

**Oklahoma's Wetland Program Plan
2020-2025**



**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).

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. In 2011 the Oklahoma Wetland Technical Workgroup (OWTWG) began the process of updating the OCWCP, which culminated in 2013 with the publication of Oklahoma's first Wetland Program Plan (WPP; OCC and OWTWG 2013). WPP development involved converting the objectives from the OCWCP into the core elements framework established in 2008 (USEPA 2008), and identifying future directions to meet programmatic needs. 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 and was added to the WPP. While the objectives of the OCWCP were updated and reorganized for the 2013 WPP, the goal of the wetlands program remained the same: **To conserve, enhance, and restore the quantity, quality, and biological diversity of all wetlands in the state.**

WPP documents are typically designed to guide programmatic strategies and activities for five to six years. As such, Oklahoma's 2013 WPP expired at the end of 2018. The OWTWG was reconvened in 2019 to update the state's wetland strategy document. This updated WPP will serve as a guidance document for the OWP from 2020-2025, and provide an outline of planned wetland related activities within the state. Like the previous WPP, this document is organized into five sections for each of the four USEPA core elements and the additional element of Education and Outreach. Through a series of meetings the OWTWG reviewed progress in each of the core elements since 2013, and discussed the necessary next steps to advance Oklahoma's Wetlands Program. Working collaboratively with partners through the OWTWG to create this WPP was a critical step towards the development a functional strategy document that captures the diverse interests and jurisdiction of wetland managers in Oklahoma. The OWP's overarching goal and the objectives for each core element continue to remain the same. However, the actions and activities outlined for each core element have been revised to account for completed projects and renewed strategic planning among partners. Furthermore, while Oklahoma has not adopted a formal definition for wetlands, the federal wetland definition applied to the 2013 WPP will be carried forward for this document:

“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)

The timeframe for the completion of the included activities is six years beginning in January 2020 and ending in December 2025. 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, development of improved capabilities to characterize, monitor and assess the wetland resource was a primary focus of the previous WPP. During the last 10 years much 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 (Brinson 1993) for the Cross Timbers, Central Great Plains (Dvoretz et al. 2012; Dvoretz et al. 2010), Ouachita Mountains (Davis et al. 2012), Arkansas Valley, Central Irregular Plains and South Central Plains Ecoregions (Walters et al. 2015) of Oklahoma. These data serve as the foundation to identify appropriate monitoring and assessment strategies. While HGM classification is primarily completed across the state, identification and compilation of reference wetlands in each wetland class was identified as an important action for this WPP. To date, a pool of reference sites have only specifically been identified and cataloged for oxbow wetlands (OWRB 2016). However, through the application of many statewide wetland assessment and planning projects, reference wetlands of other classes have been located (Gallaway et al. 2017; Walters et al 2015; Davis et al. 2012; Dvoretz et al. 2010; OCC 2000). Understanding the range and highest attainable condition of wetlands can be useful for setting restoration targets, establishing appropriate wetland-specific water quality standards, planning conservation efforts, and establishing baseline data for monitoring and assessment programs.

During the last six years, Oklahoma has made significant progress towards the development of a rapid condition-based wetland assessment method called Oklahoma Rapid Assessment Method (OKRAM). OKRAM is a qualitative assessment of anthropogenic stressors on wetland hydrology, biogeochemistry and biota (OWRB et al. 2015). OKRAM has been calibrated and validated at depressional wetlands across the state (Gallaway et al. 2019; Gallaway et al. 2017), and work is ongoing to tailor the method to additional common hydrogeomorphic wetland classes (e.g. riverine, lacustrine, etc.). Because of the potential applications of OKRAM in evaluating wetland health in the context of CWA programs, continued advancement of OKRAM remains a priority for the OWP. Additional work needs to be done to ensure OKRAM provides accurate results at all wetland classes and that the method is

interpretable by potential users. Future work planned for OKRAM is calibration and validation at remaining common wetland types to ensure method output is reflective of wetland condition. Additionally, development of detailed guidebooks and training programs are of critical importance, once methods are validated, so the method is accessible and interpretable by all potential end-users.

