OVERVIEW OF VOLUME TWO: TOOLS FOR MONITORING COASTAL HABITATS

Volume One of *Science-Based Restoration Monitoring of Coastal Habitats* provides guidance on designing and implementing scientifically defensible monitoring plans. Volume Two contains the tools to aid the development and implementation of a plan. Together, these volumes focus practitioners on key habitat characteristics to be monitored and provide assistance in the selection among the many available monitoring techniques. This will result in the collection and dissemination of timely information that can be used in project and estuary or watershed level adaptive management, as well as contribute to the improvement of the design, construction, and monitoring of future projects.

Volume Two: Tools for Monitoring Coastal Habitats includes seven parts:

- Coastal Habitats: Ecology, Restoration, and Monitoring
- Selection of Reference Sites or Conditions
- Review of Restoration Monitoring Programs in the United States
- Review of Acts Relevant to Restoration Monitoring
- Sample List of Costs Involved in Restoration Monitoring
- Review of Socioeconomic Factors Associated with Restoration Monitoring
- Glossary

Coastal Habitats: Ecology, Restoration, and Monitoring provides a review of the ecology and restoration monitoring approaches applied within the marine and Great Lake coastal habitats listed earlier in this document. An introduction and description of each coastal habitat type is listed. Habitat structure, including dominant species and prevailing factors, and habitat functions and ecological values are explained for each habitat type and supported by case studies. Common anthropogenic impacts on each coastal habitat are described. Examples of significant restoration monitoring projects on each coastal habitat are listed and briefly described. Finally, a list of experts who have provided input to this document and are willing to answer detailed questions will be provided for each habitat.

Coastal Habitats: Ecology, Restoration, and Monitoring also presents two annotated bibliographies for each habitat that will assist practitioners with planning, designing, restoration, and monitoring. The first annotated bibliography for each habitat includes summaries and case studies of recent monitoring projects. Each of the entries includes the source and a short abstract of various studies that have been conducted for restoring and monitoring the habitat. The second annotated bibliography for each habitat includes commonly used protocols and techniques manuals used in coastal habitat monitoring for those in need of ideas on how to monitor the habitats in their restoration project. The techniques manuals discussed here are not recommended as the standard for all monitoring, but are suggested as examples that should be modified with each monitoring project. These annotated bibliographies include both gray and peer-reviewed literature, but are not all-encompassing. The entries within the bibliography are arranged in alphabetical order either by the author's last name or by source. The techniques manuals discussed here are not recommended as the standard for all monitoring, but are suggested as examples that should be modified with each monitoring project. Finally, a list of experts who have provided input to this document and are willing to answer detailed questions will be provided for each habitat.

Selection of Reference Sites or Conditions reviews the methods available for choosing areas or conditions to which a restoration site may be compared, both for the purposes of setting goals during project planning and for monitoring the development of the restored site over time. Without the use of reference sites or conditions, a restoration practitioner would be unable to appropriately determine what plant or animal species to introduce to an area, which abiotic characteristics to create, and if changes in a restoration site over time were caused by natural variation or were actually the result of restoration efforts.

Review of Restoration Monitoring Programs in the United States is a review and inventory of current and significant regional restoration monitoring programs in the United States and its protectorates. Information on each monitoring program will be compiled into an easily searchable database available on the Internet. This review of restoration monitoring programs will allow restoration practitioners to locate regional monitoring programs that may serve as models for the establishment or improvement of their own efforts. Monitoring programs selected for inclusion in the database are current or have easily accessible, extensive data. This database is not meant to be comprehensive, but will serve as a list of significant examples of restoration monitoring programs in the United States.

Information presented on each monitoring program is intended to give the general scope of the program. Contact information and references are provided to allow the reader to gather more detailed information as needed. Specifically, the database provides the name, website address, supporting agency, location and region, secondary website address, status, start and end date, habitat types, metrics, contact name and information, goals and objectives, and descriptive notes for each monitoring program.

Review of Acts Relevant to Restoration Monitoring is a summary of the major United States Acts that support restoration monitoring. Responsibility for restoration and monitoring of coastal habitat is a shared responsibility among the states, Tribal Nations, and other Federal departments of the United States The Acts described in this section include the Estuaries and Clean Waters Act of 2000, Anadromous Fish Conservation Act, the Clean Water Act, the Endangered Species Act, Marine Protection Research and Sanctuaries Act, the Fish and Wildlife Coordination Act, the Magnuson-Stevens Fishery Conservation and Management Act, and the National Environmental Policy Act.

Sample List of Costs Involved in Restoration Monitoring is designed as a general aid in the development of planning preliminary cost estimates of restoration monitoring activities. Estimates on costs of personnel, labor, and equipment are provided on a daily or hourly rate. These examples of planning cost estimates will vary by region and demand and can be updated by a cost inflation factor.

Review of Socioeconomic Factors Associated with Restoration Monitoring is a review of methods for gauging the socioeconomic impacts of restoration projects. It will identify the socioeconomic goals commonly associated with coastal restoration projects and discuss the relationship between the ecological objectives and the socioeconomic benefits. Additionally, the document will examine metrics used to monitor progress toward socioeconomic goals and will present an annotated bibliography of references on socioeconomic factors in restoration projects.

Glossary contains definitions for terms commonly used in coastal habitat restoration and monitoring.

Future Documents

After publication of Volumes One and Two of *Science-Based Restoration Monitoring of Coastal Habitats*, the authors will develop a series of habitat and issue-specific documents for selected habitats. Each document will include a summary of common protocols used in restoration monitoring, a list of experienced scientists willing to answer questions, examples of monitoring for past and current projects, a summary of current research related to restoration and monitoring, a discussion of common problems in restoration monitoring, and the prominent socioeconomic issues surrounding monitoring. These habitat-specific documents will supplement the information presented in this manual and will be written for both scientists and non-scientists.

Figure 18. Grab sampler being used to determine soft bottom characteristics. Photo courtesy of Robert A. Pawlowski, NOAA Corps. Publication of the NOAA Central Library. http://www.photolib.noaa.gov/fish/fish1017.htm