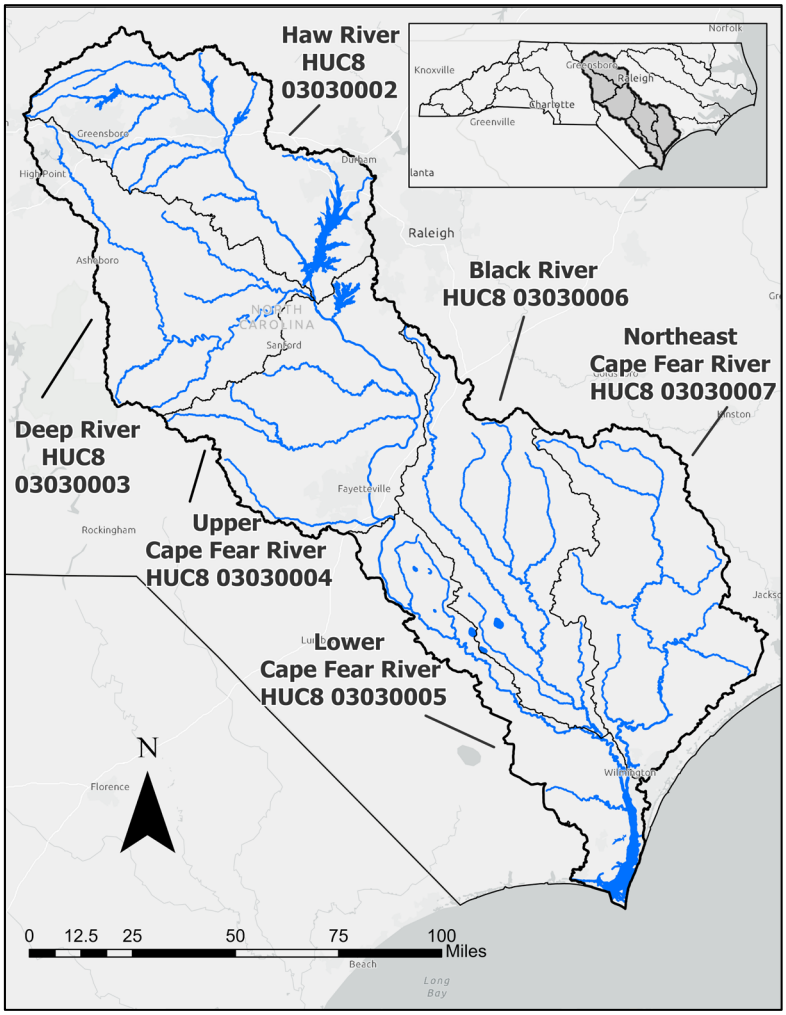

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Chapter 4 – Cape Fear River Basin Local Initiatives, Funding Opportunities and Land Management

BASINWIDE WATER RESOURCES MANAGEMENT PLAN

CYCLE 4 – CAPE FEAR RIVER BASIN 2026

North Carolina
Department of Environmental Quality
Division of Water Resources
Basin Planning Branch

NORTH CAROLINA
Department of Environmental Quality

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4 Local Initiatives, Funding Opportunities, Planning, and Land Management

Many strategic approaches are being applied to protecting and improving water resources in North Carolina's river basins and watersheds. The future of our rivers, streams, wetlands and estuaries are closely linked to land use decisions made on both a public and private scale, with private landowners playing a major role in protecting waters of the state through conservation and various land use management practices. This chapter explores various options for protecting natural resources through watershed planning, Watershed Action Plans (WAPs), local, regional, and statewide initiatives, land conservation and preservation, forest management, grant funding opportunities and other relative information. In the Cape Fear River Basin, comprehensive nutrient strategies have also been put in place by DWR for Jordan Lake. The Jordan Lake Rules are a nutrient strategy designed to restore water quality in the lake by reducing the amount of pollution entering upstream. See the Jordan Lake Nutrient Strategy or Chapter 6 for more information.

In addition to items identified in this chapter, there is also the Nutrient Criteria Development Plan (NCDP) process underway for the central portion of the Cape Fear River described in detail in Chapter 2 section 2.14. The goal is to develop scientifically defensible criteria based primarily on the linkage between nutrient concentrations and protection of designated uses. A large portion of the Cape Fear River Basin has been identified as possibly experiencing impacts from excess nutrients. The basin was chosen in order to facilitate appropriate management actions by the Division of Water Resources (DWR) based on any newly developed criteria for flowing streams and rivers.

4.1 Watershed Planning

The first step to watershed restoration is to develop a watershed plan. A watershed plan is a strategy and a work plan for achieving water resource goals that provides assessment and management information in a watershed. A watershed plan includes analyses, actions and participants. The plan will also detail related resources needed for the development and implementation of water improvement projects. The Use Restoration Watershed (URW) Program was established by DWR to restore the beneficial uses of impaired waters of the state while also ensuring that protective measures are in place to prevent future degradation. Several guidance documents are available online including factsheets about watershed planning and how to develop a watershed plan. The URW has a Local Watershed Plan map that shows watersheds at the HUC-12 level where some type of watershed plan or study had been completed. It should be noted that the Local Watershed Plan map data is static and has not been updated since 2014.

There are many different organizations that develop watershed plans or fund the development and implementation of them, and not all watershed plans are the same. A 9-element watershed plan is an EPA-defined watershed plan designed to focus on impaired waters and help watershed managers address some of the most common pitfalls seen in watershed plans. A DWR approved 9-element plan can be considered a Voluntary Restoration Plan and is eligible for Category 5r on the 303(d) list. Waterbodies with a 5r designation are still considered impaired and are included on the 303(d) list, but TMDL

development is deferred while the plan is being implemented. Approved 9-element watershed plans are also eligible for federal funds through Section 319 of the Clean Water Act (CWA) (USEPA, 2013).

Division of Mitigation Services (DMS) is described later in this chapter (DMS is formerly known as the Ecosystem Enhancement Program [EEP]). DMS follows its own program guidance for watershed plan preparation. In some instances, DMS watershed plans can also qualify as 9-element plans (e.g., the 2017 Northeast and Crooked Creek 9-Element Checklist). Often 9-element or watershed plans written for another purpose are developed after a Total Maximum Daily Load (TMDL, found in more detail in 4.2.2) has already been completed and are used to assist. These plans are often used to help implement the TMDL.

As of 2022, 12 9-element plans and other watershed planning efforts have been completed in the Cape Fear River Basin, including one Watershed Action Plan described in the next section. There are five plans in the Haw River (HUC8 03030002), three plans in the Deep River (HUC8 03030002), two plans in the Upper Cape Fear River (03030004), and one plan in the Lower Cape Fear River (03030005) subbasins, see these subbasin chapters for more information.

4.2 Watershed Action Plans

There are several approaches that DWR uses to restore and protect water resources in North Carolina that are generally referred to as Watershed Action Plans (WAPs). WAPs rely on existing approaches such as Total Maximum Daily Load (TMDLs), or existing management strategies, but include voluntary restoration and protection approaches as well. All WAPs within the Cape Fear River Basin are located in the Haw and Deep River subbasins.

A TMDL is usually developed to address one parameter that is not meeting water quality standards. In the Integrated Report (IR), the waterbody/parameter combination would be in Category 4t, 3t or 1t depending on current assessment data. An EPA-approved TMDL removes a waterbody/pollutant combination from the 303(d) list (Category 5).

A management strategy is also usually developed to address one parameter that is not meeting water quality standards. However, because management strategies are more programmatic, multiple parameters could be addressed. Management strategies can be in the form of state rules or restoration programs developed and implemented by local governments. In the Integrated Report, the waterbody/parameter combination would be in Category 4b, 3b or 1b depending on current assessment data. These management strategies require a regular audit to ensure implementation is proceeding according to the plan schedule. An EPA-approved management strategy often removes a waterbody/pollutant from the 303(d) list. Because of the Integrated Reporting category assignment, management strategies are usually referred to as 4b demonstrations. The Cape Fear River Basin has one 4b demonstration plan for Little Alamance Creek. The plan for Little Alamance Creek, located in the Bowden Branch subbasin (HUC12 030300020309), was developed to address the biological integrity of benthic communities.

Map figures *Figure 4-1* to *Figure 4-8* display the geographic boundaries of each individual parameter addressed by single or combined WAPs within the Cape Fear River Basin. An interactive Map is also available for all of North Carolina's completed WAPs. More information about the Cape Fear River Basin's WAPs can be found on DWR's Modeling and Assessment Branch website and in the Haw and Deep River subbasin chapters.

4.2.1 Voluntary Restoration WAPs

Voluntary restoration or protection WAPs are developed in a similar manner as TMDLs and management strategies, however, due to the voluntary nature of these plans, EPA does not approve them for removal from the 303(d) list if the waterbody/parameter is exceeding criteria. Many voluntary WAPs include the 9-elements defined by EPA. These 9-elements are crucial for identifying and implementing restoration projects. An approved 9-element WAP is also eligible for certain federal funding sources implemented by the state. The Integrated Report category for these waterbody/parameter combinations is Category 5r.

These WAP approaches should provide some evaluation and assurance of protection. Plans that are developed solely for the purpose of protection are placed in Integrated Reporting Category 1b. The new WAP approach provides more flexibility and more local involvement in both developing and implementing watershed improvement projects. The Cape Fear River Basin has two approved WAPs located in the Deep River subbasin: the Haskett Creek WAP found in the Hasketts Creek-Deep River subwatershed (HUC12 030300030110) developed for benthos and the Richland Creek WAP found in the Richland Creek subwatershed (HUC12 030300030103) developed for fecal coliform.

4.2.2 Total Daily Maximum Loads

A TMDL is a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards. It also includes an allocation of that amount to the pollutant's sources and a margin of safety. A TMDL includes a detailed water quality source assessment that can provide the scientific foundation for a WAP including an implementation timeline. However, under the federal Clean Water Act (CWA), there is no requirement to develop an implementation plan once a TMDL is complete. In addition, nonpoint source reductions named in a TMDL are implemented through voluntary measures only, whereas point source reductions are implemented through the NPDES permitting program. DWR is supporting local development and implementation of management strategies to address nonpoint sources in these watersheds.

The state prioritizes the development of TMDLs for waterbodies that have persistently remained on the 303(d) list. Rarely is a TMDL developed the first time a waterbody appears on the 303(d)list. DWR follows a prioritization plan to determine the order of TMDL development. The Cape Fear River Basin has approved TMDLs in the Haw River (HUC8 03030002) and Deep River (HUC8 03030003) subbasins for multiple parameters (*Figure 4-1* through *Figure 4-8*). A link to the Cape Fear River Basin TMDL page is here.

