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PROTECTING AND RESTORING WETLANDS: STRENGTHENING THE ROLE OF LAND TRUSTS

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PREFACE

This paper has been written to help strengthen the role of land trusts in protecting and restoring wetlands. First, it provides examples of how land trusts are now protecting and restoring wetlands. References are provided of land trust web sites for readers who wish more detailed information. Second, it suggests how federal, state, and local governments could encourage and help land trusts protect and restore wetlands.

The paper has been written as part of a two-year Association of State Wetland Managers, Inc. (ASWM) project to strengthen local government, land trust and watershed council wetland protection and restoration programs for vulnerable wetlands. One or more workshops will also be conducted as part of this project.

BASIS FOR PAPER

The paper draws upon a review of the wetland literature and web sites (see bibliography). It draws upon interviews with land trust staff concerning local wetland protection and restoration efforts. It draws upon an earlier question and answer guide pertaining to the roles of land trusts in protecting and restoring wetlands prepared by the author.

ACKNOWLEDGEMENTS

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Much of the material in this paper has been derived from publications and the web sites of the Land Trust Alliance. We greatly appreciate their assistance and strongly recommend their publications. Anyone wishing more information should contact them directly at Land Trust Alliance, 1331 H Street, NW, Suite 400, Washington, DC 20005, 202-638-4725, info@lta.org.

Thanks also goes to the many individuals who shared their perceptions on particular topics and provided review of the draft, especially Jeanne Christie of ASWM for her helpful comments, and Sharon Weaver for her editorial assistance.

DISCLAIMER

The report was prepared with funding support from grant number X7-83266801-0 from the U.S. Environmental Protection Agency, Office of Wetlands, Oceans, and Watersheds, Wetlands Division. The opportunity to share our views on this subject is much appreciated. The ideas contained herein are the author's and should not be attributed to the U.S. Environmental Protection Agency or ASWM.

Cover Photo: Great Salt Lake Shorelands Preserve Visitor Center. The Nature Conservancy. See http://nature.org/wehrewework/northamerica/states/utah/misc/art10381.html.

All photos are from Internet web sites listed by the photos unless otherwise indicated. We do not list photographer's name, only web address of the site. Please contact us if there are any errors of if you do not wish a photo from the web used in this report.

EXECUTIVE SUMMARY

In the last decade, the 1600 land trusts in the U.S. have played an important role in protecting and restoring wetlands primarily through fee acquisition and conservation easements. Increasingly, they applying other techniques as well which are discussed below. Land trusts are also key to strong local government wetland protection and restoration programs. Federal agencies, states, and local and governments should encourage and support land trust protection and restoration initiatives.

WHAT CAN LAND TRUSTS DO TO PROTECT AND RESTORE WETLANDS?

Options include:

- **Buy or otherwise acquire in fee additional wetlands.** Acquisition of open space and wildlife habitat is a principal goal of most land trusts. Wetlands and related ecosystems (e.g. riparian habitat) often constitute a major portion of community open space and wildlife habitat.

- **Persuade landowners to adopt conservation easements for wetlands and related ecosystems; negotiate and accept such easements.** Acquisition of conservation easements is an increasingly important role for land trusts.

- **Map or help map wetlands throughout a community.** Maps can help land trusts identify protection and restoration sites. Maps can also help landowners, local governments and others protect and restore wetlands.

- **Assess or help assess the biodiversity, habitat, and other functions and values of wetlands in a community or specific areas.**

- **Prioritize potential wetland and related ecosystem restoration sites for fee acquisition, easements, intensive land management, other protection or restoration measures.**

- **Actively manage wetlands** acquired by land trusts such as restoration of natural hydrology, creation of buffers, construction of boardwalks, and removal of exotic species.

- **Provide wetland interpretative programs** for the public such as wetland walks, programs for school children.

- **Help local governments undertake conservation planning.**

- **Educate and work with landowners** with regard to wetland functions and values, benefits of protection and restoration, management options techniques.

- **Comment on regulatory permits at federal (e.g., Section 404), state, and local levels.**

- **Persuade communities to adopt wetland protection regulations, draft such regulations, lobby for adoption.**

- **Buy, assemble, and hold land for other conservation entities.**

- **Construct and operate visitor centers.**

- **Construct boardwalks and trails to make wetlands accessible to the public.**

- **Restore wetlands.**
- **Organize and manage mitigation banks and other mitigation projects.**
- **Orchestrate wetland protection and restoration projects.**
- **Monitor wetlands.**
- **Carry out or assist wetland and related ecosystem research.**

HOW CAN FEDERAL AGENCIES, STATES, AND LOCAL GOVERNMENTS ENCOURAGE AND HELP LAND TRUSTS PROTECT AND RESTORE WETLANDS?

Options include:

- **Provide continued and strengthened tax incentives** for wetland protection and other open space objectives at all levels of government—income tax, gift tax, estate tax, and real estate tax. Tax incentives are the lifeblood of land trusts.
- **Provide detailed, accurate, and up-to-date wetland maps to land trusts.**
- **Provide trusts with wetland practical and accurate wetland assessment models and training in the use of such models.**
- **Provide land trusts with information suggesting location of endangered species, areas of special biodiversity, other features important in establishing protection and management priorities and plans.**
- **Provide training programs** in mapping wetlands, assessment wetlands, managing wetlands, restoring wetlands, creating mitigation banks, other management.
- **Provide "how to" manuals** pertaining to boardwalk construction, control of exotics, other management topics.
- **Provide case studies** of wetland protection and restoration by land trusts regionally and nationally.
- **Conduct joint research with trusts in exotic weed control, use of fire, restoration, assessment techniques, use of GIS systems, other topics of interest.**
- **Help land trusts establish mitigation banks.**
- **Provide land trusts with educational materials** suggesting how protection and restoration will benefit landowners as well as society.

TABLE OF CONTENTS

ABOUT LAND TRUSTS

Land Trusts

Land Trusts[1] are local, regional, or statewide not-for-profit corporations organized by members of the public and landowners under the laws of particular states to work with landowners to protect open spaces--natural, recreational, agricultural, historic, archaeological, and cultural sites. There are almost 1600 land trusts nationally (1537 in 2003) with over 800,000 members in the U.S. A survey of land trusts in 2000 by the Land Trust Alliance indicated that wetlands were among the most common types of land protected by trusts (52% protected wetlands). See http://www.caledonia.org.uk/socialland/land_trusts.htm.

The Sonoran Institute web site describes the functions of land trusts. See http://www.sonoran.org/resources/terms/si_glossary_trusts.html:

> Land trusts serve many functions in a community. They provide information on private, voluntary action landowners can take to protect their land while meeting their financial needs. Land trusts often perform natural and cultural resource inventories of individual properties. In addition, they may accept donations of land or conservation easements, typically holding the land 'in perpetuity'. Larger land trusts may broker purchases on behalf of differing interests, such as buying and then selling private land to a city or county for a local park, pooling funds from public and private entities for land purchases, or ensuring that private property is purchased by a conservation-oriented buyer.
>
> A local land trust provides an effective partner when protecting significant community resources. Although not a substitute for local land-use planning and regulation, land trusts can provide the leadership, commitment, and flexibility that are essential to effective community stewardship.

Land trusts have been formed in every state. As of the end of 2003, local and regional land trusts had protected 9,361,600-acres of natural areas. National land trusts have protected an additional 25 million acres. Land trust members are often motivated and influential members of a community. They are in a position not only to lobby for government funds for acquisition of wetlands and related ecosystems but to persuade their neighbors and other members of the community to protect and restore wetlands. They can map and assess wetlands, prepare community land and water plans, and encourage adoption of regulations and other protective measures.

Because they rely upon persuasion and landowner tax incentives, land trusts often avoid the negative connotations associated with zoning and other regulatory approaches to land use.

Some lands trusts like the Wetland Conservancy in Oregon operate statewide. Others are more regional like the Compact of Cape Cod Conservation Trusts, Inc. See http://www.compact.cape.com/. Still others focus upon specific local government or specific landscape features. For example, the Katy Prairie Conservancy in Texas is a land trust formed to help preserve a broad sweep of wetlands and uplands west and northwest from Houston.

[1] A land trust is a "nonprofit organization that, as all or part of its mission, actively works to conserve land by undertaking or assisting in land or conservation easement acquisition, or by its stewardship or such land or easements." This definition has been taken from the Land Trust Alliance. See http://www.lta.org/aboutlt/census.shtml.

The primary role of most land trusts is to purchase or otherwise acquire and protect open space lands. They are experts in working with landowners to help them protect their lands. Land trusts also acquire easements. Many local land trusts are also playing an increasingly important role as advocates and educators at the local level to assist community land and water planning efforts. See more detailed discussion of their roles below.

How Are Land Trusts Formed?

Steps in forming a land trust include:

- Organize a group of interested individuals who will serve as a board of directors and unpaid staff.
- Incorporate as a not-for-profit corporation in the state. Usually forms can be obtained from the Department of Corporations or Department of State. This may often be done at minimal cost with the help of a local lawyer (donated help is common).
- Apply for 501(c)(3) status with the IRS (the IRS requires a $500 fee).
- Operate the trust with a board of directors and volunteers or a combination of volunteers and paid staff.

