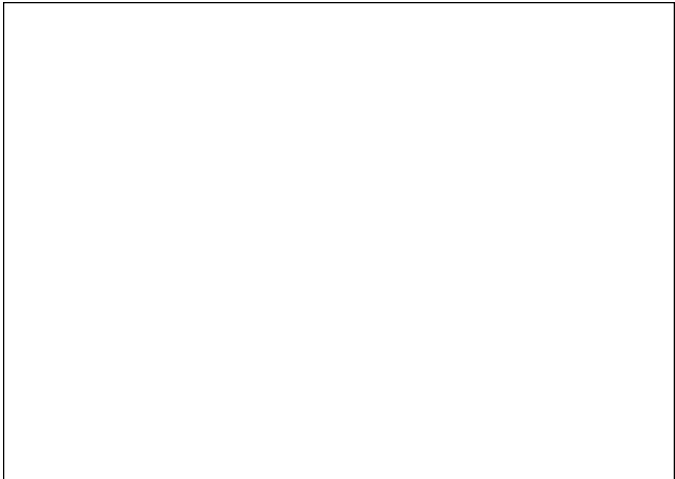


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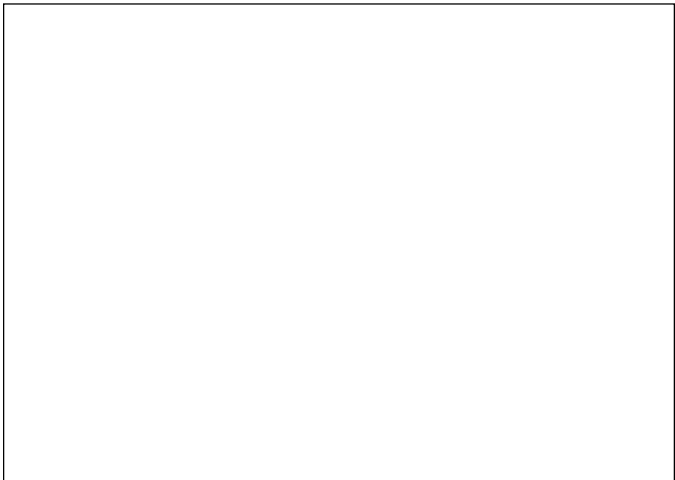
Communities

Outline of Lecture 7

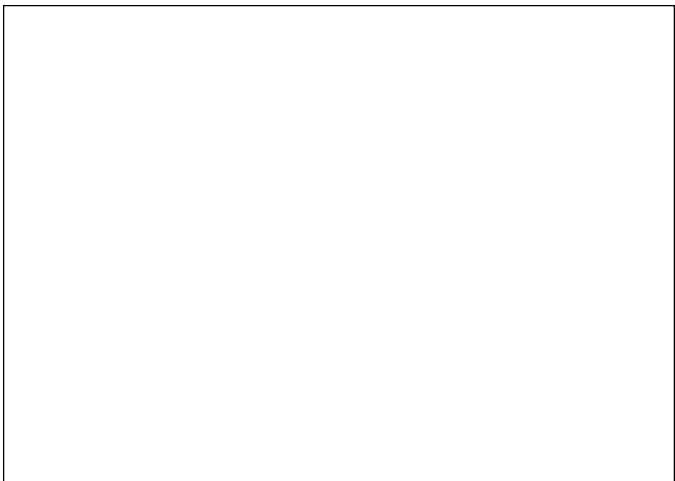
- A. *Views of communities*
- B. *Coevolution*
- C. *If there are so many herbivores why are there any plants left?*
- D. *Animal defenses*
- E. *Mimicry*
 - 1. *Batesian*
 - 2. *Mullerian*
- F. *Community diveristy*
- G. *Are all species equally important to community functioning?*
- H. *Succession types*
- I. *Successional processes (three processes)*
- J. *Richness changes during succession*



- A. Populations of organisms that live together at a given site form a biological community.
 - 1. *One view:* a chance assembly of species found in the same area because they have similar ecological requirements.
 - 2. *Another view:* organisms are united in some way by ecological relationships; they influence each other's abundance and distribution.



