HYDE COUNTY, NC

Resilience Strategy

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1. Introduction

1.1 Purpose and Context

The Hyde County Resilience Strategy was developed through the Resilient Coastal Communities Program (RCCP), a program administered by the North Carolina Department of Environmental Quality's (DEQ) Division of Coastal Management (DCM) and funded by the N.C. State Legislature and the National Fish and Wildlife Foundation. RCCP is the culmination of several coastal resilience efforts in North Carolina over the last several years. The program aims to facilitate a community driven process for setting coastal resilience goals and address local capacity constraints that hinder the actions needed to enhance resilience and reduce vulnerability within coastal communities.

RCCP works with local governments throughout the 20 coastal North Carolina counties (designated under the Coastal Area Management Act (CAMA)) and provides funding to local governments to help overcome barriers in coastal resilience and adaptation planning, boost local government capacity, and support a proactive, sustainable, and equitable approach to coastal resilience planning and project implementation.

What is Resilience?

Resilience can be defined as increasing a community's ability to rebound, positively adapt to, or thrive amidst changing conditions or challenges—including disasters and climate change—and maintain quality of life, healthy growth, durable systems, and conservation of resources for present and future generations.

With support and guidance through RCCP, this plan was developed as a tool to better position Hyde County to address current and future challenges related to flood hazards and climate change. This Resilience Strategy focuses solely on Lake Landing township, which Hyde County leadership identified as particularly vulnerable to flood hazards and a priority area for resilience planning. County leadership recognize that current issues will be exacerbated and complicated by future flood hazard events and that the County's actions must account for future conditions to be lasting, economical, and sustainable. This plan aims to increase understanding of local risks and vulnerabilities and to identify strategies for building resilience to flood hazards.

1.2 Project Objectives

Hyde County was selected for participation in Phase 1: Community Engagement & Risk/Vulnerability Assessment and Phase 2: Planning, Project Identification, & Prioritization of the 2025-2026 RCCP funding cycle. Phase 1 includes performing a risk and vulnerability assessment, developing a community action team, and engaging with the public. Phase 2 involves a community- and data-driven process to identify priority actions that can be taken to adapt to short- and long-term hazards. This Resilience Strategy is the culmination of these efforts, and includes two major components:

- **Vulnerability Assessment Report:** Details the quantitative and qualitative assessments performed, which evaluate the vulnerability of critical assets, natural infrastructure, and vulnerable populations to several hazards, including flooding (rainfall, tidal and riverine), storm surge, sea level rise, and other locally relevant hazards such as erosion.
- **Project Portfolio:** Presents a portfolio of well-planned and prioritized solutions to address risks. This includes a combination of structural (i.e., infrastructure) and non-structural (i.e., policy) approaches, and at least one natural or nature-based component.

1.3 Planning Process

RCCP Program Objectives

RCCP provides a multi-phased planning framework to lead communities through a community engagement process, risk and vulnerability assessment, and development of a resilience project portfolio that address their unique needs. The RCCP Planning Handbook provides guidance for completing Phases 1 and 2 and specifies program requirements and existing data, tools, and resources to help communities meet these requirements. The planning handbook outlines the following steps for the planning process:

Phase 1: Community Engagement & Risk/ Vulnerability Assessment

Step 1: Develop a Community Action Team (CAT)

Step 2: Review Existing Plans and Efforts

Step 3: Set Vision and Goals

Step 4: Develop a Community Engagement Strategy

Step 5: Identify and Map Critical Assets, Natural Infrastructure, and Socially Vulnerable Populations

Step 6: Conduct Risk and Vulnerability Assessment

Phase 2: Planning, Project Identification, & Prioritization

Step 1: Identify a Suite of Potential Solutions

Step 2: Consolidate and Prioritize Projects

1.3.1 Community Action Team

A Community Action Team (CAT) was formed to guide the County through the planning process and oversee the development of this Resilience Strategy. The County Manager, Kris Noble, led the development of the CAT by identifying and inviting County staff and community members to participate. The Assistant County Manager and Board Clerk, Richard Mann, served as the CAT point person. CAT members and the departments and groups they represented are listed in Table 1.1.

Table 1.1 – Community Action Team Membership

Member	Department/Group Represented
Richard Mann	Assistant County Manager/Board Clerk
Kris Noble	County Manager
Johnny Gibbs	Airport Manager and Deputy Emergency Manager
Thomas Midgette	Commissioner
Joanne Spencer	Engelhard VFD and Engelhard Development Corporation
Wilson Daughtry	Mattamuskeet Farms
Earl Pugh Jr.	Slocum Drainage
Michael Gibbs	Sanitary District
Natalie Wayne	Hyde County Cooperative Extension & Engelhard Resident
Andrea Gibbs	Hyde County Cooperative Extension
Josh Latham	Resident and Farm Consultant
Claire Rapp	NC Coastal Federation

Hyde County and the CAT received support from numerous additional stakeholders who attended CAT meetings, provided data and input, and otherwise supported the planning process. Stakeholders involved in the planning process are listed in Table 1.2 and included representatives from Hyde County, North Carolina Cooperative Extension, North Carolina Coastal Federation, NC State Resilience Office, NC Sea Grant, and NC Division of Coastal Management.

Table 1.2 – Additional Stakeholders Involved in Planning Process

Stakeholder	Role/Agency Represented
Elena Williamson	Lead for North Carolina Fellow, Hyde County
Jacob Boyd	NC Coastal Federation
Sarah Spiegler	NC Sea Grant
Holly White	NCDEQ Resilience Planner
Helene Weatherington	NCDEQ Resilient Communities Specialist
Kelly Hoeltzel	SBP
Mackenzie Todd	DCM Coastal Resiliency Coordinator
Kasen Wally	DCM Coastal Resiliency Specialist

The CAT met for four formal meetings over the course of the planning process, as detailed in Table 1.3. These meetings were organized around key project milestones to review progress and findings and make decisions on plan goals and content. The CAT also coordinated via email throughout the planning process. Detailed meeting notes and attendance records documenting CAT coordination efforts are provided in Appendix A.

Table 1.3 – Community Action Team Meetings

Meeting	Date & Format	Meeting Summary
Meeting 1 – Project Kickoff	1/14/2026 Davis Center, Engelhard & Microsoft Teams	The CAT was presented with an overview of the RCCP and the Resilience Strategy project scope, and reviewed relevant hazards and stressors and preliminary flood data. The CAT also discussed the type of assets that were to be assessed in the plan. Strategies for public and stakeholder involvement were discussed and the CAT provided input on existing planning efforts.
Meeting 2 – Vulnerability Assessment Review	2/11/2026 Davis Center, Engelhard & Microsoft Teams	The CAT was presented with the updated critical asset inventory and provided feedback. The approach for the vulnerability assessment was reviewed, including methods for evaluating exposure, sensitivity, and adaptive capacity.
Meeting 3 – Resilience Strategy	3/11/2026 Davis Center, Engelhard & Microsoft Teams	The CAT reviewed the plan's vision state and goals and provided feedback. The final vulnerability assessment results were presented. The CAT started to brainstorm and discuss potential projects.
Meeting 4 – Project Portfolio Prioritization	5/13/2026 Davis Center, Engelhard & Microsoft Teams	The CAT was presented with project ideas and prioritization criteria and discussed which projects to include in the Project Portfolio. The CAT was also given the opportunity to review the draft Vulnerability Assessment report and provide feedback and comments.

1.3.2 Public and Stakeholder Engagement

Public involvement in the development of this Resilience Strategy was sought throughout the planning process through a variety of methods, including a project webpage, a public survey, public workshops, outreach through stakeholders, and online announcements intended to publicize these opportunities for involvement. A subset of CAT members and stakeholders met to discuss approaches to outreach and engagement, which informed the development of the Community Engagement Strategy for this plan. Because Hyde County was also updating the countywide CAMA Land Use Plan in conjunction with this Resilience Strategy, this group sought ways to simplify engagement and reduce duplication of efforts, so that residents and stakeholders could easily engage with and inform both projects simultaneously. Documentation of public and stakeholder coordination efforts, including the Community Engagement Strategy, is provided in Appendix B.

Plan Webpage

To kick off the planning process, a project webpage for the Hyde County Resilience Strategy was created and linked to the County's planning webpage. This project webpage served as a tool to educate and engage the public by providing ways to learn about the plan goals, get involved in the planning process, complete the public survey, and provide feedback to the CAT. The website housed agendas, minutes, and presentations from the CAT meetings and public workshops; and shared links to key resources that supported and informed the planning process.

Public Survey

A key element of public and stakeholder engagement, which was incorporated into the project webpage and publicized through additional outreach networks by the CAT, County staff, and WSP, was the use of a web-based survey to gather public and stakeholder input. The public survey asked about past experiences of flood hazards, critical assets, particularly vulnerable locations, and things that Hyde County could do to become more resilient. Summary results from the public survey are provided below.

- Placeholder for summary of survey responses

Stakeholder Outreach

The CAT represented a range of stakeholder viewpoints and served as trusted points of contact for other groups in Lake Landing and across Hyde County. CAT members were provided with surveys, flyers, email templates, and other resources to support them in reaching directly to their networks to encourage participation and input in the Resilience Strategy. The objective in reaching out through stakeholders was to establish trust and facilitate honest feedback from others who could bring additional information to the planning process regarding flood risks and vulnerability issues within Lake Landing.

Social Media Outreach

WSP identified and coordinated with several Hyde County Facebook groups during the planning process to share information about the plan, public survey, project website, workshops, and other opportunities for input.

Public Workshop

To directly engage with the public and provide a forum for input on the plan, Hyde County held a public workshop. This workshop served a dual purpose of supporting both Lake Landing's Resilience Strategy and the countywide CAMA Land Use Plan update. Participants were asked for input on what they like about Hyde County and what makes it a place they like to live as well as what they struggle with and where they face challenges in Hyde County. For the Resilience Strategy, this input supported the identification of a vision and goals and helped determine potential areas of focus for resilience projects.

1.4 Data Collection

Detailed data related to the County's assets and flood-related scenarios were required to assess exposure, sensitivity, adaptive capacity, and vulnerability. This section describes the data sources used to identify critical assets and hazard scenarios. The resulting asset inventory and hazard analyses are provided in Section 4.

1.4.1 Asset Data

Following guidance in the RCCP Handbook, Hyde County and the CAT compiled asset data to identify critical buildings, infrastructure, natural resources, and other critical facilities or locations that could be exposed to and impacted by flooding and other hazards. WSP developed an initial asset inventory using

data from the Northeastern NC Regional Hazard Mitigation Plan, and worked with County staff, the CAT, and stakeholders to determine the types of assets that should be included and to compile a comprehensive inventory. Hyde County staff and CAT members suggested additional data sources for asset information and provided supplemental information concerning locally significant assets.

As part of the asset identification process, the CAT also reviewed FEMA's Community Lifelines framework to consider potential assets based on their significance relative to the continuity of government operations and/or other services or functions essential to human health, safety, and economic security.

The final asset inventory was developed through an iterative process by collecting input during CAT meetings, on paper maps, and through a web map tool. Spatial data for critical assets were sourced from County, State, and National datasets or digitized based on CAT input. The asset inventory is organized into four categories: Buildings and Infrastructure, Historic and Cultural Resources, Natural Resources, and Roads. Data sources used to develop the asset inventory are listed in Table 1.4.

Table 1.4 – Asset Data Sources

Data Sources	Assets Identified
Northeastern NC Regional Hazard Mitigation Plan	Fire Departments, Water Systems
North Carolina Department of Transportation (NCDOT) Resilience Analysis Framework for Transportation (RAFT), Roadway Inundation Tool (RIT) and Coastal Roadway Inundation Simulator (CRIS)	Roads
Hyde County Parcel Data (NC OneMap)	Farmland
National Land Cover Data	Farmland
North Carolina State Historic Preservation Office	Historic Structures and Districts
NC Natural Heritage Data Explorer	Parks and Open Space
CAT and stakeholder input	Sewer District, Cemeteries, Businesses, Farmland, Drainage Infrastructure

1.4.2 Hazard Data

FEMA Flood Hazard Areas

Regulated floodplains are illustrated on inundation maps called Flood Insurance Rate Maps (FIRMs). FIRMs are the official maps for a community on which FEMA has delineated both the Special Flood Hazard Areas (SFHAs), which are those areas that would be inundated by the 1% annual chance flood event, and the other risk premium zones applicable to the community, such as the Shaded X Zone, which is the area that would be inundated by the 0.2% annual chance flood event. Flood prone areas were identified within Lake Landing using the Hyde County Effective FIRMs dated 6/15/2022. This data was downloaded from the FEMA Flood Map Service Center.

NOAA Sea Level Rise and Tidal Flooding

The National Oceanic and Atmospheric Administration (NOAA) Office for Coastal Management's Sea Level Rise Viewer provides inundation mapping for half-foot intervals of sea level rise. The Sea Level Rise Viewer is created and maintained through NOAA's Office for Coastal Management Digital Coast. Inundation mapping is produced using detailed elevation maps and water surface elevations that account for local and regional tidal variability.

NOAA's Tides & Currents platform was used to collect additional data on sea level rise and high tide inundation. The Tides & Currents Sea Level Trends product contains regional scenarios for relative sea level rise for tide gage stations at Beaufort, NC and Oregon Inlet Marina, NC. Additionally, the Tides & Currents Coastal Inundation Dashboard contains data on historic water levels and thresholds for flooding at the Hatteras, NC tide gage station. Water level data for past dates of sunny day high tide flooding reported by the CAT were reviewed.

Flood Inundation Mapping and Alert Network (FIMAN)

FIMAN provides real-time water levels and flood inundation products across North Carolina to support flood preparedness and response. The real-time riverine and coastal water level and rainfall data in FIMAN are collected from over 600 gauges across North Carolina. Many of these gauges are managed by North Carolina Emergency Management (NCEM), but the network also includes gauges from the U.S. Geological Survey (USGS) and NOAA. Gauge forecast data from the National Weather Service (NWS) and National Water Model (NWM) are also at more than 270 sites.

In addition to real-time water level and rainfall measurements, FIMAN provides an array of data including stream stage trends with flood risk rating (Normal Stage to Major Flooding), inundation scenarios at various stream stages, building risk data (Flood Depths and Damage), and transportation layers showing potential flood impacts on road segments, bridges, and other NCDOT assets. There is a FIMAN gauge in Engelhard on Far Creek at US 264. Scenario data was reviewed for this location.

NOAA Storm Surge Modeling

NOAA's Sea, Lake and Overland Surges from Hurricanes (SLOSH) model is a computerized numerical model developed by the National Weather Service to estimate storm surge heights resulting from historical, hypothetical, or predicted hurricanes. The SLOSH model accounts for atmospheric pressure, size, forward speed, storm track, and unique geography and water depths to estimate surge. These parameters are used to create a model of the wind field which drives the storm surge. The SLOSH model consists of a set of physics equations which are applied to a specific locale's shoreline, incorporating the unique bay and river configurations, water depths, bridges, roads, levees and other physical features. The model creates outputs for all different storm simulations from all points of the compass. Each direction has a maximum envelope of water (MEOW) for each category of storm. All directions combined result in a maximum of MEOWs (MOMs) set of data. The resulting inundation estimates in this dataset represent a worst-case composite of storm surge for each storm category.

NC Coastal Federation Estuarine Erosion Rates

The North Carolina Coastal Federation provided data on the rate of erosion along most of Lake Landing's estuarine coastline. The Coastal Federation conducted a comprehensive Marsh Edge from Image Processing (MEIP) erosion analysis for portions of the coast, including Hyde County. This coastal erosion analysis uses remote sensing that processes multi-temporal National Agriculture Imagery Program (NAIP) aerial imagery to quantify shoreline change rates. The resulting data provides highly localized estimates of the annualized rate of erosion or accretion for most of Lake Landing's shoreline along the Pamlico Sound.

2. Review of Existing Plans and Efforts

2.1 Plan Review

A crucial step in this planning process is to ensure an integrated approach to resilience that is tailored to Hyde County's specific needs. To build upon past local, regional, and state efforts, the CAT evaluated existing plans to identify what the community has already done that can be incorporated into this planning process. Specifically, WSP reviewed existing plans and efforts for information on asset locations, hazards, potential resilience projects, resilience strategies already in place, and relevant goals and objectives and discussed findings and missing information with the CAT.

Below is a summary of local and regional plans and ordinances that were reviewed for their relevance to Hyde County's resilience planning efforts.

The Hyde County CAMA Land Use Plan (2008)

The Hyde County CAMA Land Use Plan was updated in 2008 to meet the requirements of the Coastal Area Management Act (CAMA) of 1974, which mandates that North Carolina's coastal counties prepare land use plans outlining existing conditions and future policy direction in sensitive coastal environments. The plan serves as a foundational tool for local government decision-making by documenting current demographic, economic, environmental, and infrastructure conditions across mainland Hyde County and Ocracoke Island. It establishes the framework that guides future actions related to zoning, land use, public facilities, transportation access, resilience, and hazard mitigation—functions especially critical in a county characterized by low-lying terrain, extensive wetlands, and a substantial seasonal population.

The plan adopts policies for Natural Hazard Areas that reinforce hazard mitigation and long-term resilience by emphasizing the conservation of fragile environments, continued enforcement of flood damage prevention and building code standards, discouraging development in the most flood-prone and storm-exposed areas, and supporting strategic land acquisition. It also provides detailed background data on natural systems and environmental conditions throughout Hyde County, including extensive mapping of flood zones, storm surge exposure, coastal wetlands, and Areas of Environmental Concern. These analyses highlight repetitive flooding locations, infrastructure vulnerabilities, and community facilities situated within high-risk areas, offering essential context for managing growth and protecting public safety in one of North Carolina's most environmentally sensitive coastal counties.

Northeastern NC Regional Hazard Mitigation Plan (2025)

A local hazard mitigation plan is a community's blueprint for how it intends to reduce the impact of natural, and in some cases human-caused, hazards on people and the built environment. The essential

elements of a hazard mitigation plan include a risk assessment, capability assessment, and mitigation strategy.

Hyde County is one of the participating jurisdictions in the Northeastern NC Regional Hazard Mitigation Plan, which was updated and adopted in 2025. The Northeastern NC region includes Bertie, Martin, Hyde, Tyrrell, and Washington Counties. The region is located between the Albemarle Sound to the north and the Pamlico Sound to the South. The plan includes a risk assessment that identifies and profiles hazards that pose risk to the planning area, assesses the planning area's vulnerability to these hazards, and examines each participating jurisdiction's capabilities in place to mitigate them. Some of the hazards profiled in this plan include dam & levee failure, drought, earthquakes, extreme heat, flood, hurricane & coastal hazards, tornadoes & thunderstorms, winter weather, sinkhole, wildfire, and hazardous substances. This plan serves as an important source of information on natural hazards and climate change risks, vulnerabilities, and mitigation opportunities for Hyde County.

Hyde County Hurricane Matthew Resilient Redevelopment Plan (2017)

The Hyde County Resilient Redevelopment Plan is the local plan produced for Hyde County as part of the North Carolina Resilient Redevelopment Planning (NCRRP) program that was established in 2016 after Hurricane Matthew. The NCRRP program aimed to provide communities damaged by Hurricane Matthew with a roadmap for community rebuilding and revitalization assistance. This plan summarizes the impact from Hurricane Matthew and presents strategies for resilient redevelopment in Hyde County, including several infrastructure and property protection projects within the county.

Resilient Coastal Communities Program Ocracoke Resilience Strategy (2022)

The Ocracoke Resilience Strategy comprises two reports, a Resilience Vulnerability Assessment (RVA) and a Project Portfolio for Ocracoke Village, which were developed as part of the North Carolina Office of Recovery and Resiliency (NCORR) Regions Innovating for Strong Economies and Environment (RISE) Program. Building on vulnerabilities identified in the RVA, the portfolio includes infrastructure, policy-based, and nature-based strategies addressing hazards such as flooding, storm surge, sea level rise, and wind. The portfolio report presents broad strategies to support resilience at the local level, including eight high priority projects and a selection of other projects considered. Together, these initiatives form a coordinated strategy to enhance safety, protect critical infrastructure, and support long-term resilience for the community.

Hyde County Parks and Recreation Master Plan (2014)

The Hyde County Parks & Recreation Master Plan provides a comprehensive framework for guiding future investments in parks, recreational facilities, and programming across both the Hyde County mainland and Ocracoke Village. Developed through an extensive public engagement process, the plan evaluates existing recreational assets and outlines strategic recommendations to support long-term community well-being. Broader themes addressed include population and demographic trends, equity of recreational access, facility standards, public health considerations, and opportunities for land acquisition, trail development, and facility upgrades. The plan was funded through the Region 9 Community Transformation Grant and created collaboratively by Hyde County staff, the Hyde County

Recreation Committee, and local citizens. The Hyde County Parks and Recreation Master Plan may assist the CAT in identifying recreational resources and understanding existing open space within Hyde County.

Lake Mattamuskeet Watershed Restoration Plan (2018)

In 2018, The N.C. Coastal Federation prepared The Lake Mattamuskeet Watershed Restoration Plan. This plan outlines a comprehensive strategy to address declining water quality, chronic flooding, and ecological degradation in North Carolina's largest natural lake and its surrounding watershed. Centuries of hydrologic alteration, rising sea levels, nutrient and sediment loading, and vegetation loss have transformed the lake into a hyper-eutrophic system with frequent algal blooms and the near-total disappearance of submerged aquatic vegetation. To reverse these trends, the plan identifies three central goals and proposes actions such as creating a formal water-management authority, developing hydrologic and hydraulic models, and installing engineered drainage improvements. Together, these measures aim to ensure long-term resilience for the lake and surrounding Hyde County communities and may be beneficial to the CAT team when discussing projects or concerns around Lake Mattamuskeet.

State of North Carolina Hazard Mitigation Plan (2023)

The North Carolina 2023 Hazard Mitigation Plan is a federally mandated plan that evaluates hazards that could potentially affect North Carolina and identifies actions to help reduce the loss of life and property from a disaster. The plan was developed by North Carolina Emergency Management (NCEM) with the collaboration of other state agencies. The plan provides a risk and vulnerability assessment, capabilities assessment, mitigation strategy, and monitoring and implementation methods.

Although this plan is focused on statewide hazard mitigation, it incorporates data and findings from regional hazard mitigation plans and presents summarized vulnerability information at a county level. This approach provides statewide context for hazards that impact Hyde County. However, as the State plan draws local hazard risk and vulnerability related information from the regional hazard mitigation plans, the Northeastern NC Regional Hazard Mitigation Plan is a better source of hazard related information for Hyde County.

Within the capability assessment, the State Hazard Mitigation Plan reviews existing State plans, planning functions, and programs that support resilience, summarizes each relevant State agency's resources and capabilities to implement mitigation, reviews federal and state programs and funding for mitigation, and evaluates local and tribal mitigation capabilities and opportunities to build local capacity. The plan summarizes local capabilities and their effectiveness for mitigation; this summary may be useful to Hyde County and the CAT when considering resilience action alternatives.

NC Climate Risk Assessment and Resilience Plan (2020)

To help understand the state of North Carolina's vulnerability to climate change, the North Carolina Climate Risk Assessment and Resilience Plan was created in 2020 by NCDEQ with support from other state agencies and stakeholders. The plan defines a vision of making North Carolina more resilient to both climate and non-climate related stressors to ensure the health and safety of communities,

economies, and ecosystems within the state. The plan summarizes climate change projections and non-climate stressors facing North Carolina and evaluates the vulnerability of key state sectors to these hazards and stressors. The plan concludes with recommendations for nature-based solutions to enhance ecosystem resiliency. The climate change projections, non-climate stressor projections, and recommendations are relevant to Hyde County's resilience planning efforts.

2.2 Summary of Existing Efforts

Table 2.1 summarizes the findings from the review of existing local and regional plans and efforts that impact Hyde County.

Table 2.1 – Summary of Findings from Existing Plans and Efforts

Document Name (Year)	Asset Locations	Hazard Information	Potential Resilience Projects	Resilience Strategies Already in Place	Resilience Goals and Objectives
Hyde County CAMA Land Use Plan (2008)		•		•	•
Northeastern Regional Hazard Mitigation Plan (2025)	•	•	•	•	•
Hyde County Resilient Redevelopment Plan (2017)		•	•		
Ocracoke Resilience Portfolio (2022)	•	•	•	•	
Hyde County Parks and Recreation Master Plan (2014)	•		•		
Lake Mattamuskeet Watershed Restoration Plan (2018)			•	•	•
State of North Carolina Hazard Mitigation Plan (2023)	•	•	•	•	•
NC Climate Risk Assessment and Resilience Plan (2020)		•	•	•	•

3. Vision and Goals

A vision statement is a forward-looking, aspirational statement that describes the intended long-term outcome of this planning process. To develop the vision statement for this plan, the CAT participated in a facilitated discussion to explain the impetus for this plan and to describe what a resilient Lake Landing would look like in the future. After sharing their own ideas on these topics, CAT members were presented with summarized responses from the first public survey and the first public workshop and discussed common themes from this feedback. From there, the CAT agreed upon a statement that combined the key elements of all contributors.

The resulting vision statement reflects the aspirations of the CAT, County staff, and the public for a resilient Lake Landing.

Lake Landing is a close-knit community that protects its people, natural resources, fishing industry, and working lands by evolving with and proactively responding to the dynamics of coastal living while maintaining the rich heritage that makes Lake Landing a special place to live.

Goals are general guidelines that explain what is to be achieved. They are usually broad-based policy type statements and represent long term comprehensive visions. Goals help define the benefits that the plan is trying to achieve. Goals are also necessary to guide the review of possible resilience strategies and to ensure that recommended actions are consistent with what is appropriate for the County and Lake Landing township. Resilience goals need to reflect community priorities and should be aligned with other County plans.

To set a path for how to realize the vision statement, the CAT further refined the planning intentions into five plan goals. These goals offer broad approaches to building resilience and will serve as a guide for identifying resilience strategies:

- ***Goal 1:*** *Strengthen and expand Lake Landing's existing flood control systems and infrastructure to manage current flood conditions and plan for long-term flood control.*
- ***Goal 2:*** *Safeguard farmland, recreation lands, conservation lands, forestry, and water dependent businesses to allow residents to continue living and working while reducing impacts from flooding and saltwater intrusion.*
- ***Goal 3:*** *Guide post-event recovery and consider planning decisions that lead the Town toward safer outcomes by promoting and supporting intentional redevelopment and reinvestment that reduces repeat losses over time and enhances the community's well-being.*
- ***Goal 4:*** *Maintain and enhance the benefits of existing wetlands and other natural systems as essential components of Lake Landing's flood resilience strategy, recognizing their role in water storage, drainage, habitat protection, and long-term risk reduction.*

- ***Goal 5:*** *Implement flood resilience in a way that maintains Lake Landing's rural character, sense of community, outdoor recreation opportunities, and what residents value most about living here.*

4. Asset Inventory

4.1 Overview

Hyde County followed DCM guidance and the RCCP Planning Handbook to compile an asset inventory. This process involved collaboration between County staff, the CAT, and WSP to collect relevant data and identify and map assets. Preliminary data collection was focused on the seven required asset categories identified by DCM, shown in Figure 4.1 below. Following CAT discussion, the asset inventory was expanded to include historic districts, historic properties, farmland, local businesses, and other culturally important assets.

Figure 4.1 – Required Critical Assets

Source: NC Resilient Coastal Communities Program Planning Handbook

Data collection and data sources used to compile the asset inventory are detailed in Section 1.4.1.

Assets are grouped into four categories: buildings and infrastructure, historic and cultural resources, natural resources, and roads. Details on each of these categories are presented in the following sections.

4.2 Buildings and Infrastructure

Data on buildings and infrastructure assets were gathered from the Northeastern NC Regional Hazard Mitigation Plan, Hyde County staff, and CAT input. Buildings and infrastructure assets are listed in Table 4.1 and mapped in Figure 4.2.

Table 4.1 – Buildings and Infrastructure Assets

ASSET	ADDRESS
Business & Business District	
Dollar General Store	34230 US-264, Engelhard, NC 27824
Engelhard Hotel	34901 US-264, Engelhard, NC 27824
NAPA Auto parts Store	34200 US-264, Engelhard, NC 27824
H&L Restaurant	32046 US-264, Engelhard, NC 27824
Gibbs Hardware Store	35095 US-264, Engelhard, NC 27824
R.S. Spencer Hardware Store	34910 US-264, Engelhard, NC 27824
Sugar and Spice Restaurant	34981 US-264, Engelhard, NC 27824
Business District	N/A
The Feed House	33301 US-264, Engelhard, NC 27824
Mattamuskeet Seafood	24694 US-264, Swanquarter, NC 27885
Williams Seafood	192 Hill St, Engelhard, NC 27824
Engelhard Marine Industrial Park	114 Hill St, Engelhard, NC 27824
Engelhard Seafood	269 Goshen Back Rd, Engelhard, NC 27824
Communication	
Telephone/Internet Hub	195 Roper Ln, Engelhard, NC 27824
Radio Tower	1590 High Rd, Engelhard, NC 27824
Cell Tower	Radar Road, Engelhard, NC 27824
Radio Tower	661 Goshen Rd, Engelhard, NC 27824
Drainage Districts	
Mattamuskeet Drainage Association Area	N/A
Slocum Drainage District	N/A
Government Services	
US Post Office	34668 US-264, Engelhard, NC 27824
Hyde County Convenience Site	36154 US-264, Engelhard, NC 27824
Sanitary District Treatment	Lima Ave, Engelhard, NC 27824
Sanitary District	N/A
Health Services	
Hyde County Department of Social Services	35015 US-264, Engelhard, NC 27824
Mattamuskeet Village	32105 US-264, Engelhard, NC 27824
Engelhard Medical Center	33270 US-264, Engelhard, NC 27824

ASSET	ADDRESS
Infrastructure	
Water Tower	34658 US-264, Engelhard, NC 27824
Hyde County Water System	13692 N Lake Rd, Engelhard, NC 27824
Hyde County Water System	13692 N Lake Rd, Engelhard, NC 27824
Mattamuskeet Drainage Association Pump	2nd Ave E and US-264, Engelhard, NC 27824
Mattamuskeet Drainage Association Pump	5th Ave E and US-264, Engelhard, NC 27824
Mattamuskeet Drainage Association Pump	670 4th Ave W, Engelhard, NC 27824
Mattamuskeet Drainage Association Pump	4th Ave W and 8th St W, Engelhard, NC 27824
Mattamuskeet Drainage Association Pump	1st Ave W and 8th St W, Engelhard, NC 27824
Water pump - Middle Creek Farms	White Plains Rd and The High Rd
Drains - Middle Creek Farms	The High Rd
Drainage pump, tide gate and pump - Middle Creek Farms	Nebraska Rd and White Plains Rd
Drainage pump - Middle Creek Farms	-
Pump and drain - Alligator River Farms	-
Tide gate - Alligator River Farms	812 Swamp Rd, Engelhard, NC 27824
Tide gate - Engelhard Fire Dept	34501 US-264, Engelhard, NC 27824
Tide gate	34910 US-264, Engelhard, NC 27824
Tide gate	669 Goshen Back Rd, Engelhard, NC 27824
Tide gate	Radar Rd and Lazy Ln
Tide gate	Radar Rd
Tide gate	861 Farrow Fork Rd, Engelhard, NC 27824
Tide gate - Middle Creek Farms	Middle Creek Rd
Tide gate - Middle Creek Farms	-
Tide gate - Middle Creek Farms	1044 Goshen Rd, Engelhard, NC 27824
Pump	Goshen Rd
Pump - Slocum drainage	Nebraska Rd
Pump - Middle Creek Farms	626 Great Ditch Rd, Engelhard, NC 27824
Pumo and gate - Carawan Farms	Great Ditch Rd
Tide gate - Farrow Farm	971 Great Ditch Rd, Engelhard, NC 27824
Tide gate - Farrow Farm	Great Ditch Rd
Tide Gate -Farrow Farm	Great Ditch Rd
Tide gate - Middle Creek Farms	899 Great Ditch Rd, Engelhard, NC 27824
Tide Gate - Davis Farm	Gum Swamp Rd and Great Ditch Rd
Tide Gate - Cradle Farm	Gum Swamp Rd and Great Ditch Rd
Tide Gate - Pugh Farm	307 Great Ditch Rd, Engelhard, NC 27824
Tide Gate - Watson Farm	Nebraska Rd and Great Ditch Rd
Tide Gate - Dudley Farm	3120 Nebraska Rd, Engelhard, NC 27824
Tide Gate - Boyd Farm	2556 Nebraska Rd, Engelhard, NC 27824
Tide Gate - Sadler Farm	1094 High Rd, Engelhard, NC 27824
Tide Gate - Farrow Farm	The High Rd and Middle Creek Rd
Tide Gate - Gibbs Farm	1418 White Plains Rd, Engelhard, NC 27824
Tide Gate - Gibbs Farm	White Plains Rd and Marsh Rd
Tide Gate - Middle Creek Farms	306 White Plains Rd, Engelhard, NC 27824

ASSET	ADDRESS
Tide Gate - Daughtry Farm	-
Drainage Pump - Carawan Farms	26570 US-264, Engelhard, NC 27824
Drainage pump - Jeannette Farms	26570 US-264, Engelhard, NC 27824
Pump - Potter Farm	26105 US-264, Engelhard, NC 27824
Drainage pump and gate - Potter Farm	23730 US-264, Swanquarter, NC 27885
Tide Gate - Davis Farm	Outfall Canal Rd
Drainage pump - Outfall Farm	Outfall Canal Rd
Drainage Pump - Outfall Farm	Outfall Canal Rd
Drain Pump - Stokesberry Farm	US HWY 264
Drain Pump - Hydeland Farm	Hydeland Rd
Pump and Tide Gate - Wysocking Farm	3976 Gull Rock Rd, Engelhard, NC 27824
Drain Pump - Gull Rock Farm	Grill Rack Rd
Public Safety Assets	
Engelhard Volunteer Fire Department, Inc.	34545 US-264, Engelhard, NC 27824
Swan Quarter Volunteer Fire Department, Inc.	149 NC-94, Swanquarter, NC 27885
School	
Beaufort County Community College / BHM Regional Library	33460 US-264, Engelhard, NC 27824
Transportation Assets	
ETHCO Service Station	34970 US-264, Engelhard, NC 27824
Gibbs Convenience Store	34835 US-264, Engelhard, NC 27824
Far Creek Gas Station	34260 US-264, Engelhard, NC 27824
Hyde County Airport	470 Airport, Engelhard, NC 27824
Hyde Transit	1275 Main St, Swanquarter, NC 27885
Engelhard Far Creek Harbor	17 Summerlin Dr, Engelhard, NC 27824
Engelhard Boat Launch	Kitty Island Road, Engelhard, NC 27824
Boat Ramp	Meekins Landing Rd, Engelhard, NC 27824
Utilities	
Tideland EMC	34656 US-264, Engelhard, NC 27824

4.3 Historic and Cultural Resources

Historic and cultural resources include historic districts, historic properties, and cemeteries. Historic and cultural resources are listed in Table 4.2. These assets are mapped in Figure 4.3.

