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**PROTECTING AND RESTORING  
WETLANDS:  
STRENGTHENING THE ROLE OF  
LOCAL GOVERNMENTS**



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## **PREFACE**

This paper has been written to help strengthen local government wetland protection and restoration efforts. It first considers options for local governments to strengthen their protection and restoration efforts. Many web site references are provided for those wishing more detailed information. It then considers measures federal agencies, states, land trusts and others could take to encourage and help local governments strengthen their efforts.

The paper has been written as part of a two year ASWM project to strengthen local government, land trust and watershed council wetland protection and restoration programs. One or more workshops will also be conducted as part of this project.

## **BASIS FOR REPORT**

The report draws upon a review of the wetland literature and web sites (see bibliography). It draws a survey of the states concerning local wetland protection and restoration efforts. It draws upon a web, literature, and telephone survey of selected local governments, land trusts, and watershed councils.

## **ACKNOWLEDGEMENTS**

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## **DISCLAIMER**

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Cover Photo: Huntley Meadows Boardwalk, Alexandria, Virginia  
<http://www.friendsofhuntleymeadows.org/Gallery/Images/boardwal.htm>

All photos are from internet web sites listed with 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 or if you do not wish a photo from your web site used in this report.

## EXECUTIVE SUMMARY

### How can local governments strengthen their protection and restoration efforts?

Options include:

- ◆ Form expert conservation committees (e.g., conservation commissions, environmental commissions, wetland boards) to help local governments draft adopt, and administer wetland policies and regulations. They may also help prepare local wetland plans, review permits, carry out education efforts, and undertake other activities described below.
- ◆ Coordinate with the U.S. Army Corps of Engineers, U.S. Environmental Protection Agency (EPA), and States implementing their wetland regulatory programs. This would include but not be limited to reviewing and commenting upon federal (Section 404, Other) and state wetland permits, reporting violations, etc.
- ◆ Adopt a community wetland protection and restoration policy in the local government master plan, comprehensive plan, other plans, policies, and regulations.
- ◆ Prepare and adopt accurate wetland maps to locate the boundaries and types of wetlands for planning and regulating purposes.
- ◆ Create wetland-related GIS systems to facilitate evaluation of wetlands, wetland planning, permitting, acquisition, management.
- ◆ Assess wetland functions and values for all wetlands in the community or for selected areas under development pressures or of special importance (e.g., areas with endangered species habitat).
- ◆ Prioritize wetlands in terms of acquisition and management potential, restoration potential, etc. This prioritization may consider wetland size, type, functions, scarcity, presence or absence of rare and endangered species, biodiversity, other factors.
- ◆ Prepare and adopt wetlands and watershed management plans.
- ◆ Prepare and adopt comprehensive land use plans or watershed plans with wetlands as one component.
- ◆ Assist land trusts in land acquisition, conservation easement, and other protection and restoration efforts.
- ◆ Adopt regulations. These regulations may be “stand alone” wetland regulations or may be incorporated in the following sorts of regulations:
  - ◆ Floodplain
  - ◆ Shoreland
  - ◆ Coastal Zone
  - ◆ Comprehensive zoning
  - ◆ Subdivision controls
  - ◆ Buffer requirement
  - ◆ Building codes
  - ◆ Sanitary codes
  - ◆ Other special codes
    - ◆ Grading
    - ◆ Tree cutting
    - ◆ Pesticide application
- ◆ Acquire and create wetland parks or establish wetland nature reserves.

- ◆ Inventory wetlands on public lands and develop protection and management practices.
- ◆ Provide local real estate tax incentives to conserve wetlands to landowners.
- ◆ Restore wetlands on public or private lands.
- ◆ Construct wetlands to provide flood storage, stormwater treatment, polishing of sewage effluent, recreation and bird watching, etc.
- ◆ Carry out public education efforts:
  - ◆ Educational programs for children
  - ◆ Seminars, workshops, lecture
  - ◆ Web pages
  - ◆ Guidebooks
  - ◆ Brochures, question and answer fact sheets
  - ◆ Workshops for the public
  - ◆ Wetland brochures, fact sheets
- ◆ Construct boardwalks and trails on wetlands owned by local governments, land trusts.
- ◆ Conduct wetland festivals.
- ◆ Establish and operate wetland mitigation banks.
- ◆ Establish wetlands and ecotourism plans.

**How can federal agencies, states, foundations, others encourage and help strengthen local government wetland protection and restoration efforts?**

Options include:

- ◆ Recognize that local governments have an important long term role to play in protecting and restoring wetlands; reflect this local role in federal and state agency wetland protection and restoration planning and policies.
- ◆ Refer wetland permit applications (Section 404), other wetland related permits (e.g., dam construction, floodplain regulation) submitted to federal agencies and states to local governments for comment prior to issuance.
- ◆ Undertake joint permitting with local governments.
- ◆ Map (or remap) wetlands, digitize maps, and provide maps and digital data to local governments.
- ◆ Provide practical wetland assessment models; involve local governments in preparing and testing models.
- ◆ Provide local governments with endangered species, biodiversity, natural hazard, soils, topographic and other maps and information relevant to permitting, acquisition, restoration, and other management.
- ◆ Maintain joint databases, GIS systems with local governments.
- ◆ Encourage and help local governments integrate wetland planning into water programs by providing technical assistance.
- ◆ Prepare model ordinances and distribute such ordinances to local governments.
- ◆ Prepare and distribute educational materials to local governments.

- ◆ Enhance technical assistance.
- ◆ Provide continued and enhanced financial assistance for local acquisition, conservation easements, exotic species control, restoration, etc.
- ◆ Continue federal and state income, gift, and estate tax incentives for donation of wetlands and other conservation interests to government units and not for profits.
- ◆ Provide training in mapping, assessment, restoration, other priority topics.
- ◆ Provide “how to” manuals concerning mapping, assessment, restoration, construction of boardwalks and trails, other priority subjects.
- ◆ Provide local government case studies of local wetland protection and restoration in other communities throughout the nation.
- ◆ Conduct joint research with local governments pertaining to restoration techniques, monitoring, integration of wetlands into water planning, wetlands and natural hazards, wetland assessment techniques, etc.
- ◆ Help local governments establish and operate mitigation banks.
- ◆ Provide local governments with educational materials describing how protection and restoration will benefit landowners as well as society such as use of wetlands for birding (ecotourism).
- ◆ Adopt Memoranda of Understanding or Memoranda of Agreement between local governments, federal agencies, states, and tribes that address delineation, joint permit processing, assessing, monitoring and enforcement to improve coordination and reduce inconsistencies and duplication. Such MOUs and MOAs can be used to divide and clarify responsibilities and share tasks.
- ◆ Issue (the U.S. Army Corps of Engineers) local or regional general permits “programmatic general permits” for state, tribal, and local wetland protection and restoration efforts which meet or exceed federal standards.
- ◆ Create a national “local government wetland protection and restoration” web page in cooperation with a broad range of local government organizations (e.g., National League of Counties). This web page would have many links and report information of particular interest to local governments.

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## **CHAPTER 1: WHY ARE STRENGTHENED LOCAL ROLES NEEDED?**

Over the last two decades much attention at the national level has been placed upon the roles of the federal government (e.g. the Section 404 program) and the states in protecting and restoring wetlands. Federal agencies and the states have done much to protect and restore wetlands and their continued roles are much needed. But there are gaps in activities regulated or otherwise protected. Funds and staffing are limited at federal and state levels, and monitoring and enforcement are spotty. See Appendices A and B for a more detailed examination of gaps in federal and state programs.

Prior to the U.S. Supreme Court SWANCC decision in 2001 and the invalidation of the migratory bird rule, the U.S. Army Corps of Engineers (Corps) at least theoretically regulated all wetlands since migratory birds utilize almost all wetlands. However, even prior to SWANCC, the capability of the Corps and the U.S. Environmental Protection Agency (EPA) staff in delineating, assessing, mapping, processing permits, and monitoring and enforcing wetland regulations was limited by the costs of wetland regulation and the location of Corps and EPA regulatory staff. Federal costs are often higher than comparable regulatory activities by state or local governments because Corps and EPA staff are primarily located in large cities along major waterways hundreds of miles from many isolated and headwater wetlands. Even a simple delineation may take three days (1 day out, 1 day for delineation, 1 day back) and cost as much as one thousand dollars.

The ability of the federal government alone to regulate wetlands, particularly isolated and headwater wetlands, through case-by-case permitting and broader watershed approaches is further limited by the lack of federal control of water extractions (regulated by the states) and land use (regulated primarily by local governments), which determine hydrologic regimes. All wetland characteristics, including functions and values, depend upon these regimes.

Strengthened local government role in protecting and restoring vulnerable wetlands can help fill the gaps in federal and state protection and restoration. Local wetland programs can also help educate landowners and the public concerning wetland functions and values and management approaches. Such a strengthened local government role is also consistent with enhanced wetland protection and restoration by land trusts, the subject of a companion paper.

### **LOCAL GOVERNMENTS**

A large number of general purpose and, to a lesser extent, special purpose governments in the U.S. can help protect and restore wetlands.

In 2002 the U.S. Census Bureau identified a total of 87,576 governmental units (note, all figures which follow are from the Census Bureau and are posted on the web). The Census Bureau considers a “governmental unit” an organized entity with governmental character and discretion in management of its affairs. Almost all general purpose government units are governed by elected officials. Most have taxing powers. Almost all general purpose units of government have land use regulatory powers for zoning, subdivision control, and building codes authorized by “home rule” constitutional or statutory provisions as well as explicit land use control enabling statutes.

General purpose governments include 3,034 county governments, 19,429 municipal governments, and 16,504 town or township governments. Special purpose local governments included 13,506 school district governments and 35,052 special district governments. Of the special districts, over 90% perform a single function. More than 36% serve a function related to natural resources such as soil and water conservation, drainage and flood control. This included 3,247 drainage and flood control districts, 2,506 soil and water conservation districts, 1,287 park and recreation districts, 3,405 water supply districts and 2,004 sewerage districts. Most of the rest of the special districts served fire protection, housing, or community development functions.

County governments are found throughout the nation except for Connecticut, Rhode Island, and the District of Columbia. Some states have as little as 20 and Texas has 254.

Most of the other general purpose units of government (municipalities) are incorporated cities or villages. In the Northeast and Midwest, towns and townships play the same general purpose governmental roles as cities.

As of July 2004, 11,601,136 individuals worked for local governments out of a total U.S. population of 293,101, 881. Of these, 161,587 worked with natural resources and 227,341 with parks and recreation. As of March 2004, there were a total of 5,041,143 state employees with 161,512 working with natural resources. As of December 2004, there were a total of 2,733,869 federal employees with most working in national defense and the postal service. Total federal employees working with natural resources was 191,705.

## **LOCAL GOVERNMENT WETLAND PROTECTION AND RESTORATION EFFORTS**

Although precise figures are not available, it is estimated that approximately 5,000 to 6,000 counties, cities, villages and towns have adopted specific wetland protection regulations. Adoption is not only because of the growing interest in wetland protection at the local level, but also because many of the state acts pursuant to which state wetland regulations have been adopted require or encourage local adoption of regulations. For example, the shoreland zoning acts of Wisconsin, Minnesota, Michigan, Washington and Maine require local regulation of shoreland areas consistent with state standards. Wetland protection is one component. Similarly, coastal zone management acts in Alaska and California place primary regulatory implementation at the local level. The Virginia state coastal wetland act and the freshwater wetland acts of Massachusetts, Connecticut, Florida, and Maryland also place primary regulatory implementation authority at the local level.

In addition to communities with wetland protection regulations, many thousands of other communities have adopted floodplain regulations (a total of 18,300) or broader zoning, subdivision control, building code, or special codes (e.g., grading regulations, tree-cutting regulations, erosion controls) which have the potential for controlling the types and densities of some activities in wetlands and watersheds. Some special purpose units of government such as Soil and Water Conservation Districts and park districts are also involved, but primarily with nonregulatory wetland restoration and restoration.

## **Benefits of Local Government Involvement**

A strengthened local role in wetland protection and restoration is consistent with home rule concepts and the traditional roles of local governments in regulating land use. Local governments implement the broadest range of regulatory, public works, and other programs of any level of government and have more influence over land uses (and to a lesser extent water uses) than any other level of government. It is local governments, not the federal government or the states, that exercise the full range of land use control powers through zoning, subdivision controls, building codes, septic tank regulations, vegetation removal regulations, and other regulations. This means that they can strongly influence what happens throughout communities, which is particularly important for isolated freshwater wetlands and long-term management of watershed hydrology.

Local governments also have considerable on-the-ground field presence: zoning administrators, building inspectors, and planning staff. They are close to wetland areas, cutting down travel time to wetland sites.

Local governments often have many sources of information available to them in permit processing, such as tax maps, land use maps, detailed topographic maps (prepared for sewer and water), which are not readily available at other levels of government.

Local governments are often better able to involve the local public and landowners than states and federal agencies due to their strong local presence.