Maintenance of an accurate statewide wetland map remains of critical importance to the OWP. Wetland maps are used as a planning tool for a variety of applications including but not limited to, identifying potential impacts to wetlands for any project utilizing federal moneys, 404 impact screenings, NPDES permitting, and highway construction projects. Furthermore, the wetlands dataset used for the National Wetland Condition Assessment (NWCA) will be locked within the next seven years. This means updates to the National Wetlands Inventory (NWI) digital wetland map past that time will not be included in national assessments of wetland condition. During the last six years, the OWP has made it a priority to update wetland maps to improve map accuracy, utilizing improved mapping techniques (Dvoretz et al. 2016). NWI maps have been updated for over 1.7 million acres of Oklahoma in priority areas of high wetland density where map accuracy was in need of improvement (OCC 2015; OCC 2017). For this WPP, prioritization and completion of future mapping projects that utilize new mapping techniques was identified by the OWTWG as key to advancing monitoring and assessment in Oklahoma.

For this WPP, a new action will be added: "Coordinate and Collaborate with tribal partners". Collaboration will be pursued where state and tribal goals on wetland management overlap. This collaboration should lead to increased project success, as technical expertise is shared among partners. The OWTWG, by intent and design, is a coordination among partners in our state to advance our goal of conservation, enhancement, and restoration of wetland ecosystems. This action includes improved outreach between state and tribal partners and coordination on shared interests and management goals. In particular as part of any planned wetland projects, state partners should work to inform tribes with jurisdiction overlapping or adjacent to study boundaries. Improved coordination and communication should serve to enhance project outcomes through strengthening partnerships and avoiding duplication of effort.

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 five key actions to meet this objective:

1. Develop a modular field-based assessment tool that can be used to identify unique and pristine wetlands for protection and degraded wetlands for voluntary restoration as well as estimate wetland functions for guiding and tracking wetland mitigation following impacts to jurisdictional wetlands (as defined in the current rules and guidance for determining jurisdictional waters subject to the Clean Water Act applicable at the time).
2. Develop remote tools to improve wetland map accuracy

3. Develop a monitoring strategy utilizing field and remote assessment tools to expand/improve tracking general trends in wetland extent and condition.
4. Coordinate and collaborate with tribal partners.
5. Establish a pool of reference wetlands.

A table of activities that will be completed to achieve these actions are listed below.

Action 1: Develop modular field-based assessment tools that can be used to identify unique and pristine wetlands for protection and degraded wetlands for voluntary restoration as well as estimate wetland functions for guiding and tracking wetland mitigation following impacts to jurisdictional wetlands						
Activity	2020	2021	2022	2023	2024	2025
1: Develop a guidebook for OKRAM application at depressional wetlands.	x	x	x			
2: Create a training program to teach potential OKRAM users how to apply the assessment in the field at depressional wetlands.	x	x	x			
3: Create online training modules for OKRAM to teach potential users how to apply the assessment at depressional wetlands.	x	x	x			
4: Coordinate with United States Army Corps of Engineers to integrate the depressional OKRAM module into CWA programs.	x	x	x			
5: Calibrate and validate the Oklahoma Rapid Assessment Method (OKRAM) at riverine and lacustrine wetlands.	x	x	x	x		
6: Develop a guidebook for OKRAM application at riverine and lacustrine wetlands.				x	x	x
7: Create a training program to teach potential OKRAM users how to apply the assessment in the field at riverine and lacustrine wetlands.				x	x	x
8: Create online training modules for OKRAM to teach potential users how to apply the assessment at riverine and lacustrine wetlands.				x	x	x
9. Coordinate with United States Army Corps of Engineers to integrate the lacustrine and riverine OKRAM modules into CWA programs.						x
10. Develop a standard field assessment form that can be shared among partners as a rapid means of evaluating a sites potential for wetland restoration.	x	x				

