



Habitat Restoration: Information for Land Trusts

What is Habitat Restoration?

Habitat restoration is defined as “the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed” by the Society for Ecological Restoration. The goals for an individual project will vary from site to site, but overall the intention is to allow a site to return to its historic ecological trajectory. This return can be measured by comparing site characteristics to an undisturbed or less-disturbed “reference” site. Restoration can encompass a wide variety of actions including removing a specific source of stress, restoring natural processes like flooding and fire, removing invasive species or reintroducing extirpated native species.

Elements of a Habitat Restoration Plan

The habitat restoration process can be expensive and usually entails multiple years, decades or even perpetual commitment. A habitat restoration plan ensures that goals and methods are well defined, transparent and incorporate community support. Habitat restoration plans also provide a basis for monitoring, which is important for measuring success and enabling managers to share the results of different restoration methods.

The Society for Restoration Ecology identifies these essential elements of a habitat restoration plan:

1. A clear rationale as to why restoration is needed;
2. An ecological description of the site designated for restoration;
3. A statement of the goals and objectives of the restoration project;
4. A designation and description of the reference site;
5. An explanation of how the proposed restoration will integrate with the landscape and its flows of organisms and materials;
6. Explicit plans, schedules and budgets for site preparation, installation and post-installation activities, including a strategy for making prompt mid-course corrections;
7. Well-developed and explicitly stated performance standards, with monitoring protocols by which the project can be evaluated; and
8. Strategies for long-term protection and maintenance of the restored ecosystem.

General Restoration Planning Resources

Society for Ecological Restoration (www.ser.org)

The Society for Ecological Restoration (SER) is the non-profit professional society for restoration ecology researchers and practitioners. SER publishes the peer-reviewed journal *Restoration Ecology*, organizes conferences and creates publications to encourage best practices in the restoration field. These publications include: “International Primer on Ecological Restoration,” which is an excellent broad description of the range of restoration practices:

www.ser.org/content/ecological_restoration_primer.asp, and “Guidelines for Developing and Managing Ecological Restoration Projects,” which highlights critical considerations for the entire project cycle from conceptual planning through to implementation and evaluation of results. In this guide, the authors discuss concepts like restoration options and goals; practical considerations like equipment, personnel and permitting; and elements of an adaptive management system such as installing monitoring fixtures and ecological evaluation: www.ser.org/content/guidelines_ecological_restoration.asp.



The Nature Conservancy's Conservation Action Plan

The Nature Conservancy's Conservation Action Plan process, summarized to the right, is used to plan and implement biodiversity enhancement projects at multiple scales. The ten-step process covers conservation targets, stresses, sources, strategies and successes.

www.conserveonline.org/docs/2005/08/CAP_2-pager.doc
(general overview)

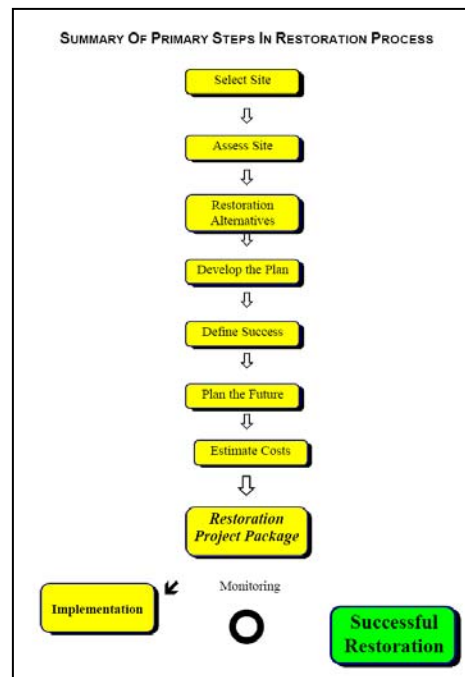
www.conserveonline.org/docs/2005/08/TNC_CAP_Basic_Practices_v_17_Jun_05.pdf (more in depth)