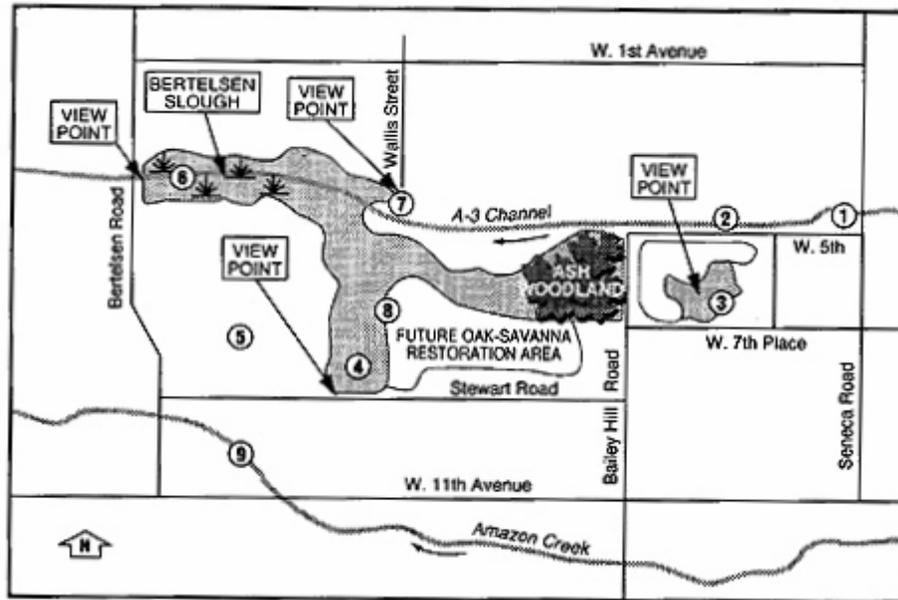
Local governments can coordinate and help apply on the ground fragmented federal and state wildlife, wetland protection, natural hazard reduction, and other resource management efforts.

Local governments are playing increasingly important roles in watershed planning and regulating the quality and quantity of water within their jurisdictions, including water extractions for water supply and other purposes, drainage, nonpoint pollution, stormwater, and floodplain management.

Larger local governments, particularly those in metropolitan areas, now often employ a range of experts and have considerable resource assessment and management capability, although this varies greatly. The expertise of large metropolitan governments often equals or exceeds that of state or federal wetland regulatory agencies.

Local governments often have major opportunities to restore or create wetlands as part of infrastructure projects, such as construction of stormwater management facilities, and public land management such as management of local parks and recreation areas.

For these reasons, strengthened local government roles in protecting and restoration of wetlands are needed and possible. Local governments can adopt their own comprehensive programs or they can reinforce and fill the gaps in state and federal regulations. See, for example, the West Eugene, Oregon, Wetlands Project which has been extensively documented by the city of Eugene and by Rice University. See <http://www.rice.edu/wetlands/home.html>.



*Map of Bertelsen Pond/Bertelsen Slough Wetlands in West Eugene, Oregon prepared as part of a comprehensive wetland planning effort. <http://www.rice.edu/wetlands/Maps/m26.html>.*



*Frank Shoemaker Marsh, Lincoln, Nebraska  
<http://www.ci.lincoln.ne.us/city/parks/admin/wetlands/localwet.htm>*

Frank Shoemaker Marsh was purchased in June 2003 by the City of Lincoln, Nebraska with funding from the Nebraska Environmental Trust and the U.S. Fish and Wildlife Service. The site is 160-acres of land containing nearly 50-acres of eastern saline wetlands. The marsh provides a habitat for a variety of wetland plants and wildlife. Saline plants found on this site include the state endangered saltwort plant.

<http://www.ci.lincoln.ne.us/city/parks/admin/wetlands/localwet.htm>.

### **Limitations Upon a Local Role**

Local government programs are not without limitations. Local governments are often more susceptible to real estate pressures than state or federal agencies since they depend upon local real estate taxation to provide roads, schools, and all public services. Often developers are well

represented on local government planning commissions and governing bodies. Many local governments have limited staff needed to map wetlands, delineate boundaries, evaluate permits, and monitor sophisticated restoration/creation compensation projects. Many local governments have limited budgets. This is particularly true for small, rural governments. Local governments have a limited geographical perspective and quite often control only a portion of a lake, river, or wetland.

There are further problems. Many local governments (particularly small, rural units) lack expertise in wetland protection and restoration. Watershed planning, mitigation banks, regulation of drainage, advanced planning, and sophisticated evaluation techniques may be beyond the technical capabilities of regulatory agency staff, making it impossible for many local governments and some states to carry out such activities without substantial financial resources and help or technical assistance from federal agencies.

**Table 1**  
**Selected Local Government Programs Relevant**  
**to Wetland Protection and Restoration**

**Planning and Regulatory:** may help protect wetlands if properly carried out; will destroy wetlands if not:

- Comprehensive and use plan: usually contains an open space element and may specifically address wetland and floodplain areas.
- Zoning: many communities have adopted special wetland protection districts or overlays. These often contain density controls, setbacks from waters, and transferable development rights for wetland areas.
- Subdivision control: often contain cluster provisions, dedication requirements for park and open space, and stormwater detention requirements.
- Sanitary codes: usually prohibit septic tanks in high groundwater areas.
- Floodplain regulations: usually prohibit fills or other alternations in floodways (preferably defined with a zero rise standard) or broader floodplains; regulations may also prohibit fills in wetlands and other flood storage areas.
- Sediment and erosion control, grading ordinances: may contain buffer and revegetation requirements for development near wetlands.
- Tree-cutting and other vegetation removal ordinances: some prohibit or limit vegetation removal in or near wetlands; require restoration.
- Environmental impact statement requirements: statements required for certain types of projects.

**Acquisition:** may help protect wetlands if properly carried out.

- Acquisition programs for parks, recreation areas, greenways, scientific areas, general open space, and public works projects.

**Public works projects:** may threaten wetlands or help protect wetlands, depending upon the circumstances and how projects are carried out. These include sewer, water supply, solid waste disposal, highways, airports, dikes, levees, chanelization projects, stormwater detention, pipelines, erosion control (bank stabilization), schools, municipal offices, mosquito control, and marinas.

**Public land management:** may help protect wetlands.

- This may overlap with acquisition and public works projects but involve the long-term operation and maintenance. Parks, greenways, sewers, water supply reservoirs, road corridors, dikes, levees, stormwater facilities, forestlands and other open land.

It is for these reasons that federal and state technical and financial assistance is needed to help local governments. Future efforts to protect and restore wetlands need to be cooperative, building upon the collaborative strengths of each level of government including local governments, states, tribes, and federal agencies.

## CHAPTER 2: LOCAL GOVERNMENT OPTIONS

What options do local governments have to strengthen wetland protection and restoration efforts? Some priority options include the following (note, the options are not listed in order of priority):

### **OPTION: COORDINATE WITH THE CORPS OF ENGINEERS AND EPA IMPLEMENTING THE SECTION 404 PROGRAM**

Short of establishing their own programs, local governments can carry out a range of activities to help the Corps, EPA, and other federal and state agencies implementing the Section 404 program and other regulatory efforts. Options for helping the Corps and EPA include:

- Review proposed Section 404 permits and provide comments to the Corps, EPA, and other agencies on permit applications. Comments may often pertain to fish and wildlife values, historical values, land use conflicts, property ownership and other local issues.
- Provide notice to landowners with regard to federal and state regulatory requirements by referencing such requirements in zoning and other bylaws, posting regulatory requirements in planning and zoning offices, and notifying landowners one-on-one when they apply for building permits.
- Monitor landowner compliance with Section 404 and state regulations as part of local enforcement of zoning and other bylaws. This including compliance with conditions attached to permits. Report violations to federal agencies.
- Acquire or prepare wetland maps and provide such maps to landowners with a warning that activities within such wetlands may require a federal Section 404 and/or a state permit.
- Establish GIS systems with a broad range of information relevant to regulatory permitting, such as sites of endangered species, wetland maps, floodplain maps and potential restoration sites. Share this information with the Corps, EPA, and other federal and state agencies.
- Establish and operate mitigation banks. This can help Section 404 regulatory staff and state wetland staff to decide on the acceptability of off-site mitigation and provide options.
- Regulate buffer areas adjacent to federal or state regulated wetlands.
- Prepare and implement water and land use strategies for watersheds through zoning and other regulations.
- Provide education and technical assistance to landowners with regard to alternatives analysis, techniques for reducing impacts, restoration of wetlands, and preparing wetlands and watershed management plans (e.g., Soil and Water Conservation Districts) and site plans as part of Section 404 permitting.
- Designate potential wetland restoration sites, including sites for potential mitigation banks.

- Provide public education and wetland interpretation through the creation of interpretative centers and walks, establishment of wetland courses or components of courses in schools, creation of adult education programs, distribution of regulations, maps and other educational materials, and working with individual landowners.

**OPTION: CREATE AN ENVIRONMENTAL CONSERVATION BOARD;  
HIRE A WETLAND INSPECTOR**

Thousands of towns, cities, and villages have appointed conservation boards, conservation commissions, or environmental commissions to provide increased local expertise in wetland and other environmental matters. For example, the Town of Carmel, New York has appointed a seven-member environmental conservation board, which makes field inspections for all sites where an application for a wetland permit has been submitted. In addition the Board has hired a wetland inspector who is familiar with all of the wetlands and water bodies of the town. See [http://www.carmelny.org/env\\_cons\\_brd\\_01.htm](http://www.carmelny.org/env_cons_brd_01.htm). For some additional examples on the web see the Franklin, Massachusetts Conservation Commission at <http://www.franklin.ma.us/auto/town/conservation/links/default.htm> and Portsmouth, Virginia Wetlands Board. <http://www.portsmouthva.gov/planning/wetlands.htm>.

**OPTION: ADOPT A COMMUNITY WETLAND PROTECTION AND RESTORATION  
POLICY**

Many communities have adopted explicit wetland protection policies to guide both community and private activities. Such a policy can be a stand-alone resolution by the city, village or town council. It can be contained in a master plan or a comprehensive plan. It can be included in zoning, subdivision control, building code, special wetland code, or other regulations. For example a Draft Concord, California General Plan for Parks, Open Space and Conservation Element propose Principle 3.2—“Preserve and Protect Wetlands”. The Policy is to “Preserve bay marshes, wetlands, and tidal areas adjacent to Suisun Bay and other wetlands and creeks in the Planning Area as open space.” The plan states that “(t)he Policy is consistent with state and federal “no net loss” policies for wetlands.” See <http://www.ci.concord.ca.us/citygov/dept/planning/gp2030/06-Parks-Element.pdf> .

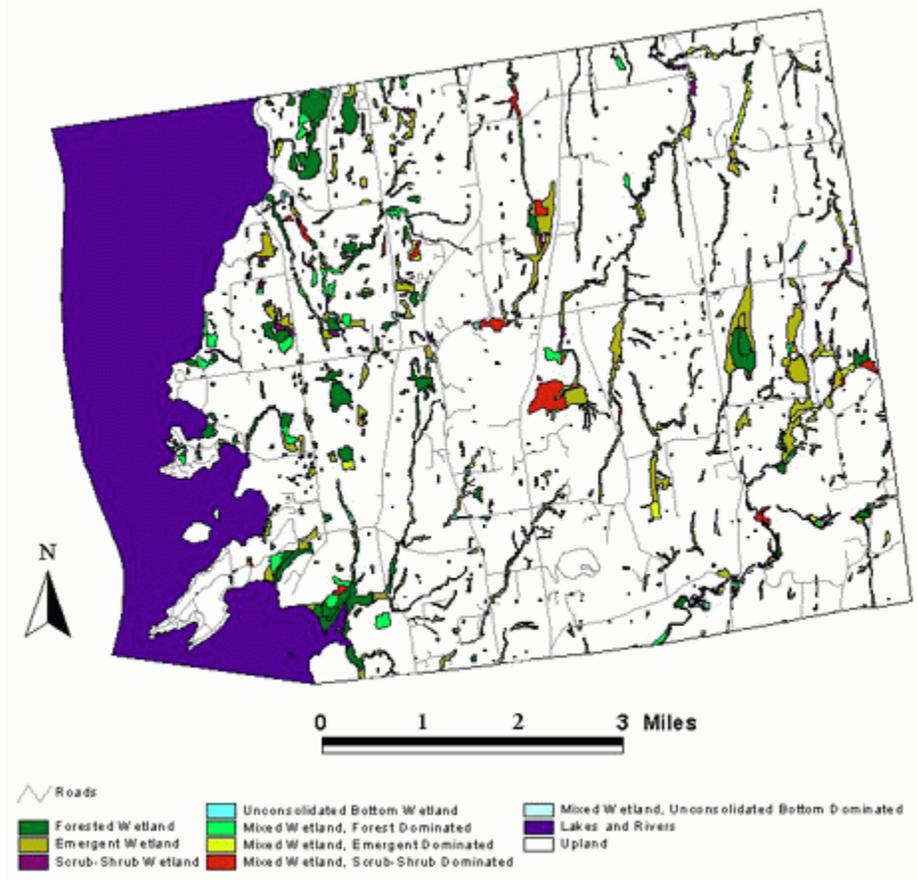
The Clinton Watershed Council in Michigan has developed recommendations for “wetland stewardship for local governments” with a “master plan” as a basis. It sets forth several functions for such a plan including providing “a single, comprehensive view of the community’s desire for the future, an aid in daily decision-making, the basis for zoning decisions, and as an educational tool. It suggests and discussed in some depth four basic elements of a master plan including (<http://www.crowc.org/programs/watershedmgmt/scwetlands/masterplan.html#spas>):

1. Supportive Background Information
2. Goals and Policies
3. Land Use Plans
4. Special Planning Areas

## OPTION: MAP WETLANDS

An increasing number of local governments have acquired or prepared wetlands maps. These maps often use as a starting point National Wetland Inventory or state wetland maps but are more detailed and accurate. Wetland maps can then be used in local government infrastructure planning (sewer, water, roads, etc.) and in comprehensive planning and zoning. Examples of local wetland mapping include the following:

- The Town of Charlotte, Vermont Conservation Commission funded the University of Vermont to prepare up-to-date wetland maps for the Town. See <http://www.uvm.edu/envnr/sal/leslie/charlotte.html>. Air photos were interpreted to identify wetlands and the resulting acetate overlays scanned. The resulting wetland maps included almost twice as much wetland area as National Wetland Inventory maps for the area.



