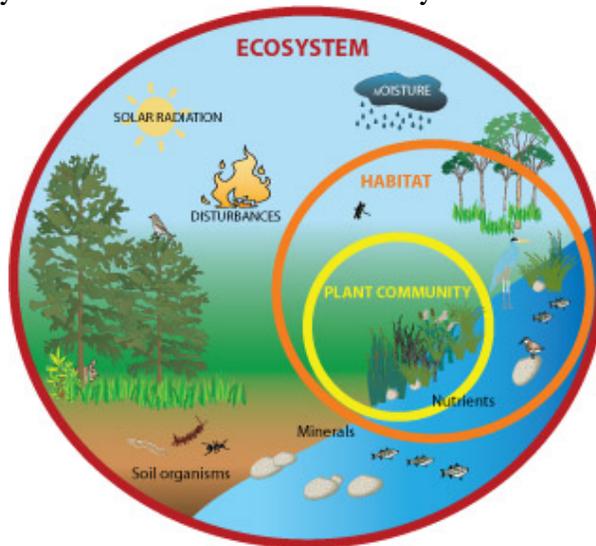


I. Biological Community

→ consists of a group of organisms of different species that interact and live together

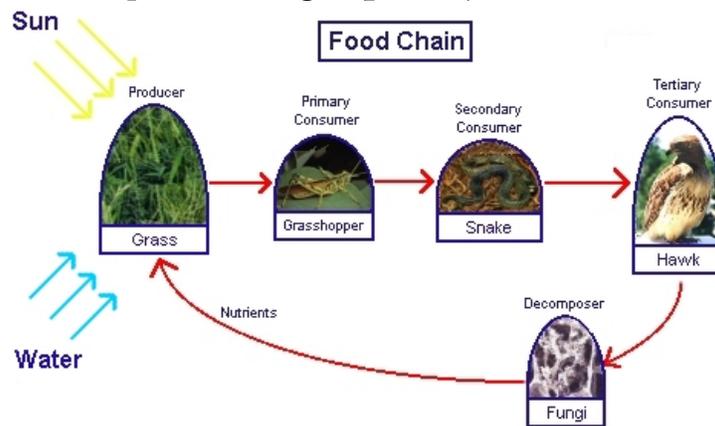
→ community + abiotic environment = ecosystem



II. The Major Players in Communities

A. Autotrophs-make their own food

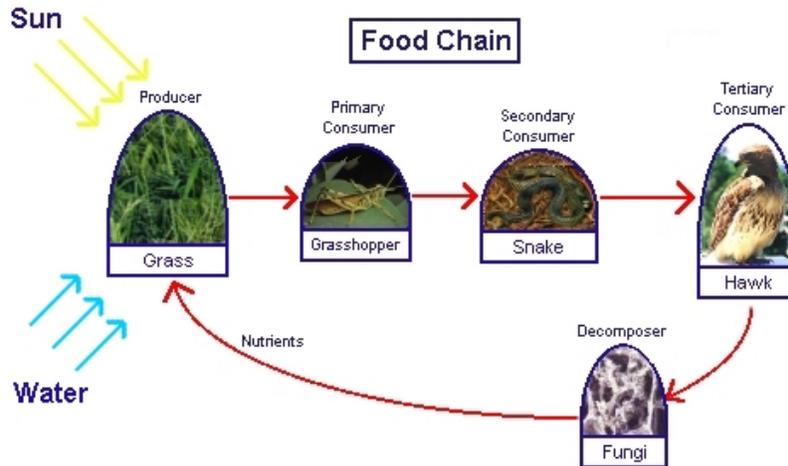
1. producers
2. photosynthetic
3. base of food web
4. include plants and algae (protists)



B. Heterotrophs-feed on other organisms

1. consumers
 - a. primary
 - i. herbivores-feed on plants
 - b. secondary
 - i. carnivores-feed on primary consumers
 - ii. detritivores (decomposers)-feed on detritus
 - a. dead organic matter
 - iii. omnivores-eat a variety of foods