Restoration Procedures Manual for Public Lands in Florida

The Nature Conservancy created this detailed manual for restoring public lands in Florida, for the Florida Department of Environmental Protection. The primary steps are summarized to the right. The manual consists of four major components: (1) an overview of restoration planning; (2) a step-by-step discussion of the planning process; (3) an explanation and checklist of information typically required for soliciting funding for restoration work; and (4) tips for implementation.

www.dep.state.fl.us/water/wetlands/mitigation/rpm.htm



Trustees of Reservations, Massachusetts

The Trustees of Reservations, the oldest land trust in the nation, has a mission to protect land for scenic, historic and ecological values. As a result, the Trustees developed a set of guiding principles and strategies for incorporating biodiversity protection into their land management practices. In addition to this paper, they have posted comprehensive management guides for forests, grasslands and wetlands.

www.thetrustees.org/pages/1418_ecological_resources.cfm

Habitat-Specific and Regional Resources

Restoration techniques clearly must vary depending on which region or habitat type is being restored. The following resources give guidance for particular habitat types, although the information can be applied in other areas with similar habitats with some modifications.

Terrestrial Habitats

Grassland Habitat for Birds in Wisconsin

This U.S. Geological Survey website provides a general guide to managing grassland habitat for birds in Wisconsin. Sections include an overview of management issues, priority species and habitats, guidelines and recommendations for habitat management (including habitat size and shape, surrounding land use and land management techniques) and management priorities in each region of Wisconsin.

www.npwr.usgs.gov/resource/birds/wiscbird

Woodland Health in Iowa

The Iowa Natural Heritage Foundation posted “Woodland Health: Stewardship Options for Iowa Woodland Owner” which is useful for woodlot owners, especially in the Midwest. This guide gives practical information for dealing with invasive species, limiting damage from livestock and deer, minimizing habitat fragmentation and permanently protecting woodlots.

www.inhf.org/Woodland-booklet.htm

Oak Woodlands and Prairies in the Willamette Valley in Oregon

“Restoring Rare Native Habitats in the Willamette Valley: A Landowners Guide for Restoring Oak Woodlands, Wetlands, Prairies, and Bottomland Hardwood and Riparian Forests”. This guide provides detailed guidance on the mechanics of re-establishing functioning examples of the Willamette Valley's rare native habitats. The information, drawn from published sources, on-the-ground experience and trial-and-error, is a distillation of lessons learned over the years by Bruce Campbell and other practitioners of the science, art and craft of habitat restoration.

www.biodiversitypartners.org/pubs/Campbell

Aquatic Habitats

Office of Water, Environmental Protection Agency

The Environmental Protection Agency maintains a number of websites and publications on wetlands and stream restoration. The following websites link to manuals, aimed at a general audience, that give technical guidance for riparian and wetland restoration.

www.epa.gov/owow/wetlands/restore

Stream Corridor Restoration

Fifteen federal agencies (including Natural Resource Conservation Service, U.S. Forest Service, National Oceanic and Atmospheric Administration, Environmental Protection Agency, Federal Emergency Management Agency and U.S. Department of Defense) came together to produce this comprehensive handbook to stream corridor restoration. The handbook includes background information on stream morphology, restoration planning, restoration design and monitoring. The website also links to case studies of stream restoration and other useful resources.

www.nrcs.usda.gov/technical/stream_restoration

Wetland Restoration in Wisconsin

Wisconsin Department of Natural Resources produced this handbook to help landowners restore wetlands on their land. It includes practical information on wetland biology, restoration planning, seeding and planting, invasive species, regulations, monitoring and where to go for more help.

www.dnr.state.wi.us/org/water/fhp/wetlands/resman.shtml

Riparian Restoration in the Chesapeake Bay

The Maryland Cooperative Extension maintains a website with numerous links to fact sheets, manuals and peer-reviewed journal articles relating to various aspects of stream restoration. Some topics covered include stream bank stabilization, buffer design, wildlife considerations and economic considerations.