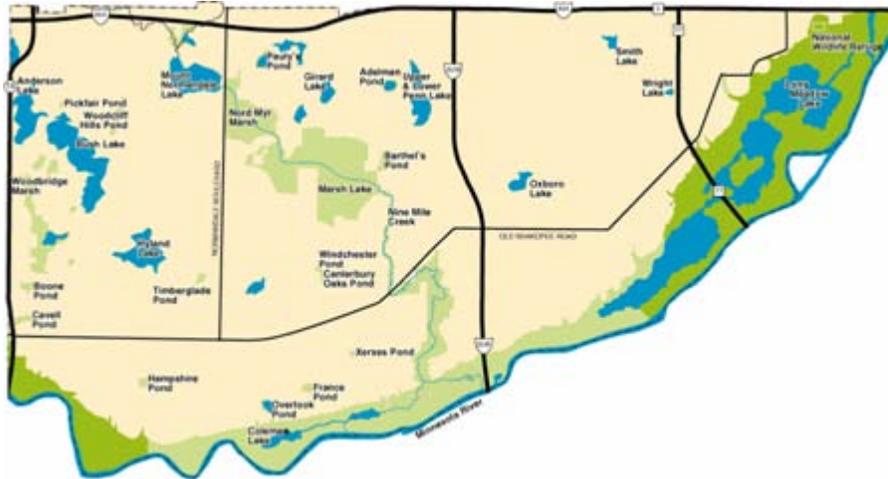
*Wetland map for Charlotte, Vermont*  
<http://www.uvm.edu/envnr/sal/leslie/charlotte.html>

- The City of Clearwater, Florida has created a Wetland Atlas to facilitate planning and permitting activities. The Atlas includes a figure and data for each wetland. The figure was prepared by ground-truthing 1999 aerial photography. Wetland limits were drawn on field copies of the areals at the scale of 1 inch equals 200 feet. This was then digitized into a GIS system in the office. Field data were collected pertaining to a broad range of wetland characteristics. All of this has been posted to a web page. See <http://www.myclearwater.com/gov/depts/pwa/engin/EnviroStorm/wetlands/Wetlands.asp>.

Features evaluated for each wetland include:

- The dominant vegetative species present,
  - Each species status as a wetland indicator,
  - An estimate of the percent cover provided by that species,
  - Any endangered or threatened species observed,
  - The nuisance species present,
  - The total percent cover of nuisance species,
  - An assessment of the hydrological conditions within the wetland,
  - A cursory evaluation of the water quality,
  - Existing observable and potential water quality impacts,
  - Information regarding the soils from the Pinellas County Soil Survey,
  - A cursory assessment of impacts to the soils, such as grading, etc.,
  - Wildlife observations,
  - Adjacent wildlife habitat, if any,
  - An assessment of the degree of disturbance to the wildlife habitat,
  - A list of the types of disturbances to the habitat,
  - Recommendations for the restoration or enhancement of the wetland for water quality or habitat benefits,
  - A description of the wetland according to the U.S. Fish and Wildlife Service (FWS) Classification of Wetlands and Deepwater Habitats of the United States (Cowardin, 1992), and
  - One or more photographs of the wetland from the jurisdictional limits, when possible.
- The Northwest Michigan Council of Governments completed a Special Wetland Area Management Project in cooperation with the Michigan Department of Environmental Quality and the Tappan Watershed Council. This involved preparation (among other products) of GIS wetland maps and CDs for each township in a ten county area, a wetlands functional assessment methodology, and a guide for local communities concerning wetland protection. The GIS wetland maps were created by combining three data sources: National Wetland Inventory Maps, Michigan Resource Inventory System land use/land cover data, and digital soil surveys from the U.S. Soil Conservation Service.

- Kane County Illinois completed a fen identification and recharge area mapping project for the county with Advance Identification funding from the EPA. See [http://www.co.kane.il.us/kcstorm/fen/final\\_report.pdf](http://www.co.kane.il.us/kcstorm/fen/final_report.pdf).
- A particularly large number of Oregon communities are developing local wetland inventories, consistent with state standards. See <http://www.oregon.gov/DSL/WETLAND/lwi.shtml> of such state standards.



*City of Bloomington, Minnesota Wetland Map*

<http://www.ci.bloomington.mn.us/cityhall/dept/pubworks/engineer/wetland/lakepond.htm>

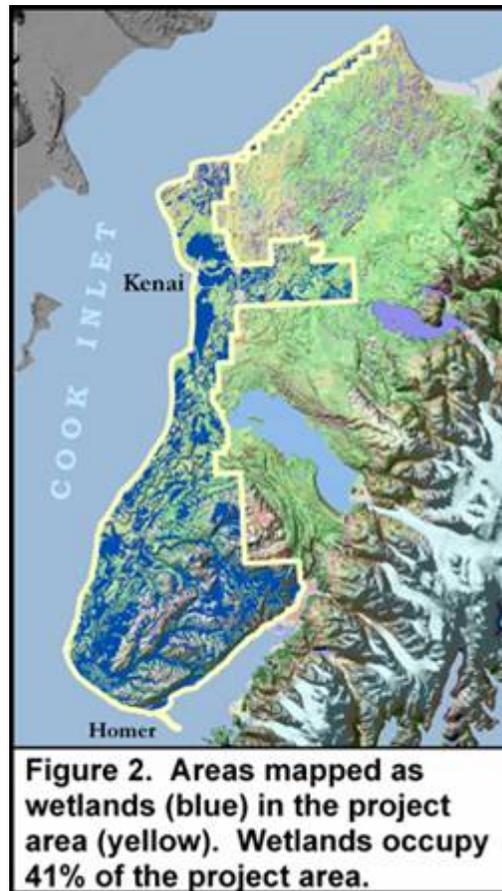
- Thurston County, Washington first attempted to use National Wetland Inventory maps when it adopted zoning regulations in the 1980s prohibiting the filling of wetlands. However maps proved to be unsatisfactory because of their large scale (1 inch=2000 feet) and inaccuracies. As a result the Thurston Regional Planning Council (TRPC) in 1989 undertook a series of pilot projects to map wetlands using false-color infrared aerial photographs. Much of the county was mapped. However, these maps also proved to be inaccurate and the regional wetland maps were “scrubbed”. In 1999 the TRPC contracted with Thurston County to prepare new maps based upon a combined analysis of topography, the National Wetland Inventory maps, soil survey data, and an air photo base with some field reconnaissance. In 2001 color aerial photos replaced the black and white images used as the base for work maps. The regional mapping program was complete in 2002. These maps are now available on two Thurston County web sites. See <http://www.trpc.org/programs/environment/water/thurston+county+wetlands+mapping.htm>.



*Example of a wetland map from Thurston County, Washington.*

<http://www.trpc.org/programs/environment/water/thurston+county+wetlands+mapping.htm>

- The Kenai Alaska Watershed Forum classified and mapped wetlands in the Kenai Lowland beginning in 1999 and finishing in 2004. The wetlands were mapped using stereo-paired aerial photography and extensive field visits. Many other types of data were also used such as National Wetland Inventory data and USDA Natural Resources Conservation Service (NRCS) soil maps. These maps are available on the Kenai Borough's web site. See <http://www.kenaiwetlands.net/index.htm> for quite detailed discussion how the wetlands were classified and mapped.



*Area Mapped as Kenai Lowland Wetlands in Alaska. By Kenai Watershed Forum.  
<http://www.kenaiwetlands.net/index.htm>*

### **OPTION: ESTABLISH WETLAND-RELATED GIS SYSTEMS**

An increasing number of communities have created wetland-related GIS systems or a wetland component to larger GIS systems to help guide regulatory permitting and to prioritize wetlands for acquisition, restoration, enforcement and other purposes. These include many of the communities with mapping efforts listed above. Often GIS efforts are part of broader GIS systems established to aid local governments in master planning and comprehensive planning, tax assessment, and infrastructure management. See City of Clearwater, Florida mapping and GIS described above. Other objectives for mapping may be wetlands and watershed management and comprehensive land use planning. Examples of GIS systems include:

- Cass County, Minnesota has used its GIS system to map wetlands, identify and map functions, and determine restoration priorities. Eight factors were defined and used to rate wetlands with each function assigned a numerical value including fisheries, uniqueness, wildlife habitat, rare and endangered species, cultural resources, surface water quality, ground water quality and flood attenuation. This scoring is used in determining wetland replacement values for mitigation. See [http://mnlakes.org/main\\_dev/news/2000\\_jan\\_feb/cass\\_county\\_a\\_model.cfm](http://mnlakes.org/main_dev/news/2000_jan_feb/cass_county_a_model.cfm).

- Bolder Colorado has mapped wetlands and inputted this data to its GIS system. It has also evaluated the functions of wetlands using its GIS as part of an “Advanced Identification” effort. See <http://www.ci.boulder.co.us/buildingservices/wetlands/wetlandsID.pdf>. For actual data as part of a GIS system for Bolder Colorado see [http://www.co.boulder.co.us/gis/downloads/dl\\_data\\_dict/dl\\_dd\\_wetlds\\_os.htm](http://www.co.boulder.co.us/gis/downloads/dl_data_dict/dl_dd_wetlds_os.htm).

### **OPTION: ASSESS WETLAND FUNCTIONS AND VALUES**

Some communities have assessed wetland functions and values throughout a community or for specific areas. Quite detailed assessments have been carried out by local governments as part of comprehensive water and land use planning efforts, wetland “Advanced Identification”, SWAMP, and similar efforts. Examples include:

- A Northeastern Illinois Planning Commission “Advanced Identification” Study for Kane County, Illinois Wetlands and Streams mapped county wetlands and identified two categories of wetlands and wetland functions as critically important to Kane County—habitat value and water quality/stormwater storage value. See <http://www.co.kane.il.us/kcstorm/adid/ADIDreport.pdf>.
- The Clinton River Watershed Council valued wetlands along Stoney Creek in Michigan as part of an Advanced Identification of Wetlands Project. See <http://www.crowc.org/programs/watershedmgmt/scwetlands/scram.html>. The Council evaluated wetlands using a five step wetland assessment methodology called Rapid Assessment Method (RAM) which focused on seven wetland functions (floral diversity and wildlife habitat, fishery and herpetile habitat, flood and stormwater storage, runoff attenuation, water quality protection, shoreline and streambank protection, and aesthetics and recreation) through five evaluation steps:
  - Locate wetlands.
  - Determine which wetland functions you want to assess.
  - Record wetland characteristics using RAM data sheets.
  - Assess the degree to which each wetland performs each function.
  - Create a wetland protection plan.
- Eugene Oregon mapped and evaluated wetlands for an Advanced Identification project using the Wetland Evaluation Technique (WET), Level 11. See [http://www.rice.edu/wetlands/Reports/R12\\_1.html#scope](http://www.rice.edu/wetlands/Reports/R12_1.html#scope). A combination of onsite and offsite assessment procedures was used including extensive field surveys. The following sorts of data were used in the study: habitat rating inventory, FWS National Wetland Inventory, FEMA flood data, USDA soils information, historic wetlands information, Oregon natural heritage databases, and waterways and drainage information (from air photos and historic records). In addition a number of more specific inventories were carried out including a “habitat rating inventory”, “winter waterfowl and amphibian and reptile survey” and a variety of onsite investigations to apply WET.
- Similarly, both Juneau and Anchorage Alaska mapped and assessed the functions of wetlands in preparing wetland management plans.