Table 4.2 – Historic and Cultural Assets

ASSET	ADDRESS
Cemeteries	
Ada and Addison Brown Cemetery	Goshen Back Rd, Engelhard, NC 27824
Faithful Hannah Church Cemetery	95 Faithful Hannah Church Rd, Engelhard, NC 27824
Fullford Cemetery	N Lake Rd and Lake Swamp Rd
Soule Cemetery	20702 US-264, Swanquarter, NC 27885
Amity Church Cemetery	31655 US-264, Engelhard, NC 27824

ASSET	ADDRESS
Historic Districts	
Davis High School Historic District	N/A
Lake Landing Historic District	N/A
Historic Properties	
Wynne's Folly	32742 US-264, Engelhard, NC 27824
Davis High School	33478 US-264, Engelhard, NC 27824
The Inkwell/Octogon House	30868 US-264, Engelhard, NC 27824
Mattamuskeet Lodge	1 Mattamuskeet Rd, Swanquarter, NC 27885

4.4 Natural Resources

Natural resources in Lake Landing include several County open space parcels, state and federal game land, conservation land, farmland, and wetlands. These assets are listed in Table 4.3 and mapped in Figure 4.4.

Table 4.3 – Natural Resources

ASSET	OWNERSHIP	OWNER
Alligator River National Wildlife Refuge	Federal	US Fish & Wildlife Service
Dare County Air Force Range	Federal	US Department of Defense
Emily and Richardson Preyer Buckridge Coastal Reserve	State	NC Division of Coastal Management
Gull Rock Game Land	State	NC Wildlife Resources Commission
Swanquarter National Wildlife Refuge	Federal	US Fish & Wildlife Service
Mattamuskeet National Wildlife Refuge	Federal	US Fish & Wildlife Service
Hyde County Open Space (2 parcels)	Local	Hyde County
NC Department of Transportation Mitigation Site (2 parcels)	State	NCDOT
NC Wildlife Resources Commission Engelhard Access Area	State	NC Wildlife Resources Commission
NC Hazard Mitigation Buyout Property - Hyde County (3 parcels)	State	NC Division of Emergency Management
Conservation Reserve Enhancement Program Easement (40 parcels)	State (Easement)	NC Division of Soil and Water Conservation
Wetland Reserve Program Easement (16 parcels)	Federal (Easement)	USDA Natural Resources Conservation Service
Farmland (567 parcels)	Private	N/A
NCDEQ Wellhead Protection Area	N/A	N/A

4.5 Roads

North Carolina Department of Transportation (NCDOT) Resilience Analysis Framework for Transportation was used to evaluate roadway vulnerability in Lake Landing. The evaluated roads are included in Table 4.4 and Figure 4.5.

Table 4.4 – Roads

ASSET	ROAD CLASS
Airport Rd	4
Arch Rd	4
Cahoon Rd	4
Chat & Thomas Rd	4
Collins Ln	4
Cooper Ln	4
Faithful Hannah Church Rd	4
Farrow Fork Rd	4
Golden St	4
Goshen Back Rd	4
Goshen Rd	4
Great Ditch Rd	4
Green Hill Road	4
Gull Rock Rd	4
Gum Swamp Rd	4
Hill St	4
Horse Shoe Loop Rd	4
Hycienda Heights	4
Hydeland Rd	4
Juniper Bay Rd	4
Lake Swamp Rd	4
Lakeview Rd	5
Lazy Ln	4
Main St	3
Maple Rd	5
Marsh Rd	4
Mt Pleasant Village Rd	4
Mt Sinai Rd	4
Mulberry Rd	4
Nebraska Rd	4
New Holland Rd	4
North Lake Rd	4
Pleasant Grove Rd	4
Radar Rd	4
Roper Ln	4
Scrouge Town Rd	4
Shaw Rd	4
Silver Ln	4
Slocum Ln	4
St Lydia Rd	4
Swamp Rd	4
The High Rd	4

ASSET	ROAD CLASS
US 264 Hwy E	2
Whipping Creek Rd	5
White Plains Rd	4

Figure 4.2 – Buildings and Infrastructure Locations

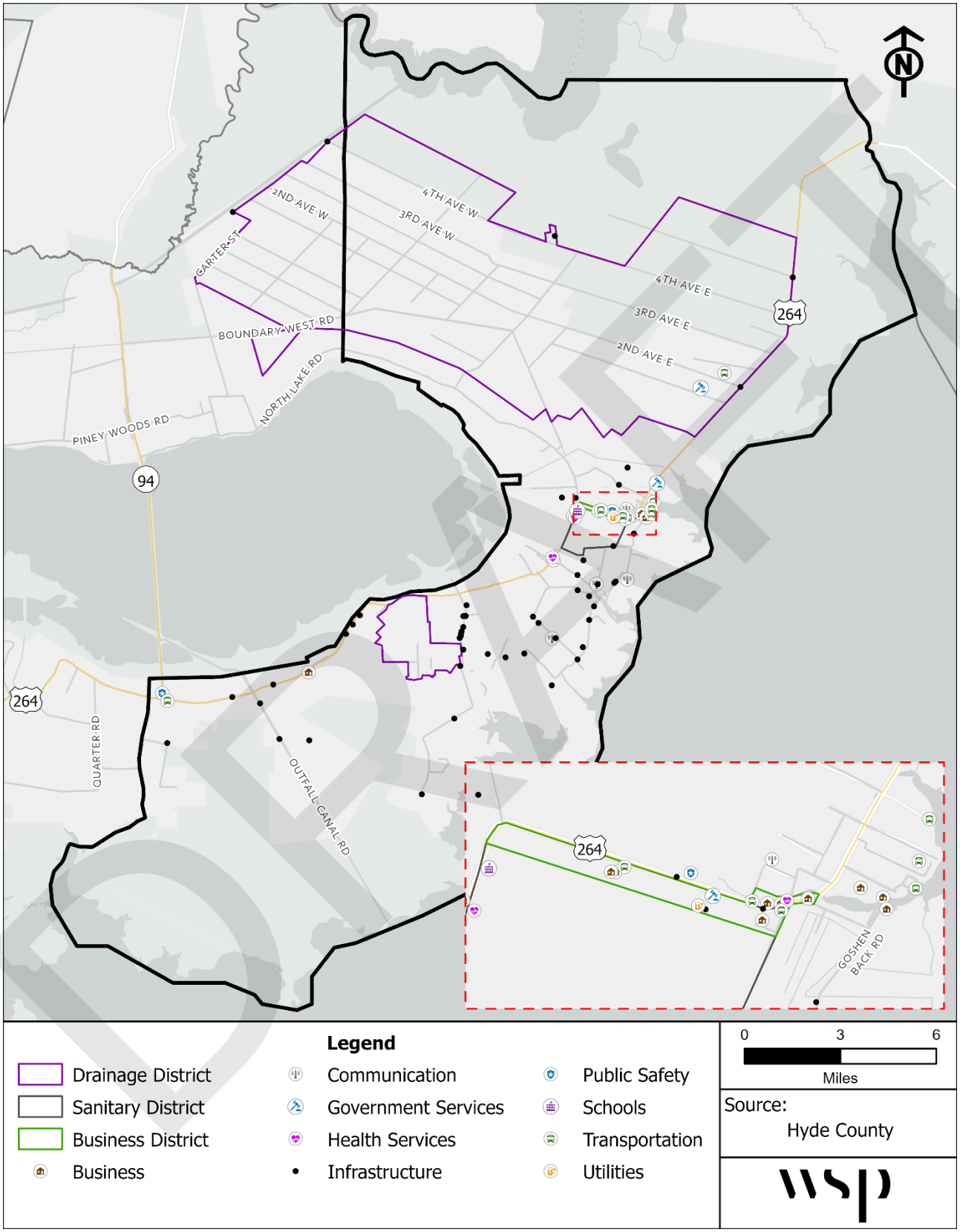


Figure 4.3 – Historic and Cultural Resources

Figure 4.4 – Natural Resources

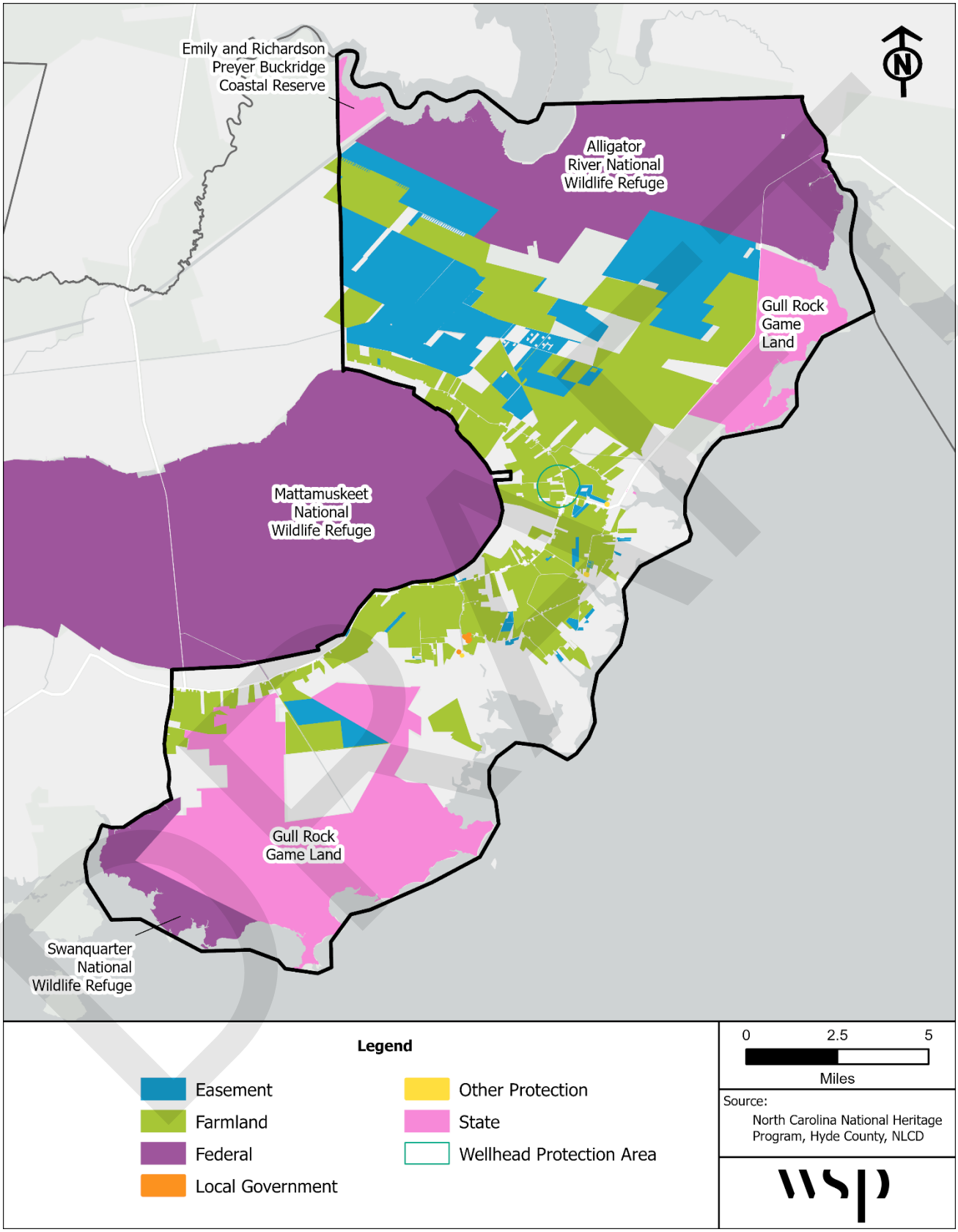
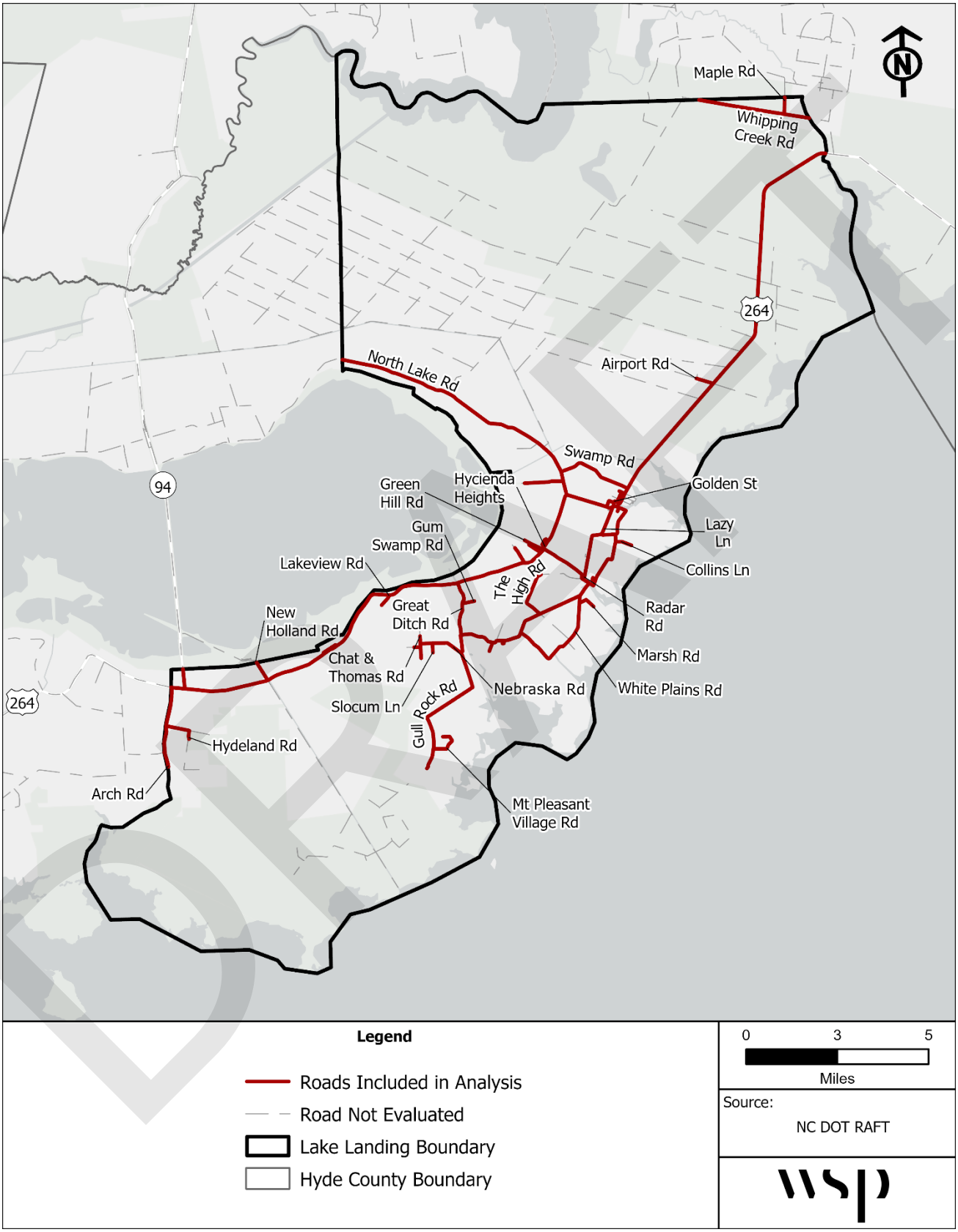


Figure 4.5 – Roads



5. Hazards & Stressors

5.1 Overview

Coastal communities face varying levels of risks from natural hazards and non-climate stressors. Potential hazards and stressors in Hyde County were identified based on past event records and experiences, current local and regional trends, and expected future changes. Identifying hazards and stressors is important to understanding how Hyde County's assets may be threatened.

The Northeastern NC Regional Hazard Mitigation Plan was the first point of reference for identifying hazards relevant to Hyde County. Based on the flood-related hazards in the Hazard Mitigation Plan and input from the CAT on local flood conditions, the following list of hazards was selected for assessment in this plan:

- Sea Level Rise
- High Tide
- Riverine & Coastal Flooding
- Storm Surge
- Shoreline Erosion

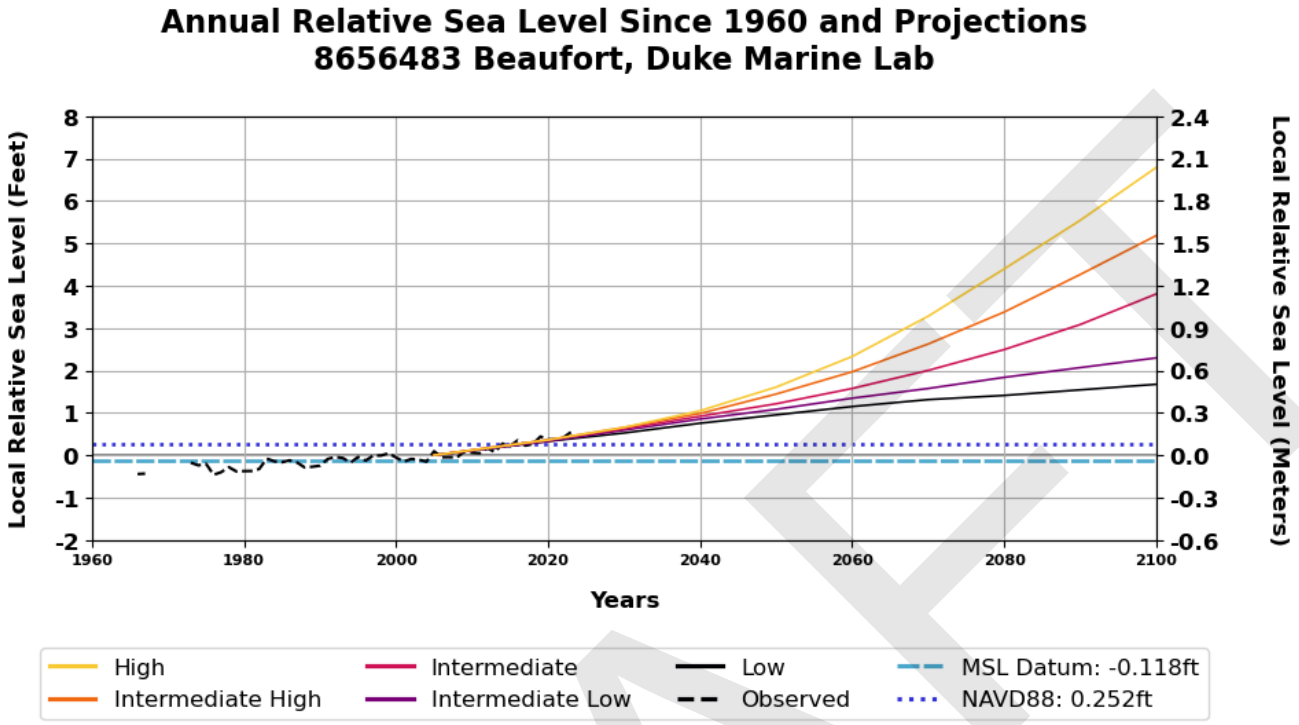
In evaluating these hazards, the CAT considered both current and future conditions based on the projected impacts of climate change. The following subsections summarize each of the identified potential hazards using current best available data and past occurrences.

5.2 Hazards

5.2.1 Sea Level Rise

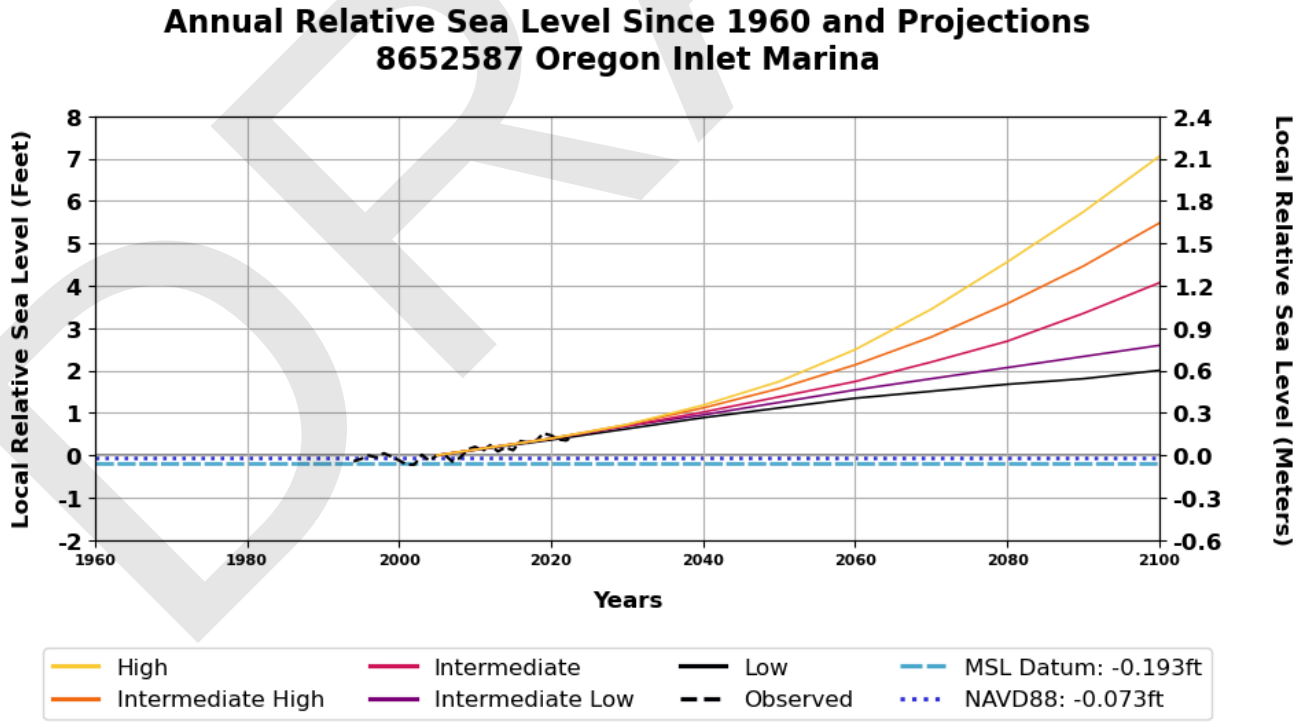
Data compiled from tidal gauges by NOAA was used to approximate local relative sea level rise projections. While there is a tidal gauge in Hatteras, NC, the closest tidal gauges to Hyde County with established regional relative sea level rises projections are located in Beaufort, NC and Oregon Inlet Marina, NC. Figure 5.1 and Figure 5.2 below from NOAA Tides & Currents show five regionalized sea level rise scenarios for each station, plotted relative to a 1996-2014 baseline period with the year 2005 as the "zero" point. The five scenarios are generated to account for emissions uncertainty and process uncertainty. Emissions uncertainty relates to the unknown amount of greenhouse gases that will be emitted in the future, and process uncertainty relates to ice-mass loss, ocean thermal expansion, and local ocean dynamic changes, which will be affected by increased emissions. Based on these projections, under the intermediate scenario, Hyde County could experience 1 foot of sea level rise by 2040, 2 feet by about 2065, and around 4 feet by 2100.

Figure 5.1 – Annual Relative Sea Level Since 1960 and Projections for Beaufort, NC



Source: NOAA Tides & Currents

Figure 5.2 – Annual Relative Sea Level Since 1960 and Projections for Oregon Inlet Marina, NC



Source: NOAA Tides & Currents

While sea level rise will eventually result in direct inundation of land area, the CAT discussed that the more immediate and concerning impacts of sea level rise are the ways in which it compounds other hazards and stressors. For example, rising sea level may reduce drainage capacity to the Pamlico Sound by raising Sound water levels, causing more inundation in Lake Landing from upstream rainfall that drains to Hyde County.

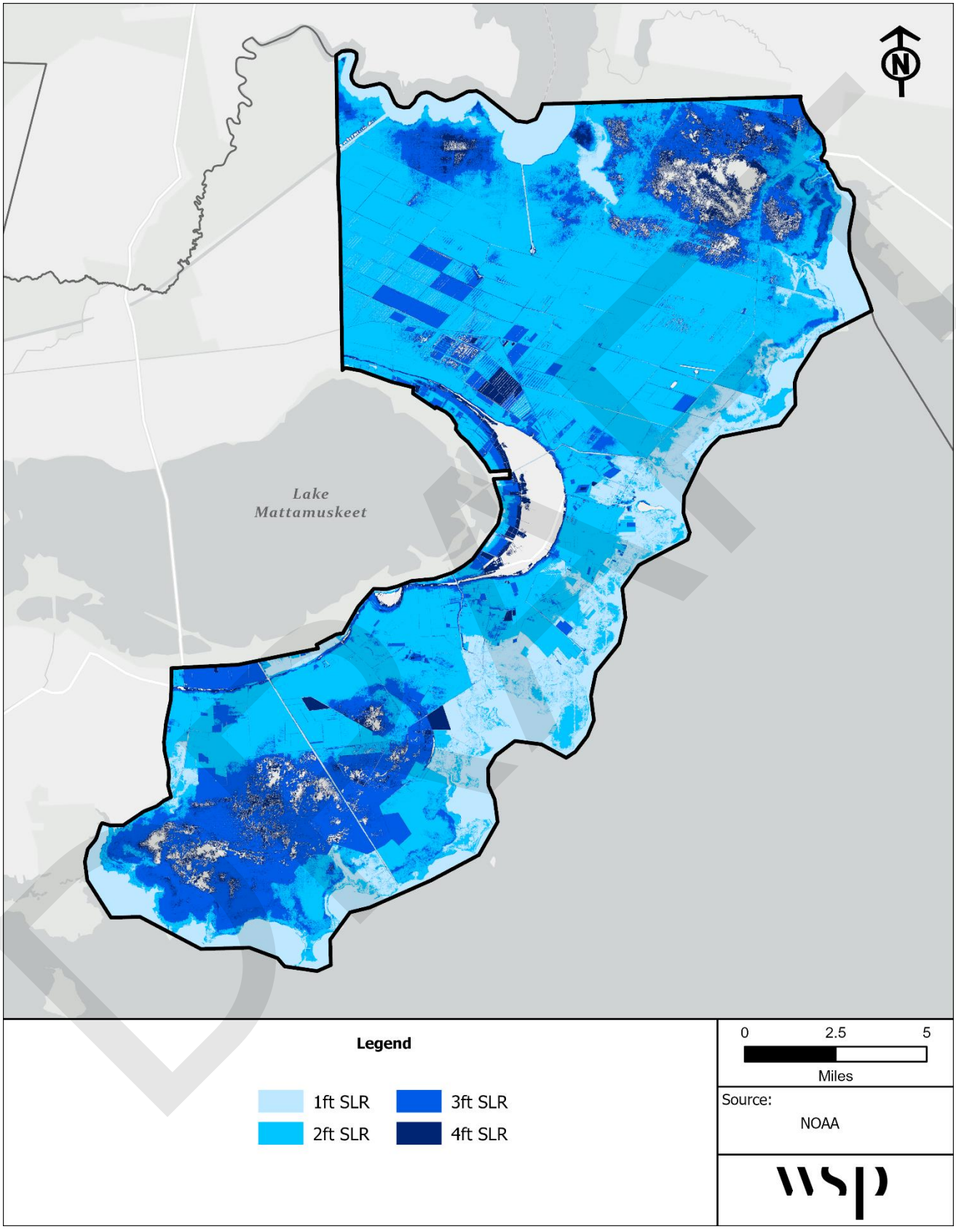
Additionally, sea level rise is causing salt marshes to migrate inland, infringing on agricultural lands, which are crucial local economic resources. The North Carolina Coastal Federation's May 2024 North Carolina Salt Marsh Action Plan projects that much of Lake Landing will be converted to salt marsh by 2050 as a result of sea level rise without efforts to slow or impede salt marsh encroachment into agricultural or forested uplands.[1]

Rising sea level will also exacerbate other coastal flooding events. For example, per the 2020 North Carolina Climate Science Report, by 2100, coastal areas are expected to experience high tide flooding, which is water levels of 1.6-2.1 feet above mean higher high water, nearly every day. This change is largely due to projected sea level rise. Similarly, sea level rise will likely increase the potential extent of storm surge inundation. To account for these compounding impacts of sea level rise, the CAT chose to evaluate the estimated inundation of 2-, 3-, and 4-feet of sea level rise.

Figure 5.3 shows the area that would be inundated by 1-, 2-, 3-, and 4-feet of sea level rise in Hyde County, using GIS data from the NOAA Office for Coastal Management's Sea Level Rise Viewer.

[1] North Carolina Salt Marsh Action Plan, May 2024; https://www.nccoast.org/wp-content/uploads/2024/05/NC-Salt-Marsh-Action-Plan-2024.pdf

Figure 5.3 – Sea Level Rise Extent



5.2.2 High Tide

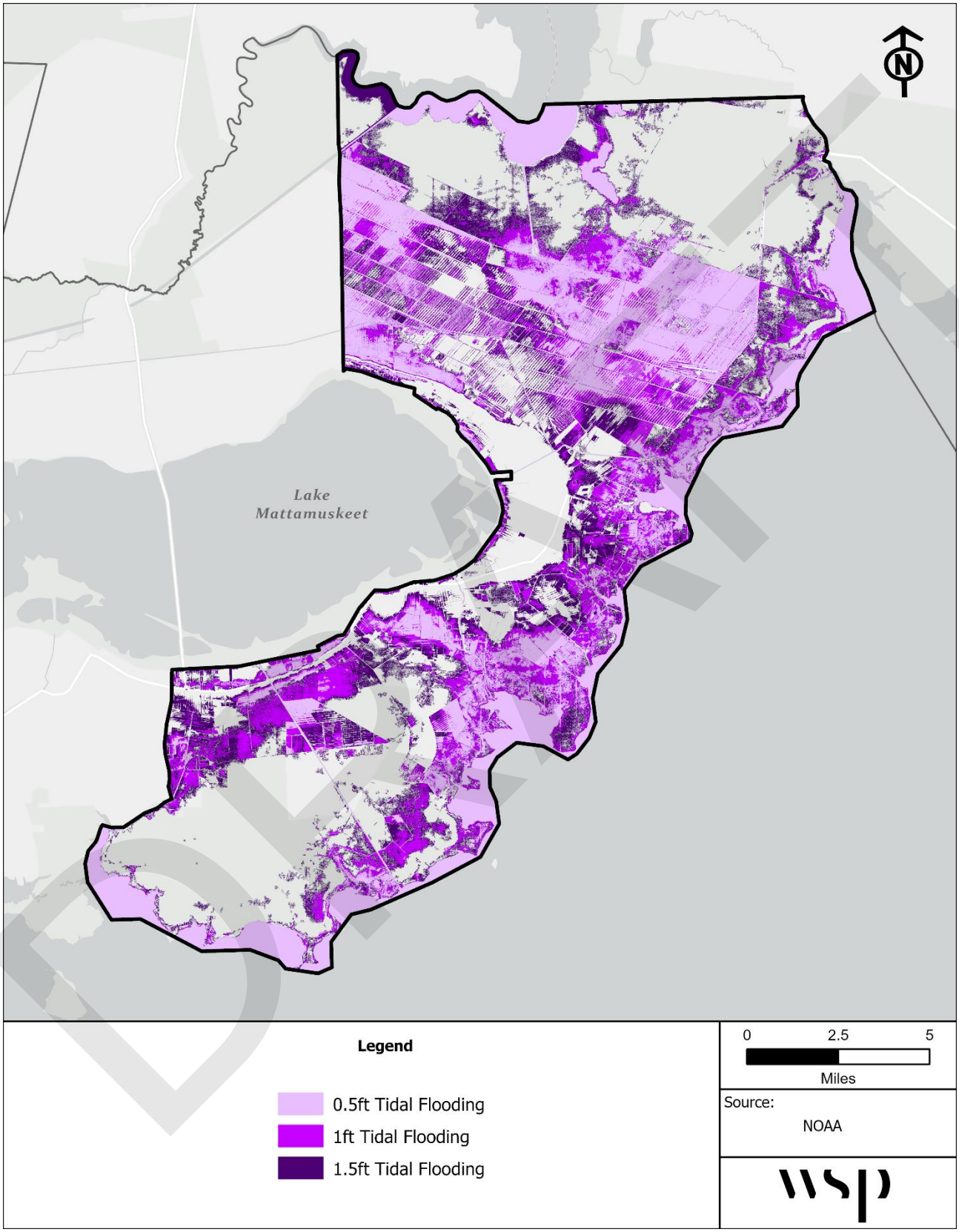
As discussed above, high tide flooding is expected to become significantly more frequent as a result of sea level rise. However, the CAT reported that high tide flooding is already a regular occurrence in many low-lying areas of Lake Landing.