Community Ecology Notes
Mrs. Laux AP Biology

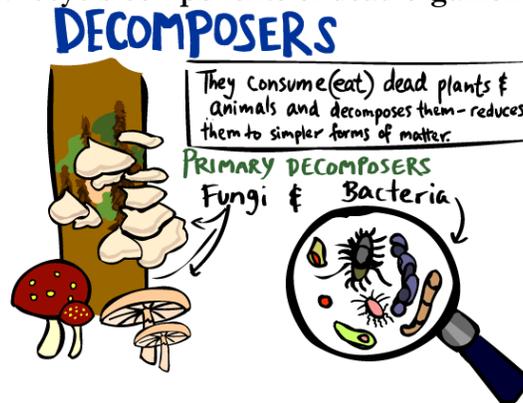


C. Decomposers-saprotrophs-saprobies

1. microbial heterotrophs

a. bacteria and fungi

b. recycle components of dead organisms and organic wastes



III. Predation

→ consumption of one species (the prey) by another (the predator)

A. Coevolution

1. predator evolves more efficient ways to catch prey

2. prey evolves better ways to escape the predator

a. ex: the Roadrunner (*Runnus fasticus*) and Wile e Coyote

(*Dumbus a.*) ☺

B. Effective predator strategies

1. pursuit

2. ambush

C. Plants' adaptations

1. spines, thorns, tough leathery leaves

2. unpalatable or toxic chemicals to herbivores

D. Animal strategies to avoid being killed or eaten

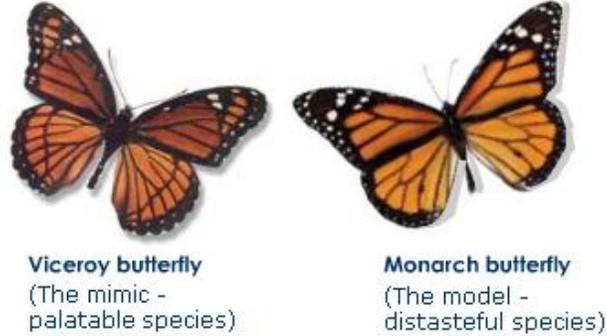
1. flee from predators

2. mechanical defenses

3. associate in groups

4. chemical defenses

- 5. warning coloration
- 6. cryptic coloration
 - a. camouflage
- 7. Batesian mimicry
 - a. harmless or edible species resemble dangerous species



- 8. Müllerian mimicry
 - a. several different species, all of which are poisonous, harmful, or distasteful, resemble one another
 - b. predators learn to avoid their common warning coloration
 - c. *Heliconius* butterflies



IV. Symbiosis

→ any intimate or long-term association between two or more species

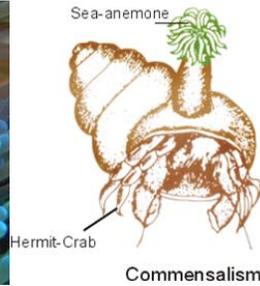
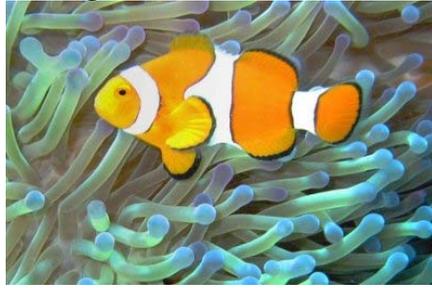
A. Mutualism

- 1. both partners benefit



B. Commensalism

2. one organism benefits; other is unaffected



C. Parasitism

1. one organism (parasite) benefits; other (the host) is harmed
2. some are pathogens → cause disease



V. Competition

→ occurs when two or more individuals attempt to use an essential common resource such as food, water, shelter, living space, or sunlight

A. Intraspecific

1. between individuals within a population

B. Interspecific

2. between individuals of different species

C. Interactions are complex

VI. Ecological Niche

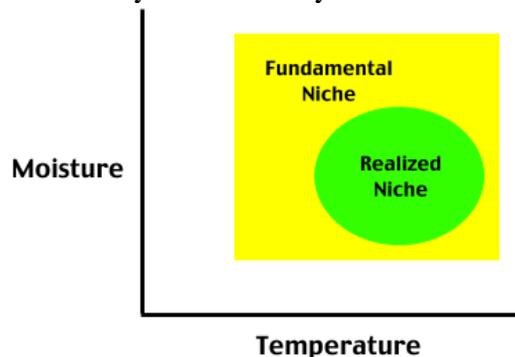
→ distinctive lifestyle and role of an organism in a community