## **OPTION: PRIORITIZE WETLANDS**

Some communities have identified certain priority groups of wetlands for protection, acquisition, restoration, or other purposes. Examples include (note there is overlap with GIS and mapping):

- The Town of Greenwich, Connecticut started to develop a GIS in the mid to late 1990's. The GIS has been used to identify wetlands likely to function as vernal pools, one of the Towns most threatened habitats. A database on the nature and location of vernal pools in the town has been prepared using a combination of GIS data and field investigations. As part of this database, GIS information on the location of wetlands and watercourses was obtained. Data was interpreted from 1997 color aerial photos, the land records of the Town and 2000 color infrared aerial photos. A consulting firm delineated and classified wetlands and watercourses in 1991 and this data was inputted to the GIS.
- The Minnesota Board of Water and Soil Resources undertook a GIS project for a seven county metropolitan area (Minneapolis/St. Paul) to identify restorable wetlands using readily available GIS data. This project merged two geographic data sets, the County Digital Soil Survey and the National Wetlands Inventory to generate maps representing potentially restorable wetlands. See <http://www.bwsr.state.mn.us/wetlands/publications/PotentiallyRestorableWetlands.pdf>.
- The Milwaukee Metropolitan Sewerage District contracted for the preparation of a Conservation Plan for each watershed that identifies parcels that need to be protected or restored for conservation purposes as floodplains, riparian habitats, environmental corridors or isolated natural resource areas within the watershed. This included identification of undeveloped private properties potentially at risk from development that could provide future flood-reduction benefits. The Project Team used a GIS and remote sensing (aerial photography, soils maps, wetlands maps) to identify more than 28,000-acres of undeveloped land containing hydric soils. A subset of 199 sites greater than or equal to 25-acres was identified for further investigation. Forty-two of these sites were identified as high priorities for acquisition. See <http://www.epa.gov/owow/nps/natlstormwater03/26MOLeary.pdf>.

## **OPTION: PREPARE WETLAND MANAGEMENT PLANS**

An increasing number of communities have prepared wetland management plans. Others are proposing to do so including many communities in Oregon. Oregon has published a guidebook for communities working on wetland resources in their comprehensive planning efforts. See [http://www.oregon.gov/DSL/WETLAND/wetland\\_guidebook.shtml](http://www.oregon.gov/DSL/WETLAND/wetland_guidebook.shtml). The West Eugene Oregon wetland plan is particularly well known and is extensively documented on the Eugene web site. See <http://www.eugene-or.gov/portal/server.pt?space=CommunityPage&cached=true&parentname=CommunityPage&parent>. See also <http://www.rice.edu/wetlands/Reports/R21.html>. Other examples include:

- Kane County Council of Governments, which prepared the West Eugene wetland plan, offers a broad variety of “hints” for other local governments in preparing wetland management plans on its web sites. These included both “general” and “more specific” hints. General hints included ([http://www.rice.edu/wetlands/Reports/R12\\_1.html#scope](http://www.rice.edu/wetlands/Reports/R12_1.html#scope)):
  - Plan to work with affected people at the local, state and federal levels.
  - Use the best information available.
  - Develop a vision or overall direction for your plan early in the process.
  - Use lessons found in Oregon and Washington to your advantage; for example, have a citizen involvement program, develop goals and policies, use maps and graphics to convey information, develop and evaluate alternatives, and use criteria for making final decisions.
  - Consider implementation and financing as part of your plan.
  - Treat wetlands as an asset and fit them into a multiple objective natural resources, public facilities, and public enjoyment framework.

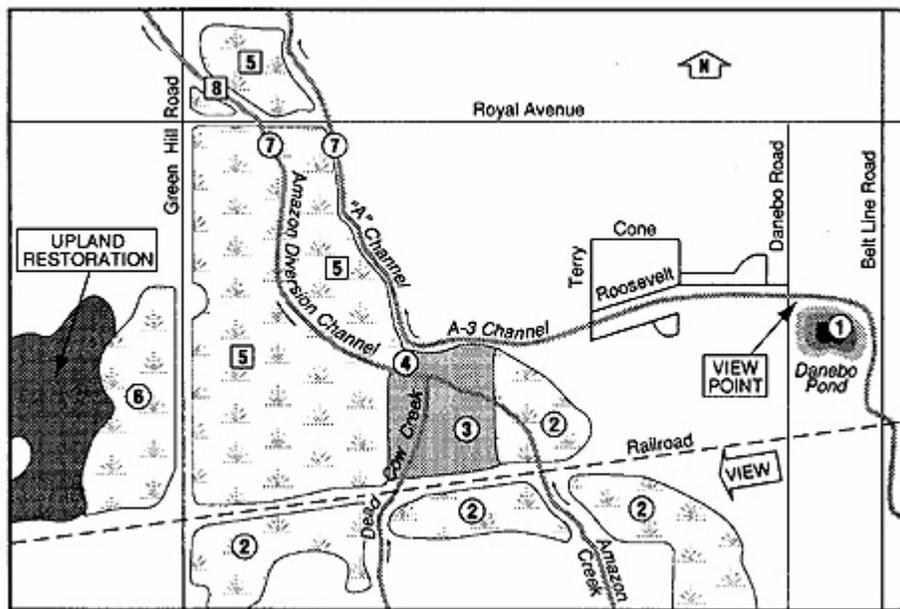
More specific hints include ([http://www.rice.edu/wetlands/Reports/R12\\_1.html#scope](http://www.rice.edu/wetlands/Reports/R12_1.html#scope)):

- “Consider the Scope and Nature of Your Wetlands
- Recognize Comprehensive Wetland Management Plan (CWMP) Advantages Over the Permitting Process
- Develop a Work Program and Budget
- Conduct the Best Inventory and Assessment That You Can Afford
- Support of Elected and Planning Officials is Vital
- Develop a Citizen Involvement Program
- Involve Affected State and Federal Agencies
- Develop Multi-disciplinary Local Expertise within Affected Departments
- Consider the Role of a Non-Profit Group
- Consider Involving Your State and Federal Representatives
- Link the Wetlands Plan to Your Comprehensive Land Use Plan
- Use a Systems Approach
- Think About Implementation Early in the Process
- Be Positive
- Think of Multiple Objective Approaches
- Evaluate the Economic Impacts of Your Wetlands Plan
- Develop a Vision
- Treat Wetlands as an Opportunity
- Be Realistic in Assessing Development Goals and Needs”



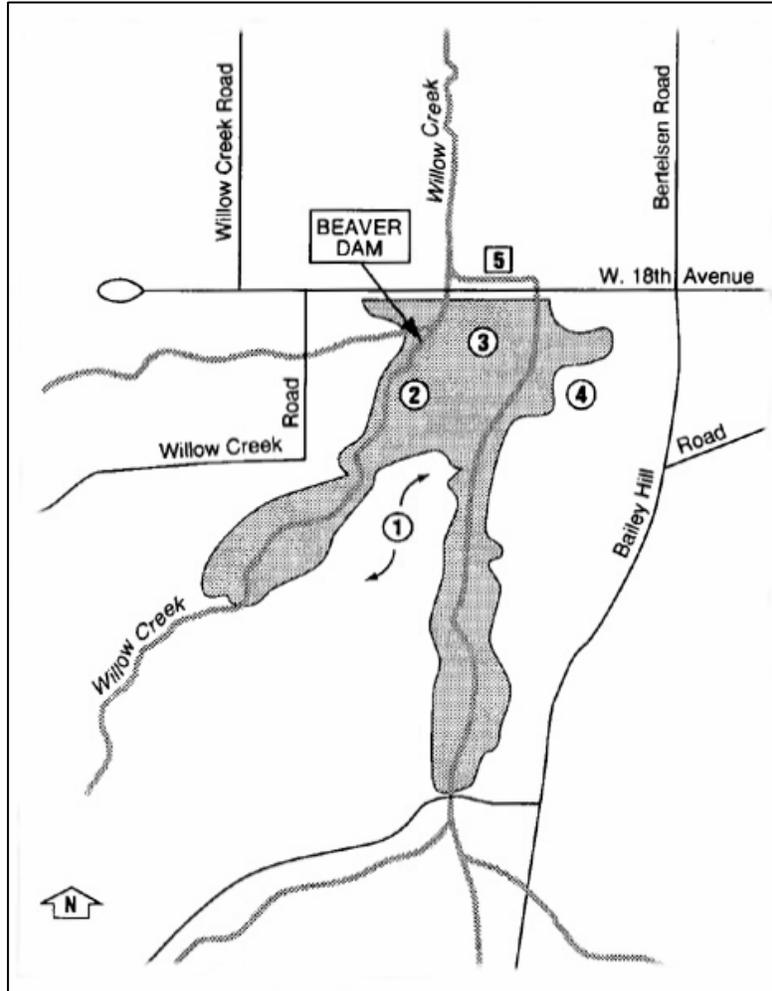
The West Eugene, Oregon wetland program has mapped and evaluated these and other wetlands.

<http://www.eugene-or.gov/portal/server.pt?space=CommunityPage&cached=true&parentname=CommunityPage&parent>



Map of Lower Amazon Creek wetland sites in West Eugene, Oregon.

<http://www.rice.edu/wetlands/Maps/m25.html>



*Map of Willow Creek Natural Area and Beaver Dam Site in West Eugene, Oregon.*  
<http://www.rice.edu/wetlands/Maps/m23.html>

For other examples of community wetland management plans see the following:

- Preparation of the Box Elder County Comprehensive Wetlands Management Plan. Begun in 1997 by the Great Salt Lake Wetlands Ecosystem Plan Steering group with the mission “to conserve and enhance the integrity of (the) Great Salt Lake wetland ecosystem in Box Elder Country...” The Plan had the dual goals of preserving and enhancing the quality of wetlands and encourages responsible urban development. Among other more specific goals stated in the plan was to “ensure no net loss of wetlands and wetland values”. ... The Plan was completed in 1999. This was based upon extensive information gathering and mapping including field inventories. The Plan recommended seven planning classes of wetlands. See [http://www.mitigationcommission.gov/wetlands/pdf/box\\_elder\\_wetland\\_conservation\\_plan.pdf#search='Box%20Elder%20County%20Comprehensive%20Wetlands%20Management%20Plan'](http://www.mitigationcommission.gov/wetlands/pdf/box_elder_wetland_conservation_plan.pdf#search='Box%20Elder%20County%20Comprehensive%20Wetlands%20Management%20Plan').

- The City of Bloomington, Minnesota prepared a Wetland Protection and Management Plan in 1997.  
<http://www.ci.bloomington.mn.us/cityhall/dept/pubworks/engineer/wetland/wetplan.htm>. The planning effort was part of a Comprehensive Surface Water Management Planning program. City staff inventoried and mapped approximately 300 wetlands in the city. The city ranked the wetlands based on functions and values, how they are managed, and their susceptibility to storm water and snow melt runoff. The plan recommends actions to provide appropriate management of wetlands in the future.
- The City and Borough of Juneau established a wetlands management plan and have been using this plan for regulatory purposes. In preparing this plan the Borough mapped and evaluated all wetlands.  
<http://www.dnr.state.ak.us/acmp/Explore/amsas/JuneauWMP.pdf>.

### **OPTION: CLASSIFY WETLANDS FOR REGULATORY PURPOSES**

A number of communities have rated and ranked wetlands for regulatory purposes such as Anchorage and Juneau, Alaska, West Eugene, Oregon, Bolder, Colorado, and Du Page County Illinois. Many of these efforts have been part of Advanced Identification or Special Area Planning efforts (see discussion above) and have involved mapping and evaluation in a GIS format. A number of states have also classified wetlands such as New York and Vermont.

However, these efforts have met with problems.

There is argument that wetlands vary in terms of hydrologic regime, size, depth, vegetation, animal species, rarity within a region and many other characteristics. There is also little argument that wetland functions, values and natural hazards also vary depending not only upon the characteristics of a specific wetland but its relationship to other wetlands, hydrologic regime, and users.

Superficially, then, proposals to classify wetlands based on function and value alone seem sensible and perhaps not too difficult to carry out, until one begins to consider the dynamic nature of wetlands, their interdependence with watershed and human activities, and the high cost of attempting to assess up-front all functions and values. It is very difficult, if not impossible, to define function and value once and for all because of changing hydrologic regimes and changing land uses in watersheds. Accurate determination of wetland functions and values is extremely expensive, even on a case-by-case basis, for a relatively small number of wetlands and prohibitively expensive on a statewide or nationwide basis.

Grouping of wetlands for determination of development potential based on natural resource functions alone is also misleading since development potential often depends not only on natural resource values, but also on natural hazards (flooding, erosion) and overall community context. A wetland with few natural functions may, nonetheless, lie in a river floodway or coastal high hazard area. Development may be subject to severe hazards and may increase hazards on other lands.

This does not mean that some useful classification of wetlands for regulatory and other purposes is not be possible. The FWS is experimenting with a combination of the HGM categories and National Wetland Inventory maps to indicate overall functions and values. Several states now use some type of presumptive regulatory classification scheme in their wetland regulation efforts to establish functions and values. Regulatory classifications should, if they are to be used, be approached with care and based upon preparation of wetland management plans or comprehensive land use planning with wetlands as one component.

### **OPTION: CARRY OUT COMPREHENSIVE LAND USE OR WATERSHED LEVEL PLANNING**

Thousands of communities have carried out comprehensive land use planning or watershed planning with wetland conservation and restoration as one goal. See American Planning Association Policy Guide on Wetlands for recommendations concerning “the inclusion of wetlands in overall planning”: <http://www.riapa.org/policyguides/FinalWetlandPolicy02.htm>. Many of these efforts include “conservancy” or “sensitive land” zones for wetlands. Some states (e.g., Oregon, California, Florida, Wisconsin, and Massachusetts) mandate local governments to prepare plans with wetland components. These plans typically are based on surveys of existing land uses and natural resource characteristics including wetland maps. They reflect population characteristics, needs and other local conditions. These plans deal not only with existing conditions, but also establish goals for infrastructure development and various land use activities throughout a community, including the types and densities of uses.