- B. **Coevolution** is the mutual influence that occurs in the evolution of two different species that interact with each other and reciprocally influence each other.
- C. If there are so many herbivores why are there any plants left?
 - 1. Morphological and chemical defenses
 - 2. Predators and parasites



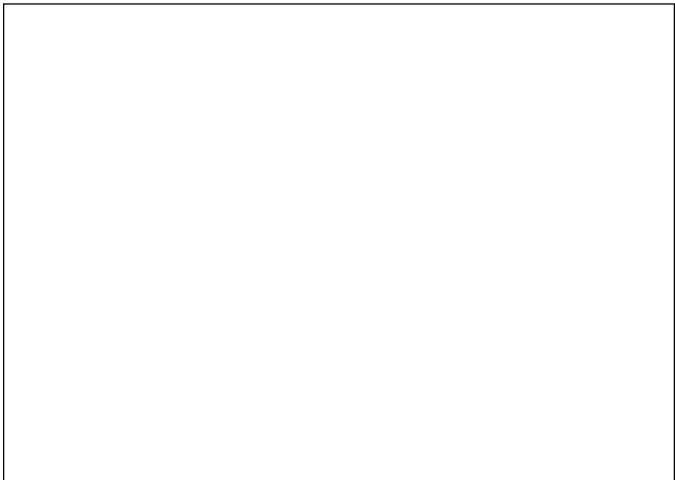
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Communities

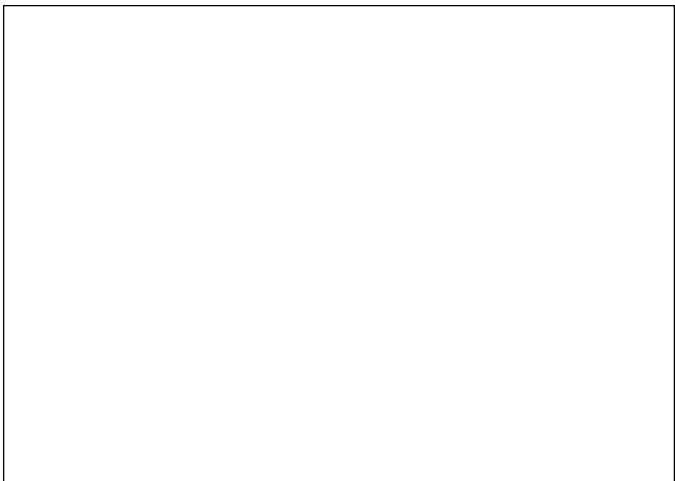
- D. **Animal defenses:** morphological and chemical, warning (aposomatic) coloration, crypsis.
- E. **Mimicry:** the deceptive resemblance of one species to another
 - 1. *Batesian:* the model is distasteful, the mimic is not.
 - 2. *Mullerian:* several unrelated species, all of whom would be protected on their own, evolve to look alike.



- F. We can consider communities in terms of the influence that one species (e.g. a redwood) has on species around it or in terms of a common resource, or by summarized properties.
 - 1. Richness (number of taxa), evenness (distribution of individuals among the different species), numbers, diversity indices (which are combinations of richness and evenness), trophic status, and stability (the ability of a community to return to its original composition following disturbances) can be used to characterize a community.



- 2. Two communities with same richness and number of individuals can have very different evenness, and therefore different diversity index values.
- 3. Because of the popular use of the term “biodiversity,” the term diversity now connotes both species richness and species diversity values (which is confusing).



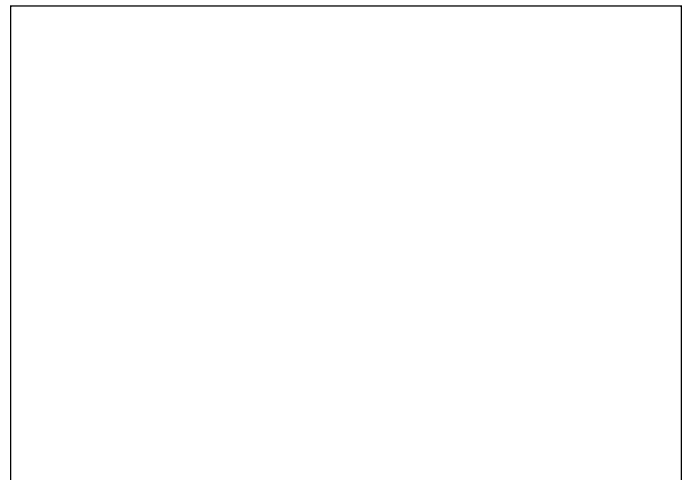
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Communities

