CHAPTER X. PRIORITY HABITAT ISSUES: ENVIRONMENTAL RULE COMPLIANCE AND ENFORCEMENT TO PROTECT COASTAL HABITATS

1.1 Issue

The River and Harbors Act (RHA) of 1899 represented the beginning of federal laws that provided authority to regulate discharges to navigable waters. The passing of the Water Quality Improvement Act (WQI) in 1970 established a state certification procedure to prevent degradation of waters that was subsequently followed by an amendment to the Federal Water Pollution Control Act commonly referred to as the Clean Water Act (CWA) of 1972. Additionally, the Coastal Zone Management Act (CZMA) of 1972 was passed as a national policy to preserve, protect, develop, and where possible, restore or enhance, the resources of the Nation's coastal zone for this and succeeding generations.

Since that time, an emphasis has been placed on permitting impacts to wetlands and the surface waters of the United States. The meeting of mandated regulatory processing times has often taken precedent over compliance and enforcement programs due to staff prioritization and funding shortfalls. There is limited literature on the effectiveness of compliance and enforcement program efforts associated with wetland protections that exist at the state level (Dorney et al. 2015). With the unknowns of compliance and enforcement programs, the estimates of further loss and impairment of the existing wetlands and surface waters can only be inferred. However, we do know that the extent of impaired waters in North Carolina's coastal waters is significant.

A more balanced approach between compliance and enforcement program efforts and the process of written authorizations for impacts to wetland and surface waters, will ensure transparency and fairness within the application of regulatory framework. The predictability of compliance efforts and possible enforcement action would serve to reinforce the reason for property owners and/or permittees to adhere to written authorization conditions and other applicable laws and regulations. It also serves as a deterrent for potential violators to adhere to the applicable regulations and laws for the risk of receiving monetary loss in civil penalties and/or criminal penalties. There is strong support from the public to enforce existing rules to improve effectiveness in wetland and water quality protection (Street et al 2005; DEQ 2016)

1.2. Origination

Ensuring compliance with Coastal Resources Commission (CRC), Environmental Management Commission (EMC), and Marine Fisheries Commission (MFC) rules and permits has been a recommendation of the CHPP since 2005. The CHPP Steering Committee selected this as a priority issue to investigate at their October 2019 meeting. Improving compliance of the Division of Water Resources (DWR), Division of Energy, Mineral, and Land Resources (DMELR), and Divison of Coastal Management (DCM) rules will be benefit wetland and water quality protection, in turn, benefiting fish and their habitats.

1.3. Background

1.3.1. Scale of the NC's Wetland and Surface Waters and their Services

North Carolina has the tenth largest acreage of wetlands and surface waters in the Nation (Sucik et al. n.d., USCB 2012). The 2010 National Resources Inventory Summary Report utilizing the non-regulatory Cowardin classification system estimates that approximately 4.7 million acres of N.C. lands (non-federally owned) are wetlands (Sucik et al. n.d.). According to the 2011 National Land Cover Database (NLCD), there were approximately 3.7 million acres of woody and emergent herbaceous wetlands present in the CHPP Regions, representing 21 percent of total land area (Jin et al. 2013; CHPP 2016). More information on wetland trends and stressors is provided in the 2021 CHPP priority habitat issues,

Wetland Protection and Enhancement with Focus on Nature-Based Methods and **Habitat Monitoring to Assess Status and Regulatory Effectiveness**. Wetlands provide a variety of functions that include surface and subsurface water storage, nutrient cycling, particulate removal, maintenance of plant and animal communities, water filtration or purification, and groundwater recharge (2005 NRCS). Because of the many water quality benefits provided by wetlands, their protection and enhancement benefits the water column and all other aquatic habitats. Loss of wetlands can lead to increased stormwater runoff and increased loading of pollutants, leading to increased shellfish closures, impaired conditions for survival of SAV and shell bottom, algal blooms, and fish kills.

