

## Community Ecology: Structure, Species Interactions, Succession, & Sustainability: Chapter 8

1. How does species diversity or richness differ from species abundance?
2. What is meant by niche structure?
3. What is the most common spatial distribution pattern?
4. Describe what is meant by “edge effects”; provide two examples.
5. Relate edge effects and potential or realized biodiversity reduction.
6. Identify the most species-rich environments and provide one possible explanation for how/why these environments are, in fact, so diverse in species.
7. Generally, the latitudinal species diversity gradient illustrates what pattern?
8. Provide four major reasons why this latitudinal pattern in species diversity occurs:
9. Briefly explain the specifics of the depth-species diversity gradient:
10. What are the major factors determining the number of species on islands?
11. Robert MacArthur and E.O. Wilson proposed the theory of island biogeography (also known as the species equilibrium model); briefly summarize their theory:
12. How can Nonnative species cause problems in an ecosystem?
13. Provide three synonyms(they are essentially synonymous) for Nonnative species:
14. Describe what an indicator species is; be sure to include the operative/essential word(s) and identify two “classic examples” of indicator species.
15. Describe what a keystone species is and give two examples of species which are generally identified as classic keystone species.
16. Define the following: a. Interspecific Competition c. Predation b. Intraspecific Competition d. Parasitism f. Commensalism e. Mutualism
17. Identify three species which exhibit territoriality and briefly describe how this form of competition is specifically carried out.
18. Describe two potential disadvantages of territoriality:
19. Contrast fundamental niche and realized niche: include in your discussion the major reason why these two are not typically the same.
20. Discuss the typical result when the fundamental niches of different species overlap.
21. When there is significant niche overlap between two species, there are usually four possible general outcomes; identify each of these 4:
22. Describe each of the following and provide an example of each: Interference Competition; Exploitation Competition; The Competitive Exclusion Principle; Resource Partitioning; Character Displacement
23. Provide three examples of predator-prey relationships:
24. Describe three ways in which predators increase their chances of “catching lunch”/ getting a meal:
25. Describe three ways in which prey species decrease their chances of “becoming lunch”:
26. The term Symbiosis refers to:
27. Identify and briefly describe the three general types of symbiosis:
28. Give two examples of each of the three types of symbiosis in #27 above:
29. Describe Ecological Succession:
30. Name and describe the two fundamental types of ecological succession:
31. Describe the major characteristics of “early successional species” which enable them to survive or even thrive in areas which are relatively “immature” successional:
32. What possible advantage(s) might there be to being a small perennial plant vs. a small annual plant, regarding succession?
33. Comment on the relative rates of primary succession in Polar/Very Cold areas vs. Tropical areas.
34. Describe each of the following as they pertain to Ecological Succession: A. Facilitation B. Inhibition C. Tolerance

35. Compare the following characteristics of ecosystems as they apply to Immature Ecosystems (Early Successional Stage) and Mature Ecosystems (Late Successional Stage): (Comparison)  
Immature Mature A. Plant Size B. Species Diversity C. Trophic Structure D. Ecological Niches E. Biomass F. Efficiency of Nutrient Cycling/ Recycling
36. What role do “disturbances” play in succession and species diversity? e.g., a very large tree falls in a tropical forest.
37. Briefly explain the intermediate disturbance hypothesis:
38. For what reasons has the “climax community” paradigm undergone modification over the last 20-30 years?
39. What “descriptors” or labels have gradually come in to use in place of or to be used in conjunction with “climax community”?
40. What is stability, in terms of an organism, a population, a community, or the biosphere?
41. Define each of the following: Inertia, or Persistence; Constancy; Resilience, or “Bounce-a-back-ability”
42. Does species diversity increase ecosystem stability?
43. Comment on the phrase, “biodiversity provides insurance against catastrophe”.
44. Explain why/how a tropical rain forest is much less resilient than a grassland:
45. Recent research suggests that average annual NPP of an ecosystem reaches a peak with 10-40 producer species. Propose a possible explanation for NPP having a “maximum” value for a given ecosystem, such as a given area of tropical rain forest, or estuary.
46. Present an argument for protecting natural systems. Why should human beings bother protecting these natural systems?
47. What is the general message of the “precautionary principle”?

### **Important Terminology & Concepts Chapter 8**

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|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| 1. Species Diversity, Species Richness                                   | 26. Pollination                                                                                   |
| 2. Species Abundance                                                     | 27. Lichens                                                                                       |
| 3. Niche Structure                                                       | 28. Rhizobium Bacteria                                                                            |
| 4. Edge Effects                                                          | 29. Commensalism                                                                                  |
| 5. Latitudinal Species Diversity Gradient                                | 30. Epiphytes                                                                                     |
| 6. Depth-Species Diversity Gradient                                      | 31. Ecological Succession                                                                         |
| 7. Theory of Island Biogeography, Species Equilibrium Model              | 32. Primary Succession                                                                            |
| 8. Habitat Islands                                                       | 33. Secondary Succession                                                                          |
| 9. Native Species                                                        | 34. Pioneer Species                                                                               |
| 10. Nonnative Species, Exotic Species, Alien Species, Introduced Species | 35. Early Successional plant species                                                              |
| 11. Indicator Species                                                    | 36. Midsuccessional plant species                                                                 |
| 12. Keystone Species                                                     | 37. Late successional plant species                                                               |
| 13. Intraspecific Competition                                            | 38. Facilitation                                                                                  |
| 14. Interspecific Competition                                            | 39. Inhibition                                                                                    |
| 15. Territoriality                                                       | 40. Tolerance                                                                                     |
| 16. Interference Competition                                             | 41. Disturbance                                                                                   |
| 17. Exploitation Competition                                             | 42. Intermediate Disturbance Hypothesis                                                           |
| 18. Competitive Exclusion Principle                                      | 43. Climax Community                                                                              |
| 19. Resource Partitioning                                                | 44. “Balance of Nature” Paradigm; Equilibrium Model of Succession                                 |
| 20. Predation                                                            | 45. Biotic Change: “ever-changing mosaic of vegetation patches at different stages of succession” |
| 21. Predator-Prey Relationship                                           | 46. Mature Community                                                                              |
| 22. Mimicry                                                              | 47. Stability                                                                                     |
| 23. Parasitism, Parasite, Host                                           | 48. Inertia, or Persistence                                                                       |

24. Mutualism

25. Nutritional Mutualism

49. Constancy

50. Resilience

51. Precautionary Principle