

**Oklahoma's Wetland Program Plan  
2013-2018**



**Prepared by:  
The Oklahoma Conservation Commission and  
The Oklahoma Wetland Technical Work Group**

## INTRODUCTION

The Oklahoma Wetlands Program (OWP) was formally created in 1990 when the Oklahoma Legislature directed the Oklahoma Conservation Commission (OCC) to prepare a wetlands management strategy. While OCC was appointed the lead agency in wetland planning and strategy development, the OWP, since its inception, has represented a collaborative effort among partner agencies and organizations through the Oklahoma Wetland Workgroup (OWWG). While Oklahoma has not formally adopted a wetland definition, the definition included in the original Oklahoma Comprehensive Wetland Conservation Plan will serve the purpose of this document. Therefore, we define wetlands according to the United States Army Corps of Engineers (USACE) and United State Environmental Protection Agency (USEPA) joint definition.

“Those areas that are inundated or saturated by surface or ground water 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.” (Federal Register 1980, 1982)

With assistance from the OWWG and financial aid from US Environmental Protection Agency (USEPA) wetland program development grants, Oklahoma’s Comprehensive Wetland’s Conservation Plan (OCWCP) was published in 1996 (OCC 1996). The OCWCP set the foundation for the Oklahoma Wetland Program by outlining 12 programmatic objectives and associated action items. This report updates the original objectives from the OCWCP based on the results and outcomes of wetland projects completed over the last 16 years as well as the 2008 framework for wetland program plan (WPP) development published by the USEPA (USEPA 2008). To provide initial guidance for updating the OCWCP, the Oklahoma Wetland Technical Work Group (OWTWG) published a letter report in the summer of 2012, summarizing all previous wetland activities within the state and providing recommendations for future directions to meet programmatic objectives (OCC 2012). For this WPP, the OWTWG has taken the recommendations from the letter report and distilled them into actions and activities that fall under the core elements for a wetland program outlined by the USEPA. The core elements include **(1) Monitoring and Assessment, (2) Regulation, (3) Voluntary Restoration and Protection, and (4) Water Quality Standards**. Though not one of the core elements outlined by the USEPA, the OWTWG agreed that a fifth element of Education and Outreach was essential to the success of the wetlands program. While the objectives of the OCWCP have been updated and reorganized for this document, the goal of the wetlands program remains the same: **To conserve, enhance, and restore the quantity, quality, and biological diversity of all wetlands in the state**. The letter report is presented in Appendix A for background on the relationship between the original 12 objectives from the OCWCP and the new structure of core elements, actions and activities in this Wetland Program Plan.

The purpose of Oklahoma’s Wetland Program Plan is to guide and focus wetland related activities within the state to ensure that programmatic goals are met. This document is organized into five sections for each of the four USEPA core elements and the additional element of Education and Outreach. For each of the five elements, the OWTWG has identified an overall

objective and specific activities nested within broad based actions designed to advance programmatic objectives and goals. The timeframe for the completion of the included activities is six years beginning in January 2013 and ending in December 2018. Oklahoma's WPP should be considered a "living document" subject to revision as a result of funding constraints and as the knowledge base concerning wetlands in the state expands.

## MONITORING AND ASSESSMENT

Monitoring and assessment are crucial components of a successful wetland program. “Monitoring is the systematic observation and recording of current and changing conditions, while assessment is the use of that data to evaluate and appraise wetlands to support decision making and planning processes” (USEPA 2008; pp 1). Well rounded monitoring and assessment programs can appraise the health of waterbodies (including wetlands) at multiple scales, from system to entire watersheds. Such efforts provide foundational data that informs the development of the other core elements. Within the regulatory framework, wetland assessment can be used to identify and track the success of mitigation projects for Clean Water Act (CWA)§404 projects. In the context of systematic and random monitoring programs, assessment can identify high quality wetlands for protection and low quality sites in need of restoration and enhancement. Finally monitoring and assessment efforts are crucial to development of reasonable and appropriate water quality standards and, in turn, to determine if the standards are being met (USEPA 2008).

In Oklahoma, there is currently no formal monitoring and assessment program for wetlands. However, over the last five years a great deal of work has been done to better characterize the wetland resources throughout the state. Hydrogeomorphic (HGM) classification systems and HGM based wetland inventories have been developed for wetlands based on system hydrology and geomorphology for the Cross Timbers and Central Great Plains Ecoregions of Oklahoma (Brinson 1993, Dvoretz et al. 2012). These data serve as the foundation to identify appropriate monitoring and assessment strategies. The objective of this WPP for monitoring and assessment is to: **Develop a sensible monitoring and assessment strategy to serve as the foundation for tracking local and statewide trends in wetland health and extent, prioritizing and tracking restoration activities, and guiding compensatory mitigation projects.** For this WPP, we identified four key actions to meet this objective:

1. Complete Hydrogeomorphic (HGM) classification and functional characterization to further understanding of the distribution and functions of wetlands in Oklahoma.
2. Develop an assessment tool that can be used to identify unique and pristine wetlands for protection and degraded wetlands for restoration as well as estimate wetland functions for guiding and tracking wetland compensatory mitigation.
3. Develop remote tools to expand tracking general trends in wetland loss, gain and health.
4. Develop a preliminary monitoring strategy utilizing field and remote assessment tools.

A table of activities that will be completed to achieve these actions are listed below. The OCC will be the lead agency for the completion of these actions. However, to successfully complete many of these activities will require financial assistance from USEPA wetland program development grants and other sources and technical support from partner universities and agencies through the OWTWG.

<b>Action 1: Complete HGM classification and functional characterization</b>						
Activity	2013	2014	2015	2016	2017	2018
1: Complete HGM subclass development and functional characterization for wetlands in the Arkansas Valley, Central Irregular Plains and South Central Plains.	x	x				
2: Create functional profiles for playa wetlands through coordination with the regional wetland management entities (Playa Lakes Joint Venture, Rainwater Basin Joint Venture, Texas Parks and Wildlife Department, etc.) and HGM characterization in the field.	x	x				
3: Integrate previously developed HGM subclassifications for Oklahoma Ecoregions into a statewide dichotomous key for HGM wetland classification with field indicators and functional descriptions of each subclass.			x			
<b>Action 2: Develop a modular field-based assessment tool</b>						
Activity	2013	2014	2015	2016	2017	2018
1: Conduct a review of methodologies from surrounding states for assessing wetland condition and function.	x					
2: Conduct a literature review of landscape and local stressors that impact wetland structure, processes and biota.	x					
3: Convene the Oklahoma Wetland Technical Work Group (OWTWG) to develop a list of potential biotic, structural, hydrologic and landscape assessment metrics for inclusion in condition and functional assessments based on previous empirical data collection within the state, literature review and field observations.	x					
4: Calibrate potential assessment metrics to landscape and local stressors based on field assessments at sites ranging from highly degraded to "pristine" at surface-water depressions.	x	x	x			
5: Develop draft condition assessment tools and draft functional assessment tools for oxbow wetlands and surface-water depressions. Validate and refine the methods' ability to assess condition and function through application of the tools in the field.			x	x	X	

6: Assess the effectiveness of the condition and functional assessment methods on two additional wetland subclasses within the state and refine methods as necessary.					X	x
<b>Action 3: Develop remote assessment tools.</b>						
<b>Activity</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>
1: Convene the OWTWG to identify areas within the state with high concentrations of wetlands, areas where wetlands are at risk of loss or degradation, and areas where National Wetlands Inventory (NWI) maps are inaccurate. Develop a priority "wetland area" list for remapping efforts within the state.		x				
2: Map the top two highest priority "wetland areas" complying with Federal Geographic Data Committee (FGDC) standards.			x	x		
<b>Action 4: Advance the wetland monitoring program</b>						
<b>Activity</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>
1: Develop a wetland monitoring strategy identifying how assessment tools as well as fixed and probabilistic monitoring efforts will be utilized to track trends in wetland health and extent.			x	x		
2: Conduct probabilistic monitoring to track gains/losses in the two highest priority "wetland areas" and one randomly selected HUC 8 watershed according to the US Fish and Wildlife Service (USFWS) publication "Technical procedures for conducting status and trends of the Nation's wetlands."				x	X	