Figure 4-1: Cape Fear Fecal Coliform TMDLs

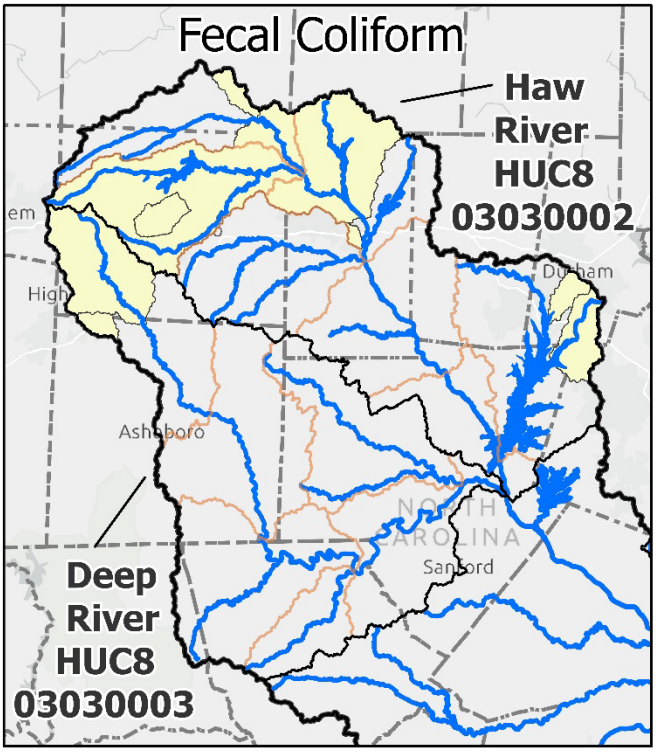


Figure 4-2: Cape Fear Nitrogen and Phosphorus TMDLs

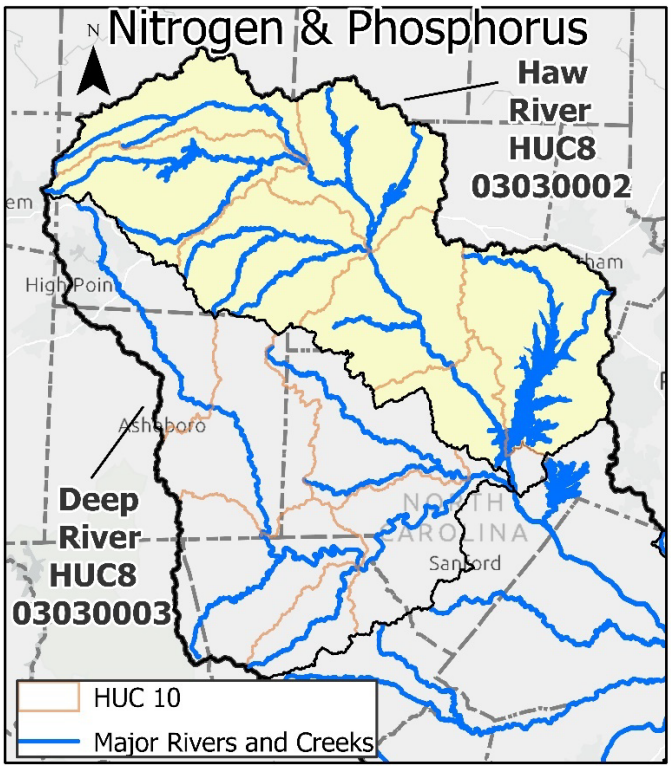


Figure 4-3: Cape Fear Turbidity TMDLs

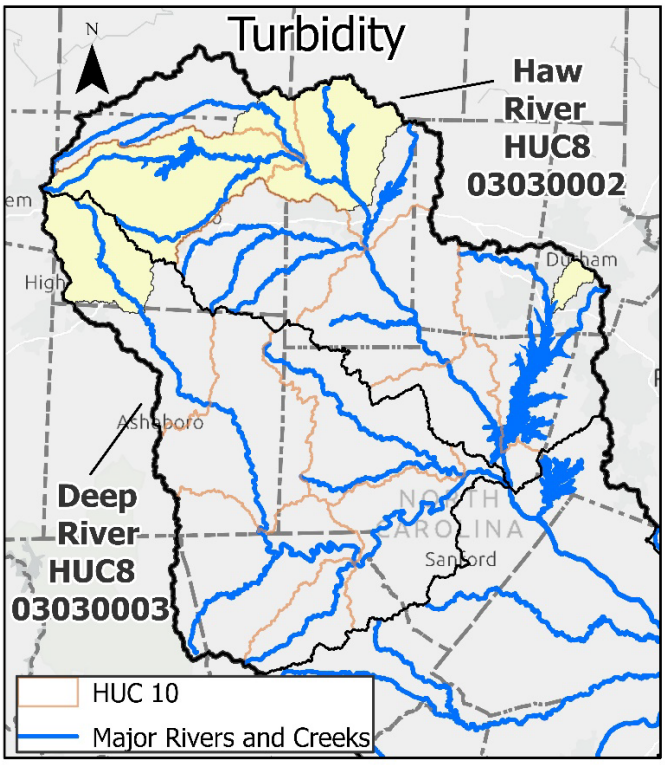


Figure 4-4: Cape Fear Cyanide TMDLs

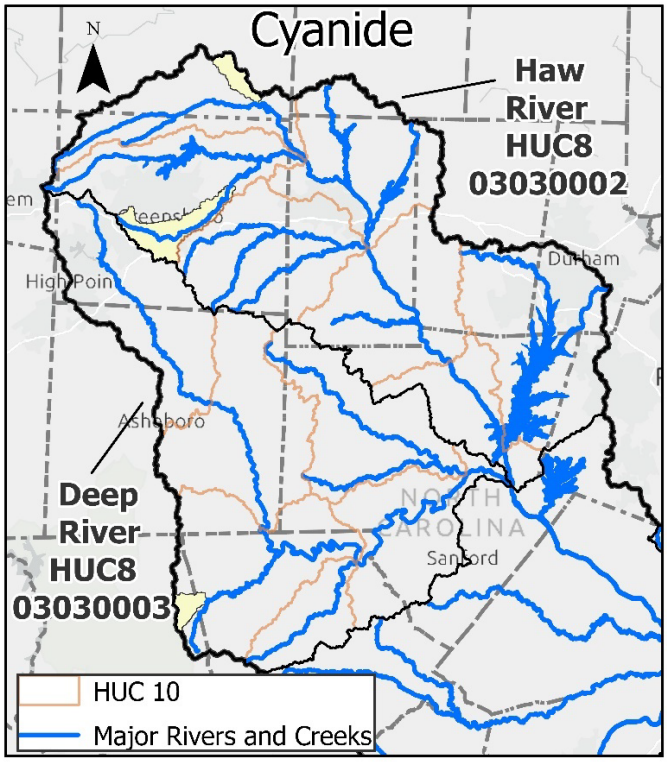


Figure 4-5: Cape Fear Fluoride TMDLs

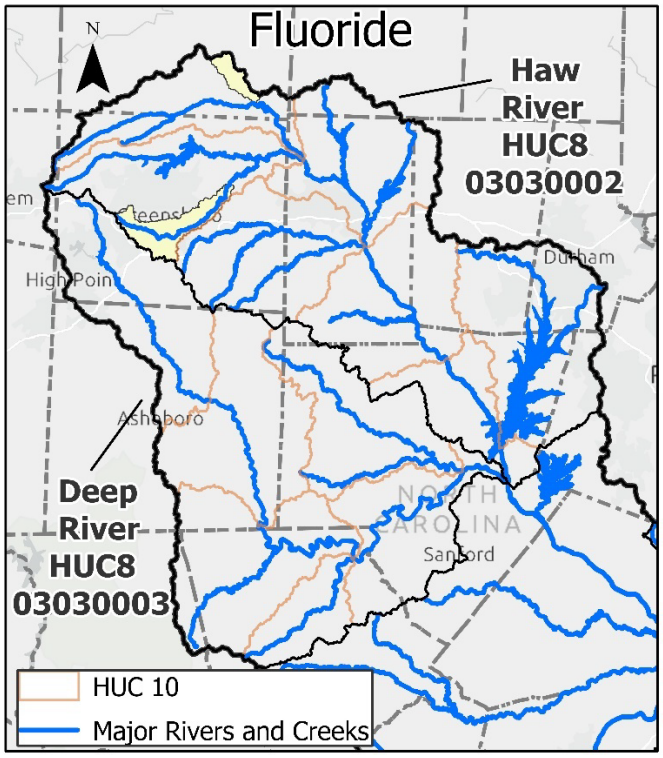


Figure 4-6: Cape Fear TMDLs – Metals and MBAS

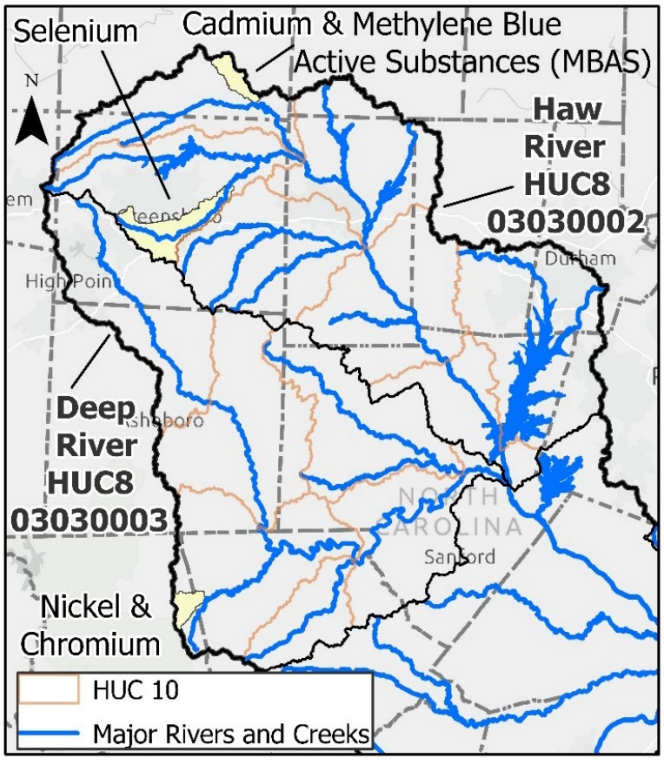


Figure 4-7: Lead and Chromium TMDLs

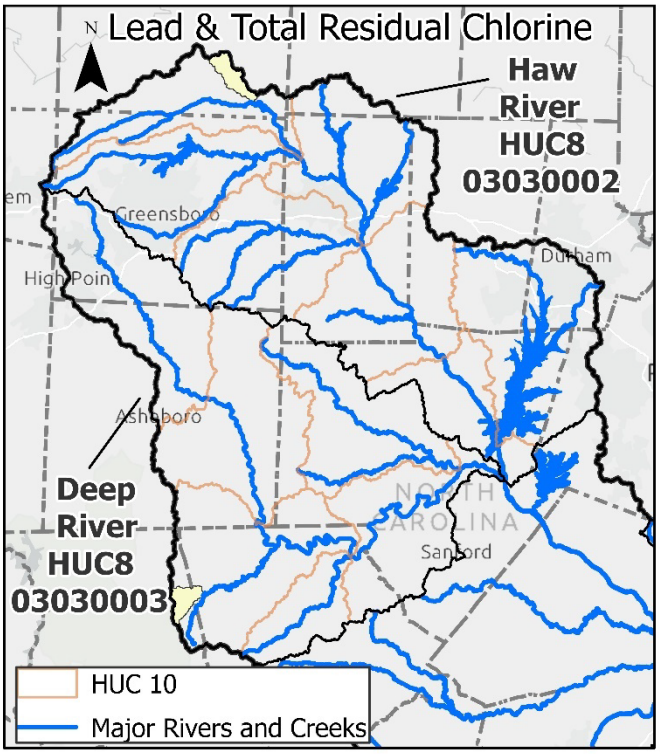
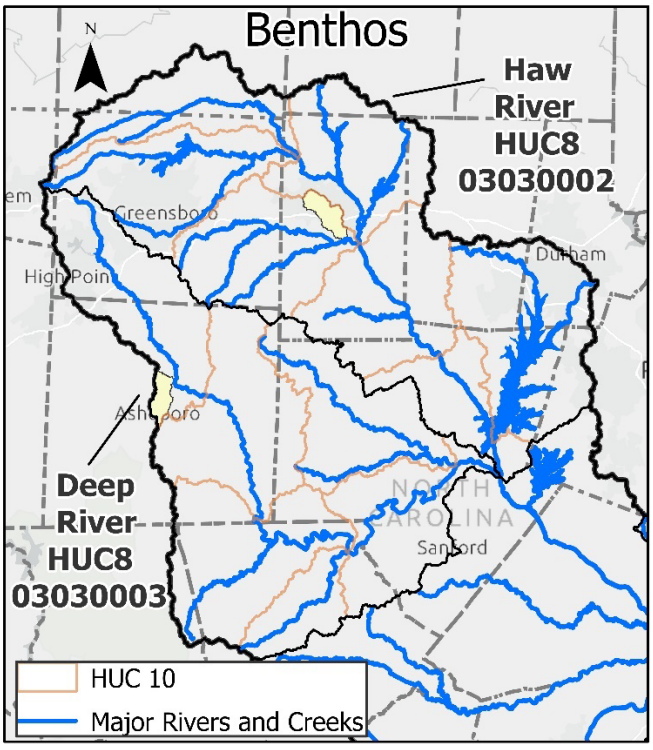


Figure 4-8: Cape Fear Benthos 4b and 5r Plans



4.3 Compensatory Mitigation

The continued incremental loss of stream and wetland aquatic resources in a watershed can have detrimental downstream effects on water quality and on natural hydrologic and hydraulic processes. Streams are dynamic ecosystems that, when healthy, provide numerous ecosystem functions such as water retention and infiltration, groundwater recharge, nutrient transformations, primary productivity, and aquatic habitat (NCSU, 2015). Healthy stream channels that are not incised and are connected with their floodplain will attenuate flood pulses and spread nutrients and organic matter during flood events. The interface between the soil surface and the stream channel, known as the hyporheic zone, is of critical importance for water quality through chemical transformations that affect nutrients and other compounds within stream systems. Streams are dynamic systems that evolve slowly over time through natural processes of erosion, transport, sorting and deposition of sediments. Land use changes in the watershed that promote alterations to a stream, such as channel straightening, culvert installation, removal of streambank vegetation, impoundments and other activities, can alter these natural processes. Development in a watershed increases the rate and amount of runoff during storm events, resulting in flashy hydrologic events. These stream alterations and land use changes may lead to downstream instability that can cause rapid degradation (incision) or aggradation (in-fill) of streams. Eroding streambanks associated with actively incising streams add sediment to the water column. Streams on the receiving end of excessive sediment can rapidly aggrade, burying aquatic habitat and sensitive benthic fauna (Harmon et al. 2012).

Wetlands provide wildlife habitat, attenuate flood waters and absorb excess nutrients, sediments, and other pollutants before they reach streams, rivers and lakes. Wetlands also protect ocean and lake shorelines from erosion during storm events (EPA 2004). Riparian wetlands that have direct association with streams and rivers, such as headwater forests, riverine swamps and bottomland forests, play a critical role for water quality. Non-riverine wetlands, such as hardwood flats, pocosins and basin wetlands, although generally not as directly connected to rivers and streams, still provide an important role in the watershed landscape for water quality and quantity by absorbing runoff from the surrounding landscape and acting as a natural sink for nutrients and other pollutants. These wetlands deter pollutants from reaching groundwater or ephemeral channels and man-made conveyances that drain to streams and rivers during storm events. Restoring wetlands and streams, along with the implementation of other water resource-oriented best management practices (BMPs), is an effective measure for restoring water quality, hydrologic and hydraulic processes and aquatic habitat within watersheds. It has been generally recognized that many of the impairments to water resources have occurred at the watershed level so addressing watershed problems must be done at the watershed scale (Harmon et al, 2012, EPA 2004). This section provides information on compensatory mitigation for streams, wetlands, and riparian buffers in North Carolina.

4.3.1 Compensatory Mitigation Background

Federal and state regulations, rules and guidance have been developed to ensure adequate replacement of permanent losses to aquatic resources through compensatory mitigation. The federal 404-permitting program has followed a three-part sequence: (1) avoidance, (2) minimization, and (3) compensation since 1990. The 2008 Mitigation Rule codified the requirements of compensatory mitigation and the three-part sequence of avoidance, minimization, and compensation (EPA 2018a). The US Army Corps of Engineers

(USACE) Wilmington District, in coordination with DWR and other resource agencies, developed the Wilmington District Stream and Wetland Compensatory Mitigation Update in October of 2016 to follow standards set in the 2008 Mitigation Rule.

The 2008 Mitigation Rule identifies and defines four compensatory mitigation methods These include: (1) Restoration, (2) Enhancement, (3) Establishment (Creation), and (4) Preservation. The rule also establishes a watershed approach to mitigation and allows for three mechanisms to achieve mitigation: (1) Mitigation Banks, (2) In Lieu Fee Programs, and (3) Permittee-Responsible mitigation (EPA n.d., Environmental Law Institute n.d., EPA 2018a). More information on mitigation specific to North Carolina can be found on the Wilmington District's Regulatory In-Lieu Fee and Bank Information Tracking System (RIBITs) website.

4.3.2 Compensatory Mitigation Methods

There are four compensatory mitigation methods: restoration, enhancement, establishment and preservation (defined below). The credit ratios typically vary by mitigation method and how much ecological functional uplift is successfully achieved.

- **Restoration** – "Re-establishment or rehabilitation of a wetland or other aquatic resource (e.g., streams) with the goal of returning natural or historic functions and characteristics to a former or degraded wetland. Restoration may result in a gain in wetland function or wetland acres, or both."
    - **Re-establishment – "**Manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former aquatic resource. Re-establishment results in rebuilding a former aquatic resource and results in gain in aquatic resource area and functions."
    - **Rehabilitation –** "Manipulation of physical, chemical, or biological characteristics of a site with the goal of repairing natural/historic functions to a degraded aquatic resource. Rehabilitation results in a gain in aquatic resource function but does not result in a gain in aquatic resource area."
- **Enhancement** – "Activities conducted within existing wetlands (or streams) that heighten intensify or improve one or more wetland functions. Enhancement is often undertaken for a specific purpose, such as to improve water quality, floodwater retention or wildlife habitat. Enhancement results in a gain in wetland function but does not result in a net gain in wetland acres."
- **Establishment** (formerly known as creation) – "The development of a wetland or other aquatic resource where a wetland did not previously exist through manipulation of the physical, chemical and/or biological characteristics of the site. Successful establishment results in a net gain in wetland acres and function."
- **Preservation** – "The permanent protection of ecologically important wetlands or other aquatic resources (streams) through the implementation of appropriate legal and physical mechanisms

(i.e., conservation easements, title transfers)" (EPA n.d.; Compensation Mitigation for Losses of Aquatic Resources, 2008)

4.3.3 Mechanism for Compensatory Mitigation

Permittees can establish their own mitigation sites ("Permittee-Responsible") or purchase mitigation credits from a "third-party" ("Mitigation Bank" or "In-Lieu Fee Program") for the compensatory mitigation requirements with regulatory approval. Mitigation sites are established "on-site" within the project limits by the permittee, or "off-site" and typically within the same watershed (8-digit HUC) by the permittee or a third-party.

- **Mitigation Banking:** Mitigation banks are usually privately owned, established, and operated and are ultimately responsible for the success of the mitigation used to compensate permitted aquatic resource losses.
- **In-Lieu Fee Mitigation:** Mitigation that occurs when a permittee provides funds to an in-lieu-fee sponsor (a public agency or non-profit organization). North Carolina's In Lieu Fee Program, the Division of Mitigation Services (DMS), is described later in this section.
- **Permittee-Responsible Mitigation:** The permittee performs the mitigation after the permit is issued either on-site or off-site and is ultimately responsible for implementation and success of the mitigation.

4.3.4 Watershed Approach to Mitigation

The 2008 Mitigation Rule encourages a "watershed approach" for compensatory mitigation, where appropriate and practicable, when a watershed plan is available. Compensatory mitigation decisions should be made from a watershed perspective in which the type and location of compensatory mitigation follows from an analytically based watershed assessment to assure that the proposed compensation furthers the watershed goals. A watershed plan developed by an intensive regional planning effort and stakeholder input may be used when available. A less formal watershed approach may be used instead that involves analysis of data concerning regional issues, efforts to inventory historic trends in aquatic resource condition, and prioritization of aquatic resource restoration opportunities (EPA n.d.; Environmental Law Institute n.d., EPA 2018b).

As per the 2008 Mitigation Rule, In-Lieu Fee Programs must have a Compensation Planning Framework for the watershed approach for planning mitigation. The Compensation Planning Framework incorporates 10 watershed planning elements that ultimately guide the selection and implementation of aquatic resource restoration, enhancement, establishment, and preservation projects (Environmental Law Institute 2013). The "Watershed Approach" required by the 2008 Mitigation Rule is essential for identifying the optimum location within the watershed and the type of mitigation for implementation.

