Name _____

Principles of Landscape Ecology 565

David Mladenoff

***Write your name on each page now*.**
Answer concisely, and write clearly. Phrases are fine if they are complete thoughts, otherwise concise sentences. Numbering items can be useful. Long narrative will not be rewarded. Do not use more space than what is under a question, writing in normal-sized script. Think first. *Read all parts of a question before beginning to answer the first part. Read each part carefully and be certain you are answering the question.* Each question is worth 30 pts, and everyone gets 10 bonus points. **Answer 3 of the 4 questions. Good luck.**

1-A. Describe a study landscape in Wisconsin. You decide if it is in the south or north, and what cover types dominate. The landscape must have a stream and lakes.

1-B. Use a graphic to show the various pathways of precipitation into the surface water. Indicate relative importance of the pathways.

Name _____

1-C. Explain why these pathways differ in importance.

2. Compare island biogeography, metapopulation theory, and a more explicitly 'landscape ecology' approach as conceptual models of organism population dynamics. Explicitly consider both theory and usefulness in conservation applicaton.

2-A. What did island biogeography contribute? Explain with a conceptual graph if you wish.

2-B. How was metapopulation theory an improvement?

Name _____

2-C. What does landscape ecology contribute?

3-A. Give four reasons why it makes no sense to apply landscape ecology to micro-scale studies of beetles, or forest herbs.

3-B. Give four reasons why these kinds of studies are very appropriate to landscape ecology.

Name _____

4. Describe a landscape which has undergone significant human-induced change.

4-A. Describe how information on both current conditions, and past activities and events, would contribute to understanding the current state of the ecosystems.

4-B. Considering info in (4-B), that is, current and past conditions, how would this be of value in restoring conditions and processes for the future? Describe items explicitly for this landscape.

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1) A) Describe a 'landscape' (any scale; can be aquatic, any kind) in which natural ecological disturbances predominate, or once did.

A) How could you assess if this was an equilibrium system?

2) A) Conceptually, describe the advantages and disadvantages of the 'patch-matrix' conceptual model of a landscape.

2) B) Operationally, if you were mapping a landscape, when would a polygon-based map type as described in 2-A be more or less useful than a pixel-based map as, for example, portrayed by a classified Landsat scene.

Name _____

3) A) How are landscape metrics useful?

3) B) How are they not useful, and with what cautions should you approach using metrics?

4) Read the entire question first.

Name _____

A) Briefly describe a landscape in which you are interested.

B) State a well-defined, limited question or hypothesis related to this landscape that could be investigated by simulating landscape change with a cellular automata model.

C) Describe the extent, grain, and classes on this landscape that you would need to best answer this question, and to develop the model.

D) Would a four-neighbor rule or an eight-neighbor rule be best for simulating change in the process you are interested in? Why?

5) A) Briefly describe another landscape (or use the same one in #4).

Name _____

A) State a question or hypothesis that involves landscape pattern and a process.

B) Describe which landscape metrics you would want to calculate, and why.

6) A) For your question in 5-B, describe the hierarchical scale at which your question lies.

B) What are higher level constraints on the focus of your question or hypothesis? At How many levels?

Name _____

C) What are lower level mechanisms that might be investigated to answer your question?

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