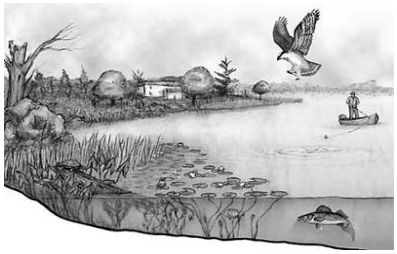
# Interactions Within Ecosystems



http://www.kidsgeo.com/images/ecosystem.jpg

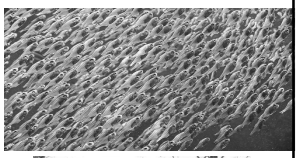
## Groups of living things interact within ecosystems

- The environment can be organized into five levels
  1. **Biome** : region with similar climate, types of plants, and animals
  2. **Ecosystem**: The living and non- living things that interact in one environment.
  3. **Community**: The living organisms of an ecosystem
  4. **Population**: A group of organisms of the same species that live in the same area.
  5. **Organism**: A single living thing, made up of one or many cells, that is capable of growing and reproducing.

## Patterns Exist in Populations

http://farm1.static.flickr.com/90/208997985_692784c75f.jpg

- Patterns in Living Space
  - Animals in a habitat are located based on food supplies, water, and shelter locations.
  - Some animals live in large groups for safety ( fish and elephants )



http://www.biology-blog.com/images/blogs/3-2007/the-majestic-elephants-of-southern.jpg

- Patterns in Time
  - Population sizes can change with seasons
  - Many organisms migrate to other areas (monarch butterflies and birds)

http://www.learner.org/jnorth/images/graphics/monarch/monarch13.jpg

## Organisms Interact in Different Ways

- Organisms may **cooperate**, **compete**, or **depend on each other** for survival

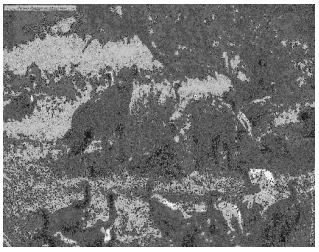
- Predator and Prey relationships
  - ***Predators*** can **affect** how the prey populations are distributed (fish in large groups)
  - ***Prey*** can **affect** the location and number in predator populations (birds feeding on insects migrate to the areas where the insects are plentiful)

## Organisms Interact in Different Ways

- **Competition**
  - Competition is the struggle between individuals or different populations for a limited resource

http://cache.eb.com/eb/image?id=95240&rendTypeId=4

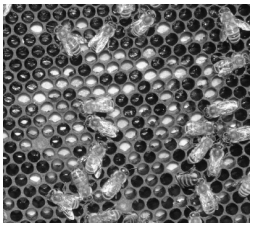
- Competition can happen with the same species (plants compete for light, space, and nutrients)
- Competition between different species (hyenas and vultures compete for remains of dead animals)



http://www.duiops.net/seresvivos/galeria/hienas/hyena-and-whitebacked-vultures-01301147b.jpg

## Organisms Interact in Different Ways

- **Cooperation**
- Some organisms work together to benefit each other
  - Killer whales hunt in pods (groups)
  - Ants, bees, and termites (members of a colony have different roles and responsibilities…queen bee, worker bees, etc.)



http://www.apitherapy.com.au/contents/media/1_bee%20pollen%20dw.jpg

## Survival of One Species Might Depend on Another Species

- Symbiosis: two different species who live together in a close relationship
  - Both species benefit
  - One species benefits while the other is not affected
  - One species benefits while the other is harmed

## Types of Symbiosis

- Mutualism: Two species interacting with each other that benefits both species. (bees and flowers)

http://www.physicalgeography.net/fundamentals/images/bee_flower.jpg

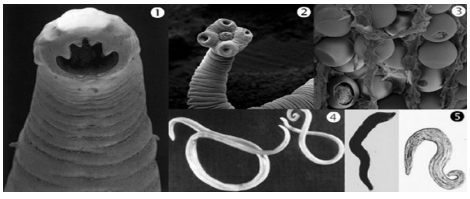
## Types of Symbiosis

- Commensalism: two species interacting with each other with one species benefiting and the other unaffected. (jellyfish and fish)

http://www.immediart.com/catalog/images/big_images/SPL_R_Z140032-Jellyfish_with_fish-SPL.jpg