## REGULATION

Wetland regulatory programs are generally built around the Clean Water Act (CWA) §404 and §401. The broad goal of the CWA is to “restore and maintain the physical, chemical and biological integrity of the Nation’s waters” (USEPA 2008; pp 2). Sections 404 and 401 help to meet this goal by requiring avoidance, minimization and compensation for impacts of the discharge of dredge or fill into waters of the U.S (USEPA 2008). States can have varying degrees of responsibility for regulatory actions. While some states administer the §401 water quality certification program, two have also assumed responsibility for §404 permitting programs as well (USEPA 2008). In Oklahoma, the United States Army Corps of Engineers (USACE) administers the CWA §404 program and the Oklahoma Department of Environmental Quality (DEQ) administers the §401 water quality certification program. Where activities such as draining or filling of wetlands are conducted to make possible the production of an agricultural commodity for USDA program participants, the Natural Resource Conservation Service (NRCS) is responsible for wetland determinations and delineations for compliance with the Food Security Act of 1985 (USDA 2005). The objective for the regulation core element for this WPP is to: **Promote greater understanding of the scope of the program in wetlands.** In order to more clearly define the scope of the wetland regulatory program in Oklahoma, three actions have been identified for this WPP.

1. Provide input for the revisions to the USACE Tulsa District Mitigation and Monitoring Guidelines
2. Develop guidelines for the creation/maintenance of stormwater detention and wastewater treatment wetlands.
3. Advance wetland mitigation banking in the state.

The Tulsa District Mitigation and Monitoring Guidelines are designed to improve predictability of mitigation requirements for permit applicants and to increase the likelihood of success of the mitigation plan (USACE 2004). The OWTWG will provide comments on the forthcoming revisions to the Mitigation and Monitoring Guidelines to further improve clarity and consistency in the §404 process within Oklahoma. When wetland mitigation is required under §404, wetland mitigation banks are the preferred method (EPA 40 CFR 230; USACE 33 CFR 332). Mitigation banks are permanently protected lands that are being restored or enhanced for biological diversity and a variety of ecosystem functions. Once established, the bank is assigned a value in credits by federal and state agencies which can then be sold to permit applicants as wetland mitigation. Action 3 will advance wetland mitigation banking in the state through literature reviews and by identifying potential locations for mitigation bank creation.

A table of activities that will be completed to achieve these actions are listed below. The OCC will be the lead agency for this core element. However, to successfully complete these activities will require technical assistance from the USACE, DEQ and the entire OWTWG.

<b>Action 1: Provide input for the revisions to the US Army Corps of Engineers (USACE) Tulsa District Mitigation and Monitoring Guidelines.</b>						
Activity	2013	2014	2015	2016	2017	2018
1: Convene the OWTWG to review the revisions to the USACE Tulsa District Mitigation and Monitoring guidelines and provide comments. (timing depends on the completion of the revisions)						
<b>Action 2: Develop guidelines for creation/maintenance of stormwater detention and wastewater treatment wetlands.</b>						
Activity	2013	2014	2015	2016	2017	2018
1: Conduct literature review of guidance for stormwater detention and wastewater treatment wetlands.		x				
2: Convene OWTWG to draft a guidance document for stormwater detention and wastewater treatment wetlands.			x	x		
<b>Action 3: Advance wetland mitigation banking in the state.</b>						
Activity	2013	2014	2015	2016	2017	2018
1: Conduct literature review on wetland mitigation in surrounding states.		x				
2: Identify priority areas for the creation of wetland mitigation banks by reviewing locations of Clean Water Act (CWA)§404 permits and coordinating with the entities most in need of wetland mitigation sites.			x	x		
3: Apply the "restorable wetland identification method" in areas of high mitigation need to identify any large restorable areas suitable for mitigation banking.					x	x



## VOLUNTARY RESTORATION AND PROTECTION

Wetland restoration is defined as “the manipulation of a former or degraded wetland’s physical, chemical, or biological characteristics to return to its natural functions” (USEPA 2008; pp 1). Protection is defined as “removing a threat or preventing the decline of wetland conditions” (USEPA 2008; pp 1). *Voluntary* restoration and protection refers to all restoration and protection activities that are not legally required such as conservation easements, changes to conservation practices, land trusts or invasive species removal (USEPA 2008). Voluntary restoration and protection play crucial roles in meeting the state wetland program’s goal: to conserve, enhance, and restore the quantity, quality, and biological diversity of all wetlands in the state. Restoration and protection are particularly important because close to 67% of Oklahoma’s wetland acres were lost to development between 1780 and 1980 (Dahl 1990). Several state and federal agencies as well as NGOs have active restoration and protection programs in Oklahoma. To date, a major source of wetland acquisition, protection and restoration in the state has been through the USFWS refuge acquisition program and through ODWC wetland development units and wildlife management areas. The Natural Resource Conservation Service (NRCS) wetland reserve program (WRP) has also restored and protected over 61,000 acres of wetlands and surrounding uplands since 1996 through permanent or 30 year easements. Because there are already numerous wetland restoration and protection programs in existence, a primary focus is to integrate these activities within the state to improve the effectiveness in restoring wetland functions and biological diversity to the landscape. Integration is also essential to provide landowners with a clear list of options for wetland restoration on their property. Wetland restoration and protection can also be improved in the state by integrating these programs with CWA §319 non-point source management programs. Wetlands can be restored to promote reduction in non-point source pollution to receiving waterbodies. As a result, 319 grant monies can be used both to improve water-quality and restore wetlands to the landscape. The objective for this WPP for voluntary restoration and protection is to: **Clearly and consistently establish integrative wetland restoration, enhancement, creation, and protection goals.** In order to meet this objective, the OWTWG identified two action items.

1. Integrate federal, state, and non-governmental organization (NGO) wetland restoration, enhancement, creation and protection (RECP) programs, promote wetland RECP, and develop informational tools for land-users.
2. Integrate wetland RECP with watershed based approaches.

A table of activities that will be completed to achieve these actions are listed below. The OCC will be the lead agency for this core element. However, to successfully complete these activities will require financial assistance from USEPA wetland program development grants and technical assistance from partners at the OWTWG.

**Action 1: Integrate federal, state, and non-governmental organization (NGO) wetland restoration, enhancement, creation and protection (RECP) programs, promote wetland RECP, and develop informational tools for land-users.**

Activity	2013	2014	2015	2016	2017	2018
1: Develop a RECP strategy document that identifies current priorities, how future priorities should be established, and the roles of federal, state, and NGO programs in wetland RECP within the state.		x				
2: Develop a web application/guidance for land-owners and land-users to evaluate wetland restoration, protection, creation and enhancement options.			x			
3: Promote the wetland registry to landowners with restorable wetlands and land-users in need of restoration locations. The wetland registry is a tool that was created to connect those in need of restoration opportunities with owners of restorable wetlands.	x	x	x	x	x	x
4: Develop a use-guidance tool for wetland land-owners and land-users. This tool will provide information regarding what types of activities are appropriate and legal within and surrounding jurisdictional and non-jurisdictional wetlands.				x	x	x

**Action 2: Integrate wetland RECP with watershed based approaches.**

Activity	2013	2014	2015	2016	2017	2018
1: Develop a "restorable wetland identification method" that identifies and prioritizes potential restoration sites using GIS mapping, spatial modeling, landowner outreach, and field verification.	x					
2: Apply the "restorable wetland identification method" to identify and prioritize restoration sites within priority watersheds for which Oklahoma Conservation Commission (OCC) watershed plans have been or are being developed.	x	x				
3: Create a restorable wetland database based on the application of the "restorable wetland identification method" to priority watersheds.		x				

## WATER QUALITY STANDARDS

Water quality standards “define the goals for a water body by designating its highest attainable uses, setting criteria that reflect the current and evolving body of scientific information to protect those uses, and establishing provisions to protect water bodies from further degradation” (USEPA 2008; pp 1). Because wetlands are unique relative to other surface water bodies, default standards are often not relevant (USEPA 2008). The USEPA recommends five key steps for the development of water quality standards for wetlands: “(1) define wetlands as “state waters”, (2) designate uses that protect the structure and function of wetlands, (3) adopt narrative criteria and appropriate numeric criteria in the standards to protect the designated uses (4) adopt narrative biological criteria in the standards, and (5) extend the antidegradation policy and implementation methods” (USEPA 1990). Currently Oklahoma does not have wetland specific water quality standards; instead, default criteria for warm water streams apply. The objective for this WPP for water quality standards is to: **Develop wetland-specific water quality standards.** In order to meet the stated objective, the OWTWG identified three action items:

1. Develop the role of water quality standards and how they could be applied.
2. Advance the development of criteria specific to wetlands.
3. Identify appropriate mechanisms for listing impaired wetlands.