In general, local land use plans are prepared by professional planners working under the supervision of a local planning board. Local zoning regulations are implemented by a zoning administrator who makes field visits to any major development. Other local staff, such as building inspectors and members of the planning and/or engineering staff (if a subdivision is involved), also visit building sites.

For an example of comprehensive planning or watershed planning efforts with wetlands as one component see the Wellfleet, Massachusetts Comprehensive Plan at [http://www.wellfleetma.org/public\\_documents/wellfleetma\\_Compplan/LCP%202b%20Wet\\_Wild.pdf](http://www.wellfleetma.org/public_documents/wellfleetma_Compplan/LCP%202b%20Wet_Wild.pdf) which set forth quite extensive policies dealing with wetlands and wildlife habitat. Other examples include:

- Summit County Colorado in 1994 adopted interim wetland regulations. See generally <http://www.co.summit.co.us/planning/wetlands.htm>. In 1996 it completed a detailed wetland mapping project. In 1997 through 2000 the County and partners undertook a wetland assessment project. In 1998 the county established an 18-month effort to develop a management plan to protect wetlands in Summit County. A Task Group was formed. In 2003 the county adopted wetland goals, policies/actions and implementation strategies as part of the updated Countywide Comprehensive Plan. See <http://www.co.summit.co.us/planning/longrange.htm>. It has also continued efforts to incorporate wetland protection strategies into basin master plans.



*Summit County, Colorado has adopted wetland policies as part of its comprehensive planning process. [http://www.co.summit.co.us/Planning/MajorProjects/Environment\\_Element.pdf](http://www.co.summit.co.us/Planning/MajorProjects/Environment_Element.pdf)*

- The City of Santa Cruz California has prepared a draft City-wide Creeks and Wetlands Draft Management Plan. <http://www.ci.santa-cruz.ca.us/pl/Creeks/WMP.html>. The draft management plan contains much useful information concerning the city planning and regulatory efforts.

In some instances these planning efforts have been undertaken by coalitions of groups. For example, the Lake County Ohio Marsh Area Regional Coalition has been formed including a group of government organizations, private conservation groups and individuals to protect Mentor Marsh and its surrounding environs through innovative planning. See <http://www.lakecountyohio.org/planning/marc/>. A Special Area Management Plan is being prepared for the area. This Coalition includes a number of local governments including the Lake County Planning Commission, Lake Metroparks, Village of Fairport Harbor, Lake County Utilities Department, and Lake County Soil and Water Conservation. A steering committee has broken into a number of more specific Task groups. A GIS data based is being compiled for the Marsh.



*A coalition of groups is preparing a Special Area Management Plan for Mentor Marsh in Lake County, Ohio.*  
<http://www.lakecountyohio.org/planning/marc/>

Such plans may be part of broader open space planning. See, for example, A Plan for the Conservation of Open Space in Chester, Ct. [http://www.chesterct.com/Open\\_Space\\_Plan.pdf](http://www.chesterct.com/Open_Space_Plan.pdf).

### **OPTION: WORK WITH AND ASSIST LAND TRUSTS**

Many local governments are working closely with local, regional, and national land trusts to protect and restore wetlands. Conversely, many land trusts depend in part upon local government funding for projects and local government management of lands. For example, the Trust for Public Land puts all of its property once acquired in the hands of local, state, or federal hands.

Land trusts can assist local governments in protecting and restoring wetlands in many ways. As stated by the Sonoma Land Trust: “Because land trusts are local, private, and nonprofit, we can act quickly and flexibly to address landowners’ goals and achieve public benefit.” Land trusts often buy and hold lands until a public agency is able to find enough money to pay for the land. They can also help broker direct purchases of land by government agencies. For example, the Land Trust of Virginia works together with local governments interested in developing an easement policy or working together on projects and co-holding the resulting easements.

Land trust members are increasingly powerful advocates of land planning and environmental protection at the local levels. As stated by the Natural Lands Trust (see <http://www.natlands.org/categories/article.asp?fldArticleId=90>):

Local decisions determine the fate of most open space. That means interested residents can make a dramatic difference in whether or not land gets protected.

Local governments and land trusts can, more specifically:

- Acquire, protect, and restore high value and vulnerable wetlands.
- Acquire conservation easements from landowners to protect wetlands.
- Comment on permit applications.
- Help a community map wetlands.
- Educate the public concerning the value of wetlands.
- Work and negotiate with individual landowners to persuade them to protect and restore wetlands.
- Help draft and support wetland planning and regulatory efforts.
- Help monitor wetlands and report violations.

### **OPTION: ADOPT REGULATIONS**

As indicated above, many thousands of local governments have adopted their own wetland regulations. Regulations can take a number of forms. Often communities adopt several types of regulations simultaneously (e.g., zoning, subdivision controls, special codes). These may include:

Special Wetland Protection Regulations. Local governments in many states have adopted special wetland protection ordinances. These ordinances are particularly common in Maine, Rhode Island, New Hampshire, New York, Connecticut, Massachusetts, Maryland, Virginia, Florida, Wisconsin, Minnesota, Michigan, Washington State, and Oregon. These ordinances typically include a wetland map and regulations for permitted and prohibited activities. Many ordinances tightly control filling and drainage of wetlands. Others establish permitting procedures and general standards such as no net loss of acreage and function.

Wetland Zone Restrictions as Part of Comprehensive Land Use Planning and Zoning. Wetland zone restrictions incorporated into comprehensive land use plans and zoning regulations are the most common type of wetland regulation. Wetlands are designated as wetlands, conservation areas, or sensitive lands on local government zoning maps. Zone restrictions are then included in the written text of the zoning regulations. As with special wetland protection regulations, written text typically lists permitted, prohibited, and conditional activities in wetlands.

Wetland Protection Regulations as Part of Boarder Shoreland Zoning and Coastal Zone Management Regulations. Wetland protection requirements are contained in hundreds of “shoreland” or “shoreline” ordinances in Wisconsin, Minnesota, Washington State, and Maine. Such requirements are also contained in coastal zone regulations in many states such as California, South Carolina, Massachusetts, Alaska, and Louisiana.

Wetland Protection Regulations as Part of Floodplain Zoning. Over 18,000 communities have adopted floodplain zoning regulations. Some of these regulations (particularly in states such as Massachusetts) also contain wetland protection provisions. Even where there are no explicit wetland protection provisions, many of these regulations provide at least partial protection for riverine wetlands. Many communities has adopted restrictive regulations for inner floodway (flood conveyance) areas. Fills and other obstructions to flood flows are typically prohibited in floodways. Many riverine wetlands lies within floodways in and immediately adjacent to rivers

and streams. The floodway regulations help protect these wetlands. However, many ordinances permit channel alterations and alterations of floodplains including drainage of floodway and filling of outer floodplain areas, destroying wetlands. To remedy this, an increasing number of communities prohibit fill in wetland areas of floodplains or floodways.

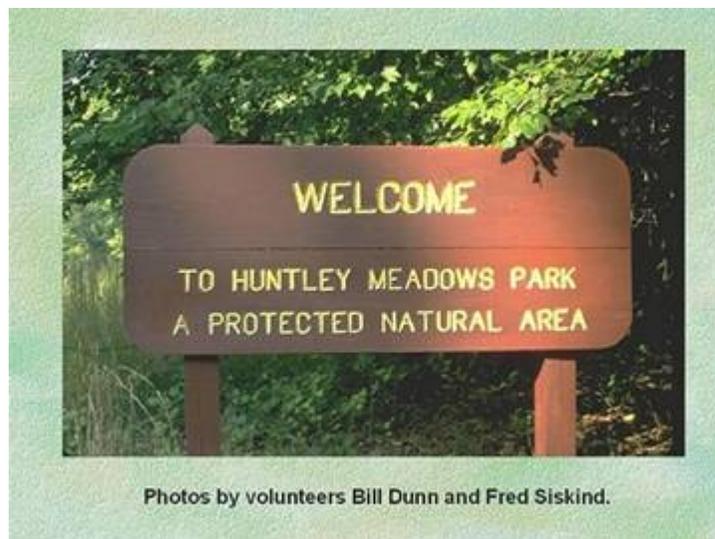
Sanitary Code Regulations. Many local governments have adopted sanitary code regulations which prohibit development without sewer and water without approved onsite waste disposal, usually septic tanks and soil absorption fields. Sanitary code regulations usually prohibit soil absorption fields in areas of high ground water and tight soils. Septic tanks are rarely allowed in wetland areas because of the high groundwater and organic content of soils.

Subdivision Regulations. Many communities have adopted subdivision regulations which require that subdividers set aside a portion of each subdivision for open space and recreation purposes. Floodplains and, in some instances, wetlands are not to be subdivided although they may be included as open space.

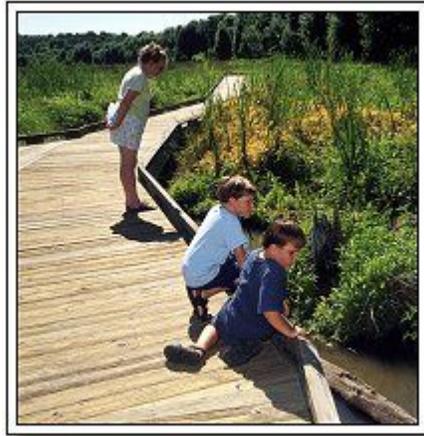
Other Special Regulations. Many communities have also adopted a variety of special regulations which provide some measure of protection for wetlands. These include buffer set back requirements from rivers and streams, public water supply protection zones, tree cutting and other vegetation removal regulations, grading and fill regulations, and various point and nonpoint source regulations including regulations for stormwater management.

### **OPTION: ACQUIRE AND CREATE WETLAND PARKS**

Many local governments have established trails, boardwalks, and other wetland-related services in public parks or have established wetland parks. Examples include Huntley Meadows, Virginia; the Jackson-Frazier, Oregon wetland; and Jug Bay, Maryland described below.



*Huntley Meadows, Virginia*  
<http://www.fairfaxcounty.gov/parks/nature.htm>



*Friends of Huntley Meadows, Virginia*  
<http://www.fairfaxcounty.gov/parks/nature.htm>

- Benton County Oregon Natural Areas and Parks Department has managed the Jackson-Frazier Wetland since 1993. In 1992 the Benton County Board of Commissioners appointed a Jackson-Frazier Wetland Management Plan Task force to develop a management plan for the wetland. The task force identified seven major management issues to form the structure for the management plan including management goal, administrative structure, vegetative management, hydrologic management, public use, wildlife management, and adjoining land uses and ownerships. A 3,400-foot wooden boardwalk has been constructed to allow access to the wetland. Other site improvements include educational kiosk, interpretive signage, and educational materials. See <http://www.cse.pdx.edu/wetlands/jackfrazer.dir/mngpln.html>.



*Boardwalk in the Jackson-Frazier Wetland, Oregon*  
<http://www.cse.pdx.edu/wetlands/jackfrazer.dir/mngpln.html>

- Anne Arundel County, Maryland, Department of Recreation and Parks established Jug Bay Wetlands Sanctuary in 1985. The 620-acre Sanctuary is the largest freshwater tidal wetland on the east coast. More than 250 bird species have been observed there. The McCann Wetland Study Center at the sanctuary contains an exhibit room, conference room, lab and staff offices. See <http://www.jugbay.org/>.



*Huntley Meadows, Virginia*

<http://www.fairfaxcounty.gov/parks/huntley/education.htm>

### **OPTION: PROVIDE LOCAL TAX INCENTIVES FOR WETLAND PROTECTION**

In at least 36 states, local governments can provide real estate tax incentives to landowners for wetland protection. For example, in 1998 the Virginia General Assembly passed legislation that allows local governments to grant tax incentives to protect wetlands and riparian buffers. Under Title 58.1 of the Code of Virginia, wetlands and riparian buffers have been added to the definitions of “Real estate devoted to open-space use” under Chapter 36 on Land Use Assessment. See <http://www.dcr.virginia.gov/sw/ordinanc.htm>. Most of these programs provide current use valuation for tax assessment purposes. Others provide reduced property taxes and outright exemptions. A few provide tax credits for open space. <http://www.biodiversitypartners.org/pubs/CinAReport/Results1.shtml>. But there are limitations as well. Illinois provides that land dedicated as a nature preserve or as a nature preserve buffer under the Illinois Natural Areas Preservation Act shall be depreciated for assessment purposes. Seventeen states provide for property tax relief for land subject to a conservation easement. For example, Iowa provides tax benefits for certain conservation easements. Both Colorado and South Carolina allow income tax benefits as well as property tax benefits for authorized conservation easements.

## OPTION: RESTORE WETLANDS

Many local governments have restored wetlands, often in cooperation with federal agencies, state agencies and lands trusts. These restoration projects have been located in local parks or other parkland, greenways, floodplains, or to create stormwater treatment facilities. For example:



*City of Lincoln, Nebraska, wetland restoration*  
<http://www.ci.lincoln.ne.us/city/parks/admin/wetlands/localwet.htm>

- The City of Lincoln, Nebraska has helped restore 25-acres of degraded saline wetlands including a pavilion and three quarter mile interpretive trail. See photo.
- West Seattle, Washington is supporting the restoration by Westwood Neighborhood Council of a peat bog in Roxhill Park. Dirt is being removed from the bog and the area replanted. In 2000 and 2001 volunteers planted over 20,000 native plants in the peat bog and surrounding uplands. See <http://www.scn.org/westwood/roxhill/>.



