LANDSCAPE ECOLOGY OF FOREST AND RANGELANDS

Discussion: Conservation of biological diversity at the landscape scale

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Discussion Questions.

1) What is biodiversity and how can it be measured? What are the dangers of approaching biodiversity conservation at only one scale? What are the strengths and weaknesses of species-level and ecosystem-level conservation plans? What is a biodiversity hotspot?

2) Why does the matrix surrounding conservation areas matter in landscape-level management? Why is the matrix critical in conserving biodiversity?

3) How does metapopulation theory differ from landscape ecology? How should landscape ecologists use metapopulation analyses in their work? What is a minimum dynamic area and how should it be applied?

4) How much does one need to know about the landscape/organisms present in order to be able to apply each of these concepts: single-species umbrella, multi-species umbrella, focal species?

5) When considering site-selection umbrellas or even area-sensitive umbrellas, how do we know that we are addressing all the important ecological processes and functions that affect the species we are interested in?

6) When considering the conservation of landscapes, which is more important—capturing more biodiversity and conserving rare/uncommon species or conserving large areas of landscape that may not necessarily encompass all species, but do encompass most ecosystem processes?

Main Points.

1) Biodiversity conservation requires a multi-scale approach—one that examines local, intermediate, coarse, and regional geographic scales. Looking at biodiversity on only one scale will lead to an incomplete picture of the issues at hand. Although a multi-scale approach seems obvious, management strategies and actual application can be very complicated.

2) The umbrella species concept approaches management at the species level, but can be an effective tool for managing biodiversity of landscapes when funding and/or time are limited. It is a tool to simplify the multi-scale approach.
3) Single species umbrellas have little support for conservation benefits on beneficiary species, but multispecies concepts seem to be more effective. Perhaps this is because they address more complexity within the system similar to the complexity of the multi-scale approaches.

4) Ecosystem or landscape-based conservation can be difficult to implement because of the processes involved, so using multiple focal species can be a practical way to address this problem. Using multiple focal species is only effective when one considers a broad range of taxa (vertebrates, invertebrates, and plants).

5) The make-up of the landscape is unique in almost all situations. Analyses of patch size, the matrix, population dynamics, and disturbance must be done in order to organize a plan for conserving biodiversity. These ideas incorporate the concepts of fragmentation and corridors discussed previously.

Readings (all available online through U of I library)


Recommended:
Franklin, J.F. 1993. Preserving biodiversity: species, ecosystems, or landscapes? Ecological Applications 3(2): 202-205. (This is a very short article that is easy to read…we will briefly discuss this one)

Additional References.