There are eight coastal draining river basins, of which only four (Cape Fear, Neuse, Tar-Pamlico, and White Oak) are entirely contained within the State. The major rivers and sounds within the four CHPP Regions include the Roanoke River, Chowan River, Pasquotank River, Albemarle and Currituck Sounds, Pamlico Sound, Neuse River, Tar-Pamlico River, Core Sound, Bogue Sound, New River, White Oak River, and Cape Fear River. The Albemarle-Pamlico Sound estuary with an estimated area of 31,478 square miles is the second largest estuary by area in the eastern United States (APNEP n.d.). Approximately 20% of the total CHPP area, which includes the coastal plain up to the fall line encompasses consists of surface waters (2,813,620 acres) (CHPP 2016). Streams and waters can be ephemeral, intermittent, and perennial in nature and serve to protect communities from flooding by storage of surface waters, retain harmful pollutants, keep sediment and nutrients from reaching downstream waters, provide habitat throughout all life stages for a diverse assemblage of flora and fauna, and provides economic benefits such as fishing, hunting, manufacturing, and agriculture (EPA 2013).

North Carolina's coast hosts a wide diversity of waters and wetlands, from the Black River, containing some of the world's oldest trees (2,624 years old) to the pocosin wetlands, the most critically endangered wetland in the US, the coastal plain. North Carolina is home to some 61 federal threatened or endangered species and 604 State species that are listed as threatened, significant concern, or significantly rare (USFWS 2019, NCDNCR 2018). Most of these species spend a portion, if not all, of their life cycles within the wetlands and waters of the State.

1.3.2. Demography and Demands on the Wetland and Surface Waters of NC

A 2018 estimate of North Carolina's population has approximately 10.4 million people residing in the State (Tippett 2018). The estimated State's population has increased by 8.9 percent since 2010 with the majority of the increase resulting from in-migration from other states (Tippett 2018). The North Carolina Office of Budget and Management projects the State's population will increase by approximately 1.4 million people by 2030 (NCOBM 2018). Although the majority of the projected growth is concentrated within Charlotte and Triangle Regions (74% of State growth), additional projected growth ranging from six to more than 18 percent is also to occur in the coastal plain counties of Currituck, Dare, Pitt, Carteret, Duplin, Cumberland, Onslow, Pender, New Hanover, and Brunswick (Tippett 2015).

As North Carolina's population continues to expand, the stress on the State's waters and rare ecosystems will also intensify. Development pressure will cause a rise in impervious surface coverage thus compounding the amount of stormwater runoff entering downstream receiving waters and amplifying the potential for both point and non-point pollution. A current estimate from the EPA states that approximately 7 million of North Carolina's residents depend on the State's surface water as their primary potable water source (DWR n.d.). Over 750,000 acres of the State's waters (encompassing the streams, sounds, and Atlantic Ocean) are considered impaired and listed on the Section 303 (d) of the Clean Water Act (DWR 2018).

The coastal plain contains the majority of wetland resources in the State and serves as the discharge point for seven of the major rivers into the Atlantic Ocean. The wetlands within these river basins and

others Statewide serve as protections to neighboring communities by storing and slowing rapid runoff of stormwater thus minimizing the danger of damaging floods. An estimate from Purdue University's Cooperative Extension Service found one acre of wetlands can store approximately 330,000 gallons of water. When an acre of wetland is filled, the 330,000 gallons of water is not retained but rather is discharged directly into the waterway thus increasing the risk of flooding (PUCES 1990). Additionally, hurricanes have had a significant influence on flooding and coastal damage over the past two decades or more, emphasizing the importance of protecting and restoring coastal wetlands to enhance coastal resiliency. For additional information on **Climate Change and Resiliecny** see chapter XX.

Wetlands also serves as a "sink" for suspended sediments by acting as a filter that serves as a retention area that slow down the flow of water allowing sediments to be assimilated by the wetlands prior to reaching waters of the U.S. In addition, excess nutrients such as nitrogen and phosphorus are only a few of the ecological services that wetlands provided to clean waters and ensure the best usage. When wetlands are under drained conditions, nitrogen and phosphorus otherwise bound in the soil matrix or held in the biomass of plants can be transported by ditches or other drainages features allowing possible pollutant source to migrate to receiving waterways.

From the headwaters of coastal rivers where recreational fisheries are popular, to the estuaries of the coast that bolster the State's commercial fisheries, wetlands play a vital role in both protection of the existing water quality and supporting the livelihood of the State's citizens. Over 90% of North Carolina's commercial fisheries landings and 60% of the recreational harvest (by weight) are comprised of estuarine-dependent species (DEQ 2016). In North Carolina over $77.8 million of revenue was generated from commercial fishery landings and approximately 156.9 billion of economic impact was generated from recreational anglers, hunting and wildlife watching (DMF 2018, USFWS 2018).

