

# North Carolina's Wetland Program Plan 2015-2019

Submitted by:  
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Department of Environmental Quality  
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October 2015



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*Oct. 21, 2015*

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Funded by EPA Wetland Program Development Grant CD 95488411



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## LIST OF ABBREVIATIONS

Abbreviation	Description
APNEP	Albemarle-Pamlico National Estuary Partnership
BMP	Best Management Practice
C of C	Coefficient of Conservatism
CAMA	Coastal Area Management Act
CD #####	EPA Wetland Program Development Grant Number
CEF	Core Element Framework
CFR	Code of Federal Regulations
CVS	Carolina Vegetation Survey
CWA	Clean Water Act
ELI	Environmental Law Institute
EPA	Environmental Protection Agency
ESTP	Enhancing State and Tribal Programs Initiative
FEMA	Federal Emergency Management Agency
GIS	Geographic Information System
HUC	Hydrologic Unit Code
IBI	Index of Biological Integrity or Index of Biotic Integrity
IRT	Interagency Review Team
Level 1	Assess wetland condition: Landscape assessments relying entirely on GIS data
Level 2	Assess wetland condition: Rapid assessment using relatively simple metrics
Level 3	Assess wetland condition: Intensive site assessments using direct/detailed measurements
NC	North Carolina
NC-CREWS	North Carolina Coastal Region Evaluation of Wetland Significance
NC DCM	North Carolina Division of Coastal Management
NC DEMLR	Division of Energy, Mineral and Land Resources
NC DENR	North Carolina Department of Environment and Natural Resources
NC DEQ	North Carolina Department of Environmental Quality
NC DOT	North Carolina Department of Transportation
NC DMS	North Carolina Division of Mitigation Services (Formerly Ecosystem Enhancement Program)
NC DWQ	North Carolina Division of Water Quality
NC DWR	North Carolina Division of Water Resources
NC SAM	North Carolina Stream Assessment Method
NC WAM	North Carolina Wetland Assessment Method
NC WPP	Wetland Program Plan
NCAC	North Carolina Administrative Code
NCGS	North Carolina General Statutes
NEP	National Estuarine Program
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRCS-WRP	Natural Resources Conservation Service – Wetland Reserve Program
NWCA	National Wetland Condition Assessment
NWI	National Wetland Inventory
NWP	Nationwide Permit
ORAM	Ohio Rapid Assessment Method
PILT	Payments in lieu of taxes
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plans
REMAP	Regional Environmental Monitoring and Assessment Program
SEWWG	Southeast Wetlands Workgroup
SWITC	Surface Water Identification Training and Certification
SWL	Saltwater Wetlands
T&E	Threatened and Endangered
TMDL	Total Maximum Daily Load
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
UWL	Unique Wetlands
FWL	Freshwater Wetlands
WPDG	Wetland Program Development Grant
WPP	Wetland Program Plan
WRC	Wildlife Resources Commission (North Carolina)



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## **North Carolina's Wetland Program Plan**

**October 2015**

### **THE PURPOSE OF THE NORTH CAROLINA WETLAND PROGRAM PLAN**

The Environmental Protection Agency's (EPA) Enhancing State and Tribal Programs (ESTP) Initiative aims to enhance state and tribal wetland programs through technical and financial support. The ESTP Initiative works to accomplish this goal by increasing dialogue between the EPA and the states/tribes, providing a clear vision of program building goals and activities, aligning the Wetland Program Development Grants (WPDG) with activities that support program development, and providing appropriate technical assistance.

The North Carolina Department of Environmental Quality (NC DEQ): Division of Water Resources<sup>1</sup> (NC DWR) aims "to protect, enhance and manage North Carolina's surface water and groundwater resources..." The North Carolina Wetland Program Plan (NC WPP) is a document developed by NC DWR to support the ESTP Initiative. The NC WPP addresses the functions and services of wetlands (e.g., water quality, water supply, flood protection, erosion control, fish and wildlife habitat, recreation/aesthetics, commercial benefits), and the activities needed (e.g., collect baseline data, conduct long-term monitoring, increase voluntary restoration and protection, compare the functions of natural and restored wetlands) to further understand and manage these valuable ecosystems. The NC WPP supports the goals of the ESTP by listing goals and activities that will enhance the state wetland program. The NC WPP also serves as an additional communication tool, between North Carolina and the EPA, which will inform the EPA regarding technical and financial support the EPA can provide to continue to assist with enhancing North Carolina's wetland program.

The NC WPP provides a list of activities that may be completed by any party interested in conducting a project related to North Carolina wetlands over the next five years. This list is not an exhaustive list, but presents activities that may currently have resources available to complete the task, or areas that are currently seen as priorities in North Carolina. Since beginning this project, NC DWR's available resources have decreased and NC DWR does not currently have the staff or monetary resources necessary to conduct all of the activities proposed in this document. However, there are many other local, regional, and state entities with a strong interest in North Carolina wetlands. The list of stakeholder group members, referenced below, provide

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<sup>1</sup> On September 18, 2015, the North Carolina Department of Environment and Natural Resources (NC DENR) officially changed its name to the North Carolina Department of Environmental Quality (NC DEQ). Also, on August 1, 2013, North Carolina's Division of Water Quality (NC DWQ) merged with the Division of Water Resources (NC DWR). For simplicity of this document, except when necessary for clarification, all work done by NC DENR prior to September 18, 2015 and all work done by NC DWQ prior to August 1, 2013 and all subsequent work done by the department or division will be attributed to NC DEQ and NC DWR respectively.

some context for the number and variety of organizations that have an interest in this work. Therefore, this plan presents project ideas that can be pursued and implemented collectively and/or collaboratively to advance wetland information, wetland science, and wetland protection in the state. The stakeholder group members and their varying interests, objectives, and funding sources may help leverage the necessary resources to initiate and complete wetland work across the state.

NC DWR will continue to coordinate, develop, and/or complete various wetland projects, training, education, etc. to support and enhance the state's wetland program. The activities that NC DWR currently anticipates pursuing are marked accordingly in the timeline tables presented in Appendix C, D, E, and F.

The NC WPP is not a regulatory document and is not intended to impose additional regulations. It is designed to provide suggestions for project ideas, methods, and techniques for wetlands work in North Carolina. Unless required as part of an approved permit, all items listed in the NC WPP are suggestions or recommendations of project activities that may be undertaken within North Carolina by any interested party. Each interested party, can determine his/her level of participation, monetary or otherwise; therefore, no required financial costs are being imposed upon the citizens of North Carolina.

## **THE VALUE OF THE NC WPP**

The NC WPP is a valuable tool that has the potential to benefit the state in many ways. The NC WPP may provide some of the following values:

- An opportunity for the State to provide support, or serve as a hub and support center, for wetland work in the state
- A focus on wetland work being engaged in across the state to minimize duplication of efforts by providing statewide information on what wetland work has been done, what work still needs to be done, what data are currently available, what techniques are currently being used, etc.
- Opportunities for people to share wetland information and learn from each other's successes and challenges
- Opportunities for groups to work collaboratively, improve the efficiency of their programs, and expand and leverage available resources
- An improvement in transparency, efficiency and consistency in the wetlands regulatory program
- Encouragement of and improvements in the amount and quality of wetland restoration and protection projects

- Additional funding opportunities for wetland work through grant programs like the EPA's Wetland Program Development Grants

## **WHO CAN USE THE NC WPP**

The NC WPP is designed for use by any individual or group, which is interested in contributing to the body of knowledge pertinent to wetlands in North Carolina. Groups that may find great benefit in using this document are government agencies, nonprofit organizations, professional organizations, academic institutions, research groups, special-interest groups, and anyone interested in contributing information concerning North Carolina wetlands. Certain sections of the NC WPP may be more appropriate for individual projects depending on the group conducting the work and the focus of the wetland project.

## **HOW TO USE THE NC WPP**

The NC WPP begins with an introduction to wetlands and the EPA's 2009 guidelines and expectations for the development of wetland program plans among the states.

The remainder of the NC WPP is divided into four sections based on the EPA's four established Core Elements: (1) Monitoring & Assessment, (2) Regulations, (3) Voluntary Restoration and Protection, and (4) Water Quality Standards for Wetlands (USEPA 2008). The EPA's four Core Elements provide a list of activities a state can use to help develop a more comprehensive wetland program. In this NC WPP document, each Core Element section has background information, a goal, a plan, objectives, actions, and suggested activities.

For each of the Core Elements, the NC WPP can be utilized to determine what the state's overall goal and plan are for addressing each of the Core Elements. Background information can also be obtained regarding the structures already in place and what work has already been accomplished. The NC WPP can then be used to find a specific activity of interest to target efforts, or to find a broader action or objective that a proposed project can support. Items in this document, being part of a statewide effort, may assist with acquiring funds or support for specific wetland projects.

A suggested schedule for conducting each of the proposed activities was based on the need to accomplish certain tasks in a logical order, as well as resource needs, public needs, and available funding sources. Given that the NC WPP is a living document, it is understood that changes may be made to the proposed schedule or other aspects of the proposed activities over the next five years (e.g., change in needs or available resources). Proposed activities may be worked on prior to, or after, the proposed schedule if an activity has a greater priority for a particular group or should the need or available resources change. Timely evaluations of the NC WPP will allow for additions, deletions, or adjustments to the proposed activities and their respective schedule based

on emerging knowledge, changes in an organization's needs or priorities, and availability of additional resources.

In general, the NC WPP can be used to find suggestions on specific activities, actions, or objectives that can do the following:

- Obtain and provide more baseline data on the extent and quality of wetlands in the state
- Support wetland program planning and existing regulatory programs
- Facilitate the sharing of data
- Increase collaboration opportunities
- Promote integration amongst programs to provide more comprehensive water quality protection
- Enhance community outreach and education
- Improve the allocation of resources and regulations
- Help with the implementation of more wetland protection and restoration projects
- Provide justification and supporting information for alternative and/or sustainable funding sources for wetland monitoring, protection, and restoration

#### **HOW THE NC WPP WAS DEVELOPED:**

In October 2009, the U.S. Environmental Protection Agency wrote a memorandum encouraging each State and Tribe to develop a Wetland Program Plan (WPP). The EPA stated that the WPP should outline goals and actions within the wetland program that would be pursued over roughly a five-year time frame and provide a schedule of completion for each action. The memorandum also informed States and Tribes that beginning in FY2011, EPA WPDG funds could be used to develop a WPP, and that additional value would be given to grant applications that proposed to conduct work supporting an EPA-approved WPP. This memorandum came on the heels of the EPA's 2007 initiative for "Enhancing State and Tribal Programs" and the EPA's 2008 development of the "Core Elements Framework" (CEF) which established four core elements of a comprehensive wetland program: Monitoring and Assessment, Regulation, Voluntary Restoration and Protection, and Water Quality Standards for Wetlands, described below.

- "Wetland Monitoring and Assessment" helps a wetland program establish baseline wetland conditions, functions, services, and values, and determine changes due to human or environmental impacts or changes over time. A strong Monitoring and Assessment program supports the development and success of the other Core Elements.
- "Regulation" provides a mechanism for states to protect their aquatic resources by authorizing impacts to aquatic resources and assuring compliance. An effective regulatory program requires clear explanation and consistent application of the regulations.

- “Voluntary Restoration and Protection” allows for wetland protection and restoration beyond what is required by wetland regulations. Voluntary restoration and protection includes improvements in and protection of wetlands that are not required by state or federal laws or mandates. This work is often implemented by various resource groups or agencies, local communities, and nonprofit organizations to help locations or resources of interest.
- “Water Quality Standards for Wetlands” help protect wetlands as waters of the state, as required by the Clean Water Act (CWA). These wetland water quality standards can be numeric criteria (e.g., water chemistry data) or they may establish narrative criteria (e.g., designated uses, biological diversity) to account for the variability in wetlands and the differences between wetlands and flowing water. Certain water quality standards may also be able to be used to help guide wetland restoration and protection efforts.

This effort by the EPA was aimed at helping states and tribes develop WPPs that could focus work within states’/tribes’ wetland programs to achieve specifically stated goals. NC DWR began receiving WPDGs from the EPA in 1990. The WPDGs funded NC DWR research on pressing issues or areas of interest, but they were not always part of a larger programmatic plan.

NC DWR realized that North Carolina’s Wetland Program could benefit from the development of a WPP and applied for and received an EPA WPDG in 2011 to fund its development. The NC WPP provides direction and focus for proposed wetland work, allows work to be planned that is directed towards achieving program goals, and serves as a communication tool with the public and other interested agencies, to garner support for and encourage partnerships to accomplish program goals.

In addition to NC DWR, there are a large number of agencies, organizations, and individuals interested in and already contributing to the understanding and protection of wetlands in North Carolina. With that in mind, NC DWR desired to create a central NC WPP that included the goals of as many groups working with wetlands as possible. This is consistent with NC DEQ’s “fundamental science” component (a part of its mission statement), which states, “all public programs and scientific conclusions must be reflective of input from a variety of legitimate, diverse and thoughtful perspectives” (NC DEQ 2013). NC DWR recognized that including a diverse group of individuals as part of a stakeholder group process to develop a comprehensive NC WPP would incorporate local knowledge, produce better outcomes and decisions, and help ensure completion of items outlined in the NC WPP. The new relationships formed through the stakeholder group meetings have already afforded new opportunities for collaboration, and may help increase public understanding and garner public support.

Stakeholder group members were identified from various special-interest groups, professional organizations, nonprofit groups, universities, and state, federal, and local government agencies with vested interest in North Carolina’s wetlands. NC DWR received input and feedback from

NC WPP Stakeholder Group members throughout the development of this document. The stakeholder process for the development and refinement of all four Core Elements began in May 2013. Stakeholder group meetings were held from May 2013 to March 2015 to obtain ideas and solicit feedback from the group members on all four Core Elements. The list of NC WPP Stakeholder group members (Table 1) represents the individuals who attended the meetings, contributed to the discussions, and/or reviewed the document related to the NC WPP. To capture the interests of as many areas and groups within North Carolina as possible, attempts were made to include all actions or activities proposed by stakeholder group members as part of the NC WPP. However, given the diversity of interests represented within the stakeholder group, not all stakeholder group members support all of the actions or activities listed in the NC WPP. All portions of the NC WPP are intended to be part of a living document. Requests for revisions can be presented to NC DWR for consideration. NC DWR may suggest revisions through the stakeholder group process when appropriate and/or necessary during the WPP's five-year time frame.

## **INTRODUCTION TO WETLANDS:**

According to the Association of State Wetland Managers' August 2013 Annual Report, the most recent National Wetland Inventory (NWI) mapping shows that North Carolina has 5.7 million acres of wetlands (95% are in the Coastal Plain). This is nearly half of the estimated 11 million acres of wetlands present in North Carolina prior to European colonization. Wetlands provide many vital functions including flood control [cost of \$1.5 million to replace flood control function of 5,000 acres of wetlands removed in Minnesota (USEPA 1995)], erosion control, shoreline stabilization, maintenance of streamflow and groundwater levels, nutrient assimilation [wetlands may remove up to 90% of entering nitrogen and around 50% for phosphorus (Gilliam 1994)], drinking water protection, improvement of water quality [Congaree Bottomland Hardwood Swamp in South Carolina removes pollutants equivalent to \$5 million water treatment plant (USEPA 1995)], buffering against storm surges, food/seafood production [75% of commercial and 90% of recreational fish harvest species are dependent on wetlands for food or shelter (USEPA 1994)], hunting, ecotourism, and wildlife habitat [50% of all Threatened and Endangered (T&E) species require wetlands at some point in their life (North Carolina State University)]. The value that an individual attributes to a wetland can vary depending on the needs of the individual as well as the functions the wetland performs, the corresponding ecosystem services it provides, and the specific wetland type, size, and location. Wetlands are an indispensable part of North Carolina's environment; therefore, continued understanding and protection of these systems are very important. Wetlands and waters of the state of North Carolina are currently regulated through federal programs like the National Pollutant Discharge Elimination System (NPDES) Program and the Clean Water Act (CWA) §404; and State programs like the §401 Water Quality Certification program, Coastal Area Management Act

(CAMA), and Isolated Wetlands permitting; as well as through activities associated with nutrient management strategies and stormwater and floodplain management.