Action 2: Develop remote assessment tools to improve wetland map accuracy.						
Activity	2020	2021	2022	2023	2024	2025
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 highest priority "wetland areas" complying with Federal Geographic Data Committee (FGDC) standards.	x	x	x	x	x	x
Action 3: Develop a monitoring strategy utilizing field and remote assessment tools to expand/improve tracking general trends in wetland extent, condition and function.						
Activity	2020	2021	2022	2023	2024	2025
1: Explore new techniques for quantifying the historic extent of wetland area, as well as measuring trends in gains/losses of wetland extent, functions and services.	x	x	x	x	x	x
2: Evaluate the availability and extent of digitized/geo-referenced historic aerial imagery across the state. Digitize and geo-reference historic aerial imagery in priority "wetland areas".	x	x				
3: Conduct monitoring to track gains/losses in priority 'wetland areas' according to the US Fish and Wildlife Service (USFWS) publication "Technical procedures for conducting status and trends of the Nation's wetlands."	x	x	x	x	x	x
4: Quantify the ecological services and functions provided by wetlands. Assess gains/losses in wetland functions and identify/quantify potential sources of ecosystem degradation and stress. Focus should be in priority 'wetland areas' but efforts may be extended statewide.	x	x	x	x	x	x
5. Develop a strategy and assessment tools to measure and track the impacts of wetland stressors that occur across broad spatial and temporal scales.	x	x	x	x	x	

Action 4: Coordinate and collaborate with tribal partners						
Activity	2020	2021	2022	2023	2024	2025
1: Improve outreach between state and tribal partners including presentations at tribal environmental conferences, and communication with tribal environmental programs. Develop a mechanism to inform tribal partners when state wetland projects have a geographic impact that overlaps tribal jurisdictions.	x	x	x	x	x	x
2: Collaborate on wetland projects where state and tribal priorities overlap.	x	x	x	x	x	x
Action 5. Establish a pool of reference wetlands						
Activity	2020	2021	2022	2023	2024	2025
1. Compile a list of reference sites that have been identified through previous wetland projects in the state.	x	x				
2. Develop a strategy for identifying reference sites for wetland classes where data gaps exist.			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, two actions have been identified for this WPP.

1. Provide input for the revisions to the USACE Tulsa District Mitigation and Monitoring Guidelines
2. Advance prioritization of high quality wetland mitigation

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.

In order for the state to meet its goal of conservation, enhancement and restoration of wetland quantity and quality, it is critical that wetland mitigation permitted through the Clean Water Act is of high quality. The action "Advance prioritization of high quality wetland mitigation" was included so the state can focus on developing resources that promote the restoration of highly functional wetland ecosystems. This action involves identifying areas of high mitigation need, promoting the wetland restoration opportunities identified through the restorable wetlands identification tool (RWIP) and exploring the possibility of state-led mitigation projects.

A table of activities that will be completed to achieve these actions are listed on the following page.

Action 1: Provide input for the revisions to the US Army Corps of Engineers (USACE) Tulsa District Mitigation and Monitoring Guidelines.						
Activity	2020	2021	2022	2023	2024	2025
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).						
Action 2: Advance prioritization of high quality wetland mitigation						
Activity	2020	2021	2022	2023	2024	2025
1: Identify areas with high demand for mitigation and market restoration opportunities within those areas to mitigation bank programs.	x	x				
2: Utilize the Wetland Registry to promote wetland restoration opportunities to those in need of mitigation. Promote opportunities that maximize the potential for gains in wetland functions and connectivity.	x	x	x	x	x	x
3: Explore possibilities for state led wetland mitigation efforts for impacts to wetlands resulting from government projects.	x	x	x	x	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 it has been estimated that 53% of the nation's wetlands and 67% of Oklahoma’s wetland acres were lost to development between 1780 and 1980 (Dahl 1990). In more recent times, the rate of wetland loss has been slowed due to effective implementation of restoration and protection programs in Oklahoma and across the country (Dahl 2011). However, the functional loss of these historic wetlands is significant. Additionally, while the estimated rate of nationwide loss during 2004 to 2009 was relatively small compared with historic trends (approximately 62,300 acres or 13,800 acres/year), the loss affected certain types of wetlands disproportionately; freshwater forested wetlands lost an estimated 633,000 acres (approximately 140,000 acres/year) during the same time period (Dahl 2011). Where the actions and activities outlined in the Monitoring and Assessment core element are critical towards identifying restoration priorities (i.e., wetland types, regions and functions), collaboration among voluntary restoration and protection programs are essential to implementing those priorities

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 easement program (WRE) has also restored and protected over 61,000 acres of wetlands and surrounding uplands since 1996 through 268 permanent or 30 year easements. The USFWS Partners for Fish and Wildlife (PFW) Program has also helped restore over 22,000 acres of wetlands in Oklahoma through technical and financial assistance to private landowners. 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.