A table of activities that will be completed to achieve these actions are listed below. The Oklahoma Water Resources Board (OWRB) will be the lead agency for Actions 1 and 2 of this core element. The OCC will be the lead agency for Action 3. However, these activities will require technical assistance from the DEQ and all partners at the OWTWG.

<b>Action 1: Develop the role of water quality standards and how they could be applied.</b>						
Activity	2013	2014	2015	2016	2017	2018
1: Convene the OWTWG to discuss the role of water quality standards within the state and general implementation.	x					
<b>Action 2: Advance the development of criteria specific to wetlands.</b>						
Activity	2013	2014	2015	2016	2017	2018
1: Conduct literature review on narrative criteria developed in the surrounding states.	x					
2: Develop and propose wetland-specific water quality standards. The OWRB will work with the Wetlands Working Group, EPA Region 6, and stakeholders to: a) Provide a specific definition for wetlands, which are currently considered “waters of the state”, b) Designate uses that protect the structure and function of wetlands, c) Adopt narrative criteria and appropriate numeric criteria in the standards to protect designated uses, d) Adopt narrative biological criteria in the standards, and e) Extend the antidegradation		x				

policy and implementation methods.						
<b>Action 3: Identify appropriate mechanisms for listing impaired wetlands.</b>						
<b>Activity</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>
1: Convene the OWTWG to identify appropriate mechanisms for listing impaired wetlands and how lists will be reported and stored.		x	x			

## EDUCATION AND OUTREACH

While education and outreach is not among the core elements defined by the USEPA, the OWTWG believe that dissemination of wetland related information, guidance and tools to Oklahomans is an essential aspect of a successful wetland program. The objective of education and outreach for this WPP is to: **Provide landowners, land-users and land-managers with the necessary information to manage wetland resources and provide the general public with information regarding the importance of wetlands.** In order to meet the programmatic objective, the OWTWG identified one action item:

1. Improve the availability of wetland information to landowners, land-users, land-managers and the general public.

This action item will be achieved through several activities including creating a wetland program website where all wetland related information, tools, reports and data can be disseminated. Among the information available on the website, will be an application that allows land-users to identify solutions to wetland specific issues such as invasive species management and water quality improvement. Trainings and educational programs will also be provided to land managers regarding new developments in wetland assessment, monitoring and management in the state.

A table of activities that will be completed to achieve this action are listed below. The OCC will be the lead agency for this core element. However, these activities will require technical assistance from partners at the OWTWG.

<b>Action 1: Improve the availability of wetland information to landowners, land-users, land-managers and the general public.</b>						
Activity	2013	2014	2015	2016	2017	2018
1: Create a wetland program website for the dissemination of all relevant state wetland information, reports, tools and data to other wetland managers and the general public.	x					
2: Maintain the wetland program website by adding new project information, project reports, wetland tools and relevant data.		x	x	x	x	x
3: Continue ongoing wetland education efforts for youth, parents and teachers.	x	x	x	x	x	x
4: Create an educational program for land managers as an avenue to disseminate new information regarding the wetland program and provide trainings on the proper usage of assessment methods and tools.				x	x	x
5: Develop a web application that allows landowners, land-users and land-managers to identify solutions to wetland specific issues					x	x

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APPENDIX A: Letter Report on the Status for all Wetland Activities in Oklahoma



Development of a Wetland Program Plan for the State of Oklahoma  
Oklahoma's FY 2011 §104(b)(3) Wetlands Program CD-00F299-01, Project 1  
**Letter Report on the Status for all Wetland Activities in Oklahoma**

**Introduction**

In 1990 the Oklahoma Conservation Commission (OCC) was directed by the Oklahoma Legislature to develop a wetlands management strategy for the state. In the same year, the Environmental Protection Agency (EPA) provided OCC funding to create Oklahoma's Comprehensive Wetland Conservation Plan (OCWCP). The OCWCP, completed in 1996, laid out Oklahoma's goals for its wetland program to, "conserve, enhance, and restore the quantity, quality, and biological diversity of all wetlands in the state". To achieve these goals, the OCWCP identified 12 objectives, each of which was further subdivided into actions (Appendix A). These 12 objectives are not directly analogous to the four core elements of a state wetland program outlined by the EPA (monitoring and assessment, regulation, voluntary restoration and protection, and water quality standards). However, meeting the objectives set forth in the OCWCP would ensure a state plan that adheres to the framework recommended by the EPA.

The OCC and its federal, state, tribal, and university partners have undertaken numerous wetland projects designed to directly address the state's wetland objectives or have helped meet objectives through everyday programmatic activities. While the OCC is responsible for preparing the state wetland strategy, the partner agencies conduct essential wetland research, restoration, protection, and regulatory activities, through which objectives can be attained. Furthermore, partners provide direction and guidance for the state wetlands program through the Oklahoma Wetland Technical Working Group (OWTWG). Because wetland expertise is dispersed throughout agencies, tribes, and universities, the OWTWG provides important functions in the dissemination of information and the development of a cohesive wetland program. The purposes of this letter report are to (1) summarize how Oklahoma's completed and ongoing wetland projects have helped meet the 12 objectives of the OCWCP, and (2) identify future directions needed to meet the objectives. Each objective will be discussed below in the context of the wetland projects conducted during the 16 years since the completion of the OCWCP.

**OCWCP Objectives, Progress and Future Directions**

**Objective 1:** *To promote the coordination of wetlands management in Oklahoma through discussion, information exchange, cooperation, and the sharing of resources.*

**Progress:** Development of the OWTWG



**Future Directions:** Hold more frequent OWTWG meetings and complete a WPP

This objective has largely been met through the creation of the OWTWG in 1998, which was scheduled to meet quarterly (OSE 1995). However, meetings have been less frequent than planned. It is a priority of the OCC to maintain more frequent meetings moving forward to ensure that Oklahoma's wetland plan advances and objectives are achieved. This letter report is the first step in the development of an updated wetland program plan (WPP) to be implemented over the 3-6 years following completion. Regular OWTWG meetings will be essential for the creation of a WPP with broad interagency support and adherence to EPA's four core element framework. These meetings should convene quarterly or at a minimum semi-annually, depending upon the current needs of the program. Meetings will address specific action items and agendas will be provided to OWTWG members prior to convening. Meeting minutes will be recorded by OCC and provided to all OWTWG members following meetings. In order to accommodate the schedules of OWTWG members, some meetings may utilize remote meeting technology (e.g. webinars).

**Objective 2:** *To establish a net gain wetlands policy for state-owned lands and a no net loss policy on state funded projects to encourage the restoration, enhancement, and creation of wetlands.*

**Progress:** Digitization of NWI maps, Pilot study tracking the loss and gain of wetlands in the Deep Fork Watershed, Creation of the Wetlands Registry to help identify mitigation bank sites, Approval of USACE mitigation bank area near Chandler, OK.

