

Watershed Based Assessment and Planning for Wetlands in the Subwatershed of the Deep Fork River in Lincoln County, Oklahoma

**A “How-to” Report on Creating a Watershed Based
Management Plan for Wetlands**

Compiled by:

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Creating a Watershed Based Management Plan for Wetlands



Introduction

Wetland and watershed management is an approach that integrates wetland ecosystem management with traditional water and watershed management goals and techniques. It manages water resources, taking into account the functions and values of wetlands, and it manages wetlands in broader water regime and ecosystem contexts.

A wetland and watershed management approach can be useful in all wetland and watershed planning and management contexts. However, this approach is particularly useful in urban, agricultural, and other areas with large numbers of headwater and semi-isolated wetlands. The approach is also useful where significant changes in natural runoff have taken place or may take place. This approach is also particularly useful in locating and avoiding development of wetlands along smaller rivers and streams where the quality and quantity of water depends upon activities in the immediate watershed. The Deep Fork of the Canadian River Watershed was chosen for the development of this wetland management plan.

The Deep Fork of the Canadian River Watershed is recognized by both state and federal agencies for its high quality, important wetland functions, and its excellent fish and wildlife values. For example, the watershed in Lincoln County has been identified as the number one wetland site in Oklahoma in the U.S. Fish and Wildlife Services' Regional Wetlands Concept Plan (USFWS, 1991). The efforts of this management plan are also consistent with objectives of the Partners in Flight Program for conservation and

management of bottomland hardwoods for neotropical migratory birds (Fitzgerald et al., 2000). The management plan is complimentary to the *Eastern Oklahoma Wetlands Plan*, which is the state of Oklahoma's implementation plan for the Lower Mississippi Joint Venture of the North American Waterfowl Management Plan (NAWMP) (Brabander et al., 1985). This area is one of seventeen priority-one sites listed in the *1985 Texas and Oklahoma Land Protection Plan* (USFWS, 1985). In addition, it has the highest priority ranking for protection in *Oklahoma's State Comprehensive Outdoor Recreation Plan (SCORP)* (Oklahoma Tourism and Recreation Department, 1987). The majority of the area contains palustrine, forested wetlands of the type that have been identified as rare and/or declining habitats in the *National Wetlands Priority Conservation Plan (NWPCP)* (USFWS, 1989).

Historically this resource has been under-valued locally due to problems associated with erosion, flooding, infrastructure damages, and the resulting devaluation of property in an agriculture-based economy. Recent interest among local, state, and federal entities in the watershed approach to planning includes steps to have the watershed designated as a Natural Resources Conservation Service (NRCS) – Environmental Quality Incentive Program Priority area. This designation will provide opportunities to develop a watershed management approach toward enhancing, restoring, and protecting wetland resources.

The Lincoln County Conservation District (LCCD) has experience in watershed based planning including five watershed protection and flood prevention (Public Law 566) projects. These upstream flood control projects included land treatment practices in at least 70% of their watersheds, which included but were not limited to, riparian corridor restoration to minimize erosion. The conservation district understands the need for district support and involvement in planning and management of local wetland resources. There are a number of local groups whose interests span the spectrum from flood loss reduction to waterfowl habitat enhancement.

Steps for Development

Essential steps for development of a wetland management plan may vary somewhat but generally include:

- Description of the management area
- Compilation of existing inventory information and programs
- Identification and involvement of key actors for a working group
- Identification of wetland and watershed problems, issues, and goals
- Mapping and assessment of wetland and other resources on a watershed basis
- Creation of future plans for wetland resources
- Education of adults and children regarding the functions and values of wetlands
- Implementation

Description of the Management Area

The location of the management area needs to be identified and described in order to give everyone involved with the plan an idea of the size and type of area that they will be analyzing. It is important to have a description of the area because the issues and practices will vary with different regions.

The Deep Fork Watershed is located in Lincoln County, Oklahoma. The project area is about 40 miles northeast of Oklahoma City, Oklahoma. The moderately rolling landscape ranges from about 800 to 1,150 feet above sea level. The area of the county is about 973 square miles and approximately 75 percent of that drains into the Deep Fork River. About 17 percent of the county is bottomland, 39 percent is upland prairie, and 44 percent is partially wooded. The Deep Fork River crosses the county from west to east.