*Roxhill Bog in Washington replanting*  
<http://www.scn.org/westwood/roxhill/010224/>

- The San Diego, California, Parks and Recreation Department cooperated with a broad range of organizations to conduct a “Wetland Avengers” on Saturday, September 8, 2001 to restore and clean up a salt marsh in Ocean Beach. Close to 600 volunteers from throughout San Diego County were on a “mission possible” to save the wetland habitat.



*“Wetland Avengers” Restoration in California*  
<http://www.projectpacific.org/wetland.html>

- The City of Clearwater, Florida transformed the former site of the Friendly Village of Kapok mobile home park back into a 27-acre floodplain with 26-acres of wetland-- Kapok Park Wetland and Floodplain Restoration. The City of Clearwater purchased the land for approximately \$10 million. The mobile homes were moved or demolished. This restoration was pursuant to a broader watershed management plan. See [http://www.ffva.com/member\\_resources/e-resource\\_dec2005.pdf](http://www.ffva.com/member_resources/e-resource_dec2005.pdf); <http://www.swfwmd.state.fl.us/documents/publications/watermatters/JanFeb2006/1.html>.
- Clark County, Nevada is in the process of creating a 2,900 acre, seven miles by one mile Wetlands Park and Nature Preserve. See [http://www.co.clark.nv.us/Parks/Wetlands/Wetlands\\_Nature\\_Preserve.htm](http://www.co.clark.nv.us/Parks/Wetlands/Wetlands_Nature_Preserve.htm). The Wetlands Park is designed to enhance wetlands habitat, restore the large wetlands environment, and provide recreation and education opportunities. A 100-acre Nature Preserve will be at the core of this project. Also included will be a visitor’s center with approximately 35,000 square feet of gathering, exhibits, classrooms, and office facilities; Ponds behind specified dams (for wildlife and plant habitat); habitat enhancement of 210-acres (re-vegetation plan); trails: equestrian, multi-use, unimproved, pedestrian-only; 43 miles total. Rest stops every half-mile; 6 multi-use trailheads, parking for 30 cars each; signage, restrooms, seating. 3 equestrian trailheads.



*Visitor and education center, Clark County Wetland Park and Nature Preserve, Nevada*  
[http://www.co.clark.nv.us/Parks/Wetlands/Visitor\\_&\\_EducationCenter.htm](http://www.co.clark.nv.us/Parks/Wetlands/Visitor_&_EducationCenter.htm)

### **OPTION: CONSTRUCT WETLANDS**

Hundreds of local governments have created wetlands for stormwater management and for the polishing of sewage effluent. In some instances they have also been “mitigation” wetlands to compensate for losses elsewhere in the community. Examples include:

- The City of El Paso, Texas created the Rio Bosque Wetlands Park in 1997. This 372-acre park is located in southeastern El Paso County adjacent to the Rio Grande River. Water for this wetland is wastewater from the adjacent Roberto Bustamante Wastewater Treatment Plant. Water is supplied to the wetland park when it is not being used for irrigated agriculture. The project involved rebuilding the old river channel through the park and diverting water from this channel into a series of shallow wetland cells. See <http://www.research.utep.edu/Default.aspx?PageContentID=979&tabid=18875>.
- The Sewickly Creek Wetlands Interpretive Area is a man-made wetland covering 21-acres constructed by the Pennsylvania Turnpike Commission to compensate for construction of a bypass. It is managed by Westmore Parks and Recreation Area.



*Sewickly Creek Wetlands Interpretive Area, Pennsylvania*  
<http://www.inwestmoreland.com/countyparks/>

- The city of Arcata, California in 1986 completed a 100-acre marsh designed to treat wastewater. In 1986 the Coastal Conservancy funded the Butchers Slough Restoration which reconfigured and increased saltwater wetlands which expanded the marsh area to its current size of 154-acres. Arcata's system has become an international example of wastewater reuse and wetlands restoration. In 1987 Arcata received a grant of \$100,000 from the Ford Foundation's "Innovations in Government" awards program for the City's approach to the treatment of its wastewater. In response to the widespread interest that has been generated by this program, the City of Arcata used the Ford Foundation funds and funds received by the Friends of the Arcata Marsh to construct the Arcata Marsh Interpretive Center (AMIC). Opened in 1993, the AMIC is the focal point for the Arcata Marsh & Wildlife Sanctuary. The Arcata Marsh and Sanctuary is used by over 200 species of migrating birds and is a popular Pacific coast birding spot. See [http://www.arcatacityhall.org/arcata\\_marsh.html](http://www.arcatacityhall.org/arcata_marsh.html).



*Arcata Marsh and Sanctuary, Arcata, California*  
[http://www.arcatacityhall.org/arcata\\_marsh.html](http://www.arcatacityhall.org/arcata_marsh.html)

- The city of Petaluma, California is in the process of constructing a new wastewater treatment plant in the upper portion of Gray's Ranch which will include 45-acres of polishing wetlands. About 230-acres of the site will be open to the public with walking trails, educational areas, public parking, and access to a natural brackish tidal marsh. See <http://www.petalumawetlandspark.org/HTML/ProjectDesign.html>.



*Orlando Wetland Park, Florida*

<http://www.nbbd.com/festivals/OrlandoWetlands/>

- In 1987 Orlando created a 1,650-acre wetland park with 1,220-acres of wetland treatment system designed to polish up to 35 million gallons a day of reclaimed wastewater. Seventeen wetland cells were created to remove excess nutrients from the water. Over 2 million aquatic plants and 200,000 trees were planted to create deep marsh, mixed marsh and hardwood swamp habitats. Water conveyed through a four-foot diameter pipeline for 17 miles flows first into the deep marsh with cattails and giant bulrush. From here the water flows into the deep marsh. Over 20 miles and roads and woodland trails cross the Park.



*Orlando, Florida treatment wetland designed as a wetland park.*

<http://www.nbbd.com/festivals/OrlandoWetlands/>

- The Wayne County and the Detroit Metro Airport, Michigan built a 900-acre man-made wetland, Crosswinds Marsh, to replace the wetlands that were destroyed by expansion of the airport. In this effort the County purchased 900-acres of farmland which had at one time been wetland. Drains were redirected, ponds dug, and fields flooded. Wetland plants were planted. Boardwalks, hiking and horse trails were developed. This area is now broadly used. See [http://www.waynecounty.com/parks/cwinds\\_park.htm](http://www.waynecounty.com/parks/cwinds_park.htm).



*Vermontville, Michigan*

[http://www.waynecounty.com/parks/cwinds\\_park.htm](http://www.waynecounty.com/parks/cwinds_park.htm)

An increasing number of local governments are also retrofitting stormwater management facilities as wetlands. The Center for Watershed Protection in Maryland has worked with many local governments to retrofit stormwater management facilities. See [http://www.stormwatercenter.net/Assorted%20Fact%20Sheets/Tool6\\_Stormwater\\_Practices/Wetland/Wetland.htm](http://www.stormwatercenter.net/Assorted%20Fact%20Sheets/Tool6_Stormwater_Practices/Wetland/Wetland.htm) for an excellent discussion of stormwater wetlands including design diagrams. See also the Stormwater Manager's Resource Center <http://www.stormwatercenter.net/> for both model and adopted ordinances and much technical information. See also excellent slide shows addressing stormwater wetland design.



*Stormwater wetland community with a low flow channel and complex microtopography.*

<http://www.stormwatercenter.net/Slideshows/ponds%20and%20wetlands%20for%20smrc/sld079.htm>

- The Tulsa, Oklahoma, Stormwater Management Program has prepared master drainage plans for all drainage basins and a citywide master plan. In stormwater and flood design it considers ultimate watershed urbanization. It protects flood water valley storage including wetlands. It requires freeboard for flood protection elevations. Over the last 15 years Tulsa has cleared more than 900 buildings from its floodplains. Tulsa is working to protect the last 17-acres of bottomland hardwoods in the Mingo Creek basin.

### **OPTION: IDENTIFY AND PRIORITIZE WETLANDS ON PUBLIC LANDS INCLUDING PARKS**

A number of communities have inventoried and prioritized wetlands on public lands for wildlife conservation, birding, and other purposes. For example, the Parks Operation Division of the City of Salem, Oregon has undertaken a study to identify and address environmentally sensitive areas within its city parks including wetlands. See [http://www.cityofsalem.net/~parks/sensitive\\_area.htm](http://www.cityofsalem.net/~parks/sensitive_area.htm). Best management practices were also identified and a Sensitive Area Handbook was prepared. The inventory of lands was based upon a combination of citywide shape files, aerial photography, and field data. Information was imported to a GIS system. The Sensitive Area handbook contains summary description of sensitive areas and BMP for 65 parks.

### **OPTION: CONDUCT WETLAND PUBLIC EDUCATION PROGRAMS**

#### **Provide educational programs for primary and secondary schools**

Hundreds of communities conduct wetland public education programs for primary and secondary school children and the general public at wetland sites on public lands. Some communities such as Fairfax County, Virginia have constructed wetland interpretive centers.



*Huntley Meadows, Virginia, Visitor and Education Center.*  
[http://www.friendsofhuntleymeadows.org/Gallery/Images/visitor\\_center.html](http://www.friendsofhuntleymeadows.org/Gallery/Images/visitor_center.html)

The Wheaton Park District and the DuPage County, Illinois, Forest Preserve District purchased more than 100 parcels of land between 1979 and 1992 to form the 130-acre core of Lincoln Marsh Natural Area. This marsh serves as a flood storage area which would cost more than \$10 million to construct. Partners for the Lincoln Marsh, a community group, provides citizen input and assistance to develop and manage the marsh. The marsh is used extensively by school groups for educational purposes with over 60 annual public nature interpretive programs offered.



*Lincoln Marsh Natural Area, Wheaton, Illinois.*

<http://www.wheatonparkdistrict.com/recreation/fourth/index.html>

### **Conduct seminars and workshops, offer lectures, field trips**

Some local governments also conduct seminars and workshops. See Friends of Huntley Meadows

<http://www.friendsofhuntleymeadows.org/Conservation/preserva.htm>

### **Establish a wetlands web page with extensive linkages**

Some communities have posted extensive wetland-related links on their web pages. See, for example, the Franklin, Massachusetts, Conservation Commission web page.

<http://www.franklin.ma.us/auto/town/conservation/links/default.htm> which posts the Franklin Wetland ordinance and has dozens of helpful wetland links.

### **Prepare wetland protection and management guidebooks**

For example, see *Protecting Nature in Your Community: A Guidebook for Preserving and Enhancing Biodiversity*. Prepared by the Northeastern Illinois Planning Commission. See <http://www.nipc.org/environment/sustainable/biodiversity/protectingnature/>. See also Franklin, Massachusetts development practices handbook at <http://www.franklin.ma.us/town/planning/HANDBOOK.PDF>.

### **Create wetland question and answer fact sheets; post to web site**

The Town of Brookhaven, New York on Long Island has developed a wetland question and answer fact sheet and placed it on their web site. See [http://www.brookhaven.org/town\\_faq/faq\\_topic.asp?faq\\_topic\\_id=20](http://www.brookhaven.org/town_faq/faq_topic.asp?faq_topic_id=20).

### **OPTION: PROVIDE PUBLIC ACCESS TO WETLANDS THROUGH TRAILS AND BOARDWALKS**

An increasing number of local governments have constructed trails and boardwalks through wetlands to provide public access for bird watching, school educational programs, and research. Examples include:

- Port Aransas Wetland Park. The City of Port Aransas has constructed a wetland park on a tidal flat. This park includes a boardwalk, observation area, and interpretative signage.



*Port Aransas, Texas, Wetland Park. Boardwalk and Observation Area.*  
<http://www.cityofportaransas.org/recreationalfacilities.html>

- The Millbrook Marsh Nature Center, State College, Pennsylvania. Is operated by the Centre Region Parks & Recreation Department. This is a 62-acre site with a 12-acre farmstead and a 50-acre wetland. The wetland is protected by a conservation easement between Penn State and the Clearwater Conservancy of Central Pennsylvania. [http://crpr.centreconnect.org/Millbrook/MMNC-Menu.html#Millbrook\\_Marsh\\_Nature\\_Center](http://crpr.centreconnect.org/Millbrook/MMNC-Menu.html#Millbrook_Marsh_Nature_Center)



*Millbrook Marsh Boardwalk, Pennsylvania.*

[http://crpr.centreconnect.org/Millbrook/MMNC-Menu.html#Millbrook\\_Marsh\\_Nature\\_Center](http://crpr.centreconnect.org/Millbrook/MMNC-Menu.html#Millbrook_Marsh_Nature_Center)



*Huntley Meadows Boardwalk, Virginia.*

<http://www.friendsofhuntleymeadows.org/Gallery/Images/boardwal.htm>

## OPTION: CONDUCT WETLAND FESTIVALS

An increasing number of local governments also conduct wetland festivals, often in cooperation with state and federal agencies and land trusts. For example, a coalition of groups in Montana has conducted Longfellow's Wetland Festival to help children and the public explore and learn about the nature and characteristics of wetlands. These groups include the Montana Water Course, International Project Wet, Montana Fish, Wildlife and Parks, Bozeman Public Schools, and the City of Bozeman.