Land Trusts and Wetlands

Some land trusts, like the Wetlands Conservancy in Oregon, have been formed primarily to protect wetlands. Other examples of land trusts focusing primarily upon wetlands include:

- The Bolsa Chica Land Trust, California (http://www.bolsachicalandtrust.org/). This land trust is devoted to the protection of Bolsa Chica wetlands in southern California.

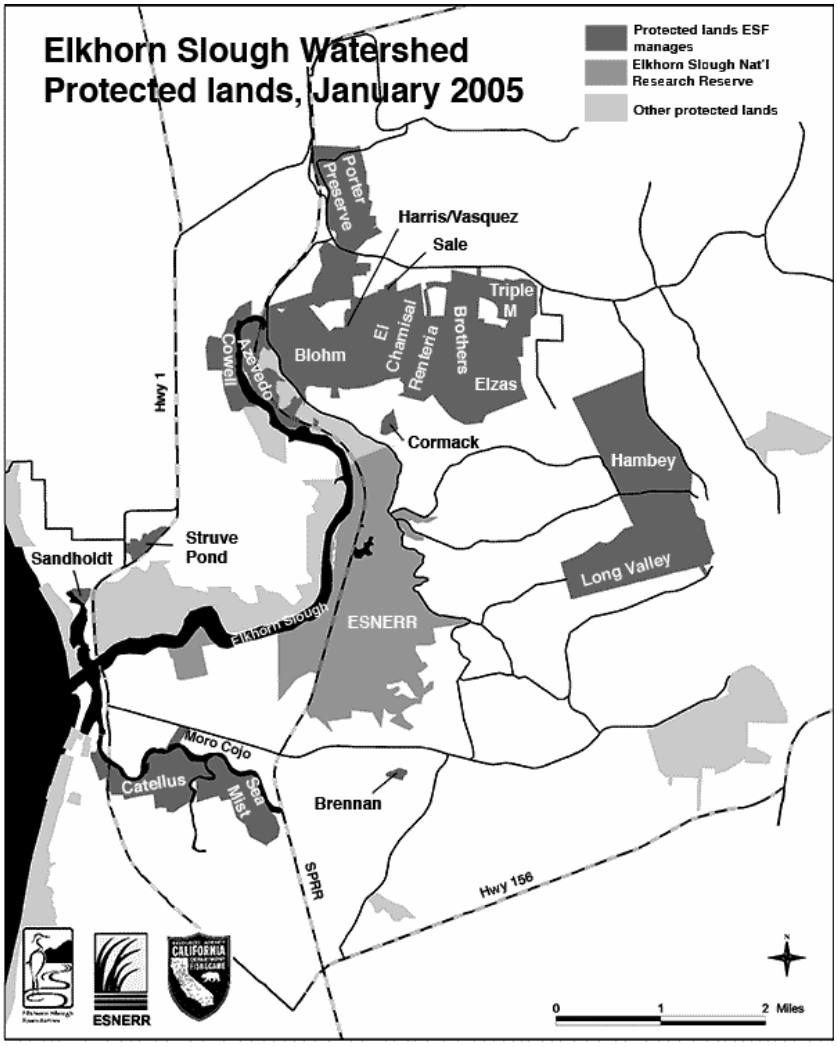
- Ballona Wetlands Land Trust, California (www.ballona.org/position.html). This land trust was formed to protect the Ballona Wetlands, also in southern California.

- Huntington Beach Wetlands Conservancy, California (http://www.hbwc.org/). This land trust is dedicated to the protection of California's Huntington Beach wetlands.

- Wetland Habitat Alliance of Texas, Texas (http://www.whatduck.org/homepage.htm). This is a nonprofit organization dedicated to the preservation, enhancement, restoration and creation of wetland habitat in Texas.

- Big Thicket Natural Heritage Trust, Texas (http://www.btatx.org). This Texas Land Trust has been formed to protect and preserve the land, water, scenic beauty, plants, wildlife, biodiversity and natural and historic communities of the Big Thicket swamp.

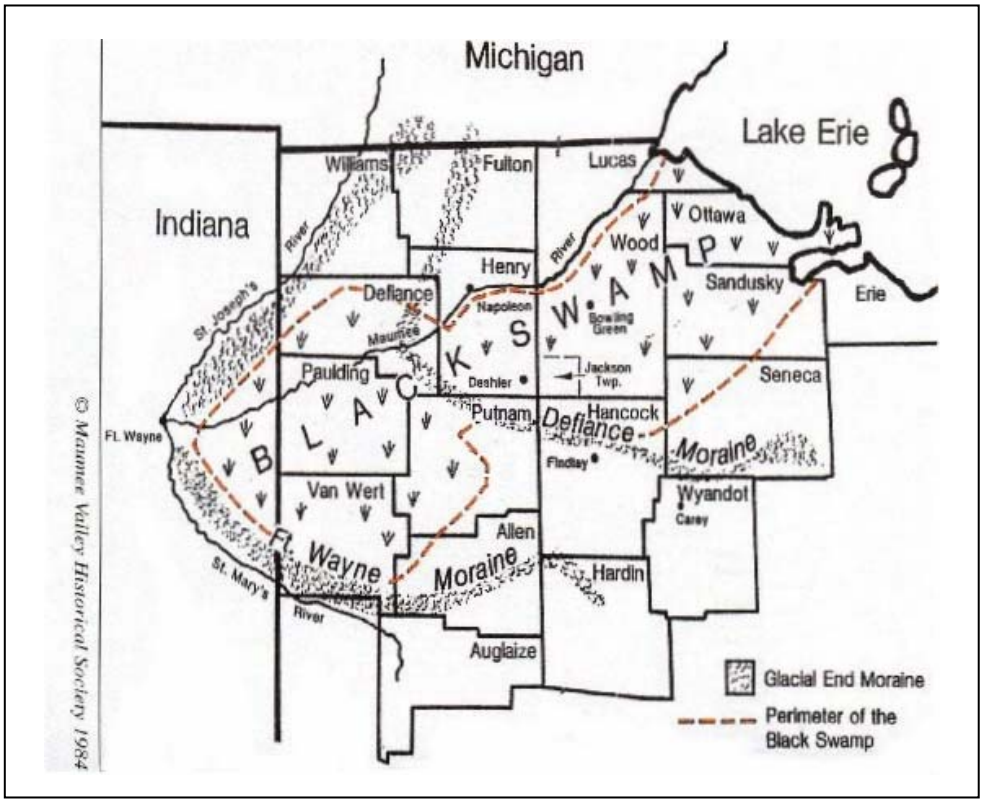
- Elkorn Slough Foundation, California (http://www.elkhornslough.org/). The Elkhorn Slough Foundation is a not for profit organization dedicated to the conservation and restoration of Elkhorn Slough and its watershed. It works in partnership with a broad range of organizations.



Protected areas, Elkhorn Slough, California
http://www.elkhornslough.org/protectedMap.htm

- Limberlost Swamp Remembered, Indiana (http://our.tentativetimes.net/gspnews/swamper1.html). This a land trust in Indiana formed to restore the famous "Limberlost" Swamp described by Jean Statton Porter in her novels.

- Black Swamp Conservancy, Ohio (http://www.blackswamp.org/). The mission of this land trust is to protect natural and agricultural lands. Protection of the remnants of Black Swamp, at one time a massive wetland, is a goal.



Former extent of Black Swamp in Northwestern Ohio
http://www.blackswamp.org/BSC_Swamp.html

- Great Swamp Conservancy (http://gscincny.tripod.com/index.html). The goal of this land trust is to foster environmental education, preserve biological diversity and conserve and manage natural resources in the Oneida Lake and Lake Ontario Watersheds with a focus on 36,000 acres on the south eastern shore of Oneida Lake, New York. This area is home to what the Iroquois called Great Swamp. The Conservancy hopes to return a portion of the wetlands to their original state through partnerships with landowners, local, federal, and state governments, tribes and non-profits.

Great Swamp Conservancy Nature Center, New York
http://gscincny.tripod.com/index.html

Many other land trusts have been formed to protect rivers and adjacent lands such as the Battenkill Conservancy (Vermont), Scenic Hudson (New York), McKenzie River Trust (Oregon), Brandywine Conservancy (Pennsylvania), and the Land Trust for the Little Tennessee (North Carolina). Others have been formed to protect ecosystems with large wetland components. See, for example, Katy Prairie Conservancy http://www.katyprairie.org/home.html which is attempting to protect many wetlands as part of a prairie ecosystem near Houston.

Protection of wetlands is often one of the priorities of other land trusts. For example, in 1999 the Little Traverse Conservancy in Michigan purchased a 135-acre Mud Lake Bog. The bog is a peatland which formed in a glacial kettle hole. The bog is prime habitat for woodcock, ruffed grouse, mink and raptors. The Conservancy plans to retain the title to the property and to maintain an existing boardwalk at the southern end for educational purposes. The Conservancy will allow public access for activities such as bird watching, walking, cross-country skiing and photography.