1.3.3. Introduction to North Carolina Regulatory History for Wetlands and Waters

Precise historic estimates of total area of wetlands in North Carolina are lacking and only anecdotal estimates of wetlands exist. A common reference is approximately 11 million acres of wetlands existed prior to the European pre-colonization of North Carolina and by mid-1980s only 5.7 million acres or about one-half of the historic acreage remained (Dahl 1990). From the mid-1970's to mid-1980's, North Carolina experienced a conversion of approximately 1.2 million acres of wetlands to silviculture, agriculture or other uses representing the highest acreage of wetland losses in the southeastern US (USDA 2002). Approximately 3 million acres of emergent and forested wetlands were mapped by National Wetlands Inventory within the CHPP Regions (DEQ 2016).

The roots of North Carolina's authority to regulate discharge to wetland, streams, and waters of the State can be traced to the State's passage of the Dredge and Fill Act of 1969 and the federal passage of the CWA and CZMA of 1972. Subsequently, state and federal laws and regulations have followed that have sought to clarify jurisdiction and define regulatory authority. In 1985, Congress passed key provisions within the Farm Bill commonly known as "Swampbuster" to financially discourage the conversion of jurisdictional wetlands or highly erodible lands to produce agricultural uses. Loss of jurisdictional wetlands acreage continued through the use of ditching and draining. Over the years federal laws have had a major influence on wetland loss, particularly from regulatory changes associated with the 1993 Tulloch Rule, which resulted in approximately 11,580 acres of wetlands being drained in the coastal plain (DWQ 1999; Hershner 1999; DEQ 2016). In 1999, after determining that wetland ditching and draining activities were under the state's authority, the EMC adopted a wetland drainage policy. Inspections of previously ditched wetlands resulted in restoration of 50 percent of the wetlands area found to be in violation of the wetland standard (CHPP 2016). In 2002, the North Carolina Court of Appeals upheld that wetlands were considered part of the definition of "waters" of the State and

therefore, subject to enforcement under the State wetlands standards.

The DWR has the regulatory authority to issue permits for impacts to isolated and other non-404 jurisdictional wetlands and waters. The agency also has regulatory authority over riparian buffer programs in 3 coastal watersheds. The National Pollution Discharge Elimination System (NPDES) program, established under the Section 402 of the CWA of 1972 and succeeding federal and state rules and regulations, granted the regulatory authority to permit a discharge of wastewater or stormwater from a known point source to surface waters. The regulatory oversight under the NPDES program is shared between the DWR and the DEMLR. The DEMLR also has authority established under the Sedimentation Pollution Control Act (SPCA) of 1973, North Carolina Mining Act of 1971, North Carolina Dam Safety Law of 1967, and other related subsequent laws, regulations and amendments to regulate activities associated with erosion and sediment control, mining, and dam safety activities.

Currently, North Carolina's programmatic approach to proposed development impacting jurisdictional wetlands, streams, and/or waters begins with the applicable permitting requirements of the USACE and/or the DCM. The USACE under authority of Section 404 of the CWA and Section 10 of RHA regulates the discharge of dredge and fill material into waters of the United States. The DCM regulates and issues permits for development in or affecting an Area of Environmental Concern (AEC) within North Carolina's 20 coastal counties under the CAMA and State Dredge and Fill Law. Any permits issued by either the USACE, DCM, or other federal licensing and permitting agencies that propose impacts to jurisdictional wetlands, streams and/or waters will require a corresponding Section 401 of CWA Water Quality Certification (401-WQC) issued by DWR. This is to ensure the proposed activity does not violate wetland or water quality standards under authority of Section 401 of the CWA and other State regulations and laws.

Traditionally, DWR's staff reviews about 1,500 – 2,000 individual and nationwide permits per year via 404 and DCM permits, Section 10 permits and Federal Energy Regulatory Commission permits to ensure compliance with 401-WQC and other State regulations and laws (BIMS 2020). Over the period of 1999 - 2019, DWR issued 11,591 401-WQC within the seven coastal draining river basin that represents 8,125 acres of wetland and 1.3 million linear feet of stream of impacts.