The CAT reported an example of high tide flooding that occurred in October 2025 which inundated roads and bridges and nearly flooded many structures. Water level data from NOAA Tides & Currents for the Hatteras, NC tide gage was evaluated to establish thresholds for high tide flooding for this analysis. The North Carolina Flood Inundation Mapping & Alert Network (FIMAN) scenario viewer for the FIMAN gage at Far Creek at US 264 in Engelhard was also reviewed to visualize and compare the inundation extent of high tide scenarios.

Water surface elevation data from NOAA's sea level rise viewer was ultimately used to map thresholds for high tide flooding at 0.5-foot, 1-foot, and 1.5-feet above mean higher high water (MHHW). To account for uncertainty and take a more conservative approach in estimating exposure to this hazard, "low lying areas," defined as those areas below the water surface elevation but not necessarily hydrologically connected, were included in each inundation extent.

Areas vulnerable to high tide flooding are shown in Figure 5.4.

Figure 5.4 – Tidal Flooding Extent Estimates



5.2.3 Riverine and Coastal Flooding

During and following heavy rainfall events, the primary riverine flooding sources in Hyde County are the Pungo River, Pamlico River, and Alligator River. Rainfall-induced flooding can be compounded by astronomical tides and storm surge along the Pamlico Sound. FEMA's Flood Insurance Study (FIS) for Hyde County, revised effective on June 15, 2022, incorporates astronomical tides, freshwater inputs from rainfall and runoff, and storm surge into calculated stillwater elevations for the 1% annual change storm event which is used to delineate flood zones. The flood zones on the resulting Flood Insurance Rate Maps (FIRMs) are representative of the areas vulnerable to compound flooding for the 1% and 0.2% annual chance storms. The FIRM zones for Hyde County are shown in Figure 5.5. The estimated depth of flooding during the 1% annual chance flood event is shown in Figure 5.6.

Per the 2020 North Carolina Climate Science Report, total annual precipitation is likely to increase across the state, and it is very likely that extreme precipitation frequency and intensity will increase. Additionally, it is very likely that heavy precipitation accompanying hurricanes that pass near North Carolina will increase, which would increase the potential for freshwater flooding.

Figure 5.5 – Flood Hazard Areas

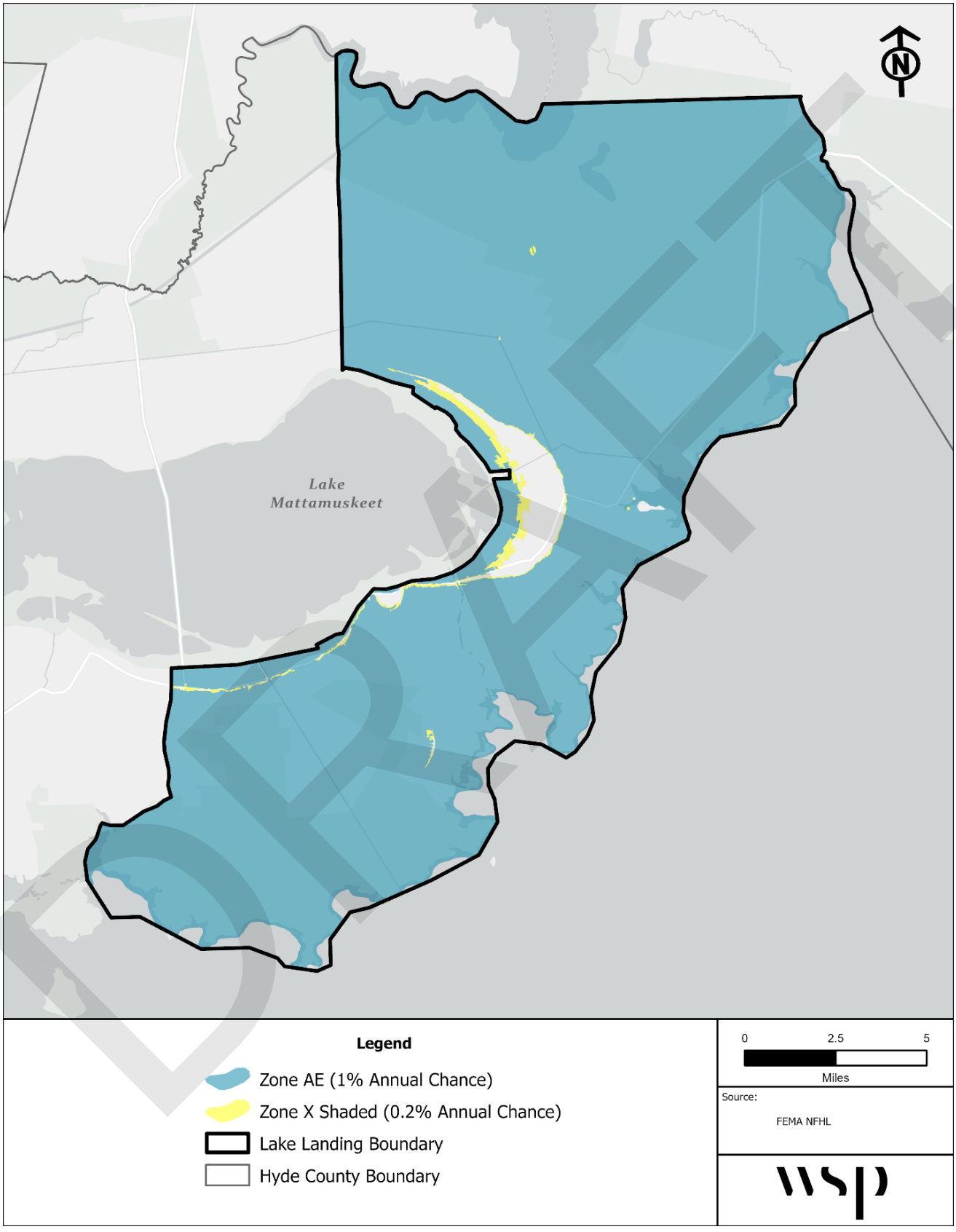
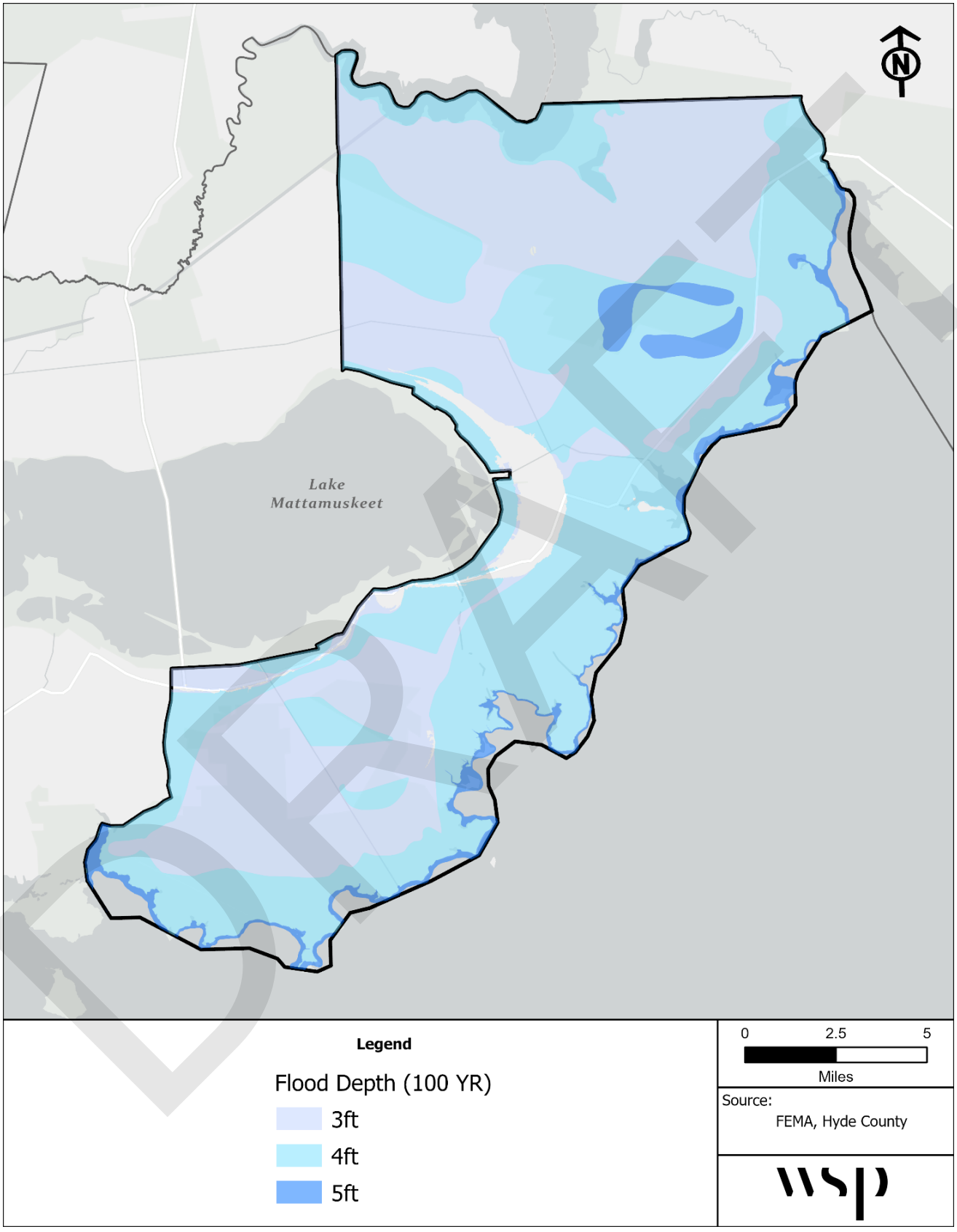


Figure 5.6 – Estimated 1% Annual Chance Flood Depth



5.2.4 Storm Surge

During tropical storms and hurricanes, wind pushes water toward the shore and can increase the mean water level to heights impacting roads, buildings, and critical infrastructure. Storm surge can be particularly damaging when it coincides with normal high tides. During more severe storm events, storm surge flooding can also involve wind driven waves.

NOAA's SLOSH model outputs were used to estimate the potential impact of storm surge in Hyde County. The composite approach, used for this vulnerability assessment, compiles the results of thousands of hypothetical storm conditions and presents the maximum height of surge for each storm category. This output is considered by the National Hurricane Center to be the best approach for determining an area's storm surge vulnerability because it accounts for forecast uncertainty.

Figure 5.7 through Figure 5.11 show the extent of the estimated maximum storm surge for a Category 1 through Category 5 storm.

The Category 2 Storm was used in the vulnerability assessment to determine exposure and sensitivity. Based on SLOSH data, a Category 2 storm would primarily cause flood depths greater than 3ft and would inundate almost the entire county.

Figure 5.7 – Estimated Category 1 Storm Surge

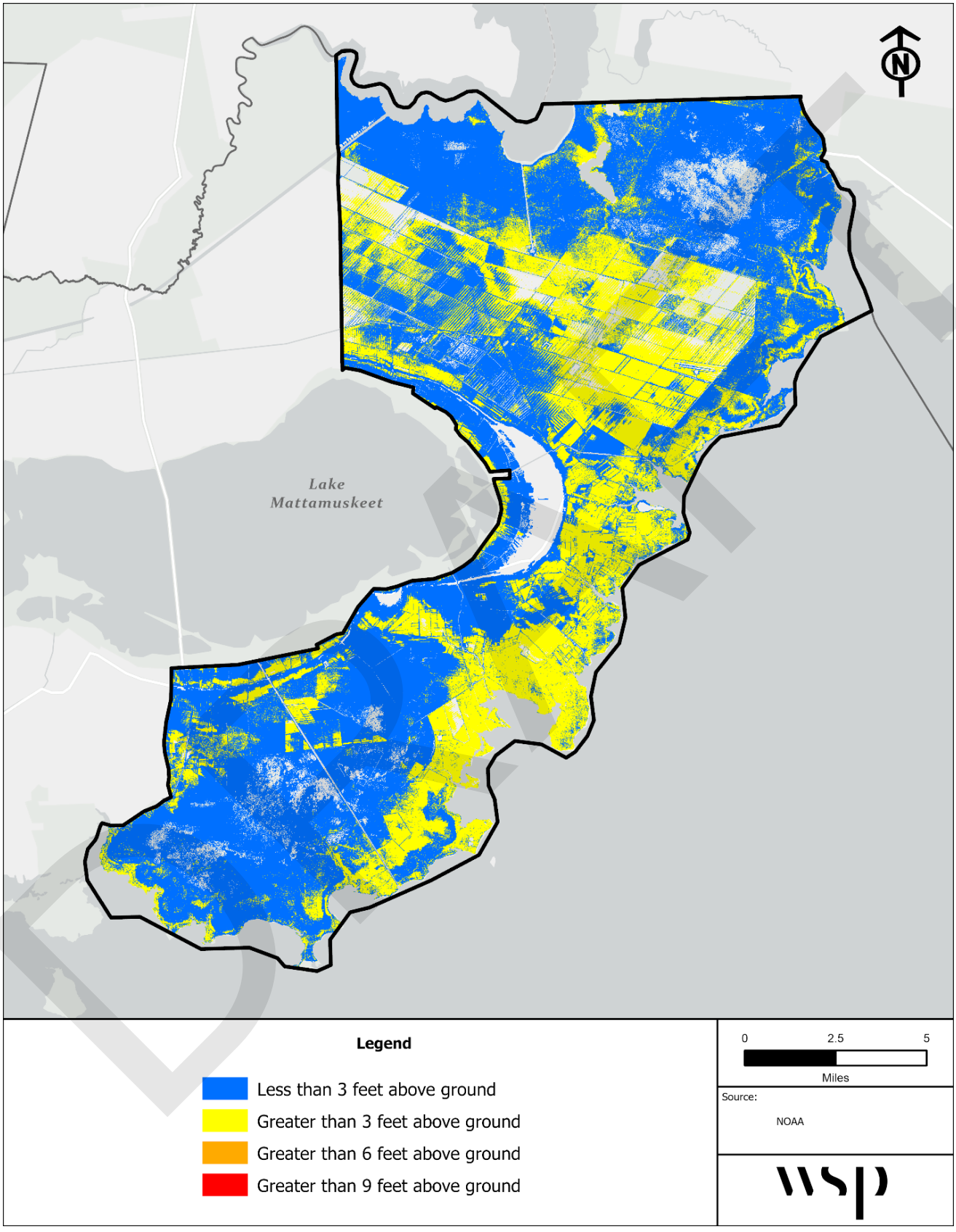


Figure 5.8 – Estimated Category 2 Storm Surge

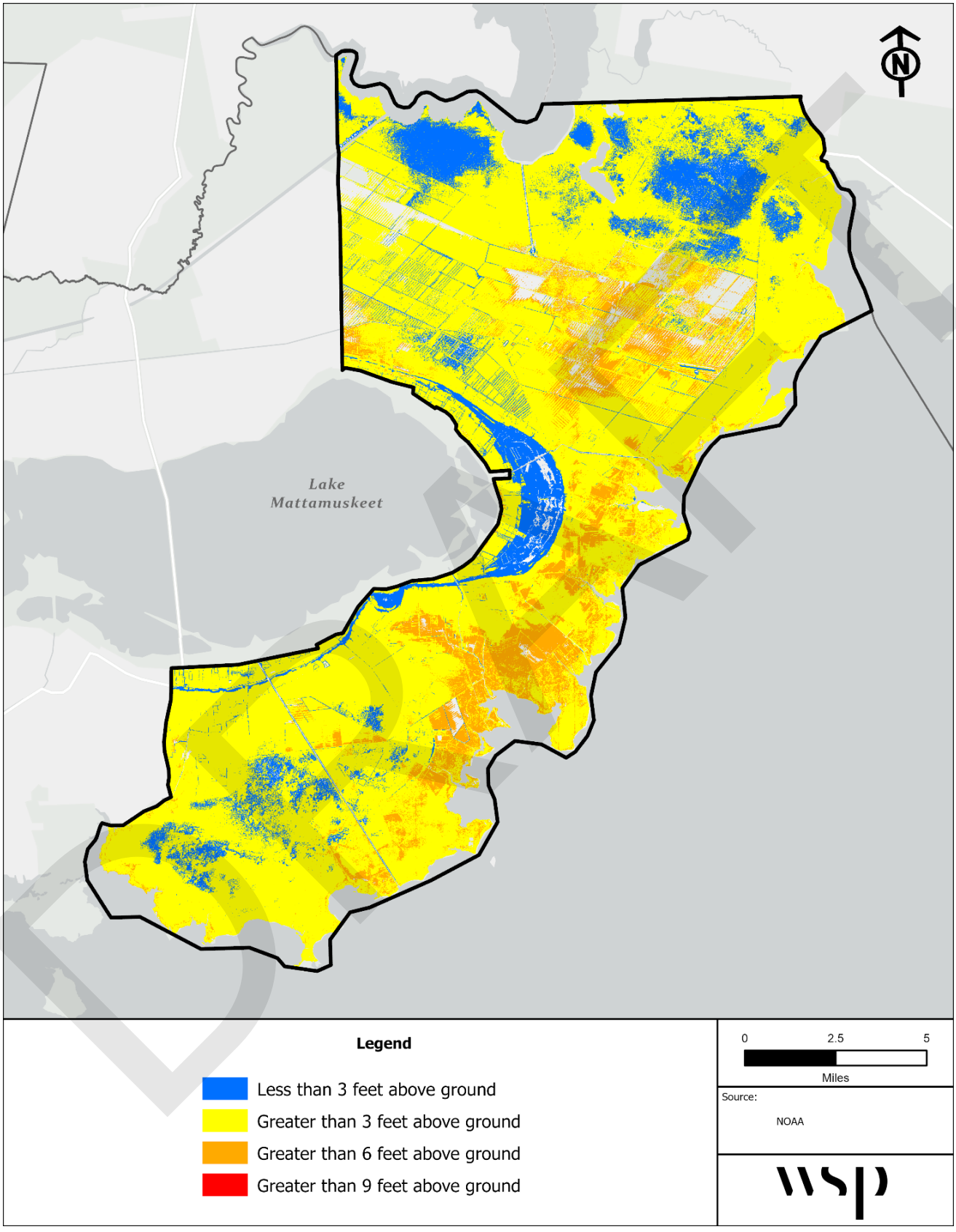


Figure 5.9 – Estimated Category 3 Storm Surge

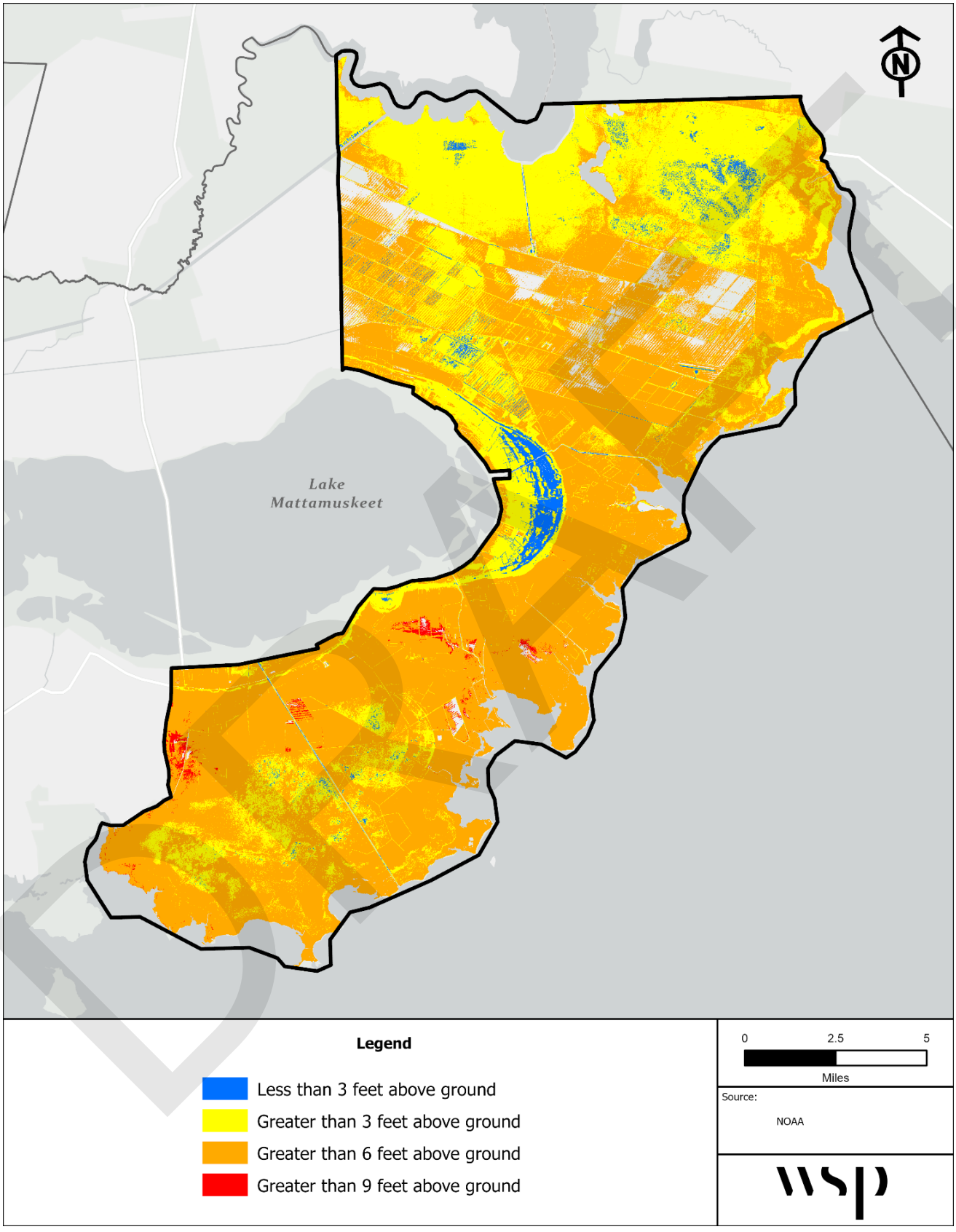


Figure 5.10 – Estimated Category 4 Storm Surge

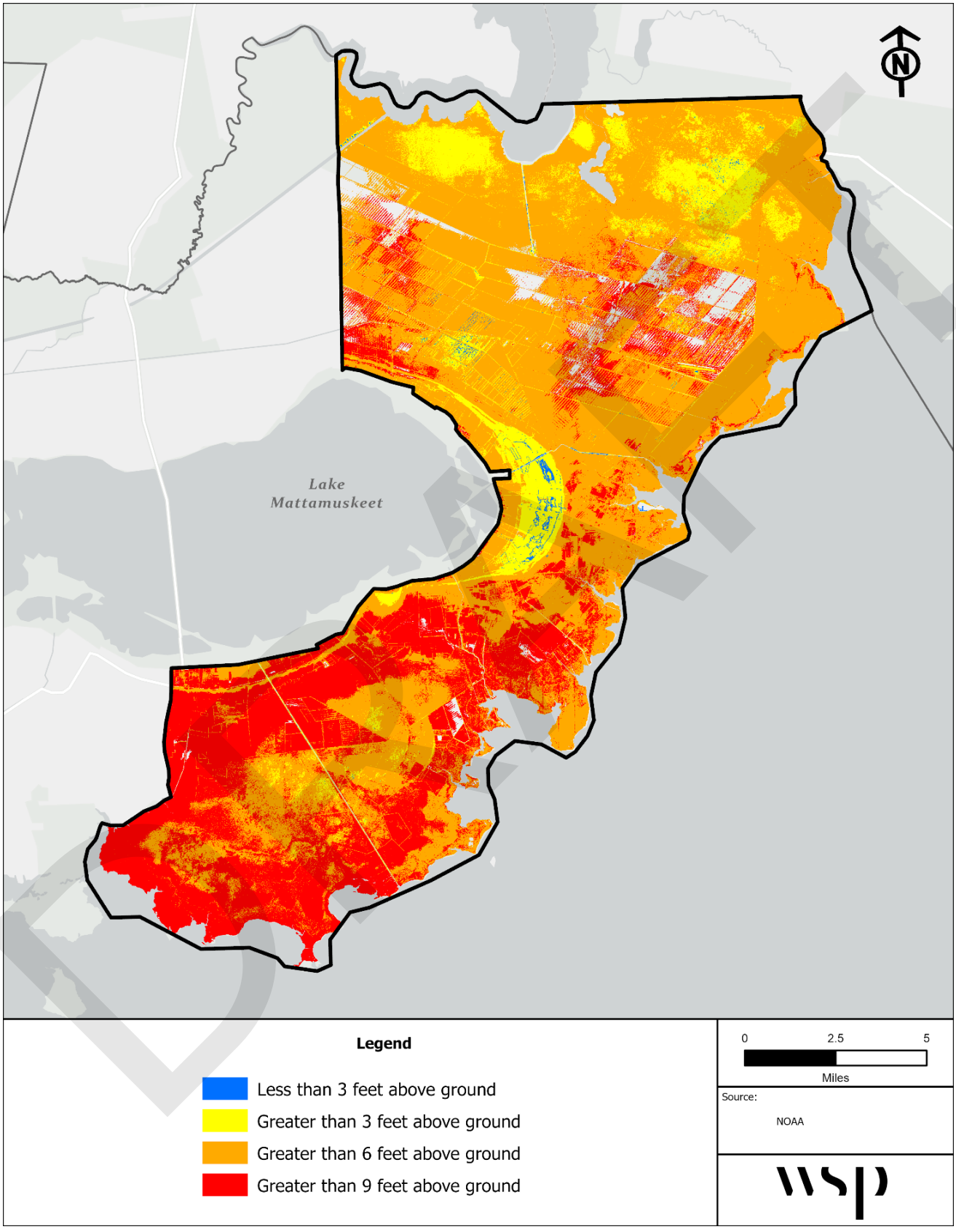
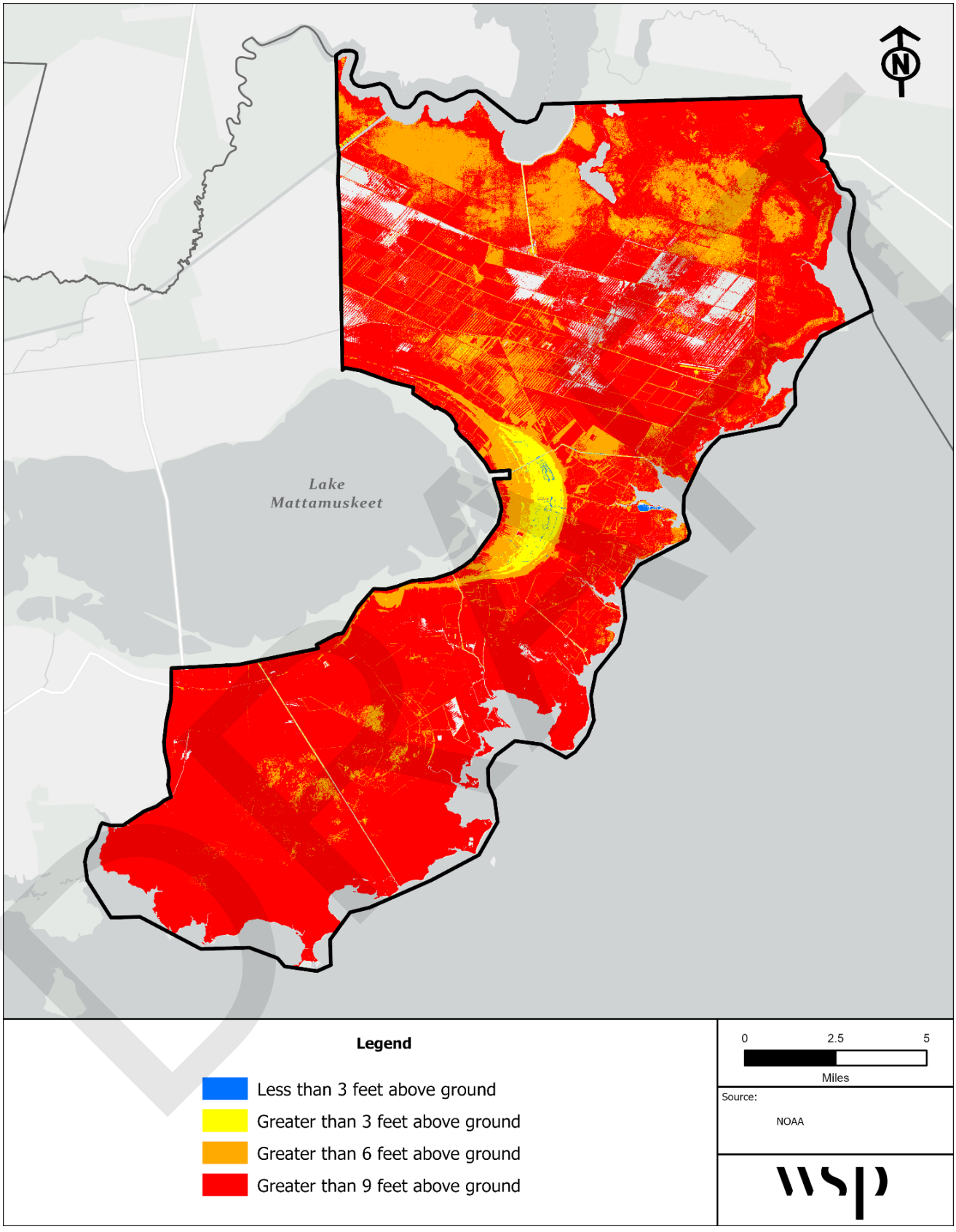


Figure 5.11 – Estimated Category 5 Storm Surge



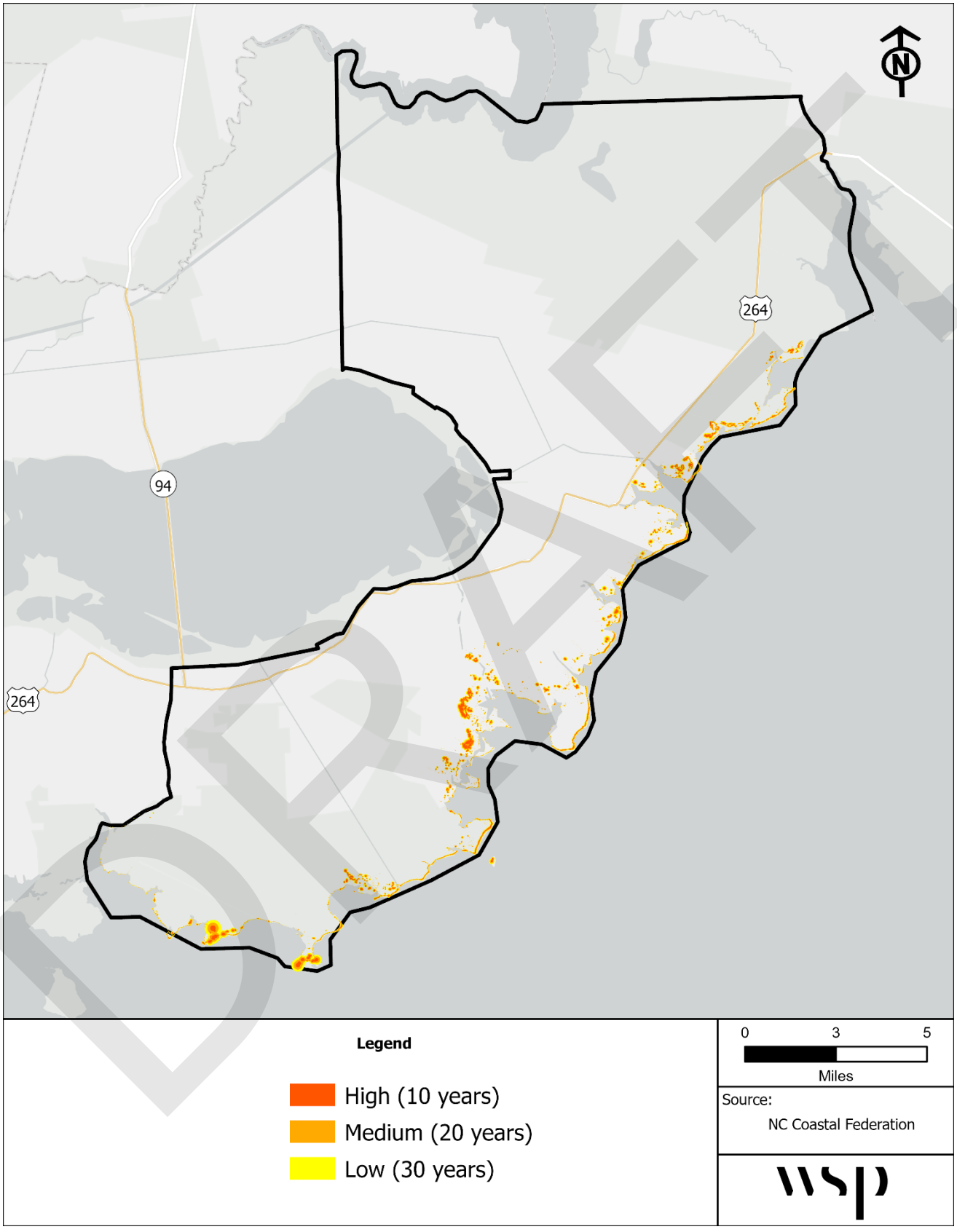
5.2.5 Shoreline Erosion

Gradual erosion occurs naturally along streambanks and coastal waterfronts. Erosion can be exacerbated by the repetitive impact and turbulence generated by boat wakes, especially in shallow waters. Severe erosion can occur over a very short period of time when an area is impacted by a hurricane, tropical storm, or other weather system that intensifies flows, currents, and sedimentation.