www.riparianbuffers.umd.edu/manual.html

Wetlands and Riparian Forests in the Willamette Valley in Oregon

“Restoring Rare Native Habitats in the Willamette Valley: A Landowners Guide for Restoring Oak Woodlands, Wetlands, Prairies, and Bottomland Hardwood and Riparian Forests”. This guide provides detailed guidance on the mechanics of re-establishing functioning examples of the Willamette Valley's rare native habitats. The information, drawn from published sources, on-the-ground experience and trial-and-error, is a distillation of lessons learned over the years by Bruce Campbell and other practitioners of the science, art and craft of habitat restoration.

www.biodiversitypartners.org/pubs/Campbell

Riparian Restoration in Washington State

The Water Center at the University of Washington maintains a website with published, peer-reviewed articles about stream restoration and watershed management in the Pacific Northwest.

www.depts.washington.edu/cwws/Research/rehabilitation.html

LIVING LANDS: Helping Land Trusts Conserve Biodiversity

Species Restoration

Habitat Conservation Planning

Habitat Conservation Plans (HCPs) are a pre-requisite to obtaining an "incidental take" permit under the Endangered Species Act. Incidental take refers to take (i.e. harm to an endangered species) that is "incidental to, and not the purpose of, the carrying out of an otherwise lawful activity." HCPs outline specific steps that the applicant must take to minimize and mitigate impacts to the endangered species. Frequently these plans require habitat protection, restoration and enhancement in one area in exchange for some lost habitat in another. The U.S. Fish and Wildlife Service has developed the Habitat Conservation Planning Handbook to help guide applicants and planners through the HCP planning process.

www.fws.gov/endangered/hcp

Endangered Species Permit Requirements

Work with endangered species normally requires permits from the U.S. Fish and Wildlife Service or the National Marine Fisheries Service, as well as state and in some cases, local government. See the website below for details.

www.fws.gov/endangered/permits

Neotropical Migratory Birds in Iowa

The Iowa Natural Heritage Foundation has published the free booklet "A Bird's Eye View: A Guide to Managing and Protecting Your Land for Neotropical Migratory Birds in the Upper Mississippi River Blufflands." This guide recommends actions that can provide nesting habitat for this set of sensitive and declining bird species.

www.inhf.org/neotropbook.htm

Small Scale Project Resources

The following sites can help individual landowners initiate small scale restoration projects on their land.

Partners for Fish and Wildlife Program (U.S. Fish and Wildlife Service)

This federal program provides technical assistance to private landowners interested in habitat restoration projects. The program pairs a local field biologist with private landowners to create a restoration plan. The program gives preference to projects that will benefit Federal Trust Species, complement National Wildlife Refuge efforts, address other species and habitat priorities, reduce habitat fragmentation, help buffer public lands and produce self-sustaining ecosystem functions.

<http://ecos.fws.gov/partners>

Small Habitat Restoration Program, Washington State

This website provides information to landowners interesting in doing small scale re-vegetation projects along streams and wetlands. The site includes information on creating a site plan, choosing native plant species, creating and implementing a planting plan and maintaining the site.

www.dnr.metrokc.gov/wlr/cposa/shrp

Habitat Restoration Examples

Habitat restoration is most effective when it is part of a larger conservation planning effort. Even small scale restoration projects can contribute to a landscape or regional conservation network if planning efforts are coordinated effectively. The following examples illustrate restoration projects and planning at multiple scales.

State and Regional Restoration

State Wildlife Action Plans

In a new effort to address non-game wildlife, each state wildlife agency has recently completed a comprehensive wildlife action plan. The plans include information on priority species and habitats in the greatest need of conservation and outline strategies, including restoration efforts, to protect and enhance these species. Defenders of Wildlife has recently completed a review of all the state plans. More information is available at these websites.