- Amherst, Massachusetts has hosted several wetland fests organized by the Fish and Wildlife Service.



*Wetland Festival, Amherst, Massachusetts, 2001.*

- Houma, Louisiana helped organize a “Voice of Wetlands Festival”. See <http://www.voiceofthewetlands.com/vowfest.htm>. The Voice of Wetlands is a nonprofit organization formed in 2003 with the mission of bringing together global awareness concerning Louisiana's wetland losses. Similarly the Town of Jean Lafitte, Louisiana has organized a “Wings over the Wetlands Birding Festival”. See <http://wowbirdfest.com/index.html>.
- The Great Bend, Kansas, Convention and Visitor's Bureau has put together a broad range of wetland educational materials including wetland maps and guides for Great Bend and Quivera National Wildlife Refuges. It also organizes a “Wings N' Wetlands” Festival which draws thousands. It has also prepared an extensive wetland-related web site. See <http://www.visitgreatbend.com/wetlands.htm>.



*Great Bend Kansas “Wings N’ Wetlands” Festival.*  
<http://www.visitgreatbend.com/images/scan0013.jpg>

- The Port Aransas Chamber of Commerce helps organize and host a celebration of Whooping Cranes festival.



*Celebration of Whooping Cranes and other bird festival in Port Aransas, Texas.*  
<http://www.portaransas.org/cranes.html>

- The City of Socorro, New Mexico helps to host an International Festival of the Cranes each year. This event is organized by Friends of Bosque del Apache Wildlife Refuge. This draws tens of thousands of participants.



*Sand Hill Cranes at Bosque del Apache Wildlife Refuge, on the Rio Grande, south of Albuquerque, New Mexico. Photo by Jeff Goffe  
<http://www.fws.gov/southwest/refuges/newmex/bosque/>.*

- Orlando, Florida conducts a Wetlands Park Festival for a 1,650-acres partially constructed wetland (1,220 acres).



*Web page for Orlando Wetlands Festival. From the Titusville, Florida Community Guide.  
<http://www.nbbd.com/festivals/OrlandoWetlands/>*

## OPTION: ESTABLISH AND/OR OPERATE MITIGATION BANKS

In some instances, local governments have constructed and operated wetland mitigation banks. See an article by Lisa Morales, Wetlands Division, EPA for discussion: "Local Government Involvement in Mitigation Banking" at <http://www.epa.gov/ORD/WebPubs/nctuw/Morales.pdf>.

For example:

- Eugene, Oregon created a mitigation bank operated by the City of Eugene Public Works Department. This bank was based upon a West Eugene Wetlands Plan which was first locally adopted in 1992. This plan identified about 1,300-acres of wetlands with 1,000-acres recommended for protection and restoration. It delineates 300-acres of lower value wetlands for future fill and development. See [http://www.eugene-or.gov/portal/server.pt?space=Opener&control=OpenObject&%20cached=true&parentname=CommunityPage&parentid=3&in\\_hi\\_ClassID=514&in\\_hi\\_userid=2&in\\_hi\\_ObjectID=1495&in\\_hi\\_OpenerMode=2&](http://www.eugene-or.gov/portal/server.pt?space=Opener&control=OpenObject&%20cached=true&parentname=CommunityPage&parentid=3&in_hi_ClassID=514&in_hi_userid=2&in_hi_ObjectID=1495&in_hi_OpenerMode=2&)



*West Eugene Oregon Mitigation Bank*

[http://www.eugene-or.gov/portal/server.pt?space=Opener&control=OpenObject&cached=true&parentname=CommunityPage&parentid=3&in\\_hi\\_ClassID=514&in\\_hi\\_userid=2&in\\_hi\\_ObjectID=1495&in\\_hi\\_OpenerMode=2&](http://www.eugene-or.gov/portal/server.pt?space=Opener&control=OpenObject&cached=true&parentname=CommunityPage&parentid=3&in_hi_ClassID=514&in_hi_userid=2&in_hi_ObjectID=1495&in_hi_OpenerMode=2&)

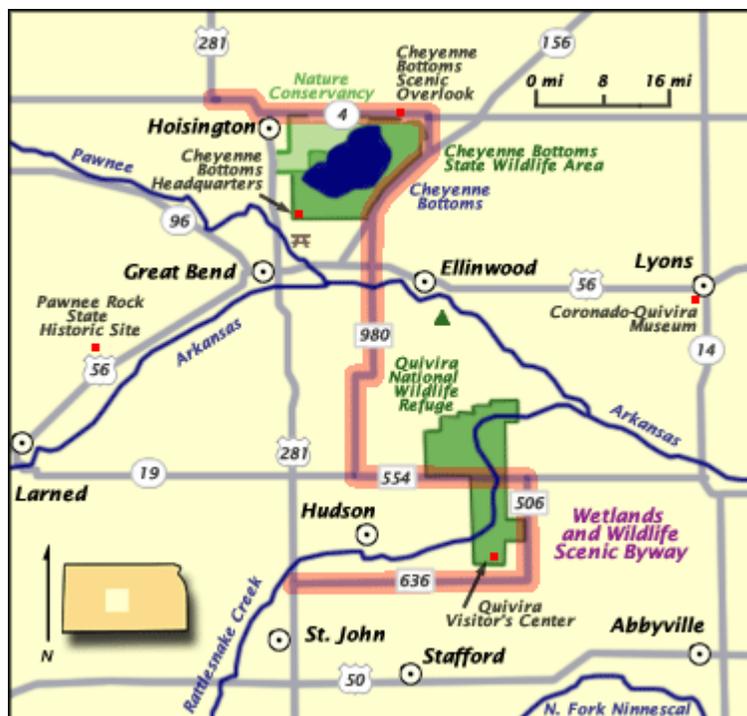
- The Town of Limon, Colorado created a wetland mitigation bank in 1996 and 1997 with the help from the Colorado Department of Transportation, Corps and federal Highway Administration. The site was a 14-acre abandoned sewage lagoon. Four different ponds were created of varying depths to provide varied wetland habitat. About 8.2-acres of wetland were created. In May and June of 1997 wetland areas were planted with approximately 12,000 nursery plants plus 2,000 plugs from adjacent wetlands, 820 shrubs, 42 trees, and 2,000 willow brush layer cuttings. This site is operated by the Colorado DOT. See [http://www.google.com/search?hs=uSP&hl=en&lr=&client=firefox-a&rls=org.mozilla%3Aen-US%3Aofficial\\_s&q=wetlands+banking+in+Limon&btnG=Search](http://www.google.com/search?hs=uSP&hl=en&lr=&client=firefox-a&rls=org.mozilla%3Aen-US%3Aofficial_s&q=wetlands+banking+in+Limon&btnG=Search)

- DuPage County, Illinois has established mitigation banks in each of the four main watersheds within the County as part of a comprehensive stormwater management planning process. The watersheds are the service areas for the banks. The County has five banks in various stages of implementation. The land for these banks was already in public ownership. Goals for the banks include minimizing the effects of urbanization on stormwater drainage, enhancing the quality and quantity of surface waters, preserving existing wetlands and riparian zones, and encouraging restoration of degraded areas.  
<http://www.epa.gov/ORD/WebPubs/nctuw/Morales.pdf>.

Other examples of local government mitigation banks include the Snohomish County airport mitigation banking program and the Pembroke Pines and Florida Wetlandsbank, Inc. See <http://www.epa.gov/ORD/WebPubs/nctuw/Morales.pdf>.

**OPTION: PREPARE AND IMPLEMENT WETLAND AND ECOTOURISM PLANS**

To help promote ecotourism, the Great Bend, Kansas Convention and Visitors Bureau has developed a broad range of excellent wetland materials including self-guiding auto tours for Quivera National Wildlife Refuge and surrounding areas. See [www.visitgreatbend.com/wnw2005.html](http://www.visitgreatbend.com/wnw2005.html). The Convention and Visitors Bureau has also helped create a Kansans Wetlands and Wildlife Scenic Byway. See <http://www.visitgreatbend.com/scenicbyway.htm>.



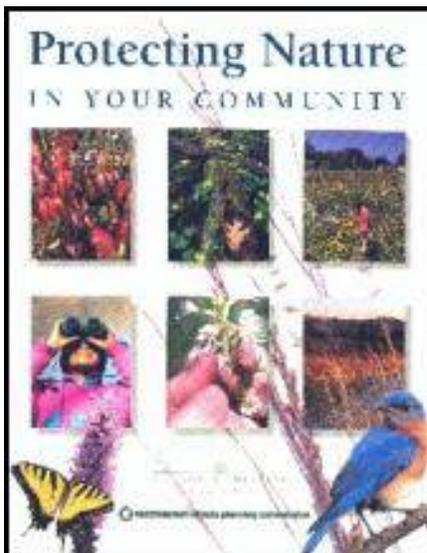
*Kansas Wetlands and Wildlife Scenic Byway*  
<http://www.visitgreatbend.com/scenicbyway.htm>

## CHAPTER 3: STATE AND FEDERAL ASSISTANCE TO LOCAL GOVERNMENTS

How could states, federal agencies, land trusts and others encourage and help local governments strengthen wetland protection and restoration through the sorts of activities described in Chapter 2?

- **Explicitly recognize that local governments have an important long term role to play in protecting and restoring wetlands in federal and state agency protection and restoration plans and policies.** Many state and federal agencies are already recognizing the importance of the local role but this recognition could be strengthened.
- **Refer wetland regulatory permit applications (e.g, Section 404) to local governments for comment.** This is being done for some communities but could be more systematically done by the Corps, state agencies.
- **Undertake joint permitting with local governments.** The Corps and state agencies are already doing this in some instances. See, for example, the Minnesota Local/State/Federal Application Form for Water/Wetland Projects. [http://www.bwsr.state.mn.us/wetlands/wcamanual/form03\\_B.pdf](http://www.bwsr.state.mn.us/wetlands/wcamanual/form03_B.pdf). This could be expanded to many more local governments.
- **Map (or remap) wetlands, digitize maps, and provide accurate maps and digital data to local governments.** The FWS needs to complete, update, and digitize remaining National Wetland Inventory maps. Other federal agencies such as NOAA and state wetland agencies have already also assisted local governments map wetlands. FWS, EPA, USGS, NOAA and other state and federal agencies need to assist local governments develop more accurate and detailed maps in some instances.
- **Provide practical wetland assessment models, involve local governments in preparing and testing models.** EPA, the FWS, the Corps and other federal agencies have developed wetland assessment models such as HGM and IBI models. They could help local governments by continuing to develop and test these models with local governments. They should also provide training to local governments concerning their use.
- **Provide local governments with maps and information pertaining to natural hazards, endangered species, soils, and other information relevant to acquisition, restoration, permitting, other management of wetlands.** Many types of information are of interest to local governments in planning and managing wetlands such as hydrologic information, endangered species information, flood maps, soils map, existing land use information, and pollution and flooding information.

- **Maintain joint databases, GIS systems with local governments.** Federal and state agencies should, increasingly, create joint and mutually compatible databases with local governments pertaining to wetland location, types, functions, and other features. Information should be placed on the web and meta-data should be provided to facilitate use by local governments in GIS systems.
- **Encourage and help local governments integrate wetland planning into water programs.** To date local, state, tribal and federal and state water programs have not been well integrated with land use planning. Such integration at federal and state levels could encourage local government integration.
- **Prepare model ordinances and distribute such ordinances to local governments.** To some extent federal and state agencies have already prepared model ordinances. However, additional ordinances are needed to address the full range of wetland and riparian types such as western riparian habitat.
- **Prepare and distribute educational materials pertaining to local wetland management planning, ecosystem analysis, wetland assessment and other topics.** For example, the Northeastern Illinois Planning Commission has prepared a guidebook for local communities: *Protecting Nature in Your Community: A Guidebook for Preserving and Enhancing Biodiversity*. While not specifically directed to wetlands, this guidebook contains a great deal of useful information applicable to wetlands and other ecosystems.  
<http://www.nipc.org/environment/sustainable/biodiversity/protectingnature/>



*Northeastern Illinois Planning Commission*  
<http://www.nipc.org/environment/sustainable/biodiversity/protectingnature/>

- **Enhance technical assistance.** Local governments typically include many motivated and well educated individuals. However, these individuals often lack expertise in wetland-specific mapping, assessment and management. This is particularly true for smaller local governments. Federal agencies and state government could help local governments by enhancing technical assistance (note, some is already being provided) on topics such as:
  - Delineating wetlands
  - Mapping wetlands
  - Wetland assessment techniques
  - Regulating wetlands
  - Restoring wetlands
  - Constructing wetlands and stormwater, pollution control facilities
  
- **Provide continued and enhanced financial assistance.** Local governments (like other levels of government) are often short of funds for wetland mapping, assessment, acquisition, restoration, and other activities. Wetland activities must also compete for funds with a broad range of other activities. State, and federal governments could assist local governments by continuing a variety of existing programs and providing new funding which will highlight wetland protection efforts such as the:
  - EPA Five Star Restoration grand program
  - FWS Partners for Wildlife program
  - NRCS Wetland Reserve program
  - NOAA Restoration programs
  - EPA 319 Nonpoint Source Program
  
- **Continue federal and state income, gift, and estate tax incentives.** Federal gift and estate tax incentives are critical to local government and local land trust wetland protection and restoration efforts. The federal government provides 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. Congress and state legislatures could assist local governments by continuing and enhancing tax incentives.
  