**Table 1: North Carolina Wetland Program Plan Stakeholder Group Members as of October 29, 2015**

<b>Group/organization</b>	<b>Last Name</b>	<b>First Name</b>
Albemarle-Pamlico Natural Estuary Partnership	Carpenter	Dean
Duke University	Richardson	Curtis
NC Association of County Commissioners	Reese	Johanna
NC Association of Environmental Professionals	Marotti	Ward
NC Association of Floodplain Managers	Key	David
NC Coastal Federation	Miller	Todd
NC Department Of Transportation	Paugh	Leilani
NC Division of Mitigation Services	Baumgartner	Tim
NC Division of Water Resources - 401 & Buffer Permitting Unit	Higgins	Karen
NC Division of Water Resources-Water Planning Section	Kreiser	Gary
NC Environmental Restoration Association	Webster	Norton
NC Farm Bureau Federation	Coan	Anne
NC Forestry Association	Hulka	Bryan
NC Home Builders Association	Minton	Tim
NC League of Municipalities	Sadler	Mary
NC Regional Councils	Schlegel	Mike
NC State University Dept. of Biological & Agricultural Engineering	Burchell	Mike
NC Wildlife Resources Commission	Cox	David
Professional Engineers of NC	Jewell	Ian
RTI International	Truesdale	Robert S.
UNC Chapel Hill - Biology Department	Peet	Robert K.
UNC Wilmington	Mallin	Michael
US Army Corps of Engineers	Tugwell	Todd
US Fish & Wildlife Service - Raleigh Ecological Services Field Office	Wells	Emily
US Fish & Wildlife Service-Asheville Ecological Services Field Office	Tompkins	Bryan



The remainder of the NC WPP addresses the four Core Elements on the following pages:

MONITORING AND ASSESSMENT	p. 8- 21
REGULATIONS	p. 22-33
VOLUNTARY RESTORATION AND PROTECTION	p.34-41
WATER QUALITY STANDARDS FOR WETLANDS	p. 42-45

## **CORE ELEMENT 1: MONITORING AND ASSESSMENT**

### **BACKGROUND**

The EPA Core Element Framework (Wetland) Monitoring and Assessment document states, “Monitoring is the systematic observation and recording of current and changing conditions, while assessment is the use of that data to evaluate or appraise wetlands to support decision-making and planning processes.” It is important to utilize monitoring data to obtain an accurate assessment of the state’s wetlands. To facilitate the most effective use of monitoring data, consistency in collection protocols and techniques is important. A statewide, standardized, coordinated sampling approach will allow for routine sampling and result in consistent and comparable data being collected across the state, consistent as appropriate with the basic protocols used by wetland practitioners in NC and throughout the United States. Consistent data will allow comparisons on a community, state-wide, or national level and between different types of sites (e.g., restoration and natural reference sites).

#### *NC DWR WPDG Baseline Studies:*

NC DWR’s wetland monitoring program<sup>2</sup> has been primarily supported by EPA WPDGs beginning in 2004, when NC DWQ first began their wetland monitoring work. This work established a foundation for the development of a strong wetland monitoring and assessment program that examined particular wetland types (e.g., natural or mitigated), unique wetlands, reference and disturbed wetlands, wetlands in particular watersheds and regions, specific wetland characteristics (e.g., amphibian usage, hydrology, connectivity), and wetland assessment tools. NC DWR’s wetland monitoring program monitored over 10 wetland types [as defined by the [North Carolina Wetland Assessment Method \(NC WAM\) version 4.1](#) (see description below)], collected extensive water quality, soil, hydrology, and biological (i.e., vegetation, amphibian, and macroinvertebrate) data, and conducted rapid assessments and Geographic Information System (GIS)/land use analysis. The wetland monitoring and the subsequent lessons learned from conducting all of this work led to the establishment of a consistent methodology ([NC DENR 2014](#)) that can be used for monitoring wetlands anywhere in the southeastern United States. NC DWR’s wetland monitoring methods are also consistent with those utilized in the EPA’s National Wetland Condition Assessment (NWCA).

From 2004-2013, NC DWR collected wetland data at 188 sites statewide (Figure 1). North Carolina’s initial WPDG (CD 97426001) focused on monitoring headwater forest wetlands [Figure 1: Headwater Wetlands; 34 sites] and defining, establishing, and implementing supplemental Unique Wetland water quality classifications. NC DWR also worked with the State’s in lieu fee program, known as the NC Division of Mitigation Services (NC DMS)

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<sup>2</sup> In September 2013, DWR merged the Program Development Unit into the Wetlands Branch and chose not to accept an EPA WPDG which would have provided funding for the wetland monitoring program. North Carolina State University received a WPDG to continue monitoring some of the long-term wetland monitoring sites over the next three years.

(formerly known as the NC Ecosystem Enhancement Program (NC EEP)), to monitor Basin Wetlands, Riverine Swamp Forests, and Bottomland Hardwood Forests on a watershed basis (CD 96422105) [Figure 1: Watershed Basis; 25 sites]. Several sites from each of these two projects were incorporated into a suite of sites that have been monitored on a longer-term basis.

Two additional grant projects examined isolated wetlands, developed an isolated wetland prediction tool, and determined the frequency, acreage, volume, depth, condition, and hydrologic connectivity of isolated wetlands to other wetlands and streams connected to navigable waters (CD 95415809 and a Regional Environmental Monitoring and Assessment Program [REMAP] Grant). Vegetation biocriteria, soil carbon stores, water storage volume, and pollution absorption capacity of isolated wetlands were characterized. Macroinvertebrate and amphibian biocriteria were also developed for some of the sites. These statistically designed studies enabled the extrapolation of individual wetland characteristics to the entire eight-county (four in NC and four in South Carolina) study area. Additional isolated wetland sites were monitored as reference sites for a grant project that was assessing the success of enhancement, restoration, and mitigation sites (CD 00D01512). [Figure 1: Isolated Wetlands, 24 sites in NC]

NC DWR also participated in the EPA's NWCA wetland survey in 2011 and worked collaboratively with South Carolina, Georgia, and Alabama on a Southeast Wetlands Monitoring Intensification grant project (CD 95449910) to apply a regional emphasis to wetland monitoring and draw conclusions about wetland condition on a regional level [Figure 1: NWCA/Intensification Grant; 67 NC sites]. Information gained from these collaborations was shared among the EPA's Region 4 states through North Carolina's instrumentation of the Southeast Wetlands Workgroup (SEWWG).

*NC DWR WPDG Wetland Enhancement, Restoration, and Mitigation Studies:*

Several projects have been used to evaluate, guide, and improve the quality of wetland mitigation in North Carolina. One study (WL 96435005) found that approximately 75% of stream and wetland mitigation projects in North Carolina met some of the projects proposed success criteria, while another study (CD 95415709) looked at the spatial relationship between aquatic resource impacts and compensatory mitigation in North Carolina. NC DWR, in collaboration with NC State University, was contracted by the Environmental Law Institute (ELI) to complete the North Carolina Wetland Mitigation Evaluation Pilot Survey. The ELI study (WD83504301) compared the ecological integrity of restored riverine/riparian wetland compensatory mitigation sites constructed between 2002 and 2006 by one of the three NC mitigation mechanisms: mitigation banking, in-lieu fee programs, or permittee-responsible. To make these comparisons, this project used NWCA methodology for floristic, soil and water quality assessment, a GIS landscape analysis, NC WAM, and the Ohio Rapid Assessment Method (ORAM). Another grant project (CD 00D01512) focused on data collection in isolated wetland sites that were enhanced for habitat use or restored for mitigation purposes. [Figure 1: Enhancement/Restoration/Mitigation; 38 sites]. NC DWR's permitting and mitigation databases are reviewed on a quarterly basis to

track the number of permitted impact and mitigation acres. A Wetland Mitigation Guidance document (CD 95450010) was developed, as were guidelines for stream and wetland restoration in response to violations of the Clean Water Act (CD 95415509).

*NC DWR WPDG Wetland Assessment Tool Development:*

Collaborated efforts on other WPDGs led to the development of innovative wetland assessment tools. State and federal agency staff worked together with wetland scientists to develop the NC WAM, a rapid assessment method that assesses hydrology, water quality and habitat functions of wetland sites. NC DWR's wetland monitoring data is being used to verify and validate NC WAM. Through SEWWG, a team of expert botanists from across the Southeast was also assembled to develop a wetland plant Coefficient of Conservatism (C of C) database (available at <http://sewwg.rti.org>) for the Southeast region of the US that ranks wetland plant species according to their affinity to natural and undisturbed wetland habitat (CD 95488411). This information can be used to determine the floristic quality of a wetland, allowing the determination of reference site quality and the comparison between sites (e.g., natural and/or mitigation).

*Potential Uses of the NC DWR WPDG Data:*

NC DWR's wetland monitoring and assessment protocols and data have many potential uses throughout the state and can continue to be integrated into other state programs through various partnerships, collaborations, and sharing of data. The wetland monitoring protocols and data can assist with permitting decisions and mitigation guidelines associated with wetland impacts due to 401 Water Quality Certification approvals, stormwater, dewatering, and mining operations. Wetlands monitoring data can be used to help determine, assess, and improve impaired waters of the state and be incorporated in various reports (e.g., biannual 305 (b) Water Quality Report). Monitoring data can continue to be used for developing watershed plans, like those prepared for Fishing Creek and Lockwoods Folly by NC DMS. Collaborations have also been established to share data from existing wetland monitoring sites (e.g., Albemarle-Pamlico National Estuary Partnership (APNEP), NC DWR Water Science Section/Biological Assessment Branch, NC Museum of Natural Sciences Amphibian Collection) to improve organizations' abilities to meet their program goals and bolster their data sets. Scientists can use these data to improve their assessment of wetland and water quality using biological indices developed with the increased knowledge of species' ranges and requirements. Program capacity, regulatory decision-making, and long-term planning efforts across North Carolina's water quality programs will also benefit from these collaborations.

*Work by Other Agencies/Groups:*

Several other federal, state, local, university, non-profit, and private groups also conduct wetland monitoring and assessment on wetlands of varying sizes and locations. Duke University, North

Carolina State University, East Carolina University, University of North Carolina, and other academic institutions are conducting various degrees of monitoring, design, construction, and pre- and post- restoration monitoring of wetlands throughout the state. Many of these sites, like sites in the Cape Fear River Basin, Duke Forest, North River Farms, Timberlake Farms, Juniper Bay and Pocosin Lakes, have greater than five years of accumulated data. Other groups are using landscape assessments that utilize GIS data (Level 1) to monitor and assess wetlands (e.g., NC Coastal Region Evaluation of Wetland Significance (NC-CREWS)). NC Department of Transportation (NC DOT) is developing an ecoregion driven wetland mapping model and the National Oceanic and Atmospheric Administration's Office for Coastal Management provides ecosystem change analysis (NOAA <http://coast.noaa.gov/digitalcoast/tools/list>).

Voluntary restoration and compensatory mitigation sites are also monitored and assessed by NC DMS, mitigation bankers, and others involved in designing, developing, and managing mitigation projects<sup>3</sup>. For compensatory mitigation projects, monitoring and assessment reports are submitted on an annual, or more frequent, basis for a minimum of five or seven years. The United States Army Corps of Engineers (USACE) and NC DWR receive monitoring reports for compensatory mitigation sites; the reports may also include monitoring information for reference sites being monitored at the same time for comparison. NC DMS utilizes a watershed-based planning process, while working with state and federal agencies, private companies, and land trusts, to obtain the best possible return from their restoration, enhancement, and protection projects. NC DMS has been monitoring the progress and success of its more than 580 projects aimed at conserving, restoring, or enhancing approximately 30,000 acres of wetlands beginning in the late 1990s/early 2000s. Mitigation bankers also monitor their sites during the design and development stages of the projects. Some mitigation banking sites have long-term data ranging over 10 years. Some stewardship programs also monitor and assess the boundary areas of mitigation sites on a long-term basis.

North Carolina State University is utilizing funds from a 2014 EPA WPDG to continue monitoring efforts on 16 NC DWR long-term monitoring sites for three additional years (to compare with the current baseline) (CD 00D25014). The group will also compile and assess monitoring data from previous WPDGs and the NWCA, improve monitoring and assessment protocols and metrics (e.g., for hydrology), and develop new remote monitoring methods using unmanned aerial vehicles. The project also plans the establishment of a collaborative wetland monitoring technical work group, and development of an online, North Carolina wetlands data clearinghouse that includes the previously mentioned data sources (e.g., Figure 1) as well as data collected under the current grant.

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<sup>3</sup> The type and amount of monitoring data collected varies depending on the goals and duration of the mitigation projects.

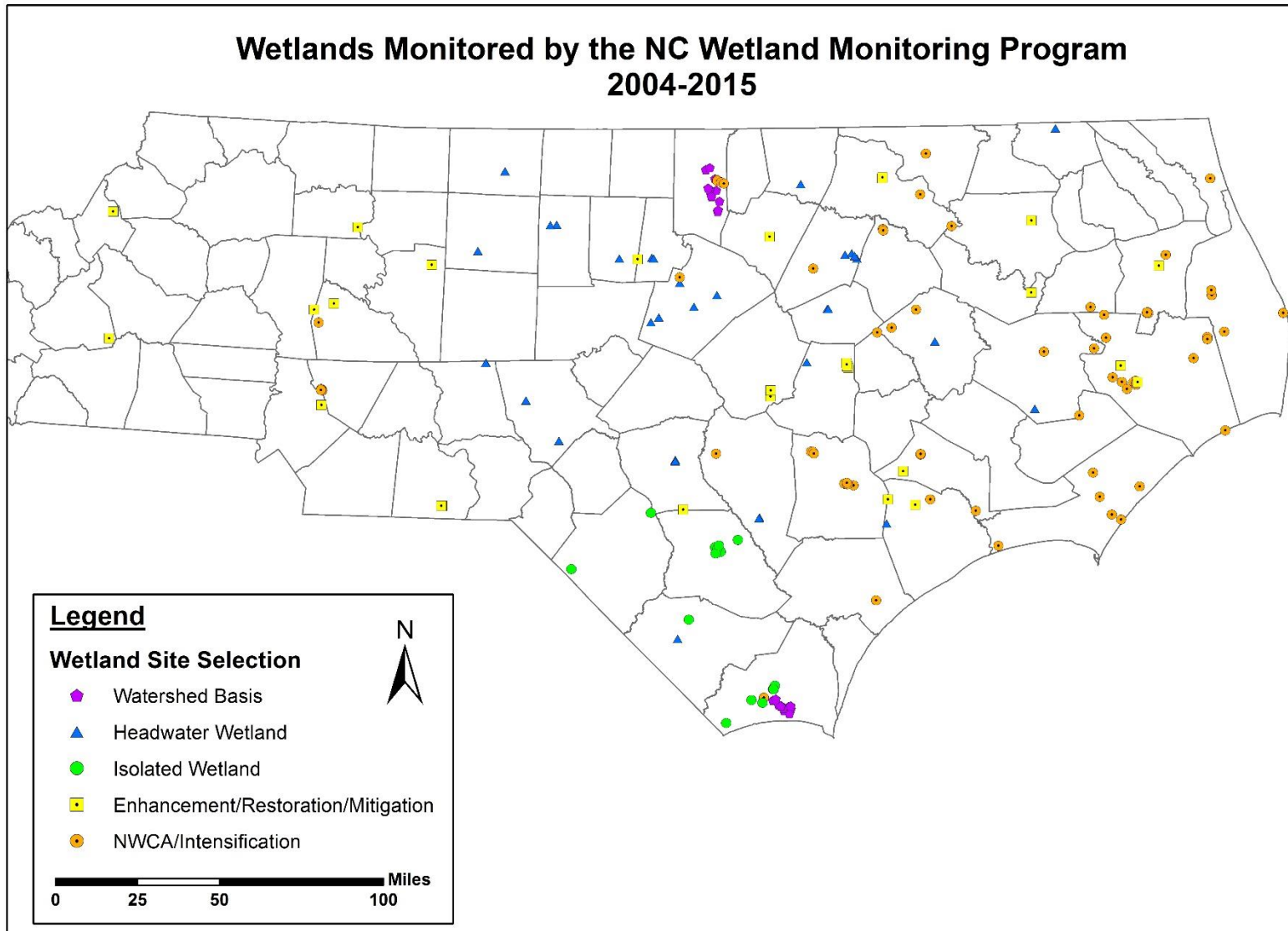


Figure 1: Wetland sites (188 total) monitored as part of NC DWR’s Wetland Monitoring Program’s various wetland projects, as of October 2015.

Future Direction:

While a large amount of work has been done on wetland monitoring and assessment throughout North Carolina, more information still needs to be collected, analyzed, compared, and shared. Along with data collection of new variables, there is a need for monitoring of additional baseline sites, so statuses and trends in wetland quantity and quality can be evaluated using a common metric as they relate to natural or human induced events. Some of the wetland monitoring and assessment activities which NC DWR and other groups do not foresee having sufficient staff and/or funds to complete over the next five years are retained as part of Appendix A (Items for Future Consideration).

**THE GOAL**

The goal of the Monitoring and Assessment portion of the NC WPP is to work towards a statewide, coordinated sampling approach. The use of similar sampling techniques and the collection of comparable data will allow for more accurate assessments and comparisons of the monitoring data.

**THE PLAN**

To accomplish the NC WPP Monitoring and Assessment goal, the NC WPP proposes that North Carolina refine and publish a wetland monitoring and assessment strategy document, develop and refine recommended standardized wetland monitoring protocols, make wetland monitoring and assessment data available to inform wetland decisions, and identify sustainable financing sources. Together these will allow for greater integration of wetland monitoring data into other programs and build partnerships to share data and experiences that will further common goals. This additional information can also inform wetland planning and policy actions and be used in future projects.