Palustrine forested wetlands cover 85 percent of the identified wetland area. Palustrine emergent, palustrine scrub-scrub, lacustrine, palustrine open water, and riverine wetlands make up the remaining 15 percent. The majority of these habitats have been identified as rare and/or declining habitats in the NWPCP. The area is rich in diversity and of value to a variety of migrating and wintering waterfowl, especially mallards. It is also an important breeding and wintering area for wood ducks. Furbearer populations, which are among the highest in the State, along with many game and non-game species inhabit the area. A wide variety of resident bird species and neotropical migratory songbirds are supported by the bottomland hardwood habitat along the Deep Fork River. The area is an important wintering habitat for bald eagles. In addition to their value as excellent fish and wildlife habitat, these wetlands provide other important benefits such as surface and groundwater sources; water quality improvement; flood and storm damage reduction; and opportunities for public recreation, research, and education.

Compilation of Existing Inventories and Programs

Gathering information is essential for the development of a wetland management plan. Obtaining wetland inventory information, such as the National Wetlands Inventory (NWI), will aid with the identification and location of existing wetland areas. Assembling existing conservation programs creates a framework for more effective



planning. Watershed management planning efforts can also lead to coordination of regulations and reduction of duplication and conflicts, reducing the regulatory burden on landowners.

NWI maps were obtained for Lincoln County along with information on conservation practices that had been implemented as part of the following programs:

Wetland Reserve Program—Natural Resources Conservation Service

- 15 sites
- 2369.6 acres

This is a voluntary program to restore and protect wetlands on private property. USDA will purchase a 30-year or permanent easement and pay 100 percent of the cost of wetland restoration on permanent easements, and 75 percent of the costs on 30-year easements. Ten-year restoration agreements paying 75 percent cost-share without easements are also available.



Partners for Wildlife—U.S. Fish and Wildlife Service

- 27 sites
- 2326 acres

This program provides technical and financial assistance to restore and enhance fish and wildlife habitat, including degraded or converted wetlands and those upland habitats that meet specific eligibility criteria, based on 12-year agreements.

Upstream Flood Control Structures—Natural Resources Conservation Service

- 60 sites

The purpose of the Watershed Program, including River Basin operations, is to assist Federal, State, local agencies, local government sponsors, tribal governments, and program participants to protect and restore watersheds from damage caused by erosion, floodwater, and sediment, to conserve and develop water and land resources, and solve natural resource and related economic problems on a watershed basis. The program provides technical and financial assistance to local people or project sponsors, builds partnerships, and requires local and state funding contribution.

Resource concerns addressed by the program include watershed protection, flood prevention, erosion and sediment control, water supply, water quality, opportunities for water conservation, wetland and water storage capacity, agricultural drought problems, rural development, municipal and industrial water needs, upstream flood damages, water needs for fish, wildlife, and forest-based industries, fish and wildlife habitat enhancement, wetland creation and restoration, and public recreation in watersheds of 250,000 or fewer acres. Both technical and financial assistance are available.

Conservation Plans—Natural Resources Conservation Service

The Natural Resources Conservation Service (NRCS) provides conservation planning and technical assistance to clients (individuals, groups, and units of government). These clients develop and implement conservation plans to protect, conserve, and enhance natural resources (soil, water, air, plants, and animals) within their related social and economic interests.

Conservation planning is a natural resource problem-solving and management process. The process integrates ecological (natural resource), economic, and social considerations to meet private and public needs. This approach, which emphasizes identifying desired future conditions, improves natural resource management, including wetlands, minimizes conflict, and addresses problems and opportunities.

Public Outreach—Lincoln County Conservation District

LCCD is dedicated to conservation and wetlands education. LCCD has many wetland educational opportunities and activities for the public, including wetland field days, teacher workshops, newsletter publications, dissemination of information at public events, and wetland outdoor classrooms.