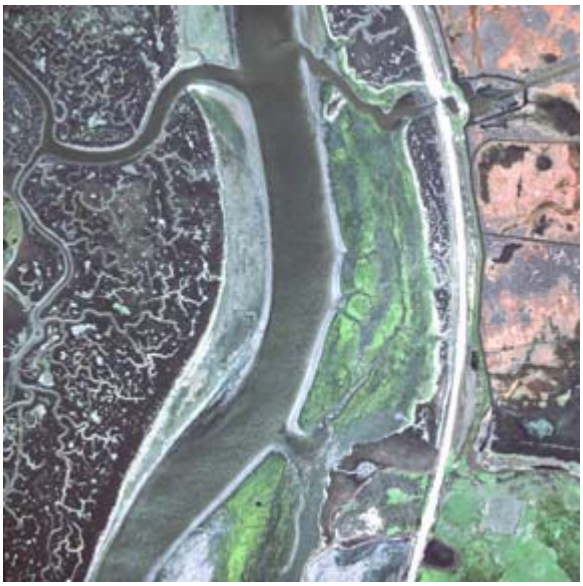
Often rare and "vulnerable" wetlands are a protection priority for land trusts. See Appendix A. Some examples vulnerable wetland types protected by land trusts include the following (see photos below):

The Placer County Land Trust is protecting vulnerable vernal pools in Placer County, California http://www.lta.org/regionallta/s_pacific.htm

The Genesee Land Trust manages Hipp Brook Preserve in Rochester, New York a hydrologically sensitive swamp, as a nature preserve. http://www.geneseelandtrust.org/p-hipp_brook.html

The Land Trust for the Little Tennessee in Macon County, North Carolina has purchased large amounts of vulnerable floodplain. It purchased a 21-acre parcel at Coweeta Bottoms shown here in 2003 to protect one half mile of wetland and river frontage.
http://www.ltlt.org/properties.html

The Lowcountry Open Land Trust in Charleston, South Carolina protects 85 properties covering 10,564 acres of natural, scenic and rural land including many wetlands.
http://www.lolt.org/protected_detail.asp?ArealD=3



The Elkhorn Slough Foundation working with a broad range of organizations has done much to protect and restore vulnerable estuarine and coastal wetlands in Elkhorn Slough, California.
www.elkhornslough.org/research/GIS.HTM.

Some statewide land trusts also play major wetland protection roles like the Massachusetts Audubon Society which maintains Wellfleet Bay Wildlife Sanctuary on Cape Cod and has undertaken a broad range of wetland protection and education efforts over a period of years. Much of the 1,000-acre Wellfleet Bay preserve is coastal and estuarine wetland. The Sanctuary has constructed a beautiful Nature Center, many trails, and a wetland boardwalk at the site. It provides extensive educational programs.

A number of national environmental land trusts/organizations also acquire and protect wetlands at the regional and local levels:

- The Nature Conservancy (http://nature.org/). The Conservancy was founded in 1951. It is dedicated to protecting the diversity of life on earth. Since then it has worked to help protect more than 117 million acres of land and 5,000 miles of river around the world. It is the largest international nonprofit environmental organization with about 1 million members and supporters and more than 1,500 volunteers. It has 3,200 employees. It bases its acquisition and management priorities upon a science-based plan. It has acquired and protects and manages hundreds of wetlands throughout the nation. It also conducts research on these properties.

- National Audubon Society (http://www.audubon.org/). The Audubon Society has over 500 local chapters. Local chapters have undertaken wetland protection efforts for over 400,000-acres including the preparation of many sanctuaries. The Society focuses primarily upon protection of bird habitat. It has undertaken a variety of wetland protection initiatives including wetland campaigns, the preparation of educational and guidance materials, and the publication of wetland newsletters.

- Ducks Unlimited (http://www.ducks.org/). Ducks Unlimited (DU) conserves, restores, and manages wetlands and associated habitats for North America's waterfowl. These habitats also benefit other wildlife and people. Since its inception in 1937 DU has conserved more than 9.4 million acres of waterfowl habitat in North America. DU supporters have raised more than $1.6 billion since l937. Ducks Unlimited has helped landowners restore tens of thousands of acres across the nation. It has more than 700,000 members. Its 2005 goal was to conserve 177,000-acres and it exceeded this goal by conserving more than 220,000-acres. It also conducts research focusing on issues pertaining to design and effectiveness of wetland and waterfowl conservation programs, primarily through the Institute for Wetland and Waterfowl Research.

- The Trust for Public Lands (http://www.tpl.org/). The Trust for Public Lands (TLP) is a national nonprofit land conservation organization formed in l972. It conserves lands for people to enjoy as parks, gardens, and natural areas and to ensure livable communities. TPL has worked with landowners, communities and government agencies to complete more than 3,000 land conservation projects in 47 states, protecting more than 2 million acres. It has helped states craft and pass almost 300 ballot measures, generating over $19 billion in conservation-related funding. TPL has acquired many wetlands and has led efforts to protect others such as the Okeefenokee Swamp, the Ballona wetlands (California), Auroa wetlands (Ohio), and Chisago wetlands (Minnesota). It also conducts research concerning conservation issues and conservation practices.

- The Conservation Fund (http://www.conservationfund.org/). The Conservation Fund (Fund)) is a national nonprofit land conservation organization. Since 1985 the Conservation Fund and its partners have protected more than 5 million acres including many wetlands. The Fund has dual goals of promoting economic development and environmental protection.

- Land Trust Alliance (http://www.lta.org/). The Land Trust Alliance (formed in 1982) is a national membership organization with over 1,227 local, regional, and national land trust members. While not a land trust itself, it serves as an umbrella for land trusts across the nation. The Alliance provides a broad range of training services. In 1990 the Alliance organized, with the Hastings College of Law in San Francisco, the Land Conservation Law Institute to provide legal advice to land trusts. It publishes a quarterly newsletter, Exchange, and also holds an annual national Land Trust Rally every year. The Rally typically includes sessions on wetlands. Land Trust Alliance, 1331 H Street, NW, Suite 400, Washington, DC 20005, 202-638-4725, info@lta.org.

Wetland Protection and Restoration Goals

Protection of wetlands is a common land trust goal because:

- Wetlands often constitute an important portion of community undeveloped open spaces.
- Wetlands are havens for biodiversity—a principal concern of many land trusts.
- Wetlands are principal bird watching areas. Many land trust members are bird watchers.
- Wetlands are of great interest to students and teachers. Land trusts often wish to provide educational and research opportunities.
- Wetlands are often some of the most seriously threatened areas in a community and in need of protection.
- Because of federal, state, and local wetland regulations, many landowners are willing to donate rather than develop their lands.

Open space inventories often reveal that wetlands are priority acquisition areas. For example, The Compact of Cape Cod Conservation Trusts, Inc. has undertaken a comprehensive wildlife habitat mapping and assessment project for Cape Cod. This inventory indicates that wetlands are prime open space with over 20,000 acres of salt marsh, shrub swamp, forested swamp, bog, and fresh marsh.

PROTECTION AND RESTORATION TECHNIQUES

Land trusts may use a wide variety of techniques to help protect and restore wetlands:

- Acquire wetlands in fee by donation from landowners and protect and manage these lands. This is the most common and important role for land trusts.
- Acquire conservation easements from landowners. This is also an important role for many land trusts.
- Inventory and map wetlands along with other habitat types. Examples include wildlife inventory carried out by Cape Cod Conservation Trust described above.
- Identify priority acquisition sites.
- Identify priority restoration sites.
- Restore wetlands.
- Construct and operate boardwalks, trails and interpretative facilities. Examples include Corkscrew Swamp in Florida (National Audubon Society), and Wellfleet Bay Sanctuary (Massachusetts Audubon Society).
- Provide wetland educational programs. Examples include the Georgia Conservancy, Corkscrew Swamp, and Wellfleet Bay Sanctuary.
- Conduct wetland fests, bird festivals. An example is the Horicon Marsh Bird Festival.
- Help landowners restore wetlands. Ducks Unlimited has helped landowners with hundreds of projects.
- Help landowners and government entities monitor and control invasive species.

- Take leadership roles in promoting local wetland protection plans, regulations, and acquisition. Examples include the Oregon Wetland Conservancy and the Tipp of the Mitt Watershed Council.

These and other roles will be now considered individually.

Acquiring Fee

The principal wetland role of land trusts continues to be acquisition and protection of specific wetlands. Land trusts can use a variety of techniques to persuade landowners to donate lands or conservation easements to the trust or a governmental unit. A trust may:

- Offer the landowner **income tax** incentives spread out over five years for donation of lands or conservation easements to the trust. See discussion below.
- Offer the landowner **estate tax** incentives for donation of lands or easements to the trust. See discussion below.
- **Buy wetlands or conservation easements outright or through "bargain sales".** See discussion below.

Land trusts often persuade landowners to sell their wetlands outright or conservation easements to the land trust or a governmental unit in a "bargain sale" at less than fair market value. Donated lands and conservation easements meeting Internal Revenue Code section 170(h) criteria are charitable gifts. The difference between the fair market value and the sale value is considered a donation and may be subtracted from adjusted gross income. Donors can deduct an amount up to 30 percent of their adjusted gross income of the year of the gift when they sell to a land trust at less than appraised market value. Donations in excess of fair market value can be applied to federal taxes for the next five years, subject to some restrictions. Many state income tax laws provide similar benefits.