1.3.4. Compliance and Enforcement Programs

Different agencies have varying ways of achieving compliance within their established regulatory authorities. For the purpose of this report, compliance will be defined as an inspection of a site to determine if it conforms to either the conditions of a written approval (i.e., a permit or certification) or the relevant State regulations associated with a development activity resulting in a discharge or impacting wetlands, streams, waters or riparian buffer (Dorney et al. 2015). The State agencies with regulatory authority over these activities included the DCM, DEMLR, and DWR.

Typically, site inspections are the result of complaints or referrals received from the general public, an organization, or government agencies concerning activities that do not comply with the regulatory mandates of the respective agencies. Other inspections can be routine in nature such as a site inspection associated with application review or monitoring of a site for compliance with written approvals. Inspections may also result from self-reporting of a violation. The failure of authorized persons, parties, and/or entities to comply with written approval or relevant state rules may result in the issuance of notice of deficiency (NOD), notice of violation (NOV), after-the-fact written approval, cease and desist order (C&D), injunctive relief, enforcement action, and/or civil penalty. In extreme cases, even criminal charges with penalties may result from non-compliant inspection.

Reporting on the effectiveness of individual state's compliance and enforcement programs associated

with wetlands, streams, and waters regulations are limited. Generally, only specifics on guidance associated with compliance and enforcement policies for individual states (Vermont and Southern Florida 2014) or federal jurisdiction (Sacramento District 2014) are available (Dorney et al. 2015). Variations in state laws that establish states's authority to protect wetland and waters and how each implements their authority compounds the task of comparing the individual states regulatory success. For example, only fifteen states have adopted some sort of water quality standards specific to wetlands, with specifics between states varying greatly (Kusler et al. 2012). Other states rely solely on EPA and the USACE to perform compliance and enforcement on sites that are non-compliant with conditions of 401-WQC.

Published information regarding the historic effectiveness of compliance and enforcement programs associated with development activities that impact wetlands and waters across the State's regulatory agencies is lacking. General discussion regarding past work was reported by Burby (1995) indicated that overall compliance was less than 50 percent for N.C. Sedimentation and Erosion Control Program during their study period (Dorney et al. 2015). Due to concerns regarding the lack of adequate information pertaining to compliance and enforcement programs, DWR applied for and was awarded an EPA Wetland Development Grant CWA Section 104(b)(3) in 2005. Before the grant was awarded, DWR estimated that staff visited less than one percent of all permitted site per year, mainly based on complaints received by the Regional or Central Office (Dorney et al. 2015). The grant funded three full time inspection positions (one per regional office in Washington, Raleigh, and Mooresville) to conduct compliance and enforcement activities for written authorization and unauthorized activities associated with 401-WQC, riparian buffer, state stormwater, and water quality and wetland standards for a period of three years.

Over the period of 2007 – 2011 (2010 and 2011, grant was extended two years), compliance rates rose from 15 percent in 2007 to 82 percent in 2011 for permitted sites and 10 percent in 2007 to 69 percent in 2011 for unpermitted sites (Dorney et al. 2015). In addition, the amount of civil penalty assessments dropped from $151,000 in 2007 to $41,579 in 2011 (Dorney et al. 2015). The end goal of the grant was met by inspecting at least 15 percent of the sites authorized in the previous year and demonstrating the outcome of the addition of a limited number of compliance and enforcement staff on overall compliance. Unfortunately, at the conclusion of the grant, the three compliance positions were not funded by DWR.

From 2008 to 2018, 367 positions were eliminated within the Department of Environmental Quality and the budget decreased from $136 million in fiscal 2008 to $90 million in 2018 when adjusted for inflation (Rumley 2019). The additional regulatory burden associated with the elimination of staff has led to a decrease in number of compliance inspection and an increase in the number of non-compliant sites. Inspection data was requested from the DWR, DCM, DEMLR and North Carolina Department of Agriculture Forest Service (Forest Service) in order to understand any correlation between the staffing of individual agencies and its effects on regulatory compliance and enforcement program within the agency's respective authority. Theses divisions provided results of initial site inspections conducted within the four CHPP Regions over the period of January 1, 2014 through December 31, 2019 (reporting period) to gain an understanding of the rate of compliance for any subject written authorization or regulation prior to conducting a follow up compliance inspection.

