



Integrating Wetland Conservation Into Local Planning

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Purpose of the guidebook

The propose of this guidebook is to provide practical information to local planners and decision-makers on how to best integrate wetland conservation into the full range of community planning activities. The audience of this document includes those who are involved with local planning and have interests in wetland protection, restoration, preservation, conservation, planning. As well as managing local planning efforts, particularly for land-use planners, environmental managers, floodplain managers, parks and recreation managers, and water resources managers.

The guidebook serves as a reference to improve local wetland conservation efforts and does not impose legally enforceable rights or obligations for any local actions. The toolkits help promote the integration of wetland conservation with multiple types of local planning mechanisms and thus maximize the capacity of federal and state wetland conservation mission. This guidebook incorporates a combination of literature review, plan evaluation, case studies, field surveys, and professional conferences relating to wetland conservation topics. Feedback, suggestions, and comments from the stakeholders, including federal/state/regional/local agencies, non-profit organizations, landowners, developers, and researchers, are incorporated into this guidebook.



Targeted readers for this guidebook

- Land-use and zoning planners
- Environmental conservation managers
- Floodplain managers
- Hazard mitigation planners
- Park and recreational resources managers
- Transportation/infrastructure planners
- Watershed and water resources managers
- Local elected and appointed officials
- Consultants for planning engineering, construction
- Environmental researchers/educators

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Introduction to wetlands

What are wetlands?

The U.S. Army Corps of Engineers defines wetlands as "Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas" (USACE 1987). This definition of wetlands has been used by the U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency since the 1970s for regulatory purposes.

The three characteristics used for wetland delineation are vegetation, soils, and hydrology. U.S. Army Corps of Engineers published [the 1987 Corps Wetland Delineation Manual](#) and [the Regional Supplements to Corps Wetland Delineation Manual](#).



Wetland vegetation



Wetland hydrology



Wetland hydric soils

Why wetlands are important for local community?

- Store flood waters within wetlands, slows runoff, and reduce flooding damages/expenditures
- Preserve natural drainage features, and enhance ground water recharge
- Minimalize the need to construct, repair, maintain, or replace structural infrastructure
- Reduce soil loss and erosion of stream beds and banks, and hold sediment in wetlands
- Intercept pollutants and treat polluted water before reaching lakes, streams, and other water bodies
- Provide spawning, nesting, and feeding areas for fish, waterfowl, and wildlife, and enhance biodiversity
- Enhance scenic beauty and use of adjacent water bodies for biking, canoeing, boating, outdoor activities
- Provide opportunities for outdoor recreation, open space, educational/research sites for local schools
- Improve ecosystem condition for water quality/quantity, wildlife/fisheries habitat, groundwater supplies



Federal role in wetland conservation

Major federal laws relating to wetlands

Clean Water Act (CWA) of 1972	This act includes a numbers of sections relating to wetlands. Section 404: establishes a program to regulate the discharge of dredged and fill material into waters of the United States, including wetlands. Section 403: Ocean Discharge Criteria; Section 402 - National Pollutant Discharge Elimination System; Section 401 - State Certification of Water Quality; Section 309 - Federal Enforcement Authority; Section 308 - Inspections, Monitoring, Entry; Section 502 - General Definitions
National Environmental Policy Act of 1969 (NEPA)	NEPA is the basic national charter for protection of the environment. It establishes policy, sets goals, and provides means for carrying out the policy.
Rivers & Harbors Appropriation Act of 1899	This act establishes a program to regulate activities affecting navigation in United States waters, including wetlands.
Federal Agriculture Improvement and Reform Act of 1996	This act is commonly known as the Farm Bill, the 1996 revisions included modifications to four programs related to the conservation of wetlands on agricultural land.
Endangered Species Act (ESA)	This act provides a program for the conservation of threatened and endangered plants and animals and the habitats in which they are found.
Transportation Equity Act for the 21st Century (TEA-21)	This act authorizes funding to improve the Nation's transportation infrastructure, enhance economic growth and protect the environment, including opportunities to improve water quality and restore wetlands.
Coastal Wetlands Planning, Protection & Restoration Act (CWPPRA)	This act is designed to identify, prepare, and fund construction of coastal wetlands restoration projects.
North American Wetlands Conservation Act (NAWCA)	This act provides funding and administrative direction for implementation of the North American Waterfowl Management Plan and the Tripartite Agreement on wetlands.

Major federal regulations relating to wetlands

Section 404(b)(1) Guidelines	Compensatory Mitigation Rule
Fill Material	Permit Regulations
Program Definitions and Permit Exemptions	Section 404(c) Regulations
Nationwide Permit Program	Enforcement Regulations
State Assumption Regulations	Tribal Assumption Regulations

Major executive orders relating to wetlands

Executive Order 11988: Floodplain Management
Executive Order 11990: Protection of Wetlands
Executive Order 12630: Government Actions and Interference with Constitutionally Protected Property Rights
Executive Order 12962: Recreational Fisheries
Executive Order 13186: Responsibilities of Federal Agencies to Protect Migratory Birds

The summary tables of the major federal laws, regulations, and executive orders relating to wetlands are dated on December, 2019. The US Environmental Protection Agency (EPA) lists the major laws, regulations, and executive orders on wetlands on the [EPA website](#).

Major federal agencies relating to wetland protection and regulations

- U.S. Environmental Protection Agency (EPA)
- U.S. Fish and Wildlife Service (FWS)
- U.S. Army Corps of Engineers (Corps)
- U.S. Department of Agriculture (USDA)
- National Oceanic Atmospheric Administration (NOAA)

State role in wetland conservation

State governments play essential roles in wetland conservation. Each state develops its own wetland program plan, conducts regular monitoring and assessments, and adopts state-level regulations for wetland management. Each state has its own regulations, policies and programs on wetland protection, restoration, permitting, and management. Four types of wetlands regulatory and permitting programs included in the state and tribal programs regulating wetland resources are:

- **401 certification of the Clean Water Act:** A state-level (or tribe) certification is needed to be valid for the federal permits/licenses under the Clean Water Act.
- **404 assumption of the Clean Water Act:** With the assumption of the 404 permitting authority, a state and tribe can issue the 404 permits under the Clean Water Act for the discharge of dredged or fill material into waters of the U.S. within the state's/tribe's jurisdiction. Only a few states have done this.
- **State Programmatic General Permit (SPGP) or a Regional General Permit (RGP):** These general permits are issued by the U.S. Army Corps of Engineers (USACE) and authorize certain types of wetland-related or aquatic-related activities regulated by another entity such as a state or tribe.
- **Other regulatory items:** A state or tribe can implement some state-level or tribal-level regulatory or permitting programs under state or tribal laws and regulations independent of EPA or USACE review to avoid, minimize, and or compensate for impacts to wetlands and other aquatic resources. Based upon its wetland conditions, each state and tribe can develop its own regulatory or permitting programs, such as dredging and filling, mitigation (In-lieu fee, Stream mitigation), water quality standards for wetlands, or voluntary restoration and protection.

State-level wetland management programs also serve an important role in restoration and management, land acquisition, program coordination, public education, and community engagement. State-level wetland programs help bridge federal and local agencies in wetland conservation. These roles help protect the critical wetland resources in each state. State programs can help achieve wetland conservation goals through joint programs, such as conservation easements, wetland and stream restoration, floodplain management, invasive species management, endangered and threatened species management, stormwater management, waterfront revitalization, and water quality program (e.g. Total Maximum Daily Loads).

For example, the state of Nebraska does not have any wetland-specific regulatory statutes or administrative rules. However, there are a number of state-level regulations relating to wetlands.