**Future Directions:** Pursue a state policy on wetland no net-loss, Develop a probabilistic monitoring program to track wetland gain and loss using the Deep Fork pilot study as a guideline, Promote the Wetlands Registry, Revise the Tulsa District USACE Mitigation Guidelines

Some progress has been made toward achieving this objective, but there is currently not an integrated policy for wetland net gain/no net loss. There has been no gubernatorial executive order or state legislation regarding no net loss. However, the USACE and DEQ are carrying out no net loss actions by requiring mitigation for wetlands lost or impacted by development. USACE and DEQ are in the process of updating the 2004 Mitigation Guidelines for the Tulsa District and are requesting coordination with the OWTWG. The OCWCP called for the inclusion of a "wetland component on all resource management plans for state owned land and state run projects", "a system to coordinate, review, and monitor the impacts of state funded actions on wetlands", and "an overall monitoring program for wetland gains and losses". While the former two actions have largely been unmet, significant steps have been made toward the development of a monitoring program for gains and losses. The OCC and Oklahoma Water Resources Board (OWRB) collaborated to digitize National Wetland Inventory (NWI) maps (OCC-OWRB 2008). Digital maps were completed in 2010 and made publicly available through

the USFWS Wetlands Mapper. Furthermore, OCC and OWRB conducted a pilot study to track the loss and gain of wetlands in the Deep Fork Watershed (OCC-OWRB 2010). The protocol developed for the Deep Fork Watershed should be integrated into a probabilistic monitoring program to track gains and losses of wetlands throughout Oklahoma. The OCWCP also called for the development of a "state wetlands mitigation bank". To meet this action, the OCC created the Oklahoma Wetlands Registry to help identify potential mitigation bank sites. However, few sites have been listed on the Wetlands Registry. Future work should be done to promote the wetland registry and coordinate with agencies in need of mitigation sites to make the tool functional. The Army Corps of Engineers (USACE) Tulsa District has also approved a mitigation area near Chandler, OK.

**Objective 3:** *To integrate wetlands management with other related resource issues on a watershed or hydrologic unit basis.*

**Progress:** Wetland restoration demonstration projects completed within a watershed context

**Future Directions:** Develop a framework for the systematic integration of wetland management and restoration with watershed based restoration.

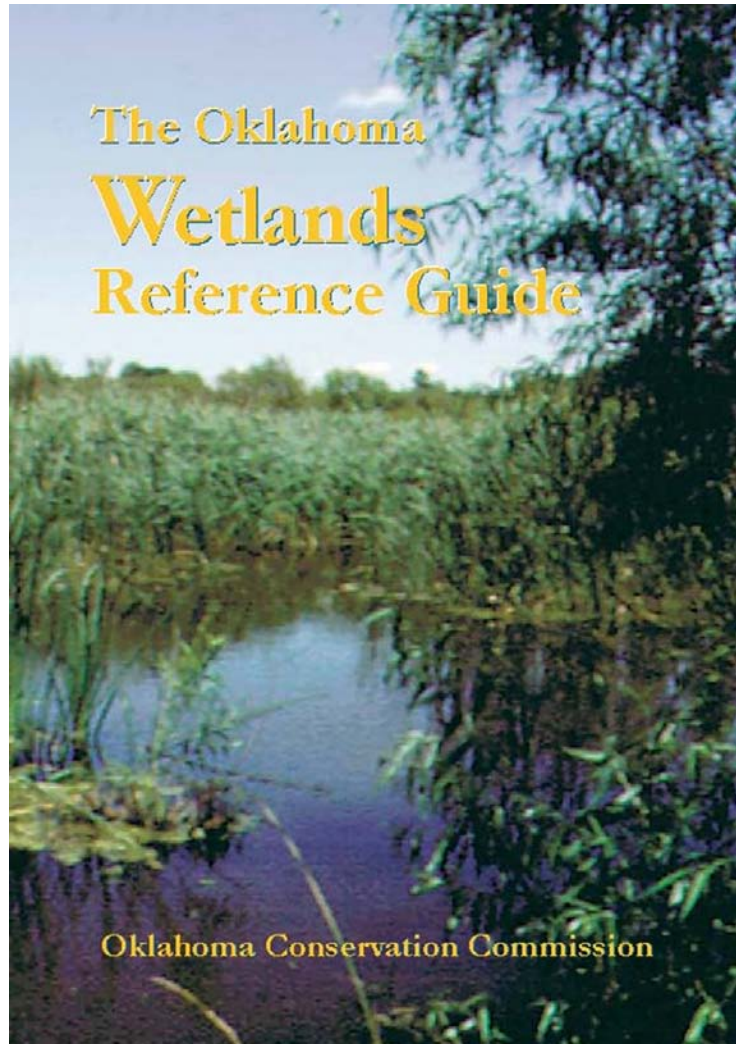
There is currently not a systematic approach for the integration of wetland management into a watershed context, and the State Watershed Management Committee has not yet been created. However, the state has undertaken several demonstration wetland restorations in the broader context of watershed restorations. These projects have been completed in the Little Washita River (OCC 1993a), Salt Creek (OCC 1993b), Willow Creek (OCC 1993c), North Fork Creek (OCC 2008) and Brookhaven Creek watersheds (OCC/Watershed Restoration Inc. 2011). The Brookhaven Creek project included emergent wetland and riparian restoration projects aimed at creating habitat and improving water quality in the creek. This project also incorporated extensive education and outreach including the creation of an outdoor classroom at Morgan Park. These demonstration projects are a first step in informing the public about the importance of wetlands in improving water quality within a watershed. Moving forward, the state needs to develop a framework for how these wetland restorations can be incorporated into future watershed based projects. Integrating wetland management and restoration with the §319 nonpoint source pollution program is one potential avenue for including wetlands within a watershed context. The OCC has obtained fy 2013 104(b)(3) funding to commence work toward this goal. The Natural Resource Conservation Service (NRCS) upstream flood control program is another potential watershed based avenue for wetland management.

**Objective 4:** *To characterize the wetlands resource more completely and identify critical functions of the major types of Oklahoma wetlands.*

**Progress:** Completion of Oklahoma Reference Wetland Guide, HGM classification and functional characterization in several ecoregions, Identification of sources of natural variability in wetland biota and structure

**Future Directions:** Complete HGM classification and functional characterization for the remaining ecoregions, Develop wetland classification tools, Continue to advance wetland assessment methods that account for natural variability, Digitally re-map high priority wetland areas

Significant progress has been made to meet this objective. The Oklahoma Reference Wetlands Guide was the first step in identifying the types of wetland resources within Oklahoma (OCC 2000). Over the course of the last 3 years, Oklahoma State University (OSU), OCC, and OWRB have conducted hydrogeomorphic (HGM) classification and functional characterization of wetlands in the Cross Timbers and Central Great Plains Ecoregions (Dvoretz et al. 2010). Classification and functional characterization is ongoing in the Ouachita Mountains Ecoregion (OSU 2008) and commencing in the Arkansas Valley, Central Irregular Plains, and South Central Plains Ecoregions (OSU 2011). These projects have also included the identification of a population of wetlands within each HGM class. Currently, OCC and OSU are in the process of collecting data from statewide reference wetlands for several of the most dominant HGM wetland subclasses (OSU 2010). The aforementioned ecoregions represent the majority of Oklahoma's area. Classification and characterization have not yet been scheduled for the remaining ecoregions (Southwestern Tablelands, High Plains, Flint Hills, Ozark Highlands, and East Central Texas Plains). Priorities should be the completion of classification and characterization, the integration of data from all ecoregions, and the publication of tools for wetland classification within the state.



Characterization of functions for wetland HGM classes was based on rapid field visits and previously documented characterizations of classes in HGM procedural documents and regional guidebooks. This is an important step in the process of developing a monitoring and assessment program for wetlands. However, it will be necessary to quantify the level of

functionality or condition of wetlands using more empirically driven methods to not only characterize the State's wetlands but to meet many of the other objectives in the OCWCP. Wetland assessment is necessary to prioritize wetland acquisition, protection, and restoration (Objectives 8 and 9) as well as create functional wetland restorations on state lands (Objective 2), in a watershed context (Objective 3), on private land (Objective 6), for floodplain management (Objective 10), or for mitigation (Objective 12). Furthermore, assessment methods are needed to both derive water quality standards and determine if wetlands are meeting those standards (Objective 5). Because of the relationship of wetland assessment to almost all of the objectives outlined in the OCWCP, it can be considered one of the most essential aspects of creating a successful state wetland program moving forward.