Since 1999, LCCD has held wetland field days at a privately owned wetland site in Lincoln County. Three schools have participated in the activities with a total of 635 students, teachers, and adults. In addition, LCCD with the support of the Oklahoma Conservation Commission (OCC) has held teacher-training workshops in both the *Project WET* and *WOW! The Wonders of Wetlands* curricula. LCCD has also constructed

a permanent wetland outdoor classroom site through the USFWS's Partners for Fish and Wildlife Program.

Forming a Workgroup

Critical actors are the individuals and groups with significant decision-making power over the future of wetlands and waters within the geographical area being considered. For a small watershed owned by a public or private landowner, a single landowner might undertake wetland and watershed management. For larger areas, critical actors will often include (a) local (and sometimes state and federal) land and water management agencies; (b) private landowners and developers; (c) nonprofits, and (d) the general public.



The workgroup assembled for this project included members from Lincoln County Conservation District (LCCD), Oklahoma Conservation Commission (OCC), Natural Resources Conservation Service (NRCS), Oklahoma Department of Wildlife Conservation (ODWC), and local landowners. This diverse group consisted of members ranging from waterfowl experts to constructed wetland experts to landowners with knowledge of local problems and issues. LCCD personnel who are familiar with the local citizens as well as state and federal professionals assembled the group. This group provided an opportunity for exchanging ideas from local and expert perspectives. Monthly meetings were held to identify problems, issues, and goals for the Deep Fork watershed.

Identifying Problems, Issues, Goals

Identifying problems and issues for wetlands within a watershed context involves both local knowledge and expert evaluation. Local knowledge is a key factor for identification of problems within a watershed. Landowners are often the first to identify problems within a watershed because they are the ones observing the land first hand. That information linked with expert knowledge leads to the identification of problems and their sources.

Typical goals for wetland and watershed management include both traditional watershed management goals—water quality protection, flood loss reduction, stormwater management, water supply maintenance, and other goals—and sustainable protection and restoration of wetlands. Other common goals include predictable, flexible, and low costs for development projects, and reduced duplication and increased consistency in wetland and water policies. Some state, federal, and local planning and management efforts to date have incorporated a more specific “no net loss” of wetland function and/or acreage goals as well.

Workgroup meetings were held monthly to identify the problems, issues, and goals for wetland and watershed management of the Deep Fork. Throughout the meeting process different problems were raised and solutions discussed. In addition, goals for wetland and watershed management were laid out. Some of these are listed below.

Problems and Issues

- Wetlands loss
- Erosion
- Flooding
- Loss of wildlife habitat
- Beaver control
- Feral hog habitat destruction
- Cattail overgrowth
- Salt cedar control
- Hardwood loss
- Oil well contamination

Goals

- Protection of existing wetlands
- Restore wetlands in eligible sites
- Riparian and hardwood restoration
- Stabilize streambanks
- Flood loss reduction
- Educate adults and youth about wetland functions and values
- Control beavers and noxious and invasive plants

Assessment and Mapping Information

Assessment

Local government-wide wetland and watershed protection efforts to date have been based upon overall, general assessment of wetland functions and values, natural hazards, soil suitability for development, costs of public services, and other factors. More detailed analyses of the functions and values of specific wetlands are typically undertaken by local governments only if fills or drainage are proposed for specific wetlands and such activities are conditionally permitted under regulations. It would be time consuming and impractical to assess every wetland in a watershed just for the sake of assessment. However, it is important to use an accredited assessment method to determine the functions and values of reference wetlands. If alterations will be made to a wetland an assessment would be important to determine losses so that proper mitigation may be conducted.

Functional assessment methods are used to represent the relationship between functional capacity and characteristics of wetlands. Wetland assessment approaches can help determine the role a wetland plays in its environment and the importance of its protection. A desire for improved wetland assessment methods has resulted in the development of many rapid assessment approaches in the United States and around the world since 1990. A trend has developed among these methods where specific functions are not evaluated and a smaller number of indicators are used to evaluate functions. However, none of these methods is used on a widespread basis. The validity of wetland assessment methods is limited by several factors, including complex processes that support wetland function; lack of information about these processes; large variability among wetlands; many components of wetland value that must be accounted; and diversity of assessment objectives.