- Nebraska Floodplain Management Statutes
- Nebraska State Programmatic General or Regional Permits
- Section 401 Water Quality Certification for the Clean Water Act
- Nebraska statute Title 117: Nebraska surface water quality standards
- Nebraska Nongame and Endangered Species Conservation Act (NESCA)



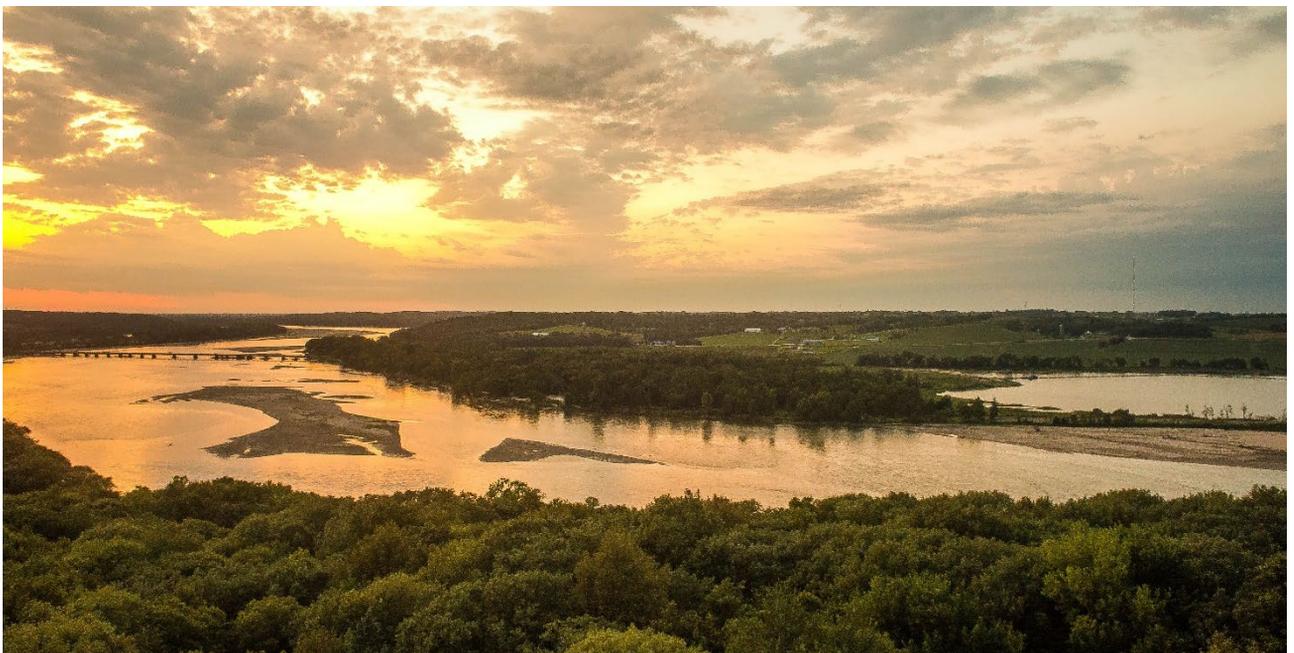
Local role in wetland conservation

Wetlands are often adjacent to rivers, streams, lakes, or floodplains. They have critical ecological values and functions to communities. Systematic identification of water-related issues, such as flood control, pollution prevention, fish propagation, wildlife habitat, and recreation can help stakeholders build consensus for wetland management. Wetlands are often subject to a series of federal, state, and local regulations and policies, such as water quality regulations, floodplain regulations, and stormwater policies. Wetland management typically relies on professional wetland managers.

Local communities play a crucial role in helping achieve the national goal of “no-net-loss of wetlands” and “increasing the quantity and quality of wetlands”. Local communities have the authority and opportunity to integrate wetland conservation into their planning programs and decision-making frameworks. Local communities can implement the policies from the state and federal governments in wetland conservation. Local communities often take the primary responsibility for local land-use management, natural resources protection, and environmental protection. Local initiatives and regulations, such as land-use planning and zoning, are key means through which local/regional entities (such as cities, towns, villages, counties, natural resources agencies, and watershed management agencies) can protect wetland resources within their planning and zoning jurisdictions. Local wetland management efforts can be coordinated and integrated with multiple local water-related protection and restoration programs (Kusler 2003). Local communities can play an information-sharing role, regulatory role, spending and taxation role, acquisition role, and coordination role that can help wetland conservation.

Local roles in wetland conservation

Information sharing role	Wetland-related information can be shared with key stakeholders and general citizens to increase public awareness, promote public participation, and build a consensus vision for wetland conservation. Wetland mapping is an important tool for information sharing to highlight the location, type, size, and environmental context for community wetlands.
Regulatory role	Local jurisdictions typically have regulatory programs that can be used to directly protect wetlands within their jurisdictions. A series of tools of local regulations can be applied to improve wetland conservation. Local communities can adopt land-use regulations, ordinances, zoning requirements, and other mandatory policies for wetland protection.
Spending and taxation role	Wetland conservation concepts and efforts can be prioritized through local spending and taxation programs (e.g. capital improvement programs, budget arrangement, specific taxation districts, preferential assessment, and others).
Acquisition role	Local jurisdictions can acquire specific wetlands, purchase development rights or conservation easements for wetland conservation.
Coordination role	At the community level, coordination can be made with multiple agencies to promote wetland conservation activities. While local jurisdictions plan or implement projects, there are multiple opportunities to incorporate wetland protection and wetland creation into local planning activities.



Two planning approaches for wetland conservation

Wetland protection, conservation, preservation, restoration, and management connect to local planning programs. Local efforts can directly contribute to wetland conservation through floodplain management, parks and recreation planning, land-use planning, transportation planning, stormwater management, water supply, point source pollution control, nonpoint source pollution control, watershed management, riparian protection, habitat conservation, and fisheries management.

Not only should local wetland conservation programs protect existing wetlands, but they also should emphasize restorable wetlands. Wetland conservation efforts should give attention to the wetlands and the associated watersheds.

At the local community level, there are two different approaches for wetland conservation: (1) stand-alone wetland conservation planning, (2) integrated wetland conservation planning. Even though the two approaches are different, the goals and processes of these two approaches are similar. Both the stand-alone wetland conservation planning and an integrated wetland conservation planning approach can facilitate local actions to improve wetland quantity and quality.



Stand-alone wetland conservation planning

A stand-alone wetland conservation plan refers to a specific plan only for wetland conservation purposes. It may also be called a local wetland protection plan, local wetland management plan, wetland preservation plan, wetland restoration plan, etc. This approach develops a plan to address the theme of wetland conservation efforts specifically. The stand-alone wetland conservation planning process can centralize community resources and prioritize community-wide policies for wetland conservation. It can help improve public awareness, identify community wetland resources, and engage stakeholders and the public into the planning process for wetland conservation. When political support and planning resources are available, a stand-alone wetland conservation plan could be the right choice.

Pros: One document; a centralized planning process; collective efforts; greater attention

Cons: Limited stakeholders involved in the planning process; extra cost; limited authority; separation from existing local plans; implementation difficulty

Integrated wetland conservation planning

An integrated wetland conservation plan emphasizes the incorporation of wetland conservation efforts into existing planning mechanisms, rather than having a separate planning document. Wetland conservation programs need to be put in a context of coordination with broader, multi-objective perspectives (Kusider 2003). The integrated wetland planning process can bridge different agency programs and geographical boundaries, maximize areas of expertise, build collaborative partnerships, and organize multi-objective visions while building consensus. Collaboration is needed to facilitate inter-agency communication for integrated efforts to incorporate wetland elements into their existing planning framework.

Pros: A collaborative platform, multi-objective opportunity; better procedural integration; fewer implementation barriers

Cons: Conflicting interests; collaboration challenges; time to build trust and collaboration

Stand-alone wetland conservation planning

Planning process for stand-alone wetland conservation plan

To develop a stand-alone wetland conservation plan, the community first needs to select a planning team leader to coordinate the entire planning process. After a core planning team is organized, more stakeholders from other agencies (including the federal, state, regional, and local levels) can review existing materials that the plan may need. The geographic area needs to be clarified, and the locations of wetlands and related water resources are necessary to be illustrated on maps. The planning team can work with stakeholders to evaluate the existing problems and highlight possible future challenges. Moreover, multiple scenarios and alternatives need to be compared and assessed to predict future changes. The planning team, stakeholders, and the public can jointly develop the overall vision and specific goals dealing with their community's wetland resources.

Public involvement can help increase public awareness and build consensus for wetland-related planning processes. Based on the community's vision and goals, an important step is to develop appropriate tools, policies, and strategies for wetland conservation. Each specific goal should have a number of applicable actions. The wetland tools, policies, and strategies may include regulatory policies, incentive policies, land acquisition programs, education programs, etc.

The implementation, evaluation, and modification are necessary steps to ensure the funding resources and responsible agencies with specific times to implement the planning policies. If there are dynamic changes, the plan needs to be updated.