The state and its partners have conducted multiple projects to develop wetland assessment tools. These projects have met with significant difficulties due to the variability in assessment metrics among wetlands even within the same HGM class. OCC and OSU collaborated to quantify sources of variability in biotic and abiotic measures in closed depressional wetlands (Bidwell et al. 2007). Both temporal and spatial variability impacted the assessment metrics. Season and wetland were significant controls on abiotic factors while season, wetland, and within wetland habitat significantly affected biotic assemblages. This variability needs to be incorporated into assessment methods to ensure that measurements are related to the function or condition of the wetland and not natural temporal or spatial variability. OCC and OSU evaluated the possibility of developing a biotic based assessment for depressional wetlands for the Iowa Tribe (Bidwell et al. 2006). Similar issues made relating metrics with disturbance difficult due to seasonal variability and poor association between disturbance scores and abiotic metrics. However, some macroinvertebrate and avian metrics might be appropriate for use within wetland assessment protocols. Assessment measures based on plant community were not found to respond well to disturbance measures. Attempts to develop HGM functional assessment methods for riverine wetlands met with the same issues (Dvoretz et al. 2010). Most HGM assessment metrics were not well correlated with landscape disturbance rendering any potential assessments based on those metrics unable to accurately determine wetland health. The inability of these two projects to develop strong relationships between wetland structure and biota with disturbance could also be due to the selection of sites without significant variability in disturbance regime.

OWRB, OSU, and OCC are currently involved in a three phased project aimed at progressing the development of wetland assessment techniques (OWRB 2010a, 2010b, 2012a). This project will attempt to solve the issues related to natural variability for oxbow wetlands and interdunal depressional wetlands of the Cimarron River. The goal is to have a preliminary assessment method that can then be applied and subsequently altered for additional HGM wetland classes. The Oklahoma Biological Survey (OBS) and the OCC are also currently working on developing a Floristic Quality Assessment (FQA) method for wetlands (OCC

2010). FQAs involve the assignment of Coefficients of Conservatism (CC) to each plant related to how likely it is to grow in high quality habitat. CCs are then aggregated into a Floristic Quality Index (FQI) which represents the quality of the wetland habitat. Additionally, OCC recently aided the EPA in the National Wetland Condition Assessment (NWCA), collecting data from 12 wetlands statewide. Analysis of NWCA data may provide insight into the development of state assessment tools.

An additional action for this objective was to remap the wetlands within the state by county in collaboration with the NRCS. However, the NRCS recommended that this action item not be pursued due to privacy issues. Because NWI maps are old and now often inaccurate, remapping should still be pursued through other channels. Focused remapping efforts should be conducted in wetland complexes as well as areas where NWI is highly inaccurate such as ephemeral wetlands and palustrine forested wetlands. Remapping of interdunal depressional wetlands along the Cimarron River will commence in 2012. Other priority wetland mapping areas include interdunal wetlands along the Salt Fork of the Arkansas River, palustrine forested wetlands along river corridors in eastern Oklahoma, and playas. These mapping efforts should be conducted in accordance with Federal Geographic Data Committee standards and made available to the public upon completion.

**Objective 5:** *To adopt a classification system and water quality standards to identify and protect wetland functions and values.*

**Progress:** HGM classification in several ecoregions

**Future Directions:** Develop an integrated approach to combine wetland classification efforts with wetland assessment methods and wetland water quality standards development

Development of water quality standards for wetlands is a difficult process due to the inherent variability between wetlands and even among habitats within a wetland. Projects have proposed wetland water quality standards for Oklahoma but to date none have resulted in adoption of wetland specific narrative or numeric criteria. No wetlands specific classification has been adopted in Oklahoma Water Quality Standards; however, the OWRB developed a set of beneficial uses for 17 wetlands throughout the state (OWRB 2007). Currently, the OWRB is working towards developing wetland water quality standards with cooperation from the OWTWG (OWRB 2012b).

Oklahoma has spent considerable time and energy to develop an HGM based classification and subclassification system (see Objective 4) that may serve as a basis for wetlands biological assessments. HGM classification is intuitive and based on the characteristics that drive wetland function (geomorphology and hydrology). As a result, HGM classification should be continued for all ecoregions in Oklahoma.



**Objective 6:** *To provide technical assistance and other initiatives to landowners implementing management practices that conserve, enhance, and restore wetlands on private property.*

**Progress:** Trainings for wetland resource managers, Educational outreach to landowners

**Future Directions:** Continue trainings and educational outreach, Promote the NRCS WRP program on the OCC website, Explore the feasibility for a state incentive program for wetland management

This objective deals with training federal, state, and local resource managers to help landowners understand wetland issues on their property, offer information directly to landowners, and to explore options for state programmatic assistance to landowners in the form of conservation/restoration incentives. The OCC and partner agencies have offered trainings on fluvial geomorphology, wetland delineation, and the California Rapid Assessment Method (CRAM) for wetlands. These trainings should continue to be offered at regular intervals so that resource managers are able

to provide assistance to landowners. Several projects have also been conducted to reach out directly to landowners, including a seminar series for watershed stakeholder partners (OSE 2000) and community outreach for wetland management (ODAFF 2001). The OCC also produced a fold-up poster distributed to



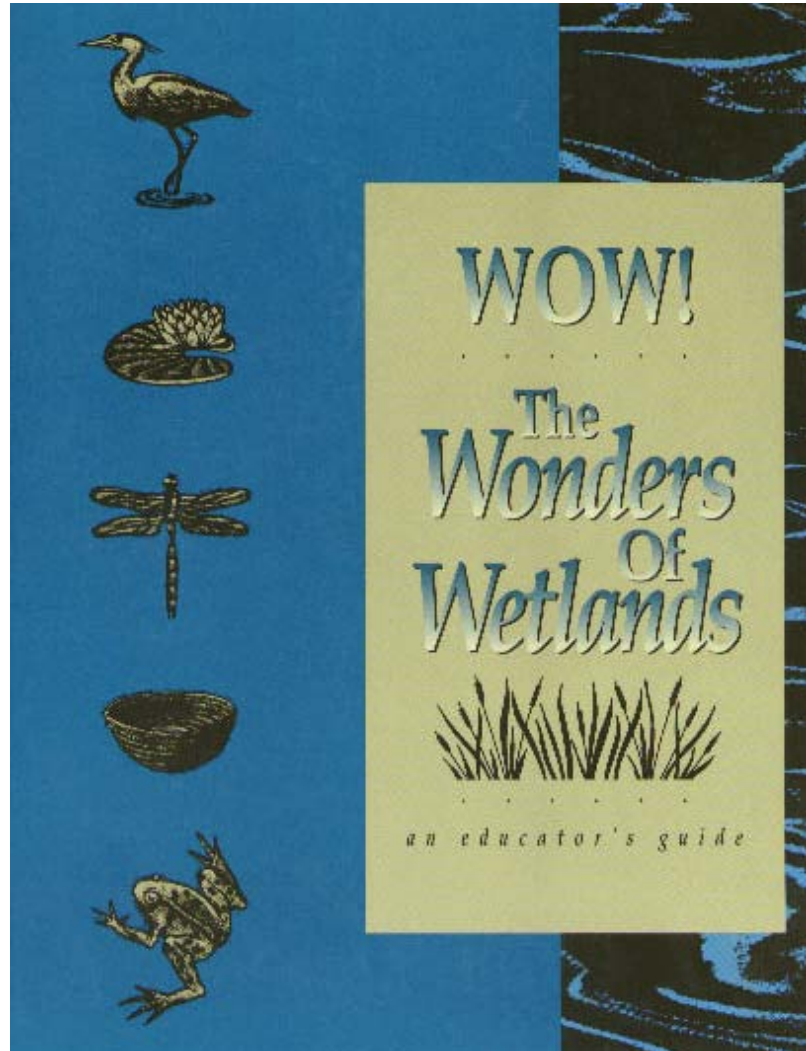
landowners regarding wetland functions and values. The NRCS, Oklahoma Department of Wildlife Conservation (ODWC), Fish and Wildlife Service (FWS) and USACE also engage in landowner outreach to improve wetland awareness. Currently, the NRCS Wetland Reserve Program (WRP) has purchased easements on more than 60,000 acres of wetlands and associated buffers within Oklahoma. This program offers landowners payments and/or cost share options to enroll and restore wetlands. The FWS Partners for Fish and Wildlife Program, as well as the ODWC Wildlife Habitat Improvement Program also offers private landowners cost share assistance to create, restore, and enhance existing wetlands on private lands. The state should explore additional opportunities for providing incentives for landowners with restorable or existing wetlands on their property.

