



Northeastern NC Regional **HAZARD MITIGATION PLAN**



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1 INTRODUCTION

Section 1 provides a general introduction to hazard mitigation and an introduction to the Northeastern NC Regional Hazard Mitigation Plan. This section contains the following subsections:

- 1.1 Background
- 1.2 Purpose and Authority
- 1.3 Scope
- 1.4 References
- 1.5 Plan Organization

1.1 BACKGROUND

This document comprises a Hazard Mitigation Plan for the Northeastern NC Region of North Carolina.

Each year in the United States, natural and human-caused hazards take the lives of hundreds of people and injure thousands more. Nationwide, taxpayers pay billions of dollars annually to help communities, organizations, businesses, and individuals recover from disasters. These monies only partially reflect the true cost of disasters because additional expenses incurred by insurance companies and non-governmental organizations are not reimbursed by tax dollars. Many natural hazards are predictable, and much of the damage caused by hazard events can be reduced or even eliminated.

Hazards are a natural part of the environment that will inevitably continue to occur, but there is much we can do to minimize their impacts on our communities and prevent them from resulting in disasters. Every community faces different hazards, has different resources to draw upon in combating problems, and has different interests that influence the solutions to those problems. Because there are many ways to deal with hazards and many agencies that can help, there is no one solution for managing or mitigating their effects. Planning is one of the best ways to develop a customized program that will mitigate the impacts of hazards while accounting for the unique character of a community.

A well-prepared hazard mitigation plan will ensure that all possible activities are reviewed and implemented so that the problem is addressed by the most appropriate and efficient solutions. It can also coordinate activities with each other and with other goals and activities, preventing conflicts and reducing the costs of implementing each individual activity. This plan provides a framework for all interested parties to work together toward mitigation. It establishes the vision and guiding principles for reducing hazard risk and proposes specific mitigation actions to eliminate or reduce identified vulnerabilities.

In an effort to reduce the nation's mounting natural disaster losses, the U.S. Congress passed the Disaster Mitigation Act of 2000 (DMA 2000) to invoke new and revitalized approaches to mitigation planning. Section 322 of DMA 2000 emphasizes the need for state and local government entities to closely coordinate on mitigation planning activities and makes the development of a hazard mitigation plan a specific eligibility requirement for any local government applying for federal mitigation grant funds. These funds include the Hazard Mitigation Grant Program (HMGP), the Building Resilient Infrastructure & Communities (BRIC) program, and the Flood Mitigation Assistance (FMA) Program, all of which are administered by the Federal Emergency Management Agency (FEMA) under the Department of Homeland Security. Communities with an adopted and federally approved hazard mitigation plan thereby become pre-positioned and more apt to receive available mitigation funds before and after the next disaster strikes.

This plan was prepared in coordination with FEMA Region 4 and the North Carolina Division of Emergency Management (NCEM) to ensure that it meets all applicable federal and state planning

requirements. A Local Mitigation Plan Review Tool, found in Appendix A, provides a summary of FEMA’s current minimum standards of acceptability and notes the location within this plan where each planning requirement is met.

1.2 PURPOSE AND AUTHORITY

This plan was developed in a joint and cooperative manner by members of a Hazard Mitigation Planning Committee (HMPC) which included representatives of County, City, and Town departments, federal and state agencies, citizens, and other stakeholders. This plan will ensure all jurisdictions in the Northeastern Region remain eligible for federal disaster assistance including FEMA HMGP, BRIC, and FMA programs.

This plan has been prepared in compliance with Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), 42 U.S.C. 5165, enacted under Section 104 of DMA 2000, Public Law 106-390 of October 30, 2000, as implemented at CFR 201.6 and 201.7 dated October 2007. Additionally, this plan will be monitored and updated on a routine basis in compliance with the above legislation and with the National Flood Insurance Act of 1968, as amended by 42 U.S.C. 4001 et seq, and North Carolina General Statutes, Chapter 166A: North Carolina Emergency Management Act, as amended by Senate Bill 300: An Act to Amend the Laws Regarding Emergency Management as Recommended by the Legislative Disaster Response and Recovery Commission (2001).

This plan will be adopted by each participating jurisdiction in accordance with standard local procedures under the authority and police powers granted to counties as defined by the State of North Carolina (N.C.G.S., Chapter 153A) and the authority granted to cities and towns as defined by the State of North Carolina (N.C.G.S., Chapter 160A). Copies of adoption resolutions are provided in Section 9 Plan Adoption.

1.3 SCOPE

This document comprises a Regional Hazard Mitigation Plan for the Northeastern NC Region. The planning areas includes all incorporated municipalities and unincorporated areas listed in Table 1.1.

Table 1.1 – Participating Jurisdictions in the Northeastern NC Regional Hazard Mitigation Plan

Bertie County		
Askewville	Roxobel	Powellsville
Colerain	Aulander	Windsor
Lewiston-Woodville	Kelford	
Hyde County*		
Martin County		
Bear Grass	Parmelee	Hassell
Hamilton	Williamston	Oak City
Jamesville	Everetts	Robersonville
Tyrrell County		
Columbia		
Washington County		
Creswell	Plymouth	Roper

* There are no incorporated jurisdictions in Hyde County

The Northeastern NC Region followed the planning process prescribed by FEMA, and this plan was developed under the guidance of a HMPC, comprised of representatives of County and Town departments; citizens; and other stakeholders. The HMPC conducted a risk assessment that identified and profiled hazards that pose a risk to the planning area, assessed the planning area's vulnerability to these hazards, and examined each participating jurisdiction's capabilities in place to mitigate them.