The DWR staff conducted 3,517 initial site inspections within the four CHPP Regions for the reporting period for projects with written authorization for North Carolina Department of Transportation (DOT) and non-DOT projects for 401-WQC and/or buffer authorization or in response to a complaint or referral of possible violations of wetlands or stream standards for water quality or riparian buffer regulations. Of the total reported initial inspections, 2,230 inspections were associated DOT projects. Compliance with

the written authorizations and/or other regulations associated with DOT projects were reported at 88.7 percent with only three inspections in response to citizen complaints. DWR staff inspections of non-DOT projects encompassed the remaining 1,287 inspections. Of the total number of initial inspections, 493 inspections were in response to citizen complaint regarding possible unauthorized activities and 794 were considered routine inspection. Reported compliance for complaint inspections were 22.5 percent and the routine inspection were 68.2 percent. The total unauthorized impacts for the wetlands, streams, waters, and riparian buffer (if applicable) for the four CHPP Regions within the reporting period are summarized in Table 1 (Sullivan, DWR, personal communication).

Table 1: Summary of reported unauthorized resource impacts annually.

Annual Unauthorized Resource Impacts	2014	2015	2016	2017	2018	2019
Wetlands (acres)	1.91	37.16	15.62	41.7	2,028.47	7.06
Stream (linear ft.)	13,653	16,248	5,130	1,825	12,008	3,880
Waters (acres)	0.07	0.10	0.00	1.00	0.56	0.00
Buffers (acres)	1.09	2.07	10.29	2.53	2.49	4.06

Within the four CHPP Regions, DWR has seven regulatory staff (non-DOT projects) and four regulatory staff (DOT projects) in four regionals offices that are responsible for review and processing of 401 and buffer authorization application, review and providing comment for other regulatory agency permits for compliance with wetlands standards, water quality standards, riparian buffer rules, and conducting compliance and enforcement activities. The agency's central office in Raleigh has additional regulatory staff responsible for permit review for DOT and non-DOT projects for 401-WQC and buffer authorization and oversight of the State's compliance and enforcement programs for the Section 401, stream and wetland water quality standards, and riparian buffer programs.

Division of Coastal Management staff conducted 4,688 initial site inspections associated with processing of general or CAMA major development permits, monitoring of site conditions, routine site inspections, or responding to complaints over the reporting period (Brownlow 2020). Inspection information from January 1, 2014 through May 11, 2015 were lost due to computer memory malfunction (Brownlow, DCM, personal communication). Only nine site inspection resulted in violation of CAMA regulations. The DCMhas three district offices and the central office in Morehead City. The DCM regulatory staffing commonly consists of a district manager, three to four county field representatives (non-DOT projects), one representative (DOT-projects), and a district land use planner. The Morehead office also oversees compliance and enforcement programs supervision, public policy, permitting, and are within the administration. Local Permitting Officers for townships or county that can issue minor CAMA development permits. Regulatory staff issue minor and general, process application for review of major CAMA development permits and conduct compliance and enforcement activities under the authority of the CAMA and State Dredge and Fill Law.

Division of Energy, Minerals, and Land Resources staff conducted 4,910 initial compliance inspection under the NPDES programs for state stormwater and stormwater Phase II Rule (Phase II) associated with development within the four CHPP Regions over the reporting period. Of the reported initial inspection, 1,401 sites were reported to be non-compliant with the associated written authorization or stormwater regulations. Compliance rates for initial inspection for NPDES state and Phase II over the reporting period was 0.72 percent. In addition, DEMLR staff also conducted 8,188 initial site inspections for compliance with approved Erosion and Sediment Control Plan (ESCP), NPDES General Permit No. NCG100000 (Construction stormwater permit), and other related regulations. Of the reported initial

inspection, 5,075 sites were reported to non-compliant with their associated written authorization or construction stormwater regulations. Compliance rates for initial inspection for ESCP, Construction stormwater permit (NCG01) and associated regulations over the reporting period was 38.0 percent.