**Objective 7:** *To develop information/education programs on Oklahoma's wetlands resources.*

**Progress:** Publication of educational material for wetlands, Wetland workshops through Oklahoma Project WET program, Creation of outdoor classrooms

**Future Directions:** Continue conducting wetland workshops, Continue developing outdoor classrooms, Develop volunteer wetland monitoring program, Disseminate wetland publications through the OCC website

OCC and partners have undertaken numerous projects to educate the public on the importance of wetlands including production of educational materials and the creation of outdoor classrooms. The teacher packet "Your Guide to Oklahoma's Wetland Treasures" was updated in 2000 and included a student booklet titled "Oklahoma Wetlands: Wet, Wild and Wonderful" available on the OCC website. Since 1996, over 30 workshops using the Wonders of Wetlands (WOW) curriculum have been offered. These workshops have been conducted through the Oklahoma Project WET program, for which the OCC became an official sponsor in 1995 (cosponsored by ODEQ and OWRB). Several outdoor classrooms also have been created in the cities of Chandler (OCC 2008a) and Norman (OCC 2008b). The USFWS has 132 outdoor classrooms completed or under development in Oklahoma. Many of these outdoor classrooms focus on wetlands. Additional funding is available for future outdoor classrooms through partnerships with USFWS. The OWRB developed and implemented a pilot





program for volunteer monitoring of wetlands. However, this program is not currently active. The creation of a volunteer monitoring program should be a priority moving forward. Dissemination of wetland information through the OCC website should also be made a priority. Currently three wetland documents are available through the OCC website. All wetland publications and deliverables including those funded through federal §104(b)(3) money should be made available for public download.

**Objective 8:** *To identify and prioritize unique or scarce wetland types and sites for acquisition or special protection.*

**Progress:** Online wetland and aquatic plant manual, Inventory of riparian wetlands in southwestern Oklahoma, Identification of ecologically significant wetlands in north-central and northwestern Oklahoma, Inventory of wetlands in the Cross Timbers and Central Great Plains

**Future Directions:** Continue inventory of wetlands in other ecoregions, Explore new partnerships for the acquisition of future unique wetlands.

Identification of unique and scarce wetlands has been advanced by the Oklahoma Biological Survey's identification of ecologically significant wetlands in north-central and northwestern Oklahoma (OBS 1997), development of an online wetland and aquatic plant manual (OBS 1998), and an inventory of riparian and wetland areas in southwestern Oklahoma (OBS 1999). Furthermore, the recent collaboration between OSU and OCC to classify wetlands and characterize functions has led to insights into the types and relative abundances of wetlands throughout the state (Dvoretz et al.

2010). A rough inventory of the number of wetlands was created for each HGM subclass in the Cross Timbers and Central Great Plains Ecoregions. This type of inventory data will be generated for additional ecoregions including the Ouachita Mountains, Arkansas Valley, Central Irregular Plains, and South Central Plains. The data generated by OBS, OSU, and OCC should be synthesized to produce a list of priority wetland



types for acquisition, protection and restoration. To date, a major source of wetland acquisition in the state has been through the FWS refuge acquisition program and through the ODWC. Both are funded through federal and state duck stamp monies generated through duck hunting activities. Furthermore, lists of priority wetland restoration could help to identify and inform compensatory mitigation under Section 404 of the Clean Water Act through coordination with



the USACE. Additional partnerships/funding sources however are needed to acquire additional unique and scarce wetlands within the state.

**Objective 9:** *To identify wetland sites for restoration and enhancement; identify and develop funding sources to accomplish this work.*

**Progress:** Partnering with Conservation Districts (CCDs) to restore Teal Ridge, Kingfisher Creek wetlands, and Battle Creek riparian wetlands

**Future Directions:** Develop restoration priorities and work with current and potential partners to fund critical wetland projects

There were several mechanisms for identifying sites for restoration and enhancement outlined in the OCWCP. Partnering with local conservation districts represents a potential avenue for coordinating restoration projects. The Teal Ridge wetland in Stillwater was created through a partnership with the Payne County Conservation District (CCD). OCC also partnered with Lincoln CCD (OCC 1999) and Delaware CCD (OCC 1998a) for wetland restorations. Based on the data generated to identify scarce and unique wetlands (Objective 8), the OCC should generate a list of restoration priorities. The OWTWG should seek to achieve these priorities through current and potential funding sources. Multi-agency collaboration will be necessary to ensure that the most critical wetland resources are protected and restored. The US Fish and Wildlife Service (USFWS) Partners for Wildlife Program and the WRP program are also potential pathways for wetland restoration and enhancement. Compensatory mitigation under Section 404 of the Clean Water Act may serve as a means for funding restoration. Coordination between the USACE and the OWTWG may aid in the selection of compensatory mitigation sites that meet both permit requirements and state priorities. OCC should explore additional partnerships with other organizations such as the Nature Conservancy to develop funding sources to restore and enhance wetlands within the state.

**Objective 10:** *To integrate wetlands conservation with Oklahoma's floodplain management program and create more wetland/urban riparian areas.*

**Progress:** Riparian restoration projects on creeks and reservoirs, CREP and CRP program restoration accomplishments

**Future Directions:** Integrate riparian restoration into floodplain management programs

Many projects have been undertaken to enhance, create and restore riparian areas. These projects include riparian corridor restorations on East Roaring Creek (OCC 1992a), Illinois River (OCC 1992b), and North Fork Creek (OCC 2008b). The Brookhaven Creek (OCC/Watershed Restoration Inc. 2011) project was a successful riparian restoration in an urban setting. OWRB also conducted riparian and emergent plantings in two Oklahoma reservoirs, Stanley Draper (OWRB 2011) and Lake Atoka (OWRB 2009). Moving forward, focus should be placed on integrating riparian restorations into broader floodplain management programs, watershed plans

or existing riparian restoration programs to ensure restorations improve ecosystem functioning (e.g. flood abatement, or water quality improvement). Oklahoma has partnered with NRCS on the Conservation Reserve Enhancement Program (CREP) and Conservation Reserve Program (CRP) to restore riparian zones as well as create filter strips and wetland buffers. In the Spavinaw Lake and Illinois River/Tenkiller Lake watersheds the USDA has allocated 20.6 million dollars to CREP to restore 8,500 acres of riparian zones and 500 acres of filter strips. Oklahoma will provide NRCS with technical support to help identify appropriate locations for CREP restoration acreage. Additionally, Oklahoma currently has over 800,000 acres of land enrolled in the CRP program. The Oklahoma Floodplain Managers Association (OFMA) also represents a potential partner for integrating wetland restoration with floodplain management.

**Objective 11:** *To establish a comprehensive statewide wetlands mapping program.*

**Progress:** Digitization of NWI and Soil Survey

**Future Directions:** Development of statewide georeferenced wetland inventory managed by the OCC

This objective has largely been met through the digitization of the NWI maps and NRCS soil survey maps, which include hydric soil designations. These data are available through the USFWS Wetland Mapper and the NRCS Soil Survey Geographic Database (SSURGO) respectively. Future work should be focused on the development of a statewide geo-referenced wetland inventory managed by the OCC.

**Objective 12:** *Research and develop techniques for protecting, enhancing, and constructing wetlands for pollutant control and/or mitigation. Developed techniques will be implemented to maximize beneficial uses of wetlands pollutant removal and mitigation capabilities.*

**Progress:** Wetland restoration projects aimed at water quality improvement/pollutant treatment

**Future Directions:** Develop functional wetland assessment tools for use in mitigation

Several treatment wetland projects have been completed including the Gowen treatment wetlands for acid mine drainage (OCC-AML 1995) and Teal Ridge Wetland (OCC 1998b). Furthermore, wetland restoration has been integrated into several watershed based planning projects for water quality improvement on the Deep Fork (OCC 1998c) and on Kingfisher Creek (OCC 1999). Moving forward, focus should be placed on developing tools to streamline the selection, design, and monitoring of wetland mitigation projects. Functional assessment tools are needed to determine the functional capacity of wetlands lost to development and monitor those created through mitigation. The design of these functional tools will need to be a collaborative effort between state agencies, the USACE, and local universities.