The plan evaluates and prioritizes hazards for the planning area using a Priority Risk Index, as determined through the risk and vulnerability assessments. Hazards are categorized as "low," "moderate," or "high" priority, however, mitigation strategies are identified for all profiled hazards. The hazards profiled in this plan include:

- Dam & Levee Failure
- Drought
- Earthquake
- Excessive Heat
- Flooding
- Hurricanes & Coastal Hazards
- Tornadoes & Thunderstorms
- Severe Winter Weather
- Sinkholes
- Wildfire
- Hazardous Substances

1.4 REFERENCES

The following FEMA guides and reference documents were used to prepare this document:

- FEMA 386-1: Getting Started: Building Support for Mitigation Planning. September 2002.
- FEMA 386-2: Understanding Your Risks: Identifying Hazards and Estimating Losses. August 2001.
- FEMA 386-3: Developing the Mitigation Plan. April 2003.
- FEMA 386-4: Bringing the Plan to Life. August 2003.
- FEMA 386-5: Using Benefit-Cost Review in Mitigation Planning. May 2007.
- FEMA 386-6: Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning. May 2005.
- FEMA 386-7: Integrating Manmade Hazards into Mitigation Planning. September 2003.
- FEMA 386-8: Multijurisdictional Mitigation Planning. August 2006.
- FEMA 386-9: Using the Hazard Mitigation Plan to Prepare Successful Mitigation Projects. August 2008.
- FEMA. Local Mitigation Planning Handbook. June 2025.
- FEMA. Local Mitigation Planning Policy Guide. April 11, 2025.
- FEMA Hazard Mitigation Assistance Program and Policy Guide. January 20, 2025.
- FEMA Hazard Mitigation Assistance Unified Guidance. June 1, 2010.
- FEMA. Integrating Hazard Mitigation into Local Planning: Case Studies and Tools for Community Officials. March 1, 2013.
- FEMA. Mitigation Ideas. A Resource for Reducing Risk to Natural Hazards. January 2013.
- FEMA National Fire Incident Reporting System 5.0: Complete Reference Guide. January 2008.

Additional sources used in the development of this plan, including data compiled for the hazard identification and risk assessment, capability assessment, and mitigation strategy, are listed in Appendix D.

1.5 PLAN ORGANIZATION

The Northeastern NC Regional Hazard Mitigation Plan is organized into the following sections:

- Section 1: Introduction
- Section 2: Planning Process
- Section 3: Planning Area Profile
- Section 4: Risk Assessment
- Section 5: Capability Assessment
- Section 6: Mitigation Strategy
- Section 7: Mitigation Action Plans
- Section 8: Plan Maintenance
- Section 9: Plan Adoption
- Annexes
- Appendix A: Local Plan Review Tool
- Appendix B: Planning Process Documentation
- Appendix C: Mitigation Alternatives
- Appendix D: References

2 PLANNING PROCESS

Requirement §201.6(b): An open public involvement process is essential to the development of an effective plan. To develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:

- 1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;
- 2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia, and other private and nonprofit interests to be involved in the planning process; and
- 3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

Requirement §201.6(c)(1): The plan shall include the following:

- 1) Documentation of the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

This section provides a review of the planning process followed for the development of the Northeastern NC Regional Hazard Mitigation Plan. It consists of the following sub-sections:

- 2.1 Purpose and Vision
- 2.2 History of Hazard Mitigation Planning
- 2.3 Preparing the Plan
- 2.4 Hazard Mitigation Planning Committee
- 2.5 Meetings and Workshops
- 2.6 Involving the Public
- 2.7 Outreach Efforts
- 2.8 Involving the Stakeholders
- 2.9 Documentation of Plan Progress

2.1 PURPOSE AND VISION

As defined by FEMA, “hazard mitigation” means any sustained action taken to reduce or eliminate the long-term risk to life and property from a hazard event. Hazard mitigation planning is the process through which hazards are identified, likely impacts determined, mitigation goals set, and appropriate mitigation strategies determined, prioritized, and implemented.

The purpose of the Northeastern NC Regional Hazard Mitigation Plan is to identify, assess, and mitigate hazard risk to better protect the people and property within the Region from the effects of natural and human-caused hazards. This plan documents progress on existing hazard mitigation planning efforts, updates the previous plan to reflect current conditions in the Region including relevant hazards and vulnerabilities, increases public education and awareness about the plan and planning process, maintains grant eligibility for participating jurisdictions, maintains compliance with state and federal requirements for local hazard mitigation plans, and identifies and outlines strategies the Region’s participating jurisdictions will use to decrease vulnerability and increase resiliency.

During the development of the 2021 Northeastern NC Regional Hazard Mitigation Plan, the Hazard Mitigation Planning Committee (HMPC) developed a vision for the Region in terms of hazard mitigation planning by considering what the successful implementation of the plan would achieve, what outcomes the plan would generate, and what the Region will look like in the future. This vision statement, presented below, remains relevant to define and guide the planning process and the Region’s approach to hazard mitigation:

The vision of the Northeastern NC Regional Hazard Mitigation Plan is to establish sound public policy to protect life, property, and the quality of the natural environment; and to reduce risk and prevent loss from future hazard events.

2.2 WHAT'S CHANGED IN THE PLAN

This plan is an update to the 2021 Northeastern NC Regional Hazard Mitigation Plan, which included participation from Bertie, Hyde, Martin, Tyrell, and Washington Counties and was approved by FEMA on April 13, 2021.