4.3.5 Division of Mitigation Services

The Wetlands Restoration Program (WRP), North Carolina's first in-lieu fee (ILF) program, was established in 1996 to meet the growing mitigation needs of the NC Department of Transportation (NCDOT). WRP was reorganized into the Ecosystem Enhancement Program (EEP) in 2003 and renamed the DEQ Division of Mitigation Services (DMS) in 2015 (NCDENR 2013). DMS is responsible for providing "ecologically and

cost effective" compensatory mitigation to offset unavoidable impacts to aquatic resources resulting from development. Their mission is to "restore and protect wetlands and other waterways for future generations while offsetting unavoidable environmental damage from economic development." DMS has four ILF programs: Statewide Stream and Wetland ILF, NCDOT Stream and Wetland ILF, Riparian Buffer ILF and the Nutrient Offset ILF. An interactive map of DMS sites is available here.

4.4 Environmental Justice

DEQ's Environmental Justice Program works to ensure "the fair and equal treatment and meaningful involvement of all North Carolinians regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies." DEQ and its staff adhere to policies and programs for enhanced public participation and non-discrimination as defined under all pertinent nondiscrimination laws and regulations. The Environmental Justice and Equity Board was formed under DEQ's Secretary Michael Regan on May 2, 2018, to assist the Department in achieving and maintaining environmental justice. Board members have been tasked with working directly with the Secretary and NCDEQ staff to help elevate the voices of the underserved and underrepresented as DEQ works to protect the public's health and natural resources. Environmental Justice Reports on several concerning topics in Cape Fear River Basin have been completed including wood pellets in biogas, asphalt, coal ash, wood pellets, fumigation, animal agriculture, and electric vehicles (see *Table 4-1*). More information related to the *Title IV Report: Increasing Equity, Transparency, and Environmental Protection in the Permitting of Swine Operations in North Carolina* is included in Northeast Cape Fear River subbasin Chapter (Chapter 11).

Table 4-1: Cape Fear River Basin Department of Environmental Quality Environmental Justice Reports

Site	Division	Topic	Municipality	County	Report Date
Haw River HUC8 03030002					
Duke Energy – Cape Fear Power Station	DWR	Coal Ash	Moncure	Chatham	3/22/2019
Duke Energy – Cape Fear Power Station	DWR	Coal Ash	Moncure	Chatham	6/4/2019
Carolina Sunrock, LLC Burlington North Facility	DAQ	Asphalt	Burlington	Caswell	3/15/2022
Deep River HUC8 03030003					
Toyota Battery Manufacturing NC	DAQ	Electric Vehicle	Liberty	Randolph	9/28/2022
Lower Cape Fear HUC8 03030005					
Duke Energy - Sutten Energy Complex EJ Impact Statement, issued to EPA Office of Civil Rights	DWR	Coal Ash	Wilmington	New Hanover	6/17/2016
Malec Brothers	DAQ	Fumigation	Riegelwood	Columbus	7/24/2018

Site	Division	Topic	Municipality	County	Report Date
Ecolab, Inc.	DAQ	Fumigation	Wilmington	New Hanover	7/29/2021
Black River HUC8 03030006					
Align RNG Swine Farm Permit Modifications	DWR	Biogas	Turkey	Duplin	12/22/2020
Prestage AgEnergy	DAQ	Biogas	Clinton	Sampson	3/15/2021
Align RNG	DAQ	Biogas	Turkey	Duplin	1/6/2022
Northeast Cape Fear River HUC8 03030007					
Enviva - Sampson	DAQ	Wood Pellets	Faison	Sampson	
Title IV Report: Increasing Equity, Transparency, and Environmental Protection in the Permitting of Swine Operations in NC	DWR	Swine Operations			May 2020
Statewide					
Biogas Digester General Permit Development	DWR	Biogas	Statewide		6/30/2022

*DAQ - Division of Air Quality, DWR - Division of Water Quality

4.5 Stakeholder Engagement

The collaboration of local efforts is key to protecting and improving our water resources. This chapter identified multiple stakeholders, local agencies and governments working to improve water resources throughout the Cape Fear River Basin. Many of these same groups have identified priorities for conserving and protecting water resources in various planning documents and within their agency's or organization's mission statement. DWR has worked with several of these agencies and organizations in the development of sections in this chapter and other parts of the plan.

DWR's Basin Planning Branch (BPB) supports and encourages local groups to continue to identify issues, concerns and impairments as well as potential solutions. DWR also supports the development of online watershed action plans (Section 4-7). An online watershed action plan using various GIS and modeling-based tools and can provide a "living" document that actively identifies project areas and potential partnerships. It can also help track progress towards implementing goals and BMPs identified within the watershed action plan on a community basis. Several resources are available on DWR's website for developing a watershed action plan. Watershed groups, community partners, and neighborhood residents are encouraged to contribute to the development of a watershed action plan by:

- Reviewing this map to see if there's an existing watershed action planning in your area.
- Reviewing this map for an overview of what water quality issues may be impacting the area.
- Identify an existing watershed group in your area on this page.
- Explore existing watershed action plans (mentioned in this chapter) to find inspiration for your neighborhood.

To better represent all the communities that live, work and depend on the Cape Fear River and its tributaries for drinking, recreation, connection to nature, and way of life, DWR basin planners and the Cape Fear River Assembly (CFRA) (Section 4.63) launched an effort to capture various and diverse voices throughout the basin. Working collaboratively, basin planners and CFRA compiled and distributed a survey during plan development with the hope of identifying issues, concerns, connections, opportunities and priorities in the basin. A co-created framework was also circulated to community leaders, state and local governments, small business owners who make their living off the river, utilities and several watershed groups throughout the basin. DWR worked with CFRA to identify community leaders in areas of the basin that are typically underserved or may not be aware of DWR's basin planning initiatives and plan development. The survey was a new approach to engage stakeholders during plan development. It captured concerns and interests in the basin, it identified where more education and outreach is needed, and it captured input from some underserved communities and residents in the region.

DWR and CFRA received 230 responses to the Cape Fear River Basin survey. A total of 17 questions were in the survey, and it was divided into two sections. The first section consisted of eight questions. Many were multiple choice, including questions regarding where the participant lived in the basin, opinions on how current strategies are protecting the river and topics of interest. The second section asked participants to rank concerns and challenges. It also allowed participants to write-in their own concerns and thoughts on how to address water resource concerns in the basin. Participants were advised that not all topics would be addressed in the basin plan but that responses would be used to help guide where additional information, education, and resources are needed in the basin for both DWR and CFRA.

Many of the organizations that participated have some stake in how the river is managed, both from a qualitative and quantitative perspective. Participants identified sources of pollution, the health of the rivers and streams in the basin, policies regarding the river basin, contaminants, and water supplies as topics of interest to include in the basin plan. Besides emerging compounds (i.e., GenX, PFAS, 1,4-dioxane), urban development and stormwater, drinking water, aquatic habitat, wastewater infrastructure, and declining fisheries and shellfish were identified as concerns. Development pressures, current management strategies and protections (or lack thereof), lack of oversight (i.e., inspections, reporting, etc.), and lack of prioritization by state and federal officials were identified as challenges to addressing concerns in the basin. To address these challenges, participants thought state elected officials should prioritize water protection, that oversight and enforcement of existing rules and regulations need to be increased, more funding is needed for data collection, monitoring, technical assistance and planning, and management measures need to be improved. Issues not included in the plan but identified by participants as a concern included improving or increasing recreational opportunities, subsistence fishing, invasive species, tree protections and urban sprawl.

Authentic connection and more access to the river in addition to education and outreach efforts are needed to cultivate awareness of the issues and opportunities in underserved communities. These communities need safe spaces to tell their stories, ask their questions and platforms to understand the obstacles and challenges the Cape Fear River faces on an ongoing basis. This type of work is place-based, and the Cape Fear River Basin is vast. What happens upstream affects the people downstream. The decisions made in one area on the river have consequences in all areas on the river.

CFRA took the lead on compiling resources on concerns not addressed or minimally addressed in the basin plan and began identifying how people and organizations can connect and work together to address ongoing concerns. Resources will vary based on the region and organizations working in these areas. DWR and CFRA will continue to communicate that the basin plan can be used as a guidance document to support decision making and educate the public on nutrient issues, watershed resource planning, BMP implementation, and water quality and quantity. While next steps were identified, CFRA will be sunsetting in June 2026. Basin planners will continue to work with various stakeholders throughout the basin to address some of the issues identified as part of the survey. The results and the framework can be found in Appendix 4.

4.6 Local and Regional Initiatives

4.6.1 County Soil & Water Conservation District

County level Soil & Water Conservation Districts (SWCD) work collaboratively with county and city departments to improve water quality throughout the county by conserving land, managing stormwater, providing technical support to citizens, and providing education and outreach about natural resources. Contacts for all North Carolina SWCDs are available on the NC Department of Agriculture & Consumer Services (NCDA&CS) website.

4.6.2 Councils of Governments

Regional Councils of Governments (COG) are multi-county planning and development agencies serving different areas of the state. Membership in these councils is voluntary. In North Carolina, 16 councils serve regions that share similar economic, physical and social characteristics. Their function is to aid, assist and improve the capabilities of local governments in administration, planning, fiscal management and development.

There are six COGs serving the 29 counties partially or entirely located in the Cape Fear River. In the upper part of the basin, the Piedmont Triad (Region G) serves Rockingham, Caswell, Forsyth, Guilford, Alamance, Randolph and Montgomery counties and the Central Pines Regional Council (Region J) (formerly known as Triangle J) serves Orange, Durham, Chatham, Wake, Lee, Moore and Johnston counties. In the middle and lower parts of the basin the Mid-Carolina (Region M) serves Harnett, Cumberland, and Sampson counties, the Lumber River (Region N) serves Hoke, Robeson, and Bladen counties, the Eastern Carolina (Region P) serves Duplin, Onslow, Wayne, and Jones counties, and the Cape Fear (Region O) serves Brunswick, Columbus, Pender, and New Hanover counties.

The Central Pines Regional Council Water Resources Program facilitates intergovernmental partnerships and provides technical assistance to sustainably manage water supply and water quality across jurisdictional lines. An important Water Resources Program initiated by the COG is the Jordan One Water Association (JLOW), described later in this section. The COG serves as a neutral coordinator and facilitator for the effort and provides critical liaison support between stakeholders, regulatory agencies, and other entities.

More information about the COGs serving counties in the Cape Far River Basin River basin and other associated initiatives and projects can be found on either the North Carolina Association of Regional Councils of Governments (NCARCOG) website or on each COGs respective website.

4.6.3 The North Carolina Office of Recovery and Resiliency (NCORR)

In the wake of the 2019 Hurricane Florence, the North Carolina Office of Recovery and Resiliency (NCORR) was established by Governor Roy Cooper to lead the state's efforts in re-building smarter and stronger. Many eastern North Carolina counties had been hit hard by two devastating storms, Matthew and Florence, in the span of just two years. NCORR administers both federal and state disaster recovery and mitigation funds aimed at making North Carolina communities safer and more resilient from future storms. The COGs are working with NCORR's RISE (Regions Innovating for Strong Economies) and Environment Program to identify priority projects that strengthen regional resilience. The Regional Resilience Portfolio Program supports nine regional partnerships, based on COG geographies in Eastern North Carolina, including five of the six Cape Fear River Basin COGs. The program focuses on the development of a vulnerability assessment and portfolio of priority resilience projects that reduce risk and increase resilience for the region. Final reports for the priority projects identified by each COG were released in December 2022 and are summarized below for the five Cape Fear River Basin.

- Cape Fear (Region O) Portfolio Final Report
  (Cape Fear River Basin counties include Chatham, Lee, Moore and Johnston)
  - Coastal Stormwater Management Tools
  - Regional Stormwater Engineer Services
  - Outreach and Education for Stormwater Management on Private Property
  - Living Shorelines Site Analysis and Best Practices
  - Mitigating Risk in Manufactured Housing
  - Regional Resilience Planner and Grant Writer
  - Community-Government Resilience Collaboration Centers
  - Flood Data

- Eastern Carolina (Region P) Portfolio Final Report
  (Cape Fear counties include Duplin, Onslow, Wayne, and Jones counties)
  - Regional Resilience Funding (Part 2 of 2)
  - Regional Drainage Capacity Assessment
  - Beneficial Reuse of Acquired Properties
  - Green Infrastructure to address Urban Flooding Hotspots
  - Regional Resilience Staff Position (Part 1 of 2)

- Lumber River (Region N) Portfolio Final Report
  (Cape Fear counties include Hoke, Robeson and Bladen)
  - Stormwater Infrastructure and Drainage Assessment (Mapping)
  - Stormwater Infrastructure - Hydrologic and Hydraulic Modeling
  - Housing Needs Assessment for Older Adults
  - Community-Government Resilience Collaboration Centers
  - Wetland Restoration for Flood Mitigation

- Stream Gauge Installation
- Lumber River Resilient Routes: Flood-Resilient Roadway Accessibility for Secondary Roads

- Mid-Carolina (Region M) Portfolio Final Report
  (Cape Fear counties include Harnett, Cumberland and Sampson)
  - Green Infrastructure County Pilot Projects
  - Heatwave Early Warning Systems (HEWS) and Action Plans
  - Install Additional Stream Gauges
  - Feasibility Assessment for Energy Backup Installation in Marginalized Communities & Critical Facilities
  - Stream Debris Removal
  - Climate Equity Index Tool

- Triangle J (Region J) Portfolio Final Report
  (Cape Fear River Basin counties include Chatham, Lee, Moore and Johnston)
  - Develop a River Warning System
  - Plan and Prioritize Stream Restoration
  - Install Back Up and Redundant Power Sources
  - Establish a Locally-Administered Repetitive Loss Program
  - Develop a Privately Owned Dam Inventory and Dam Ownership Guidebook
  - Develop Regional Guidance for Coordinated Stormwater Infrastructure Improvements
  - Develop a Heat Wave Response Protocol Template

4.6.4 North Carolina Coastal Federation

The North Carolina Coastal Federation is a non-profit organization dedicated to protecting and restoring the North Carolina coast. Since 1982, the Federation has been working with coastal communities and other partners to improve and protect coastal water quality and natural habitats, which are intricately tied to the coastal economy. By focusing primarily, but not exclusively on natural and productive estuarine shorelines, oyster and marsh restoration, coastal management and cleaning the estuaries of marine debris, they strive to support and enhance the coastal natural environment. The Federation has been a partner in the following projects in the Lower Cape Fear River Basin (see the Appendix for the complete description).

- **Lower Cape Fear River Blueprint** - The Lower Cape Fear River Blueprint is a collaborative planning effort, led by the North Carolina Coastal Federation, to protect, manage, and restore the important estuarine and riverine natural resources of the lower Cape Fear River.
- **Habitat Restoration Efforts** – The Federation is working with stakeholders in the region to design and implement 15 acres of oyster reef habitat restoration and living shoreline projects to form the Lower Cape Fear River Oyster Pathway (Pathway).
- **Living Shorelines** - The Federation partnered with Carolina Beach State Park, Military Ocean Terminal Sunny Point, the Division of Marine Fisheries and hundreds of communities and GE-Wilmington volunteers in 2015 on a multi-year effort to help restore oyster and salt marsh habitat in the lower Cape Fear River. More information on living shoreline work can be found here - Oyster Restoration in

the Cape Fear River , Local realtors protect the coast for Realtor Action Day and Doing Their Part: Realtor Action Day Cleans Up.

- **Artificial Reef in the Lower Cape Fear River** - The North Carolina Division of Marine Fisheries, with support from Carolina Beach State Park and the North Carolina Coastal Federation, is leading the construction of Artificial Reef (AR) 491 in a five-acre project area just off the park's Cape Fear River shoreline.
- **Oyster Pathway** - The federation is working with local partners to lead oyster restoration and living shoreline implementation efforts in the region to develop the Oyster Pathway, including through the Navassa Kerr-McGee Superfund Site Natural Resources Damage Assessment (NRDA) Restoration Plan.