Erosion, coupled with sea level rise, can cause marsh migration or an inland shift of marshland. Throughout Lake Landing, this shift has caused marshes to encroach on existing farmland and has decreased acreage of viable growing land.

The Coastal Federation provided data on the rate of shoreline change along Lake Landing's estuarine shoreline, measured in feet per year. WSP used this data to identify erosion hot spot locations by creating buffers to approximate areas potentially vulnerable to erosion in 10, 20, and 30 years, assuming a steady continuation of the measured annual rate of erosion. These hotspot areas are shown in Figure 5.12.

Figure 5.12 – Erosion Hotspots



5.3 Non-Climate Stressors

Stressors are factors or conditions that contribute to or exacerbate the impacts of a hazard. Many stressors reflect existing challenges and social vulnerability in the community, and when coupled with severe weather or flooding, these challenges can make it difficult for the community and individuals to cope and adapt. This section outlines the identified non-climate stressors affecting Lake Landing and discusses how these stressors may be exacerbated by hazards or climate change and how they may change over time.

5.3.1 Saltwater Intrusion

Saltwater intrusion is the process by which saline water moves into freshwater systems. There are five main drivers of saltwater intrusion: sea level rise, water management practices, drought, hydrological connectivity, and storm surge and tides. These factors often interact simultaneously, contributing to salinization issues. Human activities like groundwater extraction and landscape changes also play a significant role in factors that influence saltwater intrusion.

Soil salinization is the process by which salts accumulate in the soil at levels that are detrimental to plant growth. Saltwater impacts on soil pose a significant threat to Lake Landing's agricultural lands, impacting soil health, crop productivity, and the livelihoods of farmers. In coastal North Carolina, the main causes of saltwater intrusion are storm surge events, wind-driven flooding through ditch and canal networks, sea level rise, and lateral saltwater movement through the subsoil. Drainage ditches run all throughout farmland and are important for draining floodwater from the fields. However, storm surge or even regular tide events can push saltwater directly into these ditches which ultimately infiltrate the soil.

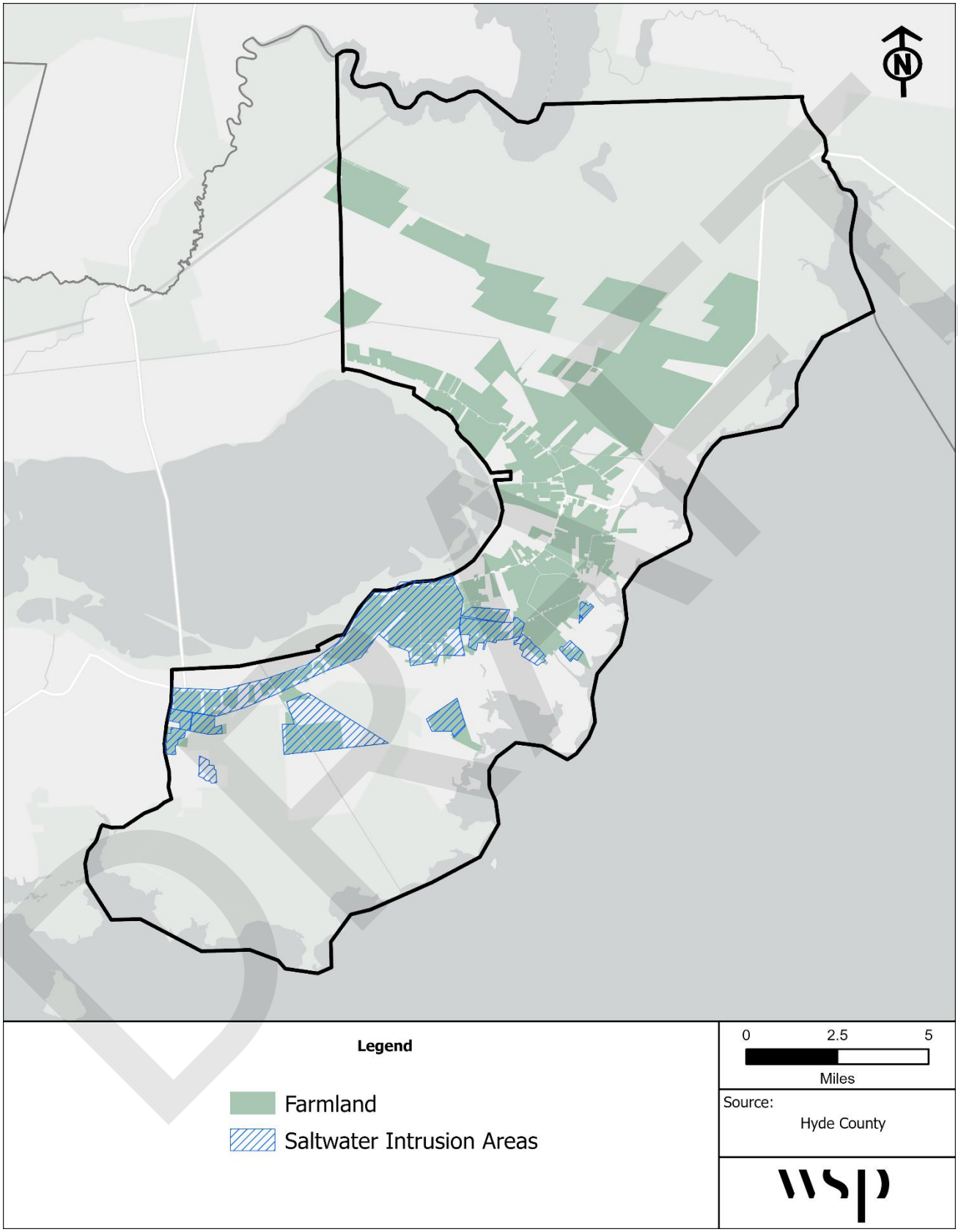
Saltwater intrusion and soil salinization is not a new phenomenon in Lake Landing and Hyde County; however, farmers are reporting an increase in impacted areas and worsening effects. While the township and county continue to produce high value crops, sea level rise and more frequent surge events pose an expanding threat. Members of the CAT reported that an increase in duck ponds has exacerbated saltwater intrusion through excessive groundwater pumping for impoundments. Groundwater pumping lowers the freshwater table allowing saltwater to migrate inland; this process can eventually contaminate wells, even leading duck pond owners to pump saltwater for impoundments.

NC State Cooperative Extension reports that coastal Hyde County is estimated to lose a total land area equivalent to $40 million worth of property due to soil salinization, posing a threat to the livelihoods of 4,200 individuals that rely on the agricultural industry.[2]

An NC Cooperative Extension agent and member of the CAT identified farmland impacted by saltwater intrusion in Lake Landing. These areas are identified in Figure 5.13, below.

[2] Davis, E., Wang, C., & Dow, K. (2019). Comparing Sentinel-2 MSI and Landsat 8 OLI in soil salinity detection: A case study of agricultural lands in coastal North Carolina. International Journal of Remote Sensing, 40(16), 6134–6153. https://doi.org/10.1080/01431161.2019.1587205

Figure 5.13 – Farmland Impacted by Saltwater Intrusion



5.3.2 Septic Infrastructure

In North Carolina, it is estimated that around 10-20 percent of septic systems experience a failure annually, which occurs when untreated wastewater seeps to the surface of the drain field, directly into groundwater, or backs up into the home.[3] Septic systems may fail for a variety of reasons, including inappropriate design, poor maintenance, and local hydrogeologic and climate factors.

Septic systems can only be used in soils that adequately absorb the effluent. The coastal geography of Lake Landing results in a high groundwater table and clay-based soils – both of which are factors that create limitations for septic systems by limiting absorption capacity. Systems installed in areas with high groundwater tables and in soils with high clay content may be more susceptible to failure from flooding. All soil types in Hyde County present some form of limitation to a septic system due to a combination of factors such as slow water movement, flooding, short depth to saturated zone, limited filtering capacity, seepage concerns, and subsidence.

The risks associated with failing septic systems are compounded by flooding because floodwater can spread contamination. High levels of fecal contamination have been measured in coastal North Carolina where septic systems have failed. Wastewater management systems routinely become overwhelmed during flood events, causing raw sewage to leak into the surrounding environment which causes environmental contamination and serious risks to human health.

Hyde County is currently working on a study to better understand septic vulnerability and find improved wastewater solutions. This work is supported by the EPA's Closing America's Wastewater Access Gap (CAWAG) imitative.

5.3.3 Limited Resource Availability

Lake Landing is a rural community with limited services and resources available to residents. CAT members reported limited access to grocery stores, gas stations, and banks, all of which are critical for everyday life and are particularly important in the context of disaster preparedness and recovery. Most Lake Landing residents have to travel nearly an hour for a full-service grocery store in neighboring Beaufort County or Tyrrell County.

Similarly, there is no hospital in Hyde County, which means residents must travel long distances for emergency care. With greater reliance on a single hospital, there is potential for it to be overburdened, especially in the aftermath of a hazard event. This strain, when combined with negative health impacts from climate change, could increase the potential for disruptions of health services in the future. Additionally, if transportation access is damaged or interrupted by a flood event, residents could be left without access to critical health services, food, or fuel.

Hyde County is the second least populated county in the state and has the second lowest population density in the state, and about 48 percent of the county's land is under state or federal ownership. All these factors contribute to a limited tax base for the County. The ability to cope with impacts such as

[3] Sprouse, L., Kryston, A., Lebu, S., Muoghalu, C., Woods, C., & Musa, Manga. (2024). Septic systems in North Carolina: A neglected half of the state?. PLOS Water. https://doi.org/10.1371/journal.pwat.0000304

flooding in rural areas is thus reduced by limited County resources. The limited tax base resulting from the Hyde County's rural nature and small population affects the County's ability to fund and support recovery and resilience projects. For this reason, it is crucial for the County to minimize post-disaster displacement and maintain the livelihoods that keep residents in the County, particularly in Lake Landing and across mainland Hyde County.

5.3.4 Housing Availability, Affordability, and Age

Housing Availability

Per U.S. Census Bureau statistics, as of 2023 there were an estimated 1,053 vacant housing units in Hyde County. Homeowner vacancy rate, the ratio of vacant available for-sale and sold housing units to the total number of vacant and owner-occupied housing units, was estimated at 0.0%, which may indicate very little excess inventory. The rental vacancy rate, the ratio of vacant available for-rent and rented unoccupied units to the total number of vacant available and rental-occupied housing units, was estimated at 18.9%, which suggests excess inventory and uncompetitive market. Rental vacancy is considered "healthy" if it is between 5-7%. However, despite Census data suggesting a surplus of available housing units, CAT members reported that there is a shortage of safe, affordable housing in Lake Landing and across the county and questioned whether housing units classified as vacant by the Census may actually be uninhabitable. The CAT shared an example of a housing development in Engelhard that closed in part due to septic failure, displacing about 13 families and leaving vacant uninhabitable units behind.

After a disaster, displaced families and individuals need safe, accessible, and affordable places to live. Available housing is essential to individual wellbeing and community recovery as it provides the foundation for people to continue living and working in their community. If housing stock is limited, people may have to relocate outside the County.[4] Disasters can also exacerbate a lack of affordable housing stock as damaged homes are often demolished or abandoned rather than rebuilt. CAT members discussed how the County's freeboard requirement provides a good measure of flood risk reduction for new or substantially improved buildings but comes at a significant cost that often makes it financially unfeasible to elevate homes in Hyde County. This barrier can lead to shrinking housing supply and a loss of residents to other counties.

Housing Affordability

Affordable housing not only provides alternative housing to those displaced by disasters but allows individuals to maintain housing within their financial means.

Housing affordability can be measured by the degree to which households are cost burdened, which is defined by HUD as households spending more than 30% of their annual income on housing costs. Severely cost burdened households spend more than 50% of their income. Independent from median income, cost burden serves as an indicator of a homeowner's ability to afford property maintenance and improvements. As a household spends an increasing proportion of its income on housing costs, there is

[4] Peacock, W. G., Van Zandt, S., Zhang, Y., & Highfield, W. E. (2014). Inequities in Long-Term Housing Recovery After Disasters. Journal of the American Planning Association, 80(4), 356–371. https://doi.org/10.1080/01944363.2014.980440

less income available for other necessities such as groceries, health care, and transportation, and less ability to recover and cope with disaster events. Table 5.1 summarizes cost burden statistics for renters and homeowners in Hyde County. Countywide nearly half of homeowners and almost two-thirds of renters are cost-burdened.

Table 5.1 – Cost Burdened Households in Hyde County, 2024

COST BURDEN	OWNER[1]		RENTER[2]	
30.0%-34.9%	14	2.3%	57	14.7%
35% or more	279	46.2%	185	47.8%
Total	**293**	**48.5%**	**242**	**62.5%**

Source: U.S. Census Bureau, 2020-2024 American Community Survey 5-Year Estimates
[1]Total number and percentage of cost burdened homeowners with mortgages
[2]Total number and percentage of cost burdened occupied units paying rent

Housing Age

Older homes may be less structurally sound from age and wear, making them susceptible to more damage from natural hazards. For example, seals at entry doors and windows may be insufficient to resist the wind-driven rain of tropical storms, and repeated flooding can wear on the soil and material around the base of a home, which can compromise the integrity of a structure's foundation.

Additionally, older homes did not have to adhere to newer building codes and regulations designed to mitigate the impacts of extreme weather. For example, Hyde County first entered the National Flood Insurance Program (NFIP) and adopted a flood damage prevention ordinance in 1987, which established building construction standards for flood risk reduction. Homes built prior to 1987 may be more vulnerable to flooding. Table 5.2 summarizes housing unit counts by year built according to Census data. Based on these housing age estimates, over 60 percent of housing units in Hyde County were built before any floodplain development restrictions were required.

Table 5.2 – Housing Units by Year Built

YEAR STRUCTURE BUILT	NUMBER OF HOUSING UNITS	PERCENT OF TOTAL HOUSING UNITS
2020 or later	22	0.7%
2010 to 2019	94	3.0%
2000 to 2009	615*	19.4%
1990 to 1999	409*	12.9%
1980 to 1989	389*	12.3%
1970 to 1979	365*	11.5%
1960 to 1969	425*	13.4%
1950 to 1959	146*	4.6%

YEAR STRUCTURE BUILT	NUMBER OF HOUSING UNITS	PERCENT OF TOTAL HOUSING UNITS
1940 to 1949	145*	4.6%
1939 or earlier	558*	17.6%
Total Housing Units	**3,168**	**-**

Source: U.S. Census Bureau, 2019-2023 American Community Survey 5-Year Estimates
*Note: the margin of error for these estimates exceeds 80% of the reported value

5.3.5 Aging Population

Per the Fifth National Climate Assessment, older adults, as well as their caregivers, are one of many vulnerable population groups that are disproportionately affected by extreme weather and climate risks. Older adults are particularly vulnerable to extreme events that cause increased temperatures, power outages, and/or require evacuation. Power outages may disrupt critical at home health equipment, as well as air conditioning and heat. Additionally, support services that are usually available, such as help from caregivers, in-home health care, and meal delivery services, may be unavailable during and after a hazard event. Older adults may also experience challenges that come with advanced age, such as hearing or vision problems or cognitive impairment, which may make it difficult to access, understand, and respond to emergency instructions.

It is also important to note that elderly people are more likely to live on fixed, very low incomes and/or require special supportive service to complete their daily routines. With limited resources, older residents especially need access to affordable housing options and easy access to basic services.

In Hyde County, 22.9 percent of the population is age 65 and older, of those, 19.6 percent have a disability. Over 35 percent of households in Hyde County have one or more people 65 years or older living there, and of the percentage of individuals whose income is below poverty level, 1.9 percent are 65 years and over. According to the 2023 American Community Survey 5-Year estimates, the rate of adults age 65 years and older living in poverty is 8.3% lower in Hyde County than the State of North Carolina. Table 5.3 and Table 5.4 display statistics for Hyde County residents age 65 years and older.

Table 5.3 – Hyde County Population 65 Years and Older

AGE GROUP	NUMBER OF PEOPLE	PERCENT OF TOTAL POPULATION
65 to 74 years old	710	15.4%
75 to 84 years old	336	7.3%
85 years and over	8	0.2%
Total	**1,054**	**22.9%**

Source: U.S. Census Bureau, 2019-2023 American Community Survey 5-Year Estimates

Table 5.4 – Statistics for Population 65 Years and Older, Hyde County, 2023

	NUMBER OF PEOPLE	PERCENT OF POPULATION 65 AND OLDER
Living with a Disability	192	19.6%
Living Below Poverty Level	(X)	1.9%
Living Alone (Male Householder) *	159	7.5%
Living Alone (Female Householder) *	268	12.7%

Source: U.S. Census Bureau, 2019-2023 American Community Survey 5-Year Estimates
*Individual living alone with no spouse/partner present

5.3.6 Economic Challenges

Low Income & Unemployment

According to the Census Bureau's 2023 ACS 5-year estimates, the median household income in Hyde County was $47,338, which is 32 percent lower than the state average. More than 22 percent of Hyde County residents have an income below poverty level. Additionally, 23.5 percent of the population receives food stamps or SNAP benefits and 11.5 percent of the population does not have health insurance. Per the NC Department of Commerce, as of February 2026 Hyde County had the highest unemployment rate in the state, at 10.8 percent.

Economically disadvantaged populations are disproportionately affected by disasters, as they are less likely to have the income or assets necessary to prepare for a possible disaster or to recover after a disaster. Housing quality and access are also closely tied to socio-economic status. Low-income households may live in less structurally sound houses or mobile homes, which are particularly vulnerable to strong storms. When displaced from their homes, low-income people are disproportionately impacted through lost wages or inability to locate secure alternative housing. For households with limited income, lost or damaged property is proportionately more expensive to replace, especially without homeowner's or renter's insurance. Often renters are not insured sufficiently to recover from property loss.

Agriculture, Fishing, and Tourism Economy

Hyde County's economy is heavily based in agriculture, fishing, and tourism, which are highly vulnerable to climate change and natural hazards. Flooding, sea level rise, marsh migration, saltwater intrusion, and other hazards and stressors can directly damage these industries by damaging crops; reducing yields; affecting species' habitat ranges, health, and size; and disrupting ecosystems. CAT members discussed the interrelated nature of these industries and the businesses and services that support them. Economic losses in the agriculture, fishing, and tourism industries can have cascading impacts on supporting industries, resulting in countywide economic strain.

5.3.7 Public Health Issues

The U.S. Global Change Research Program's Climate and Health Assessment, explains that climate change has and will continue to exacerbate existing climate-sensitive health threats and create new

challenges, exposing more people to hazardous weather and climate conditions. For example, climate change affects human health by altering exposures to heat waves, floods, droughts, and other extreme events. Such events can increase vector, food, and waterborne infectious diseases, as well as influence changes in the quality and safety of air, food, and water. These increased impacts can exacerbate underlying medical conditions, increase stress, and lead to adverse mental health effects.

Vector-Borne Diseases

Climate is one of the factors that influence the distribution of diseases borne by vectors (such as fleas, ticks, and mosquitoes, which spread pathogens that cause illness). The CDC reports that the Southeast is the region of the country with the most favorable conditions for the Aedes aegypti mosquito and thus faces the greatest threat from diseases the mosquito carries. It is expected that summer months will produce an increase in dengue cases across every southeastern state and potentially increase mosquitos' capacity to transmit Zika virus. CAT members reported that mosquitoes already pose a significant issue and are difficult to manage when surface water cannot drain; increasing wet periods and drainage issues will only exacerbate this problem.

Food Access and Security

As discussed above, CAT members reported limited access to grocery stores, with Lake Landing residents needing to travel nearly an hour for a full-service grocery store in neighboring Beaufort County or Tyrrell County. Residents previously had access to a local grocery store in Engelhard, but the store closed due to high operations and maintenance costs. Other options within the county include a small grocer about 30 minutes' drive from Engelhard or a local convenience store where CAT members expressed concern about food quality.

Not only does this limited access mean that Lake Landing residents face greater time and financial burdens to get groceries, but limited access to grocery stores or other sources of healthy and affordable food also make it harder for some people to eat a healthy diet. Factors such as travel time and cost play a huge role in food access and food security. Disaster events can worsen access to food by limiting transportation options and financially overwhelming those with lower incomes.

Healthcare Access and Mental Health

Local data on public health in Hyde County is compiled by the Hyde County Health Department and most recently reported in the 2024 Hyde County Community Health Needs Assessment. The leading causes of death in Hyde County are cancer, heart disease, and Alzheimer's disease. The 2024 Health Needs Assessment identified the most important health problems to the County through a public survey which included Alcohol/drug addiction, diabetes, heart disease, and mental health (depression and anxiety). Access to primary care is essential to improving the health priorities and outcomes of communities, but the county does not meet the North Carolina Institute of Medicine (NCIOM)'s target ratio of 1 primary care provider to every 1,500 people. Hyde County currently has no local access to dental providers and the primary care provider rate of 65.4 per 100,000 population is substantially below state and national averages.

People with mental health disorders may react more strongly to natural disaster emergencies. Stress and anxiety levels may increase during preparation for extreme events and/or evacuation from homes, and people can experience a range of mental health consequences after hazard events, including increased stress and clinical disorders like anxiety, depression, and post-traumatic stress. Impacts from disasters can persist for several years. Disasters can be particularly burdensome on the mental health of children when there is forced displacement from their home or a loss of family and community stability. Also, increased use of alcohol and tobacco are common following disaster events.

6. Vulnerability Assessment

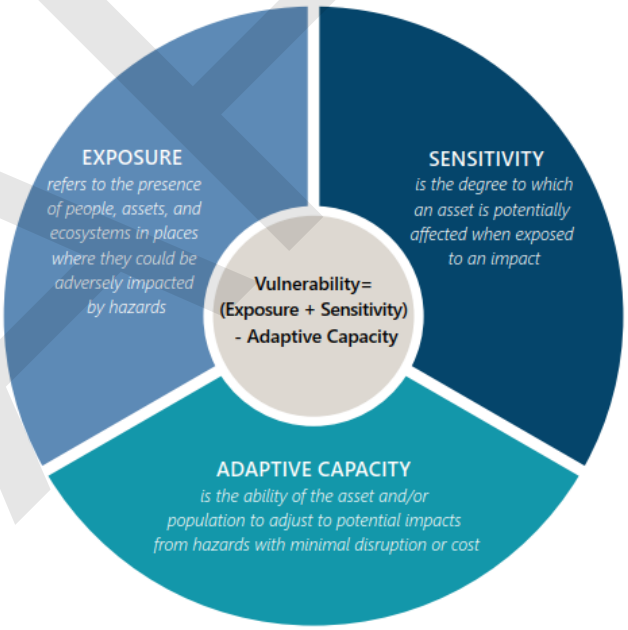
6.1 Overview

The vulnerability assessment followed the criteria outlined by the NC RCCP Handbook, which defines vulnerability as a function of exposure, sensitivity, and adaptive capacity. Exposure is the presence of an asset in a hazardous area. An asset may have varying degrees of exposure for one or multiple hazards. Sensitivity is the degree to which an asset is affected by a hazard. Sensitivity involves the significance of an asset to the community and how severely hazards impact the functionality of that asset. Adaptive capacity is the ability of an asset to adjust to potential impacts through relocation, retrofits, or temporary alternatives.

With CAT input, specific thresholds and criteria were established to define varying degrees of exposure, sensitivity, and adaptive capacity. Through this assessment, each asset was evaluated and rated on a scale of 0-3 on its exposure, sensitivity, and adaptive capacity. The overall vulnerability of each asset was then calculated with the following equation:

Vulnerability = (Exposure + Sensitivity) – Adaptive Capacity

This equation produced overall vulnerability scores of 0-6, where scores less than or equal to 2 are considered low vulnerability, greater than 2 and less than or equal to 4 are considered medium vulnerability, and scores greater than 4 are considered high vulnerability.



The vulnerability equation from the NC Resilient Coastal Communities Planning Handbook, 2025

6.2 Exposure Analysis

6.2.1 Methodology

To evaluate exposure, a spatial analysis was conducted overlaying the location of identified assets with the extent of known hazards. Each asset was assigned an exposure score of 0-3 for each hazard based on its location relative to the hazard extent, where 0 indicates no exposure, 1 is low, 2 is medium, and 3 is high. Table 6.1 below provides the criteria used to assign exposure scores for each hazard.

Note that exposure of roads to flood was limited to the riverine & coastal flooding hazard and was assessed separate from other critical assets using NCDOT Resilience Analysis Framework for

Transportation (RAFT) data. RAFT provides point data with roadway elevation every 50 feet along each evaluated road segment; it illustrates exposure to riverine flooding using water surface elevations from hydraulic models for various recurrence intervals and it estimates exposure to coastal flooding by simulating inundation above ground level at 1-foot intervals. The table below outlines which flood scenarios were used to assign exposure rankings for road segments.

Table 6.1 – Exposure Analysis Ranking Criteria

HAZARD	**EXPOSURE**			
	0 - NONE	***1 - LOW***	***2 - MEDIUM***	***3 - HIGH***
Sea Level Rise	No Exposure	Asset in 4ft extent	Asset in 3ft extent	Asset in 2ft extent
Riverine & Coastal Flooding	No Exposure	Asset in Unshaded X Zone *Roads:* Riverine: 500-yr flood Coastal: 4ft SLR	Asset in Shaded X Zone *Roads:* Riverine: 100-yr flood Coastal: 3ft SLR	Asset in AE Zones *Roads:* Riverine: 50-yr flood Coastal: 2ft SLR
Tidal Flooding	No Exposure	Asset in MHHW+1.5ft extent	Asset in MHHW+1ft extent	Asset in MHHW+0.5ft extent
Storm Surge	No Exposure	Asset in Cat 2 surge extent with less than or equal to 3ft flood depth	Asset in Cat 2 surge extent with more than 3ft flood depth	Asset in Cat 2 surge extent with more than 6ft flood depth
Erosion	No Exposure	Asset within 30-yr buffer of erosion hotspot	Asset within 20-yr buffer of erosion hotspot	Asset within 10-yr buffer of erosion hotspot

Note: Road exposure to riverine & coastal flooding was estimated using Resilience Analysis Framework for Transportation (RAFT) data; this methodology differs from the other assets which used the Effective FIRM to analyze riverine & coastal flooding exposure

After exposure was evaluated for each hazard, each asset's hazard exposure scores were averaged to arrive at an overall exposure score for each asset. Overall exposure scores were categorized as follows:

0 = No Exposure	**< 1 = LOW**	**1-2 = MEDIUM**	**>2 = HIGH**

6.2.2 Results

The results of the exposure analysis are presented by asset category in tables and maps on the following pages.

Buildings and infrastructure exposure are summarized in Table 6.2 and shown in Figure 6.1. Based on this assessment, 41 building and infrastructure assets have high exposure ratings. Around 61 percent are water infrastructure assets. Only nine assets in this category have low exposure and the remaining 42 have medium exposure. Only four assets are exposed to erosion. However, all assets are exposed to riverine and coastal flooding and storm surge. Around 95 percent of these assets are exposed to sea level rise and around 83 percent are exposed to tidal flooding.

Historic and cultural asset exposure is summarized in Table 6.3 and shown in Figure 6.2. Five of the 11 cultural and historic assets have low exposure. These assets are primarily exposed to riverine and coastal flooding and storm surge. Only three assets have high exposure: Lake Landing Historic District, Faithful Hannah Church Cemetery, and Mattamuskeet Lodge. The remaining three assets have medium exposure.

Natural resource exposure is summarized in Table 6.4 and shown in Figure 6.3. Around 62 percent of these assets have high exposure and 31 percent have medium exposure. Only eight percent have low exposure. Low exposure assets are not exposed to tidal flooding or erosion, and very few are exposed to sea level rise.

Road exposure to coastal and riverine flooding is summarized in Table 6.5 shown in Figure 6.4 and Figure 6.5. Only seven of the 45 evaluated roads have no exposure to riverine or coastal flooding.

Table 6.2 – Buildings and Infrastructure Exposure

ASSET	HAZARD EXPOSURE SCORES					AVERAGE EXPOSURE SCORE	OVERALL EXPOSURE RATING
	SEA LEVEL RISE	RIVERINE & COASTAL FLOOD	TIDAL FLOODING	STORM SURGE	EROSION		
Businesses & Business District							
Dollar General Store	3	3	0	2	0	1.6	Medium
Engelhard Hotel	3	3	2	3	0	2.2	High
NAPA Auto-parts Store	1	3	0	2	0	1.2	Medium
H&L Restaurant	0	1	0	1	0	0.4	Low
Gibbs Hardware Store	3	3	1	2	0	1.8	Medium
R.S. Spencer Hardware Store	3	3	0	2	0	1.6	Medium
Sugar and Spice Restaurant	3	3	3	3	0	2.4	High
The Feed House	0	1	0	1	0	0.4	Low
Mattamuskeet Seafood	1	2	0	1	0	0.8	Low
Williams Seafood	2	3	0	2	0	1.4	Medium
Engelhard Marine Industrial Park	3	3	3	2	2	2.6	High
Engelhard Seafood	3	3	2	2	1	2.2	High
Business District	3	3	3	3	0	2.4	High
Communication Assets							
Telephone/Internet Hub	3	3	1	2	0	1.8	Medium
Radio Tower	3	3	1	2	0	1.8	Medium
Cell Tower	3	3	2	3	0	2.2	High
Radio Tower	3	3	1	2	0	1.8	Medium
Drainage Districts							
Mattamuskeet Drainage Association Area	3	3	3	3	0	2.4	High
Slocum Drainage District	3	3	3	3	0	2.4	High
Government Services							
US Post Office	3	3	0	2	0	1.6	Medium
Hyde County Convenience Site	3	3	3	3	0	2.4	High

ASSET	HAZARD EXPOSURE SCORES					AVERAGE EXPOSURE SCORE	OVERALL EXPOSURE RATING
	SEA LEVEL RISE	RIVERINE & COASTAL FLOOD	TIDAL FLOODING	STORM SURGE	EROSION		
Sanitary District Treatment	3	3	3	3	0	2.4	High
Sanitary District	3	3	3	3	0	2.4	High
Health Services							
Hyde County Department of Social Services	3	3	1	2	0	1.8	Medium
Mattamuskeet Village	0	1	0	1	0	0.4	Low
Engelhard Medical Center	0	1	0	1	0	0.4	Low
Infrastructure Assets							
Water Tower	3	3	2	3	0	2.2	High
Hyde County Water System	0	1	0	1	0	0.4	Low
Hyde County Water System	0	1	0	1	0	0.4	Low
Mattamuskeet Drainage Association Pump	3	3	3	3	0	2.4	High
Mattamuskeet Drainage Association Pump	3	3	3	2	0	2.2	High
Mattamuskeet Drainage Association Pump	2	2	0	2	0	1.2	Medium
Mattamuskeet Drainage Association Pump	3	3	3	2	0	2.2	High
Mattamuskeet Drainage Association Pump	3	3	3	3	0	2.4	High
Water pump - Middle Creek Farms	3	3	3	2	0	2.2	High
Drains - Middle Creek Farms	3	3	2	2	0	2	Medium
Drainage pump, tide gate and pump - Middle Creek Farms	3	3	2	2	0	2	Medium
Drainage Pump - Middle Creek Farms	3	3	3	3	0	2.4	High
Pump and drain - Alligator River Farms	3	3	1	2	0	1.8	Medium
Tide Gate - Alligator River Farms	3	3	3	2	0	2.2	High
Tide Gate - Engelhard Fire Dept	3	3	2	3	0	2.2	High
Tide Gate	3	3	3	2	0	2.2	High
Tide Gate	3	3	2	2	0	2	Medium
Tide Gate	3	3	2	2	0	2	Medium
Tide Gate	3	3	2	3	0	2.2	High
Tide Gate	3	3	2	3	0	2.2	High

ASSET	HAZARD EXPOSURE SCORES					AVERAGE EXPOSURE SCORE	OVERALL EXPOSURE RATING
	SEA LEVEL RISE	RIVERINE & COASTAL FLOOD	TIDAL FLOODING	STORM SURGE	EROSION		
Tide Gate - Middle Creek Farms	3	3	3	3	0	2.4	High
Tide Gate - Middle Creek Farms	3	3	3	2	0	2.2	High
Tide Gate - Middle Creek Farms	3	3	3	2	0	2.2	High
Pump	3	3	3	3	0	2.4	High
Pump - Slocum drainage	3	3	3	3	0	2.4	High
Pump - Middle Creek Farms	3	3	3	2	0	2.2	High
Pump and gate - Carawan Farms	3	3	0	2	0	1.6	Medium
Tide Gate - Farrow Farm	3	3	0	2	0	1.6	Medium
Tide Gate - Farrow Farm	3	3	1	2	0	1.8	Medium
Tide Gate -Farrow Farm	3	3	1	2	0	1.8	Medium
Tide Gate - Middle Creek Farms	3	3	0	2	0	1.6	Medium
Tide Gate - Davis Farm	3	3	0	2	0	1.6	Medium
Tide Gate - Cradle Farm	3	3	0	2	0	1.6	Medium
Tide Gate - Pugh Farm	3	3	0	2	0	1.6	Medium
Tide Gate - Watson Farm	3	3	1	2	0	1.8	Medium
Tide Gate - Dudley Farm	3	3	1	2	0	1.8	Medium
Tide Gate - Boyd Farm	3	3	1	2	0	1.8	Medium
Tide Gate - Sadler Farm	3	3	0	2	0	1.6	Medium
Tide Gate - Farrow Farm	3	3	3	3	0	2.4	High
Tide Gate - Gibbs Farm	3	3	3	2	0	2.2	High
Tide Gate - Gibbs Farm	3	3	1	2	0	1.8	Medium
Tide Gate - Middle Creek Farms	3	3	2	2	0	2	Medium
Tide Gate - Daughtry Farm	3	3	1	3	0	2	Medium
Drainage Pump - Carawan Farms	3	3	3	2	0	2.2	High
Drainage Pump - Jeannette Farms	3	3	3	1	0	2	Medium
Pump - Potter Farm	3	3	3	1	0	2	Medium
Drainage pump and gate - Potter Farm	3	3	1	2	0	1.8	Medium
Tide Gate - Davis Farm	3	3	1	2	0	1.8	Medium