Unless required through the permitting process, all items listed in the Monitoring and Assessment portion of the document are suggestions or recommendations and are voluntary in nature.

The following activities are proposed as part of the NC WPP over the next five years:

**OBJECTIVES**

**OBJECTIVE 1: Refine and publish the North Carolina wetland monitoring and assessment strategy** [keeping it consistent with *Elements of a State Water Monitoring and Assessment Program for Wetlands* (EPA, 2003 & 2006)].

NC DWR has a preliminary North Carolina wetland monitoring and assessment strategy [[Draft: Strategy for Implementing a Wetlands Monitoring and Reporting Program in NC, April 25, 2013](#) (NC DENR 2013)] and will work with NC WPP Stakeholder group members to refine and update the document. The strategy document will consider the objectives of

**OBJECTIVE 1 (cont.): Refine and publish the North Carolina wetland monitoring and assessment strategy**

North Carolina's monitoring and assessment program, types of monitoring, site selection processes, field methodologies, and core indicators of wetland function and condition. The strategy document will also address how the monitoring and assessment data can be used to support watershed planning and various wetland programs.

ACTION 1.1: Define North Carolina's Wetland Monitoring Objectives and Strategies  
*Program Capacity Development: Providing defined wetland monitoring objectives and strategies may increase awareness, participation, and support of the state's wetland monitoring initiatives.*

ACTIVITIES:

- a) Establish a stakeholder group to provide input on the monitoring and assessment strategy and determine shared activities and goals [2015-2016]
  - i. Determine the survey types and levels of intensity needed for various wetland and/or project types
- b) Finalize and publish North Carolina's wetland monitoring and assessment strategy [2016]

ACTION 1.2: Utilize North Carolina's Monitoring and Assessment Strategy to monitor North Carolina's wetland resources  
*Program Capacity Development: Following wetland monitoring and assessment strategies, following proposed monitoring schedules, and establishing wetland monitoring networks will provide project focus and improve data consistency and project tracking.*

ACTIVITIES:

- a) Conduct various types of wetland monitoring efforts such as: [2015-2019]
  - i. Ambient monitoring (rotating basin approach)
  - ii. Basinwide/watershed monitoring (need based, targeted monitoring)
  - iii. Probability-based (random) monitoring (~2 year intensive sampling)
  - iv. EPA's NWCA [2016]
- b) Focus wetland monitoring to include: [yearly]
  - i. Routine, consistent, long-term monitoring data so valid data will be available and can be used for decision-making purposes
  - ii. Statewide data for certain wetland types
  - iii. Results of permitted impacts (pre- and post-, short and long-term) on area wetlands. This monitoring may include, but is not limited to, natural and restored sites, existing site-specific conditions, and long-term, adjacent effects of permitted impacts.
  - iv. Secondary data relevant to priority resources or activities



**OBJECTIVE 1 (cont.): Refine and publish the North Carolina wetland monitoring and assessment strategy**

- c) Participate with the organization of a regional wetland monitoring network in the Southeast [2015-2018]
  - i. Maintain list of protocols for monitoring and data management
  - ii. Coordinate data collection and reporting
  - iii. Coordinate data entry using a standard format, reliable data entry system, and common tools for sharing data

**OBJECTIVE 2: Develop and refine recommended standardized wetland monitoring protocols and utilize them to assess wetland condition.**

Obtaining additional professional input and publication of recommended standardized wetland monitoring protocols, consistent with the EPA's NWCA, will provide a framework for consistent site sampling and data reporting. This data can then be analyzed to establish wetland reference and baseline conditions. Continued refinement of the wetland monitoring techniques will provide the most accurate, up-to-date information on the condition of waters of the state.

*Note: The recommended statewide wetland monitoring protocols are not a regulatory requirement (unless stated in a permit), but the protocols should be followed if incorporation of the data into a collaborative database is proposed.*

**ACTION 2.1: Develop and refine the wetland monitoring design**

*Program Capacity Development: Providing recommendations for consistent sampling methods and data formats will allow for the compilation and/or comparison of wetland monitoring data. Multiple groups, agencies, etc. can then analyze this data for various purposes.*

**ACTIVITIES:**

- a) Formalize recommended statewide wetland monitoring protocols (utilize stakeholder group) [2015-2016]
- b) Advocate consistent scientific protocols for monitoring wetlands
  - i. Publicize the current wetland monitoring protocols [2015-2016]
  - ii. Update the wetland monitoring protocols based on current scientific data and project needs, and publicize any necessary changes [2015-2019]
  - iii. Utilize the current wetland monitoring protocols on wetland monitoring projects [2015-2019]
  - iv. Develop Quality Assurance Project Plans (QAPPs) for all appropriate projects [all years]

*Note: QAPPs may be completed for any project, but need to be developed for projects with data that will be included in a collaborative database.*

**OBJECTIVE 2 (cont.): Develop and refine recommended standardized wetland monitoring protocols and utilize them to assess wetland condition.**

ACTION 2.2: Assess, develop, and validate wetland assessment tools

*Program Capacity Development: Assessment of current monitoring techniques and development of new, appropriate techniques will provide the most accurate, up-to-date information on the condition of waters of the state. Continued work on improving assessment methods is important in obtaining the most reliable data. Validation of these methods and training users on the methodology will ensure the reliability of the methods and the data obtained.*

**ACTIVITIES:**

- a) Develop and validate assessment tools to assist with the monitoring of natural and mitigation wetland sites
  - i. Evaluate existing tools and provide needs assessment and validation plan [yearly]
  - ii. Validate the Coefficient of Conservatism for wetland vegetation and develop indicators of floristic quality [2015-2016]
  - iii. Develop hydrologic-function metrics and assessment tool [2015-2017]
  - iv. Develop example connections between function metrics and ecosystem services and establish targets for future function-to-service metric development [2017-2019]
- b) Support refinement of Rapid Assessment Methods for natural wetlands and wetland-stream complexes
  - i. Assist with training on NC Wetland Assessment Method (NC WAM) [yearly]
  - ii. Validation of NC WAM in conjunction with other monitoring projects
    - Validate NC WAM for Headwater Wetlands [2015]
    - Validate NC WAM for Basin Wetlands [2015]
    - Validate NC WAM for Riverine Swamp Forests and Bottomland Hardwood Forests [2015]
  - iii. Engage in training for NC SAM [2015-2017]
  - iv. Validate NC SAM rapid assessment forms (Level 2) with intensive site assessments using direct measurements (Level 3) [2015-2017]
  - v. Continue validating NC WAM on other wetland types as projects and sufficient data warrant [2017-2019]
  - vi. Continue validating NC SAM based on geographic location and stream size [2018-2019]
- c) Evaluate the feasibility of establishing a Level 2 assessment for restored wetlands to help determine the success or functionality of the wetland site (possibly include a sliding scale/benchmarks based on the age of the site) [2017-2019]

**OBJECTIVE 2 (cont.): Develop and refine recommended standardized wetland monitoring protocols and utilize them to assess wetland condition.**

**ACTION 2.3:** Utilize wetland monitoring data to establish wetland reference conditions and assess baseline wetland extent, density, and condition/function/services and trends

*Program Capacity Development: Defining wetland reference conditions will provide realistic, attainable guidelines and goals for wetland preservation, enhancement, and restoration. The establishment of baseline conditions will be followed by subsequent analyses to assess trends in wetland condition. These analyses and trend determinations can provide information on how protecting wetlands is protecting the environment (e.g., improving ground water quality by filtering nutrients, flood control, improving the health of trout in trout waters) and can be used to assess the condition of waters of the state in response to stressors and water quality improvement efforts. (Some high-priority areas were recommended by one or more NC WPP stakeholders and are listed in Appendix B. These priority areas, and others, may be considered when determining where to begin obtaining baseline or trend analysis data)*

**ACTIVITIES:**

- a) NC DWR wetland monitoring data and other data from wetlands in the state (e.g., Carolina Vegetation Survey (CVS), university study sites, mitigation monitoring data) will be available to assist with: [2015-2018]
  - i. Developing and refining metrics (e.g., Index of Biological Integrity (IBI), metrics for hydrologic functions), based on the monitoring data, that can be utilized to support regulatory programs
  - ii. Describe reference condition for different wetland types in North Carolina
  - iii. Utilizing collected wetland data to develop typical profiles for North Carolina wetland types and establish reference wetland parameters, parameter ranges, and baseline characteristics
- b) Establish baseline wetland conditions and functions for North Carolina wetlands having sufficient monitoring data [2015-2017]
- c) Assign wetlands having sufficient monitoring data to a categorical scale such as “reference,” “good,” “fair,” or “poor” to indicate the wetland condition and functions (a wetland can have a combined index of condition based on various factors, and it can have separate ratings for individual wetland conditions or functions) [2015-2016]
- d) Use available wetland monitoring data to assess trends in the ambient conditions of wetlands (i.e., are wetlands changing over time because of the functions they perform) [yearly]
- e) Produce estimates of relative risks, relative extent, and similar statistics to explain the association between the observed risks and stressors [2015-2016]
- f) Report NC DWR permitted wetland impacts and compensatory mitigation as part of the quarterly reports for NC DWR’s strategic plan [yearly]

**OBJECTIVE 2 (cont.): Develop and refine recommended standardized wetland monitoring protocols and utilize them to assess wetland condition.**

- g) Utilize wetland function metrics to develop ecosystem service estimates for wetland sites with sufficient monitoring data (i.e., what work are the wetlands performing and how are they helping protect the environment) [2017-2019]

**OBJECTIVE 3: Make wetland monitoring and assessment data available to inform wetland decisions.**

Utilization of the wetlands monitoring and assessment data by regulatory programs and interested parties will strengthen partnerships that can further common goals such as restoring and protecting wetlands and improving stream conditions through informed decision making.

**ACTION 3.1:** Provide public access to wetland monitoring data in an electronic system  
*Program Capacity Development: The establishment and maintenance of a primary, publicly accessible, electronic wetland monitoring data warehouse and/or database will improve the consistency and accessibility of the wetland data and improve the ability to access, analyze, use, share, and publicize those data. These improvements should improve public awareness, interest, and involvement in the protection and enhancement of the waters of the state.*

**ACTIVITIES:**

- a) Facilitate the development of a means of sharing wetland monitoring data electronically [2015-2017]
  - i. Ensure public outreach and education to share monitoring data in a useable format
- b) Organize a wetland monitoring data warehouse and/or populate the wetland monitoring electronic data set, and evaluate for any necessary changes [2015-2019]

**ACTION 3.2:** Incorporate monitoring and assessment data into other programs and planning units

*Program Capacity Development: The incorporation of wetland monitoring and assessment data into other programs in the state will greatly improve the protection and enhancement of wetlands and other waters of the state and will improve program accounting and effectiveness.*

**ACTIVITIES:**

- a) Continue to make wetland monitoring and assessment data available to, and continue discussions with, other North Carolina monitoring programs (e.g., Ambient Monitoring Program for streams, lakes, and rivers; Biological Assessment Program, Albemarle-Pamlico National Estuary Partnership (APNEP), Mining and Stormwater Programs) [2015-2019]

**OBJECTIVE 3 (cont.): Make wetland monitoring and assessment data available to inform wetland decisions.**

- b) Make wetland monitoring and assessment data available for use in watershed planning (e.g., NC DWR Planning Section, NC DMS) [2015-2019]

ACTION 3.3: Assess the environmental consequences of an action or group of actions; modify programs as needed based on monitoring and assessment data

*Program Capacity Development: Improvement on the collection and storage of scientific wetland data will aid in the assessment, understanding, and improvement of statewide guidance documents, policies, and regulations.*

**ACTIVITIES:**

- a) Report to the EPA through grant reports (CD 95488411) on permitted impacts and required compensatory mitigation prior to and following various 401 programmatic changes (i.e., are wetland regulations protecting the environment as intended) [2015]
- b) Use the standardized monitoring protocols and data to support regulatory programs (e.g., 401 Water Quality Certifications, Isolated Wetlands, Stormwater, NPDES, Non-discharge Wastewater) [yearly]
- c) Investigate restoration value and ecosystem service approaches that have been conducted to evaluate the services provided by wetlands (e.g., Delaware and the National Estuarine Program (NEP)) and identify critical gaps in the function-service metrics [2105-2016]

ACTION 3.4: Improve the site-specific conditions of wetland resources

*Program Capacity Development: The availability of the monitoring and assessment data will help improve the success of wetland restoration and enhancement sites. The data can guide improvements in the assessment of wetland enhancement and restoration projects and support updates to mitigation guidance documents.*

**ACTIVITIES:**

- a) Wetland monitoring and assessment data will be made available to assist with the success of wetland restoration and enhancement projects by providing data to:
  - [yearly]
  - i. support success criteria that take the restoration of wetland extent, function, quality, services and condition of restoration and enhancement sites into account
  - ii. suggest ways to help voluntary restoration projects accomplish their established project goals
  - iii. evaluate additional or alternative success criteria for wetland restoration sites within urban areas

**OBJECTIVE 3 (cont.): Make wetland monitoring and assessment data available to inform wetland decisions.**

**ACTION 3.5:** Develop watershed-based management plans, wetland protection, and mitigation guidance

*Program Capacity Development: Improve the state's water quality by utilizing a watershed approach to determine the best alternatives for impacts, preservation, enhancement, and restoration activities. This can also improve the location and success of mitigation projects through advancements in assessment tools, focused mitigation projects in areas with impaired waters, and improved mapping tools.*

**ACTIVITIES:**

- a) Develop mapping tools to help prioritize monitoring, management, and mitigation areas [2016-2019]
- b) Evaluate which watersheds have current and/or future needs for carbon and nutrient offset credits to mitigate for permitted impacts, and suggest areas that would benefit from the production of additional carbon and nutrient credits [2016-2017]
- c) Guide planning decisions for wetlands or wetland-stream complexes with the particular goal of improving impaired streams (e.g., basinwide and watershed restoration plans and other work done by NC DWR planning section, NC DMS, and Natural Resources Conservation Services (NRCS); development of local watershed plans) [2017-2019]
- d) Evaluate and develop tools to monitor and assess the success of wetland or wetland-stream complex mitigation sites (e.g., mitigation project construction protocols, C of C values, IBI, wetland profiles of biological communities, rapid assessments, measures of hydrologic function) [2016-2019]
- e) Evaluate the ecosystem services provided by restored streams and wetlands, or by projects seeking approval for impacts to streams or wetlands, to determine the economic value of the restoration and protection efforts and to determine what role these systems play in the overall environmental health/protection programs (i.e., how are sites seeking approval for stream or wetland impacts and/or restored streams and wetlands improving the environment, and what are the associated replacement costs) [2018-2019]

**OBJECTIVE 4: Identify sustainable financing for long-term wetland monitoring and assessment activities.**

To date, wetland monitoring conducted by NC DWR has been accomplished primarily through competitive EPA WPDGs. To effectively report on wetland condition and improve water quality, NC DWR and others may need to identify additional funding sources. Obtaining stable and renewable funding sources is critical to ensure that the wetlands monitoring groundwork developed over the past decade can be sustained for full integration into state and federal water quality programs.

**OBJECTIVE 4 (cont.): Identify sustainable financing for long-term wetland monitoring and assessment activities.**

ACTION 4.1: Investigate alternative funding sources for North Carolina's wetland monitoring program

*Program Capacity Development: Securing long-term and/or recurring funding sources will enhance all facets of the state's wetland monitoring program.*

**ACTIVITIES:**

- a) Work with the NC WPP Stakeholder Group to determine funding sources and opportunities [2015]
- b) Encourage other groups to seek funding to assist in the wetland monitoring and assessment efforts [yearly]
- c) Assist other groups with obtaining funding for wetland monitoring and assessment efforts [yearly]
- d) Investigate other grant funding opportunities [yearly]
- e) Investigate cost-sharing opportunities as well as volunteer work as a means of leveraging and improving success of targeted grants for wetland protection and restoration [yearly]

## **CORE ELEMENT 2: REGULATION**

### **BACKGROUND**

#### Section 404 of the Clean Water Act (Federal):

In accordance with Section 404 of the Clean Water Act as amended in 1977, the USACE is responsible for regulating the discharge of dredge or fill material into waters of the United States, including open waters, streams, and wetlands. The purpose of the Clean Water Act is to restore and maintain the physical, chemical, and biological integrity of the nation's waters. Under Section 10 of the Rivers and Harbors Act and this program, the USACE is responsible for receiving and evaluating permit applications affecting waters of the United States. Frequently, the required public interest review of applications results in a finding that the public must be compensated for unavoidable aquatic resource losses, including wetland resources.

Section 404(b)(1) Guidelines of the Clean Water Act: Section 230.10 (d) of the Section 404 (b)(1) Guidelines states that "... no discharge of dredged or fill material shall be permitted unless appropriate and practicable steps have been taken which will minimize potential adverse impacts of the discharge on the aquatic ecosystem."

