

Economics of Biodiversity

Based on Hanley, Shogren, and White, Chapter 13

March 23, 2005

Why worry, and about what?

- Biologists believe we are seeing a sharp increase in extinctions, likely caused by human actions that lead to habitat destruction
- Biodiversity is defined as:
 - “the variability among living organisms from all sources, including inter alia, terrestrial, marine, and other aquatic systems, and the ecological complexes of which these are a part; this includes diversity within species, between species, and of ecosystems.” (UNEP, 1993)
- Biodiversity loss is “any regional loss of species of any reduction in the geographical range of species which reduces their genetic diversity”

Why is biodiversity loss an economic issue?

- Biodiversity has several values to society:
 - Direct (use) values
 - Contribution to ecosystem services
 - Aesthetic and other non-use benefits
 - See Nunes for more.
- Economic activity influences the risk of species extinction
- Species protection has opportunity costs
- Economic incentives have an important impact on possibilities for biodiversity preservation

Their simple model of species value

- Weitzman model is based on “distinctiveness,” which they note may say little about economic value (and nothing about interdependencies)
- Choice variable in are of land preserved
- Net benefit of conservation depends on:
 - Probability of survival times
 - Direct value of distinctiveness
 - Ecosystem services value
 - Non-use value
 - Opportunity costs of conversion in terms of next highest value of the land
- See figure 13.1

Safe Minimum Standards

- If external costs in terms of species extinction have non-linear thresholds, a safe minimum standard may be called for (Remember Perman on sustainability?)
- See Figure 13.2.

Scale issues

- Broad public goals for preservation may conflict with individual incentives
- In other words, there is a scale mismatch between costs and benefits
- This is manifested at regional, national, and international scales
- Possible solutions include:
 - Laws that provide compensation to land owners for lost private values
 - Policies that allow local users to capture economic benefits from conservation

Writing assignment for next week

- Read the NYT's article, “Few Habitats, Many Species ..”
- Discuss the article in terms of the theory and policy presented in the Hanley et al. chapter. Do you think that cost-benefit analysis would support the “hotspot” approach? How about the “safe minimum standard” approach? What are the potential opportunity costs to hotspot preservation? Are there different implications for the three different sources of value described in the chapter?
- What might the Heal and Nunes papers add to this debate?