Ten steps for wetland conservation planning

- Step 1: Identify lead agency and staff and develop a representative planning team
- Step 2: Establish public engagement strategy
- Step 3: Define planning area (map)
- Step 4: Review relevant planning documents
- Step 5: Begin public engagement strategy
- Step 6: Initiate analysis of wetlands
- Step 7: Establish targeted outcomes/goals
- Step 8: Develop policies/tools/strategies to achieve outcomes
- Step 9: Establish measurable objectives in implementing goals, policies, and outcomes
- Step 10: Implementation of the actions and conduct monitoring, and updating as needed

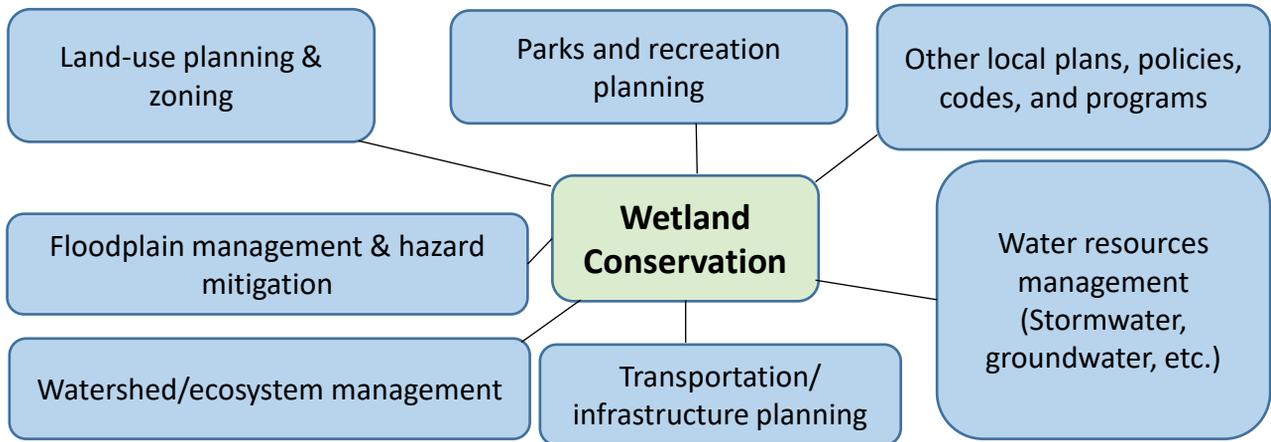


Integrated wetland conservation planning

Planning elements with connections to wetland conservation

Plan integration means a two-way exchange of information between wetland conservation initiatives and community planning mechanisms. The integration process can synthesize information from a variety of professionals about wetland conditions. The integrated planning process can provide a common informational basis about wetland conditions for multiple plans to improve efficiencies. The scope of plan integration involves plans, policies, codes, programs dealing with wetland resources. The process of plan integration offers an opportunity for various departments within the local government to work together. Plan integration blends a community's plans, policies, codes, and programs to reduce potential conflicts, build trust, and find "win-win" solutions to achieve multiple objectives.

More Integrated planning mechanisms allow the community to take full advantage of various resources, thus support multiple objectives, including those identified within other planning processes. Wetland conservation can be integrated in multiple types of local plans, policies, codes, and programs, including land-use comprehensive plan, hazard mitigation plan, transportation plan, water supply and resources management plan, stormwater management plan, parks and recreation plan, area/community development plan, capital Improvement Program, zoning regulations & municipal ordinances, and administrative procedures and policies.



Local planning framework for wetland conservation

Local jurisdictions have the authority to determine land-use. Wetland conservation can be fully integrated with local land-use based planning structure, including local comprehensive plans, functional plans (e.g., hazard mitigation plan, parks/recreation plan), area plans (e.g., subarea, neighborhood), and operational programs/procedures (e.g., zoning ordinances and municipal codes, site review criteria, capital improvement programs, and other aspects of local planning activities). Local jurisdictions can also play active roles in monitoring activities near or in wetlands and can prioritize all related projects/programs/plans/requirements to facilitate wetland monitoring, restoration, and management.

- **Local (land-use) comprehensive plans** serve as a blueprint, shaping future development and establishing a proactive platform to protect important community natural resources and address potential community challenges. Local comprehensive plans are a perfect channel to identify the critical wetland resources and develop strategic policies to balance land development and wetland conservation.
- **Function plans** generally address specific functions or services, such as hazard mitigation, transportation, water supply, stormwater management, or parks and recreation, etc. This category of particular functional plans can expand the community capacities in wetland conservation by incorporating the conservation concept into other community planning mechanisms.
- **Area plans** are developed focusing on specific geographic areas such as neighborhoods, central business districts, watersheds, transportation corridors, etc. The area plan could help implement conservation strategies into some important geographic areas which may have critical wetland resources.
- **Operational programs/procedures** provide opportunities to combine wetland conservation with some local daily operational activities, such as capital improvement programs, zoning regulations and municipal ordinances, and administrative procedures.



Integration avenue 1: Integrating with local comprehensive planning

The comprehensive plan is also called a comprehensive development plan, master plan, or general plan. The local comprehensive plan is a fundamental planning blueprint to guide local physical growth and development at the community level (such as cities, villages, counties, etc.) (Scholz et al. 2002). The local comprehensive planning process offers a collaborative framework for the preservation of valued existing community resources. Local comprehensive plans provide umbrella guidance to regulate community land-use, public facilities, utilities, transportation, housing, and environmental protection. All other community plans and policies need to be consistent with the local comprehensive plan.

A future land-use map is typically included in the local comprehensive plan to guide future land-use and development within a community. The locations of wetlands can be marked on future land-use maps to guide proposed future land-use. The land suitability analysis can be conducted to ensure compatible land-use with agriculture, housing, commerce, industry, recreation, education, public buildings and lands, and other categories of public and private use of land.

Integrating wetland conservation with local comprehensive planning can facilitate planning consistency within and concurrency between different community plans. The integration process can increase the visibility and elevate policy priority in local competitive resources and improve the likelihood of successful implementation and improve coordination among agencies. Through effective integration, conservation agencies can reduce conflicts resulting from uncoordinated land-use decisions and promote comprehensive solutions to wetland problems. The integration process can promote public engagement in conservation efforts.

Even though the structure and content of local comprehensive plans may be different in each community, wetland conservation concepts and actions can be incorporated into each planning component, including the factual base; goals and objectives; stakeholder coordination and public participation; policies, tools, and strategies; and implementation, monitoring, and updates.

The below strategies can be considered during the local comprehensive planning process:

- Mark wetlands on the maps of existing and future land-uses
- Describe wetland values, conditions, and challenges
- Describe major environmental laws, regulations, and permits relating to wetlands
- Set a goal for "no-net-loss of wetlands" or "increase the quantity and quality of wetlands"
- Set a goal to achieve sustainable and healthy ecosystems and protect biodiversity
- Coordinate with governmental and non-governmental agencies
- Incorporate the key stakeholders and the public into the planning process
- Promote public awareness programs for wetlands
- Adopt regulatory policies: land permitted use, land-use restrictions, density restrictions, buffer requirements, creation of special conservation zones, sensitive area protection, control of urban service/growth boundaries, open space protection
- Consider some incentive tools: transfer of development rights, density bonus or bonus zoning for environmental protection, clustering away from environmentally sensitive areas, mixed-use, infill/redevelopment
- Adopt conservation easements: Land trust, purchase of development rights, land acquisition programs, land and mitigation banking, property tax reduction/adjustment for conservation
- Apply financial tools: development impact fees for environmental protection, capital improvement program for environmental protection
- Identify each major agency's responsibilities in wetland/environmental protection
- Give a clear, reliable time schedule for conservation programs



Integration avenue 2: Integrating with hazard/floodplain mitigation planning

Wetlands are often physically located in lower elevation areas and are typically found in transitional areas between aquatic systems and uplands. Wetlands are often overlaid with riparian areas and floodplains. Thus, wetland conservation is naturally connected to hazard mitigation planning and floodplain management efforts.