## Conclusions

The OWTWG ranked the 12 objectives in the OCWCP for the Seven Year Strategy (Table 1 below) in 2004. The state and its partners have made great strides in meeting the top three priority objectives, landowner technical assistance (Objective 6), coordination (Objective 1), and education (Objective 7). These efforts should continue to be a priority and can be advanced through regular OWTWG meetings, continuing to develop solid partnerships, trainings, workshops, and dissemination of digital information. Furthermore, a great deal of work has been done to advance the characterization of wetlands (Objective 4) and wetland mapping is largely completed (Objective 11). Wetland characterization should continue for all the remaining ecoregions of Oklahoma. Future efforts for the wetland program should focus on the "Future Directions" listed for each objective. More specifically, the four main areas listed below will help to meet the remaining objectives and actions of the OCWCP:

- (1) Develop assessment tools that can be utilized for identifying unique wetlands, prioritizing restoration, and tracking restoration success for mitigation projects and treatment wetlands.
- (2) Create a probabilistic monitoring program to track the net loss or gain of wetlands as well as trends in wetland health using remote and field assessment tools.
- (3) Integrate state wetland management into existing programs, watershed based plans, and floodplain management programs.
- (4) Develop scientifically defensible water quality standards for wetlands.

**Table 1: Rankings for the 12 Objectives from the OCWCP**

Objective	Rank 1-12
Objective 1	2
Objective 2	11
Objective 3	6
Objective 4	4
Objective 5	10
Objective 6	1
Objective 7	3
Objective 8	12
Objective 9	5
Objective 10	7
Objective 11	8
Objective 12	9

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- OBS (1998) "Development of an Aquatic and Wetland Plant Manual and Worldwide Web Site for Oklahoma" §104(b)(3) grant
- OBS (1999) "An Inventory of Riparian and Wetland Areas in Southwestern Oklahoma" §104(b)(3) grant
- OCC (1992a) "East Roaring Creek Riparian Corridor Restoration" §104(b)(3) grant
- OCC (1992b) "Illinois River Riparian Corridor Restoration" §104(b)(3) grant
- OCC (1993a) "Little Washita River Watershed Demonstration Project" §104(b)(3) grant
- OCC (1993b) "Salt Creek Watershed Restoration" §104(b)(3) grant
- OCC (1993c) "Willow Creek Watershed Restoration" §104(b)(3) grant
- OCC-AML (1995) "Red Oak and Gowen Treatment Wetlands for Acid Mine Drainage" §104(b)(3) grant
- OCC (1998a) "Riparian restoration on Battle Creek, Delaware County" §104(b)(3) grant
- OCC (1998b) "Teal Ridge Wetland in Stillwater" §104(b)(3) grant
- OCC (1998c) "Water based assessment and planning for wetlands in the sub-watersheds of the Deep Fork River in Lincoln County" §104(b)(3) grant
- OCC (1999) "Watershed-based planning and implementation for Kingfisher Creek" §104(b)(3) grant

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**APPENDIX A. Oklahoma’s state wetland program objectives from the Oklahoma Comprehensive Wetland Conservation Plan**

**Objective 1** To promote the coordination of wetlands management in Oklahoma through discussion, information exchange, cooperation, and the sharing of resources.

Actions	
1.1	Establish an Oklahoma Wetlands Technical Working Group led by the Office of the Secretary of Environment.
1.2	The Technical Working Group representatives
1.3	The Technical Working Group will serve in the role of coordinating and collecting technical data on the status of wetlands within Oklahoma.
1.4	Pursue and monitor the implementation of Oklahoma’s Comprehensive Wetlands Conservation Plan.

**Objective 2** To establish a net gain wetlands policy for state-owned lands and a no net loss policy on state funded projects to encourage the restoration, enhancement, and creation of wetlands.

Actions	
2.1	Promote by Governor’s executive order, legislation establishing a policy of “net-gain” of wetlands on state-owned land and a policy of “no-net-loss” of wetlands on any state-funded projects.
2.2	Promote the inclusion of a wetlands component on all resource management plans for state owned lands and state-funded projects, utilizing the Oklahoma Wetlands Technical Working Group.
2.3	Establish through the Oklahoma Wetlands Technical Working Group a system to coordinate, review, and monitor the impacts of state-funded actions on wetlands and establish an overall monitoring program for wetlands gains and losses in the state.
2.4	Utilize the Oklahoma Wetlands Technical Working Group to pursue the establishment of a state wetlands mitigation banking program (using the Oklahoma Department of Transportation’s current efforts as a demonstration).

**Objective 3** To integrate wetlands management with other related resource issues on a watershed or hydraulic unit basis.

<b>Actions</b>	
3.1	Encourage the state’s Watershed Management Committee to incorporate a wetlands component into the overall watershed management strategy for the state.
3.2	Encourage, through the Oklahoma Wetlands Technical Working Group, federal agencies to coordinate their wetlands management and program activities on a watershed or hydrologic unit basis.
3.3	Develop partnerships with the EPA, the Commission, and other agencies to carry out demonstration projects in three watersheds (Salt Creek, Little Washita, and Willow Creek) to show how wetlands conservation practices can be developed and implemented in a watershed context.
3.4	Encourage the NRCS to include wetlands restoration, enhancement, and creation in their implementation of the upstream flood control program (Public Law 566).

**Objective 4** To characterize the wetlands resource more completely and identify critical functions of the major type of Oklahoma wetlands.

<b>Actions</b>	
4.1	Seek state funding and/or personnel, through the Oklahoma Wetlands Technical Working Group, to assist the efforts of NRCS to re-map wetlands at the county level.
4.2	Encourage and provide funding to Oklahoma universities to prepare a literature review of research on Oklahoma wetland characteristics and critical functions.
4.3	Prepare technical characteristics and critical functions for each wetlands type in each ecoregion of the state. Included in this effort would be the development of criteria for and a listing of “reference” wetlands by wetland type and ecoregion. This would be a university project.



**Objective 5** To adopt a classification system and water quality standards to identify and protect wetland functions and values.

Actions	
5.1	The Oklahoma Wetlands Technical Working Group will review and refine the OWRB’s recommendation for the use of water quality standards in wetlands protection. Proposed changes in the water quality standards should be developed in time for the 1997/2000 revision of the Oklahoma Water Quality Standards.
5.2	Adopt a classification system for each wetland type and designate uses for each based on functions and values, utilizing the technical work group (described in 4.1 above).

**Objective 6** To provide technical assistance and other initiatives to landowners implementing management practices that conserve, enhance, and restore wetlands on private property.

Actions	
6.1	Establish, through the Oklahoma Wetlands Technical Working Group, a training program for federal, state, and local resource managers on how to provide landowners with technical assistance for restoration, enhancement, and creation of wetlands on private property.
6.2	Coordinate the state training program with the Corps to certify state and local personnel in wetlands delineation using the 1987 Corps of Engineers delineation manual.
6.3	Conduct wetlands management workshops for landowners, utilizing personnel from appropriate state and federal agencies. Workshops would be conducted on a regional basis.
6.4	Conservation district offices will be provided as a local point of contact for landowners to receive information about wetlands technical assistance.
6.5	Work with the NRCS and local conservation districts to incorporate a wetlands component in conservation or ecosystem based assistance plans with private landowners.
6.6	Coordinate, through the Oklahoma Wetlands Technical Working Group, a recognition/awards program for landowners undertaking excellent wetlands conservation projects.
6.7	Identify private organizations that provide technical assistance on wetlands restoration, enhancement, and creation, and coordinate their efforts with state and

	federal efforts.
6.8	Prepare pamphlets for landowners on wetlands regulations, functions and values of wetlands, and management practices for wetlands conservation.
6.9	Work with the NRCS National Plant Material Centers, the Forestry Division of OSDA, and other public and private agencies to develop and make plant materials available for use in restoring, enhancing, and creating wetlands.
6.10	Promote, through the Oklahoma Wetlands Technical Working Group, the USFWS Partners for Wildlife Program, the NRCS Wetlands Reserve Program, and other programs that provide incentives to landowners to restore, enhance, and create wetlands.
6.11	Explore state funding opportunities to establish a state wetlands reserve program and/or a cost share program to provide landowners with funds to restore, enhance, or create wetlands.
6.12	Initiate a study to examine the feasibility of granting tax incentives for landowners with designated wetlands on their property as a tool for conserving wetlands on private property.