#### Food Security Act of 1985 (Federal):

The Food Security Act of 1985 is often referred to as the 1985 Farm Bill. The Highly Erodible Land and Wetland Conservation provisions of the Act (16 U.S.C. 3801-3862) are administered by the US Department of Agriculture's Farm Service Agency. The Wetland Conservation provision, commonly called "Swampbuster," was written to discourage the conversion of wetlands to non-wetland areas for the production of commodity crops. If a farmer converts wetlands to non-wetland areas after December 23, 1985 the farmer becomes ineligible for benefits through the Federal farm program (commodity price support, farm storage facility loans, disaster payments, and several other benefits). Other provisions of the Act include the Highly Erodible Land provisions, commonly referred to as the "Sodbuster" and "Conservation Compliance" provisions. Farmers become ineligible for federal farm program benefits if, after December 23, 1985, they convert or produce crops on highly erodible land without adequate conservation practices in place to control erosion and sedimentation.

The Agricultural Act of 2014 reinstated federal crop insurance to the list of benefits affected by these three provisions, with a separate compliance date for that benefit. In order to be eligible for any premium subsidy paid by the Federal Crop Insurance Corporation for any policy or plan of insurance, the farmer must be in compliance with a conservation plan for all highly erodible land; not plan or produce an agricultural commodity on a wetland converted after February 7, 2014; and not have converted a wetland after February 7, 2014 to make possible the production of an agricultural commodity.



The Highly Erodible Land and Wetland Conservation regulations are set forth in the [Code of Federal Regulations at 7 CFR Part 12](http://www.ecfr.gov/cgi-bin/text-idx?SID=bb48534852fd64b59444a8cf05326d36&mc=true&tpl=/ecfrbrowse/Title07/7cfr12_main_02.tpl) at: [http://www.ecfr.gov/cgi-bin/text-idx?SID=bb48534852fd64b59444a8cf05326d36&mc=true&tpl=/ecfrbrowse/Title07/7cfr12\\_main\\_02.tpl](http://www.ecfr.gov/cgi-bin/text-idx?SID=bb48534852fd64b59444a8cf05326d36&mc=true&tpl=/ecfrbrowse/Title07/7cfr12_main_02.tpl)

*Sedimentation Control and Stormwater Programs (State):*

Both the Erosion and Sedimentation Program and Stormwater Permitting Program are integral to the long-term health of the surface waters in North Carolina. Both programs are administered by the Land Quality Section of NC DEQ's Division of Energy, Mineral and Land Resources and are designed to help protect streams, lakes, reservoirs, and coastal waters from impacts from sediment and associated pollutants.

Sedimentation is, by volume, the single largest pollutant in North Carolina's surface waters (North Carolina Sedimentation Erosion Control Program, 2007). Sedimentation can occur as a result of natural processes such as erosion of stream banks and decomposition of plant material as well as runoff from anthropogenic activities such as clearing and grading of land during construction, mining, and hydrologic impacts from urbanization. The NC Sedimentation Pollution Control Act of 1973 (§113A-50 to §113A-69) acknowledges sedimentation as a major source of pollution and is "to provide for the creation, administration, and enforcement of a program and for the adoption of minimal mandatory standards which will permit development of this State to continue with the least detrimental effects from pollution by sedimentation." Title 15A North Carolina Administrative Code 04B addresses Erosion and Sediment Control; more specifically, 15A NCAC 04B .0118 requires that an erosion and sedimentation control plan shall be filed for any land disturbing activity that covers one or more acres. An Erosion and Sedimentation Control Plan and associated permit requires the permittee to minimize the amount of soil being disturbed and take measures to prevent runoff from leaving the construction site. It also requires that disturbed soil be revegetated within a certain timeframe to help reduce the potential for erosion.

The NC Stormwater Permitting Program implements the stormwater control rules and handles permitting for industrial, municipal, and post-construction activities. The Stormwater Permitting Program also provides oversight of delegated local government stormwater programs. Polluted stormwater runoff is the number one threat to North Carolina's water quality (Clean Water Education Partnership) and occurs when rain or melting snow travels across the land, picking up pollutants before flowing into wetlands, streams, lakes, rivers, or oceans (NC DEQ, <http://www.ncstormwater.org/>). Parts of 15A NCAC 02H and 15A NCAC 02B establish requirements for application and issuance of permits for activities related to new development as well as permits for certain industrial and manufacturing land uses. These rules can help protect North Carolina's water quality by preventing pollutants from entering the surface waters, a much less expensive option than cleaning up polluted waters.

Both of these programs are designed to help protect North Carolina's surface waters. Water quality degradation can occur with the removal of natural wetland systems and their filtering capacity. Natural wetland systems can filter and retain sediment and pollutants that enter the system; however, they can be overwhelmed and possibly destroyed if allowable inputs are too high. Restored or constructed wetlands, sometimes part of a stormwater or sediment erosion control plan, can also filter and retain sediments, but may require long-term maintenance and may or may not be as successful as the natural systems in performing these functions.

*Section 401 Water Quality Certification Program (State):*

NC DWR, a division of NC DEQ, currently administers a comprehensive regulatory program to minimize and mitigate impacts to wetlands, streams, and open waters. Impacts to wetlands, streams, and open waters in North Carolina are primarily regulated under three categories. **404 Wetlands:** The USACE is the federal agency responsible for issuing permits pursuant to Section 404 of the Clean Water Act. These permits are required for the discharge of fill material into streams, wetlands and open waters. **Coastal Area Management Act (CAMA) Wetlands:** Along with being subject to Section 404 rules, CAMA permits are required under the Coastal Area Management Act and are issued by the North Carolina Division of Coastal Management (NC DCM) for development projects within one or more of North Carolina's twenty coastal counties in or affecting an Area of Environmental Concern. **Isolated/Non-404 Wetlands:** According to the EPA's June 2007 Guidance, a wetland that does not have a significant nexus to a Traditionally Navigable Waterway (i.e., isolated wetland) is not protected under Section 404 of the Clean Water Act and therefore is not under USACE jurisdiction. Since isolated wetlands perform many of the same functions as other wetlands, impacts to isolated wetlands in North Carolina are subject to state permitting and compensatory mitigation requirements under 15A NCAC 02H .1300.

Section 401 of the Clean Water Act stipulates that no federal permit or license, including 404 permits, will be issued unless a 401 Water Quality Certification has been issued or waived. 401 Certifications are required for any federally permitted or licensed activity that may result in a discharge to or filling of streams, wetlands or open waters. NC DWR requires applicants to document measures taken to avoid and minimize impacts to these resources during the design of the projects and to perform compensatory mitigation in accordance with the 401 Water Quality Certification requirements in 15A NCAC 02H .0506. The 401 process essentially provides verification by NC DWR that a given project authorized by a federal permit will not contravene the water quality standards provided in 15A NCAC 02B .0200.

*North Carolina Wetland Compensatory Mitigation (State):*

North Carolina's 401 Water Quality Certification Program has compensatory mitigation requirements for 404 wetland and isolated/non-404 wetland impacts. For 404 wetlands, 15A NCAC 02H .0506(h)(6) states that all mitigation proposals shall provide for replacement of wetland area lost due to proposed activity at a minimum of 1:1 through restoration or creation

prior to utilizing enhancement or preservation to satisfy the mitigation requirements, unless NC DWR's Director determines that the public good would be better served by other types of mitigation. For isolated wetlands, 15A NCAC 02H .1300 requires 1:1 mitigation of wetland acreage if impact notification thresholds are triggered, and specifies that the mitigation must include restoration or creation, unless NC DWR's Director determines that the public good would be better served by other types of mitigation. The USACE Wilmington District may have different compensatory mitigation requirements than the state, and generally requires mitigation at a ratio of more than 1:1.

On-site and off-site permittee-responsible mitigation is one option for fulfilling mitigation requirements within North Carolina. North Carolina General Statute (NCGS) 143-214.11 requires that applicants other than the State of North Carolina or the federal government who wish to purchase wetland mitigation credits to satisfy compensatory mitigation requirements for impacts to wetlands must participate in a private wetlands mitigation bank, if 1) a bank that has been approved by USACE is located in the appropriate hydrologic area (identified as eight-digit Hydrologic Unit Code (HUC)) and 2) if the bank has available and appropriate mitigation credits. Payment of a fee to the State's in-lieu fee program, NC DMS, is only available to an applicant if a private bank as described above is not available as an option. The Federal government, State agencies, including NCDOT, and county/municipal governmental entities with an existing local compensatory mitigation bank are not subject to the sequencing requirements of this legislation.

*Federal Compensatory Mitigation for Losses of Aquatic Resources; Final Rule. 2008 (Federal):*

The Federal Compensatory Mitigation for Losses of Aquatic Resources; Final Rule (33 CFR Parts 325 and 332; 40 CFR Part 230) updates and revises many aspects of compensatory mitigation nationwide. The intent of the rule is to establish standards and criteria for use on all types of compensatory mitigation, including on-site and off-site permittee-responsible mitigation, mitigation banks, and in-lieu fee mitigation to offset unavoidable impacts to waters of the U.S. through issuance of USACE permits. The rule reinforces the applicability of the CWA §404(b)(1) guidelines to all projects permitted by the USACE. The rule includes definitions, general compensatory mitigation requirements, requirements for planning and documentation, mitigation performance standards, and monitoring and management requirements. The rule also provides details on the necessity of applying a watershed approach when establishing mitigation requirements and details on the operation of mitigation banks and in-lieu fee programs. This rule supersedes, in whole or in part, some previous guidance documents, regulatory guidance letters (RGLs), and memoranda relating to compensatory mitigation.

*Wetland Classifications (State):*

Classifications for surface waters in North Carolina are outlined in 15A NCAC 02B .0101. Certain classifications are subject to more stringent levels of protection depending upon their use, uniqueness, and/or sensitivity to pollutants. In North Carolina, all wetlands are classified as

either “WL” (freshwater wetlands) or “SWL” (saltwater wetlands) pursuant to 15A NCAC 02B .0101(c)(8) and (d)(4). The class SWL wetlands are defined to coincide with the estuarine wetlands that are regulated by the NC DCM. North Carolina also has a supplemental classification “UWL” (unique wetlands) which includes “wetlands of exceptional state or national ecological significance” and require special additional regulatory protection to maintain existing uses pursuant to 15A NCAC 02B .0101(e)(7). Data collected as part of North Carolina’s monitoring and assessment program was instrumental in securing this level of protection for UWLs. The dichotomous key that accompanies the NC WAM manual can also be used to classify a wetland as one of the 16 general wetland types occurring in NC.

Water Quality Standards (State):

North Carolina’s water quality standards for streams and/or open waters are contained in 15A NCAC 02B .0211 - .0222, and are dependent on use classifications. These water quality standards were designed to protect various uses, such as aquatic life propagation, biological integrity, secondary recreation, etc.

North Carolina’s water quality standards for wetlands were implemented in 1996. The wetland standards contained in 15A NCAC 02B .0231 are narrative in nature (non-numeric) and were designed to protect, preserve, restore and enhance the quality and uses of wetlands and other waters of the state that are influenced by wetlands. Wetland uses (or services) protected in the rule include the following:

- Storm and flood water storage/retention;
- Hydrologic functions such as groundwater discharge and groundwater recharge;
- Filtration/storage of pollutants;
- Shoreline protection; and
- Habitat for the propagation of wetland-dependent aquatic organisms and other wildlife species.

The uses outlined above are maintained and/or enhanced through standards contained in 15A NCAC 02B .0231 (b) which states the following:

- Liquids, fill or other solids or dissolved gases may not be present in amounts which may cause adverse impacts on existing wetland uses;
- Floating or submerged debris, oil, deleterious substances, or other material may not be present in amounts which may cause adverse impacts on existing wetland uses;
- Materials producing color, odor, taste or unsightliness may not be present in amounts which may cause adverse impacts on existing wetland uses;
- Concentrations or combinations of substances which are toxic or harmful to human, animal or plant life may not be present in amounts which individually or cumulatively may cause adverse impacts on existing wetland uses;

- Hydrological conditions necessary to support the biological and physical characteristics naturally present in wetlands shall be protected to prevent adverse impacts on:
  - Water currents, erosion or sedimentation patterns;
  - Natural water temperature variations;
  - Chemical, nutrient and dissolved oxygen regime of the wetland;
  - Movement of aquatic fauna;
  - The pH of the wetland; and
  - Water levels or elevations.
- The populations of wetland flora and fauna shall be maintained to protect biological integrity as defined at 15A NCAC 02B .0202.

These narrative standards have provided NC DWR with the basic regulatory structure needed to protect wetlands from various detrimental activities such as ditching and draining. NC DWR has also utilized these standards to require some mining operations to maintain natural hydrology of surrounding wetlands that may be affected by groundwater pumping.

Finally, the State's Antidegradation Standard (15A NCAC 02B .0201), as required by the federal Antidegradation policy (40 CFR 131.12), explicitly refers to wetlands and also provides an important mechanism of protection for wetlands in North Carolina.

Activities deemed to comply with wetlands standards are outlined in 15A NCAC 02B .0230. These activities do not require Section 404 permits; therefore, no 401 Water Quality Certification is required. North Carolina's program plan for water quality standards is addressed in Core Element 4 of this document (Water Quality Standards for Wetlands).

*Session Law 2013-413 (House Bill 74) §150B-21.3A. Periodic Review and expiration of existing rules* (State):

According to §150B-21.3A, except for rules that were adopted to “conform to or implement federal law”, “Each agency subject to this Article shall conduct a review of the agency’s existing rules at least once every 10 years”. As part of the review process they shall make an initial determination and categorize each rule as “(i) necessary with substantive public interest, (ii) necessary without substantive public interest, or (iii) unnecessary”, then post their findings for public comment. All rules accepted as necessary will be readopted as though they are new rules, while any deemed unnecessary or not reviewed in time will expire. Rules related to wetlands and surface water quality that were adopted by the Environmental Management Commission (EMC) were to be reviewed in the first year. The NC DWR: 401 & Buffer Permitting Unit reviewed the 401, buffer, and isolated water rules in 2014, pursuant to §150B-21.3A. In 2015-2017, NC DWR will be rewriting and adopting revised rules based on comments and recommendations made during the 2014 review process.

Local Governments (local ordinance):

Local governments also play an important role in protecting wetlands from impacts caused by certain land use activities. Local governments can adopt wetland strategic plans which can consider wetland functions and values on a landscape-scale, work with other environmental protection efforts, evaluate and respond to cumulative impacts, coordinate mitigation banking efforts, and prioritize protection areas (North Carolina State University <http://www.water.ncsu.edu/watershedss/>). Along with wetland strategic plans, local governments may also have programs administered through local ordinances that protect surface and ground water that, in turn, may influence wetlands. These local programs include those that require management of stormwater, riparian buffers, solid waste, hazardous waste, sewage collection systems, localized water quality problems (e.g., nutrients in the Neuse and Tar-Pamlico rivers), and sedimentation pollution control. These programs are typically required by state or federal regulations like NPDES, State Stormwater Program, Water Supply Watershed Protection Act, Sedimentation Pollution Control Act, Nutrient Management Strategies, North Carolina Pesticide Board, and other clean water legislations (e.g., septic tanks and pretreatment programs) (Whisnant and Heath, 2007). Local governments often tailor their local programs to meet the unique needs and challenges of their communities which can result in further strengthening of the protections offered by these federal and state regulations.

**THE GOAL**

The goals of the Regulation portion of the NC WPP are to use wetland monitoring and assessment data in conjunction with wetland regulations that are already in place in order to improve North Carolina's wetland regulatory program in areas where concerns have been expressed (e.g., clarity, consistency, and efficiency in program operations), and continue with ongoing evaluation of the program.

**THE PLAN**

To accomplish the NC WPP Regulation goals, the NC WPP proposes that North Carolina clearly define the jurisdictional scope of the current regulatory program, administer regulatory activities efficiently and consistently, and evaluate regulatory activities to ensure environmental results. These proposals will improve the state's ability to work with the citizens to wisely manage wetland resources in North Carolina.

The following activities are proposed as part of the NC WPP over the next five years:

## OBJECTIVES

### **OBJECTIVE 1: Clearly define the jurisdictional scope of regulatory programs**

As described above, along with the USACE 404 program, NC DEQ regulates a comprehensive scope of activities through the 401, CAMA, Isolated Wetland, Erosion and Sedimentation, and Stormwater Permitting programs along with the Water Quality standards. Waters of the state are defined in NC General Statute 143-212(6) and water classifications and regulated activities are described in 15A NCAC 02B .0100, 02B.0200, 02B.0300, 02H.0500, and 02H.1300.