This hazard mitigation plan update involved a comprehensive review and update of each section of the existing plan and an assessment of the success of the Counties and participating municipalities in evaluating, monitoring and implementing the mitigation strategy outlined in their existing plans. Only the information and data still valid from the existing plans was carried forward as applicable into this update. The following requirements were addressed during the development of this regional plan:

- Consider changes in vulnerability due to action implementation;
- Document success stories where mitigation efforts have proven effective;
- Document areas where mitigation actions were not effective;
- Document any new hazards that may arise or were previously overlooked;
- Incorporate new data or studies on hazards and risks;
- Incorporate new capabilities or changes in capabilities;
- Incorporate growth and development-related changes to inventories; and
- Incorporate new action recommendations or changes in action prioritization.

Section 4.2 provides a comparison of the hazards addressed in the 2023 State of North Carolina HMP and the 2021 Northeastern NC Regional plan and provides the final decision made by the HMPC as to which hazards should be included in the updated 2026 Northeastern NC Regional Plan.

In addition to the specific changes in hazard analyses identified in Section 4.2, the following items were also addressed in this 2026 plan update:

- GIS was used, to the extent data allowed, to analyze the priority hazards as part of the vulnerability assessment.
- Assets at risk to identified hazards were identified by property type and values of properties based on current data in North Carolina Emergency Management's IRISK Database.
- An updated discussion on the effects of climate change and other future conditions was included in each hazard profile in the risk assessment.
- The discussion on growth and development trends was enhanced utilizing 2023 American Community Survey data.
- An effort was made to provide underserved communities and vulnerable populations with opportunities to participate in and contribute to the plan update process. Engagement opportunities were provided through the public survey, the plan website, and stakeholder coordination.

- Enhanced public outreach and agency coordination efforts were conducted throughout the plan update process in order to meet the more rigorous requirements of the 2017 CRS Coordinator’s Manual, in addition to DMA requirements.

2.3 PREPARING THE PLAN

The planning process for preparing the Northeastern NC Regional Hazard Mitigation Plan was based on DMA planning requirements and FEMA’s associated guidance. This guidance is structured around a four-phase process:

- 1 Planning Process;
- 2 Risk Assessment;
- 3 Mitigation Strategy; and
- 4 Plan Maintenance.

Into this process, the planning consultant integrated a more detailed 10-step planning process used for FEMA’s CRS and FMA programs. Thus, the modified 10-step process used for this plan meets the requirements of six major programs: FEMA’s HMGP; BRIC program; CRS; FMA program; and Severe Repetitive Loss Program; and new flood control projects authorized by the U.S. Army Corps of Engineers.

Table 2.1 shows how the 10-step CRS planning process aligns with the four phases of hazard mitigation planning pursuant to the Disaster Mitigation Act of 2000.

Table 2.1 – Mitigation Planning and CRS 10-Step Process Reference Table

DMA Process	CRS Process
Phase I – Planning Process	
§201.6(c)(1)	Step 1. Organize to Prepare the Plan
§201.6(b)(1)	Step 2. Involve the Public
§201.6(b)(2) & (3)	Step 3. Coordinate
Phase II – Risk Assessment	
§201.6(c)(2)(i)	Step 4. Assess the Hazard
§201.6(c)(2)(ii) & (iii)	Step 5. Assess the Problem
Phase III – Mitigation Strategy	
§201.6(c)(3)(i)	Step 6. Set Goals
§201.6(c)(3)(ii)	Step 7. Review Possible Activities
§201.6(c)(3)(iii)	Step 8. Draft an Action Plan
Phase IV – Plan Maintenance	
§201.6(c)(5)	Step 9. Adopt the Plan
§201.6(c)(4)	Step 10. Implement, Evaluate and Revise the Plan

In addition to meeting DMA and CRS requirements, this plan also meets the recommended steps for developing a Community Wildfire Protection Plan (CWPP). Table 2.2 below outlines the recommended CWPP process and the CRS step and sections of this plan that meet each step.

Table 2.2 – Community Wildfire Protection Plan Process Reference

CWPP Process	CRS Step	Fulfilling Plan Section
Convene decision makers	Step 1	Section 2 – HMPC
Involve Federal agencies	Step 3	Section 2 – Involving Stakeholders

CWPP Process	CRS Step	Fulfilling Plan Section
Engage interested parties (such as community representatives)	Step 1, 2, and 3	Section 2 – HMPC, Involving the Public, Involving Stakeholders
Establish a community base map		Section 4 – Wildfire
Develop a community risk assessment, including fuel hazards, risk of wildfire occurrence, homes, business and essential infrastructure at risk, other community values at risk, local preparedness, and firefighting capability	Step 4 and 5	Section 4 – Wildfire Section 6 – Capability
Establish community hazard reduction priorities and recommendations to reduce structural ignitability	Step 6, 7, and 8	Section 6 – Mitigation Strategy Section 7 – Mitigation Action Plans
Develop an action plan and assessment strategy	Step 8 and 10	Section 7 – Mitigation Action Plans Section 8 – Plan Maintenance
Finalize the CWPP	Step 9	Section 9 – Plan Adoption

The process followed for the preparation of this plan, as outlined in Table 2.1 above, is as follows:

2.3.1 PHASE I – PLANNING PROCESS

Planning Step 1: Organize to Prepare the Plan

With the Region’s commitment to participate in the DMA planning process, community officials worked to establish the framework and organization for development of the plan. An initial meeting was held with key community representatives to discuss the organizational aspects of the plan development process. The County Emergency Managers led each County’s effort to reorganize and coordinate for the plan update. Consultants from WSP assisted by leading the Region through the planning process and preparing the plan document.