The DELMR regulatory staff within the four CHPP Regions for ESCP and NPDES programs are composed of 37 regulatory staff within the four regional office and 12 regulatory staff within the Central office in Raleigh. The regulatory staff are responsible processing of ESCP, state stormwater, and Phase II applications, and enforcement and compliance activities under the authority of the SPCA and NPDES rules and regulations. Please note, that sites that were reported as non-compliant may not have required the issuance of an NOD or NOV.

Forest Service staff conducted 11,545 initial site inspections within the reporting period with a compliance rate of 98.3 percent (A. Coats, Forest Service, personal communication). The Forest Service is composed of eight district offices within the four CHPP Regions with regulatory staff in each district generally composed of a district forester, assistant district forester, one to two district rangers, and one to two service foresters (per county). Forest Service regulatory staff are responsible for the oversight of timber management, and administration and inspection for compliance with Forest Best Management Practices and Forest Practice Guidelines Related to Water Quality along with other related State laws and regulations.

Table 2. Compliance inspections and percent compliance by agency, 2014-2019.

Agency	Program Type	Initial Site Inspections (#)	Compliance (%)
Division of Water Resources	401 WQC, buffers, wetland and stream standards - DOT	2,230	88.7
Division of Water Resources	401 WQC, buffers, wetland and stream standards - non-DOT; routine inspection	794	68.2
Division of Water Resources	401 WQC, buffers, wetland and stream standards - non-DOT; complaint	493	22.5
Division of Coastal Management	GP and Major permits	4,688	99.8
Division of Energy, Minerals, and Land Resources	NPDES State and Phase 2 Stormwater	4,910	72.0
Division of Energy, Minerals, and Land Resources	Erosion and Sedimentation Control	8,188	38.0
Department of Agriculture - Forest Service	Forest Practice Guidelines Related to Water Quality	11,545	98.5

1.4. Authority

NC Department of Environmental Quality

NC General Statues
113A-221. Definitions.

NC Environmental Management Commission

NC General Statute:
143-215.3(a)(1) Definitions

NC Environmental Management Commission Rules
15A NCAC 02B .0100 - 15A NCAC 02B .0317
15A NCAC 02H .0100 - 15A NCAC 02H .1200
15A NCAC 02H .1300 as amended by Session Law 2015-286
Section 401 CWA

NC Coastal Resources Commission
NC General Statute:
113A-100 - 134.4 Coastal Area Management Act

NC Coastal Resources Commission Rules
113-229 NC Dredge and Fill Law
15A NCAC 7A Section .001 through 15A NCAC 7O Section .0202

NC Sedimentation Control Commission
NC General Statutes:
113A-52(3) Definitions

NC Sedimentation Control Commission Rules
15A NCAC 04A .0100 through 15A NCAC 04E .0504 Sedimentation Control

1.5. Discussion

The effectiveness of a successful compliance and enforcement program has been documented (Dorney 2015). As previously discussed, an EPA Program development grant provided funding for three full time position (one position per regional office) compliance positions (one position per regional office) over the period of 2007-2011. Over the grant period the reported number of annual site inspections associated with written approvals rose along with the rate of compliance. In addition, the amount of civil penalties assessed dropped over the reporting period. When comparing the reported results of the DWR grant with the current inspection data over the past five fiscal years, routine inspection compliance rates for non-DOT projects have dropped from 82 percent in 2011 to 69 percent in 2019. In addition, the rate of compliance for non-DOT project complaint inspections has fallen from 68.2 percent in 2011 to 22.5 percent to 2019. Subsequent to the completion of the grant, legislative budget cuts resulted in the compliance positions not being funded by the DWR.

The DCM and Forest Service, with a greater staff to need inspection ratio, have reported higher compliance rates associated with initial inspection over the reporting period of 2014-2019. Conversely, DEMLR reported a higher rate of compliance (72.0 percent) with regards to inspections of the NPDES program permits under state stormwater and Phase II, but reported lower compliance rates (38 percent) associated with inspections of ESCP and NCG01 permitted sites.

There is further evidence that increased site inspections improves regulatory compliance (Gallay 2019). When the CWA permit inspections declined between 2015 and 2018, there was a 10 percent increase in serious water pollution incidents. Similarly with Clean Air Act (CAA) inspections, there was a 28 percent increase in permit violations. In a 2005 study, 63 percent of the companies examined took additional compliance related actions after learning that other companies had received penalties for environmental law violations (Thornton et al. 2005). This is attributed to the “deterrence model”. Applicants are deterred from violating environmental regulations if the risk of penalities is real, compliance is cheaper than the expected penalties, as well as concern over reputation (Gallay 2019;

Benami et al. 2020).