## Types of Symbiosis

- Parasitism: two species interacting while one species benefits and the host species is harmed
- Examples of human parasites.



http://www.gifam.org/pic006.htm

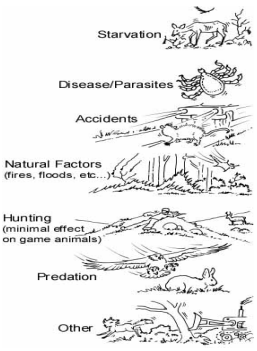
## Populations Change Over Time

- Population growth and decline
  - Predator-prey interactions can affect population increase or decrease ( as a wolf population increases the moose population decreases)
  - Birth rate may decline or increase

http://www.sciencedaily.com/images/2007/10/071019183055-large.jpg

## Populations Change Over Time

- Limiting factors: any factor or condition that limits the growth of a population in an ecosystem (food, water, light, large group of predators, small group of prey)

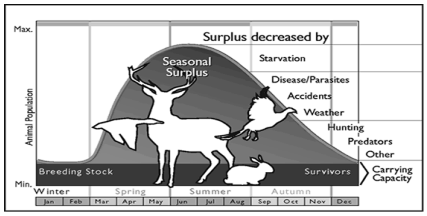



http://www.tpwd.state.tx.us/learning/hunter_education/homestudy/wildlife/wildlife/limit.phtml?print=true

## Maintaining a Balance in an Ecosystem

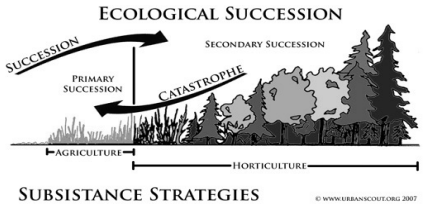
- Carrying Capacity: the maximum number of individuals that an ecosystem can support.
- Limiting factors affect the carrying capacity

http://www.hunter-ed.com/images/graphics/carrying_capacity_chart.gif




## Ecosystems change over time

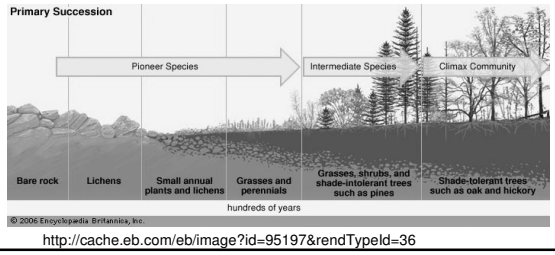
- Succession: the gradual change in an ecosystem in which one biological community is replaced by another.




http://i43.photobucket.com/albums/e358/urbanscout/succession-subsistence-1.jpg

## Primary Succession

- Primary succession: The establishment of a new biological community in an ***area of bare rocks***. (plants moving in after a lava flow or glacier retreats)

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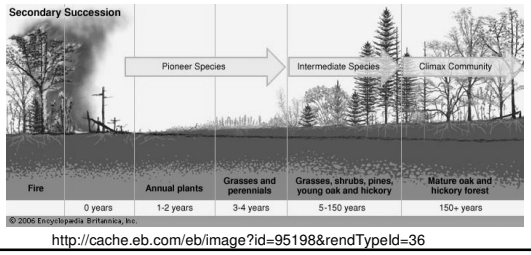
## Secondary Succession

- Secondary Succession: Occurs after a major disturbance happens and the ***soil still remains***. (forest fire)




http://cache.eb.com/eb/image?id=95198&rendTypeId=36

## Main Points on Organism Interactions in Ecosystems

- Groups of living things interact within ecosystems (biome, ecosystem, community, population, organism)
- Organisms can interact in different ways (symbiosis: mutualism, commensalism, parasitism)
- Ecosystems are always changing (primary and secondary succession)