Planning Step 2: Involve the Public

Public involvement in the development of the plan was sought using various methods, as detailed in Section 2.6.

Planning Step 3: Coordinate

The Hazard Mitigation Planning Committee (HMPC) formed for development of the 2021 plan was reconvened for this plan update. Where necessary, additional members were added to the HMPC. Each community also sought to incorporate stakeholder and public participation on the HMPC. More details on the HMPC are provided in Section 2.4. Stakeholder coordination was incorporated into the formation of the HMPC and was also sought through additional outreach methods, which are detailed in Section 2.8.

Coordination with Other Community Planning Efforts and Hazard Mitigation Activities

In addition to stakeholder involvement, coordination with other community planning efforts was also seen as paramount to the success of this plan. Mitigation planning involves identifying existing policies, tools, and actions that will reduce a community’s risk and vulnerability to hazards. The Northeastern NC Region participating jurisdictions use a variety of planning mechanisms, such as Comprehensive Plans, subdivision regulations, building codes, and ordinances to guide growth and development. Integrating existing planning efforts, mitigation policies, and action strategies into this plan establishes a credible and comprehensive plan that ties into and supports other community programs. As detailed in Table 2.3, the

development of this plan incorporated information from existing plans, studies, reports, and initiatives as well as other relevant data from neighboring communities and other jurisdictions.

These and other documents were reviewed and considered, as appropriate, during the collection of data to support the planning process and plan development, including the hazard identification, risk and vulnerability assessment, and capability assessment. The Hazard Identification and Risk Assessment can be found in Section 4 and the Capability Assessment can be found in Section 5.

Table 2.3 – Summary of Existing Studies and Plans Reviewed

Resource Referenced	Use in this Plan
Local Comprehensive Plans	Local comprehensive plans from around the region were referenced in the Planning Area Profile in Section 3. Other local comprehensive plans were incorporated into Mitigation Action Plans where applicable in Section 7 and referenced in the Capability Assessment in Section 5.
Local Ordinances (Flood Damage Prevention Ordinances, Subdivision Ordinances, Zoning Ordinances, etc.)	Local ordinances were referenced in the Capability Assessment in Section 5 and where applicable for updates or enforcement in Mitigation Action Plans in Section 7.
Bertie, Hyde, Martin, Tyrrell, and Washington Flood Insurance Studies (FIS)	The Flood Insurance Studies were referenced during preparation of the flood hazard profile in Section 4.
Northeastern NC Regional Hazard Mitigation Plan, 2021	The previous plan was referenced in compiling the Hazard Identification and Risk Assessment in Section 4 and in reporting on implementation status and developing the Mitigation Action Plans in Section 2 and Section 7, respectively.
Albemarle Regional Resilience Portfolio, Mid-East Regional Resilience Portfolio	These plans were referenced in the Capability Assessment in Section 5 and for development of the Mitigation Action Plans in Section 7.
Resilient Coastal Communities Program Resilience Strategies (Bertie County, Aulander, Windsor, Hyde County (Ocracoke), Washington County, Creswell, Plymouth)	These plans were referenced in the Capability Assessment in Section 5 and for development of the Mitigation Action Plans in Section 7.
2023 North Carolina State Hazard Mitigation Plan	The State plan was references in compiling the Hazard Identification and Risk Assessment in Section 4.

2.3.2 PHASE II – RISK ASSESSMENT

Planning Steps 4 and 5: Identify/Assess the Hazard and Assess the Problem

The HMPC completed a comprehensive effort to identify, document, and profile all hazards that have, or could have, an impact on the planning area. Geographic information systems (GIS) were used to display, analyze, and quantify hazards and vulnerabilities. A draft of the risk and vulnerability assessment was made available on the plan website for the HMPC, stakeholders, and the public to review and comment.

The HMPC also conducted a capability assessment to review and document the planning area's current capabilities to mitigate risk from and vulnerability to hazards. By collecting information about existing government programs, policies, regulations, ordinances, and emergency plans, the HMPC could assess

those activities and measures already in place that contribute to mitigating some of the risks and vulnerabilities identified. A more detailed description of the risk assessment process and the results are included in Section 4 Risk Assessment.

2.3.3 PHASE III – MITIGATION STRATEGY

Planning Steps 6 and 7: Set Goals and Review Possible Activities

WSP facilitated brainstorming and discussion sessions with the HMPC that described the purpose and process of setting planning goals and objectives and reviewing a comprehensive range of mitigation alternatives and provided a method of selecting and defending recommended mitigation actions using a series of selection criteria. This information is included in Section 6 Mitigation Strategy.

Planning Step 8: Draft an Action Plan

A complete first draft of the plan was prepared based on input from the HMPC regarding the draft risk assessment and the goals and activities identified in Planning Steps 6 and 7. This draft was shared for HMPC, stakeholder, and public review and comment via the plan website. HMPC, public, and stakeholder comments were integrated into the final draft for the NCEM and FEMA Region 4 to review and approve, contingent upon final adoption by the County and its participating jurisdictions.

2.3.4 PHASE IV – PLAN MAINTENANCE

Planning Step 9: Adopt the Plan

To secure buy-in and officially implement the plan, the plan will be reviewed and adopted by all participating jurisdictions. Resolutions will be provided in Section 9.

Planning Step 10: Implement, Evaluate and Revise the Plan

Implementation and maintenance of the plan is critical to the overall success of hazard mitigation planning. Up to this point in the planning process, the HMPC's efforts have been directed at researching data, coordinating input from participating entities, and developing mitigation actions. Section 8 Plan Maintenance provides an overview of the strategy for plan implementation and maintenance and outlines the method and schedule for monitoring, updating, and evaluating the plan. The Section also discusses incorporating the plan into existing planning mechanisms and how to continue public involvement.