Although an overlap in regulatory jurisdiction may exist between USACE, DCM, and DWR, the USACE and DCM scope of authority is limited to activities resulting in discharge of dredge and/or fill material to wetlands and/or waters under their jurisdiction. Additionally, exemptions exist from both State and federal permitting and regulatory requirements resulting in impacts to wetlands and waters for certain silvicultural, farming and ranching practices, dam maintenance, maintenance of drainage ditches, construction of temporary sediment and erosion or best management practices (BMPs) required by North Carolina ESCP, and construction of farm roads, forest roads, and temporary roads for moving mining equipment. With DWR's regulatory authority differing in scope from DCM and USACE and limited staffing resources, implementation of any effective compliance and enforcement program has become more problematic.

A possible solution to address the lack of an effective compliance and enforcement program within the DWR 401 and buffer section could be the hiring of additional staff for the regional offices within the four CHPP Regions whose sole responsibility is to conduct inspections and implement any needed enforcement actions. Although these positions would be non-revenue generating, and therefore more likely subject to budgetary cuts, the historic data indicates the existence of a more consistent compliance and enforcement program reduces the number of and rate of non-compliance and overall enforcement costs. Over the period of 2014 – 2019, DWR reported wetlands impacts authorized under 401-WQCs of approximately 1,499 acres within the seven coastal draining river basins. Conversely, DWR's reported unauthorized impacts to jurisdictional wetlands within the same period totaled approximately 2,312 acres within the seven coastal draining river basins.

Another potential solution would be to further delegate authority of enforcement and compliance of the riparian buffer programs to the DCM for violations occurring within their AEC. However, shifting of the regulatory burden to the DCM would also possibly require additional costs associated with the training of existing staff and possible creation of new staff positions. In addition, the proposed solution would mainly only impact the regulatory burden to DWR staff in the Washington Regional Office.

Other strategies to address environmental compliance when staff limitations continue include improving detection of non-compliance through technology, lowering compliance costs through focused inspections, and increasing public disclosure. Benami et al. (2020) suggest that remote sensing and machine learning can be used to focus compliance inspections on companies predicted to have the highest risk of non-compliance and focus on areas of the greatest environmental risk. Requiring self-inspection assessments has been shown to result in improved compliance rates where agency inspections cannot get to at least 12 percent of the permitted sites. Making the public aware of violators (naming and shaming) can damage reputations and trigger public scrutiny, and consequently serve as an incentive to comply. For example, when EPA's Clean Air Act began publicizing a facility "watch list", violations decreased 10-23 percent (Benami et al. 2020). Utilizing citizen science and public reporting portals is another means to supplement site inspections and increase public awareness (Gallay 2019).

1.6. Proposed Implementation Actions

The historical losses of wetland and water resources from unauthorized development has not been well documented. Lack of regulatory staffing have resulted in larger number of sites that do not comply with regulations related to water quality. Over the last five fiscal years, the DWR reported unauthorized jurisdictional wetland impacts exceeded authorized impacts by margin of 1.54:1.

1. Increase staffing in DWR and DEMLR by a minimum of two staff (one per office per agency) in the Washington and Wilmington regional offices. Staff would be solely responsible for

conducting compliance inspections with written authorizations associated with 401-WQC, riparian buffer authorization, water quality standards for stream and wetland, and riparian buffer rules. Staff would also be responsible for the issuance of any NODs, NOVs, review of response letters and associated site restoration plans, review of applications for after-the-fact written authorizations, oversight of site restoration activities, and pursuing any enforcement action needed to bring the site back into regulatory compliance.

2. Seek funding through grants to supplement compliance efforts.
3. Establish a public portal on DEQ's website. This site could house information on compliance issues, allow the public to submit compliants, and highlight a Watch List of repeat violators.
4. Work with Riverkeepers, NGO's, or citizens to conduct preliminary inspections for non-compliance. Outreach workshops can be conducted by relevant agency staff to train these groups on how to conduct these inspections. With some initial effort this could alleviate some staff burden and result in higher inspection and compliance rates.

1.7. Literature Cited

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