Measuring the Value of Restored Coastal Ecosystems

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A key concern about attempts to restore ecosystems is whether the restorations are successful. Restorations are undertaken for many different purposes, including voluntary attempts to improve degraded habitats, a desire to provide habitat for particular species (such as waterfowl), and agency-mandated mitigation for impacts to biological resources. Success can only be evaluated with respect to the goals of a project, so it is essential to state the criteria that define success before a restoration is attempted. Unfortunately, this is seldom done.

Often, the goal of restoration will be to improve the value of a habitat or to insure that there is no net loss of resource values. Determining whether these goals are achieved requires that a value be assigned to a habitat or ecosystem. A number of habitat valuation techniques have been developed, the best known being the U.S. Fish and Wildlife Service's Habitat Evaluation Procedures (HEP) and the Wetland Evaluation Technique (WET), developed for the Federal Highway Administration and modified for the Corps of Engineers. Limitations in these techniques (in the number or types of species or habitats that can be included) have motivated a search for a more general method of valuing habitats.

This paper identifies some basic principles of valuing objects and discusses how these principles can be applied to ecosystems. Identifying the functions to be valued is critical. An ecosystem valuation method should include fundamental ecological functions that occur across a variety of habitats. A preliminary but comprehensive list of the biological functions of marine habitats is presented and a framework for a systematic ecosystem valuation is proposed. The proposed ecosystem valuation approach is illustrated with a hypothetical example comparing the value of a wetland before and after restoration. Various issues associated with ecosystem valuation are discussed, including the need to identify standards or optimal conditions, assumptions about the interchangeability of different resources, and assignment of importance to different biological functions.