2.4 HAZARD MITIGATION PLANNING COMMITTEE

This hazard mitigation plan was developed under the guidance of a planning committee comprising representatives of county and town departments, federal and state agencies, citizens, and stakeholders.

To reconvene the HMPC, County Emergency Managers and County Planning Directors were asked for their assistance to convene the County, City, and Town HMPC contacts from the previous planning effort. Each community was asked to designate a contact for the HMPC. Communities were also asked to identify local stakeholder representatives to participate on the HMPC alongside the County and Town officials in order to improve the integration of stakeholder input into the plan. Table 2.4 lists the membership of the HMPC, the agencies and jurisdictions that members represented, and members' attendance at meetings. Many of these representatives were involved in the development of the 2021 plan and have since participated in regular plan reviews and maintenance.

SECTION 2: PLANNING PROCESS

Table 2.4 – HMPC Members

Jurisdiction	Representative	Agency/Department	Position/Title or *Stakeholder	HMPC Meeting Attendance			
				Mtg.1	Mtg.2	Mtg.3	Mtg.4
Bertie County	Traci White	Bertie Co Planning	Planning Director	✓	✓		✓
Kelford	Marie Garriss	Town of Kelford	Clerk and Finance Officer		✓		
Windsor	Allen Castelloe	Town of Windsor Administration	Town Administrator	✓	✓		
Hyde County	Kris Noble	Hyde County Administration	County Manager				
Hyde County	Johnny Gibbs	Hyde County ES	Deputy Emergency Manager				✓
Hyde County	Jo Anne Spencer	Spencer True Value Furniture	Citizen/Stakeholder*				
Hyde County	Jeffrey Stotesberry	SQ Volunteer Fire Dept.	Fire Chief*				
Martin County	Jody Griffin	Martin County Emergency Management	EM Director	✓	✓	✓	✓
Bear Grass	Charlotte B. Griffin	Town of Bear Grass	Mayor	✓	✓	✓	✓
Everetts	Ben Jones	Town of Everetts	Commissioner	✓			
Parmelee	Jerry McCrary	Town of Parmelee	Mayor	✓	✓		✓
Robersonville	Tina Brown	Town of Robersonville	Mayor	✓			
Williamston	Andrew Brownfield	Town of Williamston	Town Planner & Zoning Administrator	✓	✓	✓	✓
Tyrrell County	Wesley Hopkins	Tyrrell County Emergency Management	Emergency Mgmt Coordinator				✓
Washington County	Lance Swindell	Emergency Management	EM Coordinator	✓	✓	✓	
Washington County	Connie Barnes	Planning; Emergency Management	Code Enforcement Officer, CERT Team Coordinator	✓	✓		
Washington County	David Clifton	N/A	Citizen/Stakeholder*				
Washington County	Katie Walker	N/A	Citizen/Stakeholder*				
Creswell	Penny Chapman	Town of Creswell	Town Clerk				
Creswell	Ryan Swain	N/A	Citizen/Stakeholder*				
Creswell	Brenda Logan	N/A	Citizen/Stakeholder*				
Creswell	Syble Spruill	N/A	Citizen/Stakeholder*				
Plymouth	Mike Wright	Public Works	Public Works Director				
Plymouth	Joyce Koss	Administration	Accounting Supervisor				

SECTION 2: PLANNING PROCESS

Jurisdiction	Representative	Agency/Department	Position/Title or *Stakeholder	HMPC Meeting Attendance			
				Mtg.1	Mtg.2	Mtg.3	Mtg.4
Plymouth	Vanessa P. Palin	N/A	Citizen/Stakeholder*				
Roper	Jessica Clifton	Town of Roper	Assistant Clerk				
Roper	Raemona Jackson	N/A	Citizen/Stakeholder*				
Roper	Denise Blount	N/A	Citizen/Stakeholder*				
Roper	Charles Sharpe	N/A	Citizen/Stakeholder*				
N/A	Carl Baker	NCEM	Mitigation Plans Manager*		✓	✓	✓
N/A	John Mello	NCEM	Hazard Mitigation Planner*	✓	✓	✓	✓

*Asterisk indicates that the representative is a citizen or outside stakeholder not affiliated with the local government

Several of the jurisdictions elected to designate their respective county official to represent their jurisdiction on the HMPC, generally because they did not have the time or staff to be able to attend on their own. Although these members designated county officials to represent them at in-person meetings, each was still contacted throughout the planning process and participated by providing suggestions and comments on the plan and updates to mitigation actions and local capabilities via emails and phone conversations. These members are listed in Table 2.5 by jurisdiction.

Table 2.5 – Jurisdictions Designating County Representation on the HMPC

Jurisdiction	Representative	Agency/Position
Askewville	Gloria Bryant	Mayor
Aulander	Steven A. Draper	Public Works Director
Colerain	John Adams	Public Works Director
Powellsville	James Peele	Mayor
Roxobel	Gary Johnson	Mayor
Lewiston-Woodville	Diane Harrington	Town Clerk
Hamilton	William Freeman	Mayor Pro Tem
Hassell	Michelle Davis Sledge	Mayor
Jamesville	Kimberly Cockrell	Town Clerk/Finance Officer
Oak City	Sue Harrell	Mayor Pro Tem
Columbia	Monica Mauffray	Town Manager
Creswell	Penny Chapman	Town Clerk
Plymouth	Mike Wright	Public Works Director
Roper	Jessica Clifton	Assistant Clerk

The HMPC led the planning and decision-making efforts throughout the planning process; however, other staff from the participating communities were involved in an advisory role to provide input and local data, review plan drafts, update the status of their respective mitigation actions, and otherwise support the HMPC in this plan update. These were not members of the HMPC. Additional local staff that supported the HMPC are recognized in Table 2.6 below.