Local governmental entities are required to develop and submit hazard mitigation plans to be eligible to receive federal funds, including the Hazard Mitigation Grant Program, Pre-Disaster Mitigation Program, and Flood Mitigation Assistance Program. Floodplain and wetland protection can create wildlife habitat, improve water quality, reduce flood risk, and increase carbon sequestration. Several tools dealing with land-use regulations and ordinances, natural system protection, and structure/infrastructure projects, can achieve the "win-win" goals for both floodplain management and wetland conservation. These tools are some examples:

- Mark wetlands on the floodplain maps
- Acquire floodplain/wetland lands for parks, recreation, flood reduction, waterfront renewal, open space, and greenways along creeks, streams, rivers, and lakes
- Relocate existing structures out of floodplain/wetland areas and restore wetlands/floodplains/riparian areas to natural or semi-natural conditions
- List wetland protection and restoration as a tool for flood/hazard mitigation
- Incorporate wetland conservation into structure and infrastructure projects for flood risk reduction
- Adopt combined ordinances to regulate wetland conservation and floodplain management
- Identify areas where wetland development could reduce peak flows or reduce flood risk

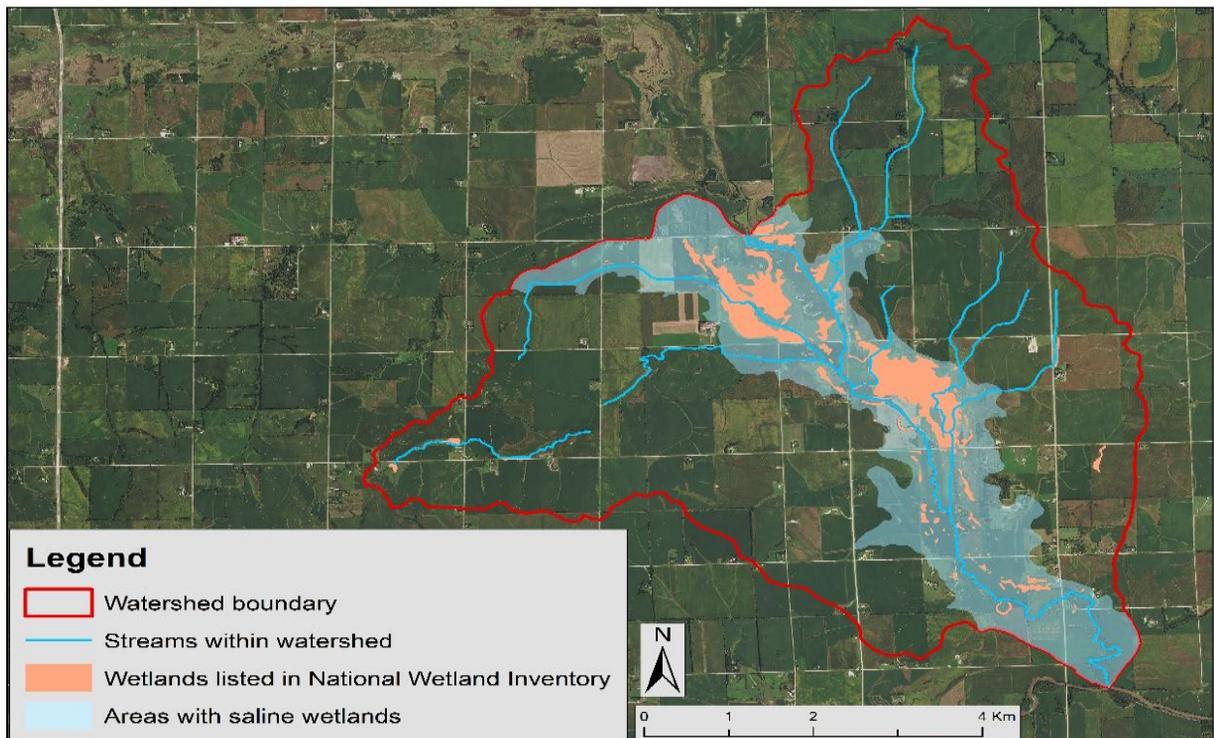


Map shows the overlap of floodplain and wetlands in east side of Omaha, NE

Integration avenue 3: Integrating with watershed planning

Watersheds are defined by a natural hydrological boundary, which is the most logical basis for managing water resources within the natural boundary. Wetlands are important natural features in watersheds. Watershed-based management approaches are vital to restoring hydrological integrity and enhancing wetland ecosystem services. EPA identified the six steps for watershed planning under section 319 Nonpoint Source Clean Water Act grant (USEPA, 2015). Wetland conservation efforts can be fully incorporated into the six steps of the watershed planning process.

- **Step 1: Build partnerships:** (1) Coordinate with partners at a watershed scale, including local/regional/state/federal watershed (or water resources) management program staff, water-related fisheries/wildlife/habitat management program staff, planners for land-use planning, transportation planning, and hazard mitigation planning, staff from nonprofit organizations and environmental groups, and representatives from landowners and developers, and others. (2) Identify the common interests and specify needs from the key stakeholders.
- **Step 2: Characterize watershed conditions:** (1) Identify the critical problem relating to wetland ecosystem at watershed scale, including inadequate water supply, flood risk areas, erosion and sedimentation sources, pollution problems, loss of wildlife and habitat, etc. (2) Make boundary map for wetlands, riparian areas, floodplains, lakes, streams, and other water bodies. (3) Evaluate hydrologic and ecological interrelationships at the watershed scale.
- **Step 3: Identify goals and solutions:** (1) Incorporate "no net loss of wetlands" as a watershed planning goal. (2) Increase the quantity and quality of the nation's wetland resources as a watershed planning goal. (3) Consider wetland conservation as an essential part of the watershed planning goals for the protection of natural hydrologic regimes, biodiversity, connectivity of ecosystems, and rare and endangered species.
- **Step 4: Design implementation programs:** (1) List potential wetland/aquatic sites to guide future restoration projects (e.g., mitigation banks) and future land development. (2) Provide maps/inventories of hydrological modifications (e.g., dams, dikes, road canvas, levees) affecting waters and wetland/aquatic ecosystems. (3) Identify the areas with possible wetland/aquatic ecosystem functions for further in-depth study or decision making.
- **Step 5: Implement policies:** (1) Local development ordinances and permits: limit development density, site design requirements (e.g., impervious surface limits or open space, riparian buffer or setback requirements), lot size, tree removal, creation of impermeable surfaces at the watershed scale. (2) Implement conservation programs for wetland restoration, wetland creation, and wetland enhancement (reclamation of gravel/agricultural pits; streambank stabilization efforts; constructing/retrofitting of stormwater detention/retention facilities; reduction of sediments into wetlands; recovery of hydrological connection to wetlands; vegetation management).
- **Step 6: Measure progress and make updates:** (1) Participate in watershed-level monitoring programs, such as water quality, floodplain, fisheries/wildlife/habitats. (2) Participate in the watershed planning updating process.



A watershed map showing the hydrological connection to wetlands

Integration avenue 4: Integrating with stormwater management planning

Natural wetlands should not be used as priority treatment of stormwater runoff. Man-made wetlands have been considered as an essential stormwater treatment tool, particularly for urban areas. Stormwater discharges are subject to the National Pollutant Discharge Elimination System (NPDES), state-level water quality 401 certifications, and local ordinances/regulations. Wetlands, including both natural wetlands and man-made wetlands, serve as a part of essential best management practices for stormwater management. Wetland areas are very suitable solutions for managing non-point source pollution, particularly in urbanizing areas. Wetlands can help achieve the critical environmental, economic, and social goals in stormwater management/planning. Wetlands naturally contribute to rainwater harvesting, stormwater runoff volume reduction, peak flow reduction, increasing water infiltration, groundwater recharge, water quality improvement, and flood risk reduction. Wetlands also work as open spaces and green spaces to attract resources to the community and improve social amenities for the health and well-being of the community (US EPA, 2016).

Stormwater Management Plan (SWMP) is also called a Stormwater Pollution Prevention Plan (SWPPP). SWMP (or SWPPP) identifies structural and non-structural best management practices to minimize negative environmental impacts caused by stormwater discharges. Wetland conservation can be a part of the SWMPs or SWPPPs is to eliminate or reduce erosion and runoff of pollutants and sediment to water bodies. Wetlands physically are often the lowest places in the drainage areas. Thus, they have natural advantages to hold runoffs and sediments.

The below policies can be used to promote both wetland conservation and stormwater management at the community level.