→ takes into account all abiotic and biotic aspects of an organism's existence

→ habitat-where the organism lives, a parameter used to describe the niche

A. Fundamental Niche

1. potential ecological niche for an organism
2. organisms able to exploit more resources and play broader role in life of community than actually do



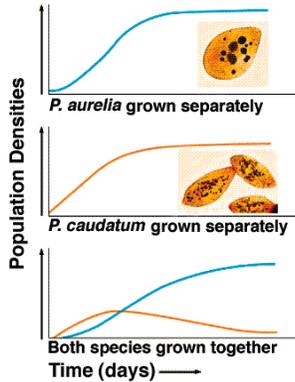
B. Realized Niche

1. niche an organism actually occupies
2. interspecific competition is one of chief biological determinants of a species' realized niche

C. Competitive Exclusion

1. prevents 2 species from occupying the same niche in the same community for an indefinite period of time
2. one species is excluded by another as a result of competition for a resource in limited supply (a limiting factor)
3. limiting factors (mineral content of soil, temperature extremes, amount of precipitation) tend to restrict an organism's realized niche

**Competition
Between Two
Laboratory
Populations of
*Paramecium***



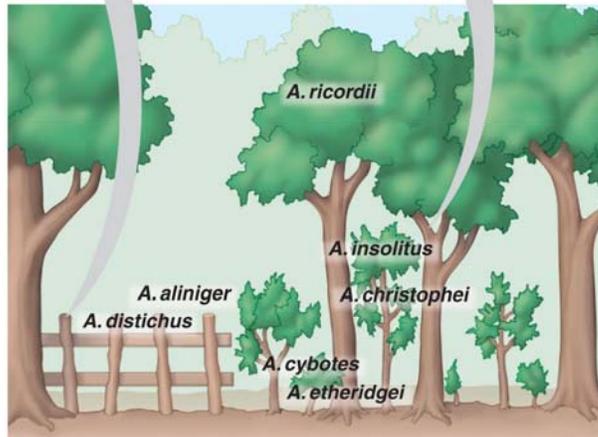
4. to reduce competition:
 - a. do resource partitioning
 - i. evolve differences in resource use



- b. do character displacement
 - i. differences in structural, ecological, and behavioral characteristics evolve where their ranges overlap

A. distichus perches on fence posts and other sunny surfaces.

A. insolitus usually perches on shady branches.



Copyright © 2008 Pearson Education, Inc., publishing as Pearson Benjamin Cummings.

VII. Keystone species

- crucial in determining the nature of the entire community
- goal of conservation biology
 - to identify and protect keystone species