ASSET	HAZARD EXPOSURE SCORES					AVERAGE EXPOSURE SCORE	OVERALL EXPOSURE RATING
	SEA LEVEL RISE	RIVERINE & COASTAL FLOOD	TIDAL FLOODING	STORM SURGE	EROSION		
Drainage Pump - Outfall Farm	3	3	3	2	0	2.2	High
Drainage Pump - Outfall Farm	3	3	3	1	0	2	Medium
Drain Pump - Stokesberry Farm	2	3	1	1	0	1.4	Medium
Drain Pump - Hydeland Farm	3	3	3	2	0	2.2	High
Pump and Tide Gate - Wysocking Farm	3	3	3	2	0	2.2	High
Drain Pump - Gull Rock Farm	3	3	3	2	0	2.2	High
Public Safety Assets							
Engelhard Volunteer Fire Department, Inc.	3	3	1	2	0	1.8	Medium
Swan Quarter Volunteer Fire Department, Inc.	3	3	1	2	0	1.8	Medium
School							
Beaufort County Community College / BHM Regional Library	1	2	0	1	0	0.8	Low
Transportation Assets							
ETHCO Service Station	3	3	2	2	0	2	Medium
Gibbs Convenience Store	3	3	3	3	0	2.4	High
Far Creek Gas Station	3	3	0	2	0	1.6	Medium
Hyde County Airport	3	3	3	3	0	2.4	High
Hyde Transit	0	2	0	1	0	0.6	Low
Engelhard Far Creek Harbor	3	3	3	2	3	2.8	High
Engelhard Boat Launch	3	3	3	3	0	2.4	High
Boat Ramp	3	3	3	3	3	3	High
Utilities							
Tideland EMC	3	3	0	2	0	1.6	Medium

Figure 6.1– Buildings and Infrastructure Exposure

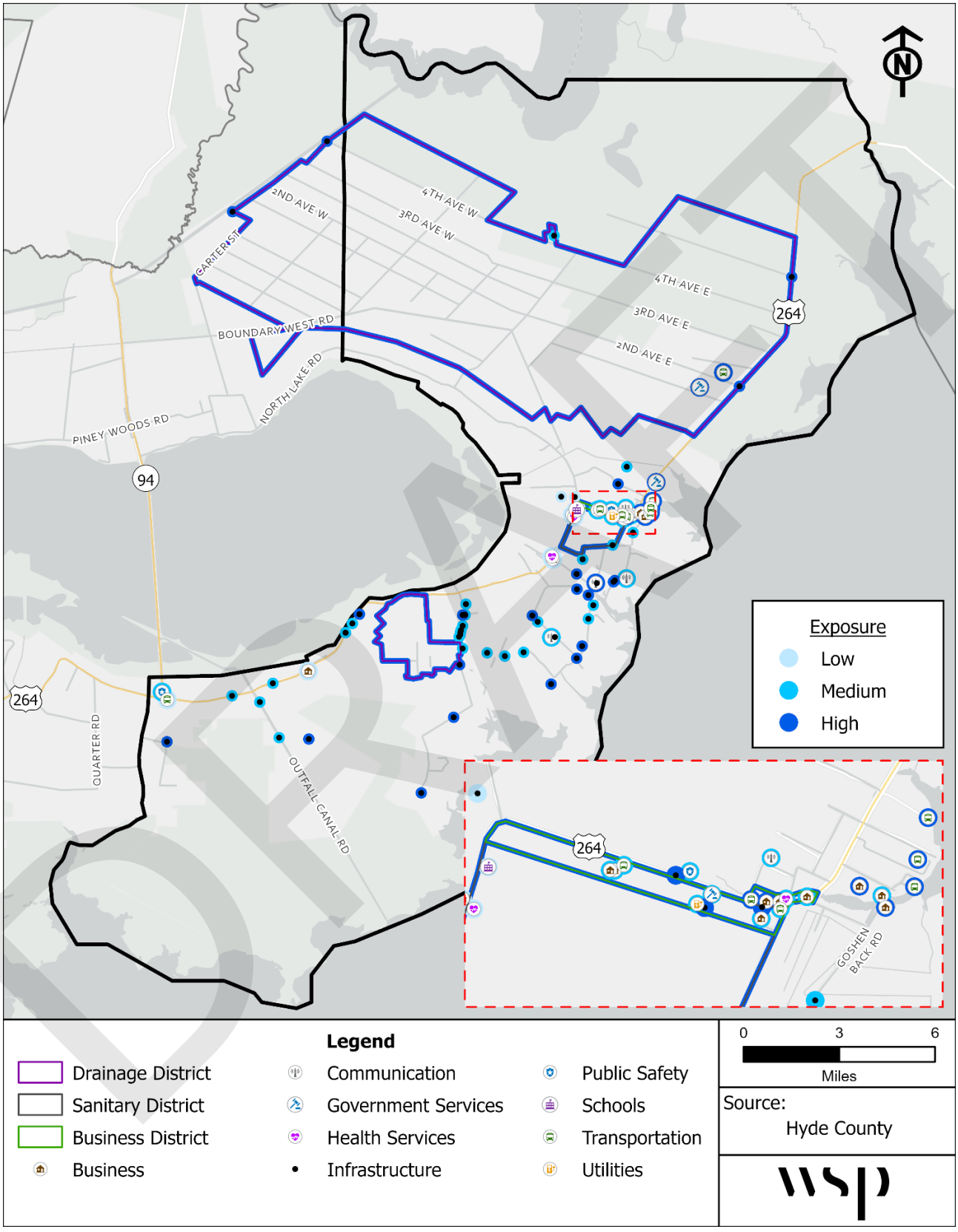


Table 6.3 – Historic and Cultural Resources Exposure

ASSET	HAZARD EXPOSURE SCORES: SEA LEVEL RISE	RIVERINE & COASTAL FLOOD	STORMWATER	STORM SURGE	EROSION	AVERAGE EXPOSURE SCORE	OVERALL EXPOSURE RATING
Cemeteries							
Ada and Addison Brown Cemetery	3	3	1	2	0	1.8	Medium
Faithful Hannah Church Cemetery	3	3	2	3	0	2.2	High
Fullford Cemetery	0	1	0	1	0	0.4	Low
Soule Cemetery	2	3	0	1	0	1.2	Medium
Amity Church Cemetery	0	1	0	1	0	0.4	Low
Historic Districts							
Davis High School Historic District	3	3	1	2	0	1.8	Medium
Lake Landing Historic District	3	3	3	3	3	3	High
Historic Properties							
Wynne's Folly	0	1	0	1	0	0.4	Low
Davis High School	1	2	0	2	0	1	Low
The Inkwell/Octogon House	0	1	0	1	0	0.4	Low
Mattamuskeet Lodge	3	3	3	2	0	2.2	High

*Historical districts – polygon feature, not point

Figure 6.2 – Historic and Cultural Resources Exposure

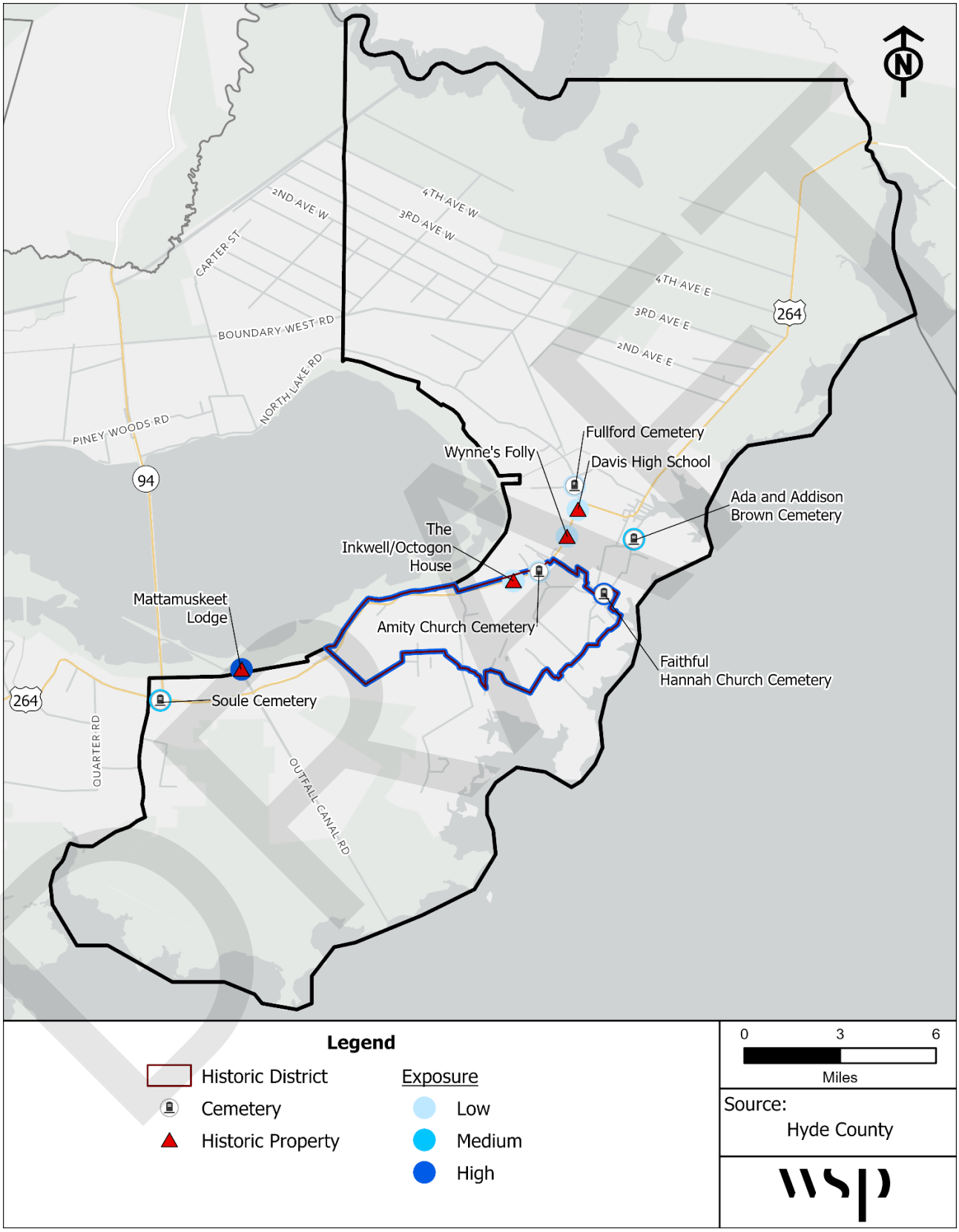


Table 6.4 – Natural Resources Exposure

ASSET	HAZARD EXPOSURE SCORES					AVERAGE EXPOSURE SCORE	OVERALL EXPOSURE RATING
	SEA LEVEL RISE	RIVERINE & COASTAL FLOOD	STORMWATER	STORM SURGE	EROSION		
Alligator River National Wildlife Refuge	3	3	3	3	0	2.4	High
Dare County Air Force Range	3	3	3	3	0	2.4	High
Emily and Richardson Pryer Buckridge Coastal Reserve	3	3	3	2	0	2.2	High
Gull Rock Game Land	3	3	3	3	3	3	High
Swanquarter National Wildlife Refuge	3	3	3	3	3	3	High
Mattamuskeet National Wildlife Refuge	3	3	3	3	0	2.4	High
Hyde County Open Space	3	3	3	3	0	2.4	High
Hyde County Open Space	3	3	3	3	0	2.4	High
NC Department of Transportation Mitigation Site	3	3	3	3	2	2.8	High
NC Department of Transportation Mitigation Site	3	3	0	2	0	1.6	Medium
NC Wildlife Resources Commission Engelhard Access Area	3	3	3	3	3	3	High
NC Hazard Mitigation Buyout Property - Hyde County	3	3	2	3	0	2.2	High
NC Hazard Mitigation Buyout Property - Hyde County	3	3	3	3	0	2.4	High
NC Hazard Mitigation Buyout Property - Hyde County	3	3	2	3	0	2.2	High
NCDEQ Wellhead Protection Area	3	3	2	3	0	2.2	High
Wetland Reserve Program Easement	3	3	3	3	0	2.4	High
Wetland Reserve Program Easement	3	3	3	2	0	2.2	High
Wetland Reserve Program Easement	3	3	3	3	0	2.4	High
Wetland Reserve Program Easement	3	3	3	2	0	2.2	High
Wetland Reserve Program Easement	3	3	3	3	0	2.4	High

ASSET	HAZARD EXPOSURE SCORES					AVERAGE EXPOSURE SCORE	OVERALL EXPOSURE RATING
	SEA LEVEL RISE	RIVERINE & COASTAL FLOOD	STORMWATER	STORM SURGE	EROSION		
Wetland Reserve Program Easement	3	3	3	2	0	2.2	High
Wetland Reserve Program Easement	3	3	3	3	0	2.4	High
Wetland Reserve Program Easement	3	3	3	3	0	2.4	High
Wetland Reserve Program Easement	3	3	3	3	0	2.4	High
Wetland Reserve Program Easement	3	3	3	3	0	2.4	High
Wetland Reserve Program Easement	3	3	3	3	0	2.4	High
Wetland Reserve Program Easement	3	3	3	3	0	2.4	High
Wetland Reserve Program Easement	3	3	3	3	0	2.4	High
Wetland Reserve Program Easement	3	3	3	3	0	2.4	High
Wetland Reserve Program Easement	3	3	3	3	0	2.4	High
Wetland Reserve Program Easement	3	3	3	3	0	2.4	High

Note: See mapping for exposure ratings of farmland and conservation reserve enhancement program easements

Figure 6.3 – Natural Resource Exposure

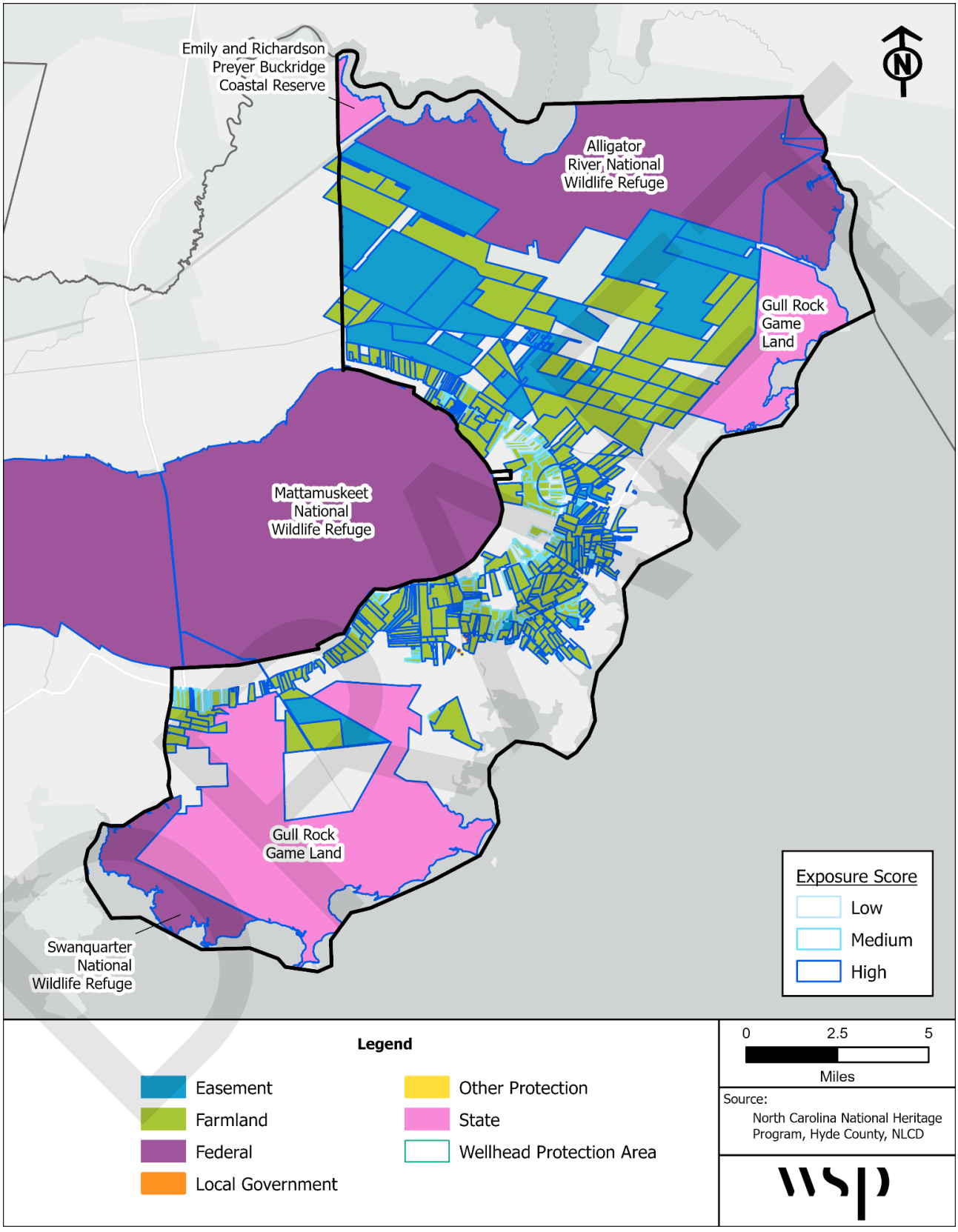


Table 6.5 – Road Exposure

ASSET	EXPOSURE SCORES (% OF ROAD SEGMENT)							
	RIVERINE EXPOSURE				COASTAL EXPOSURE			
	LOW	MEDIUM	HIGH	NO EXPOSURE	LOW	MEDIUM	HIGH	NO EXPOSURE
Airport Rd	92%	6%	0%	2%	8%	0%	0%	92%
Arch Rd	32%	2%	59%	7%	2%	59%	0%	39%
Cahoon Rd	0%	0%	95%	5%	0%	0%	100%	0%
Chat & Thomas Rd	0%	0%	23%	77%	0%	10%	10%	80%
Collins Ln	0%	0%	98%	2%	0%	15%	85%	0%
Cooper Ln	0%	0%	100%	0%	0%	40%	58%	2%
Faithful Hannah Church Rd	0%	0%	100%	0%	0%	0%	100%	0%
Farrow Fork Rd	12%	37%	35%	16%	24%	45%	2%	29%
Golden St	3%	6%	90%	1%	3%	10%	77%	10%
Goshen Back Rd	0%	15%	84%	1%	5%	53%	42%	0%
Goshen Rd	0%	5%	95%	0%	0%	86%	14%	0%
Great Ditch Rd	34%	21%	45%	0%	20%	51%	1%	28%
Green Hill Road	0%	0%	0%	100%	0%	0%	0%	100%
Gull Rock Rd	33%	9%	32%	26%	13%	22%	13%	52%
Gum Swamp Rd	0%	59%	38%	3%	26%	65%	9%	0%
Hill St	0%	15%	81%	4%	4%	52%	44%	0%
Horse Shoe Loop Rd	0%	0%	100%	0%	0%	11%	84%	5%
Hycienda Heights	0%	0%	0%	100%	0%	0%	0%	100%
Hydeland Rd	0%	1%	98%	1%	1%	14%	84%	1%
Juniper Bay Rd	8%	54%	38%	0%	38%	62%	0%	0%
Lake Swamp Rd	0%	0%	0%	100%	0%	0%	0%	100%
Lakeview Rd	0%	0%	0%	100%	0%	0%	0%	100%
Lazy Ln	0%	3%	96%	1%	1%	76%	22%	1%
Main St	89%	0%	0%	11%	50%	0%	0%	50%
Maple Rd	41%	57%	0%	2%	89%	0%	0%	11%
Marsh Rd	0%	0%	100%	0%	0%	13%	88%	-1%
Mt Pleasant Village Rd	3%	9%	85%	3%	6%	51%	36%	7%

ASSET	EXPOSURE SCORES (% OF ROAD SEGMENT)							
	RIVERINE EXPOSURE				COASTAL EXPOSURE			
	LOW	MEDIUM	HIGH	NO EXPOSURE	LOW	MEDIUM	HIGH	NO EXPOSURE
Mt Sinai Rd	0%	0%	100%	0%	0%	4%	96%	0%
Mulberry Rd	3%	3%	83%	11%	3%	87%	0%	10%
Nebraska Rd	0%	18%	81%	1%	9%	62%	29%	0%
New Holland Rd	0%	0%	0%	100%	0%	0%	0%	100%
North Lake Rd	30%	10%	12%	48%	24%	18%	0%	58%
Pleasant Grove Rd	0%	0%	0%	100%	0%	0%	0%	100%
Radar Rd	0%	3%	96%	1%	1%	64%	35%	0%
Roper Ln	0%	0%	100%	0%	0%	3%	97%	0%
Scrouge Town Rd	0%	0%	0%	100%	0%	0%	0%	100%
Shaw Rd	0%	0%	100%	0%	0%	0%	100%	0%
Silver Ln	0%	0%	91%	9%	0%	0%	91%	9%
Slocum Ln	0%	0%	96%	4%	0%	38%	62%	0%
St Lydia Rd	0%	0%	98%	2%	0%	0%	98%	2%
Swamp Rd	35%	38%	26%	1%	43%	41%	0%	16%
The High Rd	12%	41%	47%	0%	31%	50%	4%	15%
US 264 Hwy E	35%	24%	8%	33%	34%	12%	0%	54%
Whipping Creek Rd	40%	27%	0%	33%	49%	0%	0%	51%
White Plains Rd	0%	5%	94%	1%	1%	34%	64%	1%

Figure 6.4 – Road Exposure: Riverine Flooding

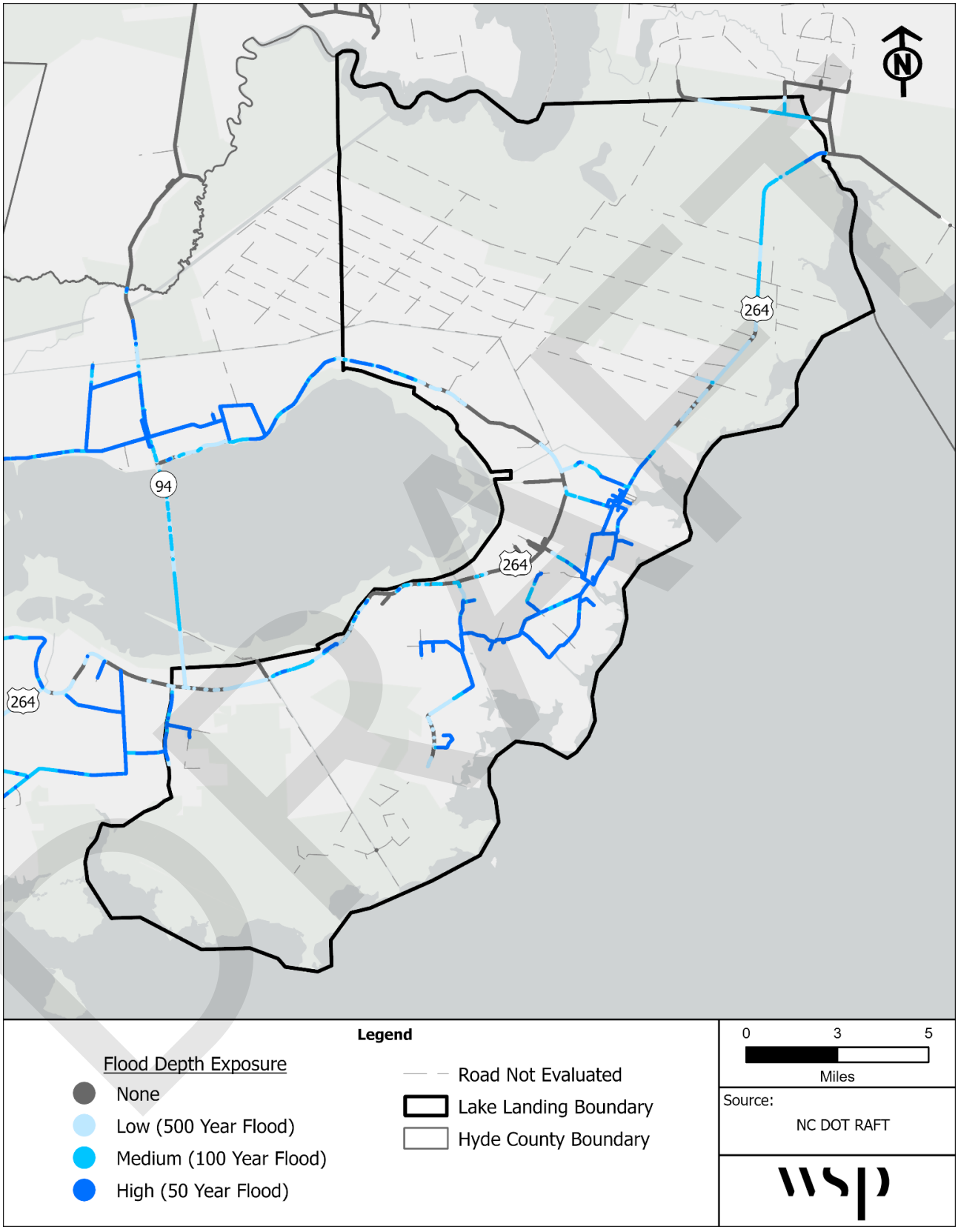
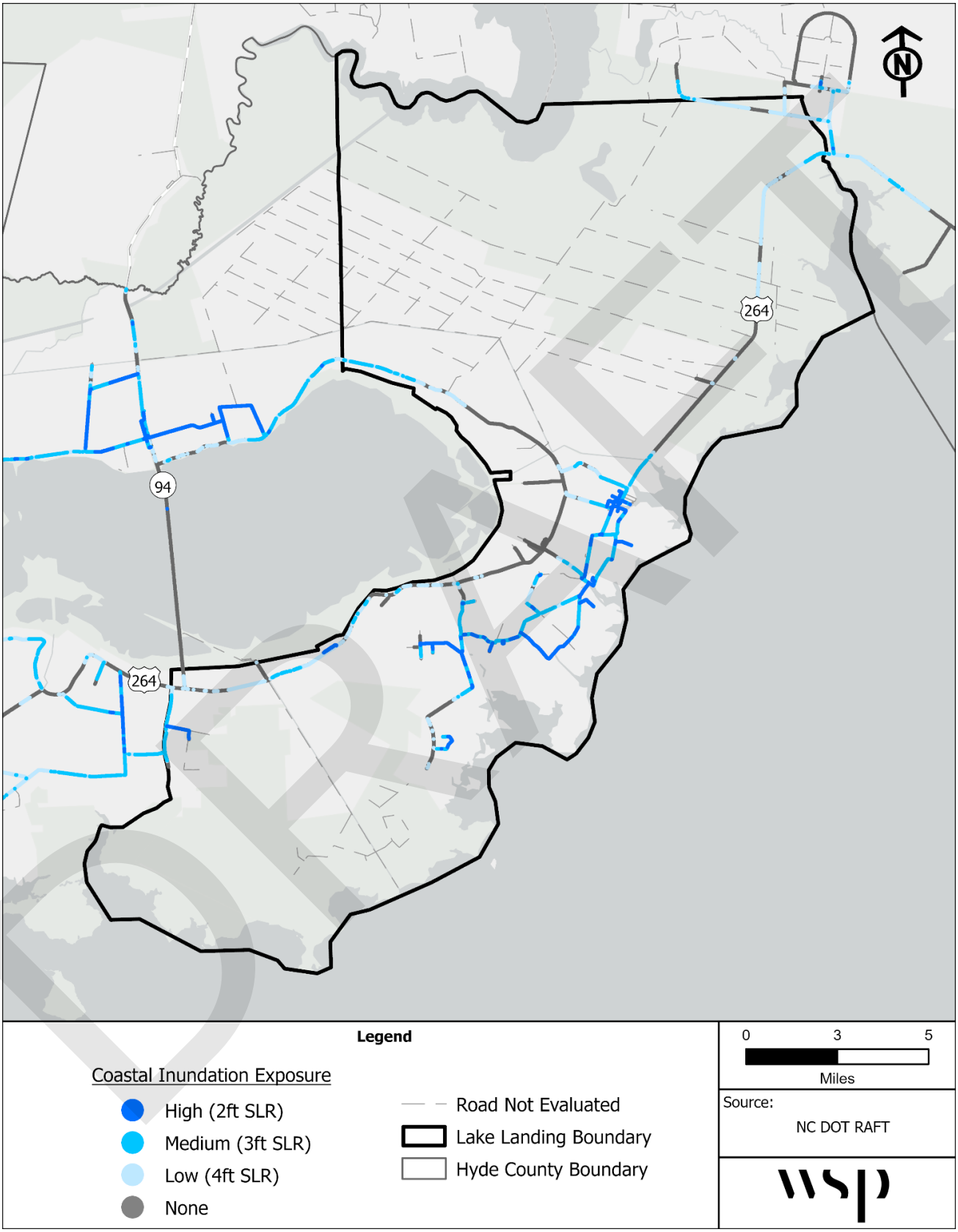


Figure 6.5 – Road Exposure: Coastal Flooding



6.3 Sensitivity Analysis

6.3.1 Methodology

An asset's sensitivity to hazards is influenced by the degree to which it's impacted by hazards and the need for that asset within the community. To capture these variables and account for the differences in sensitivity that may be applicable to different asset types, scoring criteria were developed for each asset category. Each asset was assigned a point for each applicable criterion within its category. The point total for each asset was used to assign an overall sensitivity score of 0-3, where 0 indicates no sensitivity, 1 is low, 2 is medium, and 3 is high. Sensitivity criteria for each of these categories are as follows:

Building & Infrastructure Assets

- The average exposure score for the asset category is 2 or greater
- The asset has high exposure to multiple hazards
- The asset is considered essential to community operations

Historic & Cultural Assets

- The asset has inherent community & cultural value (applies to all historic & cultural assets)
- The asset has high exposure for multiple hazards
- The asset was constructed in 1900 or earlier

Natural Resources

- The asset is actively farmed
- The asset intersects saltwater intrusion areas
- Over 50% of the asset is exposed to tidal flooding (MHHW+1.5ft or less)

Roads

Road sensitivity to flood was estimated using RAFT data. Sensitivity scores were assigned based on the depth of flooding at each road point for selected flood scenarios. Sensitivity levels based on depth are detailed below for riverine and coastal flooding.

Riverine Flooding: Depth of 100-year flood event

- Low: 0.1 – 0.5ft (1 point)
- Medium: 0.51 – 2ft (2 points)
- High: 2.1 – 5ft (3 points)

Coastal Flooding: Depth of 3ft Sea Level Rise

- Low: 0.1 – 0.5ft (1 point)
- Medium: 0.51 – 2ft (2 points)
- High: 2.1 – 5ft (3 points)

Note that roads are the only asset category for which sensitivity scores were calculated by hazard scenario.

After sensitivity was evaluated for each asset, the point total was summed to arrive at an overall sensitivity score for each asset. Overall sensitivity scores were categorized as follows:

0 = No Sensitivity	< 1 = LOW	2 = MEDIUM	3 = HIGH

6.3.2 Results

Only seven buildings and infrastructure assets have high sensitivity, including both drainage districts, three government buildings, and two transportation services. Around 70 percent of the building and infrastructure assets have medium sensitivity, and 16 percent have low sensitivity. The remaining seven percent have no sensitivity.

Two historic and cultural assets have high sensitivity – Lake Landing Historic District and Faithful Hannah Church Cemetery. Seven assets, or 63 percent, have medium sensitivity, and the remaining two assets have low sensitivity.

Around 19 percent of natural resources assets have high sensitivity, all of which are farmland. About 39 percent of natural resources assets have medium sensitivity and 37 percent have low sensitivity. The remaining 4 percent have no sensitivity which includes easement land, refuge and reserve land, game land, and more.

Around 48 percent of all the assessed miles of road have no sensitivity or are outside of the 1% annual chance floodplain. Around 7 percent have low sensitivity, 30 percent have medium sensitivity and 15 percent have high sensitivity. For coastal sensitivity, 61 percent of the assessed road miles are not impacted by the 3ft sea level rise inundation extent and have no sensitivity. Around 27 percent of roads have medium sensitivity, 12 percent have low sensitivity, and only 1 percent have high sensitivity.

Detailed results are provided in Table 6.6 through Table 6.9 and shown in Figure 6.6 through Figure 6.10.