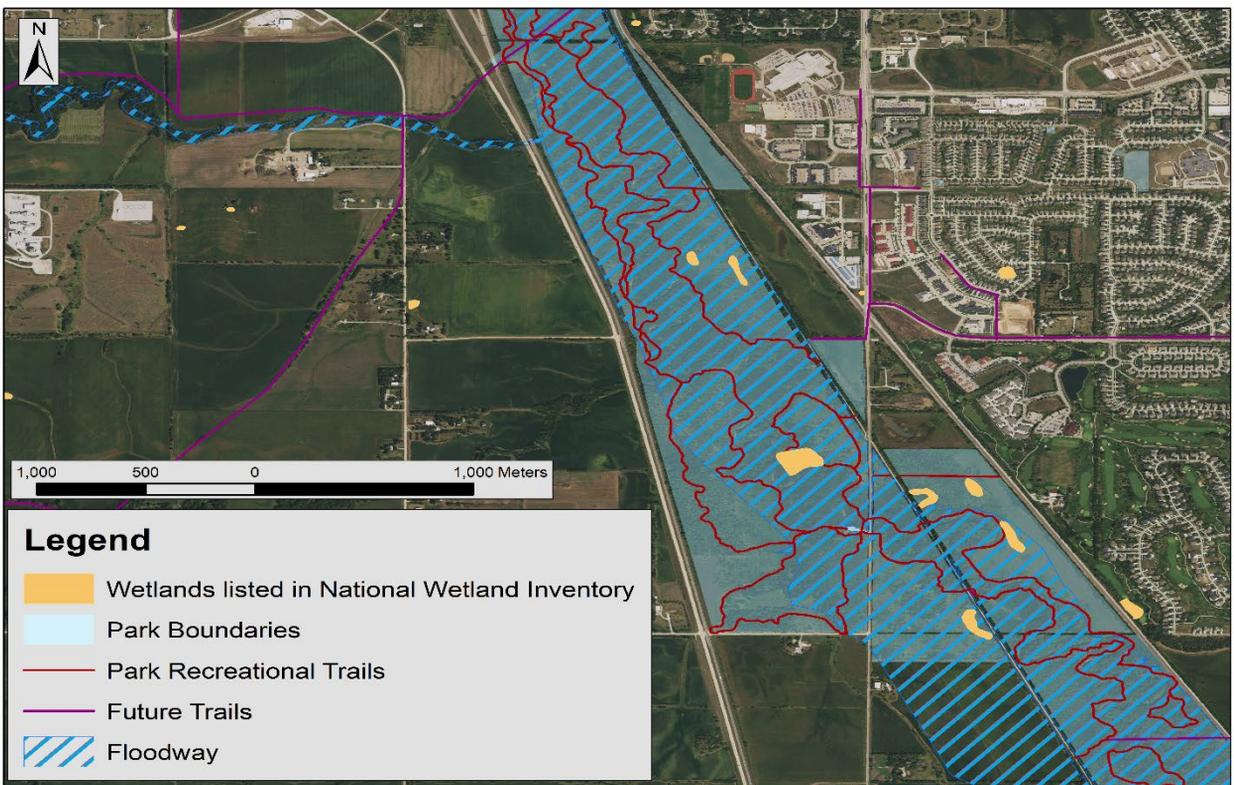
- Identify wetlands/streams/water bodies as natural features and map them during the assessment of existing construction site conditions
- Protect/restore natural wetlands as filters and buffers to reduce non-point source pollutions to water bodies (e.g., lakes, streams, creeks, etc.)
- Construct artificial wetlands to intercept pollutants from agricultural/urban lands, retain sediment on-site, and control dewatering practices
- Adopt low impact development techniques to reduce erosion and improve water quality for wetland areas
- Adopt community regulations, policies, codes for stormwater, fills, grading, sanitary/septic waste, vegetation removal, and pesticide usage to reduce pollutants and sediments into wetlands
- Limit the percentage of impermeable surfaces, and limit development density at the watershed level
- Promote the use of soil and water conservation practices around wetlands/streams



Integration avenue 5: Integrating with parks and recreation planning

Wetlands have important social functions for the general public when open spaces are increasingly viewed as valuable amenities to the quality of life in a community. Wetlands are often associated with the edges of lakes, ponds, rivers, and streams. At the community level, wetlands also serve as public parks, open spaces, green spaces, or recreational water areas. Wetlands are essential components of community parks and recreational sites. These local parks and recreation sites can bring broad health benefits to the people, such as fresh air, sunlight, scenic views, physical exercise space, and a natural aesthetic place. Thus, local park and recreation agencies help promote wetland protection and restoration. Wetlands, as an essential component of local parks and recreational sites, can be used effectively as buffers, transition zones, and barriers, when it is desirable to provide separation between different land-uses or neighborhoods in a community. In local parks and recreational planning, wetlands are important assets that add to the social and economic development of the local community. The suggestions to improve the integration of wetland conservation with park and recreation planning are provided in the below list:

- Identify wetlands on the map of local park and recreational facilities
- Dedicate wetlands as open space, green space, and park sites
- Identify the area of a site that includes wetlands and submerged areas as non-buildable areas
- Design trails at adequate buffer distance from wetlands
- Use trails or bike lanes to connect to wetlands for recreational purpose
- Collaborate with landowners and developers to protect natural wetlands and build new wetlands
- Establish signs and display boards for education purposes of understanding community wetlands
- Team with local public school systems for wetland-related field tours
- Restore wetland functions as a part of parks facility improvement efforts



Wetland conservation jointed with trails, floodplain storage area, and open space in Wilderness Park in Lincoln, NE

Integration avenue 6: Integrating with infrastructure (transportation) planning

Public infrastructure provides for the safety and well-being of all residents in the planning areas. Public infrastructure development is an excellent opportunity to consider wetland conservation. Public infrastructure includes transportation systems for vehicular, rail, air, bike, and pedestrian travel and public facilities for water, sanitary sewers, storm sewers, solid waste disposal sites, etc. Wetland conservation concepts can be incorporated into the site selection, design, construction, and maintenance of the public infrastructure planning, such as airports, rail corridors, hiking/biking/pedestrian trails, sewer treatment facilities, etc.

When wetlands are impacted by public infrastructure projects, federal, state, and local regulations require avoidance, minimization, mitigation, or compensation, for those impacts. Compensatory mitigation includes creating, restoring, or enhancing wetlands. Below are some strategies to promote the integration of infrastructure/transportation planning with wetland conservation.

- Build and strengthen collaborative partnerships among stakeholders
- Identify high-quality wetlands that may be affected by the infrastructure (transportation) development by considering the criteria for high functionality, rare wetland types, habitat to serve threatened or/and endangered species, biological/hydrological/ecosystem connectivity, a high priority of wetland importance, biodiversity richness, and wetland size
- Map of transportation, land-use, conservation, and restoration priorities under potential development scenarios
- Link wetland mitigation with multiple-purpose projects, such as fish habitat or stream corridor improvements, soil erosion control, flood control, and water quality improvements
- combine traditional wetland mitigation practices (creation or restoration) with wetland preservation
- Participate in a mitigation banking program as a type of "savings account" for wetland mitigation
- Use the best management practices of design "with nature" to support and enhance wetlands/environmental systems in built infrastructure



Photo of the Merriman South Wetland Mitigation site completed in 2008 as a part of the Nebraska Department of Transportation's wetland mitigation banks

Toolkits for wetland conservation planning

In the United States, most wetlands are privately owned, while local governments implement most of the land-use policies. Local planning is a useful platform to serve wetland conservation. Effective local planning can help achieve the goal that wetlands are protected, and all functional values be considered in a protection program. American Planning Association (2002) released the wetland policy guide and supports the goal for wetland preservation. The guide recognizes the importance of wetlands, suggests wetland protection techniques, and emphasizes avoidance and minimization of wetland impacts before compensatory mitigation. Avoidance requires locating development, fills, structures, and other land-use activities outside of wetlands. Minimization emphasizes reducing the possible environmental impact of activities upon wetlands where avoidance is not feasible. Mitigation is a backup option when avoidance and minimization cannot be implemented. Mitigation refers to wetland restoration, creation, and other techniques to compensate for losses to wetland ecosystems.