4.6.5 Coastal Habitat Protection Plan

The North Carolina Coastal Habitat Protection Plan (CHPP) is the result of North Carolina's Fisheries Reform Act (FRA) passed by the General Assembly in 1997. The CHPP is a guidance document that addresses habitat and water quality efforts needed to protect, enhance, and restore fish habitat along North Carolina's coasts and aligns closely with Albemarle-Pamlico National Estuary Partnership's (APNEP) Comprehensive Conservation and Management Plan (CCMP). Several agencies within DEQ have jurisdiction over marine fisheries, water quality and coastal management. Representatives from these agencies, along with several agencies outside DEQ, develop and implement the CHPP. The Division of Marine Fisheries (DMF), however, is the lead agency.

There are four major goals (improve effectiveness or existing rules and programs, identify and delineate strategic coastal habitats, enhance and protect habitats from adverse physical impacts and enhance and protect water quality) with multiple *recommendations under each to achieve the overarching goal of long-term improvement of coastal fisheries through habitat protection and enhancement efforts that carry over to the Cape Fear River basin. Recommendations include:*

- Coordinate and enhance assessment and monitoring of effectiveness of rules established to protect coastal habitats. (Recommendation 1.2b)
- Continue to coordinate among commissions and agencies on coastal habitat management issues. (Recommendation 1.4)
- Enhance management of invasive species with existing programs. Monitor and track status in affect waterbodies. (Recommendation 1.6)
- Support assessments to classify habitat value and conditions by selectively monitoring the condition and status of those habitats. (Recommendation 2.1b)
- Expand habitat restoration, including increasing subtidal and intertidal oyster habitat through restoration. (Recommendation 3.1a)
- Improve management of estuarine and public trust shorelines and shallow water habitats by revising shoreline stabilization rules to include consideration of site-specific conditions and advocate for alternatives to vertical shoreline stabilization structures. (Recommendation 3.4)
- Protect and restore habitat for migratory fishes by restoring fish passage through elimination or modifications of stream obstructions, such as dams and culverts. (Recommendation 3.5b)

- Prevent additional shellfish closures and swimming advisories by continuing to phase out existing outfalls by implementing alternative stormwater management strategies. (Recommendation 4.3c)
- Maintain effective regulatory strategies throughout the river basins to reduce nonpoint pollution and minimize cumulative losses of fish habitat, including use of vegetated buffers and established stormwater controls. (Recommendation 4.6)
- Maintain adequate water quality conducive to the support of present and future mariculture in public trust water. (Recommendation 4.7)

To implement recommendations in CHPP, the CHPP team develops specific actions in a separate implementation plan. The most recent implementation was developed for 2018-2020. DWR has participated in several of the recommendations identified in the CHPP (*Table 4-2*).

Table 4-2: Implementation of Recommendations Identified in the 2018-2020 CHPP Implementation Plan

RECOMMENDATION: Provide information to focus students in K-12 understanding of biodiversity in lakes, streams, and estuaries.
ACTIONS: ▪ Project WET* ▪ It's Our Water* ▪ NC Stream Watch* ▪ Watershed Wisdom* **More information and interactive links to these programs can be found in the Statewide Initiatives section of this Chapter.*
RECOMMENDATION: Assess invasive submerged aquatic vegetation (SAV) in the APNEP region annually and continue to coordinate invasive SAV treatment with DMF and APNEP.
ACTIONS: ▪ The DWR Aquatic Weed Control Program (AWCP) maintains a database serving as an archive of management activities. The database contains a query tool to allow users to access data by searching by project name. The AWCP database can be accessed here. Full list of plants designated by DEQ as noxious aquatic weeds can be found here.
RECOMMENDATION: DWR and the Division of Mitigation Services (DMS) will support and pursue aquatic passage barrier removal policies and projects where appropriate.
ACTIONS: ▪ DWR and DMS support and participate in the NC Aquatic Connectivity Team, the lead organization for aquatic passage improvements in NC. The DWR grant program managers (Section 319 & Water Resources Development Program) and the 401 Permitting Unit provide information to the NC Aquatic Connectivity Team about aquatic barrier removal projects. The Southeast Aquatic Resources Partnership (SARP) maintains a comprehensive list of known dam removal projects in North Carolina and throughout the Southeastern United States.

Currently the CHPP is being amended as called for in the Fisheries Reform Act of 1997. The focus of the amendment will be on environmental rule compliance to: protect habitat; monitor habitat to assess status and regulatory effectiveness; SAV protection and restoration, focusing on water quality improvements, wetland protection and enhancement using nature-based methods; and reduce inflow and infiltration associated with wastewater infrastructure to improve coastal water quality. The goal is to have the amendment finalized and voted on by the three regulatory commissions (Marine Fisheries, Coastal Management, and Environmental Management) during the summer of 2021 for final adoption. Prior to the amendment being adopted, it will be reviewed by DEQ, and a series of public hearings will be held. It is anticipated that no changes will be made to CHPP's source document. More information about CHPP and the implementation plans can be found on CHPP's website.

4.6.1 Cape Fear River Partnership

The Cape Fear River Partnership is a group of key federal, state, local, academic and other organizations in the region working together on multi-year action plan to improve the Cape Fear River. The Cape Fear River Partnership, formed in 2011, envisions a healthy Cape Fear River for all fish and people. The mission of the partnership is to restore and demonstrate the value of robust, productive and self-sustaining stocks of migratory fish in the Cape Fear River Basin. The Cape Fear River Partnership believes that improving habit conditions in the Cape Fear River will benefit the important migratory fish species in the basin and the many communities and businesses that depend on the Cape Fear River for water and recreational tourism.

4.6.2 Cape Fear River Watch

The Cape Fear River Watch is a grass-roots, non-profit, environmental organization founded in 1993 and dedicated to the protection and improvement of the Cape Fear Basin for all people through education, advocacy and action. Cape Fear River Watch offers multiple opportunities for citizen engagement through their citizen science Creek Watchers program, monthly seminars, paddles and clean-ups, and special events. This organization has worked on issues related to migratory fish restoration, urban stormwater, the cleanup of power plant coal ash, dissuading the building of a cement plant along the banks of the Cape Fear River, industrial agriculture, and contaminants of emerging concern - GenX and other per- and polyfluoroalkyl (PFAS) substances in the Cape Fear region. The Cape Fear River Watch has played a key role in coordinating the Cape Fear River Partnership. For additional information visit www.CapeFearRiverWatch.org.

4.6.3 Cape Fear River Assembly

The Cape Fear River Assembly (CFRA) is a basinwide group of diverse stakeholders from agriculture, local government, industry, academia, community-based organizations and citizens who strive to maintain and improve the quality of life in the Cape Fear River Basin by encouraging smart management of the river, tributaries, and adjacent land use from a basinwide perspective. The CFRA members often have divergent viewpoints, but they work together to find solutions to water quality and quantity problems impacting the entire river basin. Educational opportunities are provided to improve understanding, encourage dialogue between all interests on important issues and champion various projects that benefit all citizens of the Cape Fear River Basin. CFRA will be sunsetting in June 2026

4.6.4 North Carolina Coastal Land Trust

The North Carolina Coastal Land Trust is a non-profit organization formed in 1992 to help protect locally and regionally valuable natural areas. Since its inception, the Coastal Land Trust has protected more than 40,000 acres of barrier island beaches, riparian corridors, and other special natural areas, including over 27,000 acres in the Cape Fear River Basin (also see Section 4.9 Land Conservation and Preservation). It also strives to protect and restore native plant communities and provide for environmental education opportunities.

4.6.5 The Nature Conservancy

The Nature Conservancy (TNC) has worked to acquire and conserve unique lands across the world, including properties in North Carolina and the Cape Fear River Basin. TNC works to influence policy and practice on issues as far ranging as forest conservation, water protection and fisheries. In North Carolina, TNC has been working at the state level to ensure prescription burning and other forms of conservation management are implemented on their properties. TNC also leads educational visits and engages volunteers in participating in conservation work on TNC owned preserves. There are several TNC properties in the Cape Fear River Basin, including the Black River Preserve in Bladen, Sampson, Pender and Columbus counties, the South River Preserve in Cumberland and Sampson counties, and the Sandhills Preserve in Hoke County (also see Section 4.9 Land Conservation and Preservation).

TNC partnered with the US Army Corps of Engineers (USACE) to create the Sustainable Rivers Program (SRP). The goal of the SRP is to restore, protect and sustain riverine and floodplain habitats by modifying project operations while still accomplishing authorized project purposes (Winget, 2020). In 2017, the Cape Fear River was officially included in the program. In the spring, the goal is to release pulses of water from Jordan Lake dam to submerge the three USACE dams on the mainstem Cape Fear River allowing spawning migratory fish to migrate upstream over the barriers in order to reach their historic spawning grounds (see section 5.4.3 for more information on the SRP). Later in the year, mini pulses are released, if conditions allow, to improve water quality conditions downstream in the Cape Fear River where low riverine flows can lead to the development of harmful bluegreen algae/cyanobacterial blooms which can impact drinking water supplies, human health, recreational activities, and aquatic life.

TNC has also been involved in Cape Fear River SWAT (Soil and Water Assessment Tool) modeling projects to assist with understanding sources and location of nutrient loading with the goal of optimizing the type and location of conservation practices to reduce nutrient loading to the lower Cape Fear River (Schaffer-Smith et al. 2023; TNC, 2015). They also developed a water quality risk index (WQRI) that highlights places where watershed scale interventions can best improve water quality across the different climate conditions occurring in the basin. Their model supports how complex the Cape Fear River system is and confirms that nutrient loading is highly dependent on weather conditions. They reported that based on their modeling results “during normal flows and flooding, nonpoint source pollution accounts for 90% of the pollution going into the Cape Fear. But during drought years, point sources can drive instream pollution.” “Pull out a dry year like 2011 and as much as 70% of nutrient pollution is coming from point sources” (TNC website). For more information on the model results see Chapter 2 section 2.5.7.6.

4.6.1 American Rivers

American Rivers, a non-profit organization formed in 1973, is championing a national effort to protect and restore all rivers, from remote mountain streams to urban waterways. They recognize that rivers provide drinking water, grow our food, and sustain our spirits and that our rivers are threatened by climate change, unnecessary dams, pollution, floods, and outdated policies. They believe that the greatest threat to our rivers is simply lack of awareness of their importance to our lives. American Rivers tackles these challenges head on. They work alongside communities that are hardest hit and champion a movement to protect and restore the rivers on which we all depend. They have a half-century of experience addressing river threats from coast-to-coast: helping partners protect vital habitat, working with communities to reduce river pollution, securing policies to ensure we all have clean, abundant water, driving solutions that reduce the risk of floods, working to remove unnecessary dams, and strengthening a river movement that adds power to all of this work.

"The Cape Fear River faces threats that are interconnected and these connections reveal a web of opportunities to be pursued to make the river the asset that all of the communities depend on. American Rivers' long-term goal for the Cape Fear River is to balance the basin's water supply needs with the availability of clean water for both people and nature while encouraging the communities that live near the river to embrace it as a natural resource to enjoy and protect. We use an integrated management approach that uses the dynamic connections between the threats to resolve the problems. This approach to water management creates holistic, coordinated water systems that maximize economic, social, and environmental benefits in an equitable and sustainable manner."

American Rivers received a grant in 2023 that, when completed, will reconnect nearly 100 miles of the upper Cape Fear River and lower Deep River by removing five dams. The restoration of the Cape Fear River Basin is a priority for the restoration of migratory fish species including American shad, river herring, striped bass, Atlantic and shortnose sturgeon, and American eels. Additionally, this area is home to the endemic and endangered Cape Fear shiner (*Notropis mekistocholas*). The dams included in this project include the first four dams on the lower Deep River (Lockville, High Falls, Coleridge and Ramseur dams) and Buckhorn Dam which is the most upstream dam on the Cape Fear River. This project complements the efforts by the Cape Fear River Partnership to add fish passage to the three USACE lock and dam structures on the mainstem Cape Fear River. https://www.americanrivers.org/river/cape-fear-river/

DWR along with American Rivers is a partner in the Cape Fear River Partnership working to improve water quality and instream habitat along with supporting the need for fish passage and dam removal in order develop self-sustaining stocks of migratory fish in the Cape Fear River Basin.

4.6.2 Unique Places to Save

Unique Places to Save (UP2S) is a non-profit conservation organization that takes a creative, entrepreneurial approach towards meeting ecological resilience, conservation, and community development challenges. As a conservation stakeholder and partner in the Cape Fear River Basin, they propose the following conservation strategies that support the goals of the Cape Fear River Basin plan and restoration priorities shown below. A full description is available in the Chapter 4 Appendix.

- **Public Access** – River access and outdoor recreational facilities.

- Build opportunities for stewardship of water resources by increasing public access to rivers. Citizens that directly interact with their local water resources may be more likely to take actions to support watershed health. Inform these opportunities by providing guidance on avoiding or minimizing aquatic stressors and using the sites to meet other objectives such as access for water quality monitoring, increasing riparian buffers, and public outreach.

- **Restoration Actions** – Dam removal, wider riparian buffer/floodplain conservation, and stream and wetland restoration.
  - Where complementary to watershed goals, support or prioritize specific restoration actions and inform the expected ecological uplift when implemented. Inform restoration grant proposals with restoration methods best suited for the Cape Fear River Basin.

4.6.3 North Carolina Collaboratory

The North Carolina Collaboratory was established by the North Carolina General Assembly (NCGA) in 2016 to utilize and disseminate the research expertise across the University of North Carolina System for practical use by state and local government. A "Collaboratory" is a center without walls in which researchers perform research without regard to physical location, interacting with colleagues, accessing instrumentation, sharing data and computational resources and accessing information in digital libraries in a collaborative manner. As part of this NCGA mandate, the Collaboratory has been directed to facilitate and fund research related to the environment and economic components of the management of the natural resources within the state of North Carolina and of new technologies for habitat, environmental and water quality improvement. Principal investigators from North Carolina State University, Duke University, University of North Carolina (UNC)-Chapel Hill, UNC-Wilmington, Eastern Carolina University and North Carolina Agricultural and Technical State University have received NCGA funding for PFAS monitoring and research in the Cape Fear River Basin. More information on this project can be found on the North Carolina PFAS Testing Network website.

4.6.4 Haw River Assembly

The Haw River Assembly, works to restore and protect the Haw River and Jordan Lake by building a watershed community that shares this vision. The Haw River Assembly is a non-profit organization founded in 1982 and works in eight counties in the Haw River subbasin: Guilford, Rockingham, Caswell, Alamance, Orange, Chatham, Durham and western Wake. The goals of the Haw River Assembly are to promote environmental education, conservation and pollution prevention. Industrial contaminants, sedimentation from poor development practices, stormwater runoff and excess nutrients, microplastics, and bacteria pollution not only threaten the Haw River ecosystem and the wildlife that depends on it, but also the drinking water supplies, and recreational waters thousands of North Carolinians rely on. Through community organizing, advocacy, pollution investigation, legislative lobbying, and litigation, Haw River Assembly leads the fight against water quality issues in the watershed.

The Haw River Assembly runs a River Watch volunteer water quality monitoring program which documents water quality and environmental concerns across the Haw River watershed. Information on their monitoring program and watershed results are available at https://healthofthehaw.org/.

4.6.1 Jordan Lake One Water Association

Jordan Lake One Water Association (JLOW) brings together all public and private sector stakeholders to conduct planning in the Jordan Lake watershed and recommend policy to the North Carolina state legislature and implement an integrated water management strategy for all Jordan Lake users. "One Water" approach views all water resources – from the water resources in our ecosystems to our drinking water, wastewater, and stormwater – as resources that must be managed holistically and sustainably. Triangle J COG (renamed Central Pines Regional Council) began holding meetings in 2017 to discuss this One Water approach. Stakeholder interest was so high an advisory committee was formed to develop a workplan and move forward on collaborative planning efforts. JLOW was officially registered as a North Carolina non-profit organization in July 2022. The Advisory Committee, NCDWR, and numerous stakeholders collaborated to develop a recommended One Water/Integrated Water Management framework for the Jordan Lake watershed as part of the Jordan Lake Nutrient Management Strategy Rules Readoption opportunity.

