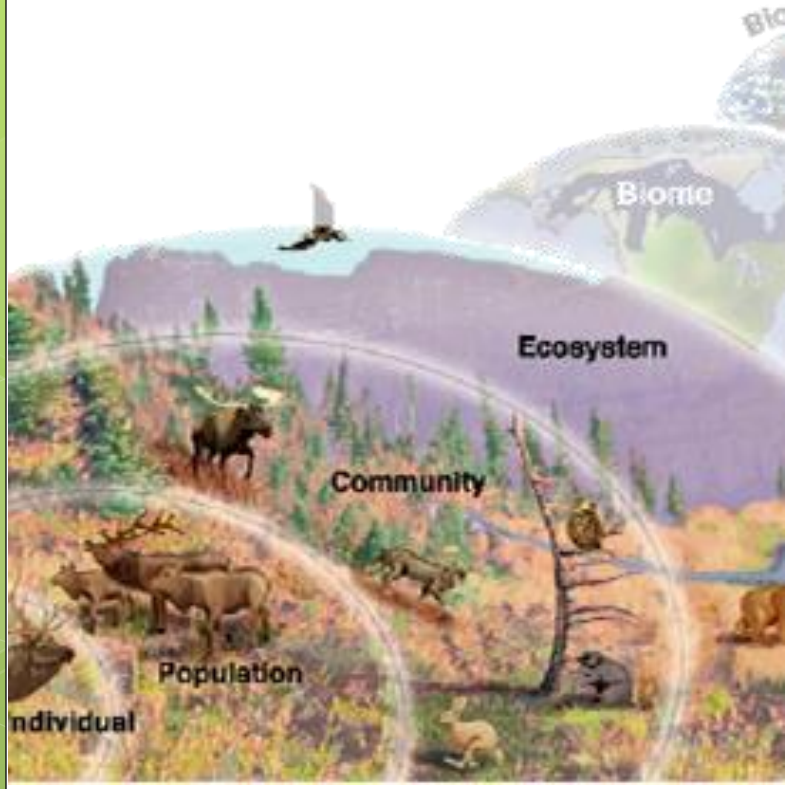
Levels of Organization



- **Community**- groups of different populations (more than one population or different groups of species)

Ex. many groups of moose, beavers, trees, grass (all living)

Levels of Organization



- **Ecosystem**- all organisms in a particular area along with the nonliving. (living and nonliving)

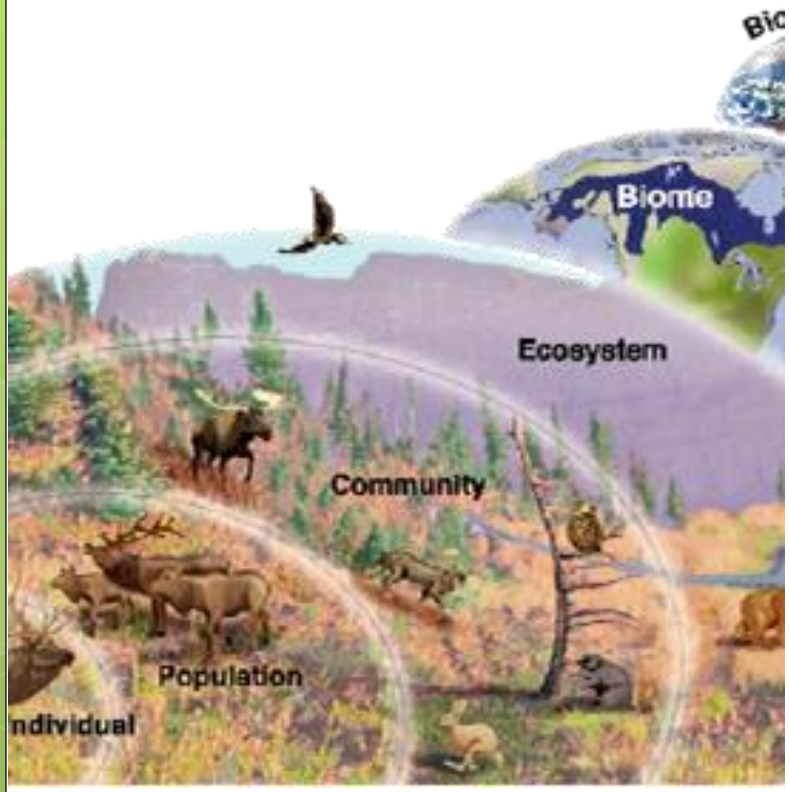
Ex. many groups of moose, beavers, trees, grass, rocks, water, mountains

Levels of Organization

- **Biome**- group of ecosystems that have the same climate and similar dominant communities

- **Biomes**: tropical rain forest, tropical dry forest, tropical savannah, temperate grassland, desert, temperate woodland and shrubland, temperate forest, northwestern coniferous forest, boreal forest (taiga), tundra, mountains and ice caps

Levels of Organization



- **Biosphere**- all of the planet where life exists, includes land, water, and air

- Life extends 8 km up and 11 km below the surface

IN AN ECOSYSTEM:

Organisms live in a ***Habitat***

Organisms fit into a ***Niche*** of the environment

Habitat vs. Niche

- **Habitat**- an area where an organism lives
- **Niche**- an organisms role in its environment
  - The Long Version → full range of physical and biological conditions in which an organism lives and the way in which the organism uses those conditions. Includes where in the food chain it is, where an organism feeds
- ***Habitat*** *is like an address in an ecosystem and a* ***niche*** *is like an occupation in an ecosystem.*

Community Interactions

- when organisms live together in an ecological community they interact constantly.