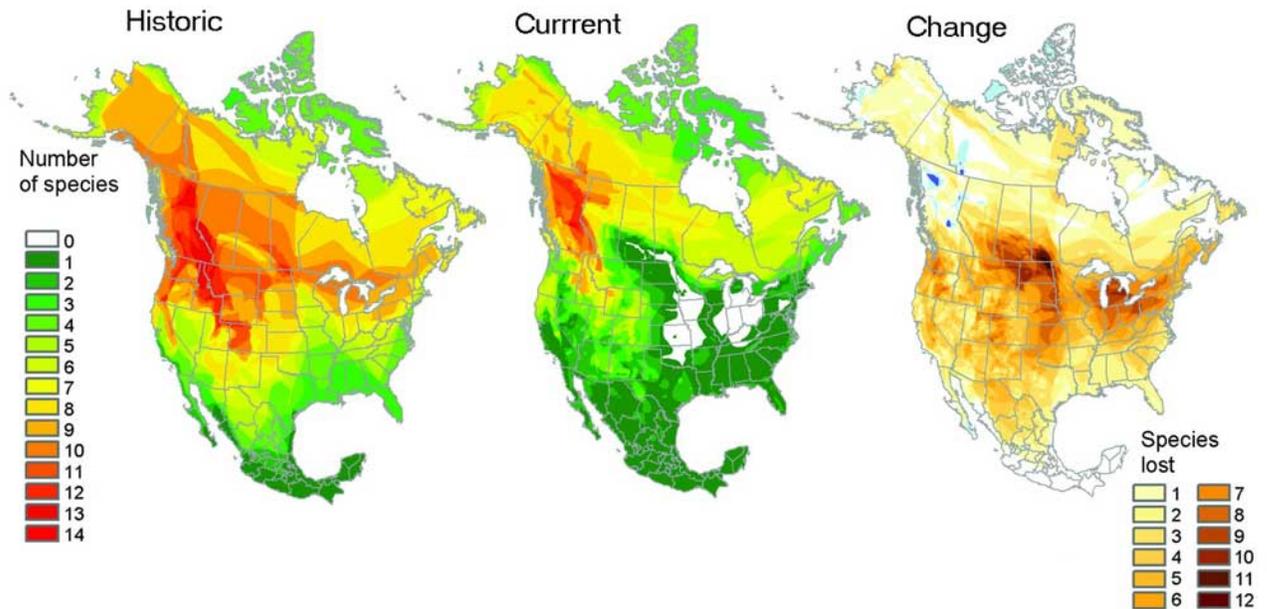


VIII. Community complexity and its relationship to certain factors

A. Species richness

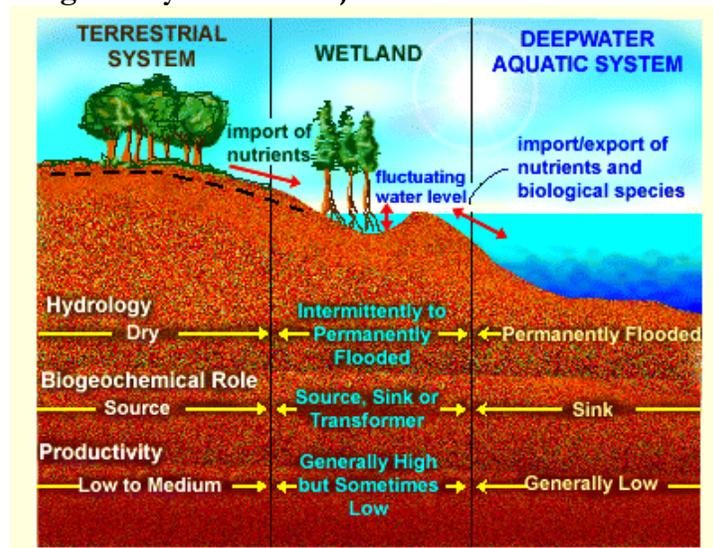
1. expressed by the number of species within a community

Species Richness



B. Species diversity great when:

1. many potential ecological niches exist
2. community is not isolated
3. community is not stressed
4. more energy is available (the species richness-energy hypothesis) in ecotones
 - transition zones between 2 adjacent but different patches of landscape
5. long history without major disturbances