4.6.2 Triangle Area Water Supply Water Quality

On August 18, 1988, several local governments in the Triangle J Council of Governments Region entered into an interlocal agreement to establish the Triangle Area Water Supply Water Quality Monitoring Project (TAWSMP). TAWSMP has been continuously funded through a series of Joint Funding Agreements with the US Geological Survey, and has just begun Phase IX, which will conclude June 30, 2027. TAWSMP exists to measure water quality conditions and long-term trends in water quality. More information about TAWSMP is available on the website and in the Chapter 4 Appendix.

4.6.3 Clean Jordan Lake

Clean Jordan Lake is a non-profit, community-driven organization to remove trash from the shoreline of Jordan Lake and prevent its recurrence. This organization was founded in 2009 to inform, inspire, and coordinate cleanups and to raise public awareness of the importance of watershed-wide, good stewardship. Jordan Lake has 180 miles of shoreline and 28,000 acres accessible to the public for recreational opportunities. However, public access has also caused issues with shoreline trash that enters the lake. Shoreline trash can erode natural beauty, destroy wildlife habitat and cause injury to birds and wildlife, endanger boaters if submerged, seep chemicals into the water and hurt the local economy by driving away visitors. As of May 2023, they have removed 208 tons of trash which includes about 21,000 bags of trash and 5,000 tires with the help of over 10,000 volunteers.

4.6.1 Rocky River Heritage Foundation

The Rocky River Heritage Foundation is a non-profit organization founded in 2005 with members from Chatham and surrounding counties. The mission of this organization is to protect the economic, natural, environmental and historical resources of the Rocky River.

4.6.2 Chatham Conservation Partnership

The Chatham Conservation Partnership (CCP) is a collaboration of local, state, and federal government agencies, non-profit organizations, businesses, universities and individuals who work together on natural resource conservation programs and issues in Chatham County.

4.6.3 Loves Creek Watershed Stewards

The Loves Creek Watershed Stewards (LCWS) work to restore the ecological function of Loves Creek and provide economic and community health benefits through watershed stewardship. LCWS members include stakeholders from federal, state and local agencies as well as local businesses, local citizens, and non-profit groups. The group meets quarterly to discuss issues in the watershed and proposes ways to address them. Loves Creek Watershed can be a unique amenity for the Town of Siler City. The urban watershed has potential to offer blue and greenway recreational opportunities for all ages. Restored channels may provide aesthetic, sound, environmental and visual interest. The surrounding former industrial sites within the watershed floodplains present the greatest opportunities for redevelopment around a dense and active downtown core. Through combined efforts, they have obtained over $1.1 million in grant funds ($1.7 million in grant funds and matching funds) to implement restoration activities targeting stormwater reductions and improving Loves Creek tributary water quality and ecological habitat in the Town of Siler City. See Chapter 7 section 7.7.5 and the Chapter 4 Appendix for more information on the Loves Creek Watershed Stewards organization and specific watershed projects.

4.6.4 Cape Fear Public Utility Authority (CFPUA)

Formed in 2008, Cape Fear Public Utility Authority (CFPUA) was created to consolidate the once separate water and wastewater systems of New Hanover County and the City of Wilmington. Today, CFPUA is the seventh-largest water/wastewater utility in North Carolina and is the primary provider for over 190,000 residents within New Hanover County. To better protect water quality and conserve the Cape Fear River Basin, CFPUA is developing a cost-share program designed to incentivize agricultural producers located north of CFPUA's water intake at Lock and Dam No. 1 to adopt conservation practices that reduce erosion and prevent pollutants from entering the water supply. Additionally, CFPUA is creating a Communication Plan to guide outreach efforts with potential contaminant sources, community holders, and other stakeholders. To learn more about their environmental management and sustainability programs see their website for more details.

4.7 Statewide Initiatives

In addition to local and regional projects and initiatives, there are several state and federal agencies that work statewide to protect and educate people about our natural resources. Examples of a few such initiatives are identified here.

4.7.1 Stream Watch

Stream Watch is housed within DWR, but relies on information collected by citizens across the state. The program encourages neighbors, civic groups and businesses to adopt a local stream, keep an eye out for any problems that might occur, and work together to ensure that the stream is healthy and able to support wildlife habitat, recreation and other uses. For more information about Stream Watch and how to get involved, visit the Stream Watch website.

4.7.2 It's Our Water

It's Our Water is a complete curriculum divided into five modules. Each module begins with a short video that presents a water quality topic, reviews scientific principles, shows real-life examples of current water issues, and introduces students to various professions related to water. Classroom demonstrations,

discussions, homework, quizzes and hands-on activities reinforce major concepts and prepare students for field investigation. Students develop an understanding of how these water resource issues affect them directly by investigating the stream nearest their school. The skills and knowledge required in each module build on earlier modules. Students will work towards completing a final project that examines the status of the water quality in their stream and offers recommendations for managing the stream. More information about It's Our Water can be found here.

4.7.3 Project WET

Project WET aims to engage children, parents, teachers, and members of the community in water resources education by advocating awareness of water and community involvement in water-related issues. This program achieves this by facilitating training workshops and community events that bring together science, social studies, and health education topics. The end result of these community level engagement efforts is a connected network of citizens, professionals and scientists. More information on how to participate in Project WET can be found here.

4.7.4 Watershed Wisdom

Watershed Wisdom is a UNC-TV science-based curriculum, geared toward 4th and 5th grade, but useable for all ages, that combines hands-on projects and interactive components to provide a robust blended lesson that introduces the value of water and maintaining healthy watershed ecosystems. Watershed Wisdom was developed in partnership with North Carolina Sea Grant, Project Wet, North Carolina Watershed Stewardship Network (WSN), and North Carolina Resources Institute (PBS Learning Media and UNC TV, 2020).

4.8 Growth Management and Land-Use Planning

Growth management can be defined as the application of strategies and practices that help achieve sustainable urban development and redevelopment while also conserving environmental qualities and features. Growth management tools range from on-the-ground best management practices (BMPs), such as stormwater wetlands, living shorelines, cisterns and vegetated (riparian) buffers, to establishing water, wastewater and/or stormwater authorities.

Several resources are available for protecting and managing water resources and include information about how to incorporate management strategies into existing and new development or changes in land use. Some examples include:

Watershed Academy: The Watershed Academy is available online through EPA's website. Online training modules, webcasts and publications are available for review.

Center for Watershed Protection (CWP): The Center for Watershed Protection (CWP), also referred to as the Center, is a nonprofit organization dedicated to research and education on the impacts of land use on watersheds throughout the nation. Several articles, reports, etc., are available through an online watershed library (OWL).

Low Impact Development (LID) Center: The Low Impact Development (LID) Center is a nonprofit national research organization that focuses on sustainable stormwater management solutions. Several projects are available for review.

Stormwater Design Manual: The Stormwater Design Manual, developed by the North Carolina Division of Energy, Mineral and Land Resources (DEMLR), is a technical guidance document about implementing the rules pertaining to post-construction stormwater measures. The companion manual, Stormwater Control Measure (SCM) Credit Document, includes the state's estimation of each SCM's effectiveness in protecting hydrology and removing pollutants.

Green Growth Toolbox (GGT): The Green Growth Toolbox (GGT) is a technical assistance tool designed to help communities conserve high-quality habitats as municipalities continue to grow. The toolbox is the result of a cooperative, non-regulatory effort led by the Wildlife Diversity program of the North Carolina Wildlife Resources Commission (WRC). A handbook, GIS dataset, training workshops and technical assistance are available for review and download.

Living Shorelines Academy: The Living Shoreline Academy has created tools to "evaluate the understanding, importance and practice of using living shorelines to enhance on-the-ground storm resiliency and create wetlands." The Academy provides training modules and includes a database of white papers and reports on existing living shoreline projects, a library of living shoreline resources and a map highlighting living shoreline projects across the United States. The Academy was developed in partnership by the NC Coastal Federation, Restore America's Estuaries, the Southern Environmental Law Center, and the Environmental Protection Agency (EPA). The NC Coastal Federation and DEQ's Division of Coastal Management (DCM) (Coastal Management Estuarine Shorelines) also has several resources available their websites.

4.9 Land Conservation and Preservation

Conservation and preservation are closely linked. Both involve a degree of protection, but conservation is generally thought of as the "proper use of nature" and preservation "protects nature from (human) use" (NPS, 2019). Both have many benefits especially in headwater areas and along stream corridors. Both preserve open and green spaces, preserve fish, wildlife and rare species habitat, promote biodiversity, and protect water and air quality. Both also maintain scenic landscapes and recreational amenities, prevent soil erosion, reduce flooding, and limit fragmentation. Conservation and preservation in coastal areas are particularly important for climate resiliency (see Chapter 2).

There are several federal and state funding sources for land conservation available to public and private landowners. State programs that offer funds for land conservation include the Parks and Recreation Trust Fund through the NC Department of Natural and Cultural Resources' (DNCR) Division of Parks and Recreation (DPR), the Environmental Enhancement Grant (EEG) Program through the Attorney General's Office, and the Agricultural Development and Farmland Preservation Trust Fund (ADFPTF) Trust Fund administered by the NCDA&CS, and the Division of Mitigation Services (for projects that include the use of restorative measures for compensatory mitigation). Federal programs include the US Department of Agriculture's (USDA) Agricultural Conservation Easement Program (ACEP) administered by the Natural

Resource Conservation Service (NRCS) and the Conservation Reserve Enhancement Program (CREP) administered by the Farm Service Agency (FSA) and the Farm Bill Program. More information about each of these programs can be found on the programs' website.

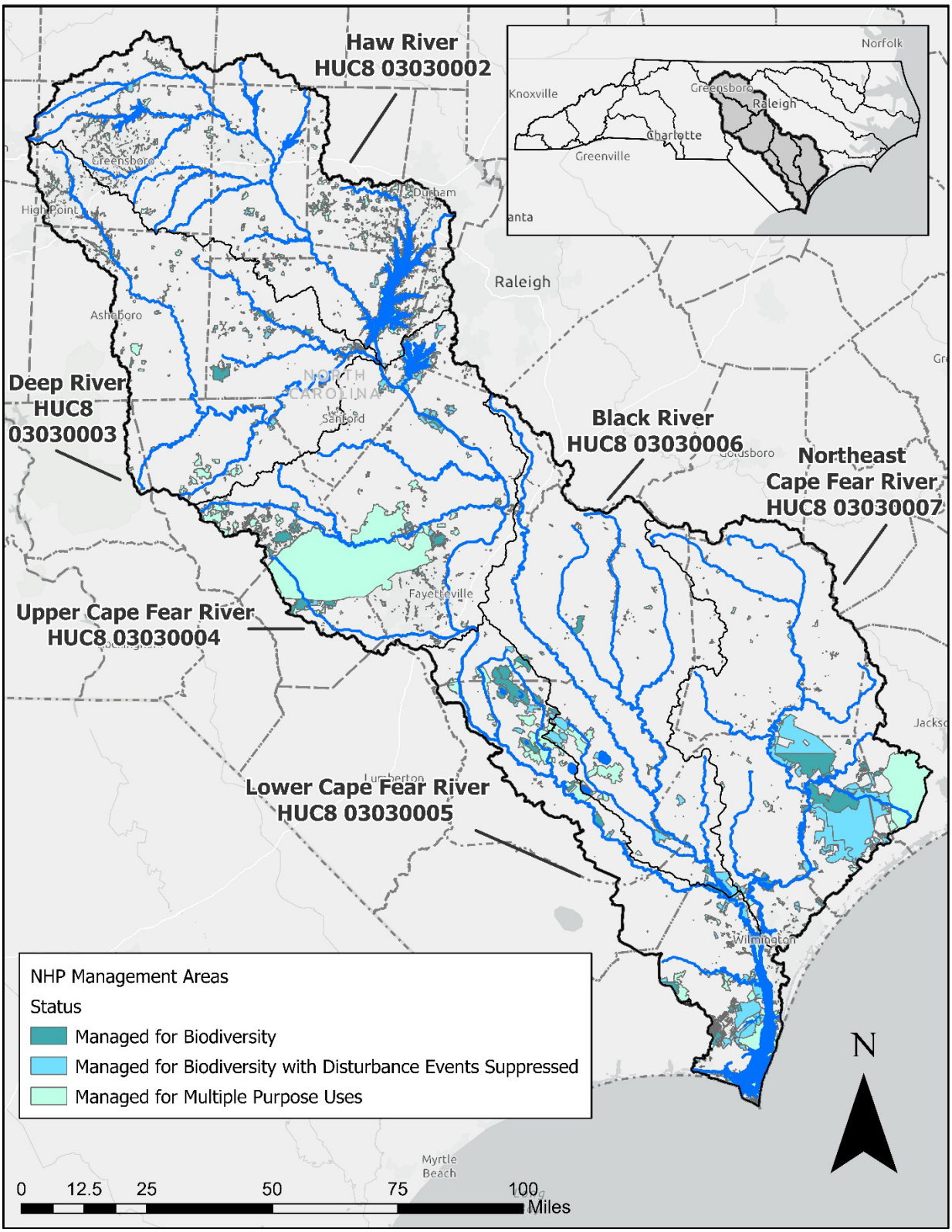
The Natural Heritage program tracked close to 1,500 mi^2 (1,47.8 mi^2) of land in the Cape Fear River Basin that had natural resource management as one of the primary management goals in 2022 (*Figure 4-9*). These "Management Areas," as designated by NHP, are federal, state, local government or privately owned parcels that are protected through fee simple, conservation easement or some other ownership mechanism. Of those tracked acres, 14.4% (212.3 mi^2) are managed strictly for biodiversity, 35.2% (520.2 mi^2) are managed for biodiversity with allowances to suppress natural disturbance and include some activities that could degrade natural communities and 50.5% (746.2 mi^2) are managed for multi-use purposes that include broad ranging low intensity activities (e.g., logging, all-terrain vehicle recreation) or localized intense activities (e.g., mining) (NHP 2022).

Protecting coastal areas is particularly important for climate change resiliency (see Chapter 2). The National Oceanic and Atmospheric Administration (NOAA) recently collaborated with local communities and nonprofit partners, the North Carolina Land Trust, National Fish and Wildlife Foundation and The Nature Conservancy to purchase 1,700 acres of wetland and floodplain habitat in the Cape Fear River Basin. The acquisitions, finalized in the summer of 2021, preserved three tracts of pristine habitat that are mostly freshwater tidal marsh and cypress swamp. The acquisition of these properties will help avoid future flooding and protect critical buffer and wildlife habitats (NOAA 2021).

The state manages many properties for biodiversity, including some that have been identified as Dedicated Nature Preserves by NHP. These are publicly or privately-owned natural areas that have established a lasting conservation commitment. Some of the larger state-owned Dedicated Nature Preserves in the Cape Fear River Basin include the Holly Shelter Game Land (23.9 mi^2), Angola Bay Game Land (23.5 mi^2), Suggs Mill Pond Game Land (17.1 mi^2), Boiling Spring Lake Plant Conservation Preserve (11.3 mi^2), Cape Fear River Wetlands Game Land (7.5 mi^2) and Carvers Creek State Park (6.8 mi^2. Many of the properties managed strictly for biodiversity are privately owned by land trusts. The North Carolina Coastal Land Trust and The Nature Conservancy are the two most active land trusts in the Cape Fear River Basin with 27,320 (42.7 Mi^2) and 42,342 (66.2 Mi^2) acres respectively under their ownership (NC NHP 2022c). Other active land trusts with large land holdings in the basin include Three Rivers Land Trust, Piedmont Land Conservancy, Triangle Land Conservancy, North America Land Trust, Conservation Fund, and Southern Conservation Trust (NC NHP 2022). There are also several Dedicated Nature Preserves owned by land trusts, such as The Nature Conservancy's Green Swamp and Angola Creek Flatwoods Preserves and the Triangle Land Conservancy's White Pines Preserve. The US Fish and Wildlife Service also manages several larger properties dedicated solely to biodiversity, including critical habitat areas for the loggerhead sea turtle (*Caretta caretta*), piping plover (*Charadrius melodus melodus*) and golden sedge (*Carex lutea*). See Chapter 1 for more information on rare species and biodiversity in some of the Dedicated Nature Preserves mentioned in this section.