Through the toolkits for integrated wetland planning, communities can increase cross-agency coordination, reduce possible conflicts, remove procedural duplication, and save operational costs in complying with environmental regulations. Integrated wetland planning will improve the protection and restoration of wetlands, improve the ability to allocate lands for most suitable uses, and meet the needs of landowners.

To protect the ecological integrity of wetlands, efforts should be made to maintain the natural hydrologic regime, including natural flood cycles. Fragmentation should be avoided, and hydrologic connectivity between wetlands, other waters, and upland ecosystems should be maintained.

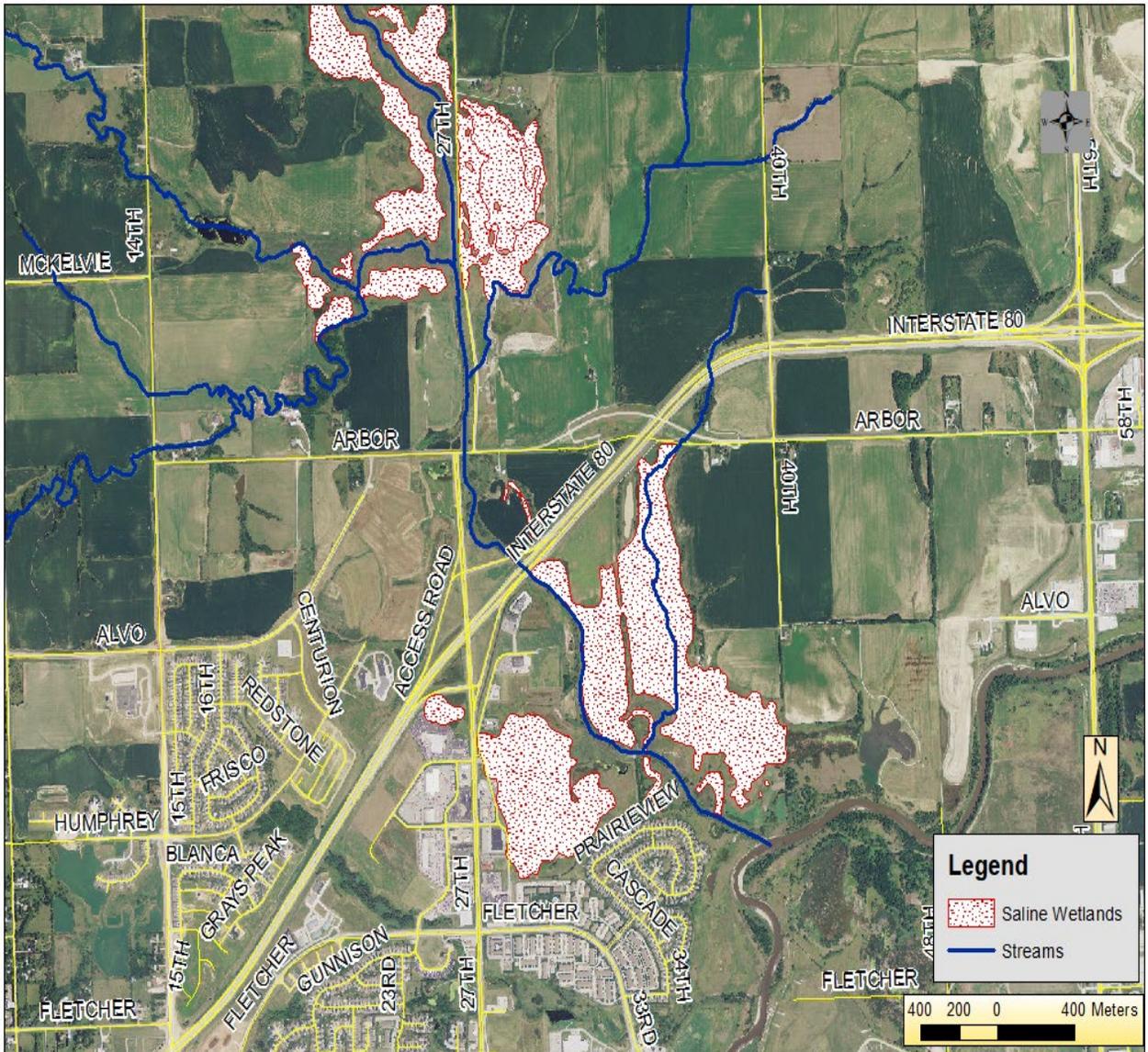
The toolkits are the most practical points to promote wetland conservation planning at local levels. Local jurisdictions can develop their own policies and practices based on their specific wetland conditions and needs.

- Toolkit 1: Wetland maps in local plans
- Toolkit 2: Natural system protection
- Toolkit 3: Land acquisition and incentive strategies
- Toolkit 4: Land-use policies (zoning, codes, standards, criteria)
- Toolkit 5: Best management practices
- Toolkit 6: Stakeholder collaborations
- Toolkit 7: Education, outreach, and engagement
- Toolkit 8: Implementation mechanisms



Toolkit 1: Wetland maps in local plans

- 1.1 Create community wetland maps/inventories based on the [National Wetland Inventory \(NWI\)](#), [Soil Survey Geographic Database \(SSURGO\)](#), and other data sources
- 1.2 Update and improve the accuracy of existing wetland maps for regulatory and planning purposes
- 1.3 Share wetland maps for public information, education, outreach, collaboration and engagement
- 1.4 Prioritize the critical wetland resources as a decision-making supporting tool
- 1.5 Document wetland loss and degradation, and identify key challenges/factors for wetland services



The above map illustrates the saline wetlands on north side of City of Lincoln, NE.

Toolkit 2: Natural system protection

2.1 Adopt permitted use ordinances to protect natural systems for wetland conservation:

- Recreation for birdwatching, canoeing, kayaking, fishing, hunting, and boardwalks
- Harvesting of timber and wild crops
- Open space uses
- Other permitted uses

2.2 Adopt prohibited use (without special exception or variance) ordinances for wetland conservation:

- Restrictions on dredging, filling, drainage, and other activities which will substantially damage or destroy wetlands
- Conservancy restriction for floodplain areas
- Limitation of water-front development to water-dependent uses
- Prohibited land development for the purposes of dune protection and vegetation protection

2.3 Adopt regulations for protecting wetlands on local public lands (e.g., parks, greenways, forest areas, playgrounds)

2.4 Adopt environmental regulations for natural system protection, including:

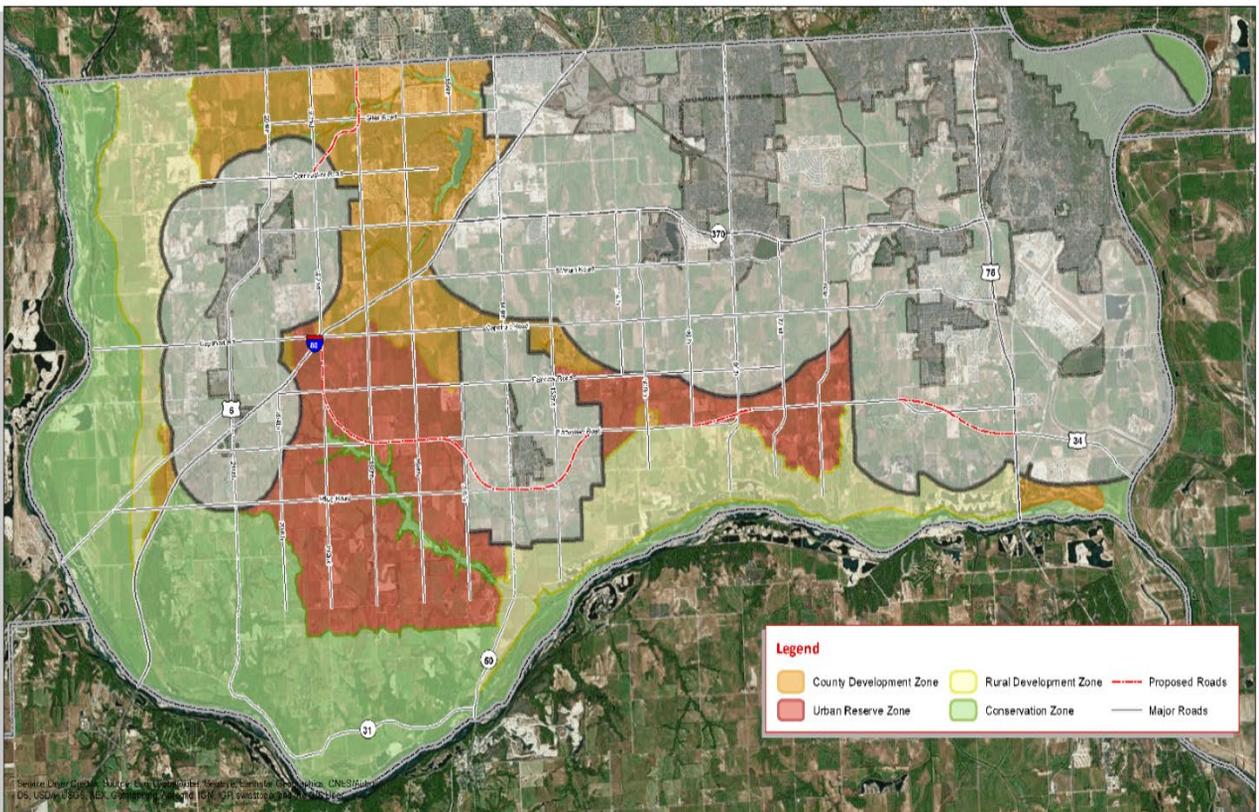
- Habitat protection and restoration areas
- Environmentally sensitive areas
- Natural drainage ways, streams, wetlands, and water bodies
- Stormwater detention areas
- Open space preservation areas
- Erosion and sedimentation control areas
- Stream corridor restoration areas
- Stream setback and buffer areas
- Groundwater recharging areas with wetlands