**ACTION 1.1:** Clearly identify the comprehensive scope of wetland activities that are regulated.

*Program Capacity Development: North Carolina has a comprehensive scope of regulated activities. Publicly identifying the regulation of various wetland sizes, types, locations, etc. can improve the understanding and/or protection of these various communities.*

#### ACTIVITIES:

- a) Provide information on the current level of protection of certain wetland types or geographic areas (e.g., isolated wetlands, wetland sites with reference condition and/or heritage value (e.g., cypress swamps, old-growth forests), wetlands near streams with state and/or federally protected species nearby or downstream) [2015-2017]
- b) Evaluate and identify where the state and federal regulatory programs are different/inconsistent from each other and determine how the differences/inconsistencies affect the aquatic resources [2015-2016]
- c) Investigate ways to improve tracking of cumulative impacts within and across agencies [e.g., 404/401 programs, NC DCM, NC DEMLR for mining, stormwater, etc., USACE, logging permits outside of the permitting process] [2017-2018]

**ACTION 1.2:** Provide clear guidance to the public on how to identify jurisdictional waters and activities that may require a 401 Water Quality Certification or Isolated Waters permit.

*Program Capacity Development: Clear guidance on how to identify waters of the state and what activities require authorization will decrease the likelihood of violations and increase compliance rates.*

#### ACTIVITIES:

- a) Seek sustainable ways to continue to provide guidance and support training on Surface Water Identification Training and Certification (SWITC) [2015] (for resource professionals)
- b) Seek sustainable funding to continue to provide guidance and support training on NC WAM (to identify wetland types and to determine a wetland's functional value relative to reference condition) and NC SAM (to determine a stream's functional value relative to reference condition) [2015-2016] (for resource professionals)

**OBJECTIVE 1 (cont.): Clearly define the jurisdictional scope of regulatory programs**

- c) Create a document summarizing all existing regulations affecting wetlands (for landowners/general public)
  - i. Summarize the existing regulations (e.g., what activities require what authorization) [2015-2016]
  - ii. Summarize the implications (purpose, impacts, etc.) of such regulations and how the regulations, or lack of such regulations, in general, impact economic, water quality, and aesthetic aspects [2017-2018]
  - iii. Summarize, in general, the quantitative and qualitative measures of regulatory success (impacts on water quality, hydrology, habitat, storm protection, carbon sequestration, etc.) [2018-2019]
  - iv. Provide outreach and education to the general public and high use groups (e.g., city officials, planners, real estate agents, consultants) [yearly]
- d) Provide transparency on existing guidance documents and on future guidance documents that will be promulgated in a rational and legal way [yearly] (for landowners/general public)
- e) Educate the regulated community regarding permitting impacts to wetlands and waters as a joint effort among several agencies and/or local governments [2015-2019] (for government employees, resource professionals, and landowners/general public)

**ACTION 1.3: Conduct ongoing Short and Long-term Evaluation**

*Program Capacity Development: Periodic review of the Regulatory program will improve the regulatory process and the responsiveness of the program to the changes in environmental needs and the corresponding scientific knowledge.*

**ACTIVITIES:**

- a) Evaluate the status of regulatory program funding resources and determine the most efficient use of those funds [yearly]
- b) Periodic review of the regulatory programs to ensure aquatic resources are not being overlooked and are regulated as needed in an efficient and effective manner (NC House Bill 74 Part I Section 3 and §150B-21.3A) [2014, then, at a minimum, every 10 years]
- c) Conduct historical analysis (GIS tools, past aerial photography, agency permit files, etc.) to determine the approximate dates of hydrologic modifications in areas mapped as wetlands in the NWI and help determine if “special case” analysis is needed to determine if wetlands in altered areas are jurisdictional. [2018-2019]



**OBJECTIVE 2: Administer regulatory activities efficiently and consistently**

NC DWR implements regulatory timelines for review of and response to permit applications including 401 Water Quality Certifications which are reviewed in conjunction with the USACE's 404/Section 10 Permits. NC DWR works to administer its regulatory program in an efficient and consistent manner. Continued work with the regulated community and ongoing evaluation of the regulatory program will improve efficiency and consistency of the program.

ACTION 2.1: Develop and operate according to a clear and effective set of criteria for reviewing and responding to applications

*Program Capacity Development: Providing the regulated community with the available permit application submittal and review criteria and guidelines will enhance the efficiency of the permitting program by decreasing the amount of incomplete or inaccurate applications and will improve the consistency of the permit review process.*

**ACTIVITIES:**

- a) Identify methods (e.g., permittee questionnaire, permittee complaints, review of permit decisions) for determining inconsistencies within the permitting process [2015-2016]
- b) Identify methods for measuring improvements in efficiency and clarity (e.g., surveys, evaluation metrics) [2016-2017]
- c) Refine the publicly accessible review criteria for permit applications and compliance guidelines to provide consistency in interpretation and consistency in the permit review, implementation, and evaluation of compliance (e.g., consistent timelines, single request for more information) (Note: individual permit applications vary in scope and complexity so some reviews may require more time and effort than others) [2016-2017]
- d) Improve on areas of inconsistency within the permitting process [2017-2019]

ACTION 2.2: Coordinate among agencies, programs, and industry groups to reduce duplicative efforts by the programs and the regulated public

*Program Capacity Development: Eliminating redundancy and improving program coordination will improve the efficiency and consistency of the regulatory programs.*

**ACTIVITIES:**

- a) Reconcile rules (e.g., 401 with isolated waters, state with federal) where possible [2015]
- b) Continue to coordinate and improve upon program implementation among state and federal agencies [yearly]
  - i. Determine where the various programs overlap
  - ii. Reduce redundancy
  - iii. Increase resources in needed areas
  - iv. Share data across agencies

**OBJECTIVE 2 (cont.): Administer regulatory activities efficiently and consistently**

- c) Investigate programmatic changes that could increase the efficiency of the 401 permitting program (e.g., 404 assumption, State Programmatic General Permits (SPGP), review of the DWR/USACE joint review process) [2015-2017]

ACTION 2.3: Ensuring effective mitigation for authorized impacts

*Program Capacity Development: Mitigation is currently required for certain approved permits. Continued refinement of the mitigation requirements based on monitoring and assessment data and other acquired scientific data, will improve the quantity and quality of successful mitigation projects.*

ACTIVITIES:

- a) Update the NC Wetland Mitigation Guidance Document as necessary to provide restoration and management guidance specific to wetland types and locations within watersheds (USACE is currently the lead agency) [2015+]
- b) Review criteria for mitigation proposals, including the monitoring plan and establishment of success criteria determination and/or protocols (e.g., consideration of full-year assessment of hydrologic criterion) (performed in large part by NC's Interagency Review Team (IRT)) [2015-2017]
- c) Evaluate ways of determining the amount of wetland mitigation required based on the assessment of the amount of wetland functions that are lost with a permitted impact [2017-2019]

ACTION 2.4: Track and/or evaluate permit activities

*Program Capacity Development: Tracking and evaluating the regulatory programs will improve program consistency and efficiency, and it will allow for programmatic improvements.*

ACTIVITIES:

- a) Develop and apply consistent performance metrics that can be tracked across and between programs [2015-2016]
- b) Provide web links to publicly accessible wetland monitoring and assessment tracking systems for stream and wetland impacts and mitigation (e.g., databases, interactive maps) [yearly]
- c) Determine if there are any resources (e.g., water quality, wetland types, aquatic species) in certain locations that need additional enhancement or restoration through flexible mitigation options (may need to go outside of the HUC or watershed, areas around known T&E or state listed species, especially landscape scale projects) [2017-2019]
- d) Evaluate the permitting program [2017-2019]
  - i. Examine the cost efficiencies for the state and permit applicants
  - ii. Examine the economic cost/benefit analysis, including ecosystem services, of regulations and/or modifications to regulations

**OBJECTIVE 2 (cont.): Administer regulatory activities efficiently and consistently**

- iii. Identify regulatory/permitting impediments to wetland restoration and mitigation
- iv. Identify regulatory disincentives that result in non-compliance (e.g., applicants unwilling to go through the hassle of the permitting process)

**OBJECTIVE 3: Evaluate regulatory activities to ensure environmental results**

NC DWR values the importance of evaluating the water quality regulatory programs in order to protect the waters of the state and to provide exceptional service to the regulated community. Permitted impact and mitigation activities, average review times, compliance visits, etc. are assessed on a quarterly basis. It is important to continue to review the most recent science (e.g., monitoring and assessment data, biological and hydrologic functions and metrics, value of ecosystem services, stormwater and sediment erosion control methods) to make appropriate updates to the various permits and conditions (e.g., mitigation success requirements), and to make sure that all current and updated information is made publicly available.

**ACTION 3.1:** Enforce aquatic resource protection

*Program Capacity Development: The protection of the state's water quality will improve with continued focus on enforcement and compliance mechanisms to work with sites that may be in violation of current state regulations.*

**ACTIVITIES:**

- a) Examine whether to place additional focus on the monitoring of impacts, follow-up, compliance, and enforcement within the Water Quality Permitting Section, Wetlands Branch (short and long-term) [2015-2019]
  - i. Utilize monitoring and assessment data
  - ii. Use wetland function and ecosystem services as a measuring tool

**ACTION 3.2:** Ensure impact assessments and mitigation crediting lead to replacement of aquatic resources with similar structural, functional or condition attributes at a watershed scale.

*Program Capacity Development: The use of monitoring and assessment data and additional scientific information, as well as addressing the flux in environmental condition, will provide the greatest success in replacing the state's aquatic resources.*

**ACTIVITIES:**

- a) Continue to examine opportunities for flexibility in mitigation by looking at local needs and specific resources (e.g., alternative mitigation methods, watershed planning, stormwater and sediment erosion control methods, preservation in threatened areas) [yearly]

**OBJECTIVE 3: Evaluate regulatory activities to ensure environmental results (cont.)**

- b) Continue to examine opportunities for flexibility in using alternative measures to achieve compliance (e.g., higher credit for higher quality wetlands, additional site management like prescribed burns, hydrologic-function metrics) [yearly]
- c) Examine opportunities to develop or utilize assessment methods to improve regulatory consistency [yearly]
- d) Evaluate and/or develop standardized tools or methodologies for locating reference sites [2017-2019]
- e) Evaluate current mitigation success criteria including hydrology and herbaceous vegetation and examine success criteria/methodologies based on the current science [2017-2019]
- f) Address how to equally value protection of existing waters vs. improving impaired waters [2017-2019]
- g) Prioritize use of available funding [yearly]

## **CORE ELEMENT 3: VOLUNTARY RESTORATION AND PROTECTION**

### **BACKGROUND**

Voluntary restoration and protection includes improvements in, and protection of, wetlands that are not required by state or federal laws or mandates. Individuals, resource groups or agencies, local communities, and nonprofit organizations often implement this voluntary work. The goals of the projects may include but are not limited to improvements in habitat, flood and stormwater management, recreation, and/or water quality. Efforts made to restore or protect wetlands using voluntary methods may include paying landowners to change land altering practices (e.g., cultivation, grazing), purchasing of wetland land titles or easements by various land trust groups, or removing invasive species and/or planting native vegetation within or near wetlands.

Voluntary restoration and protection programs are paramount in accomplishing “no net loss” of wetlands, announced as a 1989 administration policy (Votteler and Muir, 1996), and also play a crucial role in achieving a net gain in wetlands over the long term (Council on Environmental Quality, 2005) . Voluntary restoration and protection in North Carolina is encouraged and implemented on federal, state, local, and public-private partnership levels. At the federal level, agencies like the United States Department of Agriculture (USDA), Fish and Wildlife Service (USFWS), and USACE work to provide opportunities for voluntary restoration and protection of wetlands. The USDA’s Natural Resources Conservation Services’ Wetland Reserve Program (NRCS-WRP) is one such program. It is a voluntary program where land owners receive incentives for restoring, enhancing and protecting wetlands.

The North Carolina Wetlands Partnership was established in 1997 to promote the conservation of wetland, riparian buffer, and watershed values. This group consisted of individuals from federal, state, non-profit and private interest groups focused on identifying wetlands needing conservation, developing strategies for wetland and watershed conservation, providing public outreach and education, and supporting local efforts to conserve, preserve and restore wetlands and watersheds. NC DEQ divisions, like NC DCM, have programs that provide opportunities for individuals or groups to understand the state’s wetland restoration and protection goals while offering them a way to volunteer to be part of the process. Some of the ways to get involved include the donation of land or placement of a parcel of land under an easement or contract, as with Wildlife Resources Commission’s (WRC) Wildlife Conservation Land Program, the NC Conservation Tax Credit Program, and various land trust groups throughout the state such as the Conservation Trust for North Carolina. Other types of voluntary research, conservation, and restoration projects can also be funded through programs like the NC Division of Soil and Water Conservation’s Agricultural Cost Share Program, the NC Division of Water Infrastructure funding programs, and the Clean Water Management Trust Fund.

Local governments play an important part in protecting and restoring the water resources throughout the state (e.g., financing water quality improvements, motivating the development of innovative solutions to water quality and water supply issues, leveraging watershed protection fees). Groups that represent and have the vested interest of the local governments in mind also work diligently to improve waters throughout the state. The NC Regional Councils, NC League of Municipalities, and the NC Association of County Commissioners are a few of the groups that represent the interest of the local governments when it comes to protecting and improving water quality. Water utility facilities (e.g., water supply and water treatment facilities), Riverkeeper organizations, and conservation groups work on a local level to protect the water resources within their immediate area.

Numerous advocacy groups (e.g., The Nature Conservancy, Environmental Defense Fund, NC Sierra Club) and conservation groups that work with voluntary restoration projects (e.g., land trust and conservancy groups, NC Coastal Federation) strive to protect and restore water resources throughout the state. Various groups are often able to obtain and sometimes provide funding sources for work in these important ecosystems. Special-interest groups and professional organizations can have a statewide influence on the restoration and protection of aquatic resources.

Independent work as well as consolidated efforts can be combined to ultimately contribute to the increase in amount, function, services, value, and/or condition of the aquatic resources across the state. Voluntary protection and restoration of wetlands throughout the state can provide additional storm buffers, prevent erosion, help abate flooding, moderate groundwater levels and stream flow, filter/assimilate nutrients, improve water quality, provide economic benefits, increase recreational and aesthetic values, improve wildlife habitat, and accomplish watershed goals. The wetland program plan for voluntary restoration and protection of wetlands is aimed at improving the collaborative efforts to protect and restore North Carolina's wetlands.

### **THE GOAL**

The goal of the Voluntary Restoration and Protection portion of the NC WPP is to provide voluntary restoration and protection providers with tools that can help them address the goals of their project and actions that can be taken to achieve project success.

### **THE PLAN**

To accomplish the NC WPP Voluntary Restoration and Protection goal, the NC WPP proposes that North Carolina define restoration and protection goals throughout the state; promote the protection of wetlands from degradation and destruction; encourage restoration of wetland acres, condition, and function; and provide technical guidance for voluntary restoration and protection. These proposals along with an increase in public outreach and education concerning voluntary restoration efforts in North Carolina can improve collaborations and the sharing of data among groups conducting voluntary restoration projects.

Unless required through the permitting process, all items listed in the Voluntary Restoration and Protection portion of the document are suggestions or recommendations and are voluntary in nature.

The following activities are proposed as part of the NC WPP over the next five years:

## **OBJECTIVES**

### **OBJECTIVE 1: Clearly and consistently define restoration and protection goals throughout the state**

Many agencies, groups, organizations and individuals throughout the state of North Carolina are involved with protecting and restoring wetlands on a voluntary basis. To accomplish the greatest good for the resource, it is important to understand the restoration and protection goals that exist statewide so everyone can attain their goals. The state's aquatic resources can greatly benefit from planning on a watershed scale and taking multiple project goals into account (e.g., wildlife habitat, water quality protection, economic benefit) when selecting restoration/protection sites.