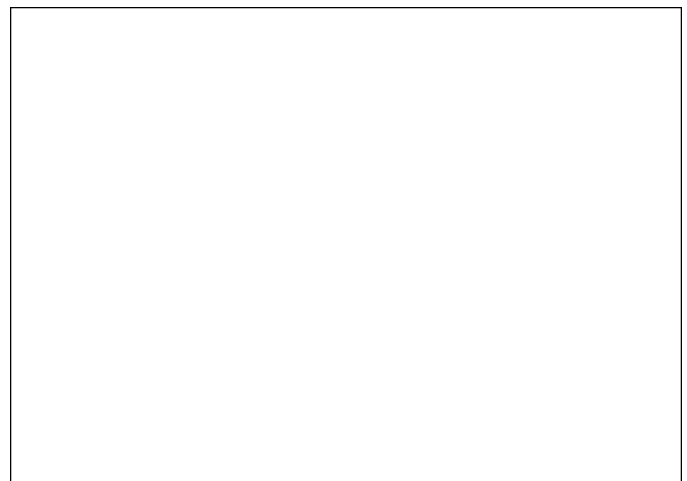
- G. Are all species equally important to community functioning?
1. Dominant species can be quick in establishment, be specialists, or be generalists.
 2. Keystone species: found in communities when some primary producer or consumer is capable of monopolizing a basic resource and thus excludes other species; the resource monopolist is itself preferentially consumed or destroyed by the keystone species. When the keystone species is there and controls the monopolist, resources are made available for other species.



- H. Succession: the orderly and repeatably change in a community over time.
1. Primary succession occurs in areas essentially barren of life because of the complete absence of soil.
 2. Secondary succession occurs when the community has been cleared by some disturbance but some soil is left intact.
 3. Climax: “end points” of communities; an equilibrium of richness and composition is reached.



- I. Successional processes
1. Facilitation: early species change the environment and create conditions for late arriving species.
 2. Tolerance: early species are outcompeted by late-arriving species that are able to tolerate lower levels of resources.
 3. Inhibition: early species prevent establishment of later species.



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Communities

What is the Resource Ratio Model of Tilman (1988) and why is it appealing to ecologists (go to the library and look it up)?



J. Richness changes during succession

1. Species that are more durable competitors replace “fugitive” or r-selected species.
2. Predation, parasitism, increased competition, and other interactions increase richness.



K. Intermediate Disturbance Hypothesis: richness is highest when disturbances are moderate in frequency and severity because organisms typical of different succesional stages occur.

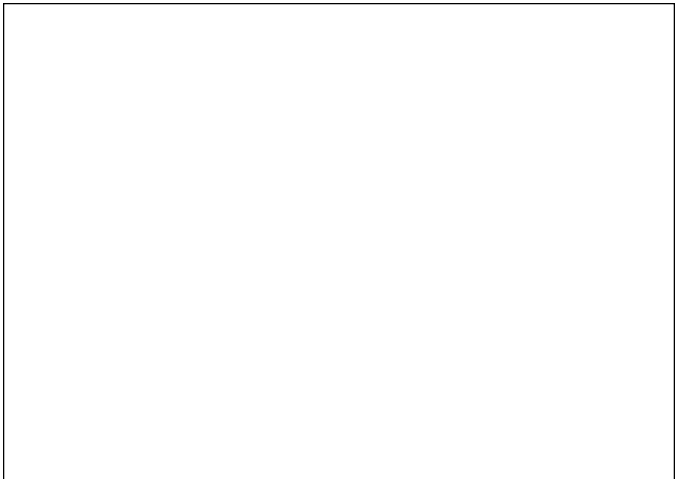
richness ↑

high

low

frequency of disturbance

rare → frequent



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Communities

L. Disturbance; any relatively discrete event in time (coming from outside the community) that changes substrate or resource availability, and creates opportunities for new colonies or individuals to be established (may be natural, animal-influenced, human-influenced).

M. Why is disturbance of interest to ecologists?
What is its role in succession?
What factors result in the length of time needed for a community to recover from disturbance (study group questions)?