See chapter 1, section 1.6 (Biodiversity in the Cape Fear River Basin) for information on the Natural Heritage Program's mission and information on the Cape Fear River basin's rare animal and plant species.

Figure 4-9: Land Conservation in the Cape Fear River Basin (NC NHP 2022)

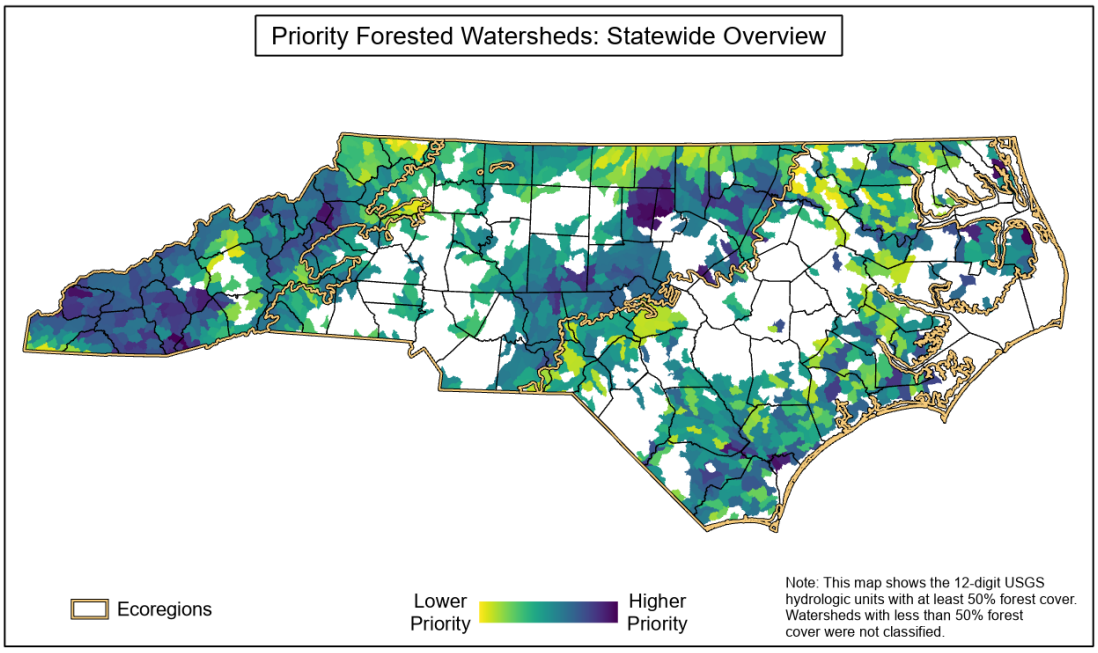


4.10 North Carolina Forest Service (NCFS)

Properly planned and executed forest management practices facilitate the sustainable harvest of forest products while protecting water quality. During forestry operations, extra attention is often warranted at stream crossings, on steep slopes with exposed soils and along streamside management zones. There are multiple federal and state-adopted rules and standards governing silviculture, and the state has a comprehensive set of recommended forestry Best Management Practices (BMPs).

Forests continue to be an important land use in this river basin and can provide watershed ecosystem services. Forests support drinking water and watershed-derived ecosystem services. The map in *Figure 4-10*, from the 2020 North Carolina Forest Action Plan, illustrates priority forested watersheds identified by the North Carolina Forest Service (NCFS 2022).

Figure 4-10: Priority Forested Watersheds in North Carolina (NCFS 2022)



Over 37% percent (3,421 mi^2) of land cover in the Cape Fear River Basin was identified as forest in 2019, with the most forested cover occurring in the upper three subbasins: the Haw River (HUC8 0303002), the Deep River (HUC8 03030003) and the Upper Cape Fear (HUC8 03030004). These three subbasins have also had the highest loss of forest cover since 2001. More information about forested land cover and NCFS forestry practices in the Cape Fear River Basin can also be found in Chapter 1. Chapter 1 provides an overview of basin characteristics including land use and potential impacts from nonpoint source pollution. More information about forested land cover changes and NCFS forestry practices for the Haw, Deep, and Upper Cape Fear subbasins specifically can also be found in chapters 6, 7, and 8 respectively.

4.10.1 Forest Management and Reforestation

Private forest landowners can work with the NCFS and/or forestry consultants to plan and undertake the management of their resources. The NCFS offers several types of plans that can be prepared depending on landowner objectives. Two frequently used plans are Forest Management Plans and Forest Stewardship Plans. NCFS personnel often prepare Forest Management Plans for landowners whose primary objective is timber management. These plans provide written prescriptions for specific forestry activities and include recommendations for minimizing impacts to water quality. Forest Stewardship Plans are prepared for landowners who want to manage for additional resources beyond timber, including wildlife habitat, cultural resources, recreation, non-timber forest products or aesthetics. The NCFS also prepares plans that address specific, time-limited prescriptions to accomplish an individual objective such as reforestation, prescribed burning or other forestry practices (NCFS 2022). Cape Fear River Basin NCFS plan numbers from May 2005 to October 2021 are summarized in *Table 4-3* displayed spatially in *Figure 4-11*. More information about NCFS plans at the HUC8 level is available in Chapters 6, 7, and 8.

Table 4-3: Forestry Plans Prepared by NCFS in the Cape Fear River Basin, May 2005 to October 2021 (NCFS 2022)

Time Period	Forest Management Plans	Total Acres	Forest Stewardship Plans	Total Acres
May 2005 – December 2010	3,308	172,732	196	28,151
January 2011 – December 2015	2,978	155,364	83	12,316
January 2016 - October 2021	2,279	111,840	127	17,855
Total	**8,565**	**439,936**	**406**	**58,322**

The NCFS also administers the Forest Development Program (FDP). The FDP is a reforestation, afforestation, and forest-stand improvement cost-sharing program offered to private landowners. The FDP is available to landowners directly after a timber harvest, or on a tract of land that has been without forest cover for an extended period. To qualify, a landowner must have a forest management plan approved by NCFS. Under the FDP, a landowner is partially reimbursed for the costs of site preparation, seedling purchase, tree planting, release of desirable seedlings from competing vegetation, or any other work needed to establish a new forest (NCFS 2022). The FDP can complement federal cost-share programs such as the Conservation Reserve Program (CRP) through the U.S. Department of Agriculture (USDA). FDP values for the Cape Fear River Basin from May 2005 to October 2021 are summarized in *Table 4-4* and spatially displayed in *Figure 4-12*. More information about reforestation and afforestation at the HUC8 level is available in Chapters 6, 7, and 8.

Table 4-4: Reforestation and Afforestation Assistance Provided by NCFS in the Cape Fear River Basin, May 2005 to October 2021 (NCFS 2022)

Time Period	Reforestation Projects[1,2]	Total Acres[1]	Afforestation Projects[1,3]	Total Acres[1]	Total Acres[1]
May 2005 - December 2010	2,167	77,874	559	7,127	85,001
January 2011 - December 2015	1,435	55,354	165	2,289	57,643
January 2016 - October 2021	1,644	72,313	130	2,079	74,392
Total	**5,246**	**205,541**	**854**	**11,495**	**217,036**

[1] Table values do not include tracts that may have been reforested without NCFS assistance, converted to other uses, or left alone to revegetate naturally.
[2] Reforestation means tree regeneration after a timber harvest.
[3] Afforestation means the establishment of forest tree seedlings on a site that was non-forested (ex: a former pasture).

4.10.2 Training, Education and Outreach

The NCFS assists with training workshops statewide on topics of BMPs, harvest planning and water quality rules. In particular, the NCFS co-hosted two workshops on the topic of bottomland forests, one in 2017 as a multi-day event (website) and one in 2020 as a follow-up workshop to examine silvicultural practices to manage these forest systems. Field tours were hosted at Bladen Lakes State Forest, where demonstration harvests have been implemented to identify techniques for regenerating important bottomland hardwood tree species for songbirds and timber (NCFS 2022).

Figure 4-11: Density of NCFS plans provided in the Cape Fear River Basin between May 2005 and October 2021 (NCFS 2022).

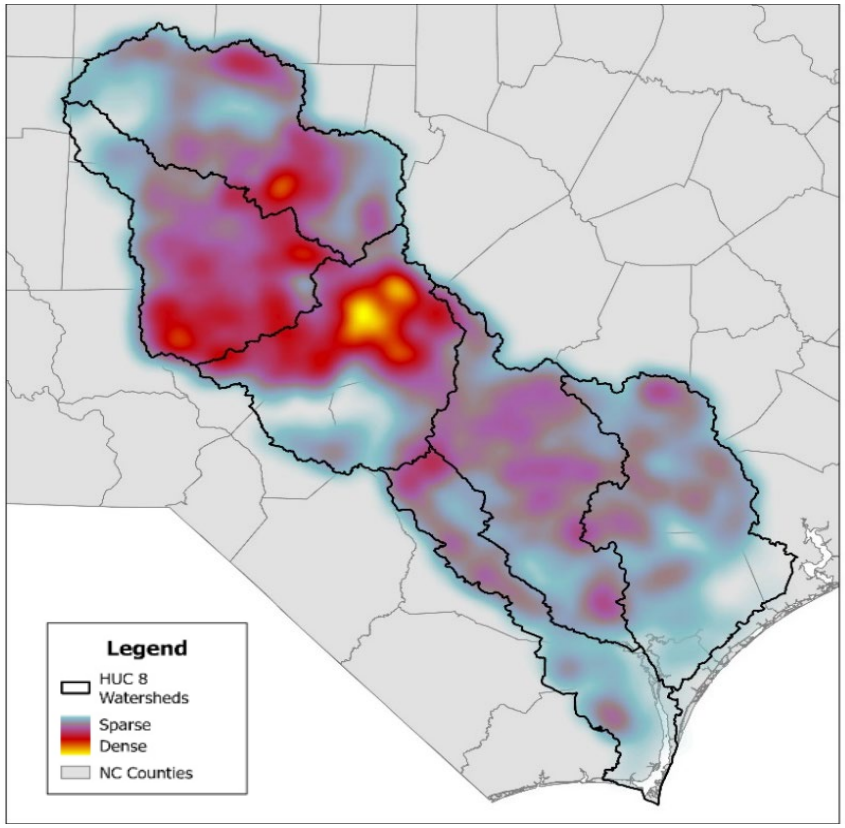
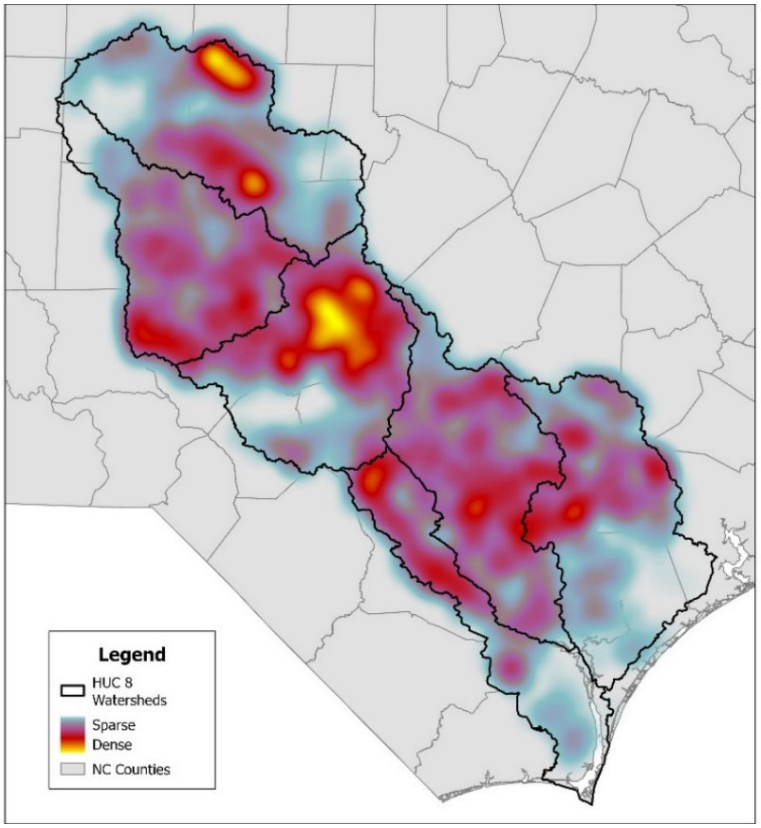


Figure 4-12: Density of Afforestation and Reforestation documented by the NCFS between May 2005 and October 2021 (NCFS 2022).



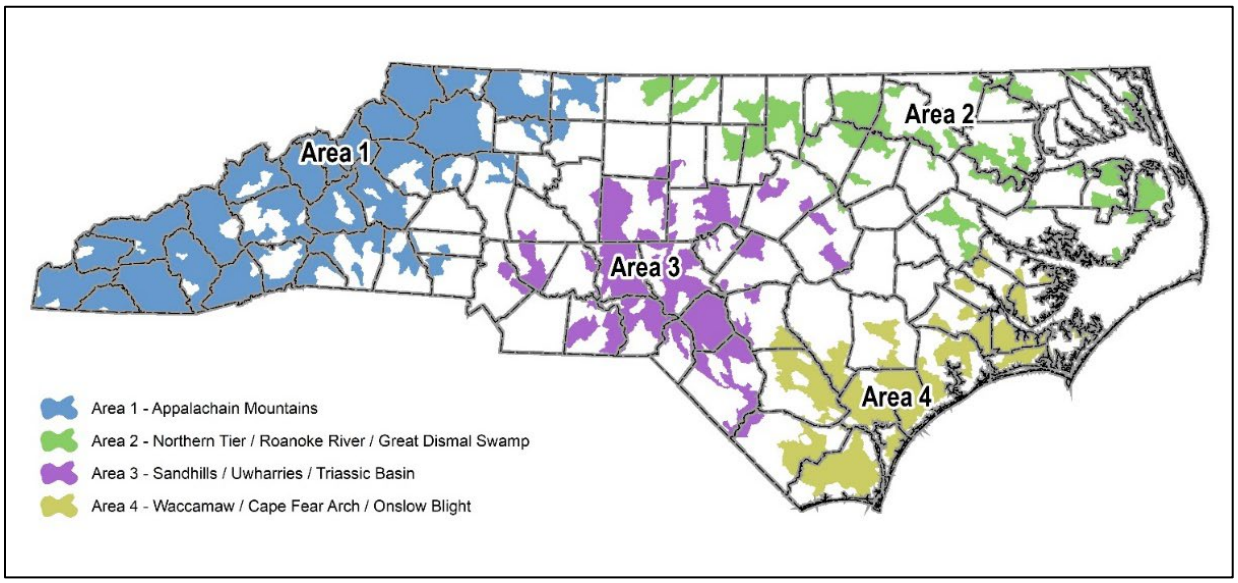
Afforestation and Reforestation includes hand planting, mechanical planting, and any other methods, excluding natural regeneration.

4.10.3 Forest Conservation

There are multiple public and private sources of funds for conserving lands. For forestlands, the Forest Legacy Program (FLP) is administered by the NCFS for conserving working forests in priority areas that are at-risk of loss or conversion (*Figure 4-13*). Funding is provided by the USDA Forest Service, and often matched by other federal or state grant funds, in concert with willing landowners (NCFS 2022).

Forests support drinking water and watershed-derived ecosystem services. *Figure 4-13* ***Figure 4-13*** is a map from the 2020 *North Carolina Forest Action Plan*, illustrating priority forested watersheds identified by the North Carolina Forest Service.

Figure 4-13: Forest Legacy Priority Areas for North Carolina, 2020 (NCFS 2020)



4.10.4 Urban Forestry

The NCFS has various programs and educational materials aimed at increasing tree cover in urban areas, assisting municipalities with urban forestry related city planning as well as encouraging the adoption of green infrastructure. With increased impervious cover, it is important that city-planners, engineers, and developers focus on water quality, flood protection and erosion control (due to either land disturbance or increased stream flow) - all of which can be addressed in-part with urban forestry. Forests have been shown to offer flood control by increasing soil infiltration rates and water storage capacity, decrease erosion with the aid of extensive root systems and canopies and help to filter excess pollutants and nutrients from runoff (NCFS 2022). Additional information about urban and community forestry can be found on the Urban and Community Forestry website.