2.5 Join other conservation efforts at larger scales with broader purposes to maintain and improve wetland ecosystem services, wetland integrity and functionality, such as wildlife and fisheries conservation, species conservation and biodiversity enhancement, habitat conservation, watershed management, parks and recreation, and hazard mitigation, etc.



Toolkit 3: Land-use policies (zoning, codes, standards, and criteria)

- 3.1 Zone specific areas for "wetland conservancy", "conservancy area", "sensitive area", "critical area", "green space", "open space", "wetland/conservation overlay zone", or other "protection zone"
- 3.2 Require some large residential zones and subdivisions to create or maintain a certain wetland area on each lot
- 3.3 Adopt design standards to protect wetlands and encourage dedication of wetlands as open space or for stormwater management purposes for local land-use activities, including site plan review, project review and permitting, lot split or lot division, lot line adjustment, parcel consolidation, open space and conservation design, and public infrastructure project planning and design
- 3.4 Adopt building codes, utility codes, and sanitary code for flood hazard resistance, open space protection, and wetland conservation
- 3.5 Allow variances from road standards, zoning setbacks, and infrastructure requirements for wetland conservation
- 3.6 Develop other types of land-use policies for wetland conservation: performance zoning, hazard setback ordinances, form-based zoning, and rezone



Sarpy County Comprehensive Plan

Future Land Use- Growth Management Zone



Created By: CFS
Date: 5/05/2016
Revised: 05/20/2016
Software: ArcGIS 10.2
File: 190339.DD



Conservation zoning to protect some of the wetland resources in Sarpy County (Nebraska) Comprehensive Plan

Toolkit 4: Land acquisition and incentive strategies

4.1 Participate in and promote land acquisition programs to protect specific wetlands

- Conservation easements (conservation covenant, conservation restriction or conservation servitude): Planners can help engage landowners with land trust agencies (a qualified private land conservation organization) or government agencies at municipal, county, state, federal level to reach voluntary legal agreements to limits uses of lands in a designated land area for conservation purposes.
- Land trusts: Planners can help facilitate the voluntary mutual agreements in which property owners transfer the title to a trustee for conservation purposes.
- Purchase the critical wetlands and undeveloped lands with wetland functions: Planners can help identify the critical wetlands for public purchases for community open space, local parks, recreational trails, and natural education sites.

4.2 Adopt local incentive strategies to promote wetland conservation

- Purchase development rights: This incentive-based, voluntary tool helps achieve the goal of permanently protecting the valuable wetlands, and the property owners can still retain ownership and management.
- Transfer of development rights (credits): This voluntary, market-driven growth management tool supports higher intensity development in designated “receiving” areas (such as an area without wetlands or critical habitats) in exchange for land or resource preservation in designated “sending” areas (such as an area with wetlands or other critical habitats) (Morley, 2018).
- Density bonuses: Incentives for either funds or in-kind support given to developers to increase the maximum allowable development in an area that normally does not have critical environmental impacts in exchange for specified purposes (e.g., wetland conservation, open space protection, etc.).
- Clustered development: Development projects can be grouped in smaller lots to preserve the remaining land on the site for certain specific purposes, such as open space, or protection of environmentally sensitive areas, and parks and recreation areas.

4.3 Adopt local tax increment financing incentives to support wetland conservation: Local governments can adopt financial incentives to promote conservation at the community level.

- Property tax reduction
- Land preservation tax credits
- Lower tax rates
- Special tax assessment
- Impact fees



Toolkit 5: Best management practices

- 5.1 **Restore wetland hydrology at the watershed scale:** Full hydrologic restoration or partial hydrologic recovery are vital steps to convert non-functioning lands back to functioning wetlands. Recovery of hydrological modifications from irrigation reuse pits, surface drains, terraces, ditches, culverts, and berms, can improve drainage patterns into the wetlands at watershed scales. Watershed-based planning is a critical approach to determine a restoration project's location and relevant implementation characteristics of the restoration or replacement of wetlands.
- 5.2 **Establish buffer for wetlands:** Establishment of vegetation buffers around wetlands, both on adjacent uplands, is a practical approach to lessen sediment accumulation and thus maintain a high level of wetland functionality. Acquisition of surrounding land allows wetland managers to fill pits appropriately, graze invasive vegetation, plug surface drainages, and pump water to wetlands. Protection of the surrounding areas of wetlands can benefit vegetation management and hydrologic restoration. The protection of round-out lands helps build more resilient wetland systems, thus results in increased frequency and duration of functional wetland status.
- 5.3 **Conduct vegetation restoration:** Vegetation restoration, management, and maintenance are essential components for wetland conservation. Reducing invasive species and improving current vegetation conditions is a continuous need for wetland restoration and enhancement.
- 5.4 **Control soil erosion and sediment input wetland:** Soil erosion and sedimentation can reduce the water holding capacity of wetlands and likely reduce the hydroperiod lengths as well. Sedimentation control practices protect soil inputs generated by bare ground. Protecting wetlands from a reduction in function due to sedimentation inputs caused by urban and agricultural runoff remains the highest priority.



Toolkit 6: Stakeholder collaborations

6.1 Link local approval to state/federal wetland permits and programs

- Clean Water Act, 404 permit
- Clean Water Act, 401 water quality certification, state and local laws

6.2 Coordinate wetland conservation with federal hazard/floodplain programs:

- National Flood Insurance Program
- FEMA Community Rating System
- Hazard Mitigation Grant Program
- Pre-Disaster Mitigation Program
- Flood Mitigation Assistance Program

6.3 Collaborate with partners to restore and construct wetlands for pollution, stormwater, parks, recreation, tourism, fish and wildlife, and other purposes that can partially protect wetlands along with objectives:

- Floodplain and floodway protection regulations (combined ordinances for floodplain and wetland protection)
- Stormwater, soil erosion and sedimentation control ordinances (to encourage or require onsite detention or wetland construction)
- Natural features setback ordinances
- River protection regulations
- Tree cutting and other vegetation cutting regulations
- Joint efforts with other programs (e.g., transportation)



A new wetland was constructed in Adams Park in Omaha, Nebraska. This wetland can hold up to 77 acre feet, or more than 25 million gallons of stormwater, slow down flow speed, reduce flood risk, and improve water quality.