Three rapid functional wetland assessment methods were chosen to apply along the Deep Fork River. The methods chosen include the Wetland Evaluation Technique (WET), Hydrogeomorphic Approach (HGM), and A Rapid Procedure for Assessing Wetland Functional Capacity (RAP). One of the first methods to consider the range of wetland functions that could be assessed quickly, accurately, and consistently was WET. WET is a broad-based wetland assessment approach that is designed to gather information rapidly regarding wetland functions. Eleven functions and values are evaluated by WET according to social significance, functional capacity, or habitat suitability. The data obtained using WET can be used for comparative analysis of all wetlands in a region.

HGM is being developed by the U.S. Army Corps of Engineers under a National Action Plan to perform wetland functional assessments across the country. HGM is a collection of concepts and methods used to develop functional indices that could be used to assess the capacity of a wetland to perform functions compared to other wetlands in the same regional class. HGM attempts to increase the accuracy of assessments, allow for reproducibility, and reduce the time required to perform an assessment. HGM is based on three factors that influence wetland function: position in the landscape, water source, and the dynamics of water once in the wetland. HGM differs from other assessments in that it classifies wetlands based on their different functions, it defines functions that each class performs, and it uses reference wetlands to develop a range of wetland functions. Wetlands assessed with HGM can only be compared with other wetlands in the same regional class. Also, HGM does not provide information regarding social significance or specific species, which may be important for regulations. Additionally, HGM requires a team of experts and requires much time during the development phase.

RAP was developed on the principles of HGM classification and the concept of functional capacity. Geomorphology and hydrology were the primary factors used to determine the physical, chemical, and biological characteristics of wetlands for this method. Thirty-three landscape, hydrologic, soil, and vegetation variables are assessed to determine the functional capacity of eight different wetland functions. However, unlike HGM, RAP does not require the use of reference wetlands and quantitative measurements in order to develop a model for assessment. HGM requires more time and money to establish reference wetlands for each wetland subclass, therefore, the RAP was developed for rapid functional assessment when time and cost factors prohibit establishing reference wetlands.

Currently, an assessment method has not been selected to be used in Lincoln County. The adoption of an accepted assessment method by the state may be necessary before one is used on a widespread basis.

Mapping

More government agencies, consultants, and others are using Geographic Information Systems (GIS) and computer-based hydrologic models to assist the analysis of water regimes, the mapping of wetlands (where digital data is available), the assessment of the functions and values of wetlands, and the design of projects including assessment of

alternative designs. Such systems are proving useful as more digital data becomes available and the costs of data storage and analysis are reduced. However, there are financial and other limits to accuracy and types of ecosystem and hydrologic data typically available for GIS analysis. GIS analysis must therefore be combined with some measure of continued on-site data gathering and analysis.

An inventory of watershed resources of the Deep Fork Watershed was the first request of the working group. GIS technology was used as the best way to show the spatial relationship and inter-relationship of the inventoried resources. Those items inventoried included land use, hydric soils, surface waters, hydrologic drainage patterns, subwatershed boundaries, flood control structures, Wetland Reserve Program sites, Partners for Wildlife Program sites, and designated wetlands from the National Wetlands Inventory.

Maps prepared with GIS technology were the primary planning tools. Organizing and manipulating data, which was then used as a visual tool, proved to be beneficial. In addition to information, the maps served as a catalyst for individual landowners to discuss issues as a watershed community rather than individually.

Education

The importance of education can sometimes be overlooked when developing a wetlands management plan. You may have a very good management plan, but if the people using it and the people that will be affected by it are not educated about the plan, success will be difficult to achieve.



The future of Lincoln County's wetland resources is closely tied to land use decisions made by stewards of those resources. Culturally, wetlands are important aspects of Lincoln County's history as well as its future. However, messages sent to Oklahoma's youth are sometimes mixed because of the colorful relationship between property rights issues and state and national attempts at conservation and protection of wetland resources.