Donation of an easement to qualified land trust or governmental unit generally provides federal and state income tax benefits equal to the reduction in fair market value caused by granting of the easement. There are limits to how much may be taken as a deduction each year but deductions may be spread over a period of years.
Land trusts also persuade landowners to donate their lands or conservation easements on lands to the land trusts to lower estate taxes. To the extent that the remaining lands (in the case of donation of fee interest) or the restricted value (easement) is lower than fair market value, the estate will be subject to a lower tax. The Taxpayer Relief Act of 1997 provides an additional incentive for landowners to grant conservation easements. Executors of estates can exclude 40 percent of the value of land subject to donation of qualified easement from the taxable estate. This exclusion is phased in over a five-year period. In 1998, landowners could exclude up to $100,000 under this provision. The amount increased to a maximum of $500,000 in 2002. The full benefits of the law are available for easements that reduce the fair market value of property by at least 30 percent. Smaller deductions are available for easements that reduce property value by less than 30 percent.

Acquiring Conservation Easements

Many land trusts have acquired, by donation, bequest, or purchase, conservation easements for wetlands and other open spaces. For example, the Delta Land Trust (http://www.deltalandtrust.org/wetlands_restoration.html) Partners in Perpetuity Program established in 1990 has accepted 53 conservation easements covering over 18,000 acres.

A conservation easement is a voluntary legal agreement permanently restricting the use of land between a landowner and qualified land trust or governmental entity. The landowner retains ownership and restricted use of the property. A wetland conservation easement typically prohibits all filling or drainage of the wetland although certain other activities such as limited timber harvest may be permitted. The easement may apply to all or only a portion of a property.

Some of the factors considered by land trusts in deciding whether to acquire a conservation easement include (see http://www.stormwatercenter.net/Assorted%20Fact%20Sheets/Tool2_Conservation/ConservationEasements.htm):

- Natural resource value - Does the property provide a critical habitat or important environmental aspects worth preserving?
- Uniqueness of the property – Does the property have unique traits worth preserving?
- Size of land - Is the land large enough to have a natural resource or conservation value?
- Financial considerations - Are funds available to meet all financial obligations?
- Perpetuity - Is the conservation agreement a perpetual one?
- Land trusts mission - Does the property align with the land trust's mission and organization specific criteria?

Restored wetlands protected by easement in Camden County, Georgia
http://www.galandtrust.org/Coastal_Programs.htm

A qualified not-for-profit, tax-exempt conservation organization or a federal, state, or local government holds the easement. The precise nature of the restrictions in the conservation easement is worked out between the holder of the easement and the landowner. Typically the easement does not grant the public access to the land. The landowner can use, bequeath, or sell the land subject to the easement. The restrictions on use of the land transfer to the new owner.

A land trust may also be able to persuade a landowner to donate a conservation easement to the trust or a government entity because this will also lower real estate taxation of lands. Taxes are based upon fair market value and a conservation easement generally lowers fair market value. A few states directly order local assessors to reduce taxes. For example, Minnesota Statutes 2000, 273.11 (Subd. 11—Valuation of restored or preserved wetland) provides that "(w)etlands restored by the federal, state, or local government, or by a nonprofit organization, or preserved under the terms of a temporary or perpetual easement by the federal or state government, must be valued by assessors at the wetland value." "Wetland value" is defined to "not reflect potential uses" which would violate the terms of the easement.

A land trust may also be able to persuade landowners to enroll in other open space real estate taxation programs offered by states even where the landowner does not donate a conservation easement for a property. However, such programs often offer only temporary relief for open space activities. A landowner deciding to withdraw lands from the program needs to pay all or a portion of the reduced taxes.

Preparing or Acquiring Wetland Maps, GIS Data Bases

Many land trusts are mapping wetlands and developing databases including GIS systems to help them identify acquisition and management priorities in a community. For example, the Elkhorn Slough Foundation is cooperating with the Elkhorn Slough National Estuarine Research Reserve to create an extensive time-series of wetland maps and digital images for the Slough including a library of digital aerial imagery from the 1930's through the present. See www.elkhornslough.org/research/GIS.HTM.

Historical map of Elkorn Slough, California
www.elkhornslough.org/research/GIS.HTM

To begin their wetland mapping efforts, land trusts typically begin with National Wetland Inventory (NWI) maps from the U.S. Fish and Wildlife Service. Wetland maps may also be acquired from state wetland agencies or local zoning boards. Land Trusts often find that they need more accurate maps and additional information pertaining to specific issues such as endangered plants and animals. Some land trusts carry out their own wetlands inventories. They usually utilize a combination of the use of existing wetland maps and air photos with updated photos and field surveys. For example, The Compact of Cape Cod Conservation Trusts has established a Geographic Information System based wildlife habitat mapping and assessment project for all Cape lands. Of the 31 wildlife habitat types mapped in the inventory, 21 are wetlands. Areas are being ranked to help other land trusts, local governments, and others acquire and protect these areas (http://www.compact.cape.com/).

Some examples of the land trusts with mapping and GIS systems include:

- Sonoma Land Trust. Founded in 1976, the Trust has protected more than 10,000-acres of baylands, wetlands, redwoods, oak chaparral, agricultural lands and other lands in Sonoma County, California. The Land Trust conducted a Sonoma Land Trust Coastal Area Parcel study using GIS which was focused on determining the feasibility of acquiring lands. See http://www.sonomalandtrust.org/.

- Land Trust of Santa Cruz County. This land trust has been building a GIS since 1997. The program began with ArcView GIS software. The GIS is designed to help the trust select land protection projects through GIS analysis. See http://www.esri.com/news/arcnews/summer99articles/20-landtrusts.html.

- The Southeast Alaska Land Trust has undertaken GIS mapping for the Mendenhall Wetland State Game Refuge. See http://www.seawead.org/flotsam/accretion.pdf.

Many of the GIS and mapping efforts have been part of broader mapping or GIS programs and not simply confined to wetlands. For example, the Vermont Land Trust and Vermont River Conservancy assisted Berlin, Vermont in preparing a natural community map for the 661-acre watershed of Berlin Pond. See http://www.berlinvt.org/Summary.htm.

Assessing Wetlands

A number of land trusts and related watershed councils have developed or helped develop wetland assessment methods to assess biodiversity, habitat, and other functions and values of wetlands to the community. For example, the Clinton River Watershed Council (not strictly speaking a land trust) in Michigan developed wetland assessment protocols which include a five basic step Rapid Assessment Method. The steps include (see for more detail):

- Locate wetlands.
- Determine which wetland functions you want to assess.
- Record wetland characteristics using Rapid Assessment Method (RAM) data sheets.
- Assess the degree to which each wetland performs each function.
- Create a wetland protection plan.

The Council works with local land trusts and local governments to acquire and manage lands. See, for example, "Wetland Stewardship for Local Governments" a Council publication, which is available on the web at http://www.crwc.org/programs/watershedmgmt/scwetlands/scwofficials.html.

Many land trusts carry out site-specific assessments of wetlands to establish acquisition and management priorities. For example, the Columbia Land Trust is protecting and restoring through acquisition and easements a variety of wetlands. It states on its web site http://www.columbialandtrust.org/stewardship.htm:

> "Columbia Land Trust evaluates every property for its conservation value, as well as the threats to these values. A stewardship plan is developed and implemented based on this analysis to include detailed annual monitoring. The stewardship program, therefore, requires a high level of intimacy with the land.
>
> Stewardship of the land will mean finding out what hidden assets exist. By getting our noses in the rocks, our hands in the streams and our eyes to the trees we will discover a lot about our conserved lands. And perhaps, we will discover something about ourselves as well."

The Columbia Land Trust is Assessing and Protecting Lands Along Willapa Bay, Washington. http://www.columbialandtrust.org/projects/coast.htm

Prioritizing Acquisition, Restoration, Management

Many land trusts are beginning to prioritize their acquisition, restoration and management efforts. Examples include the Columbia Land Trust (see above) and the Wetlands Conservancy in Oregon, which is preparing a Greatest Wetlands Statewide Conservation Plan. See http://www.wetlandsconservancy.org/oregons_greatest.html. The Nature Conservancy utilizes a rigorous science-based ecosystem approach to target potential acquisition sites including but not limited to wetlands. See http://www.nature.org/tncscience/. Its approach is called Conservation by Design. The Conservancy describes this approach on its web site at http://www.nature.org/tncscience/strategies/:

> Under Conservation by Design, the Conservancy identifies a portfolio of high priority sites in each ecoregion—places that collectively capture the biological diversity of the region. The Conservancy then develops customized conservation strategies to manage these portfolios to ensure the long-term survival of their native life and natural communities—not just those that are threatened. Taken together, these portfolios represent a Conservation Blueprint—a detailed picture of the places that must be protected and their corresponding strategies—that represents a benchmark against which the Conservancy can measure its success.