During the implementation period for the previous WPP, the Oklahoma Wetland Program focused on developing tools that help identify potential wetland restoration opportunities. The Restorable Wetlands Identification Protocol (RWIP), a desktop screening-level method for locating potential wetland restoration sites based on soils, topography, hydrology and land-use was finalized in 2016 and then applied in several watersheds throughout the state (OCC 2016a). Once identified, potential wetland restoration sites can then be considered in a broader watershed context as they are ranked based on their potential to improve water quality. This provides the opportunity to link wetland restoration with other Clean Water Act programs such

as §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. Wetland restoration opportunities identified through RWIP can also be marketed to those in need of restoration through the Wetland Registry hosted on the Wetlands Program Website (OCC 2016b). Continued development of RWIP, integration of wetland restoration into watershed planning, and dissemination of wetland restoration opportunities remain priorities for this WPP. Sites identified through the RWIP protocol have the potential to be further ranked and prioritized to maximize improvements in other functions such as groundwater recharge, stream flow maintenance and flood attenuation. Exploration of desktop tools to rank potential wetland restoration sites by additional functions may help to prioritize restoration of wetlands that return an array of ecological services to the landscape. In particular, prioritizing restoration sites based on their potential to attenuate and store floodwaters, may reduce the impact of flooding to surrounding communities, and serve as a partnership opportunity with the Association of State Floodplain Managers (ASFM) .

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 and floodplain management programs.

A table of activities that will be completed to achieve these actions are listed on the following page.

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	2020	2021	2022	2023	2024	2025
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	x				
2. Develop a collection of guidance materials and an outreach program on integrating wetland restoration into urban and rural development for resource managers and developers. Create specific guidance on how to locate and design restoration projects to maximize functional uplift.	x	x				
3: Explore methods for improved desktop identification of potential wetland restoration, as a means to increase the accuracy of the Restorable Wetlands Identification Protocol (RWIP).	x	x	x			
4. Explore methods for ranking potential restoration sites based on other functions including but not limited to groundwater recharge, stream flow maintenance, and flood attenuation.	x	x	x	x	x	x
5: Improve marketing of wetland restoration opportunities through the Wetlands Program website, Wetlands Registry, and development of an online interactive map of potential historic wetlands.	x	x	x	x	x	x

Action 2: Integrate wetland RECP with watershed based approaches and floodplain management programs.

Activity	2020	2021	2022	2023	2024	2025
1: Develop strategies for including potential wetland restoration locations in watershed based plans as a management practice to improve water quality in priority watersheds.	x	x	x	x		
2. Coordinate with voluntary restoration and conservation programs to explore the potential to use wetland restoration as a best management practice to reduce the local and watershed level impacts of NPS pollution.	x	x	x	x		
3: Contact the Association of State Floodplain Managers (ASFM) and identify potential avenues for cooperating on wetland restoration/enhancement/creation/protection in floodplains.	x	x				

WATER QUALITY STANDARDS

Water quality standards (WQS) “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 waterbodies from further degradation” (USEPA 2008; pp 1). Because wetlands are unique relative to other surface waterbodies, default standards are often not suitable to protect wetlands (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 2020, USEPA 1990). Currently Oklahoma does not have wetland-specific water quality standards. Default beneficial use designations and associated criteria work to protect wetland waterbodies; the default beneficial uses are: Irrigation Agriculture, Aesthetics, Warm Water Aquatic Community, and Primary Body Contact Recreation (785:45-5-3(a)).

Between 2013 and 2015 the OWTWG developed draft Wetland WQS as outlined in Actions 1 and 2 in the table below. As part of Oklahoma’s permanent rulemaking process, the draft Wetland WQS were published in the Oklahoma Register in December 2014 and presented at an Oklahoma Water Resources Board (OWRB) public hearing in January 2015. However, in February 2015 consideration of the draft proposed Wetland WQS by the OWRB was indefinitely postponed. Thus, the default beneficial uses and associated criteria remain in place for Oklahoma’s wetland waters and for that reason the objective, actions and activities will remain in place for this WPP. 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.

