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Environmental Management
February 2002, Volume 29, Issue 2, pp 290-300

Determining Ecological Equivalence in Service-to-Service Scaling of Salt Marsh Restoration

Abstract

The amount of ecological restoration required to mitigate or compensate for environmental injury or habitat loss is often based on the goal of achieving ecological equivalence. However, few tools are available for estimating the extent of restoration required to achieve habitat services equivalent to those that were lost. This paper describes habitat equivalency analysis (HEA), a habitat-based “service-to-service” approach for determining the amount of restoration needed to compensate for natural resource losses, and examines issues in its application in the case of salt marsh restoration. The scientific literature indicates that although structural attributes such as vegetation may recover within a few years, there is often a significant lag in the development of ecological processes such as nutrient cycling that are necessary for a fully functioning salt marsh. Moreover, natural variation can make recovery trajectories difficult to define and predict for many habitat services. HEA is an excellent tool for scaling restoration actions because it reflects this ecological variability and complexity. At the same time, practitioners must recognize that conclusions about the amount of restoration needed to provide ecological services equivalent to those that are lost will depend critically on the ecological data and assumptions that are used in the HEA calculation.



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Journal

Environmental Management
Volume 29, Issue 2 , pp 290-300

Cover Date

2002-02-01

DOI

10.1007/s00267-001-0019-X

Print ISSN

0364-152X

Online ISSN

1432-1009

Publisher

Springer-Verlag

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Keywords

- **KEY WORDS:** Salt marsh; Ecological equivalence; Habitat equivalency analysis; Ecosystem services; Natural resource damage assessment

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Authors

- ELIZABETH STRANGE ^(A1)
- HECTOR GALBRAITH ^(A1)
- SARAH BICKEL ^(A1)
- DAVE MILLS ^(A1)
- DOUGLAS BELTMAN ^(A1)
- JOSHUA LIPTON ^(A1)

Author Affiliations

- A1. Stratus Consulting Inc., P.O. Box 4059, Boulder, Colorado 80306, USA, US

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