Table 6.6 – Building and Infrastructure Sensitivity

ASSET	SENSITIVITY SCORES ASSET CATEGORY AVERAGE >2	HIGH EXPOSURE TO MULTIPLE HAZARDS	ESSENTIAL TO OPERATIONS	TOTAL	OVERALL SENSITIVITY RATING
Businesses & Business District					
Dollar General Store	0	1	0	1	Low
Engelhard Hotel	0	1	0	1	Low
NAPA Auto-parts Store	0	0	0	0	No Sensitivity
H&L Restaurant	0	0	0	0	No Sensitivity
Gibbs Hardware Store	0	1	0	1	Low
R.S. Spencer Hardware Store	0	1	0	1	Low
Sugar and Spice Restaurant	0	1	0	1	Low
The Feed House	0	0	0	0	No Sensitivity
Mattamuskeet Seafood	0	0	0	0	No Sensitivity
Williams Seafood	0	0	0	0	No Sensitivity
Engelhard Marine Industrial Park	0	1	0	1	Low
Engelhard Seafood	0	1	0	1	Low
Business District	1	1	0	2	Medium
Communication Assets					
Telephone/Internet Hub	0	1	1	2	Medium
Radio Tower	0	1	1	2	Medium
Cell Tower	0	1	1	2	Medium
Radio Tower	0	1	1	2	Medium
Drainage Districts					
Mattamuskeet Drainage Association Area	1	1	1	3	High
Slocum Drainage District	1	1	1	3	High
Government Services					
US Post Office	1	1	0	2	Medium
Hyde County Convenience Site	1	1	1	3	High
Sanitary District Treatment	1	1	1	3	High

ASSET	SENSITIVITY SCORES ASSET CATEGORY AVERAGE >2	HIGH EXPOSURE TO MULTIPLE HAZARDS	ESSENTIAL TO OPERATIONS	TOTAL	OVERALL SENSITIVITY RATING
Sanitary District	1	1	1	3	High
Health Services					
Hyde County Department of Social Services	0	1	0	1	Low
Mattamuskeet Village	0	0	1	1	Low
Engelhard Medical Center	0	0	1	1	Low
Infrastructure Assets					
Water Tower	0	1	1	2	Medium
Hyde County Water System	0	0	1	1	Low
Hyde County Water System	0	0	1	1	Low
Mattamuskeet Drainage Association Pump	0	1	1	2	Medium
Mattamuskeet Drainage Association Pump	0	1	1	2	Medium
Mattamuskeet Drainage Association Pump	0	0	1	1	Low
Mattamuskeet Drainage Association Pump	0	1	1	2	Medium
Mattamuskeet Drainage Association Pump	0	1	1	2	Medium
Water Pump - Middle Creek Farms	0	1	1	2	Medium
Drains - Middle Creek Farms	0	1	1	2	Medium
Drainage pump, tide gate and pump - Middle Creek Farms	0	1	1	2	Medium
Drainage Pump - Middle Creek Farms	0	1	1	2	Medium
Pump and drain - Alligator River Farms	0	1	1	2	Medium
Tide Gate - Alligator River Farms	0	1	1	2	Medium
Tide Gate - Engelhard Fire Dept	0	1	1	2	Medium
Tide Gate	0	1	1	2	Medium
Tide Gate	0	1	1	2	Medium
Tide Gate	0	1	1	2	Medium
Tide Gate	0	1	1	2	Medium
Tide Gate	0	1	1	2	Medium
Tide Gate - Middle Creek Farms	0	1	1	2	Medium
Tide Gate - Middle Creek Farms	0	1	1	2	Medium

ASSET	SENSITIVITY SCORES: ASSET CATEGORY AVERAGE >2	HIGH EXPOSURE TO MULTIPLE HAZARDS	ESSENTIAL TO OPERATIONS	TOTAL	OVERALL SENSITIVITY RATING
Tide Gate - Middle Creek Farms	0	1	1	2	Medium
Pump	0	1	1	2	Medium
Pump - Slocum drainage	0	1	1	2	Medium
Pump - Middle Creek Farms	0	1	1	2	Medium
Pump and Gate - Carawan Farms	0	1	1	2	Medium
Tide Gate - Farrow Farm	0	1	1	2	Medium
Tide Gate - Farrow Farm	0	1	1	2	Medium
Tide Gate -Farrow Farm	0	1	1	2	Medium
Tide Gate - Middle Creek Farms	0	1	1	2	Medium
Tide Gate - Davis Farm	0	1	1	2	Medium
Tide Gate - Cradle Farm	0	1	1	2	Medium
Tide Gate - Pugh Farm	0	1	1	2	Medium
Tide Gate - Watson Farm	0	1	1	2	Medium
Tide Gate - Dudley Farm	0	1	1	2	Medium
Tide Gate - Boyd Farm	0	1	1	2	Medium
Tide Gate - Sadler Farm	0	1	1	2	Medium
Tide Gate - Farrow Farm	0	1	1	2	Medium
Tide Gate - Gibbs Farm	0	1	1	2	Medium
Tide Gate - Gibbs Farm	0	1	1	2	Medium
Tide Gate - Middle Creek Farms	0	1	1	2	Medium
Tide Gate - Daughtry Farm	0	1	1	2	Medium
Drainage Pump - Carawan Farms	0	1	1	2	Medium
Drainage Pump - Jeannette Farms	0	1	1	2	Medium
Pump - Potter Farm	0	1	1	2	Medium
Drainage pump and gate - Potter Farm	0	1	1	2	Medium
Tide Gate - Davis Farm	0	1	1	2	Medium
Drainage Pump - Outfall Farm	0	1	1	2	Medium
Drainage Pump - Outfall Farm	0	1	1	2	Medium

ASSET	SENSITIVITY SCORES ASSET CATEGORY AVERAGE >2	HIGH EXPOSURE TO MULTIPLE HAZARDS	ESSENTIAL TO OPERATIONS	TOTAL	OVERALL SENSITIVITY RATING
Drain Pump - Stokesberry Farm	0	0	1	1	Low
Drain Pump - Hydeland Farm	0	1	1	2	Medium
Pump and Tide Gate - Wysocking Farm	0	1	1	2	Medium
Drain Pump - Gull Rock Farm	0	1	1	2	Medium
Public Safety Assets					
Engelhard Volunteer Fire Department, Inc.	0	1	1	2	Medium
Swan Quarter Volunteer Fire Department, Inc.	0	1	1	2	Medium
School					
Beaufort County Community College / BHM Regional Library	0	0	0	0	No Sensitivity
Transportation Assets					
ETHCO Service Station	1	1	1	3	High
Gibbs Convenience Store	1	1	0	2	Medium
Far Creek Gas Station	1	1	1	3	High
Hyde County Airport	1	1	0	2	Medium
Hyde Transit	1	0	0	1	Low
Engelhard Far Creek Harbor	1	1	0	2	Medium
Engelhard Boat Launch	1	1	0	2	Medium
Boat Ramp	1	1	0	2	Medium
Utilities					
Tideland EMC	0	1	1	2	Medium

Figure 6.6 – Building and Infrastructure Sensitivity

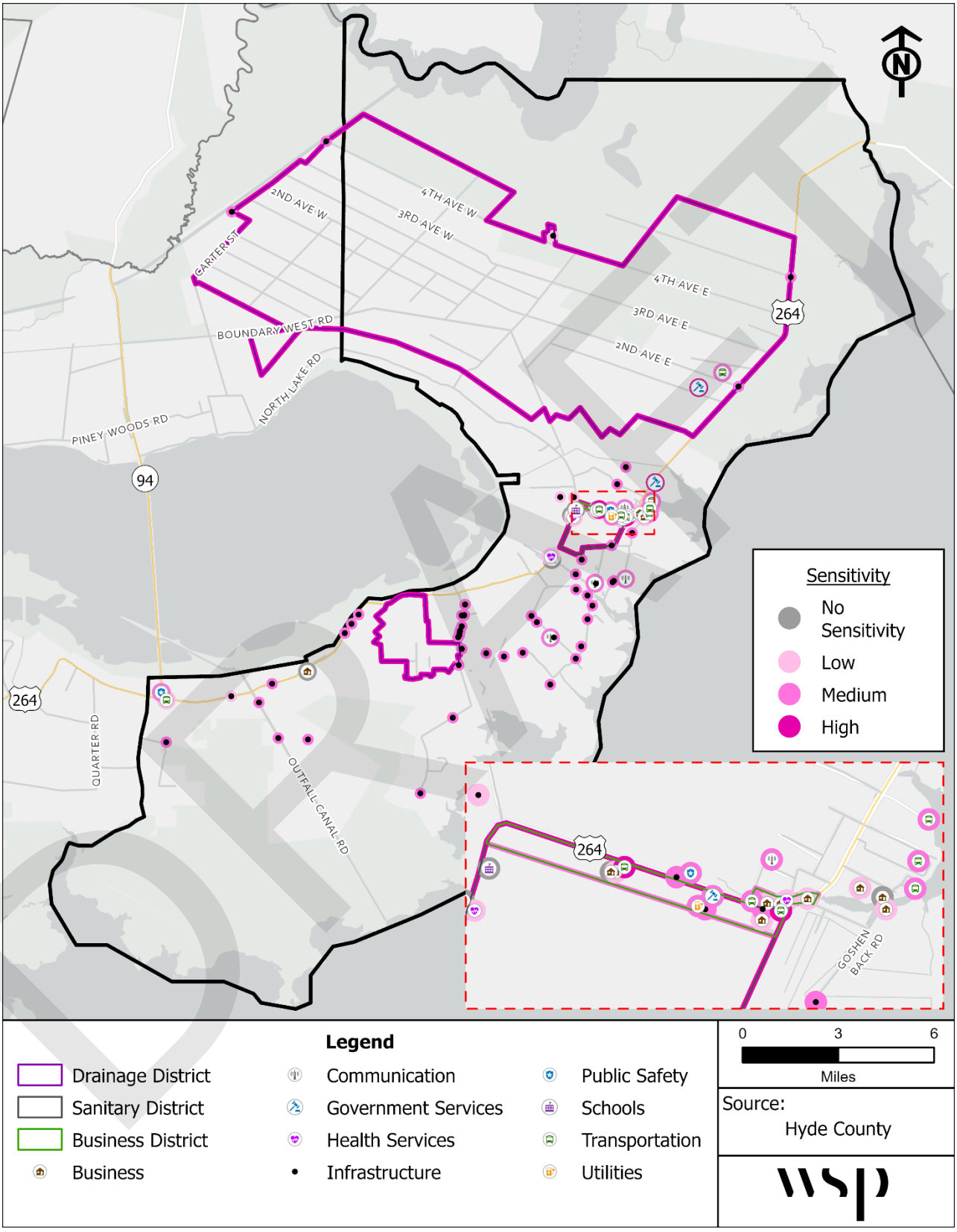


Table 6.7 – Historic and Cultural Resources Sensitivity

	SENSITIVITY SCORES				
ASSET	HIGH EXPOSURE TO MULTIPLE HAZARDS	COMMUNITY & CULTURAL VALUES	CONSTRUCTED IN 1900 OR EARLIER	TOTAL	OVERALL SENSITIVITY RATING
Cemeteries					
Ada and Addison Brown Cemetery	1	1	0	2	Medium
Faithful Hannah Church Cemetery	1	1	1	3	High
Fullford Cemetery	0	1	0	1	Low
Soule Cemetery	0	1	1	2	Medium
Amity Church Cemetery	0	1	1	2	Medium
Historic Districts					
Davis High School Historic District	1	1	0	2	Medium
Lake Landing Historic District	1	1	1	3	High
Historic Properties					
Wynne's Folly	0	1	1	2	Medium
Davis High School	0	1	0	1	Low
The Inkwell/Octogon House	0	1	1	2	Medium
Mattamuskeet Lodge	1	1	0	2	Medium

Figure 6.7 – Historic and Cultural Resources Sensitivity

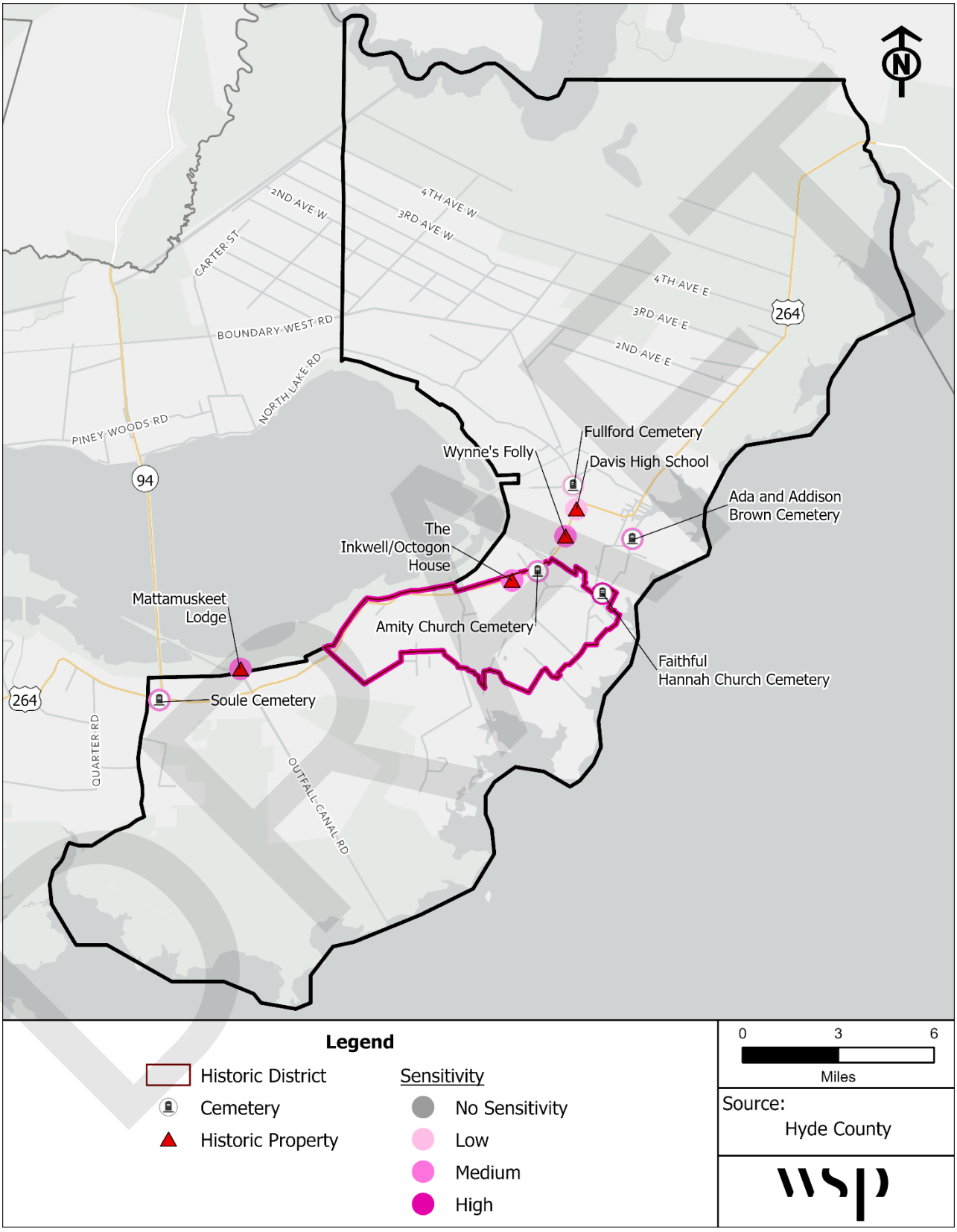


Table 6.8 – Natural Resource Sensitivity

	SENSITIVITY SCORES				
ASSET	ACTIVLEY FARMED	INTERSECT SALTWATER INTRUSION AREAS	50% OR MORE TIDAL FLOODING	TOTAL	OVERALL SENSITIVITY RATING
Alligator River National Wildlife Refuge	0	0	0	0	No Sensitivity
Dare County Air Force Range	0	0	0	0	No Sensitivity
Emily and Richardson Pryer Buckridge Coastal Reserve	0	0	0	0	No Sensitivity
Gull Rock Game Land	0	0	0	0	No Sensitivity
Swanquarter National Wildlife Refuge	0	0	0	0	No Sensitivity
Mattamuskeet National Wildlife Refuge	0	0	1	1	Low
Hyde County Open Space	0	1	1	2	Medium
Hyde County Open Space	0	0	1	1	Low
NC Department of Transportation Mitigation Site	0	0	1	1	Low
NC Department of Transportation Mitigation Site	0	0	0	0	No Sensitivity
NC Wildlife Resources Commission Engelhard Access Area	0	0	0	0	No Sensitivity
NC Hazard Mitigation Buyout Property - Hyde County	0	1	1	2	Medium
NC Hazard Mitigation Buyout Property - Hyde County	0	0	1	1	Low
NC Hazard Mitigation Buyout Property - Hyde County	0	0	1	1	Low
NCDEQ Wellhead Protection Area	0	0	0	0	No Sensitivity
Wetland Reserve Program Easement	0	0	0	0	No Sensitivity
Wetland Reserve Program Easement	0	0	1	1	Low
Wetland Reserve Program Easement	0	0	0	0	No Sensitivity
Wetland Reserve Program Easement	0	0	1	1	Low
Wetland Reserve Program Easement	0	0	0	0	No Sensitivity
Wetland Reserve Program Easement	0	0	1	1	Low
Wetland Reserve Program Easement	0	0	0	0	No Sensitivity
Wetland Reserve Program Easement	0	0	0	0	No Sensitivity
Wetland Reserve Program Easement	0	0	1	1	Low
Wetland Reserve Program Easement	0	0	1	1	Low
Wetland Reserve Program Easement	0	0	1	1	Low

ASSET	SENSITIVITY SCORES ACTIVLEY FARMED	INTERSECT SALTWATER INTRUSION AREAS	50% OR MORE TIDAL FLOODING	TOTAL	OVERALL SENSITIVITY RATING
Wetland Reserve Program Easement	0	1	1	2	Medium
Wetland Reserve Program Easement	0	0	1	1	Low
Wetland Reserve Program Easement	0	0	1	1	Low
Wetland Reserve Program Easement	0	0	0	0	No Sensitivity
Wetland Reserve Program Easement	0	0	0	0	No Sensitivity

Figure 6.8 – Natural Resource Sensitivity

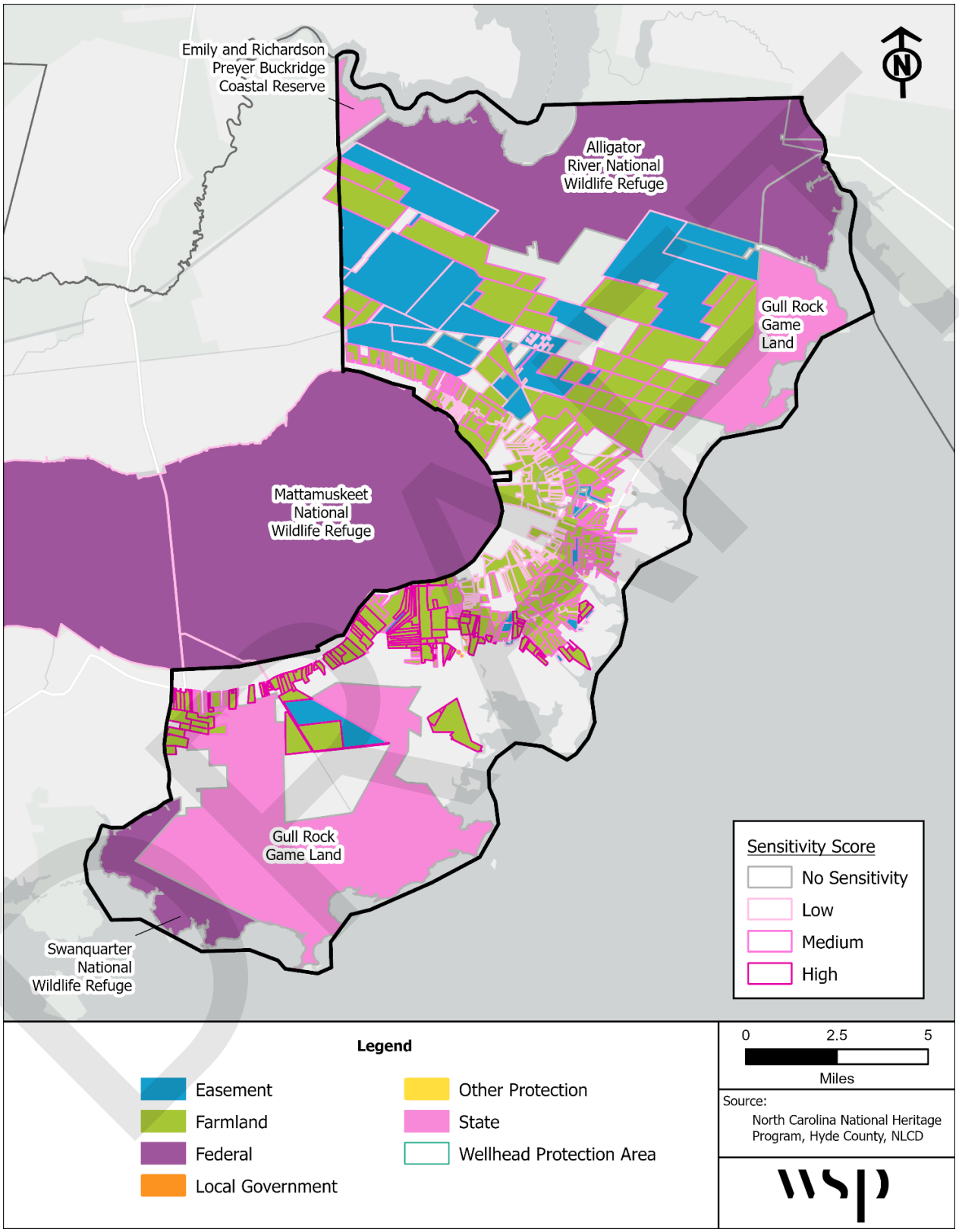


Table 6.9 – Road Sensitivity

	SENSITIVITY SCORES (% OF ROAD SEGMENT)							
	RIVERINE SENSITIVITY				COASTAL SENSITIVITY			
ASSET	LOW	MEDIUM	HIGH	N/A	LOW	MEDIUM	HIGH	N/A
Airport Rd	2%	4%	0%	94%	0%	0%	0%	100%
Arch Rd	0%	56%	5%	39%	17%	41%	0%	42%
Cahoon Rd	0%	5%	89%	6%	0%	100%	0%	0%
Chat & Thomas Rd	0%	15%	10%	75%	0%	21%	0%	79%
Collins Ln	0%	4%	96%	0%	0%	96%	4%	0%
Cooper Ln	0%	28%	70%	2%	0%	98%	0%	2%
Faithful Hannah Church Rd	0%	0%	100%	0%	0%	67%	33%	0%
Farrow Fork Rd	1%	68%	4%	27%	26%	20%	0%	54%
Golden St	3%	13%	84%	0%	0%	45%	39%	16%
Goshen Back Rd	0%	57%	43%	0%	21%	62%	12%	5%
Goshen Rd	0%	81%	19%	0%	29%	71%	0%	0%
Great Ditch Rd	12%	53%	1%	34%	20%	31%	0%	49%
Green Hill Road	0%	0%	0%	100%	0%	0%	0%	100%
Gull Rock Rd	2%	21%	18%	59%	5%	29%	0%	66%
Gum Swamp Rd	0%	88%	9%	3%	59%	15%	0%	26%
Hill St	0%	44%	48%	8%	15%	81%	0%	4%
Horse Shoe Loop Rd	0%	11%	89%	0%	0%	95%	0%	5%
Hycienda Heights	0%	0%	0%	100%	0%	0%	0%	100%
Hydeland Rd	0%	8%	91%	1%	1%	95%	1%	3%
Juniper Bay Rd	0%	92%	0%	8%	60%	2%	0%	38%
Lake Swamp Rd	0%	0%	0%	100%	0%	0%	0%	100%
Lakeview Rd	0%	0%	0%	100%	0%	0%	0%	100%
Lazy Ln	0%	73%	27%	0%	43%	55%	0%	2%
Main St	0%	0%	0%	100%	0%	0%	0%	100%
Maple Rd	39%	17%	0%	44%	0%	0%	0%	100%
Marsh Rd	0%	2%	98%	0%	0%	100%	0%	0%
Mt Pleasant Village Rd	1%	47%	47%	5%	6%	81%	0%	13%
Mt Sinai Rd	0%	4%	96%	0%	0%	88%	12%	0%

	SENSITIVITY SCORES (% OF ROAD SEGMENT)							
	RIVERINE SENSITIVITY				COASTAL SENSITIVITY			
ASSET	LOW	MEDIUM	HIGH	N/A	LOW	MEDIUM	HIGH	N/A
Mulberry Rd	20%	67%	0%	13%	20%	67%	0%	13%
Nebraska Rd	1%	67%	32%	0%	19%	70%	2%	9%
New Holland Rd	0%	0%	0%	100%	0%	0%	0%	100%
North Lake Rd	10%	13%	0%	77%	12%	7%	0%	81%
Pleasant Grove Rd	0%	0%	0%	100%	0%	0%	0%	100%
Radar Rd	0%	53%	45%	2%	7%	92%	0%	1%
Roper Ln	0%	3%	97%	0%	0%	41%	59%	0%
Scrouge Town Rd	0%	0%	0%	100%	0%	0%	0%	100%
Shaw Rd	0%	0%	100%	0%	0%	100%	0%	0%
Silver Ln	0%	0%	91%	9%	0%	64%	36%	0%
Slocum Ln	0%	31%	65%	4%	0%	100%	0%	0%
St Lydia Rd	0%	34%	61%	5%	0%	59%	39%	2%
Swamp Rd	12%	52%	1%	35%	24%	17%	0%	59%
The High Rd	15%	67%	7%	11%	21%	33%	0%	46%
US 264 Hwy E	13%	18%	1%	68%	9%	4%	0%	87%
Whipping Creek Rd	14%	13%	0%	73%	0%	0%	0%	100%
White Plains Rd	0%	27%	73%	0%	8%	89%	0%	3%

Figure 6.9 – Road Sensitivity: Riverine Flooding

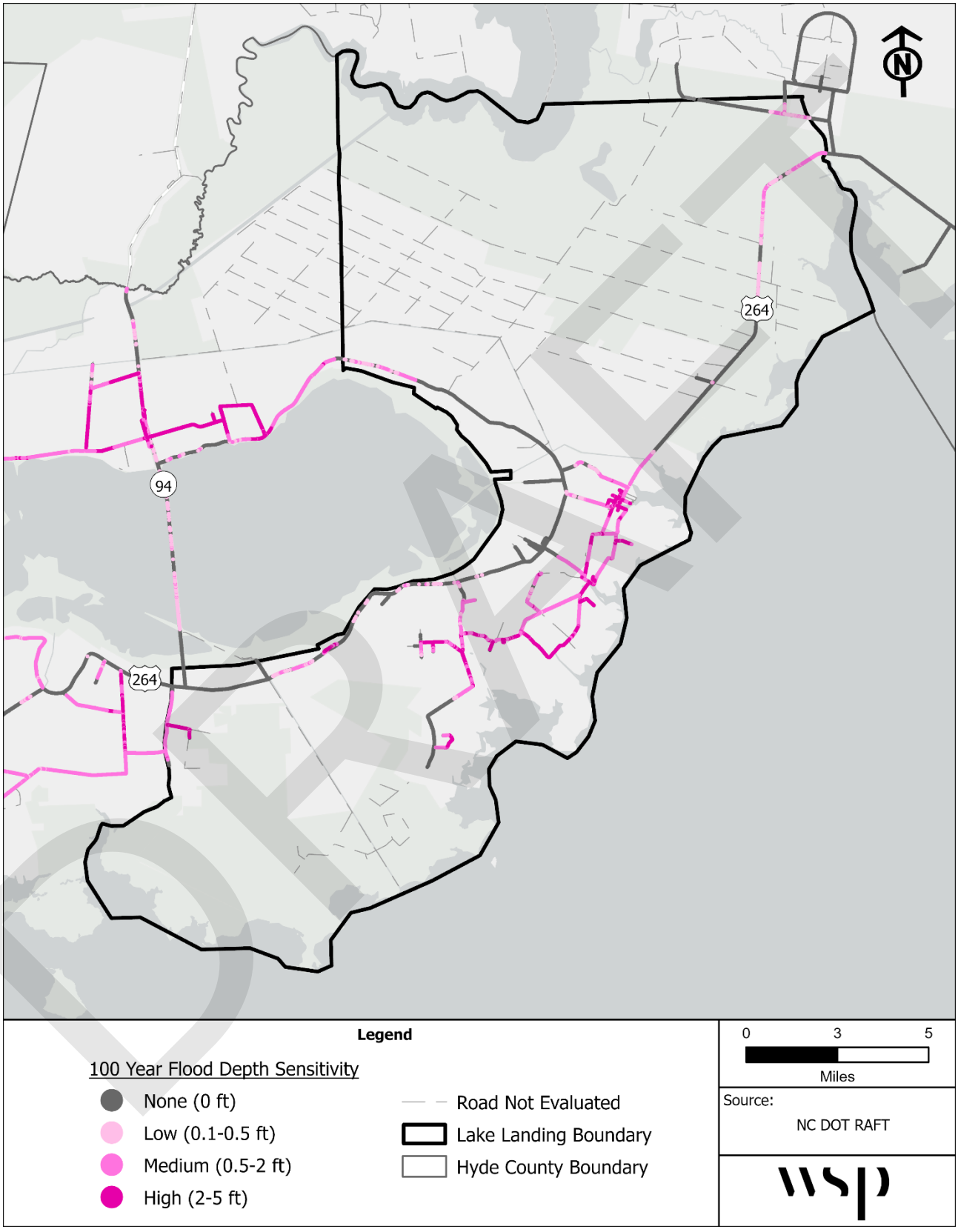
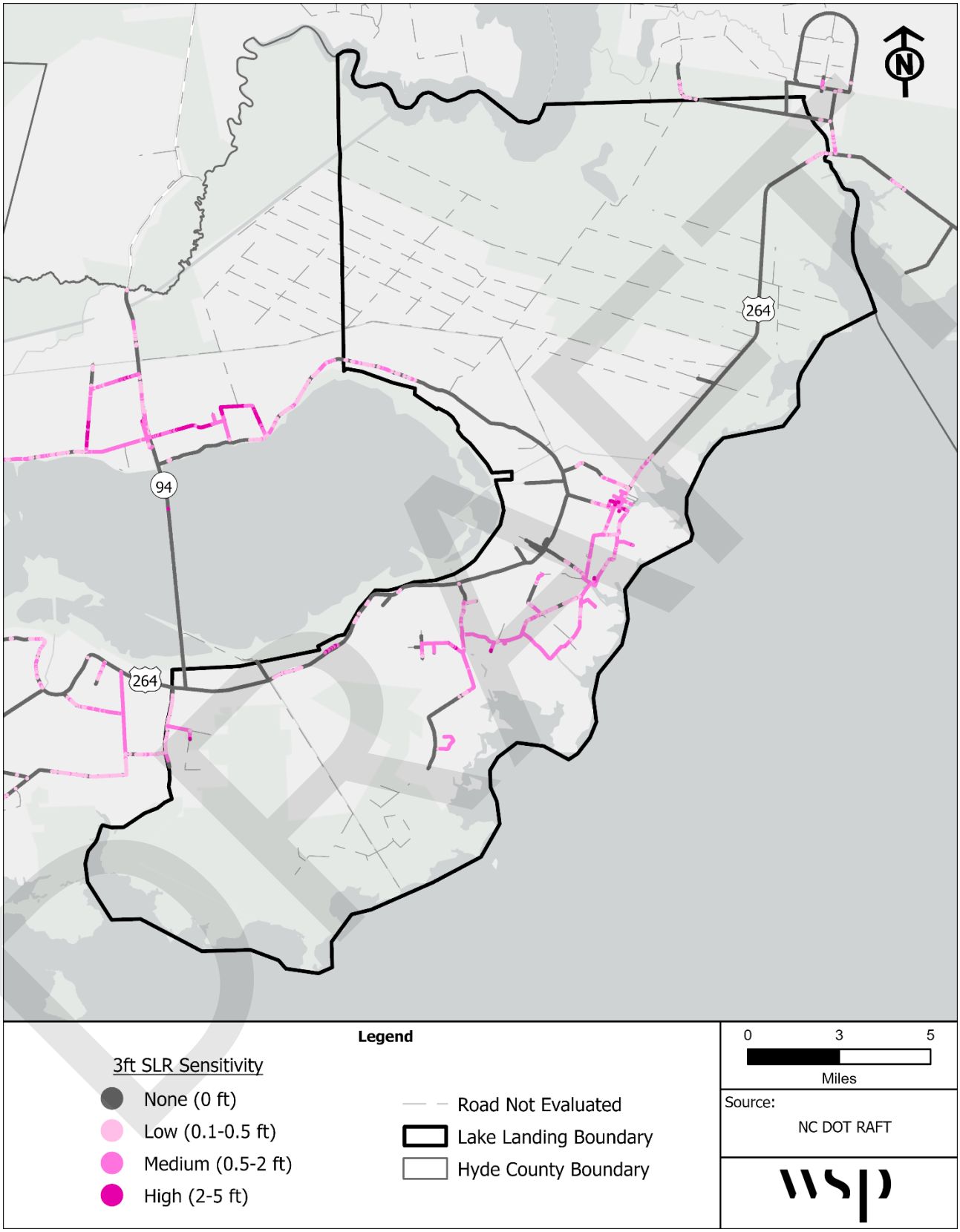


Figure 6.10 – Road Sensitivity: Coastal Flooding



6.4 Adaptive Capacity Analysis

6.4.1 Methodology

Adaptive capacity is a subjective category that describes an asset's ability to adapt or withstand hazard impacts. Measures of adaptive capacity can include physical elements or conditions that help, or hinder, how an asset avoids or absorbs an impact. High adaptive capacity is the ability to adjust to disruption or reduce the extent of the impact. To evaluate adaptive capacity, each asset was assessed for its potential for protection or adaptation measures. Asset categories were assessed using different criteria that best evaluate adaptive capacity based on their unique characteristics. Each asset was assigned an adaptive capacity score of 0-3 where 0 indicates no adaptive capacity, 1 is low, 2 is medium, and 3 is high.