**ACTION 1.1:** Establish goals that are consistent or compatible across relevant agencies  
*Program Capacity Development: Collaborative efforts to establish goals for voluntary restoration and protection projects will provide greater focus and likelihood of success in protecting and improving the quality of the state's aquatic resources.*

#### **ACTIVITIES:**

- a) Compile a summary document listing agencies and organizations that provide voluntary restoration and protection opportunities [2015-2016]
  - i. List restoration/protection goals
  - ii. List restoration strategies (priorities, planning methods, project coordination, restoration techniques, etc.)
  - iii. List target timeframes for project and restoration goal completion
  - iv. Highlight restoration priorities and goals that are shared by multiple agencies and organizations, or that have a clear nexus with parallel restoration efforts
- b) Provide access to available data on voluntary wetland restoration locations, class, and condition/function [2015-2017]
- c) Encourage collaboration and/or use of state funds to enhance federal projects (e.g., NRCS-WRP) [yearly]
- d) Investigate the formation of a collaborative group that would jointly evaluate and assist with voluntary restoration/protection projects [2016-2017]
- e) Evaluate the goals of current stewardship programs and provide recommendations for improvement [2017-2019]
- f) Develop public outreach tools to encourage voluntary restoration [2017-2019]

**OBJECTIVE 1 (cont.): Clearly and consistently define restoration and protection goals throughout the state**

ACTION 1.2: Consider watershed planning, wildlife habitat, and other factors when selecting restoration/protection sites, project goals, and restoration techniques

*Program Capacity Development: When selecting restoration sites, higher priority may be given to sites that can maximize a suite of ecosystem services, especially improvements in water quality. Selecting restoration/protection sites based on the goals of the proposed project (e.g., watershed, species, or resource needs) may maximize the benefit of designated ecosystem services.*

**ACTIVITIES:**

- a) Seek public opinion on restoration needs and/or site locations [2015-2016]
- b) Compile a list of existing strategies for locating and prioritizing voluntary restoration and protection projects [2015-2016]
- c) Gather and compile information on various voluntary restoration systems' restoration techniques and their level of success (e.g., planting or seeding methods, mulching, pre-burning) [2015-2016]
- d) Develop methods (e.g., database, website) for sharing priority items, locations, etc. with other agencies, groups, and organizations [2017-2019]
- e) Develop and maintain accurate and up-to-date inventory (including ecosystem services estimates, like carbon sequestration, hydrology, or water quality) of wetlands, especially maps [2017-2019]
- f) Provide information to help encourage natural, self-sustaining restoration outcomes that do not require ongoing maintenance. [2017-2019]
- g) Develop and apply tools to identify and prioritize restorable wetlands (Delaware has a similar tool) [2017-2019]
- h) Identify and prioritize sites for restoration/protection based on: [2017-2019]
  - i. rare, vulnerable, or important wetlands (e.g., wetland types, corridors, complexes)
  - ii. state and federally listed endangered and threatened species whose habitat needs protection
- i) Develop a strategy to help identify and rank voluntary restoration project sites to maximize the ecosystem services provided by the project (e.g., improved water quality; hydrology; habitat; overall functionality; carbon sequestration, especially in peat based wetlands). [2017-2019]
  - i. Identify ways to coordinate restoration efforts with other social or economic benefits (e.g., improved agricultural production through tail water recovery, monetary pay out, increase in functionality by 5% to 10%, salt marsh restoration to promote improvements related to carbon sequestration and sea level rise)
- j) Use monitoring and assessment data for: [2017-2019]
  - i. creating appropriate goals for restoration success, beginning with hydrology



**OBJECTIVE 1 (cont.): Clearly and consistently define restoration and protection goals throughout the state**

- ii. spatial prioritization/ranking of wetlands to target restoration areas within watersheds
- k) Train restoration partners how to establish appropriate restoration goals and how to use proven restoration techniques [2019]

**OBJECTIVE 2: Promote protection of wetlands from degradation or destruction**

One initial step in preventing the degradation or destruction of wetlands is to preserve and protect them. Encouraging, promoting, and practicing wetland protection on a voluntary basis will help further the protection of wetlands within North Carolina.

ACTION 2.1: Establish partnerships to leverage additional protection

*Program Capacity Development: Many groups within NC work to protect the wetlands throughout the state, but concerted efforts in wetland protection can go much further in protecting the state's aquatic resources (e.g., rare and unique wetlands: like mountain bogs, fens, etc.)*

ACTIVITIES: [yearly]

- a) Publicize the summary document that lists agencies and organizations providing voluntary restoration and protection opportunities (from Objective 1, Action 1.a. above)
- b) Track partnership projects (partners and project details)

ACTION 2.2: Encourage long-term protection, using mechanisms such as incentives, purchase of land title or easements, watershed protection fees, etc. to protect wetlands.

*Program Capacity Development: Some individuals care about wetlands and their benefits enough to voluntarily protect their wetlands, but some individuals need an additional incentive to protect wetlands for ecosystem services. Providing additional incentives will increase the likelihood of individuals offering their land for protection.*

ACTIVITIES:

- a) Track location, acres, and functional/service attributes of protected wetlands [2015-2016]
- b) Survey property owners, request useful incentives for implementing long-term protection on their property [2015-2016]
- c) Investigate the benefits and drawbacks of providing additional incentives such as: [2015-2016]
  - i. Title restrictions as a match for funding options
  - ii. Tax incentives for investors in voluntary restoration projects or habitat conservation efforts
  - iii. Term contracts versus perpetual easements

**OBJECTIVE 2 (cont.): Promote protection of wetlands from degradation or destruction**

- iv. More encouragements for property acquisition and/or restoration through local governments, stormwater utilities, and other agencies
  - v. Utilize existing Federal and State Hazard Mitigation Grant Programs to include wetland protection as a mitigation benefit
  - vi. Payment in lieu of taxes (PILTs)
  - vii. Ecosystem service based financial incentives
- d) Develop management plans for protected wetlands [2016-2017]

**OBJECTIVE 3: Encourage restoration of wetland acres, condition, and function**

Restoration of wetland acres, condition, and function are important towards achieving “no net loss” and an "overall increase" in wetland extent, function, and quality. Continued collaborations between groups will assist in achieving this end.

ACTION 3.1: Increase wetland acreage and improve natural wetland conditions, functions, and services through restoration

*Program Capacity Development: Assisting project coordinators with possible techniques for wetland monitoring and post restoration assessments of the ecosystem services provided by a site will improve the success of current methods, and the success, economy, and efficiency of future restoration endeavors.*

**ACTIVITIES:**

- a) Survey wetland restoration practitioners and compile a list of successful techniques for, and timing of, pre- and post- evaluation of voluntary restoration sites [2017-2018]
- b) Document and map impacts and results of wetland restoration efforts [2018-2019]
- c) Develop means of measuring the positive impacts voluntary restoration projects are having on local ecology, hydrology, water quality, etc. [2019]

ACTION 3.2: Establish partnerships to leverage more voluntary restoration

*Program Capacity Development: Restoration efforts can be greatly enhanced by combining the efforts of more than one group. An up-to-date list of entities providing wetland restoration, as well as a list of restoration projects, can connect parties with similar goals and/or interests to produce larger and/or more successful restoration projects.*

**ACTIVITIES:**

- a) Publicize the summary document listing agencies and organizations that provide voluntary restoration and protection opportunities (from Action 1.1.a. above) [2016]
- b) Provide information to the public on possible funding sources to facilitate restoration projects (e.g., USFWS Partners Program, Five Star and Urban Waters Grant, Federal Emergency Management Agency (FEMA) Hazard Mitigation Assistance Grants) [2016-2019]

**OBJECTIVE 3 (cont.): Encourage restoration of wetland acres, condition, and function**

- c) Provide public access to the NC DWR mitigation database data (see Action 4.1.a. below) to facilitate coordinated efforts on projects [2017-2019]
- d) Foster the development of close working relationships among conservation organizations, groups, etc. (e.g., The Nature Conservancy, Riverkeepers, land trusts) [2017-2019]

**OBJECTIVE 4: Providing technical guidance for voluntary restoration and protection**

Maintaining data on voluntary restoration and protection projects in the state is important to maintaining an understanding of the status of our wetland resources protection in terms of acreage, function and quality. Continuing review of the most recent scientific results is essential for making appropriate updates to the various monitoring and assessment practices (e.g., establishing appropriate restoration goals, measurements of success), and for ensuring that all current and updated information is made publicly available.

ACTION 4.1: Inventory restoration/protection sites to provide suggestions and assist with implementation, management, and linkage to relevant watershed planning efforts

*Program Capacity Development: Inventorying the restoration and protection sites will support the implementation of voluntary mitigation projects. The goal is to help the voluntary restoration projects succeed by evaluating the project's progress towards meeting the proposed goals or success criteria and providing the proposed ecological services.*

ACTIVITIES: [yearly]

- a) Evaluate and share information on effective voluntary restoration methods
- b) Evaluate and share information on successful voluntary restoration/protection sites
- c) Regularly report on the effectiveness of restoration methods and/or sites
- d) Provide information on locations and data from monitoring results, successes, and failures
- e) Identify sustainable funding sources for those wanting to monitor their voluntary restoration sites (currently not available/allowable with most restoration funding)

ACTION 4.2: Include voluntary restoration/protection projects in an electronic database

*Program Capacity Development: Including the voluntary restoration and protection projects in an electronic database will provide a more accurate picture of whether "no net loss" of wetlands is being accomplished in North Carolina.*

ACTIVITIES:

- a) Begin utilizing an electronic database to store voluntary wetland mitigation data [yearly]
- b) Utilize GIS so restoration project locations and site data can be viewed and analyzed in a spatial context and assessed for overall watershed hydrological and water quality conditions and functions [2017-2019]

**OBJECTIVE 4 (cont.): Providing technical guidance for voluntary restoration and protection**

ACTION 4.3: Examine impediments to restoration

*Program Capacity Development: Assessing and recommending changes to the regulatory process for voluntary restoration and protection projects may improve the willingness for participation and efficiency of the voluntary restoration process.*

ACTIVITIES: [2017-2019]

- a) Review existing state and federal regulations to identify regulatory impediments to voluntary restoration projects (e.g., additional permit fees, review of additional plans) and work to promote and expedite (e.g., predetermined Best Management Practices (BMP)) for wetland restoration projects, restoration rules designed for restoration projects), not inhibit, restoration efforts
- b) Balance short-term impacts with long-term gains
- c) Identify reasons for public drive for wetland protection or restoration
- d) Determine possible non-regulatory incentives for wetland protection (e.g., linking with planning efforts, conservation easements, land conservancies, watershed associations)

## **CORE ELEMENT 4: WATER QUALITY STANDARDS FOR WETLANDS**

### **BACKGROUND**

As described in detail in the “Background” for the “Core Element 2: Regulation” section of this document, waters of the state are defined in NC General Statute 143-212(6) and water classifications and regulated activities are described in 15A NCAC 02B .0100, 02B.0200, 02B.0300, 02H.0500, and 02H.1300.

North Carolina wetlands are waters within the State’s Water Quality Program. In 15A NCAC 02B .0202(71), “[w]etlands are “waters” as defined by G.S. 143-212(6) and are areas that are inundated or saturated by an accumulation of surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas. Wetlands classified as waters of the state are restricted to waters of the United States as defined by 33 CFR 328.3 and 40 CFR 230.3.” North Carolina currently has narrative water quality standards for wetlands. The goal of these standards is “to protect, preserve, restore and enhance the quality and uses of wetlands and other waters of the state influenced by wetlands.”

As defined in 15A NCAC 02B .0231, NC’s current narrative rules protect the designated uses of wetlands. Narrative standards (e.g.; “Materials producing color, odor, taste or unsightliness may not be present in amounts which may cause adverse impacts on existing wetland uses.” 15A NCAC 02B .0231) tend to be more adaptable to wetlands than do more discrete numeric standards (e.g.; water quality standards for class C waters: “Cholorphyll a (corrected): not greater than 40 µg/l..., Dissolved oxygen: not less than 6.0 mg/l for trout waters...” 15A NCAC 02B .0211) due to the variety in wetland type, size, location, hydrologic condition, vegetation structure, flow patterns, etc. These narrative water quality standards have been designed with specific goals in mind (e.g., improve public awareness, restrict use, maintain the current status of a resource, improve the quality of a resource).

### **THE GOAL**

The goal of the Water Quality Standards for Wetlands portion of the NC WPP is to support and provide consistency in applying the narrative standards.

### **THE PLAN**

To accomplish the NC WPP Water Quality Standards for Wetlands goal, the NC WPP proposes to evaluate current narrative wetland-specific water quality standards and incorporate existing wetland-specific narrative water quality standards into agency decision-making.

The following activities are proposed as part of the NC WPP over the next five years:

## OBJECTIVES

### **OBJECTIVE 1: Evaluate current narrative wetland-specific water quality standards.**

North Carolina has already established narrative water quality standards to protect the designated uses of wetlands. As with other aspects of the state's regulatory and scientific programs, it is important to assess the current information pertinent to these programs and their status. It is important to provide the best protection of these aquatic resources.

**ACTION 1.1:** Gather and analyze monitoring data and other information that will support the use of North Carolina's narrative water quality standards

*Program Capacity Development: It is important that all water quality standards be based on the most accurate and up-to-date scientific data. To this end, appropriate wetland monitoring and assessment data can be utilized to support the existing narrative wetland-specific water quality standards.*

#### ACTIVITIES:

- a) Track and report on the water quality portion of the wetland monitoring and assessment data [yearly]
- b) Investigate the implications of using wetland monitoring data to assess existing narrative water quality standards for wetlands [2015-2016]
- c) Publicize monitoring suggestions for obtaining water quality data from wetlands [2015-2016]
  - i. Provide guidance on sampling locations within the wetland (groundwater, influent, effluent, etc.)
  - ii. Provide guidance on how alternative water quality parameters (e.g., soils, macroinvertebrates) can be used to indicate the function and condition of the wetlands
  - iii. List any water quality sampling methods specific to wetland types (16 NC WAM wetland types)
- d) Determine how to use biological-integrity data to assess existing narrative water quality standards for wetlands (e.g., data along a disturbance gradient) [2017-2019]

**ACTION 1.2:** Evaluate North Carolina's current designated uses

*Program Capacity Development: It is important for North Carolina to have an accurate understanding of its current designated uses and to understand the implications for aquatic resources. This evaluation will provide greater resources and understanding for the regulated community and will shed light on any gaps in the current levels of protection.*

#### ACTIVITIES:

- a) Evaluate and provide a summary of the existing designated uses for North Carolina's wetlands [2015-2016]
  - i. Provide public outreach and education [2017-2018]

**OBJECTIVE 1 (cont.): Evaluate current narrative wetland-specific water quality standards.**

ACTION 1.3: Evaluate North Carolina’s current narrative wetland-specific water quality standards

*Program Capacity Development: It is important for North Carolina to evaluate whether the current narrative wetland-specific water quality standards are meeting their goals.*

**ACTIVITIES:**

- a) Determine how the current narrative standards are being used [2018-2019]
- b) Evaluate if existing narrative standards need to be refined (e.g., biological criteria to protect plant and animal diversity, endangered species) [2018-2019]

**OBJECTIVE 2: Incorporate existing narrative wetland-specific water quality standards into agency decision-making**

NC DWR currently has narrative wetland water quality standards established. As additional guidance becomes available, or as water quality standards are updated, various programs may use the current narrative water quality standards to strengthen their programs.

ACTION 2.1: Use existing narrative water quality standards as a guide in regulatory decisions

*Program Capacity Development: Use of existing narrative wetland-specific water quality standards can improve regulatory consistency by providing additional guidance with permitting decisions. It is important to understand how the existing narrative water quality standards are impacting the programs.*

**ACTIVITIES:**

- a) Investigate how to ensure proposed projects are meeting the existing narrative water quality standards for wetlands (e.g., hydrology) [2017-2019]
- b) Evaluate how to ensure consistency in interpretation of the standards [2017-2019]
- c) Public outreach and education:
  - i. Determine the best way to educate the public on the existing narrative water quality standards [2018-2019]
  - ii. Provide a summary of the existing narrative water quality standards, how they are implemented, and how they are relevant to North Carolina’s conditions [2018-2019]

**OBJECTIVE 2 (cont.): Incorporate wetland-specific water quality standards into agency decision-making**

ACTION 2.2: Use wetland monitoring and assessment data and existing narrative water quality standards to help guide voluntary restoration/protection and mitigation/compensation projects

*Program Capacity Development: The wetland monitoring data collected from reference and wetland restoration and/or mitigation sites can provide valuable information on the improvements in downstream water quality and ecosystem services, and the resource's ability to meet current standards. The water quality program and the wetland restoration community will both benefit from continued feedback between the programs.*

**ACTIVITIES:**

- a) IBIs developed from the wetland monitoring and assessment data will be available to help develop planning tools for restoration projects [2015-2016]
- b) Evaluate if greater mitigation value or credits can be given to mitigation projects that are affiliated with a 404 permit and are improving 303d listed waters or helping complete TMDLs (Total Maximum Daily Loads) [2016-2018]
- c) Investigate whether existing narrative water quality standards can be used in conjunction with restoration planning to strategically improve downstream water quality [2017-2019]
- d) Evaluate ways to assess how restoration projects improve downstream water quality and ecosystem services [2017-2019]
- e) Evaluate if mitigation credits can be provided for preserving the role functioning wetlands play in the removal of sediment and nutrients from the larger systems [2017-2019]

**WPP DOCUMENT SUMMARY**

North Carolina's WPP is a living document currently written to cover five years of planning (2015-2019). The NC WPP addresses all four of the EPA's Core Elements: Monitoring and Assessment, Regulation, Voluntary Restoration and Protection, and Water Quality Standards for Wetlands. This document ties together the various pieces of the Core Elements to present one cohesive plan designed to protect and improve the quality and quantity of North Carolina wetlands. Due to the hard work and efforts put forth by the stakeholder group members, a strong, cohesive document was developed to assist with the advancement of the plans for North Carolina's wetland program. The document will continue to be reviewed over the next five years so that adjustments can be made to meet the changing needs of North Carolina wetlands.



