

Conservation Science – Goals and Learning Objectives

Biological Diversity

Goal for Workshop:

To increase understanding of the role that biodiversity plays in conservation science.



Major Learning Objectives:

1. Describe biological diversity (biodiversity), including species diversity (richness), genetic diversity, and ecosystem diversity.
2. Understand the scale dependence of biodiversity and its measurement (including alpha, beta, and gamma diversity).
3. Describe some major empirical generalizations related to biodiversity, including the species-area effect, the latitudinal gradient in species richness, the relationship between habitat diversity (heterogeneity) and species richness, and the diversity-stability relationship.
4. Understand that higher biodiversity, per se, is not necessarily better from a conservation perspective.
5. Describe the processes that generate and maintain biodiversity.
6. Explain the differences between within-population and among-population genetic diversity.
7. General knowledge of past mass extinctions and the current extinction crisis.
8. Explain some utilitarian and non-utilitarian reasons for conserving biodiversity.

Ecosystem Integrity

Goal for Workshop:

To increase understanding of the factors that sustain or threaten ecosystem integrity.

Major Learning Objectives:

1. Understand different types of ecosystem services and provide examples of ultimate and proximate threats to biodiversity and ecosystem integrity.
2. Understand ecosystem resilience, ecosystem collapse and alternative stable states.
3. Understand the general history of ecosystem decline and degradation in North America.
4. Understand why both common and rare species can be important in ecosystem function.
5. Understand that ecological processes are essential for maintaining biodiversity and ecosystem integrity.
6. Understand habitat loss and fragmentation and their impacts on biodiversity and ecosystem integrity.
7. Explain the effects of altering natural disturbance regimes and the differences between historic and anthropogenic disturbance regimes on ecosystem integrity.
8. Understand how human activities can impact integrity of terrestrial, aquatic, and marine ecosystems.
9. Understand the specific threats exotic and invasive species pose to ecosystem integrity.
10. Understand threats posed by global climate change.

Conservation Strategies for Sustainable Ecosystems

Goal for Workshop:

To increase understanding of strategies and approaches used to conserve biodiversity and maintain ecosystem integrity.

Major Learning Objectives:

1. Have a working knowledge of the history of conservation responses to threats to biodiversity and ecosystem integrity, especially in North America.
2. Identify and describe strategies of modern conservation planning, including principles and methods for the selection and design of conservation areas.
3. Understand approaches used to mitigate impacts of habitat fragmentation and the impacts of roads (e.g., barrier fencing and wildlife crossings).
4. Understand the logic and concepts of using cost-benefit analysis in conservation planning.
5. Articulate the advantages of ecosystem-level conservation and management, as opposed to purely species-level management.
6. Understand that ecological restoration and mitigation are essential components of conservation today.
7. Understand the importance of local land-use planning to accomplish broader goals.