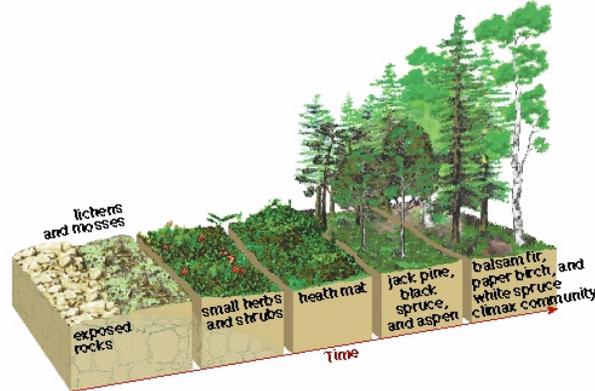


IX. Succession

→ orderly replacement of one community by another

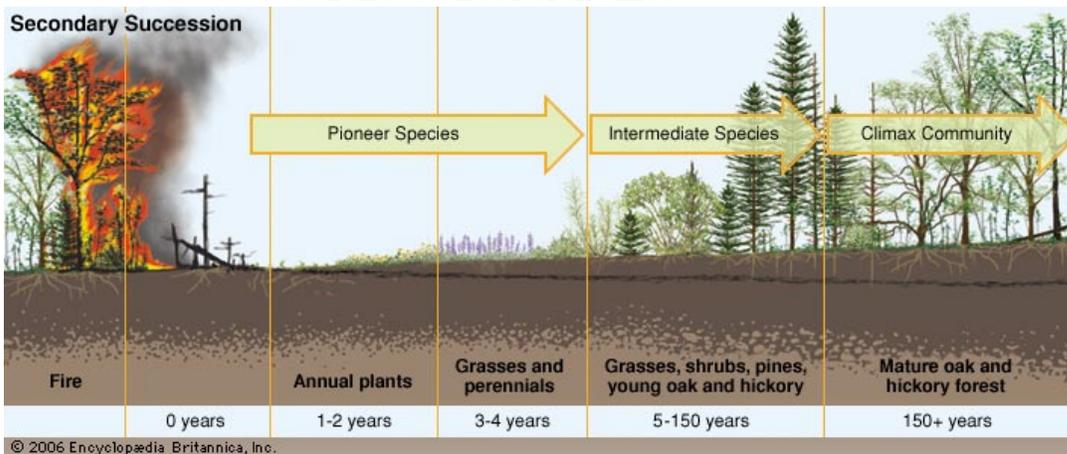
A. Primary succession

1. occurs in an area that has not previously been inhabited
 - a. ex: bare rock, shifting sand dunes



B. Secondary succession

1. begins in an area where there was a pre-existing community and well formed soil
 - a. ex: abandoned farmland
 - b. Yellowstone after the fires



X. The Nature of Communities-2 views

A. Organismic model

1. a community is a “superorganism”
2. goes through certain stages of development
 - a. succession (development) → climax (adulthood)
3. biological interactions
 - a. primarily responsible for species composition
 - b. organisms are highly interdependent

B. Individualistic model

1. most ecologists support
2. challenges highly interdependent community concept
3. abiotic environmental factors
 - a. primary determinants of species composition
 - b. organisms are largely independent of each other

XI. Biogeography

→ study of geographical distribution of plants and animals

→ includes where populations came from, how they got there, and when

A. Center of origin

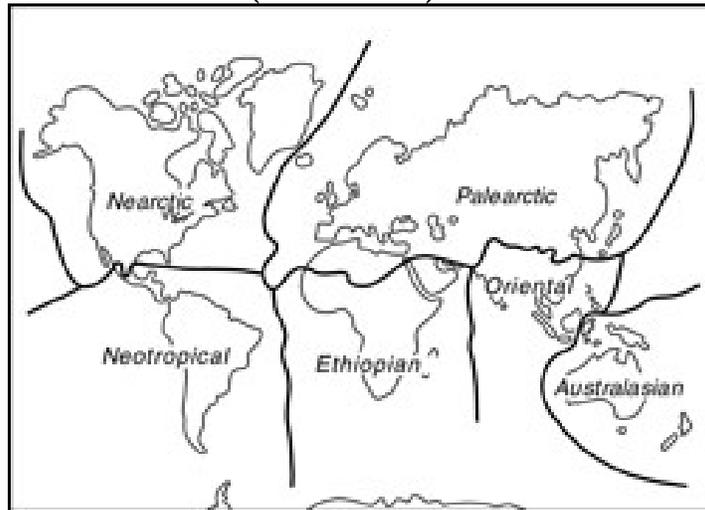
1. definition: each species originated only once
2. species spread from center of origin
3. spread halted by a physical, environmental, or biological barrier

B. Range

1. that portion of the Earth in which the organism is found

C. Alfred Wallace (remember him?)

1. divided Earth's land areas into 6 major biogeographical realms
 - a. Palearctic
 - b. Nearctic
 - c. Neotropical
 - d. Ethiopian
 - e. Oriental
 - f. Australian (Australasian)



2. each realm maintains its biological distinctiveness

- a. due to separation by
 - i. mountain range
 - ii. desert
 - iii. ocean
 - iv. other barrier

3. human activities contribute to biogeographical realms homogeneity