Table 2.6 – Additional Staff Supporting the Planning Process

Jurisdiction	Representative	Agency	Position/Title
Bertie County	John Rawls	Bertie Co Emergency Svcs	Emergency Services Director
Martin County	Michael Bryant	Martin County Emergency Management	EM Specialist/Fire Marshal
Martin County	Drew Batts	Martin County Administration	County Manager
Robersonville	Jonathan Dale	Town of Robersonville Fire Dept.	Fire Chief
Robersonville	Chris Roberson	Town of Robersonville	Town Manager
Williamston	Travis Cowan	Town of Williamston	Town Administrator
Williamston	Michael Peaks	Williamston Fire / EMS	Fire Chief
Williamston	Dean McCall	Town of Williamston	Mayor
Washington County	Allen Pittman	Planning & Inspections	Planning Director
Plymouth	Joanne Floyd	Administration	Town Manager

The formal HMPC meetings followed the 10 CRS Planning Steps. Agendas, minutes, and sign-in sheets for the HMPC meetings are included in Appendix B. The meeting dates and topics discussed are summarized in Section 2.5 Meetings and Workshops. All HMPC meetings were open to the public.

The DMA planning regulations and guidance stress that to satisfy multi-jurisdictional participation requirements, each local government seeking FEMA approval of their mitigation plan must participate in the planning effort in the following ways:

- Participate in the process as part of the HMPC;
- Detail where within the planning area the risk differs from that facing the entire area;
- Identify potential mitigation actions; and
- Formally adopt the plan.

For the Northeastern NC Region HMPC, “participation” meant the following:

- Providing facilities for meetings;
- Attending and participating in the HMPC meetings;
- Collecting and providing requested data (as available);
- Completing the Local Capability Self-Assessment;
- Providing an update on previously adopted mitigation actions;
- Managing administrative details;
- Making decisions on plan process and content;
- Identifying mitigation actions for the plan;
- Reviewing and providing comments on plan drafts;
- Informing the public, local officials, and other interested parties about the planning process and providing opportunity for them to comment on the plan;
- Coordinating and participating in the public input process; and
- Coordinating the formal adoption of the plan by local governing bodies.

Detailed summaries of HMPC meetings are provided under Meetings and Workshops, including meeting dates, locations, and topics discussed. During the planning process, the HMPC members communicated through face-to-face meetings, email, and telephone conversations. This continued communication ensured that coordination was ongoing throughout the entire planning process despite the fact that not all HMPC members could be present at every meeting. Additionally, draft documents were distributed via the plan website so that the HMPC members could easily access and review them and provide comments.

2.5 MEETINGS AND WORKSHOPS

The preparation of this plan required a series of meetings and workshops for facilitating discussion, gaining consensus, and initiating data collection efforts with local government staff, community officials, and other identified stakeholders. More importantly, the meetings and workshops prompted continuous input and feedback from relevant participants throughout the drafting stages of the plan.

Table 2.7 summarizes the key meetings and workshops held by the HMPC during the development of the plan. In many cases, routine discussions and additional meetings were held by local staff to accomplish planning tasks specific to their department or agency. For example, completing the Local Capability Self-Assessment or seeking approval of specific mitigation actions for their department or agency to undertake and include in their Mitigation Action Plan. These meetings were informal and are not documented here.

Public meetings are summarized in subsection 2.6.

Table 2.7 – Summary of HMPC Meetings

Meeting Title	Meeting Topic	Meeting Date	Meeting Location
HMPC Mtg. #1 – Project Kick-Off	1) Introduction to DMA and CRS requirements and the planning process 2) Review of HMPC responsibilities and the project schedule.	July 16, 2025 2:00 p.m.	Microsoft Teams & Bertie County Library 102 Lancaster Ave, Windsor, NC
HMPC Mtg. #2	1) Review Draft Hazard Identification & Risk Assessment (HIRA)	September 15, 2025 1:00 p.m.	Microsoft Teams & NC TeleCenter 415 East Blvd, Williamston, NC
HMPC Mtg. #3	1) Review and update capability 2) Review and update plan goals 3) Report on status of actions from the 2021 plan	November 6, 2025 11:00 a.m.	Microsoft Teams & Washington County Commissioner’s Room 116 Adams St, Plymouth, NC
HMPC Mtg. #4	3) Review the draft Hazard Mitigation Plan 4) Solicit comments and feedback	December 10, 2025 3:00 p.m.	Microsoft Teams & Bertie County Library 102 Lancaster Ave, Windsor, NC

2.6 INVOLVING THE PUBLIC

An important component of any mitigation planning process is public participation. Individual citizen and community-based input provides the entire planning team with a greater understanding of local concerns and increases the likelihood of successfully implementing mitigation actions by developing community “buy-in” from those directly affected by the decisions of public officials. As citizens become more involved in decisions that affect their safety, they are more likely to gain a greater appreciation of the hazards present in their community and take the steps necessary to reduce their impact. Public awareness is a key component of any community’s overall mitigation strategy aimed at making a home, neighborhood, school, business, or entire planning area safer from the potential effects of hazards.

Public involvement in the development of the plan was sought using various methods including open public meetings, an interactive plan website, a public participation survey, and by making copies of draft plan documents available for public review online and at government offices. Additionally, all HMPC meetings were made open to the public.