Managing Wetlands Owned by a Trust

In many instances, little management is needed for wetlands acquired by land trusts. Natural wetlands are self-sustaining systems. For example, "healing" often quickly occurs after a flood or hurricane although trees may be toppled and leaves blown off.

However, minimal levels of management such as picking up litter is needed for sites open to the public. The management needs, of course, depend upon the specifics of the situation, needs, and the desires of the land trust. But common additional activities carried out by land trusts may include:

- Restoration or enhancement of the wetland if degraded,
- Control of exotic or nuisance plant and animal species,
- Design, construction, and maintenance of trails and boardwalks (sometimes appropriate),

- Construction of bird nesting platforms and birdhouses, and
- Active wetland management, in some instances, such as controlled burns.

For example, the Branford, Connecticut Land Trust on its web site states its land management policy:

> The general property management policy of the Branford Land Trust is to leave land in its natural state, allowing natural processes to take place undisturbed. However, intervention may be allowed to encourage natural diversity, to prevent degradation of natural systems, or to allow for appropriate human use.

The Trust has undertaken a variety of land management measures to enhance the value of selected properties such as erection of osprey nesting platforms. See http://www.branfordlandtrust.org/animalhab.html. The trust also utilizes a system of volunteer land stewards to help manage individual properties. The stewards must visit there agreed upon property at least twice a year. Responsibilities of the stewards include (see http://www.branfordlandtrust.org/propman.html):

- Identifying inappropriate use. This could include activities such as camping, vandalism, dumping, building, setting fires, hunting and motorized vehicles.
- Identifying encroachment problems such as neighbors, horses or stray animals, boundaries or malicious trespass issues such as cutting wood or stealing stones from walls. Watching for safety hazards or hazardous materials.
- Assessing actual property use and visitation to the extent possible. Determining additional needs such as signs, boundary or other markers and access issues.
- Biological and ecological monitoring. The Tract Steward should, to the best of their ability, monitor the parcel for maintenance in its natural state or according to the donor's wishes stated in the deed. Checking for erosion, siltation, over-browsing, non-native or invasive species. Identifying, if possible, any rare or threatened plants, birds or animals.
- Providing tract and trail maintenance if the property has a trail. Take out litter. Checking status of trails with regard to erosion and keep paths clear for hiking. Checking trail markers. Determining if there are maintenance issues that would require a scheduled work party.
- In addition, Work Parties are scheduled to accomplish property management goals where larger efforts are needed.

Many land trusts have established exotic weed control initiatives such as the Coastal Mountains Land Trust (Maine) which has established a "Weed Team". See http://www.coastalmountains.org/htm/volunteers.htm. See also the invasive plant article on the web site of the Greater Worcester (Massachusetts) Land Trust at http://www.cyberonic.com/~gwlt/invasive.html. See the Branford Land Trust listing of invasive plants and animals at http://www.branfordlandtrust.org/naturalresources/appendix3.html. The Center for Natural Lands Management is a nonprofit tax-exempt organization in California organized, in part, "to own and/or manage lands in an ecologically beneficial manner consistent with federal and state environmental laws". It emphasis is upon "long term responsibility for managing environmentally sensitive lands. Without this commitment, mitigation lands often become degraded through inappropriate uses and the invasion of exotic species." See http://www.cnlm.org/cms/index.php?option=com_content&task=view&id=92&Itemid=79.

Working with Children

Many land trusts with wetlands have established wetland educational programs for primary and secondary school children. See, for example, the Natural Lands Trust at http://www.natlands.org/categories/category.asp?fldCategoryId=3.

Helping Local Governments Undertake Conservation Planning

Increasingly land trusts are assisting local governments to undertake conservation planning. For example, the Triangle Land Conservancy in North Carolina has conducted conservation assessments for five significant landscapes—Deep-Cape Fear River, Neuse River Lowlands, Neuse River—Mark's creek, Richland Creek, and Lower Swift Creek. Triangle Land Conservancy Staff have also played critical roles in the creation of local government-sponsored conservation plans for New Hope Creek and Little River. See http://www.tlc-nc.org/planning.shtml.

The Louisville/Jefferson County Environmental Trust, formed in 1997, works closely with Metro Louisville. It promotes voluntary methods of land preservation, coordinates Louisville Metro agencies that manage natural areas, advises the Metro Council on land conservation and educates the community about the need to protect natural areas and agricultural lands. It holds easements on 10 privately owned properties and has preservation agreements on wetlands. Trust staff are located in the Metro Planning and Design department. See http://www.louisvilleky.gov/PlanningDesign/Environmental+Trust/.

The Wetlands Conservancy in Oregon has underway a project to identify, map and gather information on Oregon's most valuable wetlands. The Conservancy has established a project web site. The Conservancy is also convening interested groups and parties in different areas of the state to develop and implement strategies to conserve valuable wetlands. See http://www.wetlandsconservancy.org/oregons_greatest.html.

Educating Property Owners

Land trusts are using a variety of techniques to persuade landowners to protect their lands. A trust may:

- **Educate** landowners with regard to functions and values of wetlands.
- **Provide plaques** and other types of community recognition for conservation efforts.
- Help landowners **find funding** from federal and state agencies, other sources to protect or restore wetlands.

For example, the Branford, Connecticut Land Trust undertakes a broad range of community outreach and public education activities such as a spring lecture series, annual hikes, the Branfrod Festival, educational activities in the Branford school system, maintenance of an environmental library, and publication of a quarterly newsletter.

Branford Land Trust, Branford, Connecticut Educational Activities
http://www.branfordlandtrust.org/learn.html

Commenting on Regulatory Permits at Federal (e.g., Section 404), State, and Local Levels

Some local land trusts such as the Galveston Bay Foundation conduct wetland permit reviews. (See www.galvbay.org/3-0.cfm.) Its activities are focused on the Galveston Bay watershed. Other activities of this foundation include advocacy, education, conservation, and research.

Persuading Communities to Adopt Wetland Protection Plans and Regulations, Draft Such Regulations, Lobby for Adoption

Land trust members can help draft and propose wetland ordinances to local governments or work with local government staff to draft such regulations. Members can then lobby local legislators and the public to adopt the regulations. Members can help administer regulations by providing comments and testimony on permit applications. They can help enforce the regulations by monitoring the wetlands and reporting violations.

Buying and Holding Land for Other Conservation Entities

Many land trusts purchase land when it is available for later transfer to governmental entities or not-for-profits. For example, the Black Swamp Conservancy in Ohio purchased 80-acres in Paulding County for $330,000 with the goal for transferring it to the Pauling County Park District which was in the process of being formed.

A remnant of Black Swamp in Ohio purchased for inclusion in a future park.
Black Swamp Conservancy, Ohio
http://www.blackswamp.org/news/Blade%20article%2010-06-2003.htm

Constructing and Operating Visitor Centers

An increasing number of land trusts are constructing and operating visitor centers. Some of these like the Jackson Bottom Wetlands Preserve in Oregon focus on wetlands.

Jackson Bottom Wetlands Education Center, Oregon
http://www.jacksonbottom.org/educationcenter.htm

Making Wetlands Accessible to the Public—Boardwalks, Trails

Increasingly, land trusts are also constructing wetland trails and boardwalks into wetlands they own. For example, the Massachusetts Audubon Society has established boardwalks and trails at several of their sanctuaries. These include the boardwalk at the Stony Brook Wildlife Sanctuary, which follows the edge of Teal Marsh. Another boardwalk enters the salt marsh at the Wellfleet Sanctuary. See http://www.massaudubon.org/Nature_Connection/Sanctuaries/Stony_Brook/index.php.

Boardwalk at Stony Brook Wildlife Sanctuary, Massachusetts
http://www.massaudubon.org/Nature_Connection/Sanctuaries/Stony_Brook/index.php

The Nature Conservancy has constructed a boardwalk and visitor center at the heart of the 4,000-acre Great Salt Lake Shorelands Preserve. The visitor's center has more than 34 educational exhibits.

Great Salt Lake Shorelands Preserve Visitor Center in Utah includes a 1-mile boardwalk.
http://nature.org/wehrewework/northamerica/states/utah/misc/art10381.html

Monitoring Wetlands

Some land trusts are monitoring changes in wetlands. For example, the Jackson Bottom Wetlands Preserve has implemented an environmental monitoring program to collect real-time information on weather, water quality, habitat and wildlife from the preserve. The system includes a weather station, remote water quality station, and remote video camera system.

Weather Monitoring at Jackson Bottom Wetlands Preserve, Oregon
http://www.jacksonbottom.org/wetlandsmonitoring.htm

Restoring Wetlands

Hundreds of land trusts are restoring wetlands. For example:

- Wetland Conservancy. The Wetland Conservancy has protected many wetlands in Oregon and restored some of these. See http://www.wetlandsconservancy.org/preserves.html. For example, a culvert was removed in Hart Wetland and ponds excavated to "daylight" a stream.