4.11 Division of Coastal Management

The DEQ Division of Coastal Management (DCM) works to protect, conserve, and manage North Carolina's coastal resources through an integrated program of planning, permitting, education and research. DCM works with and receives part of its funding from NOAA's Office of Ocean and Coastal Resource Management.

DCM is responsible for several programs, including permitting and enforcement; land-use planning; public beach and waterfront access; North Carolina Coastal Reserves; and grants for marine sewage pumpout stations. To assess the impacts of coastal development, DCM collects, hosts and analyzes data for oceanfront construction setback and erosion rates (link) as well as wetland conservation and restoration opportunities (link). DCM also has several tools available online for stormwater management, environmental justice and social vulnerability indicators, statewide flooding, coastal flooding (link), community assessments, planning and engagement (link) and shoreline management (link).

DCM also manages the Coastal Area Management Act (CAMA), which requires each of the 20 coastal counties to have a local land use plan in accordance with guidelines established by the NC Coastal Resources Commission (CRC). A land use plan is a collection of policies, maps and implementation actions that serves as a community's blueprint for growth. The management goal for water quality is to maintain, protect, and where possible, enhance water quality in all coastal wetlands, rivers, streams and estuaries. The CRC's planning objective is for communities to adopt policies for coastal waters within their planning jurisdiction to help ensure that water quality is maintained if the water is not impaired, and improve impaired waters. Local communities are required to devise policies that help prevent or control nonpoint source discharges (sewage and stormwater) through strategies, such as impervious surface limits, vegetated riparian buffers, maintenance of natural areas, natural area buffers and wetland protection. They are also required to establish policies and future land use map categories that are aimed at protecting open shellfishing waters and restoring closed or conditionally closed shellfishing waters. The Certified Land Use Plans by county can be found here (link). Four counties (Brunswick, Pender, New Hanover, and Onslow) and several municipalities have certified land us plans.

4.12 Division of Marine Fisheries

The DEQ Division of Marine Fisheries (DMF) is responsible for the stewardship of the state's marine and estuarine resources. DMF's jurisdiction encompasses all coastal waters and extends to three miles offshore. Agency policies are established by the nine member Marine Fisheries Commission and the secretary of the DEQ. North Carolina is a member of the Atlantic States Marine Fisheries Commission, the Mid-Atlantic Fishery Management Council and the South Atlantic Fishery Management Council.

North Carolina has one of the most active reef enhancement programs in the country due in part to wide public support and dedicated DMF staff. Artificial reefs and oyster sanctuaries are supported by DMF staff who develop, maintain, evaluate and administer the reef system. Biologists monitor North Carolina's artificial reefs for material stability, material durability, material performance, essential fish habitat and more. Information from these studies helps guide future enhancements. GPS Coordinates and details for

each oyster sanctuary (link), artificial reef (link) and cultch planting (link) are available in the interactive Artificial Reef Guide (link).

4.13 NC Wildlife Resources Commission

The North Carolina Wildlife Resource Commission's (WRC) mission is to conserve North Carolina's wildlife resources and their habitats and provide programs and opportunities for outdoor enthusiasts to enjoy wildlife-associated recreation. The WRC produces a Wildlife Action Plan (WAP) every 10 years that is focused on the conservation needs and management plans to help conserve and enhance the state's fish and wildlife species and their habitats. The 2015 North Carolina Wildlife Action Plan is a comprehensive planning tool developed in cooperation with numerous partners, including federal and state agencies, conservation organizations and stakeholders. *The 2015 WAP makes specific recommendations for species surveys, long-term monitoring, research, and management practices to reduce environmental impacts. It also recommends that conservation programs and partnerships work synergistically with other conservation actions to enhance the "resilience of natural resources" throughout the region*. Many of the management practices to reduce environmental impacts, improve aquatic life and protect water quality are included here.

Some of the Wildlife Action Plan recommendations related to water include:

- Manage riverine habitat to promote the presence of adequate woody and rocky structures and natural processes like bank dynamics, channel meanders and flood regimes.
- Modify discharge permits when base flow conditions decrease and the 7Q10 is lowered as part of a drought management program.
- Augment instream habitat to enhance its structural complexity to increase fish community abundance, biomass and diversity (Hrodey and Sutton, 2008).
- Restore stream flows that promote controlled overbank flows and hydrological connectivity between the river and the floodplain in managed rivers.
- Protect potential migration corridors and preserve connectivity that allows for species and ecosystem migration.
- Undertake immediate and continuing efforts to limit water quality deterioration from both point and nonpoint sources of pollution.

Some of the Wildlife Action Plan recommendations related to land use include:

- Implement and support use of agriculture and forestry BMPs to control stormwater runoff, using such structures as rain gardens, cisterns, permeable pavement, vegetated swales and filter strips.
- Reduce impervious surfaces to control runoff and erosion and encourage use of pervious paving materials where feasible. Research has shown that impervious levels of 8%–12% represent a threshold where small changes in urbanization can cause major changes in stream condition (Wang et al. 2009).
- Preserve forests and open space, farmland, rural landscapes and park lands and plant trees and vegetation in urban areas to aid in carbon sequestration.

- Use easements and value taxation as well as fee simple purchase for land conservation or preservation.

Some of the Wildlife Action Plan recommendations related to riparian corridors and floodplain zones include:

- Fence livestock out of streams to protect riparian vegetation, maintain bank stability and reduce nutrient inputs to the aquatic system.
- Preserve or restore riparian vegetation to maintain stable streambanks and dissipate water runoff energy to allow for sediment deposition.
- Update flood maps as required by changes in flood patterns, i.e., frequency and duration, and flooded lands to ensure protection of life and property. (Band and Salvesen, 2009)

The WAP identifies Species of Greatest Conservation Need (SGCN's) and these include species that are known to be rare, threatened, or endangered as well as others in need of research due to lack of knowledge or are biologically vulnerable. The 2015 WAP named 33 aquatic SGCNs in the Cape Fear River Basin: two aquatic snails, two crayfish, 17 freshwater or anadromous fishes and 12 mussel species. For additional information see chapter 1, section 1.6 on *Biodiversity in the Cape Far River Basin*. To see an example of NCWRC biologists efforts to preserve the endangered Cape Fear Shiner, see a short UNC-TV SciNC video Saving a Tiny, Shiny Fish.

4.14 Grants & Funding Opportunities

DWR's Use Restoration Watershed (URW) Program was established to help restore the beneficial uses of impaired waters of the state while also ensuring that protective measures are in place to prevent future degradation. Several guidance documents are available online including factsheets about watershed planning and about how to develop a watershed plan. The program also has a list of financial resources available through federal, state and private entities. Examples of financial resources include the Nonpoint Source EPA Section 319 Grant, Clean Water Management Trust Fund (CWMTF), Water Resources Development Grant (WRDG), Z. Smith Reynolds Foundation, and voluntary cost share programs managed by the North Carolina Department of Agriculture & Consumer Services (NCDA&CS) Division of Soil & Water Conservation (DSWC). DEQ launched a new webpage in January 2022 that provides information on all DEQ funding programs in one place, along with a searchable list of currently open applications for grant opportunities.

4.14.1 Grants Administered by the Division of Water Resources (DWR)

Several grants are administered by DWR. A brief overview of the EPA Section 319(h) and 205(j) grants and the Water Resources Development Grant (WRDG) are included here.

Section 319(h) Grants

Through Section 319(h) of the Clean Water Act, EPA provides funds to state, territory and tribal agencies to reduce nonpoint source pollution. Funds must be used to help restore waterbodies currently impaired by nonpoint source pollution. The waterbody must also be located in an area with an approved watershed restoration plan (9 Element Watershed Restoration Plan). Funds are

allocated through a competitive grant process and are used to implement stormwater and agricultural BMPs and restoration projects on impaired waterbodies. More information about the program can be found on DWR's 319 Grant Program's website.

205(j) Water Quality Management Planning Grants

The 205(j) Grant Program is also funded through EPA and provides funding to complete water quality management planning projects. Projects can involve identifying the nature, extent and cause of water quality problems or developing plans to address these problems (i.e., 9 Element Watershed Restoration Plan). Limited competitive funding is available to regional COGs for water quality management planning efforts. More information can be found on DWR's 205(j) Grant Program's website.

Water Resources Development Grants (WRDG)

The purpose of the Water Resources Development (WRDG) Program is to provide cost-share grants and technical assistance to local governments throughout the state. Applications for grants are accepted for seven eligible project types: general navigation, recreational navigation, water management, stream restoration, water-based recreation, Natural Resources Conservation Service (NRCS) Environmental Quality Incentives Program (EQIP) stream restoration projects and feasibility/engineering studies. The non-navigation projects are collectively referred to as state and local projects. The program provides a 50% cost share on approved projects. WRDG grants funded in Cape Fear River Basin counties are listed in *Table 4-5*.

4.14.2 North Carolina Land and Water Fund (NCLWF)

Created in 1996, the Clean Water Management Trust Fund (CWMTF) provides grants to local governments, state agencies and conservation non-profits to help finance projects that specifically address protecting and restoring North Carolina's water resources. Over the years, however, the mission has expanded beyond the original focus of water quality, and in 2019, the General Assembly voted to rename the CWMTF to the North Carolina Land and Water Fund (NCLWF). Projects funded through the NCLWF include land acquisitions to protect land and water resources, capital improvements to stormwater infrastructure and improving stormwater management, and restoring and improving degraded stream segments. NCLWF is managed within the NC Department of Natural and Cultural Resources (DNCR), Division of Land and Water Stewardship. More information (including eligibility requirements and funded projects) can be found online.

Table 4-5: Water Resource Development Grants funded in the Cape Fear River Basin from Fiscal Year 2010 to 2021

Project Name (Fund Projects)	Stream	County	Grant Amount	Fiscal Year	Description
Carolina Beach Access Phase 2	Atlantic Ocean	New Hanover	$100,000.00	2010-11	This project involves the purchase of a 0.287 acre parcel of land which will become part of the Ocean-to-Sound Access Park and future home of the NC Aquarium Pier.
Carolina Beach Access Phase 1	Atlantic Ocean	New Hanover	$150,000.00	2010-11	This project involves the purchase of a 0.287 acre parcel of land which will become part of the Ocean-to-Sound Access Park and future home of the NC Aquarium Pier.
Town of Caswell Beach Water Management	AIWW	Brunswick	$60,903.00	2010-11	This project will alleviate roadway and residential flooding in the Town's Caswell Dunes neighborhood.
Southern High School Water Management Design	Chunky Pipe Creek	Durham	$20,000.00	2010-11	The feasibility study will design a retrofit for stormwater conveyance from roofs, parking lots and other impervious areas on the school grounds to bioretention ponds, stormwater treatment wetlands, underground cisterns and rain gardens.
Boiling Spring Lakes - Sanford Dam Spillway	Allen Creek - Boiling Spring Lake	Brunswick	$80,000.00	2010-11	This study will design a new spillway for the Sanford Dam located on Allen Creek that will increase the flood storage capacity of the reservoir.
50% Dow Chemical Intake Extraction	Atlantic Ocean	New Hanover	$50,000.00	2011-12	This project will remove rusty and jagged remnants of an intake structure located on the beach strand that poses a safety risk to beach goers.
50% Cedarock Park Enhancement	Rock Creek	Alamance	$75,000.00	2012-13	This grant will provide financial assistance to Alamance County for the purchase of additional park acreage and developing water-based recreation amenities at Cedarock Park.
50% City of Dunn Stormwater CIP Study	Juniper Creek	Harnett	$15,000.00	2013-14	This grant will provide financial assistance to the City of Dunn for an engineering/feasibility study of four areas within the City that are prone to flooding.
50% Wilmington Waterfront Planning	Cape Fear River	New Hanover	$45,000.00	2014-15	This grant will provide financial assistance to the City of Wilmington for a feasibility study to examine potential shoreline improvements along a two-mile reach of river front.
50% Wilmington Waterfront Planning Phase 2	Cape Fear River	New Hanover	$45,000.00	2014-15	This grant will provide financial assistance to the City of Wilmington for a feasibility study to examine potential shoreline improvements along a two-mile reach of downtown river front.
50% Wallace Storm Drainage Phase 2	UT Little Rockfish Creek	Duplin	$25,000.00	2014-15	This grant will provide financial assistance to the Town of Wallace for stormwater system upgrades along North Duplin Street.
50% Burgaw Stormwater Master Plan	Burgaw Creek	Pender	$25,000.00	2014-15	This grant will provide financial assistance to the Town of Burgaw for a feasibility master plan study of seven flood prone areas.

Project Name (Fund Projects)	Stream	County	Grant Amount	Fiscal Year	Description
50% North Lake Fishing Dock	Allen Creek	Brunswick	$29,000.00	2015-16	This grant will provide financial assistance to the City of Boiling Spring Lakes for the construction of a fishing dock with amenities at North Lake.
50% Sanford Municipal Parking Lot Water Management	Little Buffalo Creek	Lee	$50,000.00	2015-16	This grant will provide financial assistance to the City of Sanford for the installation of stormwater treatment BMPs along Little Buffalo Creek.
50% Southern High School Water Management Design	Chunky Pipe Creek	Durham	$20,000.00	2015-16	This project will design a retrofit for stormwater conveyance from roofs, parking lots and other impervious areas on the school grounds to bioretention ponds, stormwater treatment wetlands, underground cisterns and rain gardens.
White Lake Multi-Use Path Project (Phase II)		Bladen	$200,000.00	2019-20	Construct approximately 2,525 linear feet of paved greenway trail and include 800 feet of wooden boardwalk. This section will become part of Segment 13 of the Mountains-To-Sea Trail bordering the northwestern perimeter of White Lake.
Rock Creek Streambank Stabilization		Guilford	$26,975.00	2019-20	Stabilize ~50 linear feet of degraded stream along Rock Creek and adjacent to a trail bordering Stoney Creek Golf Club.
Brooks Creek at Saralyn Culvert Replacement & Stream Restoration		Chatham	$199,885.00	2021-22	Replace an existing culvert with a bottomless arch culvert, restore approximately 190 linear feet of stream channel upstream and downstream of this culvert and restore 0.2 acres of riparian buffer

4.14.3 Grants Administered by the Division of Water Infrastructure (DWI)

DEQ's Division of Water Infrastructure (DWI) provides financial assistance for projects that improve water quality. Programs administered by DWI fund wastewater collection and treatment systems, drinking water treatment and distribution systems, stormwater quality management systems and stream restoration. DWR also supports the nine-member State Water Infrastructure Authority (Authority) which was created by the North Carolina General Assembly in 2013 under General Statute 159G-70. The Authority is an independent body with primary responsibility for awarding federal and state funds for water and wastewater infrastructure projects, recommending ways to maximize the use of available funding resources, and recommending best and emerging utility management practices.

In 2017, the Authority published North Carolina's Statewide Water and Wastewater Infrastructure Master Plan: The Road to Viability. The master plan presents the state's roadmap for viable water and wastewater utilities that safeguard public health, protect the environment, support vibrant communities and encourage economic growth and development. The three key areas that require focus to move toward viability are in long-term infrastructure management, organizational management and financial management. The master plan applies broadly to owners and operators of water and wastewater utilities and systems that serve the public, and emphasizes that local elected officials, town and county managers, utility governing boards, customers and stakeholders, as well as the public, play key roles in achieving viable utilities.

DWI administers financial assistance programs for projects that improve water quality through low-interest loans and grants to local governments and certain other non-profit entities for water and wastewater infrastructure. Programs within DWR include the Clean Water State Revolving Fund (CWSRF), the Drinking Water State Revolving Fund (DWSRF), the Community Development Block Grant-Infrastructure (CDBG-I) Program, the State Wastewater and Drinking Water Reserve Programs, Asset Inventory and Assessment Grant Program, Merger/Regionalization Feasibility Grant Program and the new Local Assistance for Stormwater Infrastructure Investments (LASII) Program. More information about each of these programs can be found on DWI's website under "I Need Funding."