Any effort to promulgate Water Quality Standards for wetlands will include the involvement of stakeholders. OCC will facilitate meetings of the Oklahoma Wetland Workgroup (OWWG) with all interested participants to ensure a transparent process. A table of activities that will be completed to achieve these actions are listed on the following page.

Action 1: Develop the role of water quality standards and how they could be applied.						
Activity	2020	2021	2022	2023	2024	2025
1: Convene the OWTWG to discuss the role of water quality standards within the state and general implementation.	x					
Action 2: Advance the development of criteria specific to wetlands.						
Activity	2020	2021	2022	2023	2024	2025
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 policy and implementation methods.		x				
Action 3: Identify appropriate mechanisms for listing impaired wetlands.						
Activity	2020	2021	2022	2023	2024	2025
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. Because education and outreach are not fundable aspects of a wetland program, these efforts often take a secondary role to mandatory programmatic deliverables. However, the OWTWG has recognized education as a crucial step towards improved wetland management in Oklahoma. Education enhances all the other core elements by demonstrating to the citizenry the important services that wetland provide, offering guidance on how to maximize those services, as well as presenting a rationale for the strategies and actions outlined in this document. The OWTWG identified collaboration among partners as a critical aspect of maintaining an active education and outreach program.

The objective of education and outreach for this WPP is to: **Provide landowners, land-users, resource-managers, and policy-makers 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 two action items:

1. Improve the availability of wetland information to landowners, land-users, resource-managers, policy-makers and the general public.
2. Integrate outreach among OWTWG partners to provide information to the public on the importance of wetland ecosystems and how they are managed.

A table of activities that will be completed to achieve this action are listed on the following page.

Action 1: Improve the availability of wetland information to landowners, land-users, resource-managers, policy-makers and the general public.						
Activity	2020	2021	2022	2023	2024	2025
1: Create an education subcommittee including personnel from OWTWG partners with the objective of developing educational material that advance programmatic goals.	x					
2: Develop education materials specifically tailored to target audiences including but not limited to floodplain managers and other resource managers, land-users, conservation districts, urban/city planners, policy-makers, children, and the general public.	x	x	x	x	x	x
3: Develop educational materials that summarize the purview and programmatic goals of the restoration opportunities available to Oklahomans.		x				
4: Develop educational materials that provide quantitative values to wetland ecosystem services and functions.			x			
5: Explore opportunities for funding of wetland education program development.	x					
6: Compile completed wetland publications, reports and data from OWTWG partners and ensure electronic access is available.	x	x				
7. Develop data visualization and utilization tools to promote data transferability and usage by a wider group of partners including the general public.	x	x	x	x	x	x
Action 2: Integrate outreach among OWTWG partners to provide information to the public on the importance of wetland ecosystems and how they are managed						
Activity	2020	2021	2022	2023	2024	2025
1: Create an information subcommittee including personnel from OWTWG partners with the objective of developing media/outreach strategies.	x					
2: Through collaboration among OWTWG partners develop and maintain a new wetland program website that can be used as a clearinghouse for state wetland resources, guidance, training materials, reference wetlands, and past project data/reports.		x	x	x	x	x
3: Develop a social media strategy and improve outreach to the public through social media.	x	x	x	x	x	x