Hart Wetland, Wetland Restoration by the Wetland Conservancy, Oregon
http://www.wetlandsconservancy.org/preserves/hart.html

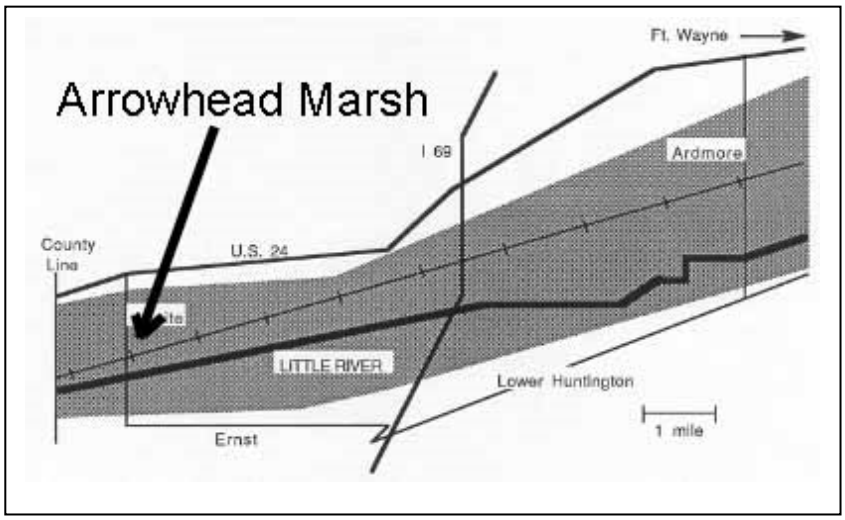
- Galveston Bay Foundation. Texas. This Foundation has a goal of restoring 24,000-acres of Galveston Bay Habitat (not limited to wetlands) by 2010. Since 1999 the Foundation has operated a "Marsh Mania" programs with over 2,400 volunteers who have helped create new habitat. (http://www.galvbay.org/5-1.cfm)

- Delta Land Trust. This trust creates and manages wetland restoration sites in Arkansas, Louisiana, and Mississippi. Restoration sties are established on economically marginal farmland and replanted with a variety of flood forest and bottomland hardwood species. Each restoration site is protected by a conservation easement. See http://www.deltalandtrust.org/wetlands_restoration.html. A Partners in Perpetuity Program established in 1990 has accepted 53 conservation easements covering over 18,000-acres.

Delta Land Trust Restoration in Mississippi
http://www.deltalandtrust.org/wetlands_restoration.html

- The Huntington Beach Wetland Conservancy was established in 1985 to preserve the few remaining wetlands in Huntington Beach and throughout Orange County, California. It has undertaken a 25-acre restoration project for Talbert Marsh. It has also assisted in the restoration of a 46-acre San Joaquin Marsh in Irvine. The Conservancy has constructed a Wetlands and Wildlife Care Center. See Huntington Beach Coastal Conservancy. See http://www.hbwc.org/.

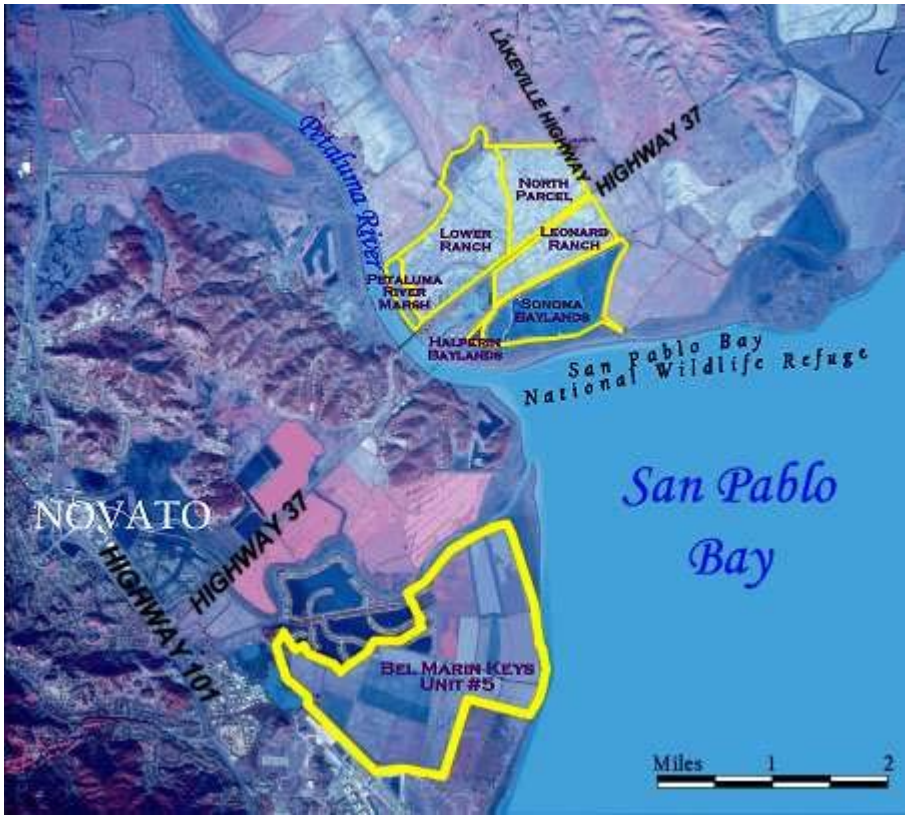
- The Little River Wetland Project in Indiana goal is to facilitate the restoration of wetlands in the historical Little River watershed and to provide educational opportunities. See http://www.lrwp.org/.



A project of the Little River Wetland Project, Indiana
http://www.lrwp.org/arrowheadmarsh.php

- Since 1976 the Sonoma California Land Trust has protected and restored more than 15,000-acres of land. These efforts have included the protection and restoration of many wetlands. See photos below. (http://www.sonomalandtrust.org)

Wetland enhancement project of the Sonoma Land Trust, California
http://www.sonomalandtrust.org/addwater.htm



Restoration areas of the Sonoma Land Trust, California
http://www.sonomalandtrust.org/area29a.htm

- Sonoma Land Trust Bel Marin Keys Unit V project in Marin County involving management and enhancement of seasonal and tidal wetlands on a 1,613-acre property. http://www.sonomalandtrust.org/area29a.htm

Sonoma Land Trust in California, Sonoma Baylands wetland restoration project. A 431-acre former diked farmland was restored to tidal action. Dredged materials were used to raise the elevation of subsided properties. http://www.sonomalandtrust.org/area29.htm#prm.

Volunteers establish coit logs on Paradise Creek. Restoration led by the Palouse-Clearwater Environmental Institute, Idaho.
http://www.landandwater.com/features/vol47no2/vol47no2_1.html

Paradise Creek in Idaho, Restoration site
http://www.landandwater.com/features/vol47no2/vol47no2_1.html

Organizing and Managing Mitigation Banks and Other Mitigation Projects

A number of land trusts are becoming involved with the organization and management of mitigation banks and other mitigation projects. For an excellent and thoughtful report exploring the full range of issues concerning the potential role of land trusts in mitigation see "Mitigation Program of the Solano Land Trust". This report does not focus exclusively on wetlands but wetlands are addressed. See http://www.solanolandtrust.org/Mitigation%20Program%20of%20the%20Solano%20Land%20Trust.pdf.

Most wetland mitigation banks are wetland restoration or creation projects. Some involve preservation. For example, the Georgia Land Trust has negotiated easements on two large tracts in Camden and Piece countries as mitigation banks. (See http://www.galandtrust.org/Coastal_Programs.htm.) While attractive in protecting some of the most sensitive systems, preservation alone results in net loss of wetland resources and is best combined with restoration or creation.

Mitigation banks have several advantages over site-specific and case-by-case mitigation. Because they are constructed upfront, there is less chance of project failure. There is also less chance of failure because the expertise of mitigation bankers is usually greater than for case-by-case mitigation. They allow the creation and restoration of larger wetlands with greater habitat diversity. The fees from mitigation banks can help fund land trust wetland acquisition, restoration, and monitoring/research programs. Such fees may be substantial.
On the other hand, mitigation banks are controversial and have a number of disadvantages. Benefits and costs are shifted from one segment of landowners, the public, and the ecosystem to another. Restoration of a wetland as part of a mitigation bank in one community does not solve the flooding, pollution, or habitat loss problems caused by wetland destruction in another community and may result in liability.

Examples or land trust involvement with mitigation banks include:

- The Brewster Wetland Mitigation Bank in northeastern Ohio is operated by the Wilderness Center, Inc. a nonprofit corporation, regional nature center and land trust. It has been approved for 46.8 wetland preservation credits. The Center's missions include nature education, wildlife and land conservation, natural history research and community service. The Center has a very active public education program. The wetland is a high quality category 3-forested wetland. See http://www.wildernesscenter.org/wetland_mit.html.