**Objective 7** To develop information/education programs on Oklahoma’s wetlands resources.

	<b>Actions</b>
7.1	Prepare an informational video on Oklahoma wetlands issues and management in cooperation with USFWS, NRCS, the Commission, and the ODWC and distribute it statewide.
7.2	Develop a wetlands teacher guide to assist in teaching about Oklahoma’s wetlands resources.
7.3	Conduct workshops on Oklahoma’s wetlands resources for teachers, utilizing state and federal agency personnel.
7.4	Prepare a brochure on Oklahoma’s Partners for Wildlife Program (a private lands habitat improvement effort) in cooperation with the Commission, ODWC, OSU Cooperative Extension, NRCS, and Ducks Unlimited, Inc., and distribute it statewide.
7.5	Develop “wetlands treasure trunks” (resource materials) for use by teachers and for use at natural resource days and outdoor classrooms.

7.6	Coordinate the development of a wetlands video library through the Oklahoma Wetlands Technical Working Group.
7.7	Become an official sponsor of National Project WET (Water Education for Teachers) in Oklahoma that will provide water and wetlands related activity guides, workshops, and related materials to teachers and students.
7.8	Produce a wetlands video highlighting the state's wetlands resources and distribute it statewide.
7.9	Utilize the Oklahoma Environmental Education Coordinating Committee to pursue other opportunities for developing and distributing wetlands educational materials to teachers, students, and the general public.
7.10	Encourage communities where rapid growth may threaten wetlands functions to apply for a planning grant and assistance from EPA and the Corps in order to undertake a joint wetlands Advanced Identification Study (ADID) to guide future regulatory decisions. This effort would be promoted by the Oklahoma Wetlands Technical Working Group.
7.11	Conduct a public outreach effort, in cooperation with other agencies, to promote the implementation of the wetlands conservation management plan. The effort will identify barriers to the acceptance and implementation of the plan through public forums/town meetings.
7.12	Prepare a brochure/information sheet for urban planners, developers, and other members of the regulated community about wetlands regulations and information sources. This effort will be coordinated by the Oklahoma Wetlands Technical Working Group.
7.13	Prepare a brochure/information sheet on potential economic uses of wetlands on private lands. This effort will be coordinated by the Oklahoma Wetlands Technical Working Group.
7.14	Prepare a summary report for public distribution of Oklahoma's Comprehensive Wetlands Conservation Plan following EPA approval.
7.15	Develop and implement education materials on the uses and benefits of constructed wetlands.
7.16	Develop and implement a volunteer monitoring program for Oklahoma's wetland resources.

**Objective 8** To identify and prioritize unique or scarce wetland types and sites for acquisition or special protection.

<b>Actions</b>	
8.1	Coordinate a review and literature search of recent academic and agency research to compile a list of candidate sites to be investigated as unique or scarce wetlands. This effort will be coordinated by the Oklahoma Wetlands Technical Working Group.
8.2	Provide coordination of existing federal, state, and private wetlands acquisition programs and develop a state database to keep records of such acquisitions. This effort will be coordinated by the Oklahoma Wetlands Technical Working Group.
8.3	Continue state participation in acquisition programs through the North American Waterfowl Management Plan, as administered by ODWC.
8.4	Maintain updated information on wetland-dependent rare and endangered species through the Oklahoma Department of Wildlife Conservation, US Fish and Wildlife Service, and the Oklahoma Biological Survey (Oklahoma Natural Heritage Inventory), and on high quality or unique wetland plant communities through the Oklahoma Biological Survey (Oklahoma Natural Heritage Inventory). This information will be maintained in a digitized format on a geographic information system when applicable.
8.5	Explore funding sources with the legislature to acquire unique or scarce wetlands. This effort will be coordinated by the Oklahoma Wetlands Technical Working Group.

**Objective 9** To identify wetland sites for restoration and enhancement; identify and develop funding sources to accomplish this work.

<b>Actions</b>	
9.1	Conduct a review of the NRCS inventory of farmed and prior converted wetlands to identify potential wetlands sites for restoration. This action will be coordinated by the Oklahoma Wetlands Technical Working Group.
9.2	Utilize the network of local conservation districts to identify potential restoration or enhancement sites in their counties. This action will be coordinated by the Commission.
9.3	Continue to promote the USFWS Partners for Wildlife Program. USFWS will be the lead agency for this action.

9.4	Seek funding for USDA’s wetlands reserve program for the state. This action will be promoted by the Oklahoma Wetlands Technical Working Group.
9.5	Identify funding sources from related natural resource programs (i.e., nonpoint source management, floodplain management, upstream flood control) that could be used for wetlands restoration and enhancement. This action will be promoted by the Oklahoma Wetlands Technical Working Group.
9.6	Explore funding sources with the legislature to provide cost share funds for landowners. This action will be promoted by the Oklahoma Wetlands Technical Working Group.
9.7	Identify potential funding mechanisms such as the Consolidated Farm Services Agency and Agricultural Conservation Program.

**Objective 10** To integrate wetlands conservation with Oklahoma’s floodplain management program and create more wetland/urban riparian areas.

	Actions
10.1	Conduct two riparian restoration demonstration projects in cooperation with other agencies to identify workable techniques and opportunities and obstacles to future riparian restoration efforts.
10.2	Develop a state riparian policy, in cooperation with other agencies, to guide future efforts for riparian conservation, restoration, and enhancement.
10.3	Develop criteria for evaluating, conserving, restoring, and enhancing riparian areas on an ecoregion basis. This action will be undertaken as part of No. 2 above.
10.4	Develop a proposal to do a riparian restoration project along a 17-mile reach of the Washita River in Carter and Johnston Counties.
10.5	Conduct a riparian restoration and enhancement project in an urban watershed through a Section 319 Clean Water Act project.
10.6	Promote floodplain management as a method for conserving, enhancing, and restoring wetlands. This action will be coordinated by the ORWB.
10.7	Enhance the flood storage benefits of Oklahoma’s wetlands.

**Objective 11** To establish a comprehensive statewide wetlands mapping program.

	<b>Actions</b>
11.1	Adopt, through the Wetlands Technical Working Group, the U. S. Geological Survey's digital orthophoto quadrangle as the statewide basemap for wetlands inventory and database development. All wetlands delineations would be recorded on this map.
11.2	Request the state legislature to authorize the Oklahoma Conservation Commission to develop and maintain a statewide, geo-referenced wetland inventory. This action would be promoted by the Oklahoma Wetlands Technical Working Group.
11.3	Support and seek funding of the effort by Oklahoma State University to produce in a digital format the USFWS National Wetlands Inventory maps for Oklahoma. This action would be coordinated by the Oklahoma Wetlands Technical Working Group.
11.4	Convert Oklahoma's county soil surveys to a digital format for use in the identification and inventory of hydric soils. The NRCS would be the lead agency for this project with assistance from the Commission.
11.5	Transfer the county level NRCS wetland inventory to a digital format for inclusion in a statewide wetland database. The Oklahoma Wetlands Technical Working Group will identify funding sources among state and federal agencies for this project.

**Objective 12** Research and develop techniques for protecting, enhancing, and constructing wetlands for pollutant control and/or mitigation. Developed techniques will be implemented to maximize beneficial uses of wetlands pollutant removal and mitigation capabilities.

<b>Actions</b>	
12.1	Conduct a literature review to determine the use of wetlands, natural and constructed, in control of pollutants.
12.2	Develop protocols for wetland enhancement, protection, and/or construction, including furnishing engineering services to aid in the design and construction of wetlands.
12.3	Develop constructed or enhanced wetlands to control nutrients, toxins, sediment, and erosion impacts to waterbodies.
12.4	Water quality enhancement and biological productivity will be monitored for enhanced/constructed wetlands.
12.5	Develop Wetland Management Plans, on a watershed basis if necessary, to ensure proper maintenance and use of wetland for pollutant control and/or mitigation.