- **Provide training.** Federal and state agencies could help local governments by providing training for local staff. Some priority topics may include:
  - Mapping wetlands,
  - Assessment of wetlands,
  - Management planning,
  - Restoring wetlands,
  - Creating mitigation banks,
  - Addressing exotic species, and
  - Other management topics.

- **Provide “how to” manuals.** Local governments need practical, step-by-step help in protection and restoration of wetlands. Quite a wide variety of wetland educational materials are available nationally. However, there are gaps and existing materials need to be made more accessible by posting them to the web. Priority topics include boardwalk and trail construction, restoration for particular types of wetlands, hydrologic and other analyses, mapping wetlands, and wetland management such as control of exotics and use of fire in wetland management.
- **Provide local government with case study examples of wetland protection and restoration.** Local governments are interested in the successes and failures of other local governments. Federal and state agencies need to compile local success and failure stories in cooperation with organizations like the National Association of Counties and then to post them to the web.
- **Conduct joint management-oriented research with local governments pertaining to site-specific protection and restoration of wetlands in the local government.** Some priority topics may include (depending upon the local wetland situation) monitoring restoration, developing creating enhancement strategies, monitoring mitigation projects over time to provide the basis for mid-course corrections, monitoring exotic weeds, investigating water management for wetlands, and using various wetland assessment techniques.
- **Help local governments establish mitigation banks.** Federal and state agencies can help local government’s site mitigation banks in watershed and ecosystem contexts to help fill ecosystem gaps and insure the hydrologic and ecological success of projects.
- **Adopt Memoranda of Understanding or Memoranda of Agreement with local governments that address delineation, joint permit processing, assessing, monitoring and enforcement, and other topics.** Such MOUs and MOAs can be used to divide and clarify responsibilities and share tasks between local governments, federal and state agencies, and tribes.
- **Issue to local governments local “programmatic general permits”.** The U.S. Army Corps of Engineers has issued to some local governments programmatic permits where local wetland protection and restoration efforts will meet or exceed federal standards. Such programmatic permits which allow local permitting on certain classes of projects in lieu of federal permitting may act as an incentive for local wetland and watershed planning and local adoption of regulations which exceed federal minimum standards.
- **Create a national “local government wetland protection and restoration” web page in cooperation with a broad range of local government organizations (e.g., National League of Counties).** This web page could have many links and report information of particular interest to local governments.

## SUMMARY

Local governments are now playing critical roles in protecting and restoring wetlands. They and their land trust partners can play even more important roles in the future, particularly with regard to isolated wetlands and other wetlands not regulated or protected at federal and state levels. But, local governments also need encouragement and assistance (in many instances).

A strengthened, cooperative partnership among local, federal, state, and tribal entities that involves improved coordination and an improved division of labor is needed to better protect and restore wetland resources and meet landowner needs. There is no reason a single level of government should undertake all aspects of wetland regulation when the different levels have different capabilities. The issues are: Who can do what best? Who has staff and financial resources and how can these be best utilized and combined? How can comprehensive wetland protection and restoration efforts be best achieved involving all levels of government?

The approximate mix of local, state, tribal, and federal should vary somewhat, depending on the overall characteristics of the wetland and water systems in various states and the capabilities and preferences of various levels of governments.

## 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: LIMITATIONS UPON FEDERAL AND STATE WETLAND PROTECTION AND RESTORATION PROGRAMS; HOW LOCAL GOVERNMENTS CAN HELP**

### **Limitations Upon The Federal Role, How Local Governments Can Help**

The federal government (Corps, EPA) regulates through the Section 404 and Section 10 programs the discharge of material into most rivers and streams, major lakes, and the oceans and wetlands in and adjacent to such water bodies. It also regulates most tributaries and adjacent wetlands although the extent of this regulation is unclear after the U.S. Supreme Court Rapanos decision. The federal government protects many wetlands through public land ownership, grants in aid to local governments and land trust, wetland mapping, and both fee acquisition and conservation easement programs for landowners. Federal income and estate tax incentives for donation of wetlands and other lands to governmental units and non profit entities also help. Nevertheless, there are gaps in federal protection of wetlands which local governments can help fill:

- Federal Section 404 regulations and other regulations do not apply to “isolated” wetlands. These wetlands may constitute 30% or more of the total wetlands. Local governments can plan and regulate these wetlands.
- The Section 404 regulatory program has partial exemptions for a variety of activities including grandfather provisions and partial exemptions for agriculture and forestry. Local governments can regulate more restrictively than the federal government if motivated to do so.
- The Section 404 and other federal regulatory programs do not control watershed activities affecting wetlands. Local governments may adopt and implement watershed management plans.
- The Section 404 and other federal regulations do not control land uses adjacent to wetlands and throughout watersheds and cannot require wetland buffers. Local governments can regulate watershed activities and require buffers.
- The Corps and the EPA lack field staff in many rural areas. Because of this lack of field staff, wetland delineation, permitting, monitoring and other planning and regulatory operations are often difficult and expensive for federal staff who must travel long distances. Local governments usually have local planning and zoning staff that may assist the Corps in providing copies of local plans and regulations, using local GIS analysis for analyzing impacts and identifying acquisition and restoration priorities and carrying out other activities.
- Federal agencies lack the necessary financial resources for extensive monitoring and enforcement of federal regulatory and nonregulatory programs. Local governments can help monitor, report violations.
- Land planning occurs primarily at local level and land planning information is often not available at the federal level. Federal staff also often lack expertise and experience in local comprehensive planning and regulation. Local governments can comprehensively plan land and water uses and reflects this information in setting standards for wetlands (e.g., local zoning) and analyzing permit applications. Local governments typically prepare master plans for roads, sewers, water supply, parks and other public works and comprehensive land use plans for communities as a whole.
- Much of the data relevant to wetland protection and management is located at the local level—land ownership, existing use information, zoning classifications, natural hazard information, etc. Local governments can apply this information in their planning and regulatory efforts.

## **Some Federal Regulatory and Nonregulatory Programs Relevant to Wetland Protection**

Local governments may help federal agencies implement these programs by reviewing permit applications, mapping wetlands, restoring wetlands, adopting wetland protection plans and policies, educating landowners and carrying out other activities.

### **Direct Regulatory Powers**

- Rivers and Harbors Act, Section 10 Program
- Water Pollution Amendments, Section 404 Programs
- Water Pollution Amendments, Point and Nonpoint Source Pollution Controls (Most of these work indirectly through state standard-setting.)
- Endangered Species Act

### **Nonregulatory Grant and Subsidy Programs**

- Coastal Zone Management Program
- Clean Water Act, Clean Lakes and Estuarine Sanctuaries Programs
- National Flood Insurance Program (Makes Federally Subsidized Flood Insurance Available to Communities Which Adopt Floodplain Regulations Meeting Federal Standards)
- CRP and Wetland Reserve Programs
- EPA's State Wetland Grant Program
- Clean Water Act, Section 208 and 319 (Watershed Planning) Program

### **Technical Assistance, Research**

- Training Efforts, Workshops Funded by EPA's Division of Wetlands
- National Wetland Inventory
- Corps of Engineers Wetland Research
- Corps of Engineers Training

### **Federal Land Management**

- National Park Planning and Management (NPS)
- National Wildlife Refuge System (FWS) Forest Service (USDA) Planning and Management
- Bureau of Land Management Planning and Management
- Forest Service Land Planning and Management
- Estuarine Sanctuaries Program
- Corps of Engineers Planning and Management of Water Projects

## **Limitations Upon The State Role, How Local Governments Can Help**

Limitations upon the state role in protecting and restoring wetlands are similar to those for the federal government although there are also some differences. Local governments can help fill the gaps in state programs as well.

- Only about one half of the states have adopted regulations for freshwater wetlands. Most of these regulations focus on wetlands in and adjacent to lakes, streams, and coastal waters. Local governments can plan and regulate unregulated wetlands.
- State wetland regulations typically contain a variety of exemptions and limitations such as wetland size limitation (e.g. 12.4-acres in New York) and agricultural exemptions. Local governments can regulate more restrictively than the state government.
- State wetland regulatory programs do not control most watershed activities affecting wetlands. Local governments may adopt and implement watershed management plans through regulatory and nonregulatory approaches.
- Most state wetland regulations establish only limited buffers. Local governments can require buffers.
- Many states have limited staff in rural areas. Because of this lack of field staff, wetland delineation, permitting, monitoring and other planning and regulatory operations are often difficult and expensive because state staff must travel long distances. Local governments usually have local planning and zoning staff who can visit wetland sites without traveling long distances.
- State agencies lack the necessary financial resources for extensive monitoring and enforcement. Local governments can help monitor, report violations.
- Land planning occurs primarily at local level. Much of the data relevant to wetland management is located at the local level—land ownership, existing use information, zoning classifications, natural hazard information, etc. Local governments can plan and gather and store a broad range of information (e.g., GIS systems).

## APPENDIX C: SUGGESTED READINGS

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U.S. Environmental Protection Agency, Region 2. 1993. Wetlands Regulation Guidebook for New York State. Marine and Wetlands Protection Branch, New York, New York

Washington State Department of Ecology. 1986. Wetlands Acquisition & Preservation: A Guide for Landowners and Government Agencies. Shorelands & Coastal Zone Management Program, Wetlands Section

World Wildlife Fund. 1992. Statewide Wetland Strategies: A Guide to Protecting and Managing the Resource. Island Press. Washington, D.C.

**APPENDIX D: SELECTED WEB SITES**  
**(SEE ALSO WEB SITES LISTED IN THE TEXT AND WITH FIGURES**  
**AND PHOTOS)**

<http://www.cwp.org/>

Center for Watershed Protection. Many excellent publications listed here.

<http://www.epa.gov/owow/nps/ordinance/>

U.S. Environmental Protection Agency, Model Ordinances to Protect Local Resources. Very useful.

<http://www.smartgrowth.org/Default.asp?res=1024>

Smart Growth Online resources.

<http://www.lawguru.com/ilawlib/4.htm>

Internet Law Library. Code of Federal Regulations (searchable).

<http://www.aswm.org/>

Association of State Wetland Managers, Inc.

<http://www2.eli.org/index.cfm>

Environmental Law Institute

[www.noaa.gov](http://www.noaa.gov)

National Oceanic Atmospheric Administration (NOAA).

<http://www.nmfs.noaa.gov/>

NOAA - National Marine Fisheries Service.

<http://www.sws.org/>

Society of Wetland Scientists.

<http://www.usace.army.mil/>

U.S. Army Corps of Engineers.

<http://thomas.loc.gov/>

The Library of Congress. Thomas Legislative Information on the Internet.

<http://www.pwrc.usgs.gov/wli/>

USDA Natural Resources Conservation Service. Wetland Science Institute.

<http://www.epa.gov/>

U.S. Environmental Protection Agency

<http://www.epa.gov/surf/>

U.S. Environmental Protection Agency, Surf Your Watershed. Wetlands, Oceans and Watersheds

<http://www.epa.gov/OWOW/>

U.S. Environmental Protection Agency. Wetlands, Oceans and Watersheds Publications

<http://www.esri.com/hazards/>

Federal Emergency Management Agency flood maps.

<http://www.fws.gov/>

U.S. Fish and Wildlife Service.

<http://wetlands.fws.gov/>

U. S. Fish and Wildlife Service. National Wetlands Inventory.

[http://www.eugene-or.gov/portal/server.pt?space=CommunityPage&cached=true&parentname=CommunityPage&parentid=0&in\\_hi\\_userid=2&control=SetCommunity&CommunityID=217&PageID=0](http://www.eugene-or.gov/portal/server.pt?space=CommunityPage&cached=true&parentname=CommunityPage&parentid=0&in_hi_userid=2&control=SetCommunity&CommunityID=217&PageID=0)

Eugene Parks and Open Space. West Eugene Wetlands Plan. Excellent. Lots of detailed information on the plan, wetland links.

<http://www.csc.noaa.gov/>

NOAA Coastal Services Center. Many helpful links and information.

<http://www.crowc.org/programs/watershedmgmt/scwetlands/scwofficials.html>

Clinton River Watershed Council. Wetland Stewardship for Local Governments. Contains a model ordinance.

<http://www.angelfire.com/in4/earthpages/indianawetlands.html>

A Model Wetlands Ordinance for Indiana Communities. However, may be of broader interest.

<http://www.co.cass.mn.us/esd/pdfs/ordinance/WETORD98.pdf>

Cass County Environmental Services. Cass County Wetland Ordinance. Wetland ordinance utilizing wetland functional assessments.

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

U.S. Fish and Wildlife Service, Partners for Fish and Wildlife Program.