Brewster, Ohio, Wetland in Winter
http://www.wildernesscenter.org/wetland_mit.html

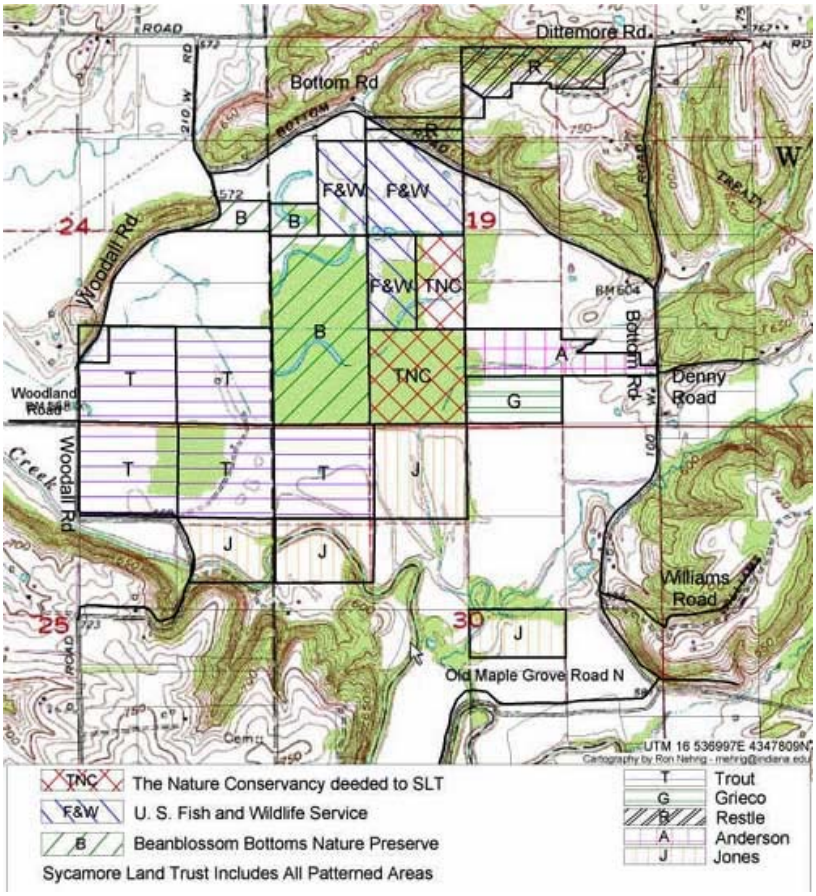
- In 1996 the Mississippi chapter of The Nature Conservancy acquired 1,700-acres of wetlands and uplands in Jackson County Mississippi to establish the Old Fort Bayou Mitigation bank. Expansion to a much larger area of bottomland hardwoods is pending. The Conservancy acquired this site because of the wetland functions, ease of restoration, and ease of management. The Conservancy has discretionary authority to see credits to developers. The Conservancy has developed a management plan for the area to provide goals, objectives, and management strategies for the area. Restoration will include filling ditches and canals, monitoring and acquisition and protection outside of the bank area. See http://www.olemiss.edu/orgs/SGLC/mitiga.htm.

Old Fort Bayou Mitigation Bank, The Nature Conservancy, Mississippi
http://www.nature.org/wherewework/northamerica/states/mississippi/work/art13093.html

- The Center for Natural Lands Management in California has been formed to help protect biological resources through the long-term stewardship of mitigation and conservation lands. This includes management of mitigation banks. See http://www.cnlm.org/soq.html.

Orchestrating Wetland Protection and Restoration Projects

Many land trusts are helping to orchestrate protection and management efforts by a broad range of local, state, and federal agencies. An example is the effort of the Sycamore Land Trust to protect and restore the Bean Bottoms Complex in Indiana.



Bean Blossom Bottoms Complex, Indiana
http://www.bloomington.in.us/~sycamore/bbbnp.html

Conducting Research

Some land trusts are conducting management-oriented wetland research on their lands. Many others are encouraging colleges and schools to carry out wetland research on trust-owned wetlands. In some instances this research is "basic" such as understanding wetland hydrology. In other instances the research relates to the management needs of wetlands owned and managed by the trust such as the use of fire in wetland management and the habitat requirement of rare and endangered species. The Nature Conservancy has a particularly large and extensive research program with many research projects at The Nature Conservancy wetland sites.

The Elkhorn Slough Foundation in California is assisting the Elkhorn Slough National Estuarine Research in assembling a chronological sequence of historical maps and air photos to trace the history of the Slough. It is also studying tidal erosion, changes in creek morphology, and loss of vegetated salt marsh.

Elkhorn Slough, California
http://www.elkhornslough.org/research.htm

For many examples of research on Nature Conservancy sites in Texas through its Conservation by Design Research Program see http://nature.org/whereweork/northamerica/states/texas/science/art7804.html.

Raising Funds

Fund raising is not a wetland protection or restoration technique per se. But it is a necessary step in implement many of the techniques described above. Funds are needed to acquire lands and conservation easements (when they are not gifts or willed). Funds are needed for staffing and for special projects such as restoration and boardwalks.

Land trusts are using a variety of techniques to raise money to restore and protect wetlands:

- Work one-on-one with landowners, governmental units to persuade them to donate lands and funds as charitable gifts or estates.
- Hold dinners, auctions, bake sales, benefits, yard sales, concerts and other activities to raise money. For example, Ducks Unlimited holds more than 5,000 dinners and banquets every year. Ducks Unlimited provides guidance concerning the holding of a Ducks Unlimited banquet. See http://www.ducks.org/about/faq/faq_events.asp#top.
- Conduct land trust membership drives for special wetland acquisition projects or protection and restoration efforts more generally. Much of the funding for land acquisition often comes from tax-deductible gifts (money or property) from land trust members.
- Seek grants from foundations. Many land trusts have successfully sought funding from foundations.
- Seek grants from public agencies. Many land trusts have also successfully sought funding from government agencies including the FWS's Partners for Fish and Wildlife grant program, USDA Natural Resources Conservation Service Wetland Reserve and Wildlife Habitat Incentive Programs, EPA Five Star Restoration Program, North American Wetlands Conservation Act grants, and NOAA's Community Based Restoration Projects grants.
- Carry out special events such as Wetland and Birding Festivals. See examples above.

ENCOURAGING AND HELPING LAND TRUSTS

Local governments, states, and federal agencies can help land trusts protect and restore wetlands in a variety of ways described below.

Provide technical assistance. Land trust staff and members often have the motivation to protect and manage wetlands but lack the expertise in wetland assessment and management. These include many well- educated staff and land trust members. This is particularly true for smaller land trusts. Land trusts can be encouraged and assisted in protecting and restoring wetlands by providing them with technical assistance.

- Local government assistance. Local government planning and zoning staff can help land trusts by providing wetland maps, flood maps, and copies of zoning and other regulations. They can provide copies of community land and water use plans. Local engineering staff (e.g., public works departments) may help land trusts address stormwater and floodplain management issues.
- State wetland agency assistance. These agencies may also supply wetland maps and education materials. They may assist land trusts in restoring wetlands and developing management plans.
- Federal agency assistance. Federal agencies may also supply maps, technical information such as information concerning endangered species and hydrology. Technical assistance is available from the FWS, NRCS, EPA, NOAA and other agencies.
- Teacher assistance. Many primary, secondary and college level schoolteachers have expertise in wetland plants and animals and can help design trails and educational materials. They also may take school children on field trips into wetlands. Contact local schools and colleges.
- Consultant assistance. Some states such as Michigan has compiled lists of wetland consultants which are available online. Some are willing to donate some time to land trusts.

Form coordinating and support organizations. Land trusts may be assisted in a state or region through the formation of coordinating and support organizations. For example, the Texas Land Trust Council (see http://www.texaslandtrusts.org/) was formed to promote and sustain the conservation efforts of Texas's land trusts. It acts as a clearinghouse, publishes a newsletter, publishes a land trust directory, published a conservation easement handbook, conducts an annual inventory of protected lands in Texas and distributes a conservation "package, which can be tailored to individual land trust needs.

The Maine Land Trust Network serves a similar communications and coordination function. It was formed in 1995 to formalize relationships between the states largest land trust—the Maine Coast Heritage Trust—and the states 88 local land trusts. It acts as a clearinghouse for communication and coordination, provides technical assistance concerning land conservation techniques, and fosters leadership **with** regard to issues of interest to Maine's land trusts. See http://www.mltn.org/.

The Compact of Cape Cod Conservation Trusts, Inc. (http://www.compact.cape.com/) was formed in 1986 to help coordinate and provide technical assistance to six land trusts on Cape Cod. It now works with 25 local and regional land trusts and watershed associations to acquire and manage important natural areas as open space. It also advises its members on non-profit administration, legal, and tax questions. This is important because most local land trusts are managed by volunteers without expertise in these matters. The Compact also conducts research and carries out projects such as mapping and prioritization of natural areas on the Cape including wetlands.

Provide financial assistance. Land trust wetland protection and restoration efforts may be strengthened through increased funding from Congress, state legislatures, and local government councils. Land trusts need money for staff and administration and to purchase lands and conservation easements. Most operating money is collected by land trusts from member fees and donations. Many trusts continue to operate on shoestring budgets with a volunteer staff and donated office space. Even small sums of money (e.g. the EPA Five Star Grant Program) can be very helpful in assisting land trusts with specific wetland protection and restoration projects. State, federal, and local governments now provide a variety of grants in aid to land trusts. These could be increased:

- Grants for restoration of wetlands from EPA (e.g., Five Star Wetland Restoration Grant Program), NRCS (Wetland Reserve, Other Programs), US Fish and Wildlife Service (Partners for Wildlife) and other agencies.
- Grants for acquisition of wetlands from the Land and Water Conservation Fund, and other state and federal programs. Funds are also available for land trust acquisition of wetlands from many state open space funds.
- Limited grants for planning wetlands and related ecosystems are available from EPA, National Fish and Wildlife Foundation, private foundations.