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Appendix A  
Items for Future Consideration

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## **Items for Future Consideration**

This list presents activities that were initially proposed as part of the NC WPP by NC DWR or one or more of the NC WPP Stakeholder group members (2014) (Note: not all Stakeholder group members support all of the activities presented in this list). However, neither NC DWR nor Stakeholder group members feel they can commit to commencing or completing these activities during the next five years. Those who suggested the activities do feel that, should funds and resources become available, undertaking these activities would be beneficial to the state.

### Monitoring and Assessment

- Use various types of monitoring data (ambient, basinwide, random, and NWCA) and the data from the monitoring networks to gather additional baseline data and to understand baseline wetland conditions.
- Use various types of monitoring data (ambient, basinwide, random, and NWCA) and the data from the monitoring networks to show trends in the ambient functions and conditions of wetlands.
- Track the quantity and quality of wetlands statewide (based on mapping and monitoring data)
- Identify changes in wetlands to establish a relationship between changing wetland condition and stream condition (e.g., due to human impact, climate change)
- Identify and collect data on stressors associated with changes in wetland condition and function.
- Document the condition and functions of wetlands that have been restored.
- Utilize mitigation wetland monitoring data to document the condition and functions of restored wetlands and the resulting improvements to water quality and/or impaired streams.
- Develop new wetland assessment methods or tools as needed, based on assessments of existing methods/tools.
- Evaluate if Level 2 and Level 3 monitoring data can be used to develop a Level 1 monitoring and/or assessment method to provide an additional accurate, cost efficient monitoring method.

### Water Quality Standards

- Update the wetland monitoring and assessment strategy and methodology to include the data collection necessary to provide supporting information for existing narrative water quality standards.
- Evaluate which designated uses in 15A NCAC 02B .0231 apply to which North Carolina wetland types (16 wetland types as classified using the NC WAM dichotomous key).



## **Items for Future Consideration (cont.)**

### Water Quality Standards (cont.)

- Evaluate the 16 NC WAM wetland types to determine if certain wetland types, subsets, locations, etc. need additional narrative standards to protect threatened resources.
- Investigate the possibility of creating a reference/guidance document that can show how numeric data supports the existing narrative water quality standards.

## Appendix B

### NC Wetland Monitoring High-priority Areas

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## **NC Wetland Monitoring High-priority Areas**

This list represents wetland types, locations, parameters, etc. that one or more members of the NC WPP Stakeholder group feel are important to consider as part of the wetland monitoring program in the state (Note: not all Stakeholder group members support all of the items presented in this list). The priorities in this list are activity or resource driven, and aim to prioritize by areas of high risk, vulnerability, and/or difficulty in mitigating impacts. The items are not listed in any particular order.

Consideration of these particular activities or resources is not mandatory. These are provided as activities or resources, which may be considered when trying to determine areas of interest for future projects.

Obtain baseline data for wetlands in high priority, high risk areas based on activities:

- Projected future climate change
- High development areas
- Resource extraction (e.g., cement manufacturing, phosphate mining, hydraulic fracturing, aggregate mining, groundwater extraction)

Obtain baseline data for high-priority, high risk areas based on the resource:

- Areas with state and/or federally protected species nearby or downstream
- Coastal Wetlands
- Headwater Wetlands
- Heritage or Reference sites (e.g., cypress swamps, old-growth forests)
- Isolated Wetlands
- Water supply or groundwater recharge areas

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## Appendix C

### Proposed Monitoring and Assessment Activities by Suggested Schedule

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## Proposed Monitoring and Assessment Activities by Suggested Schedule

This appendix presents the Monitoring and Assessment Activities proposed in the text of the NC WPP marked by year(s) in which the activities are suggested to take place. The list also estimates the amount or “Level of Effort” required for each activity, and lists the “Participating group/agency” that is working on or hopes to work on the respective activities. Multiple groups may work on the same activity. This list will be a useful tool in assessing progress on a yearly basis by providing a quick reference for items proposed each year. Many factors (e.g., change in staff or funding resources, change in priorities, site availability, time restrictions) may affect completion of the Activities in the suggested timeframe. The NC WPP is a living document so the participating groups/agencies or the suggested dates for the proposed Activities can be adjusted over the life of the document. Yearly review of the NC WPP will allow for any necessary adjustments to be made for projects that have been completed early or may not have been completed within the proposed timeframe.





Activity	Participating group/agency	Level of Effort	2015	2016	2017	2018	2019
<b>Objective 1: Refine and Publish the North Carolina wetland monitoring and assessment strategy</b>							
1.1.a. Establish a stakeholder group to provide input on the monitoring and assessment strategy and determine shared activities and goals	 DWR Division of Water Resources	Low	X	X			
1.1.a.i. Determine the survey types and levels of intensity needed for various wetland and/or project types	 DWR Division of Water Resources	Medium	X	X			
1.1.b. Finalize and publish North Carolina’s wetland monitoring and assessment strategy	 DWR Division of Water Resources	Low		X			
1.2.a. Conduct various types of wetland monitoring efforts such as ambient monitoring, basinwide/watershed monitoring, probability-based (random) monitoring, EPA’s NWCA [2016]	NCSU	High	X	X	X	X	X
1.2.b Focus wetland monitoring to include i. Routine, consistent, long-term monitoring data so valid data will be available and can be used for decision making purposes ii. Statewide data for certain wetland types iii. Results of permitted impacts (pre- and post-, short and long-term) on area wetlands. This monitoring may include, but is not limited to, natural and restored sites, existing site specific conditions, and long-term, adjacent effects of permitted impacts. iv. Secondary data relevant to priority resources or activities		High	X	X	X	X	X
1.2.c. Participate with the organization of a regional wetland monitoring network in the Southeast	 RTI, DWR Division of Water Resources	Medium	X	X	X	X	
<b>OBJECTIVE 2: Implement a wetland monitoring program consistent with the wetland monitoring and assessment strategy and effectively communicate monitoring activities and results with interested stakeholders</b>							
2.1.a. Formalize recommended statewide wetland monitoring protocols (utilize stakeholder group)	 DWR Division of Water Resources	Low	X	X			
2.1.b.i. Publicize the current wetland monitoring protocols	 DWR Division of Water Resources	Low	X	X			
2.1.b.ii. Update the wetland monitoring protocols based on current scientific data and project needs, and publicize any necessary changes	 DWR Division of Water Resources	Low	X	X	X	X	X
2.1.b.iii. Utilize the current wetland monitoring protocols on wetland monitoring projects	All	Low	X	X	X	X	X
2.1.b.iv. Develop QAPPs for all appropriate projects	All	Low	X	X	X	X	X
2.2.a.i. Evaluate existing tools and provide needs assessment and validation plan		Medium	X	X	X	X	X
2.2.a.ii. Validate the C of C for wetland vegetation and develop indicators of floristic quality		Medium	X	X			
2.2.a.iii. Develop hydrologic-function metrics and assessment tool		High	X	X	X		
2.2. a.iv. Develop example connections between function metrics and ecosystem services and establish targets for future function-to-service metric development		High			X	X	X
2.2.b.i. Assist with training on NC Wetland Assessment Method (NC WAM)		Medium	X	X	X	X	X



## Proposed Monitoring and Assessment Activities by Suggested Schedule

Activity	Participating group/agency	Level of Effort	2015	2016	2017	2018	2019
2.2.b.ii. Validation of NC WAM in conjunction with other monitoring projects		Medium	X				
2.2.b.iii. Engage in training for NC SAM		Medium	X	X	X		
2.2.b.iv. Validate NC SAM rapid assessment forms (Level 2) with intensive site assessments using direct measurements (Level 3)		High	X	X	X		
2.2.b.v. Continue validating NC WAM on other wetland types as projects and sufficient data warrant		Medium			X	X	X
2.2.b.vi. Continue validating NC SAM based on geographic location and stream size		Medium				X	X
2.2.c. Evaluate the feasibility of establishing a Level 2 assessment for restored wetlands to help determine the success or functionality of the wetland site (possibly include a sliding scale/benchmarks based on the age of the site)		High			X	X	X
2.3.a. NC DWR wetland monitoring data and other data from wetlands in the state (e.g., Carolina Vegetation Survey (CVS), university study sites, mitigation monitoring data) will be available to assist with i. Developing and refining metrics (e.g., Index of Biological Integrity (IBI), metrics for hydrologic functions), based on the monitoring data, that can be utilized to support regulatory programs ii. Describe reference condition for different wetland types in North Carolina iii. Utilizing collected wetland data to develop typical profiles for North Carolina wetland types and establish reference wetland parameters, parameter ranges, and baseline characteristics		High	X	X	X	X	
2.3.b. Establish baseline wetland conditions and functions for North Carolina wetlands having sufficient monitoring data	NCSU	High	X	X	X		
2.3.c. Assign wetlands having sufficient monitoring data to a categorical scale such as “reference,” “good,” “fair,” or “poor” to indicate the wetland condition and functions (a wetland can have a combined index of condition based on various factors, and it can have separate ratings for individual wetland conditions or functions)		Medium	X	X			
2.3.d. Use available wetland monitoring data to assess trends in the ambient conditions of wetlands	NCSU	High	X	X	X	X	X
2.3.e. Produce estimates of relative risks, relative extent, and similar statistics to explain the association between the observed risks and stressors		Medium	X	X			
2.3.f. Report NC DWR permitted wetland impacts and compensatory mitigation as part of the quarterly reports for NC DWR’s strategic plan		Low	X	X	X	X	X
2.3.g. Utilize function metrics to develop ecosystem service estimates for wetland sites with sufficient monitoring data		High			X	X	X
<b>OBJECTIVE 3: Make wetland monitoring and assessment data available to inform wetland planning and policy actions.</b>							
3.1.a. Facilitate the development of a means of sharing wetland monitoring data electronically: i. Ensure public outreach and education to share monitoring data in a useable format		High	X	X	X		
3.1.b. Organize a wetland monitoring data warehouse and/or populate the wetland monitoring electronic data set, and evaluate for any necessary changes		High	X	X	X	X	X
3.2.a. Continue to make wetland monitoring and assessment data available to, and continue discussions with, other North Carolina monitoring programs (e.g., Ambient Monitoring Program for streams, lakes, and rivers; Biological Assessment Program, Albemarle-Pamlico National Estuary Partnership (APNEP), Mining and Stormwater Programs)		Medium	X	X	X	X	X
3.2.b. Make wetland monitoring and assessment data available for use in watershed planning (e.g., NC DWR Planning Section, NC DMS)		Medium	X	X	X	X	X
3.3.a. Report to the EPA through grant reports (CD 95488411) on permitted impacts and required compensatory mitigation prior to and following various 401 programmatic changes		Medium	X				
3.3.b. Use the standardized monitoring protocols and data to support		Low	X	X	X	X	X

## Proposed Monitoring and Assessment Activities by Suggested Schedule

Activity	Participating group/agency	Level of Effort	2015	2016	2017	2018	2019
regulatory programs (e.g., 401 Water Quality Certifications, Isolated Wetlands, Stormwater, NPDES, Non-discharge Wastewater)							
3.3.c. Investigate restoration value and ecosystem service approaches that have been conducted to evaluate the services provided by wetlands (e.g., Delaware and the National Estuarine Program (NEP)) and identify critical gaps in the function-service metrics		Medium	X	X			
3.4.a. Wetland monitoring and assessment data will be made available to assist with the success of wetland restoration and enhancement projects by providing data to: i. support success criteria that take the restoration of wetland extent, function, quality, services and condition of restoration and enhancement sites into account ii. suggest ways to help voluntary restoration projects accomplish their established project goals iii. evaluate additional or alternative success criteria for wetland restoration sites within urban areas		High	X	X	X	X	X
3.5.a. Guide planning decisions for wetlands or wetland-stream complexes with the particular goal of improving impaired streams (e.g., basinwide and watershed restoration plans and other work done by NC DWR planning section, NC DMS, and Natural Resources Conservation Services (NRCS))		Medium			X	X	X
3.5.b. Develop mapping tools to help prioritize monitoring, management, and mitigation areas		High		X	X	X	X
3.5.c. Evaluate and develop tools to monitor and assess the success of wetland or wetland-stream complex mitigation sites (e.g., mitigation project construction protocols, C of C values, IBI, wetland profiles of biological communities, rapid assessments, measures of hydrologic function, services)		High		X	X	X	X
3.5.d. Evaluate the ecosystem services provided by impacted and restored streams and wetlands to determine what roles they play in overall environmental health/protection programs and economic value of protection and restoration efforts		High				X	X
3.5.e. Evaluate which watersheds have current and/or future needs for carbon and nutrient offset credits to mitigate for permitted impacts, and suggest areas that would benefit from the production of additional carbon and nutrient credits		High		X	X		
<b>OBJECTIVE 4: Identify sustainable financing for long-term wetland monitoring and assessment activities.</b>							
4.1.a. Work with the NC WPP Stakeholder Group to determine funding sources and opportunities	 <small>Division of Water Resources</small>	Low	X				
4.1.b. Encourage other groups to seek funding to assist in the wetland monitoring and assessment efforts	 <small>Division of Water Resources</small>	Low	X	X	X	X	X
4.1.c. Assist other groups with obtaining funding for wetland monitoring and assessment efforts	 <small>Division of Water Resources</small>	Low	X	X	X	X	X
4.1.d. Investigate other grant funding opportunities	 <small>Division of Water Resources</small>	Low	X	X	X	X	X
4.1.e. Investigate cost-sharing opportunities as well as volunteer work as a means of leveraging and improving success of targeted grants for wetland protection and restoration		Medium	X	X	X	X	X

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## Appendix D

### Proposed Regulation Activities by Suggested Schedule





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## Proposed Regulation Activities by Suggested Schedule


This appendix presents the Regulation Activities proposed in the text of the NC WPP marked by year(s) in which the activities are suggested to take place. The list also estimates the amount or “Level of Effort” required for each activity, and lists the “Participating group/agency” that is working on or hopes to work on the respective activities. Multiple groups may work on the same activity. This list will be a useful tool in assessing progress on a yearly basis by providing a quick reference for items proposed each year. Many factors (e.g., change in staff or funding resources, change in priorities, site availability, time restrictions) may affect completion of the Activities in the suggested timeframe. The NC WPP is a living document so the participating groups/agencies or the suggested dates for the proposed Activities can be adjusted over the life of the document. Yearly review of the NC WPP will allow for any necessary adjustments to be made for projects that have been completed early or may not have been completed within the proposed timeframe.