0 = No Adaptive Capacity	1 = LOW	2 = MEDIUM	3 = HIGH

For buildings and infrastructure assets and historic and cultural resources, factors considered include if the asset is already protected; if retrofit, relocation, or another alternative is possible, if there are multiple strategies for adaptation; and if another facility or asset could provide temporary service if/when an asset is affected. Financial burdens or barriers to mitigation or resilience measures were also considered.

Adaptive capacity for roads was determined based on road classifications which organize roads into a hierarchy based on their purpose, traffic volume, and speed and which can influence the road material, how often it's repaired, and who is responsible for maintaining the road.

Natural resources and undeveloped areas can help manage floodwaters, but some of these resources have productive uses that are harmed by flooding. Adaptive capacity for natural resources was determined based on the land cover and general use of each asset. Wetlands and areas with higher vegetation have higher adaptive capacity while areas with more intense land use or assets that have low tolerance for high water have a lower adaptive capacity. Table 6.10 below provides the criteria used to assign adaptive capacity scores.

Table 6.10 – Adaptive Capacity Analysis Ranking Criteria

	ADAPTIVE CAPACITY			
ASSET CATEGORY	***0 - NONE***	***1 - LOW***	***2 - MEDIUM***	***3 - HIGH***
Buildings and Infrastructure & Historic and Cultural Resources	No options available	■ No temporary service and very limited options adaptation (retrofit, relocation, or protection measures) ■ High financial burden or no grant funding available for mitigation/resilience measures	■ No temporary service, but multiple adaptation strategies could be employed (retrofit, relocation, or protection measures) ■ Moderate financial burden or limited grant funding available for mitigation/resilience measures	■ A temporary service is available from an alternative asset and/or multiple adaptation strategies could be employed (retrofit, relocation, or protection measures) ■ Minimal financial burden or availability of grant funding for mitigation/resilience measures
Natural Resources	No adaptive capacity	Low tolerance for high water	Medium tolerance for high water	High tolerance for high water
Roads	N/A	Class 5 (Non-System Route/Municipal)	Class 4 (Secondary Route)	Class 2 (US Route) or Class 3 (NC Route)

6.4.2 Results

Radio towers have high adaptive capacity as the majority of the infrastructure is raised high enough to not be impacted by floodwaters. Transportation assets, Hyde Transit and boat launches, have high adaptive capacity. Around 76 percent of the drainage infrastructure also has high adaptive capacity as its function is to manage water. Older drainage infrastructure assets were assigned medium adaptive capacity.

Assets such as local businesses, government buildings, key communication infrastructure, and public health and safety assets were identified as having low adaptive capacity. Several of these assets provide key services and are critical in times of an emergency, however, there are few if any additional assets that could provide adequate backup services. Local businesses also have a high financial barrier to repairing any damage.

All of the historic and cultural assets have low adaptive capacity with the exception of the historic districts which have no adaptive capacity. It is very difficult to repair buildings with historic and cultural meaning, and their preservation is inherent to their value. The physical location of cemeteries holds inherent cultural and historic so options for protection are very limited.

All farmland parcels have medium adaptive capacity – they have the ability to flood to an extent, however highwater could negatively impact the productivity of less water-tolerant crops. The wellhead protection area has low adaptive capacity as high water can overwhelm wellheads and cause them to malfunction. The remainder of the natural assets have high adaptive capacity.

The majority of assessed roads, 40 out of 45, have medium adaptive capacity. Main Street and US 264 Highway East have high adaptive capacity and Lakeview Road, Maple Road, and Whipping Creek Road have low adaptive capacity.

Table 6.11 – Building and Infrastructure Adaptive Capacity

	ADAPTIVE CAPACITY SCORES	
ASSET	**SCORE**	**ADAPTIVE CAPACITY RATING**
Businesses & Business District		
Dollar General Store	2	Medium
Engelhard Hotel	1	Low
NAPA Auto parts Store	2	Medium
H&L Restaurant	1	Low
Gibbs Hardware Store	1	Low
R.S. Spencer Hardware Store	1	Low
Sugar and Spice Restaurant	1	Low
The Feed House	1	Low
Mattamuskeet Seafood	1	Low
Williams Seafood	1	Low
Engelhard Marine Industrial Park	2	Medium

ADAPTIVE CAPACITY SCORES

ASSET	SCORE	ADAPTIVE CAPACITY RATING
Engelhard Seafood	1	Low
Business District	0	No Adaptive Capacity
Communication Assets		
Telephone/Internet Hub	2	Medium
Radio Tower	3	High
Cell Tower	1	Low
Radio Tower	3	High
Drainage Districts		
Mattamuskeet Drainage Association Area	2	Medium
Slocum Drainage District	2	Medium
Government Services		
US Post Office	2	Medium
Hyde County Convenience Site	1	Low
Sanitary District Treatment	1	Low
Sanitary District	1	Low
Health Services		
Hyde County Department of Social Services	2	Medium
Mattamuskeet Village	1	Low
Engelhard Medical Center	2	Medium
Infrastructure		
Water Tower	1	Low
Hyde County Water System	1	Low
Hyde County Water System	1	Low
Mattamuskeet Drainage Association Pump	3	High
Mattamuskeet Drainage Association Pump	3	High
Mattamuskeet Drainage Association Pump	3	High
Mattamuskeet Drainage Association Pump	3	High
Mattamuskeet Drainage Association Pump	3	High
Water pump - Middle Creek Farms	2	Medium
Drains - Middle Creek Farms	3	High
Drainage pump, tide gate and pump - Middle Creek Farms	2	Medium
Drainage pump - Middle Creek Farms	2	Medium
Pump and drain - Alligator River Farms	3	High
Tide gate - Alligator River Farms	3	High
Tide gate - Engelhard Fire Dept	3	High
Tide gate	3	High
Tide gate	2	Medium
Tide gate	3	High
Tide gate	2	Medium
Tide gate	2	Medium
Tide gate - Middle Creek Farms	3	High

ADAPTIVE CAPACITY SCORES

ASSET	SCORE	ADAPTIVE CAPACITY RATING
Tide gate - Middle Creek Farms	2	Medium
Tide gate - Middle Creek Farms	3	High
Pump	3	High
Pump - Slocum drainage	2	Medium
Pump - Middle Creek Farms	3	High
Pump and gate - Carawan Farms	3	High
Tide gate - Farrow Farm	3	High
Tide gate - Farrow Farm	3	High
Tide Gate -Farrow Farm	3	High
Tide gate - Middle Creek Farms	3	High
Tide Gate - Davis Farm	3	High
Tide Gate - Cradle Farm	3	High
Tide Gate - Pugh Farm	3	High
Tide Gate - Watson Farm	3	High
Tide Gate - Dudley Farm	3	High
Tide Gate - Boyd Farm	3	High
Tide Gate - Sadler Farm	3	High
Tide Gate - Farrow Farm	3	High
Tide Gate - Gibbs Farm	3	High
Tide Gate - Gibbs Farm	3	High
Tide Gate - Middle Creek Farms	3	High
Tide Gate - Daughtry Farm	3	High
Drainage Pump - Carawan Farms	3	High
Drainage pump - Jeannette Farms	3	High
Pump - Potter Farm	3	High
Drainage pump and gate - Potter Farm	3	High
Tide Gate - Davis Farm	3	High
Drainage pump - Outfall Farm	2	Medium
Drainage Pump - Outfall Farm	3	High
Drain Pump - Stokesberry Farm	3	High
Drain Pump - Hydeland Farm	3	High
Pump and Tide Gate - Wysocking Farm	2	Medium
Drain Pump - Gull Rock Farm	3	High
Public Safety		
Engelhard Volunteer Fire Department, Inc.	1	Low
Swan Quarter Volunteer Fire Department, Inc.	1	Low
School		
Beaufort County Community College / BHM Regional Library		
Transportation		
ETHCO Service Station	2	Medium
Gibbs Convenience Store	1	Low

ADAPTIVE CAPACITY SCORES

ASSET	SCORE	ADAPTIVE CAPACITY RATING
Far Creek Gas Station	1	Low
Hyde County Airport	1	Low
Hyde Transit	3	High
Engelhard Far Creek Harbor	2	Medium
Engelhard Boat Launch	3	High
Boat Ramp	3	High
Utilities		
Tideland EMC	2	Medium

Figure 6.11 – Buildings and Infrastructure Adaptive Capacity

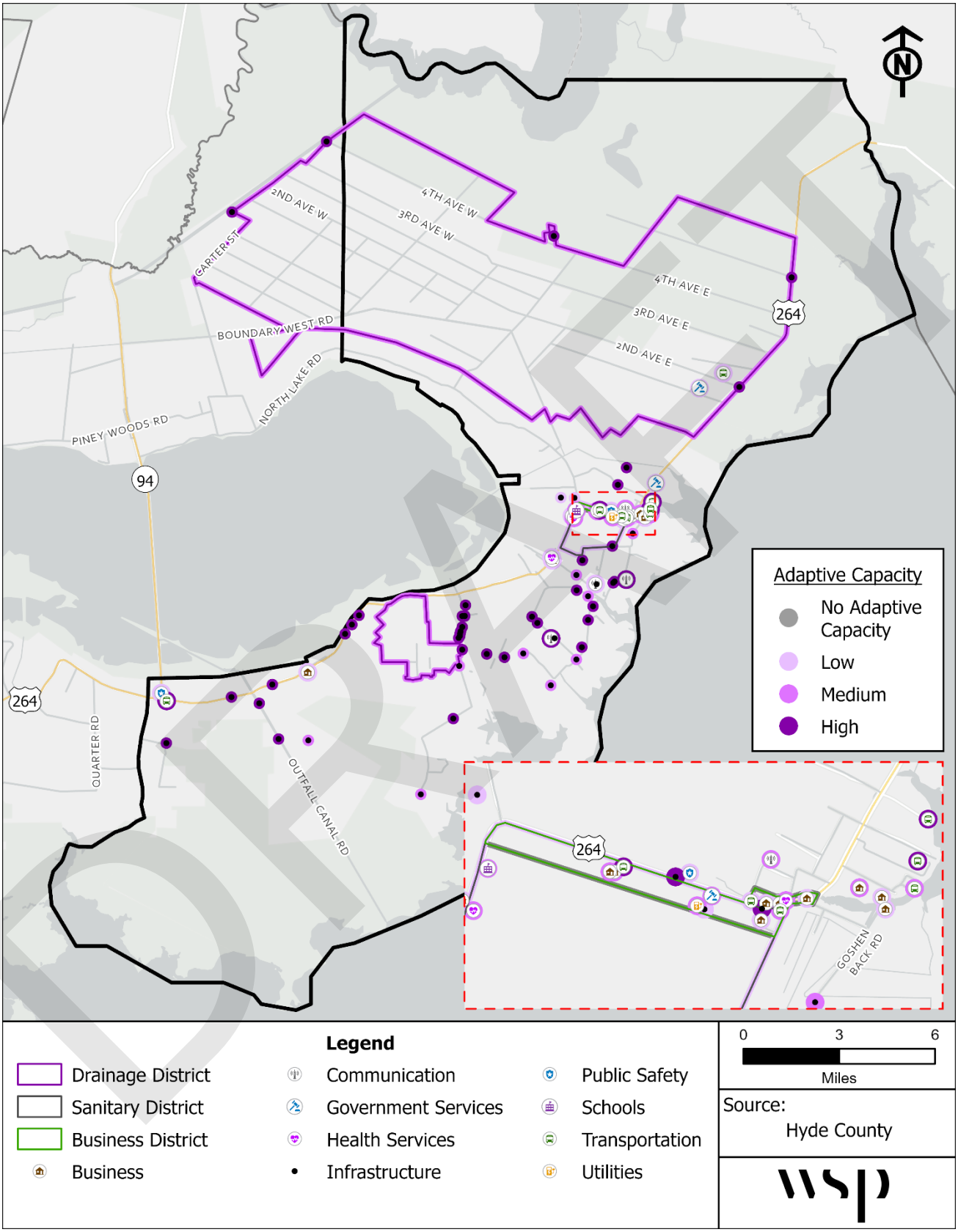


Table 6.12 – Historic and Cultural Resources Adaptive Capacity

ADAPTIVE CAPACITY SCORES		
ASSET	**SCORE**	**ADAPTIVE CAPACITY RATING**
Cemeteries		
Ada and Addison Brown Cemetery	1	Low
Faithful hannah Church Cemetery	1	Low
Fullford Cemetery	1	Low
Soule Cemetery	1	Low
Amity Church Cemetery	1	Low
Historic District		
Davis High School Historic District	0	No Adaptive Capacity
Lake Landing Historic District	0	No Adaptive Capacity
Historic Property		
Wynne's Folly	1	Low
Davis High School	1	Low
The Inkwell/Octogon House	1	Low
Mattamuskeet Lodge	1	Low

Figure 6.12 – Historic and Cultural Adaptive Capacity

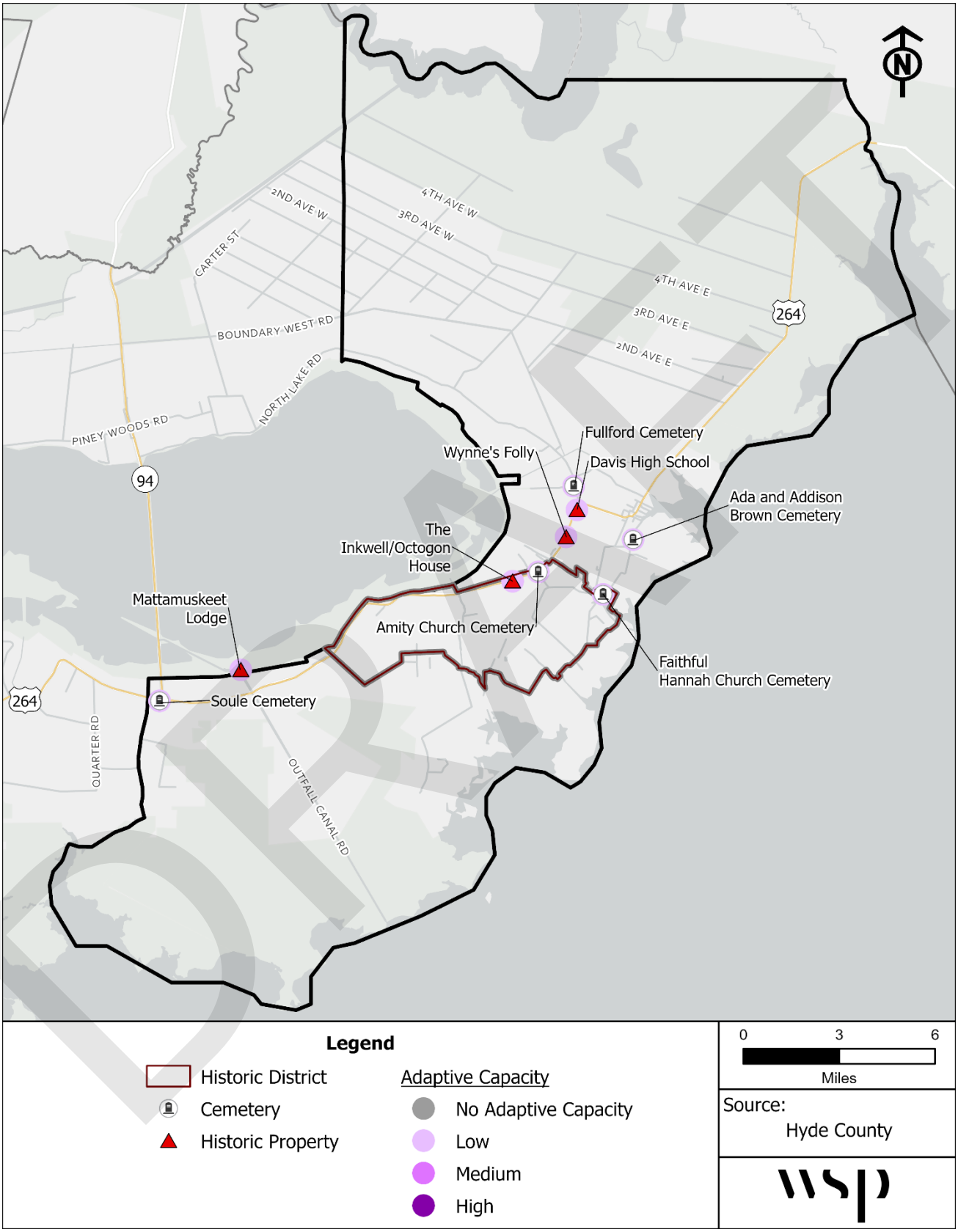


Table 6.13 – Natural Resources Adaptive Capacity

	ADAPTIVE CAPACITY SCORES	
ASSET	**TOTAL**	**OVERALL ADAPTIVE CAPACITY RATING**
Alligator River National Wildlife Refuge	3	High
Dare County Air Force Range	3	High
Emily and Richardson Pryer Buckridge Coastal Reserve	3	High
Gull Rock Game Land	3	High
Swanquarter National Wildlife Refuge	3	High
Mattamuskeet National Wildlife Refuge	3	High
Hyde County Open Space	3	High
Hyde County Open Space	3	High
NC Department of Transportation Mitigation Site	3	High
NC Department of Transportation Mitigation Site	3	High
NC Wildlife Resources Commission Engelhard Access Area	3	High
NC Hazard Mitigation Buyout Property - Hyde County	3	High
NC Hazard Mitigation Buyout Property - Hyde County	3	High
NC Hazard Mitigation Buyout Property - Hyde County	3	High
NCDEQ Wellhead Protection Area	1	Low
Wetland Reserve Program Easement (16 parcels)	3	High
Farmland (567 parcels)	2	Medium

Figure 6.13 – Natural Resources Adaptative Capacity

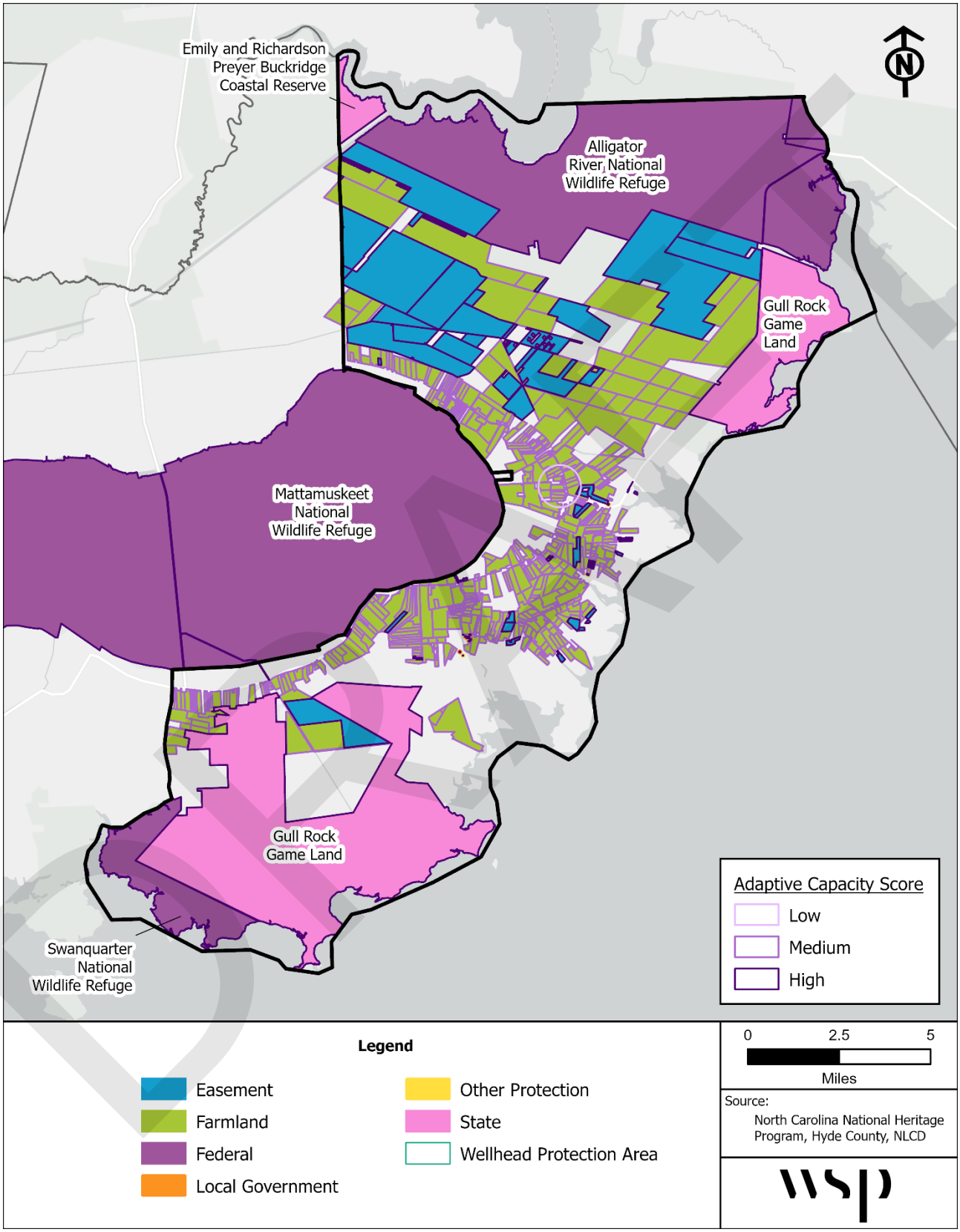


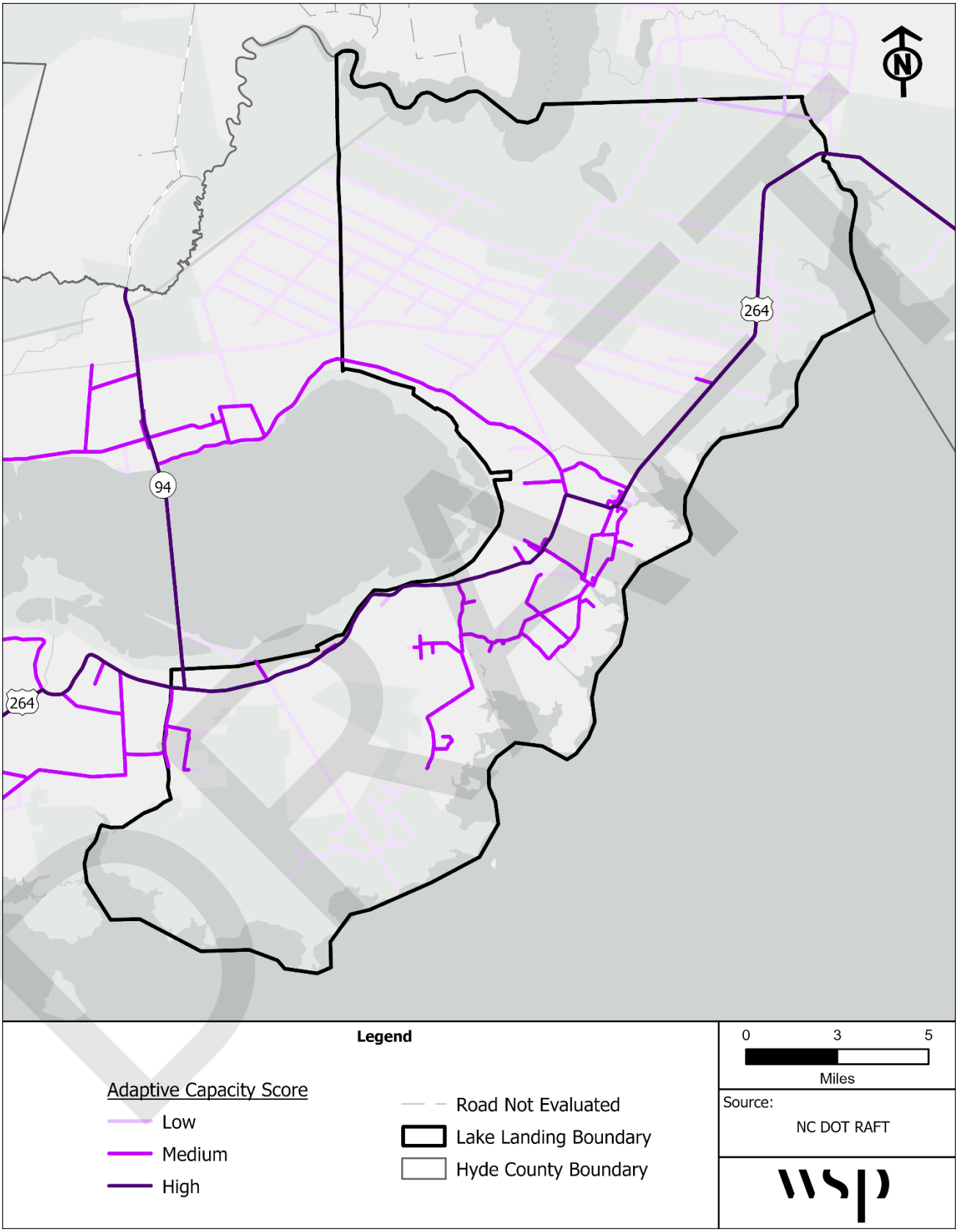
Table 6.14 – Road Adaptive Capacity

		ADAPTIVE CAPACITY SCORES	
ASSET	**ROAD CLASS**	**SCORE**	**ADAPTIVE CAPACITY RATING**
Airport Rd	4	2	Medium
Arch Rd	4	2	Medium
Cahoon Rd	4	2	Medium
Chat & Thomas Rd	4	2	Medium
Collins Ln	4	2	Medium
Cooper Ln	4	2	Medium
Faithful Hannah Church Rd	4	2	Medium
Farrow Fork Rd	4	2	Medium
Golden St	4	2	Medium
Goshen Back Rd	4	2	Medium
Goshen Rd	4	2	Medium
Great Ditch Rd	4	2	Medium
Green Hill Road	4	2	Medium
Gull Rock Rd	4	2	Medium
Gum Swamp Rd	4	2	Medium
Hill St	4	2	Medium
Horse Shoe Loop Rd	4	2	Medium
Hycienda Heights	4	2	Medium
Hydeland Rd	4	2	Medium
Juniper Bay Rd	4	2	Medium
Lake Swamp Rd	4	2	Medium
Lakeview Rd	5	1	Low
Lazy Ln	4	2	Medium
Main St	3	3	High
Maple Rd	5	1	Low
Marsh Rd	4	2	Medium
Mt Pleasant Village Rd	4	2	Medium
Mt Sinai Rd	4	2	Medium
Mulberry Rd	4	2	Medium
Nebraska Rd	4	2	Medium
New Holland Rd	4	2	Medium
North Lake Rd	4	2	Medium
Pleasant Grove Rd	4	2	Medium
Radar Rd	4	2	Medium
Roper Ln	4	2	Medium
Scrouge Town Rd	4	2	Medium
Shaw Rd	4	2	Medium
Silver Ln	4	2	Medium
Slocum Ln	4	2	Medium
St Lydia Rd	4	2	Medium

ADAPTIVE CAPACITY SCORES

ASSET	ROAD CLASS	SCORE	ADAPTIVE CAPACITY RATING
Swamp Rd	4	2	Medium
The High Rd	4	2	Medium
US 264 Hwy E	2	3	High
Whipping Creek Rd	5	1	Low
White Plains Rd	4	2	Medium

Figure 6.14 – Road Adaptive Capacity



6.5 Vulnerability Assessment Conclusions

6.5.1 Methodology

Vulnerability scores summarize how an asset might be impacted by flood hazards and its ability to withstand or adapt to those hazards. The overall exposure, sensitivity, and adaptive capacity scores are used to determine the cumulative vulnerability of the assessed assets. The following equation is applied to each asset to determine the cumulative vulnerability score:

VULNERABILITY SCORE = (EXPOSURE SCORE + SENSITIVITY SCORE) – ADAPTIVE CAPACITY SCORE

Cumulative vulnerability scores are categorized as follows:

≥2 = LOW	<2 – ≥4 = MEDIUM	<4 = HIGH

The vulnerability scoring results are presented in the tables and maps in Section 6.5.2, followed by a summary of key takeaways for each asset category in Section 6.5.3.

6.5.2 Results

Table 6.15 – Buildings and Infrastructure Vulnerability

ASSET	VULNERABILITY CRITERIA: EXPOSURE SCORE	SENSITIVITY SCORE	ADAPTIVE CAPACITY SCORE	VULNERABILITY SCORE	VULNERABILITY RATING
Businesses & Business District					
Dollar General Store	1.6	1	2	0.6	Low
Engelhard Hotel	2.2	1	1	2.2	Medium
NAPA Auto-parts Store	1.2	0	2	-0.8	Low
H&L Restaurant	0.4	0	1	-0.6	Low
Gibbs Hardware Store	1.8	1	1	1.8	Low
R.S. Spencer Hardware Store	1.6	1	1	1.6	Low
Sugar and Spice Restaurant	2.4	1	1	2.4	Medium
The Feed House	0.4	0	1	-0.6	Low
Mattamuskeet Seafood	0.8	0	1	-0.2	Low
Williams Seafood	1.4	0	1	0.4	Low
Engelhard Marine Industrial Park	2.6	1	2	1.6	Low
Engelhard Seafood	2.2	1	1	2.2	Medium
Business District	2.4	2	0	4.4	High
Communication Assets					
Telephone/Internet Hub	1.8	2	2	1.8	Low
Radio Tower	1.8	2	3	0.8	Low
Cell Tower	2.2	2	1	3.2	Medium
Radio Tower	1.8	2	3	0.8	Low
Drainage Districts					
Mattamuskeet Drainage Association Area	2.4	3	2	3.4	Medium
Slocum Drainage District	2.4	3	2	3.4	Medium

ASSET	VULNERABILITY CRITERIA				
	EXPOSURE SCORE	SENSITIVITY SCORE	ADAPTIVE CAPACITY SCORE	VULNERABILITY SCORE	VULNERABILITY RATING
Government Services					
US Post Office	1.6	2	2	1.6	Low
Hyde County Convenience Site	2.4	3	1	4.4	High
Sanitary District Treatment	2.4	3	1	4.4	High
Sanitary District	2.4	3	1	4.4	High
Health Services					
Hyde County Department of Social Services	1.8	1	2	0.8	Low
Mattamuskeet Village	0.4	1	1	0.4	Low
Engelhard Medical Center	0.4	1	2	-0.6	Low
Infrastructure Assets					
Water Tower	2.2	2	1	3.2	Medium
Hyde County Water System	0.4	1	1	0.4	Low
Hyde County Water System	0.4	1	1	0.4	Low
Mattamuskeet Drainage Association Pump	2.4	2	3	1.4	Low
Mattamuskeet Drainage Association Pump	2.2	2	3	1.2	Low
Mattamuskeet Drainage Association Pump	1.2	1	3	-0.8	Low
Mattamuskeet Drainage Association Pump	2.2	2	3	1.2	Low
Mattamuskeet Drainage Association Pump	2.4	2	3	1.4	Low
Water pump - Middle Creek Farms	2.2	2	2	2.2	Medium
Drains - Middle Creek Farms	2.0	2	3	1.0	Low
Drainage pump, tide gate and pump - Middle Creek Farms	2.0	2	2	2.0	Low
Drainage pump - Middle Creek Farms	2.4	2	2	2.4	Medium
Pump and drain - Alligator River Farms	1.8	2	3	0.8	Low
Tide gate - Alligator River Farms	2.2	2	3	1.2	Low
Tide gate - Engelhard Fire Dept	2.2	2	3	1.2	Low
Tide gate	2.2	2	3	1.2	Low
Tide gate	2.0	2	2	2.0	Low

ASSET	VULNERABILITY CRITERIA				
	EXPOSURE SCORE	SENSITIVITY SCORE	ADAPTIVE CAPACITY SCORE	VULNERABILITY SCORE	VULNERABILITY RATING
Tide gate	2.0	2	3	1.0	Low
Tide gate	2.2	2	2	2.2	Medium
Tide gate	2.2	2	2	2.2	Medium
Tide gate - Middle Creek Farms	2.4	2	3	1.4	Low
Tide gate - Middle Creek Farms	2.2	2	2	2.2	Medium
Tide gate - Middle Creek Farms	2.2	2	3	1.2	Low
Pump	2.4	2	3	1.4	Low
Pump - Slocum drainage	2.4	2	2	2.4	Medium
Pump - Middle Creek Farms	2.2	2	3	1.2	Low
Pump and gate - Carawan Farms	1.6	2	3	0.6	Low
Tide gate - Farrow Farm	1.6	2	3	0.6	Low
Tide gate - Farrow Farm	1.8	2	3	0.8	Low
Tide Gate -Farrow Farm	1.8	2	3	0.8	Low
Tide gate - Middle Creek Farms	1.6	2	3	0.6	Low
Tide Gate - Davis Farm	1.6	2	3	0.6	Low
Tide Gate - Cradle Farm	1.6	2	3	0.6	Low
Tide Gate - Pugh Farm	1.6	2	3	0.6	Low
Tide Gate - Watson Farm	1.8	2	3	0.8	Low
Tide Gate - Dudley Farm	1.8	2	3	0.8	Low
Tide Gate - Boyd Farm	1.8	2	3	0.8	Low
Tide Gate - Sadler Farm	1.6	2	3	0.6	Low
Tide Gate - Farrow Farm	2.4	2	3	1.4	Low
Tide Gate - Gibbs Farm	2.2	2	3	1.2	Low
Tide Gate - Gibbs Farm	1.8	2	3	0.8	Low
Tide Gate - Middle Creek Farms	2.0	2	3	1.0	Low
Tide Gate - Daughtry Farm	2.0	2	3	1.0	Low
Drainage Pump - Carawan Farms	2.2	2	3	1.2	Low
Drainage pump - Jeannette Farms	2.0	2	3	1.0	Low