The American Rescue Plan Act (ARPA,) signed into law on March 11, 2021, guaranteed direct financial relief to cities, towns and villages in the United States. The final rule was released on January 6, 2022, and took effect on April 1, 2022. Session Law 2021-180 (Sections 12.13 and 12.14) appropriated $1.69 billion in North Carolina's allocation of ARPA funds for drinking water, wastewater and stormwater infrastructure. DWI will administer approximately $1.6 billion in grant funding, excluding funds transferred to other agencies and administrative costs. ARPA funds are available to cities, counties, regional COGs, and nonprofit partners through the Viable Utility Reserve program, the Drinking Water Reserve and Wastewater Reserve program, and the LASII program established under S.L. 2021-180 (see descriptions below). It is anticipated at least two years of ARPA funded grant cycles will be available to cities, counties, regional COGs and nonprofit partners. Grant awards for the fall 2022 funding round were announced in February 2023 on DWI's website State Water Infrastructure Authority-funded projects. The Spring 2023 Application Process has commenced.

Clean Water State Revolving Fund (CWSRF)

The Clean Water State Revolving Fund receives federal funding through the US Environmental Protection Agency (EPA) under the Clean Water Act (CWA). This program is available for local governments (counties, cities, towns, sanitary districts, etc.) for wastewater treatment, wastewater collection, reclaimed water, stormwater quality BMPs, stream restoration and energy efficiency projects for treatment works or collection systems. The CWSRF provides funding through low-interest loans and limited-amount principal interest loans.

Drinking Water State Revolving Fund (DWSRF)

The Drinking Water State Revolving Fund (DWSRF) receives federal funding through the EPA under the Safe Drinking Water Act (SDWA). This program is available for local governments (counties, cities, towns, sanitary districts, etc.) and certain other non-profit entities for source, treatment, storage, transmission and distribution systems. The DWSRF provides funding through low-interest loans and limited-amount principal interest loans.

Community Development Block Grant-Infrastructure (CDBG-I)

Funding for the federal Community Development Block Grant-Infrastructure (CDBG-I) Program is provided by the US Department of Housing and Urban Development (HUD). The program provides grants to local government units to address water and wastewater infrastructure needs in HUD-qualified low- to moderate-income communities.

State Wastewater and Drinking Water Reserve Program

Funding for the State Wastewater Reserve and Drinking Water Reserve Program is provided by the North Carolina General Assembly. The program provides grants and loans for design and construction of critical water and wastewater infrastructure. Funds can be used by units of local government for wastewater collection and treatment projects and public water system projects.

Asset Inventory and Assessment (AIA) Grant Program

Funding for the Asset Inventory and Assessment (AIA) Grant Program is provided by the North Carolina General Assembly. The program provides grants for developing asset inventories, condition assessment of critical assets and other components of a comprehensive asset management program.

Merger/Regionalization Feasibility (MRF) Grant Program

Funding for the Merger/Regionalization Feasibility (MRF) Grant Program is provided by the North Carolina General Assembly. The program provides grants for studies to evaluate the potential consolidation of two or more systems, the potential for interconnection with another system for regional wastewater treatment or regional water supply and the managerial consolidation of systems without physical interconnection.

Viable Utility Reserve (VUR) Program

Funding for the Viable Utility Reserve (VUR) program works to build a path toward viable utility systems using long-term solutions for distressed water and wastewater units in North Carolina. VUR is currently under development.

Local Assistance for Stormwater Investment Program (LASII)

Funded by ARPA, the LASII program provides grants for construction and planning of stormwater projects to improve or create infrastructure for controlling stormwater quality and quantity. Applicants must be able to document a stormwater quality or quantity issue in their community and be able to demonstrate a significant hardship raising revenue to finance stormwater management activities. Examples of construction grants include implementation of SCMs, stream, wetland, or buffer restoration, retrofits of stormwater conveyances, installation of nature-based solutions and development and implementation of a new stormwater utility. Planning grants may include research or investigative studies, alternative analysis, engineering concepts/designs and nature-based solutions (NCDWI, 2022).

4.14.4 Cost Share Programs administered by NCDA&CS's DSWC and USDA NRCS

Several cost share programs are available through both federal and state agencies. The Division of Soil & Water Conservation (DSWC) in the North Carolina Department of Agriculture & Consumer Services (NCDA&CS) administers multiple state cost share programs, while the United States Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) administers several federal cost share programs. Cost share programs are routinely used to assist with response to natural disasters. Most of the state programs typically offer 75% cost share assistance to applicants for the installation of BMPs to protect or improve natural resource concerns. The applicant is responsible for the remaining 25% of the costs, which can include the use of existing material and labor (in-kind services) and/or monetary contributions. There are some cost share and acreage restrictions depending on the BMPs used, the type of operation involved and/or policies set by the local Soil and Waters Conservation District (SWCD) or the North Carolina Soil and Water Conservation Commission (SWCC). Cost share incentive payments are also available to encourage the use of certain agronomic management practices.

Between June 2012 and August 2022, nearly $12.2 million has been spent on the implementation of voluntary and disaster relief BMPs in the Cape Fear River Basin through the state cost share programs (*Table 4-6*), and over $53 million of federal cost share money was spent (*Table 4-7*). Each BMP installed has water quality benefits associated with it, and tools are in place to calculate how many acres are affected, how much soil was saved, and the total amount of nitrogen and phosphorus saved. During the first five-years (June 2012 to June 2016), nearly $3.4 million was spent on 948 BMPs. Over twice as much ($8,8 million) was spent on 1,508 BMPs during the last five-years (July 2016 to August 2022). Most of the cost difference was due to the amount spent on disaster relief in response to the aftermath of Hurricanes Matthew and Florence and supported by Disaster Response & Recovery funds appropriated by the General Assembly. More information about the cost share programs administered by the DSWC and the water quality benefits associated with each can be found on their website. A detailed list of BMPs implemented can be fund in the Appendix for Chapter 4.

Agriculture Cost Share Program (ACSP)

The North Carolina Agriculture Cost Share Program (ACSP) was established in 1984 to help reduce nonpoint source runoff and provide guidance to owners and producers on ways to improve their on-farm management of water resources and BMPs. The first BMPs implemented through the program were in the Chowan River basin. The program is administered by DSWC but managed by the local SWCD. The local SWCD reviews and identifies priorities on an annual basis and calls upon federal, state, local, non-profit, non-government and natural resource groups for technical, financial, planning and implementation support to restore, enhance and/or maintain natural resources throughout their jurisdictional area. BMPs include vegetative, structural or management systems that can improve the efficiency of farming operations while reducing the potential impacts to surface water and/or groundwater. Applications for cost share assistance through ACSP are ranked based on resource concerns identified by the SWCD.

Community Conservation Assistance Program (CCAP)

The Community Conservation Assistance Program (CCAP) is designed to improve water quality through the installation of various BMPs on urban, suburban and rural lands, not directly involved in agricultural production. CCAP provides educational, technical and financial assistance to landowners through the local SWCDs. This program is open to homeowners, businesses, schools, parks, churches and community groups.

Agriculture Water Resource Assistance Program (AgWRAP)

The Agricultural Water Resource Assistance Program (AgWRAP) is designed to identify opportunities to increase water use efficiency and available storage, implement BMPs to protect water resources, increase water efficiency and increase water storage for agriculture.

USDA-NRCS Environmental Quality Incentives Program (EQIP)

Through the Environmental Quality Incentives Program (EQIP), the Natural Resources Conservation Service (NRCS) provides financial assistance to cover costs associated with implementing conservation measures. NRCS also provides one-on-one help in planning, constructing and managing conservation measures. Common conservation practices include cover crops, timber or forest improvement, prescribed grazing and irrigation practices. In addition to EQIP, NRCS has funds available through the Conservation Stewardship Program (CSP). Over $53 million has been spent in counties with more than 45% land cover in the Cape Fear River Basin since 2012 (*Table 4-7*). Information about financial assistance programs to help conserve natural resources on agricultural lands can be found on NRCS's website.

Table 4-6: Total State Cost Share and Disaster Relief Funds Spent in the Cape Fear River Basin BMPs from June 2012 to August 2022

Subbasin Name & HUC8	Haw 3030002		Deep 3030003		Upper Cape Fear 03030004		Lower Cape Fear 03030005		Black 3030006		Northeast Cape Fear 3030007		Grand Total	
Practice Type - Cost* & Count (N)**	Cost	N	Cost	N	Cost	N	Cost	N	Cost	N	Cost	N	Cost	N
Agrichemical Pollution Prevention			$10,000	2	$1,507	1			$2,174	1	$2,400	1	$16,081	5
Erosion and Nutrient Management	$452,448	191	$109,344	29	$573,393	239	$185,784	35	$905,015	204	$856,116	167	$3,082,100	865
Sediment and Nutrient Management	$332,844	142	$127,998	36	$235,812	115			$75,366	23	$46,464	12	$818,484	328
Stream Protection Management	$571,593	135	$480,990	92	$131,331	33			$6,685	4	$22,001	5	$1,212,600	269
Waste Management	$241,182	13	$468,738	28	$101,606	7	$48,155	5	$131,787	13	$42,054	5	$1,033,522	71
ACSP Total	**$1,598,067**	**481**	**$1,197,070**	**187**	**$1,043,649**	**395**	**$233,939**	**40**	**$1,121,027**	**245**	**$969,035**	**190**	**$6,162,787**	**1,538**
AgWRAP	$335,242	34	$231,492	24	$363,346	43	$51,680	10	$334,586	43	$353,774	58	$1,670,120	212
CCAP	$246,892	113	$60,210	29	$12,521	8	$4,037	1	$2,400	3	$6,597	2	$332,657	156
Disaster	$175,255	22	$217,119	45	$429,927	57	$490,943	46	$635,299	114	$2,064,954	266	$4,013,497	550
Total	**$2,355,456**	**650**	**$1,705,891**	**285**	**$1,849,443**	**503**	**$780,599**	**97**	**$2,093,312**	**405**	**$3,394,360**	**516**	**$12,179,061**	**2,456**

* BMP count tables are conservative and do not include BMPs associated with supplement or repair contracts. Supplement contracts most often either support additional payment for the same BMP implementation footprint or add-to/expand total implementation of a particular BMP in the original contract. Consequently, including supplement contracts in counts can cause double counting of BMPs. As a result, BMPs associated with supplement contracts were not included in total practice count tables. This method does exclude BMPs from supplement contracts that are truly unique and are not captured in original contracts.

** BMP value paid tables include payments made on original, supplement and repair contracts.

Table 4-7: USDA NRCS Total County Funds for BMPs Implemented in the Cape Fear River Basin

County*	Program Years 2012-2016	Row Labels	Program Years 2017-2022
ALAMANCE	$444,748.64	ALAMANCE	$457,885.26
BLADEN	$1,935,620.50	BLADEN	$1,918,435.62
BRUNSWICK	$195,385.69	BRUNSWICK	$286,510.33
CHATHAM	$1,233,894.23	CHATHAM	$829,040.38
CUMBERLAND	$323,689.27	CUMBERLAND	$633,466.08
DUPLIN	$6,840,320.97	DUPLIN	$5,194,223.65
GUILFORD	$103,485.53	GUILFORD	$201,358.29
HARNETT	$996,939.95	HARNETT	$1,264,636.58
LEE	$209,365.12	LEE	$304,839.70
MOORE	$3,702,934.66	MOORE	$6,532,795.97
NEW HANOVER	$36,401.74	NEW HANOVER	$7,971.48
ORANGE	$202,772.59	ORANGE	$171,939.64
PENDER	$619,863.44	PENDER	$764,448.41
RANDOLPH	$3,225,486.70	RANDOLPH	$5,542,520.41
SAMPSON	$4,681,482.42	SAMPSON	$4,276,379.18
Grand Total	**$24,752,391.45**	**Grand Total**	**$28,386,450.98**

*Counties included in this table had >45% land area within the Cape Fear River Basin. Hoke County was not included. Most of the land area located in the Cape Fear River Basin is occupied by Fort Liberty Military Installation.

4.15 Protecting Water Resources in the Cape Fear River Basin

DWR's Basin Planning Branch (BPB) continually works collaboratively with several federal, state and local agencies as well as numerous stakeholders throughout the region to improve our understanding of point and nonpoint sources of pollution. *DWR's recommendations for water resource management in the Cape Fear River Basin includes:*

Stakeholder Engagement

- DWR and river basin planners will continue to work collaboratively with federal, state, and local resource agencies to understand water resource issues (quality and quantity) and advocate for watershed protections to improve the resources for all North Carolinians and aquatic life.

- River basin planners will continue to participate and collaborate in river basin watershed stakeholder groups to learn from them, and provide education and outreach when time and resources allow.

Watershed Planning & Research

- DWR will continue to partner on, and work to implement, actions identified in the CHPP to achieve the overarching goal of long-term improvement of coastal fisheries through habitat protection and enhancement efforts.

- DWR encourages and supports the development of watershed restoration plans and action plans through federal, state and local stakeholder initiatives.

- DWR support the implementation of projects identified in existing restoration plans.

- DWR will continue to partner with NC Wildlife Resources Commission and supports implementation of the Wildlife Action Plan (WAP) and its recommendations for reducing environmental impacts. DWR also supports the recommendation that conservation programs and partnerships work synergistically with other conservation actions to enhance the "resilience of natural resources" throughout the region.

- DWR supports the implementation of voluntary stream and/or wetland restoration projects and BMP installation as well as compensatory mitigation projects that restore, enhance or protect streams, wetlands and riparian buffers.

Stormwater Management, Green Infrastructure & Urban Mitigative Measures

- Encourage green infrastructure to minimize the impact from stormwater runoff and work with local governments and local watershed groups to identify and fund cost-effective stormwater retrofit projects. Examples include increasing tree canopy cover, reducing fertilized landscaping, minimizing impervious surfaces and implementing of urban stormwater BMPs and sediment control education for contractors and landowners.

- Encourage and support implementation of existing sediment and erosion control local programs and local stormwater control ordinances while also evaluating the need to improve them. *New construction designs should include plans to prevent or minimize the amount of runoff leaving the site and establish and protect existing buffers, floodplains and wetlands.*

Agriculture & Forestry

- Provide sufficient funding to existing state and federal cost share programs (urban, agriculture and forestry) for technical assistance and the voluntary implementation of BMPs. This includes cost share programs managed by the NCDA&CS Division of Soil & Water Conservation (DSWC) and NC Forest Service (NCFS) and federal programs managed by the USDA Natural Resources Conservation Service (NRCS). Programs should promote BMPs that reduce nutrients, turbidity, and bacteria in waterways.

Riparian Buffers, Floodplains & Wetlands

- The presence of intact riparian buffers, floodplains and/or wetlands in urban areas can reduce the impacts of urban development. Consider financial incentives (i.e., grants or tax credits) to promote strategic preservation or restoration of riparian areas. Preserving the natural streamside vegetation or riparian buffer is one of the most economical and efficient best management practices (BMPs) for reducing the amount of stormwater runoff reaching surface water. In addition, riparian buffers provide a variety of benefits including moderating water temperature by providing shade, holding water and

decreasing the high temperatures often measured in stormwater runoff, preventing erosion and loss of land, providing flood control, moderating streamflow and providing food and habitat to aquatic and terrestrial life (Burgess, 2004).

Land Conservation

- Encourage land conservation, especially in headwater areas and adjacent to rivers, creeks, and streams. Prioritize conserving tracts of land with wetlands, rare habitats, and/or rare species, including tracts of land adjacent to migratory fish habitat.

- Continue to support funding for the North Carolina Land and Water Fund (NCLWF) to support watershed planning, acquire lands, restore the habitat for fish, wildlife, and other species, and enhance the filtering of stormwater runoff to reduce pollutants from entering water supplies.

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