Activity	Participating group/agency	Level of Effort	2015	2016	2017	2018	2019
<b>OBJECTIVE 1: Clearly define the jurisdictional scope of regulatory programs</b>							
1.1.a. Provide information on the current level of protection of certain wetland types or geographic areas (e.g., isolated wetlands, wetland sites with reference condition and/or heritage value (e.g., cypress swamps, old-growth forests), wetlands near streams with state and/or federally protected species nearby or downstream)	RTI,  Division of Water Resources (isolated wetlands and bog info)	Medium	X	X	X		
1.1.b. Evaluate and identify where the state and federal regulatory programs are different/inconsistent from each other and determine how the differences/inconsistencies affect the aquatic resources	 Division of Water Resources	Medium	X	X			
1.1.c. Investigate ways to improve tracking of cumulative impacts within and across agencies [e.g., 404/401 programs, NC DCM, NC DEMLR for mining, stormwater, etc., USACE, logging permits outside of the permitting process]		High			X	X	
1.2.a. Seek sustainable ways to continue to provide guidance and support training on Surface Water Identification Training and Certification (SWITC)	 Division of Water Resources	Low	X				
1.2.b. Seek sustainable funding to continue to provide guidance and support training on NC WAM and NC SAM		Low	X	X			
1.2.c.i. Create a document summarizing the existing regulations (e.g., what activities require what authorization)		Low	X	X			
1.2.c.ii. Summarize the implications (purpose, impacts, etc.) of such regulations and how the regulations, or lack of such regulations, in general, impact economic, water quality, and aesthetic aspects		Medium			X	X	
1.2.c.iii. Create a document summarizing the quantitative measures of regulatory success (impacts on water quality, hydrology, habitat, storm protection, carbon sequestration, etc.)		High				X	X
1.2.c.iv. Provide outreach and education to the general public and high use groups (e.g., city officials, planners, real estate agents, consultants)	 Division of Water Resources	Medium	X	X	X	X	X
1.2.d. Provide transparency on existing guidance documents and on future guidance documents that will be promulgated in a rational and legal way	 Division of Water Resources	Low	X	X	X	X	X
1.2.e. Educate the regulated community regarding permitting impacts to wetlands and waters as a joint effort among several agencies and/or local governments		Medium	X	X	X	X	X
1.3.a. Evaluate the status of regulatory program funding resources and determine the most efficient use of those funds		Medium	X	X	X	X	X
1.3.b. Periodic review of the regulatory programs to ensure aquatic resources are not being overlooked and are regulated as needed in an efficient and effective manner (NC House Bill 74 Part I Section 3 and §150B-21.3A)	 Division of Water Resources	High	2014 +				
1.3.c. Conduct historical analysis (GIS tools, past aerial photography, agency permit files, etc.) to determine the approximate dates of hydrologic modifications in areas mapped as wetlands in the NWI and help determine if “special case” analysis is needed to determine if wetlands in altered areas are jurisdictional.		High				X	X

## Proposed Regulation Activities by Suggested Schedule

Activity	Participating group/agency	Level of Effort	2015	2016	2017	2018	2019
<b>OBJECTIVE 2: Administer regulatory activities efficiently and consistently</b>							
2.1.a. Identify methods (e.g., permittee questionnaire, permittee complaints, review of permit decisions) for determining inconsistencies within the permitting process		Low	X	X			
2.1.b. Identify methods for measuring improvements in efficiency and clarity (e.g., surveys, evaluation metrics)		Medium		X	X		
2.1.c. Refine the publicly accessible review criteria for permit applications and compliance guidelines to provide consistency in interpretation and consistency in the permit review, implementation, and evaluation of compliance (e.g., consistent timelines, single request for more information)		Medium		X	X		
2.1.d. Improve on areas of inconsistency within the permitting process		High			X	X	X
2.2.a. Reconcile rules (e.g., 401 with isolated waters, state with federal) where possible		High	X				
2.2.b. Continue to coordinate and improve upon program implementation among state and federal agencies: determine where the various programs overlap, reduce redundancy, increase resources in needed areas, share data across agencies		Medium	X	X	X	X	X
2.2.c. Investigate programmatic changes that could increase the efficiency of the 401 permitting program (e.g., 404 assumption, State Programmatic General Permits (SPGP), review of the DWR/USACE joint review process)		High	X	X	X		
2.3.a. Update the NC Wetland Mitigation Guidance Document as necessary to provide restoration and management guidance specific to wetland types and locations within watersheds (USACE is currently the lead agency)	USACE	Medium	X	X	X	X	X
2.3.b. Review criteria for mitigation proposals, including the monitoring plan and establishment of success criteria determination and/or protocols (e.g., consideration of full-year assessment of hydrologic criterion) (performed in large part by NC's Interagency Review Team (IRT))	IRT	Low	X	X	X		
2.3.c. Evaluate ways of determining the amount of wetland mitigation required based on the assessment of the amount of wetland functions that are lost with a permitted impact		Low			X	X	X
2.4.a. Develop and apply consistent performance metrics that can be tracked across and between programs		Medium	X	X			
2.4.b. Provide web links to publicly accessible wetland monitoring and assessment tracking systems for stream and wetland impacts and mitigation (e.g., databases, interactive maps)		Medium	X	X	X	X	X
2.4.c. Determine if there are any resources (e.g., water quality, wetland types, aquatic species) in certain locations that need additional enhancement or restoration through flexible mitigation options (may need to go outside of the HUC or watershed, areas around known T&E or state listed species, especially landscape scale projects)		Medium			X	X	X
2.4.d. Evaluate the permitting program i. Examine the cost efficiencies for the state and permit applicants ii. Examine the economic cost/benefit analysis, including ecosystem services, of regulations and/or modifications to regulations iii. Identify regulatory/permitting impediments to wetland restoration and mitigation iv. Identify regulatory disincentives that result in non-compliance (e.g., applicants unwilling to go through the hassle of the permitting process)		High			X	X	X
<b>OBJECTIVE 3: Evaluate regulatory activities to ensure environmental results</b>							
3.1.a. Examine whether to place additional focus on the monitoring of impacts, follow-up, compliance, and enforcement within the Water Quality Permitting Section, Wetlands Branch (short and long-term): Utilize monitoring and assessment data, and Use wetland function and ecosystem services as a measuring tool		High	X	X	X	X	X

## Proposed Regulation Activities by Suggested Schedule

Activity	Participating group/agency	Level of Effort	2015	2016	2017	2018	2019
3.2.a. Continue to examine opportunities for flexibility in mitigation by looking at local needs and specific resources (e.g., alternative mitigation methods, watershed planning, stormwater and sediment erosion control methods, preservation in threatened areas)		Medium	X	X	X	X	X
3.2.b. Continue to examine opportunities for flexibility in using alternative measures to achieve compliance (e.g., higher credit for higher quality wetlands, additional site management like prescribed burns, hydrologic-function metrics)		Medium	X	X	X	X	X
3.2.c. Examine opportunities to develop or utilize assessment methods to improve regulatory consistency		Medium	X	X	X	X	X
3.2.d. Evaluate and/or develop standardized tools or methodologies for locating reference sites		High			X	X	X
3.2.e. Evaluate current mitigation success criteria including hydrology and herbaceous vegetation and examine success criteria/methodologies based on the current science		High			X	X	X
3.2.f. Address how to equally value protection of existing waters vs. improving impaired waters		High			X	X	X
3.2.g. Prioritize use of available funding		Medium	X	X	X	X	X



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## Appendix E

### Proposed Voluntary Restoration and Protection Activities by Suggested Schedule



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## Proposed Voluntary Restoration and Protection Activities by Suggested Schedule

This appendix presents the Voluntary Restoration and Protection Activities proposed in the text of the NC WPP marked by year(s) in which the activities are suggested to take place. The list also estimates the amount or “Level of Effort” required for each activity, and lists the “Participating group/agency” that is working on or hopes to work on the respective activities. Multiple groups may work on the same activity. This list will be a useful tool in assessing progress on a yearly basis by providing a quick reference for items proposed each year. Many factors (e.g., change in staff or funding resources, change in priorities, site availability, time restrictions) may affect completion of the Activities in the suggested timeframe. The NC WPP is a living document so the participating groups/agencies or the suggested dates for the proposed Activities can be adjusted over the life of the document. Yearly review of the NC WPP will allow for any necessary adjustments to be made for projects that have been completed early or may not have been completed within the proposed timeframe.

Activity	Participating group/agency	Level of Effort	2015	2016	2017	2018	2019
<b>OBJECTIVE 1: Clearly and consistently define restoration and protection goals throughout the state</b>							
1.1.a. Compile a summary document listing agencies and organizations that provide voluntary restoration and protection opportunities: list restoration/protection goals, list restoration strategies (priorities, planning methods, project coordination, restoration techniques, etc.), list target timeframes for project and restoration goal completion		Low	X	X			
1.1.b. Provide access to available data on voluntary wetland restoration locations, class, and condition/function		Medium	X	X	X		
1.1.c. Encourage collaboration and/or use of state funds to enhance federal projects (e.g., NRCS-WRP)		Low	X	X	X	X	X
1.1.d. Investigate the formation of a collaborative group that would jointly evaluate and assist with voluntary restoration/protection projects		Low		X	X		
1.1.e. Evaluate the goals of current stewardship programs and provide recommendations for improvement		Low			X	X	X
1.1.f. Develop public outreach tools to encourage voluntary restoration		Low			X	X	X
1.2.a. Seek public opinion on restoration needs and/or site locations		Low	X	X			
1.2.b. Compile a list of existing strategies for locating and prioritizing voluntary restoration and protection projects		Medium	X	X			
1.2.c. Gather and compile information on various voluntary restoration systems’ restoration techniques and their level of success (e.g., planting or seeding methods, mulching, pre-burning)		Medium	X	X			
1.2.d. Develop methods (e.g., database, website) for sharing priority items, locations, etc. with other agencies, groups, and organizations		Medium			X	X	X
1.2.e. Develop and maintain accurate and up-to-date inventory (including ecosystem services estimates, like carbon sequestration, hydrology, or water quality) of wetlands, especially maps	RTI	High			X	X	X
1.2.f. Provide information to help encourage natural, self-sustaining restoration outcomes that do not require ongoing maintenance		Low			X	X	X
1.2.g. Develop and apply tools to identify and prioritize restorable wetlands (Delaware has a similar tool)		High			X	X	X
1.2.h. Identify and prioritize sites for restoration/protection based on: rare, vulnerable, or important wetlands (e.g., wetland types, corridors, complexes), or state and federally listed endangered and threatened species whose habitat needs protection		Medium			X	X	X

## Proposed Voluntary Restoration and Protection Activities by Suggested Schedule

Activity	Participating group/agency	Level of Effort	2015	2016	2017	2018	2019
1.2.i. Develop a strategy to help identify and rank voluntary restoration project sites to maximize the ecosystem services provided by the project (e.g., improved water quality, hydrology, habitat, overall functionality, carbon sequestration): Identify ways to coordinate restoration efforts with other social or economic benefits (e.g., improved agricultural production through tail water recovery, monetary pay out, increase in functionality by 5% to 10%, salt marsh restoration to promote improvements related to carbon sequestration and sea level rise)		High			X	X	X
1.2.j. Use monitoring and assessment data for: creating appropriate goals for restoration success, beginning with hydrology, and spatial prioritization/ ranking of wetlands to target restoration areas within watersheds		Medium			X	X	X
1.2.k. Train restoration partners how to establish appropriate restoration goals and how to use proven restoration techniques		Medium					X
<b>OBJECTIVE 2: Promote protection of wetlands from degradation or destruction</b>							
2.1.a. Publicize the summary document that lists agencies and organizations providing voluntary restoration and protection opportunities (from Objective 1, Action 1.a. above)		Low	X	X	X	X	X
2.1.b. Track partnership projects (partners and project details)		Medium	X	X	X	X	X
2.2.a. Track location, acres, and functional/service attributes of protected wetlands		Medium	X	X			
2.2.b. Survey property owners, request useful incentives for implementing long-term protection on their property		Low	X	X			
2.2.c. Investigate the benefits and drawbacks of providing additional incentives such as: title restrictions as a match for funding options; tax incentives for investors in voluntary restoration projects or habitat conservation efforts; term contracts versus perpetual easements; more encouragements for property acquisition and/or restoration through local governments, stormwater utilities, and other agencies; utilize existing Federal and State Hazard Mitigation Grant Programs to include wetland protection as a mitigation benefit; payment in lieu of taxes (PILTs), or ecosystem service based financial incentives		High	X	X			
2.2.d. Develop management plans for protected wetlands		Medium		X	X		
<b>OBJECTIVE 3: Encourage restoration of wetland acres, condition, and function</b>							
3.1.a. Survey wetland restoration practitioners and compile a list of successful techniques for, and timing of, pre- and post- evaluation of voluntary restoration sites		Low			X	X	
3.1.b. Document and map impacts and results of wetland restoration efforts		Medium				X	X
3.1.c. Develop means of measuring the positive impacts voluntary restoration projects are having on local ecology, hydrology, water quality, etc.		High					X
3.2.a. Publicize the summary document listing agencies and organizations that provide voluntary restoration and protection opportunities (from Action 1.1.a. above)		Low		X			
3.2.b. Provide information to the public on possible funding sources to facilitate restoration projects (e.g., USFWS Partners Program, Five Star and Urban Waters Grant, FEMA Hazard Mitigation Assistance Grants))		Low		X	X	X	X
3.2.c. Provide public access to the NC DWR mitigation database data (see Action 4.1.a. below) to facilitate coordinated efforts on projects		Low			X	X	X
3.2.d. Foster the development of close working relationships among conservation organizations, groups, etc. (e.g., The Nature Conservancy, Riverkeepers, land trusts)		Low			X	X	X
<b>OBJECTIVE 4: Providing technical guidance for voluntary restoration and protection</b>							
4.1.a. Evaluate and share information on effective voluntary restoration methods		Medium	X	X	X	X	X
4.1.b. Evaluate and share information on successful voluntary restoration/protection sites		High	X	X	X	X	X
4.1.c. Regularly report on the effectiveness of restoration methods and/or sites		Low	X	X	X	X	X

## Proposed Voluntary Restoration and Protection Activities by Suggested Schedule

Activity	Participating group/agency	Level of Effort	2015	2016	2017	2018	2019
4.1.d. Provide information on locations and data from monitoring results, successes, and failures		Medium	X	X	X	X	X
4.1.e. Identify sustainable funding sources for those wanting to monitor their voluntary restoration sites (currently not available/allowable with most restoration funding)		Low	X	X	X	X	X
4.2.a. Begin utilizing an electronic database to store voluntary wetland mitigation data		High	X	X	X	X	X
4.2.b. Utilize GIS so restoration project locations and site data can be viewed and analyzed in a spatial context and assessed for overall watershed hydrological and water quality conditions and functions		High			X	X	X
4.3.a. a) Review existing state and federal regulations to identify regulatory impediments to voluntary restoration projects (e.g., additional permit fees, review of additional plans) and work to promote and expedite (e.g., predetermined BMPs for wetland restoration projects, restoration rules designed for restoration projects), not inhibit, restoration efforts		Medium			X	X	X
4.3.b. Balance short-term impacts with long-term gains		Medium			X	X	X
4.3.c. Identify reasons for public drive for wetland protection or restoration		Low			X	X	X
4.3.d. Determine possible non-regulatory incentives for wetland protection (e.g., linking with planning efforts, , conservation easements, land conservancies, watershed associations)		Medium			X	X	X

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## Appendix F




### Proposed Water Quality Standards for Wetlands Activities by Suggested Schedule



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## Proposed Water Quality Standards for Wetlands Activities by Suggested Schedule

This appendix presents the Water Quality Standards for Wetlands Activities proposed in the text of the NC WPP marked by year(s) in which the activities are suggested to take place. The list also estimates the amount or “Level of Effort” required for each activity, and lists the “Participating group/agency” that is working on or hopes to work on the respective activities. Multiple groups may work on the same activity. This list will be a useful tool in assessing progress on a yearly basis by providing a quick reference for items proposed each year. Many factors (e.g., change in staff or funding resources, change in priorities, site availability, time restrictions) may affect completion of the Activities in the suggested timeframe. The NC WPP is a living document so the participating groups/agencies or the suggested dates for the proposed Activities can be adjusted over the life of the document. Yearly review of the NC WPP will allow for any necessary adjustments to be made for projects that have been completed early or may not have been completed within the proposed timeframe.

Activity	Participating group/agency	Level of Effort	2015	2016	2017	2018	2019
<b>OBJECTIVE 1: Evaluate current narrative wetland-specific water quality standards.</b>							
1.1.a. Track and report on the water quality portion of the wetland monitoring and assessment data	NCSU	Medium	X	X	X	X	X
1.1.b. Investigate the implications of using wetland monitoring data to assess existing narrative water quality standards for wetlands		Medium	X	X			
1.1.c.i. Provide guidance on sampling locations within the wetland (groundwater, influent, effluent, etc.)	NCSU	Medium	X	X			
1.1.c.ii. Provide guidance on how alternative water quality parameters (e.g., soils, macroinvertebrates) can be used to indicate the function and condition of the wetlands	NCSU	Medium	X	X			
1.1.c.iii. List any water quality sampling methods specific to wetland types (16 NC WAM wetland types)	NCSU	Medium	X	X			
1.1.d. Determine how to use biological-integrity data to assess existing narrative water quality standards for wetlands (e.g., data along a disturbance gradient)		High			X	X	X
1.2.a. Evaluate and provide a summary of the existing designated uses for North Carolina’s wetlands		Medium	X	X			
1.2.a.i. Provide public outreach and education		Low			X	X	
1.3.a. Determine how the current narrative standards are being used		Medium				X	X
1.3.b. Evaluate if existing narrative standards need to be refined (e.g., biological criteria to protect plant and animal diversity, endangered species)		High				X	X
<b>OBJECTIVE 2: Incorporate existing narrative wetland-specific water quality standards into agency decision-making</b>							
2.1.a. Investigate how to ensure proposed projects are meeting the existing narrative water quality standards for wetlands (e.g., hydrology)		Medium			X	X	X
2.1.b. Evaluate how to ensure consistency in interpretation of the standards		Medium			X	X	X
2.1.c. Public outreach and education: determine the best way to educate the public on the existing narrative water quality standards; and provide a summary of the existing narrative water quality standards, how they are implemented, and how they are relevant to North Carolina’s conditions		Low				X	X
2.2.a. IBIs developed from the wetland monitoring and assessment data will be available to help develop planning tools for restoration projects		Medium	X	X			
2.2.b. Evaluate if greater mitigation value or credits can be given to mitigation projects that are affiliated with a 404 permit and are improving 303d listed waters or helping complete TMDLs (Total Maximum Daily Loads)		Medium		X	X	X	
2.2.c. Investigate whether existing narrative water quality standards can be used in conjunction with restoration planning to strategically improve downstream water quality		Medium			X	X	X
2.2.d. Evaluate ways to assess how restoration projects improve downstream water quality and ecosystem services	NCSU, RTI	High			X	X	X
2.2.e. Evaluate if mitigation credits can be provided for preserving the role		High			X	X	X

## Proposed Water Quality Standards for Wetlands Activities by Suggested Schedule

Activity	Participating group/agency	Level of Effort	2015	2016	2017	2018	2019
functioning wetlands play in the removal of sediment and nutrients from the larger systems							