Local, state, and federal agencies as well as individuals have been working diligently to educate the public regarding wetlands. One way to encourage sound resource management in the future is to provide educational opportunities for the youth of the county and the state. Wetland outdoor classrooms and educational training can provide the opportunity for a better understanding of wetland science, functions, and values which will ultimately lead to a more harmonious resolution of wetland issues.

Research and experience have shown that outdoor learning centers are an effective tool to educate both youth and adults. Currently, through conservation districts, school systems, and the US Fish and Wildlife Service, over 60 of those classrooms in Oklahoma include wetland components.

In addition to wetland outdoor classrooms, Lincoln County has several avenues to further public education. For instance, public education and outreach will be accomplished through publication of quarterly newsletters, news articles with any of the five county and two tribal newspapers, dissemination of information at public events, and other special outreach activities. Also, a product from the Lincoln County workgroup was the publication of the *Wetland Resource Management Guide for Lincoln County Landowners*, which is intended for distribution to those who make decisions that affect wetland resources, including current and potential landowners. Lincoln County's location between Oklahoma's two major metropolitan areas attracts many investors with hunting and other recreational interests. This publication will be provided to realtors, investment groups, hunting clubs, recreational organizations, and other such entities in order to reach potential landowners and/or land users.

Creation of Future Plans

Creating a future "vision" for a wetland management plan is valuable for group focus and development of goals and future projects. This future "vision" should include goals for the watershed and plans to attain them. These plans will lay the groundwork for proper wetland management in the future. This section of the plan will need to be amenable to revision and update in order to keep pace with new projects and ideas.

The GIS maps that were prepared for Lincoln County were used to determine priority areas for wetland protection and restoration. By using the different GIS components, such as soils, land-use, wetland location, and proximity within the watershed, group members could determine important areas for protection and possible areas for restoration.

The LCCD and local NRCS field office staff will continue to prepare conservation plans according to NRCS standards and specifications, state technical committee recommendations and program objectives and guidelines. This wetland management plan will be used as an additional tool to assist in more comprehensive watershed planning efforts. These conservation plans will be key to the widespread implementation of the wetland and watershed management plan.

In addition, there is a proposition to hold a public forum with the intent to gauge interest and feasibility of establishing a Deep Fork special project area for WRP. By making the Deep Fork a special project area, it would allow landowners to enroll eligible areas into the program with greater ease. Regardless of whether or not the Deep Fork becomes a special project area, the work with the WRP will continue in the county while developing projects on a watershed basis.

The USFWS will also continue to pursue wetland restoration and enhancement through their Partners for Wildlife program. By consulting the wetlands management plan, future project design considerations will be based on a watershed level.

Youth education will continue to focus on wetland resources. Local teachers, school administrators, and students are very passionate about this type of innovative, hands-on learning. It has become a fundamental part of school curriculum and earned notoriety among the students. The LCCD has been pleased with the success of this program and guidance it is offering to the future stewards of our wetland resources. The addition of wetland educational tools and supplies will enhance these efforts.

Public outreach efforts will continue to address wetland protection priorities through public information, education, and other conventional methods, including promotion and distribution of the *Wetland Resource Management Guide for Lincoln County Landowners*. Also, there are plans to sponsor, with cooperating agencies, a workshop and exposition bringing together landowners, technical experts, wetland resource related vendors, and others for an information exchange exposition.

Implementation

This is a very important part of the management plan process. You may have the best wetland and watershed management plan ever created, but if it is not used its benefits will not be attained. This is where the key players and programs are put into action. The wetland management plan should be used as a “focal point” for initial planning and strategy development for any future wetland or watershed project designed to address problems within a watershed.

The wetland watershed management plan should be developed as a dynamic document that can be revised, when necessary, to incorporate the latest information, address new strategies, and define new partnerships between watershed shareholders following this

initial management plan. Also, it should be understood that the wetland goals set forth in this management plan, as well as the technical approach to address the goals, may not be comprehensive and it may be necessary to revise or expand them in the future.

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