

Name: \_\_\_\_\_

*Be as specific as possible in all answers to receive full credit.*

Fill in the Blank (each blank is worth 2 points; this section totals 22 points;)

1. Single-celled plant hairs that may deter herbivory by insects are known as \_\_\_\_\_.
  
2. A \_\_\_\_\_ is the amount of an element stored in a particular part of an ecosystem while a \_\_\_\_\_ is the movement of that element between parts.
  
3. \_\_\_\_\_ competition is when two plant species have negative effects on each other because one attracts an herbivore that will eat both species.
  
4. Most water on Earth (~96%) is found in \_\_\_\_\_.
  
5. A microbe that lives inside a plant's tissue and exchanges material with that plant is known as a(n) \_\_\_\_\_.
  
6. Clements said that the succession of a particular community would end when that community reached the \_\_\_\_\_ stage.
  
7. A \_\_\_\_\_ defense is present in a plant only after the plant has been attacked by an herbivore or pathogen.
  
8. Introducing an herbivore or pathogen to control a population of an undesirable plant species is specifically known as \_\_\_\_\_.
  
9. An animal that consumes seeds of plants is known as a(n) \_\_\_\_\_.
  
10. Many ecologists believe the shape of the relationship between productivity and diversity is \_\_\_\_\_.

Short Answer

11. Define/describe (3 points each):

a) overcompensation

b) relay floristics

c) dynamic equilibrium

d) net primary productivity (NPP)

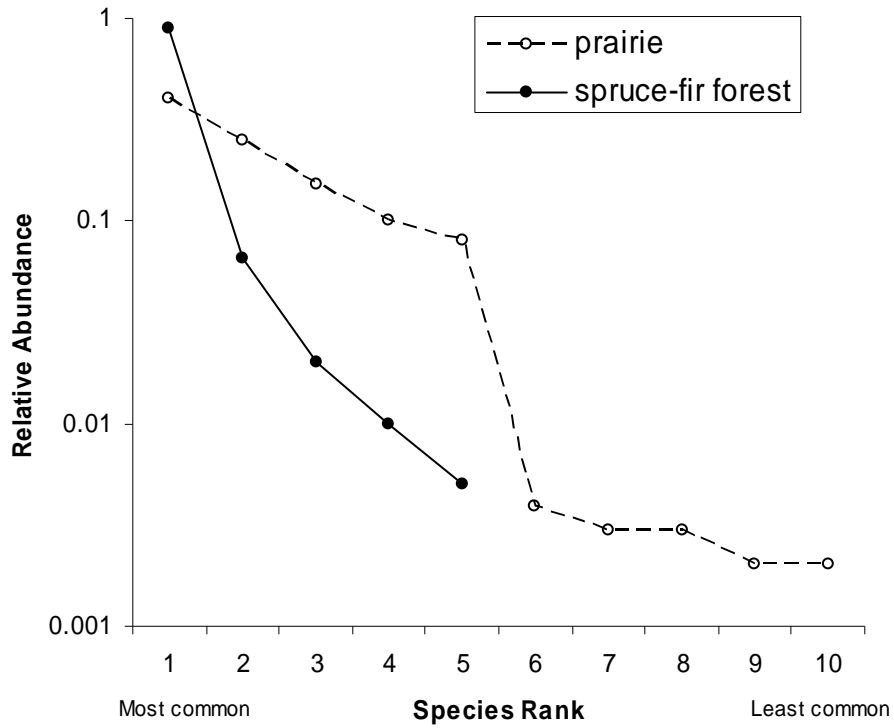
12. Describe two hypotheses used to explain the success of invasive species, and give an example of each. (6)

13. Briefly describe top-down vs. bottom-up regulation of plant populations (4).

14. What were the three mechanisms of succession described by Connell & Slatyer? Give a brief explanation of each. (3)

15. Why is an understanding of succession important for restoring natural communities? (3)

16. How did Rabinowitz describe a common species? (Hint: three characteristics) (3)



17. Use this hypothetical rank-abundance diagram (also known as a dominance-diversity curve) to answer the following questions:

a) What is the richness of each community? (2)

b) Which community has greater evenness? How do you know? (2)

c) Which community is more diverse? How do you know that by looking at the diagram? (3)

18. Give two examples of an effect of an herbivore on a plant (individual, population, or community) that is not a result of the loss of plant tissue to the animal. (4)

Essay (Each answer is worth 18 points. Use complete sentences in paragraph form for your answers.)

19. On the suggestion of Dr. Gough, you visit the Ft. Worth Nature Center and Refuge next spring and hike the trails that pass through the tallgrass prairie community. As you walk, you make several observations of patterns in the prairie community. First, you notice that a native prairie grass seems to only occur in close proximity to a native legume species. Second, two common perennial grass species seem to segregate so that they are not found together. Third, an area burned last year has very different species composition than an adjacent area that has not burned in 20 years.

UNDERGRADUATES: Write a hypothesis that you can test based on one of these observations. Briefly outline the methods you would use, and describe the kind of results you would need to accept your hypothesis.

GRADUATE STUDENTS: Follow the instructions for the undergraduates. Then, assume you do not find support for your hypothesis. Write a second hypothesis that logically follows as the next step in deciphering this pattern, outline the methods you would use, and describe the results you would need to accept this second hypothesis.

20. Answer one (and only one) of the following questions:

- a) Co-evolution has structured many plant-animal interactions. Describe two specific examples of plant-herbivore interactions in which the plant also benefits (either directly or indirectly) from its association with the herbivore. Discuss how these relationships might have evolved. Do you expect similar associations between plants and their parasites? Why or why not?
- b) Decomposition is an important process in both the carbon and nitrogen cycles. Explain why this is by describing the transformation of both elements during decomposition. Then describe how plants may directly affect this process, and also how herbivores may indirectly affect decomposition rates (in both the short- and long-term).
- c) Describe the process of primary succession as documented in Glacier Bay, Alaska. Be sure to define primary succession in your answer, and discuss the types of interactions that occur among the plant species. Would you expect a similar sequence of events to occur in other regions where primary succession occurs? Why or why not?

- d) One current explanation for the reason why some invasive species are successful is denoted EICA. Describe what this acronym stands for, and what it means in terms of comparing the native and non-native populations of a particular species. If you believe EICA is operating for a particular species, how would this knowledge allow you to plan to eradicate the species from its non-native range?

*Happy Holidays!*

*Remember to Promote the Importance of Plants!*