Provide continued and strengthened tax incentives for wetland protection at all levels—income tax, estate tax, gift tax, real estate tax. Tax incentives are absolutely critical to land trust protection and restoration activities. The federal government (Congress, the Administration) needs to continue to provide income, gift and estate tax incentives to landowners who donate their wetlands or other lands to land trusts. Some states also provide income tax incentives and real estate tax incentives for wetlands and other open space lands in some states. Congress and state legislatures could assist land trust protection and restoration efforts by enhancing tax incentives.

Provide detailed, accurate, and up to date wetland maps. Land trusts need accurate wetland maps to help them identify wetlands and prioritize acquisition and protection priorities. Accurate maps can also help them with planning and the management of wetlands once acquired. National Wetland Inventory maps are available on-line and in hard copy for most of the U.S. These are useful but have inaccuracies. Cooperative, more detailed mapping for a particular local government unit or area are needed. Other federal agencies such as NOAA and state wetland agencies have also assisted some land trusts map wetlands.

Provide practical and accurate wetland assessment models. EPA, the FWS, the U.S. Army Corps of Engineers and other federal agencies have developed biologically-oriented wetland assessment models such as HGM and IBI models. They could help land trusts by continuing to develop and test these models in cooperation with trusts. They could also help trusts develop other, broader GIS based models reflecting biodiversity, relative scarcity of particular wetland types, ecosystem context, fragmentation, restoration potential, land ownership, threats such as water pollution, and other features relevant to acquisition and management.

Provide data maps suggesting location of wetland-related endangered species, areas of special biodiversity, natural hazards and other information needed for acquiring and managing lands. Land trusts increasingly desire such data in GIS form although there are many land trusts needing old-fashion maps. For example, the Wells National Estauarine Research Reserve has provided conservation maps for the Kittery Land Trust and the Scarbough Land Trust. See www.wellsreserve.org/cmp/update_2000-12.htm.

Provide training. Federal and state agencies could help land trusts by providing more targeted training for land trust staff, members, and landowners in mapping wetland, assessment of wetlands, management planning, restoring wetlands, creating mitigation banks, addressing exotic species and other management topics.

Provide "how to" manuals. Many land trusts need practical, step-by-step help pertaining to boardwalk construction, control of exotic species, use of fire and other management, and a variety of other topics (see training above) since staff and members lack expertise in many aspects of protection and restoration.

Provide case studies of wetland protection and restoration. Land trusts are particularly interested in the success and failures of other land trusts. Detailed case study examples illustrating particular protection and restoration techniques would be useful.

Conduct joint, management-oriented research. The USGS, EPA and other agencies could help fund and conduct management-oriented research with land trusts. Some priority research topics may include control of exotic species, use of fire in management, restoration techniques, assessment techniques, and the use of GIS.

Help land trusts establish mitigation banks. Land trusts may be able to raise moneys for wetland protection and restoration through operation of mitigation banks. Federal agencies, states, and local governments could help trusts establish banks and provide guidance as to when the use of such banks may be appropriate.

Provide land trusts with educational materials such as how the protection and restoration of wetlands and related ecosystems can benefit landowners as well as society. Material should be broadly available on the web since many trusts have limited funds and depend upon the activities of volunteers.

APPENDIX A: "VULNERABLE" WETLANDS

All wetlands in the US are vulnerable to a greater or lesser extent) to climate change, acid rain and air pollution, and changing watershed hydrologic regimes due to watershed development. Wetlands throughout the U.S. are partially protected from drainage. However, many are at least partially protected from filling, flooding, water pollution, and other activities by federal, state, and local land and water use regulations. They are also partly protected by public land management policies and by nonregulatory protection programs such as the Swampbuster program and conservation easements under the Wetland Reserve program.

Multilevel protection is particularly strong for major wetlands in and adjacent to rivers, lakes, and estuaries which are regulated by the federal Section 404 and Section 10 programs, state coastal wetland regulatory programs, and, in some instances, local regulatory efforts. However, even these wetlands are threatened by adjacent land uses, watershed pollution, water diversions, impoundments, and sea level rise.

Many other wetlands are not regulated (or only partially regulated) and are particularly vulnerable to activities within the wetlands, adjacent to the wetlands, or in watersheds. Particularly vulnerable wetlands include:

- "Isolated" wetlands not clearly connected to other waters—playas, bogs, etc. These are not regulated by the federal Section 404 and Section 10 programs. They are also not regulated at the state or local levels in many states.

- Smaller wetlands not identified on wetland maps. Many smaller wetlands are not located on National Wetland Inventory or state or local wetland maps. Typically state and local regulations only apply to mapped wetlands.

- Wetlands dry much of the time such as vernal pools. Some do not meet strict wetland criteria (e.g., riparian areas in the West). Others do not appear on wetland maps because they were dry in the seasons or years when the air photos used for mapping were taken. Landowners also often do not recognize areas as wetlands, which are dry much of the time to be wetlands.

- Wetlands in urbanizing and other watersheds with changes in water quantity and quality due to development, stormwater management, and other activities. Particularly vulnerable are wetlands located in watersheds with high rates of sedimentation and pollution. Also vulnerable are wetlands located in areas with competing high demands for water (i.e., agricultural water diversions, municipal and industrial water diversion, groundwater pumping).

APPENDIX B: SUGGESTED READINGS

Byers, E. and K. Marchetti, 1988. The Conservation Easement Handbook. Land Trust Alliance

Diehl, J. and T. Barrett. 1988. The Conservation Easement Handbook: Managing Land Conservation and Historic Preservation Easement Programs. Trust for Public Land. San Francisco

Gustanski, J. and R. Squires. 2000. Protecting the Land: Conservation Easements Past, Present, and Future. Island Press 2000.

Hopper and Cook. 2004. The Conservation Finance Handbook: How Communities are Paying for Parks and Land Conservation.

Land Trust Alliance. 1990. Starting a Land Trust, A Guide to Forming a Land Conservation Organization. Land Trust Alliance.

Lind, B. 1991. The Conservation Easement Stewardship Guide, Designing, Monitoring, and Enforcing Easements. Land Trust Alliance and Trust for Public Lands.

McQueen, M. and E. McMahon. 2003. Land Conservation Financing. The Conservation Fund, Island Press

Mitch, W. & J. Gosslink, 2nd Ed., 1993. Wetlands. Van Nostrand Reinhold, New York

APPENDIX C: SUGGESTED WEB SITES

http://www.lta.org/
Land Trust Alliance. Many links. Excellent collection of publications for sale.

www.epa.gov/owow/nps/ordinance/
U.S. Environmental Protection Agency. Collection of model ordinances to protect local resources

http://www.jacksonbottom.org/
Jackson Bottoms Wetland Preserve

http://www.nrcs.usda.gov/technical/stream_restoration/
Federal Interagency Stream Restoration Working Group, Stream Corridor Restoration: Principles, Processes, and Practices.

www.smartgrowth.org/Default.asp?res=1024
Smart Growth Online.

http://www.epa.gov/owow/wetlands/restore/links:
U.S. Environmental Protection Agency, Wetland links by state.

http://www.cicacenter.org/swift.html
Construction Industry Compliance Assistance, State Wetland Information Tool.

http://aswm.org/wbn/current.htm
ASWM, Wetlands Breaking News

http://www.wetlandsconservancy.org/index.shtml
The Wetlands Conservancy – Oregon.

http://www.wetlandsconservancy.org/heroic_tales.html
Heroic Tales of Wetland Restoration (Book). Oregon Wetland Conservancy.

http://www.sonomalandtrust.org/index.htm
Sonoma Land Trust wetland restoration project.

http://www.elkhornslough.org/esf.htm
Elkhorn Slough Foundation wetland restoration projects.

http://www.uri.edu/ce/wq/mtp/html/pawshort.html
Project to identify wetland restoration sites between the Nature Conservancy and the University of Rhode Island.

http://www.tpl.org/tier2_kad.cfm?folder_id=2554#cs8
Trust for Public Lands watershed case studies.

http://www.tpl.org/index.cfm?folder_id=2105
Trust for Public Lands.

http://www.ballona.org/f-about.asp
The Ballona Wetlands Land Trust formed to protect the Ballona wetlands ecosystem.

http://www.bolsachica.org/
Bolsa Chica Conservancy.

http://landtrust.org/
Little Traverse Conservancy (MI) has acquired many properties containing wetlands.

http://www.audubon.org/local/sanctuary/corkscrew/Visit/Visit_Us.html
Audubon Society's Corkscrew Swamp Sanctuary.

http://www.massaudubon.org/Nature_Connection/Sanctuaries/Wellfleet/index.php
Massachusetts Audubon's Wellfleet Bay Sanctuary. Wetlands and boardwalks.

http://www.compact.cape.com/
The compact of Cape Cod land trusts formed to aid land trusts in protecting open space including wetlands.