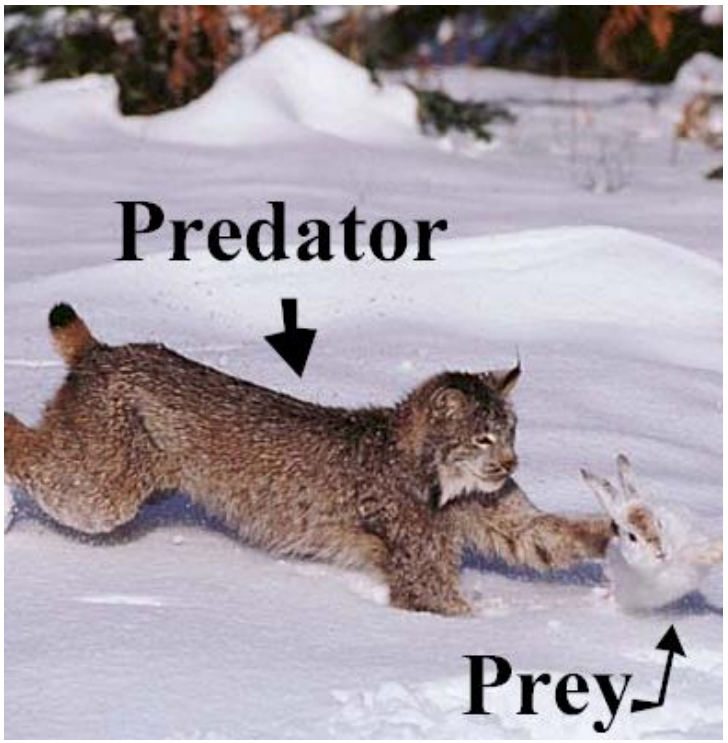
- Three types of interactions
  - Competition
  - Predation
  - Symbiosis

Competition- competing for resources

- occurs due to a limited number of resources
- **Resource**- any necessity of life. water, nutrients, light, food.
- **Competitive exclusion principle**- no two species can occupy the same niche in the same habitat at the same time

Predation

- **Predation**- when an organism captures and feeds on another organism.
- **Predator**- hunter
- **Prey**- hunted



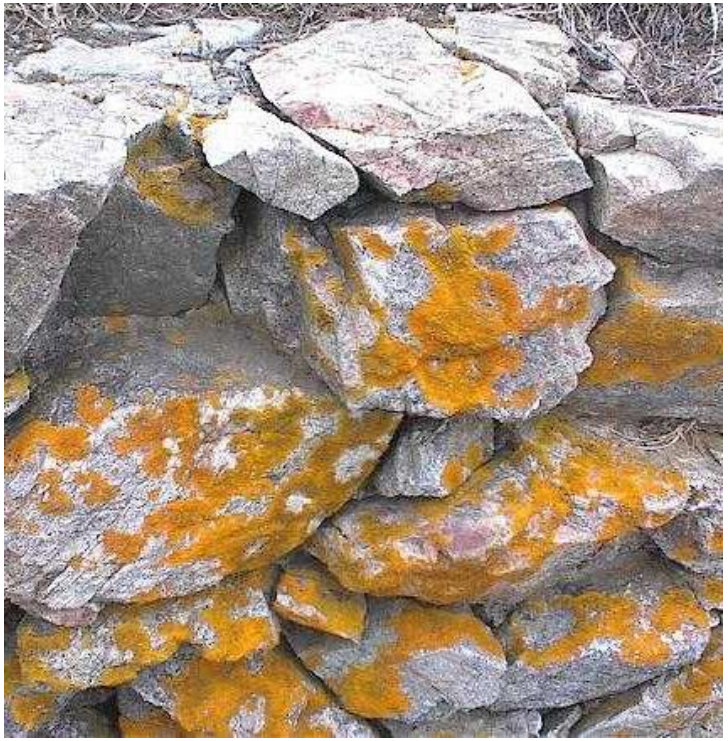
Symbiosis

- **Symbiosis**- any relationship where two species live closely together. (3 types)
  - Mutualism
  - Commensalism
  - Parasitism

Symbiosis

- **Mutualism**- both species benefit from a relationship.

- Lichens (fungus and Algae)



Symbiosis

- **Commensalism** – One member of a symbiotic relationship benefits and the other is neither helped or harmed

- Ex. Holes used by bluebirds in a tree were chiseled out by woodpeckers after it has been abandoned .

Symbiosis

- **Parasitism**- One creature benefits and one creature is harmed
- Ex tapeworm. Feeds in a humans intestines absorbing his/her nutrients.

Relationships: Symbiosis = Living Together

a) commensalism

b) mutualism

c) parasitism

Ecological Equivalents

- Unrelated organisms that occupy similar habitats and resemble each other.