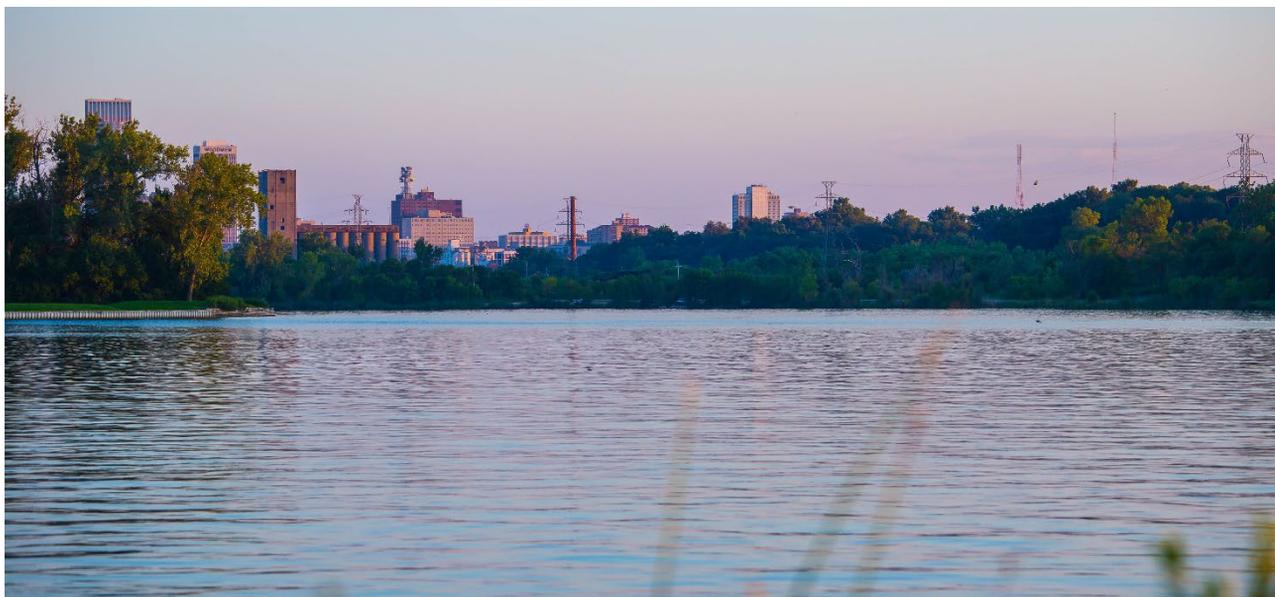
Toolkit 7: Education, outreach, and engagement

- 7.1 Provide wetland information and share with developers, landowners, and residents to highlight the value of wetlands and the location of wetlands, and the activities dealing with wetlands
- 7.2 Set up wetland sign and display boards on public lands to improve public awareness of wetland resources within each community
- 7.3 Conduct public education, outreach, and engagement activities through workshops, field trips, open houses for school/college students, community residents, and landowners
- 7.4 Develop educational materials (handouts, flyers, posters, and signs) and electronic information channels (webpage, videos, mobile applications, social media/networks, radio, television, etc.)
- 7.5 Convene a community advisory committee and partner with citizen groups, non-governmental organizations, and environmental groups for joint efforts on wetland conservation
- 7.6 Engage citizens and stakeholders in wetland-related planning decision-making process
- 7.7 Sponsor some specific events for public engagement and media coverage



Toolkit 8: Implementation mechanisms

- 8.1 Start engagement early in the planning processes: An early stage of dialogue can bring an opportunity for stakeholders to “come to the table” for the challenges and issues they are facing. Early discussions facilitate collaborative approaches to integrate stakeholders who may have different interests in the planning processes. Local programs (e.g., wetland, stormwater, floodplain management, hazard mitigation, parks and recreation, water supply, pollution control, etc.) are authorized by separate enabling legislation with separate budgets and different operational procedures. Early engagement has more time to overcome these barriers by bringing people and programs with common interests together.
- 8.2 Join cross-agency planning team and build partnerships from project level to system level: A practical and efficient approach to promote integrated conservation planning is to start an interagency collaboration and build public-private partnerships incrementally from a project (American Association of State Highway and Transportation Officials, 2008). Partners need time and trust to adapt their traditional project decision-making and implementation processes to a more integrated, mutually-beneficial plan. The integrated planning is often incremental, building on the success of specific joint efforts and collaborative working experiences that address specific projects or environmental problems. The trust will lead to the development of integrated cross-agency planning processes that can achieve multi-purpose goals at the system level.
- 8.3 Seek for “win-win” solutions that have multi-objective strategies for wetland-related problem solving: Identifying potential benefits helps break through historic barriers and generate integrated collaborations. A successful integrated planning project should address the multi-purpose needs and unique characteristics of the location and organizational relationships.
- 8.4 Ensure institutional leadership support and organizational resources commitment: The institutional support from the leadership level or executive management level is a critical element for effective integrated planning. Strong, high-level support is essential to set the stage for integrated approaches. The financial/technical resources also help to develop a strong capacity for integrated planning for joint wetland conservation.
- 8.5 Share high-quality environmental/wetland data for collaborative decision-making: Accurate wetland geospatial dataset is an essential information tool that supports collaborative decision-making. Planners need to work together with the support of geospatial data and decision support tools.



Summary for integrated wetland conservation planning

A robust integrated plan for wetland conservation can be conceptually categorized by five major planning components: (1) Factual base, (2) Goals and objectives, (3) Stakeholder coordination and public participation, (4) Policies, tools, strategies, and (5) Implementation, monitoring, and updating. In each component, the specific concepts, elements, indicators can be strategically involved in specific types of plans depending on local environmental, social, political, economic, and legal context.

Even though there is no unified code to guide the integrated wetland conservation planning, the below framework and indicators can be a reference for planners to systematically incorporate wetland conservation efforts into various types of local plans. The below summary table with a list of the possible indicators considers the key elements and expectations from the federal wetland management programs and the state-level wetland program plans. Local planners can adjust them based on their local conditions.

Summary of five plan components for integrated wetland conservation planning

Factual Base	<p><u>Principle and philosophy:</u></p> <ul style="list-style-type: none"> • Implement watershed-based management • Promote ecosystem-based management • Emphasize biodiversity-based management <p><u>Map and inventory:</u></p> <ul style="list-style-type: none"> • Define wetlands and specify wetland mapping standards • Provide map/inventory of wetland resources (SSURGO, NWI) • Specify wetland types and classifications <p><u>Wetland condition facts:</u></p> <ul style="list-style-type: none"> • Describe historical wetland loss/degradation • Identify current wetland status and major challenges • List the major federal/state/local regulations on wetland conservation
Goals and objectives	<ul style="list-style-type: none"> • Goal for “no net Loss of wetlands” • Goal for anti-degradation of wetland conditions • Goal for increasing wetland quantity and quality
Stakeholder coordination and public participation	<ul style="list-style-type: none"> • Promote wetland information sharing, communication, education, outreach, engagement • Coordinate wetland conservation with other agencies/programs/plans/projects/landowners • Develop joint reviewing procedures/standards/committee for wetland-related projects
Policies, tools, strategies	<p><u>Regulatory policies:</u></p> <ul style="list-style-type: none"> • Link local approval to federal/state wetland permitting (404 permit and 401 state certification) • Set local regulations for natural area protection and ecosystem management • Develop local regulations/codes/ standards/requirements for land-use, water resources, etc. <p><u>Wetland monitoring and assessment:</u></p> <ul style="list-style-type: none"> • Conduct regular monitoring and assessment for wetland conditions and functions • Participate in national/state wetland condition assessment and related studies • Join multi-objective environmental conservation programs for monitoring/assessment <p><u>Wetland water quality improvement:</u></p> <ul style="list-style-type: none"> • Apply best management practices at the watershed scale • Adopt stormwater, erosion and sediment management for adjacent wetlands • Improve vegetation management for wetland sites <p><u>Voluntary wetland restoration:</u></p> <ul style="list-style-type: none"> • Join the federally-funded or other sources of voluntary wetland restoration programs • Adopt a land acquisition program, conservation easement, land trust, mitigation bank, etc. • Provide local incentives (e.g., tax reduction, cost-sharing, etc.) for voluntary restoration
Implementation, monitoring, and updating	<ul style="list-style-type: none"> • Establish/participate wetland-related task force, committee, advisory group, leadership team • Specify implementation timelines, responsible agencies, support for wetland conservation • Join local plan’s updating mechanism and development continuum



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 - Nebraska Department of Transportation
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 - City of Omaha, NE
 - Saline Wetlands Conservation Partnership
 - Rainwater Basin Joint Venture
 - Playa Lakes Joint Venture
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 - The findings and conclusions in this document are those of the authors and do not necessarily represent the views of governmental agencies.



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