LITERATURE CITED

- Brinson M (1993) Changes in the functioning of wetlands along environmental gradients. *Wetlands* 13:65-74.
- Compensatory Mitigation for Losses of Aquatic Resources, 40 CFR, pt. 230 and 33 CFR, pt. 332 (2008).
- Dahl, T.E. 2011. Status and trends of wetlands in the conterminous United States 2004-2009. U.S. Department of the Interior; Fish and Wildlife Service, Washington, D.C. 108pp.
- Dahl T, Wetland Losses in the United States 1780's to 1980's, USDI Fish and Wildlife Service, Washington D.C., 1990.
- Davis C, Bidwell J and Tibbits J (2012) Hydrogeomorphic Classification and Initial Functional Assessment of Wetlands in the Ouachita Mountains Ecoregion of Oklahoma: Final Report. FY 2008 104(b)(3) Wetlands Grant.
- Dvoretz D, Davis C, Papes M (2016) Mapping and hydrologic attribution of temporary wetlands using recurrent Landsat imagery. *Wetlands* 36:431-443.
- Dvoretz D, Bidwell J, Davis C, and DuBois C (2012) Developing a hydrogeomorphic wetland inventory: Reclassifying National Wetlands Inventory polygons in geographic information systems. *Wetlands* 32:83-93.
- Dvoretz D, Bidwell J, Davis C, and Dubois C (2010) An HGM Approach for Assessing Wetland Functions in Central Oklahoma: Hydrogeomorphic Classification and Functional Attributes. FY 2007 104(b)(3) CD-966618, Project 1.
- Gallaway S, Davis C, Dvoretz D, and Tramell B (2019) Evaluating the effectiveness of Floristic Quality Assessment as a tool for determining the condition of depressional wetlands across ecoregions. *Ecological Indicators* 102:488-496.
- Gallaway S, Davis C, Dvoretz D, and Tramell B (2017) Development and Validation of a Rapid Assessment Method for Determining Condition of Oklahoma Wetlands. FY 2014 104(b)(3) CD-00F74001, Project 1.
- Oklahoma Conservation Commission (2017) Using Wetland Mapping to Guide Restoration Decisions and Determine Wetland Trends: Final Report. FY 2015 104(b)(3) CD-01F10501, Project 2
- Oklahoma Conservation Commission (2016a) Method Development to Incorporate Wetland Resources in Watershed Planning Efforts in Oklahoma: Final Report. FY 2013 CD-00F56801, Project 1.
- Oklahoma Conservation Commission (2016b) Wetland Registry: Final Report. FY 2014

104(b)(3) CD-00F74001, Project 2.

Oklahoma Conservation Commission (2015) Interdunal Wetland Mapping: Final Report. FY 2011 104(b)(3) CD-00F299-01, Project 1

Oklahoma Conservation Commission and the Oklahoma Wetland Technical Work Group (2013) Oklahoma's Wetland Program Plan 2013-2018.

Oklahoma Conservation Commission. 2000. The Oklahoma Wetlands Reference Guide (James E. Henley and Mark S. Harrison, authors). Oklahoma Conservation Commission, Oklahoma City, Oklahoma.

Oklahoma Conservation Commission (1996) Oklahoma's Comprehensive Wetlands Conservation Strategy.
http://www.ok.gov/conservation/documents/OK_Comprehensive_Wetlands_Conservation_Plan.pdf

Oklahoma Water Resources Board (2016) Development of a Reference Condition Candidate Pool for the Oxbows of Oklahoma: Final Report. FY 2014 CD-00F740-01, Project 3.

Oklahoma Water Resources Board, Oklahoma Conservation Commission and Oklahoma State University (2015) Oxbow System Assessment and Protocol Development- Phase III: Final Report. FY 12 104(b)(3) CD-00F42801, Project 2.

United States Army Corps of Engineers, Tulsa District (2004) Aquatic Resource Mitigation and Monitoring Guidelines.<http://www.swt.usace.army.mil/permits/Documents%20-%20Mitigation/M&MG.pdf>

United States Department of Agriculture (2005) Guidance on conducting wetland determinations for the Food Security Act of 1985 and Section 404 of the Clean Water Act. Memorandum to the Field. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs143_007869.pdf

United States Environmental Protection Agency (2020) Templates for Developing Wetland Water Quality Standards. Retrieved From: <https://www.epa.gov/wqs-tech/templates-developing-wetland-water-quality-standards#temp1>

United States Environmental Protection Agency (2008) Core Elements of an Effective State and Tribal Wetlands Program.http://water.epa.gov/grants_funding/wetlands/upload/2009_03_10_wetlands_initiative_cef_full.pdf

United States Environmental Protection Agency (1990) Water Quality Standards for Wetlands: National Guidance.
http://water.epa.gov/scitech/swguidance/standards/upload/2002_06_11_standards_handbook_handbookappxD.pdf

Walters M, Davis C, Bidwell J, Dzialowski A, and Dvoretz, D (2015) Classification of Wetland Habitats in Oklahoma's Eastern Ecoregions. FY 2011 104(b)(3) CA# CD-00F29901, Project 2.