All public meetings were advertised on the plan website, which was shared on local community websites where possible. Copies of meeting announcements are provided in Appendix B. The public meetings held during the planning process are summarized in Table 2.8.

Table 2.8 – Summary of Public Meetings

Meeting Title	Meeting Topic	Meeting Date	Meeting Location
Public Meeting #1	1) Introduction to DMA and CRS requirements, the planning process, and project schedule 2) Review of opportunities for public involvement	July 16, 2025 5:00 p.m.	Bertie County Library 102 Lancaster Ave, Windsor, NC

Meeting Title	Meeting Topic	Meeting Date	Meeting Location
Public Meeting #2	1) Review draft Hazard Mitigation Plan 2) Solicit comments and feedback	December 10, 2025 5:00 p.m.	Bertie County Library 102 Lancaster Ave, Windsor, NC

2.7 OUTREACH EFFORTS

The HMPC agreed to employ a variety of public outreach methods including established public information mechanisms and resources within the community. Public involvement activities for this plan update included creation of a website for the plan, a public survey, use of community websites and social media, and the collection of public and stakeholder comments on the draft plan. The table below details public outreach efforts employed during the preparation of this plan. Documentation of these efforts is provided in Appendix B.

Table 2.9 – Public Outreach Efforts

Outreach	Date	Event/Message
Plan website	Ongoing	Meeting announcements, meeting materials; contact information provided to request additional information and/or provide comments
Public notice on county website	July 2025	Announcement posted for Public Meeting #1 and plan website link shared
Local community social media posts	July 2025, November 2025	Announcements posted for Public Meeting #1 and Public Meeting #2
Public survey	July-November 2025	Survey hosted online and made available via shareable link
Draft Risk Assessment	October 2025	Draft hazard identification and risk assessment made available for review and comment online
Draft Capability Assessment	November 2025	Draft capability assessment made available for review and comment online
Draft Plan	December 2025	Full draft plan made available for review and comment online

The public outreach survey was made available in July 2025 and remained open for response until the end of November 2025. The public survey requested public input into the hazard mitigation planning process and the identification of mitigation activities to lessen the risk and impact of future hazard events. The survey is shown in Appendix B. The survey was available online on the plan website. In total, 13 survey responses were received.

Detailed survey results are provided in Appendix B.

2.8 INVOLVING THE STAKEHOLDERS

In addition to representatives of each participating jurisdiction, the HMPC included a variety of stakeholders. Stakeholders on the HMPC included a fire chief from a volunteer fire department, and several local residents. Representatives from NCEM, NC Forest Service, and the NC State Resilience Office also attended HMPC meetings. Input from additional stakeholders, including neighboring

communities, was solicited through invitations to the open public meetings and distribution of the public survey. However, if any additional stakeholders representing other agencies and organizations participated through the public survey, that information is unknown due to the anonymous nature of the survey.

2.9 DOCUMENTATION OF PLAN PROGRESS

Progress on the mitigation strategy developed in the previous plan is documented in this plan update. Table 2.10 below details the status of mitigation actions from the previous plan. More detail on actions being carried forward is provided in Section 7 Mitigation Action Plans.

Table 2.10 – Status of Previous Mitigation Actions

Jurisdiction	Completed	Deleted	Carried Forward
Bertie County	4	1	11
Askewville	3	1	9
Aulander	3	1	9
Colerain	3	1	9
Kelford	3	1	9
Lewiston-Woodville	3	1	9
Powellsville	3	1	9
Roxobel	3	1	9
Windsor	3	1	9
Hyde County	1	2	14
Martin County	2	1	12
Bear Grass	1	1	11
Everetts	1	1	11
Hamilton	1	1	11
Hassell	1	1	11
Jamesville	1	1	11
Oak City	1	1	11
Parmelee	1	1	11
Robersonville	1	1	11
Williamston	1	1	11
Tyrrell County	2	2	11
Columbia	2	2	8
Washington County	1	0	18
Creswell	0	0	16
Plymouth	0	0	17
Roper	0	0	16
Counties Total	10	6	66

Table 2.11 on the following pages details all completed and deleted actions from the 2021 plan.

Community capability continues to improve with the implementation of new plans, policies, and programs that help to promote hazard mitigation at the local level. The current state of local capabilities for the participating jurisdictions is captured in Section 5 Capability Assessment. The participating jurisdictions continue to demonstrate their commitment to hazard mitigation and have proven this by

reconvening the HMPC to update this multi-jurisdictional plan and by continuing to involve the public in the hazard mitigation planning process.

Moving forward, information in this plan will be used to help guide and coordinate mitigation activities and decisions for local plans and policies in the future. Proactive mitigation planning will help reduce the cost of disaster response and recovery to communities and their residents by protecting critical community facilities, reducing liability exposure, and minimizing overall community impacts and disruptions. This plan identifies activities that can be undertaken by both the public and the private sectors to reduce safety hazards, health hazards, and property damage.