www.defenders.org/statewildlifeplans

www.teaming.com

LIVING LANDS: Helping Land Trusts Conserve Biodiversity

Chicago Wilderness Biodiversity Recovery Plan

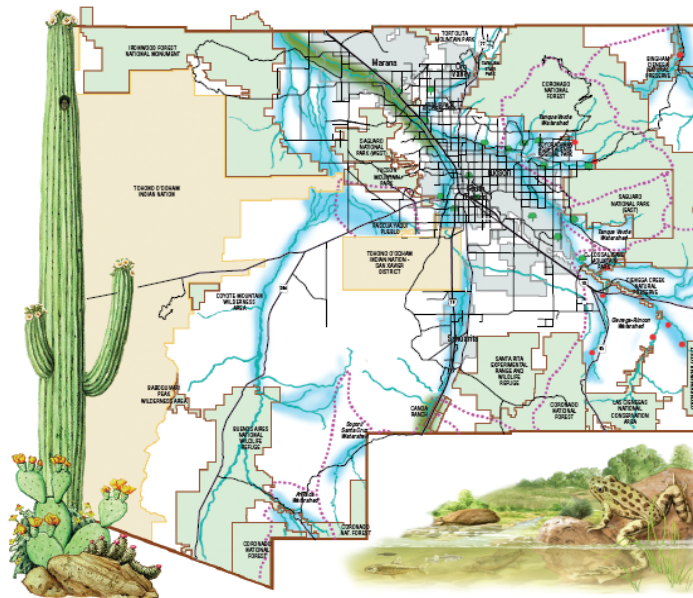
The Chicago Wilderness Biodiversity Recovery Plan for northeast Illinois illustrates the role of habitat restoration in protecting biodiversity in a highly altered landscape. The plan outlines a broad vision of actions and objectives to achieve a more sustainable and diverse ecosystem around the Chicago metropolitan area. The highest priority restoring protected lands. www.chicagowilderness.org/pubprod/brp

West Eugene Wetlands Plan, Oregon

The West Eugene Wetlands Plan provides a landscape-level wetlands management vision that coordinates with the city and county land use plans. Plan elements include a functional wetlands mitigation banking system, wetland restoration and enhancement projects, riparian restoration and enhancement projects, native seed collection for restoration and monitoring provisions. The program's website includes information on these elements and links to the Plan itself. www.eugene-or.gov/portal/wetlands

Sonoran Desert Conservation Plan

The Sonoran Desert Conservation Plan identifies ecologically significant resources in Pima County, home to fast-growing Tucson, Arizona. Riparian areas, shown at right, are critical in desert ecosystems, so the Pima County plan focuses heavily on streamside restoration. This award winning plan is an excellent example of integrating restoration with land use planning. www.pima.gov/cmo/sdcp



Comprehensive Everglades Restoration Plan

The Everglades restoration effort is one of the largest in the nation. This effort has focused primarily on restoring hydrologic function to the everglades system. This website gives an overview of the restoration effort and the plan itself as well as providing information on individual projects throughout the Everglades. www.evergladesplan.org

Site Restoration

Midwin National Tallgrass Prairie, Illinois

Midwin National Tallgrass Prairie is the first of its kind in the United States. The U.S. Forest Service, along with numerous local partners, manages the National Prairie, which covers over 19,000 acres in Illinois. Prairie and wetland restoration are critical components of the area's management plan, which is available on the area's website. www.fs.fed.us/mntp/about.htm

The Karner Blue Restoration Project, Indiana

The story of The Nature Conservancy's Ivanhoe Nature Preserve in Indiana illustrates the importance of habitat management in protecting rare species. Ivanhoe originally harbored the endangered Karner Blue Butterfly, but fire suppression encouraged a shift from the Karner Blue's preferred open savanna habitat to less suitable woody vegetation. Eventually, the butterfly disappeared from the reserve. In response, the Conservancy cleared parts of the forest canopy to allow more light to reach the understory and initiated a prescribed burn regime. These efforts have resulted in dune and swale habitats with scattered oak savanna. Re-introduction and further restoration efforts in surrounding habitat patches are some of the next steps in the Conservancy's restoration plan. www.nature.org/wherewework/northamerica/states/indiana/preserves/art12868.html

Coordination and Evaluation

Conservation Effects Assessment Program, U.S. Department of Agriculture

The Conservation Effects Assessment Project began in 2003 as a multi-agency effort to quantify the environmental benefits of conservation practices used by private landowners participating in selected USDA conservation programs. The project will complete an assessment of conservation practices at the national level and for watersheds and a bibliography and literature review of current conservation practices.

www.nrcs.usda.gov/Technical/nri/ceap