ASSET	VULNERABILITY CRITERIA				
	EXPOSURE SCORE	SENSITIVITY SCORE	ADAPTIVE CAPACITY SCORE	VULNERABILITY SCORE	VULNERABILITY RATING
Pump - Potter Farm	2.0	2	3	1.0	Low
Drainage pump and gate - Potter Farm	1.8	2	3	0.8	Low
Tide Gate - Davis Farm	1.8	2	3	0.8	Low
Drainage pump - Outfall Farm	2.2	2	2	2.2	Medium
Drainage Pump - Outfall Farm	2.0	2	3	1.0	Low
Drain Pump - Stokesberry Farm	1.4	1	3	-0.6	Low
Drain Pump - Hydeland Farm	2.2	2	3	1.2	Low
Pump and Tide Gate - Wysocking Farm	2.2	2	2	2.2	Medium
Drain Pump - Gull Rock Farm	2.2	2	3	1.2	Low
Public Safety Assets					
Engelhard Volunteer Fire Department, Inc.	1.8	2	1	2.8	Medium
Swan Quarter Volunteer Fire Department, Inc.	1.8	2	1	2.8	Medium
School					
Beaufort County Community College / BHM Regional Library	0.8	0	2	-1.2	Low
Transportation Assets					
ETHCO Service Station	2.0	3	2	3.0	Medium
Gibbs Convenience Store	2.4	2	1	3.4	Medium
Far Creek Gas Station	1.6	3	1	3.6	Medium
Hyde County Airport	2.4	2	1	3.4	Medium
Hyde Transit	0.6	1	3	-1.4	Low
Engelhard Far Creek Harbor	2.8	2	2	2.8	Medium
Engelhard Boat Launch	2.4	2	3	1.4	Low
Boat Ramp	3.0	2	3	2.0	Low
Utilities					
Tideland EMC	1.6	2	2	1.6	Low

Figure 6.15 – Building and Infrastructure Vulnerability

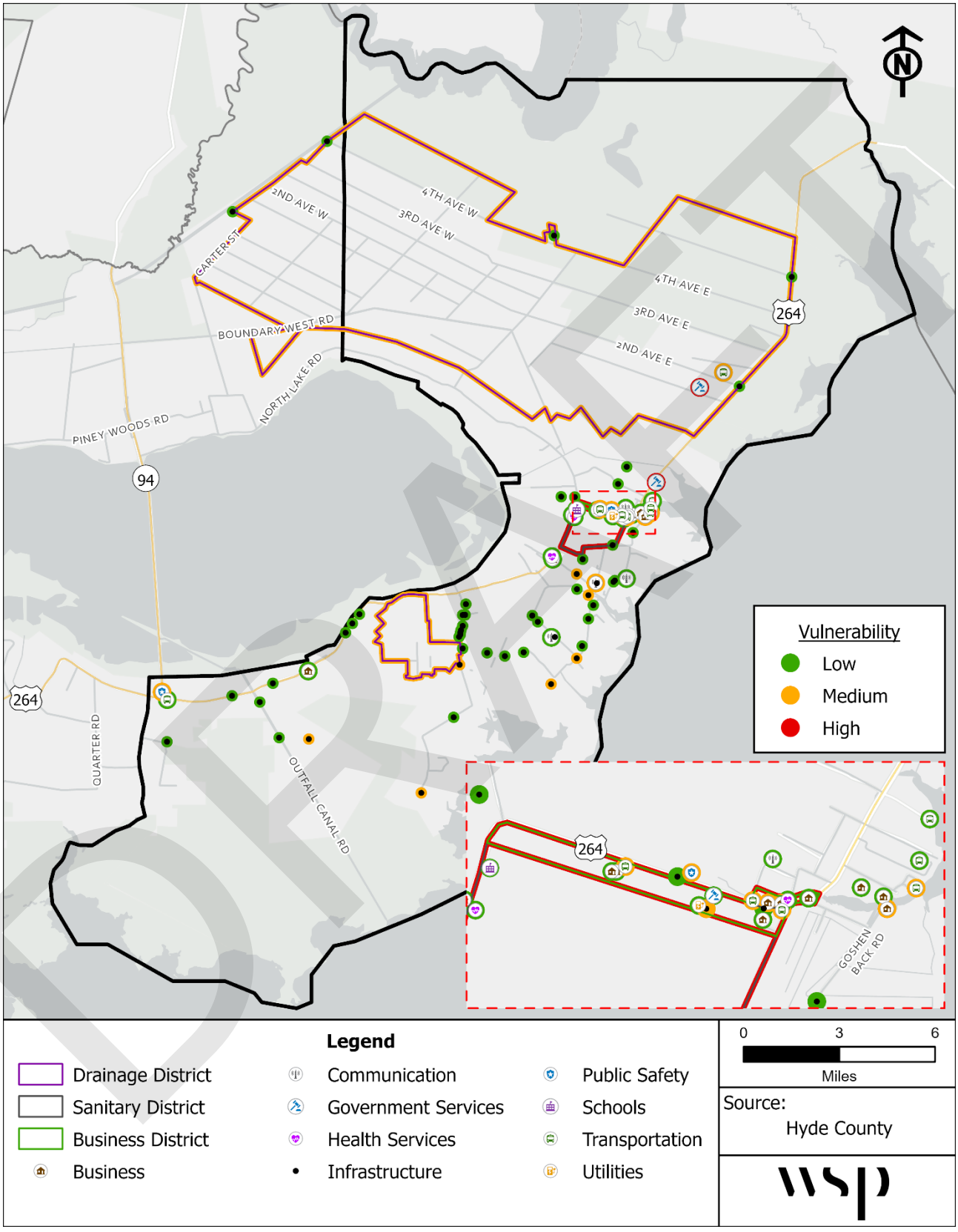


Table 6.16 – Historic and Cultural Resources Vulnerability

ASSET	VULNERABILITY CRITERIA				
	EXPOSURE SCORE	SENSITIVITY SCORE	ADAPTIVE CAPACITY SCORE	VULNERABILITY SCORE	VULNERABILITY RATING
Cemeteries					
Ada and Addison Brown Cemetery	1.8	2	1	2.8	Medium
Faithful Hannah Church Cemetery	2.2	3	1	4.2	High
Fullford Cemetery	0.4	1	1	0.4	Low
Soule Cemetery	1.2	2	1	2.2	Medium
Amity Church Cemetery	0.4	2	1	1.4	Low
Historic Districts					
Davis High School Historic District	1.8	2	0	3.8	Medium
Lake Landing Historic District	3.0	3	0	6.0	High
Historic Properties					
Wynne's Folly	0.4	2	1	1.4	Low
Davis High School	1.0	1	1	1.0	Low
The Inkwell/Octogon House	0.4	2	1	1.4	Low
Mattamuskeet Lodge	2.2	2	1	3.2	Medium

Figure 6.16 – Historic and Cultural Resources Vulnerability

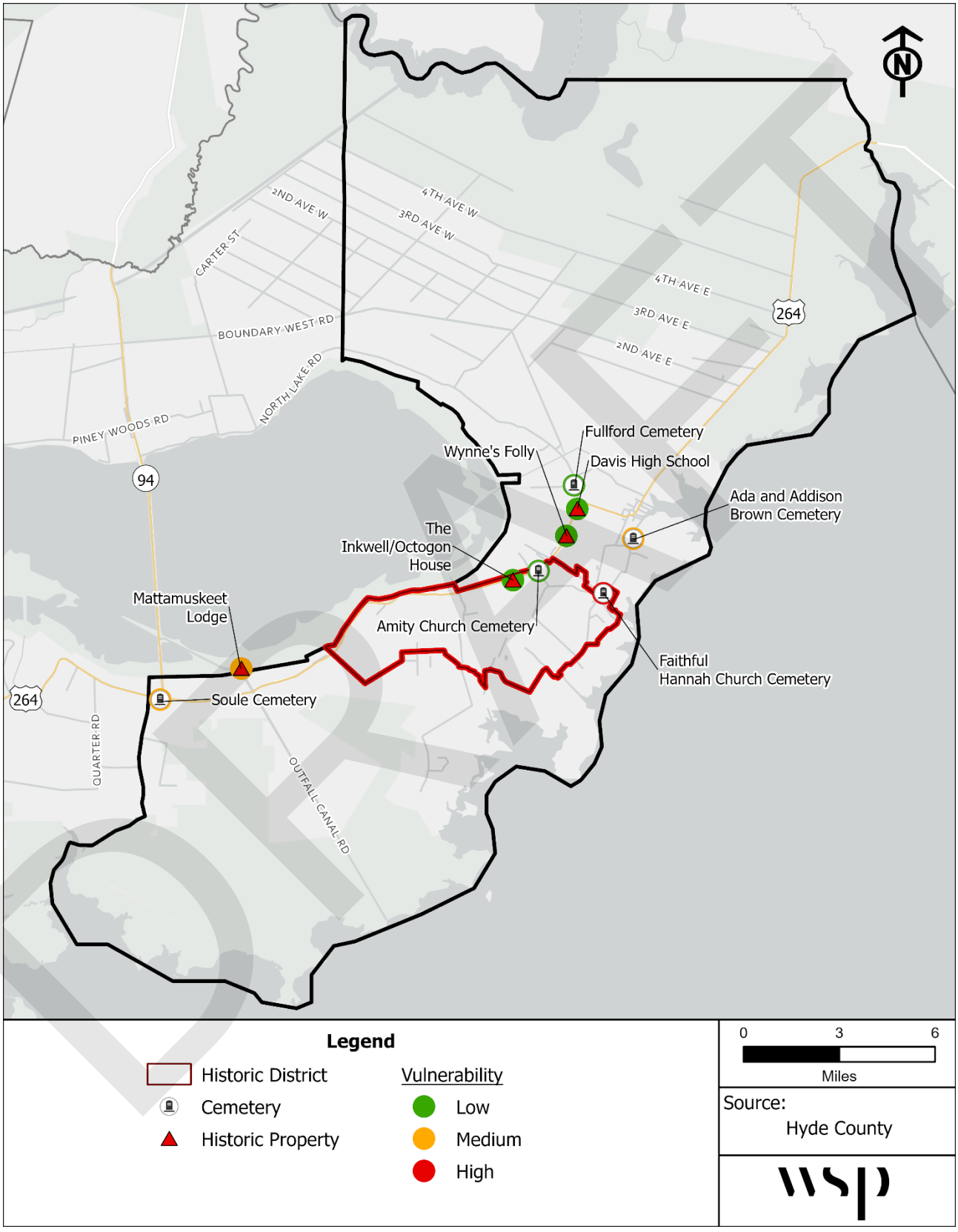


Table 6.17 – Natural Resources Vulnerability

	VULNERABILITY CRITERIA				
ASSET	EXPOSURE SCORE	SENSITIVITY SCORE	ADAPTIVE CAPACITY SCORE	VULNERABILITY SCORE	VULNERABILITY RATING
Alligator River National Wildlife Refuge	2.4	0	3	-0.6	Low
Dare County Air Force Range	2.4	0	3	-0.6	Low
Emily and Richardson Pryer Buckridge Coastal Reserve	2.2	0	3	-0.8	Low
Gull Rock Game Land	3.0	0	3	0.0	Low
Swanquarter National Wildlife Refuge	3.0	0	3	0.0	Low
Mattamuskeet National Wildlife Refuge	2.4	1	3	0.4	Low
Hyde County Open Space	2.4	2	3	1.4	Low
Hyde County Open Space	2.4	1	3	0.4	Low
NC Department of Transportation Mitigation Site	2.8	1	3	0.8	Low
NC Department of Transportation Mitigation Site	1.6	0	3	-1.4	Low
NC Wildlife Resources Commission Engelhard Access Area	3.0	0	3	0.0	Low
NC Hazard Mitigation Buyout Property - Hyde County	2.2	2	3	1.2	Low
NC Hazard Mitigation Buyout Property - Hyde County	2.4	1	3	0.4	Low
NC Hazard Mitigation Buyout Property - Hyde County	2.2	1	3	0.2	Low
NCDEQ Wellhead Protection Area	2.2	0	1	1.2	Low
Wetland Reserve Program Easement	2.4	0	3	-0.6	Low
Wetland Reserve Program Easement	2.2	1	3	0.2	Low
Wetland Reserve Program Easement	2.4	0	3	-0.6	Low
Wetland Reserve Program Easement	2.2	1	3	0.2	Low
Wetland Reserve Program Easement	2.4	0	3	-0.6	Low
Wetland Reserve Program Easement	2.2	1	3	0.2	Low
Wetland Reserve Program Easement	2.4	0	3	-0.6	Low
Wetland Reserve Program Easement	2.4	0	3	-0.6	Low
Wetland Reserve Program Easement	2.4	1	3	0.4	Low
Wetland Reserve Program Easement	2.4	1	3	0.4	Low
Wetland Reserve Program Easement	2.4	1	3	0.4	Low

	VULNERABILITY CRITERIA				
ASSET	EXPOSURE SCORE	SENSITIVITY SCORE	ADAPTIVE CAPACITY SCORE	VULNERABILITY SCORE	VULNERABILITY RATING
Wetland Reserve Program Easement	2.4	2	3	1.4	Low
Wetland Reserve Program Easement	2.4	1	3	0.4	Low
Wetland Reserve Program Easement	2.4	1	3	0.4	Low
Wetland Reserve Program Easement	2.4	0	3	-0.6	Low
Wetland Reserve Program Easement	2.4	0	3	-0.6	Low

Note: See map for vulnerability results for farmland and conservation reserve enhancement program easements (all have low vulnerability)

Figure 6.17 – Natural Resource Vulnerability

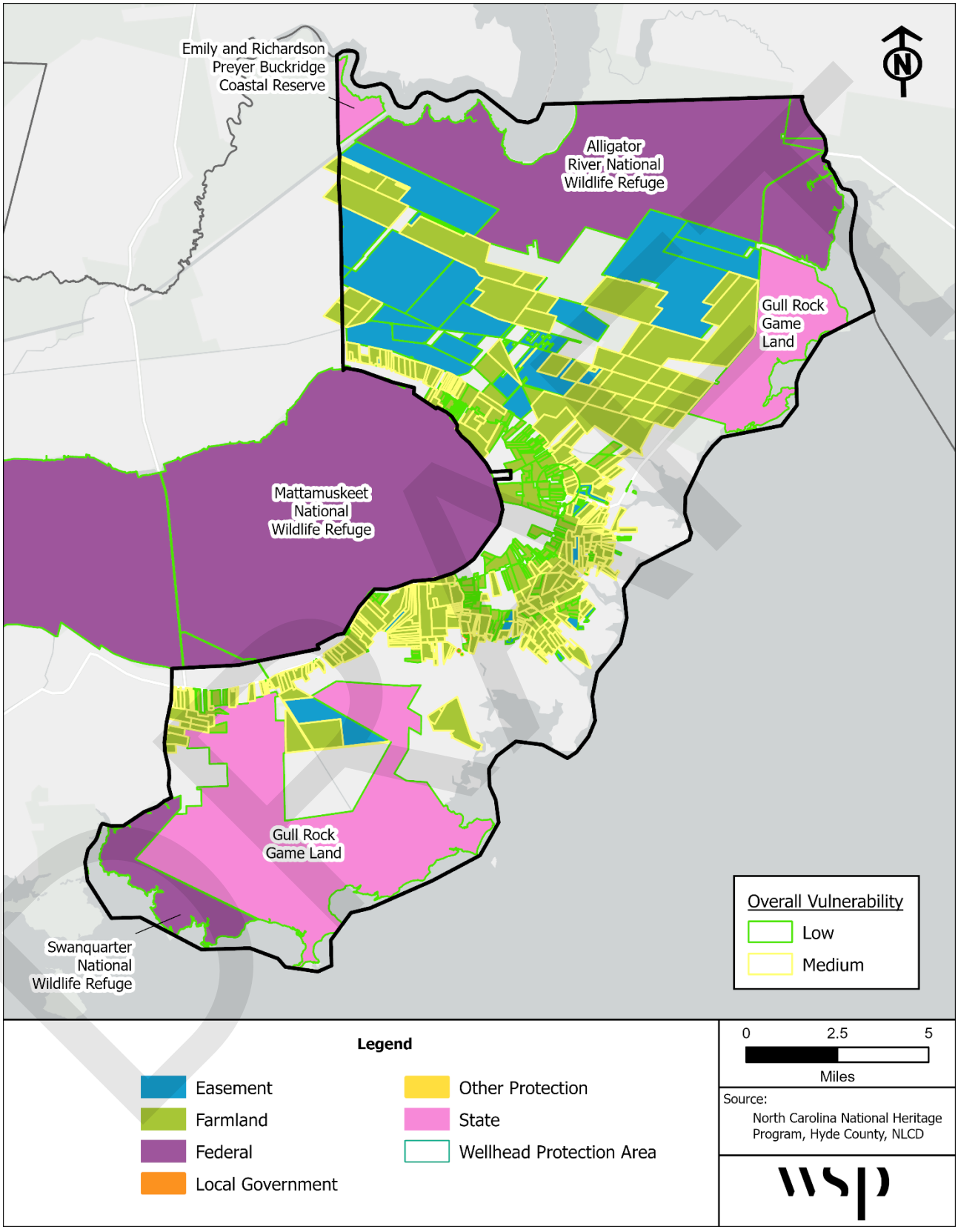


Table 6.18 – Road Vulnerability

	VULNERABILITY SCORES (% OF ROAD SEGMENT)							
	RIVERINE VULNERABILITY				COASTAL VULNERABILITY			
ASSET	LOW	MEDIUM	HIGH	N/A	LOW	MEDIUM	HIGH	N/A
Airport Rd	98%	0%	0%	2%	98%	0%	0%	2%
Arch Rd	34%	54%	5%	7%	93%	0%	0%	7%
Cahoon Rd	0%	5%	89%	6%	5%	89%	0%	6%
Chat & Thomas Rd	0%	13%	13%	74%	15%	10%	0%	75%
Collins Ln	0%	4%	96%	0%	15%	80%	4%	1%
Cooper Ln	0%	28%	70%	2%	40%	58%	0%	2%
Faithful Hannah Church Rd	0%	0%	100%	0%	0%	60%	40%	0%
Farrow Fork Rd	64%	32%	4%	0%	98%	2%	0%	0%
Golden St	10%	10%	77%	3%	26%	35%	39%	0%
Goshen Back Rd	15%	42%	43%	0%	59%	28%	12%	1%
Goshen Rd	5%	75%	20%	0%	86%	13%	0%	1%
Great Ditch Rd	58%	41%	1%	0%	99%	1%	0%	0%
Green Hill Road	82%	0%	0%	18%	82%	0%	0%	18%
Gull Rock Rd	68%	14%	18%	0%	87%	13%	0%	0%
Gum Swamp Rd	59%	29%	9%	3%	88%	9%	0%	3%
Hill St	15%	26%	56%	3%	48%	44%	0%	8%
Horse Shoe Loop Rd	0%	11%	89%	0%	16%	84%	0%	0%
Hycienda Heights	85%	0%	0%	15%	85%	0%	0%	15%
Hydeland Rd	1%	7%	91%	1%	15%	83%	1%	1%
Juniper Bay Rd	62%	38%	0%	0%	100%	0%	0%	0%
Lake Swamp Rd	100%	0%	0%	0%	100%	0%	0%	0%
Lakeview Rd	97%	0%	0%	3%	97%	0%	0%	3%
Lazy Ln	4%	68%	28%	0%	78%	22%	0%	0%
Main St	100%	0%	0%	0%	100%	0%	0%	0%
Maple Rd	83%	17%	0%	0%	100%	0%	0%	0%
Marsh Rd	0%	2%	98%	0%	15%	85%	0%	0%
Mt Pleasant Village Rd	13%	33%	53%	1%	59%	40%	0%	1%
Mt Sinai Rd	0%	4%	96%	0%	4%	84%	12%	0%

	VULNERABILITY SCORES (% OF ROAD SEGMENT)							
	RIVERINE VULNERABILITY				COASTAL VULNERABILITY			
ASSET	LOW	MEDIUM	HIGH	N/A	LOW	MEDIUM	HIGH	N/A
Mulberry Rd	27%	63%	3%	7%	90%	0%	0%	10%
Nebraska Rd	19%	48%	33%	0%	71%	27%	2%	0%
New Holland Rd	98%	0%	0%	2%	98%	0%	0%	2%
North Lake Rd	92%	8%	0%	0%	100%	0%	0%	0%
Pleasant Grove Rd	100%	0%	0%	0%	100%	0%	0%	0%
Radar Rd	3%	51%	45%	1%	64%	35%	0%	1%
Roper Ln	0%	3%	97%	0%	3%	38%	59%	0%
Scrouge Town Rd	100%	0%	0%	0%	100%	0%	0%	0%
Shaw Rd	0%	0%	100%	0%	0%	100%	0%	0%
Silver Ln	0%	0%	91%	9%	0%	64%	36%	0%
Slocum Ln	0%	27%	69%	4%	35%	58%	0%	7%
St Lydia Rd	0%	34%	61%	5%	0%	59%	39%	2%
Swamp Rd	73%	25%	1%	1%	100%	0%	0%	0%
The High Rd	52%	41%	7%	0%	96%	4%	0%	0%
US 264 Hwy E	99%	1%	0%	0%	100%	0%	0%	0%
Whipping Creek Rd	71%	13%	0%	16%	84%	0%	0%	16%
White Plains Rd	6%	20%	74%	0%	36%	63%	0%	1%

Figure 6.18 – Road Vulnerability: Riverine Flooding

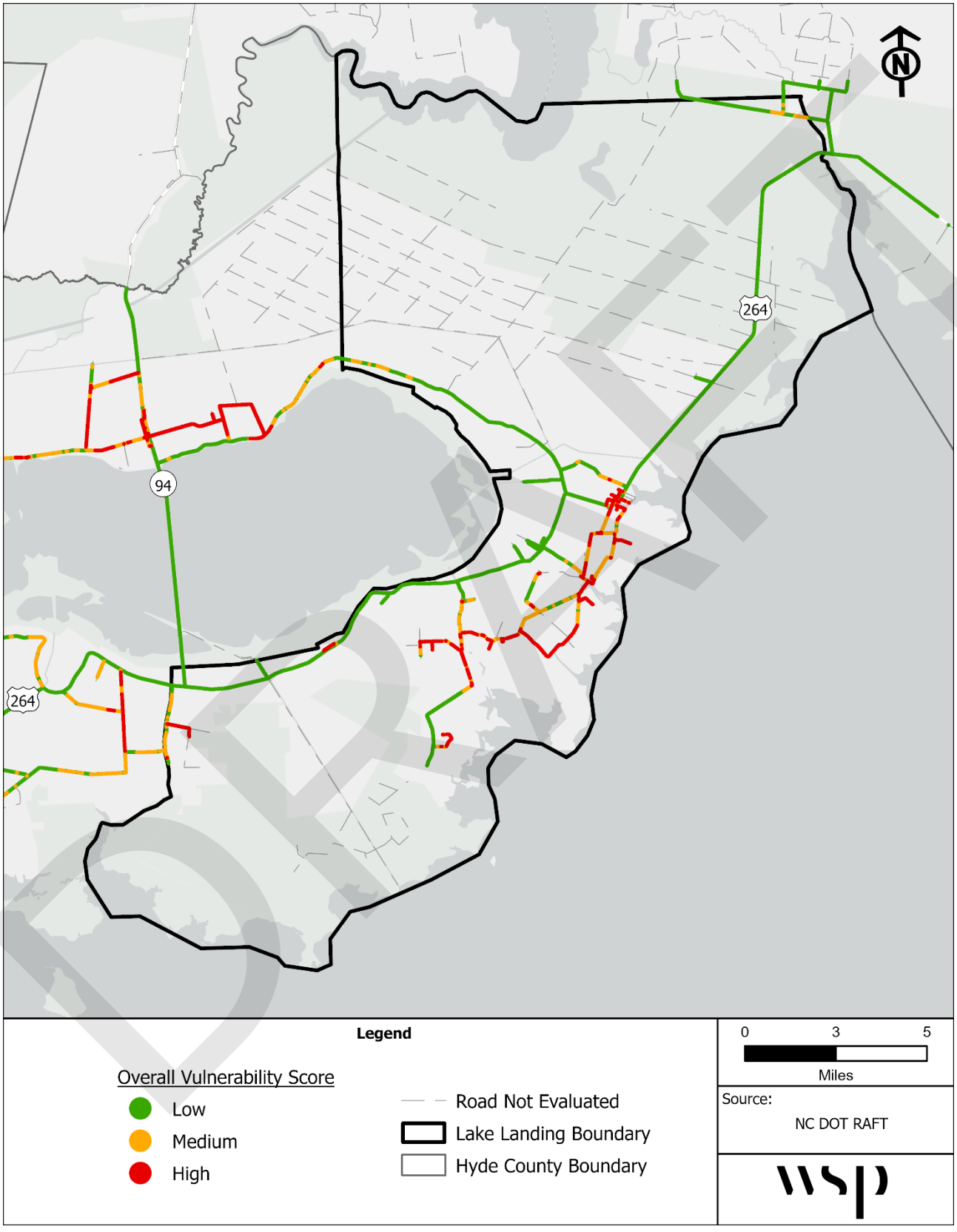
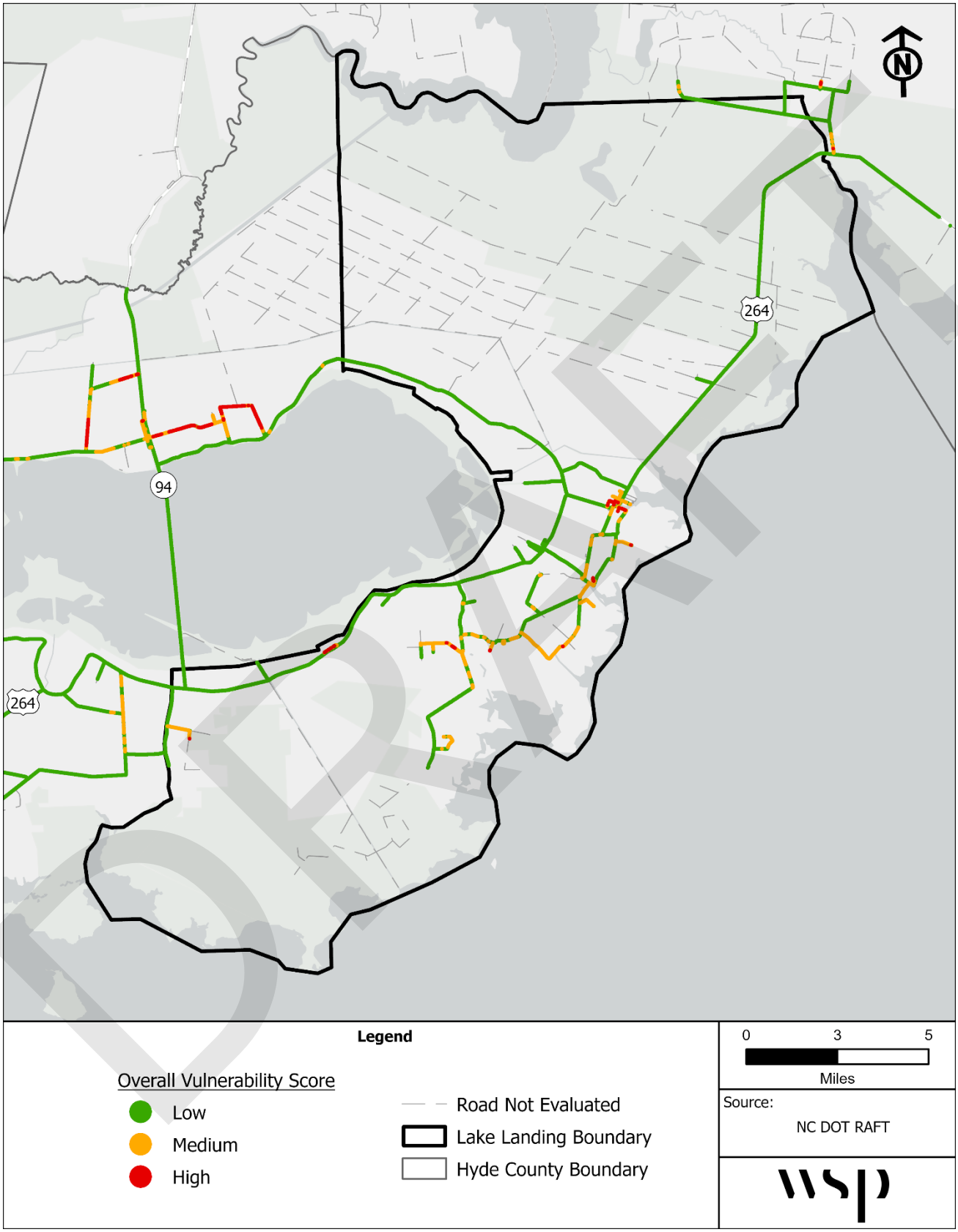


Figure 6.19 – Road Vulnerability: Coastal Flooding



6.5.3 Vulnerability Assessment Key Takeaways

Buildings and Infrastructure

Only four buildings and infrastructure assets have high vulnerability: Hyde County Convenience Site, Sanitary District Treatment, Business District, and Sanitary District. All four sites have high exposure, high or medium sensitivity, and low or no adaptive capacity. The sanitary district and the business district contain additional assets that have varying levels of individual exposure and vulnerability. Twenty-two assets, or 24 percent of the buildings and infrastructure assets, have medium vulnerability. This includes business, communication, drainage district, drainage infrastructure, public safety, and transportation assets. They have medium to high exposure, a range of sensitivity scores, and medium adaptive capacity.

The remaining 72 percent of assets have low vulnerability. While most of these assets have high to medium exposure, they tend to have low sensitivity and medium adaptive capacity. Some building and infrastructure assets are essential to government and emergency operations, support the provision of essential services, or are otherwise integral to protecting health and safety and other key functions of the community. Most of these assets have low vulnerability, however damage to these assets can still cause a disruption of essential services or make certain facilities inaccessible.

About 68 percent of low vulnerability assets are drainage infrastructure that are highly exposed to the evaluated flood hazards but are also built to handle high water. However, these assets are critical in managing flood in Lake Landing and should be monitored and maintained to ensure their continued efficacy and adaptive capacity; supplementing these assets to provide greater redundancy in drainage management can support their function and the protection they provide to other critical assets.

Several businesses have low overall vulnerability but also low adaptive capacity, which indicates that they are not the most at risk assets but if damaged they would have difficulty recovering or residents may have difficulty accessing similar services.

Historic and Cultural Resources

Two historic and cultural assets have high vulnerability – Lake Landing Historic District and Faithful Hannah Church Cemetery. Both have high exposure, high sensitivity, and low or no adaptive capacity. Four assets have medium vulnerability – they have medium exposure, medium sensitivity, and low adaptive capacity. The remaining five historic and cultural assets have low vulnerability, primarily resulting from low exposure and low to medium sensitivity.

Historic and cultural places, in many cases, are irreplaceable or difficult to repair. Flooding of historic buildings can cause structural damage, damage to furnishings and fittings, and ruin porous materials like old masonry. Such repairs can be difficult and expensive to complete. Buildings with a demonstrable risk of flooding can implement adaptive treatments to reduce the risk of flood damage as much as possible, but should do so without destroying significant historic materials, features, or spaces.

Natural Resources

Over half of the assessed natural resources (52 percent) have low vulnerability. These resources are wetlands, open space, and conservation areas, which have low sensitivity to flooding and high adaptive capacity. Wetlands, conservation land, and open space play an important role in mitigating heavy floods by increasing infiltration, limiting runoff, and protecting more sensitive land from highwater and storm surge.

The remaining 48 percent of natural resources have medium vulnerability and only consist of farmland due to these parcels' sensitivity to tidal flooding and saltwater intrusion.

Roads and Evacuation Routes

Forty-five roads were evaluated, encompassing over 77 miles. Fifteen percent of the assessed miles have high vulnerability to riverine flooding. Seventeen roads have 50 percent or more of their segments rated as high vulnerability. The following roads have 90 percent or more high vulnerability along their segments: Collins Ln, Faithful Hannah Church Rd, Hydeland Rd, Marsh Rd, Mt Sinai Rd, Roper Ln, Shaw Rd, and Silver Ln. The Faithful Hannah Church Rd and Shaw Rd segments have 100 percent high vulnerability. Seventeen percent of the assessed roads have medium vulnerability and the majority, 66 percent, have low vulnerability to riverine flooding.

Only one percent of the assessed miles has high vulnerability to coastal flooding. Roper Ln was the road with the largest proportion of high vulnerability areas along its segment – 59 percent of the segment has high vulnerability. The majority, 85 percent, of the assessed miles have low vulnerability. The following roads have 100 percent low vulnerability: Juniper Bay Rd, Lake Swamp Rd, Main St, Maple Rd, North Lake Rd, Pleasant Grove Rd, Scrouge Town Rd, Swamp Rd, US 264 Hwy E.

Most of the roads have varying vulnerability along their segments, however, most of the assessed milage has low vulnerability to riverine and coastal flooding. However, even partially inundated roadways can interrupt other critical services, particularly those necessary during severe weather events, like EMS accessibility and evacuation. The most vulnerable roads are those with the largest proportion of high vulnerability segments. For example, all the road points along Faithful Hannah Church Rd, have high vulnerability for the riverine flooding scenario. Inundated roadways can interrupt other critical services, particularly those necessary during severe weather events, like EMS accessibility and evacuation.