SECTION 2: PLANNING PROCESS

Table 2.11 – Completed and Deleted Actions from the 2021 Northeastern NC Regional Hazard Mitigation Plan

2021 Action #	Jurisdictions	Description	2025 Status	Status Comments/ Explanation
Bertie County				
B1	Bertie County, Askewville, Aulander, Colerain, Kelford, Lewiston-Woodville, Powellsville, Roxobel, Windsor	Revise/update regulatory maps upon completion of FIRM update.	Completed	Update went effective January 2025.
B3	Bertie County, Askewville, Aulander, Colerain, Kelford, Lewiston-Woodville, Powellsville, Roxobel, Windsor	Consider participating in the Community Rating System (CRS) to reduce flood insurance premiums for citizens.	Delete	Not feasible due to administrative burden.
B6	Bertie County	Consider adopting subdivision regulations that include minimum standards for property divisions.	Completed	Bertie County has subdivision regulations in place.
B7	Bertie County, Askewville, Aulander, Colerain, Kelford, Lewiston-Woodville, Powellsville, Roxobel, Windsor	Review and update the flood damage prevention ordinance to: • Ensure maximum protection from flood hazard events. • Raise the minimum finished floor elevation to at least 2' above base flood elevation (BFE) to provide more flood protection for new or substantially improved structures. • Consider prohibiting any fill within the 100-year floodplain to discourage development. • Prohibit enclosures to the lower areas of elevated buildings, including breakaway walls. • Continue to require and maintain FEMA elevation certificates for all permits for new buildings or improvements to buildings on lots including any portion of the 100-year floodplain.	Completed	Bertie County adopted a 5' freeboard requirement and enclosure limitations are in place.

SECTION 2: PLANNING PROCESS

2021 Action #	Jurisdictions	Description	2025 Status	Status Comments/ Explanation
B11	Bertie County, Askewville, Aulander, Colerain, Kelford, Lewiston-Woodville, Powellsville, Roxobel, Windsor	Review rebuilding activities in wake of recent hurricanes and flooding and establish policies/procedures for minimizing repetitive flood losses.	Completed	Bertie County has adopted a 5' freeboard and is seeking funding to implement drainage improvements to address repetitive flooding.
Hyde County				
H1	Hyde County	Consider revising the county's Flood Damage Prevention Ordinance to increase the current established two foot freeboard requirement regarding base flood elevation for new structures developed within the Flood Hazard Area. This effort will also address any necessary updates required by the National Flood Insurance Program (NFIP).	Completed	In mainland Hyde County in AE zones, the RFPE is the BFE plus 3' of freeboard OR an elevation to above 7.5 feet NAVD 1988, whichever is greater. In mainland Hyde County in AO zones, the RFPE is the base flood depth on the effective FIRM plus 3' of freeboard above the highest natural adjacent grade OR an elevation to or above 7.5 feet NAVD 1988, whichever is greatest. In mainland Hyde County in shaded X and X zones, the RFPE is three feet NAVD 1988 OR the natural grade elevation if the natural grade is greater than three feet NAVD 1988. On the Island of Ocracoke, the RFPE is nine feet NAVD 1988 for all zones for residential buildings (see definition below) and the RFPE is 7.5 feet NAVD 1988 for all zones with non-residential buildings.
H16	Hyde County	Work to implement all recommendations outlined within the Hurricane Matthew Resilient Redevelopment Plan.	Delete	Relevant projects incorporated into other actions.

SECTION 2: PLANNING PROCESS

2021 Action #	Jurisdictions	Description	2025 Status	Status Comments/ Explanation
H17	Hyde County	Hyde County will continue to work diligently on efforts to address the recovery of the Village of Ocracoke from the impacts of Hurricane Dorian. The County will exhaust all resources available to carry this effort out.	Delete	Replace with new resilience-focused action.
Martin County				
M2	Martin Co., Bear Grass, Everetts, Hamilton, Hassell, Jamesville, Oak City, Parmele, Robersonville, Williamston	Consider applying for participation in the National Flood Insurance Program Community Rating System Program.	Delete	Participation in CRS as a County is no longer in consideration. None of the communities in Martin County have enough flood insurance policies to warrant participation.
M4	Martin Co.	Annually assess the need for the establishment of subdivision regulations. If the county determines that regulations are necessary to address increased development pressure, then this effort will be initiated.	Completed	UDO adopted regulating subdivisions and mobile home/RV parks
M14	Martin Co., Bear Grass, Everetts, Hamilton, Hassell, Jamesville, Oak City, Parmele, Robersonville, Williamston	Work to improve the emergency notification system in an effort to increase awareness regarding the locations of shelters and evacuation routes during natural hazard events.	Completed	
Tyrrell County				
T1	Tyrrell Co., Columbia	Make information available regarding floodplain protection and hazards at the county administrative building, and in the building inspections office. The county will aim to make this information available through the local library and real estate agencies, as well as the Town municipal building.	Completed	

SECTION 2: PLANNING PROCESS

2021 Action #	Jurisdictions	Description	2025 Status	Status Comments/ Explanation
T6	Tyrrell Co., Columbia	Develop a county website and include information pertinent to emergency preparedness, response, and mitigation. Information will be made available focused on expanding the county's mitigation effectiveness.	Completed	
T7	Tyrrell Co., Columbia	Consider applying for participation in the National Flood Insurance (NFIP) Community Rating System Program.	Delete	Not being pursued due to limited NFIP policies in Tyrrell County and Columbia and administrative burden to join CRS and maintain rating.
T14	Tyrrell Co., Columbia	Work to implement all strategies and recommendations outlined within the County's Hurricane Matthew Resilient Redevelopment Plan.	Delete	Other plans and identified projects are being prioritized.
Washington County				
W4	Washington Co.	Through implementation of this plan, consider increasing the County's required freeboard within the county's FDPO.	Completed	Washington County updated the FDPO and enforces a 2' freeboard above BFE and 2' freeboard above highest adjacent grade where no BFE is established.

3 PLANNING AREA PROFILE

This section provides a general overview of the current conditions of the Northeastern NC Region and its participating municipalities. It consists of the following subsections:

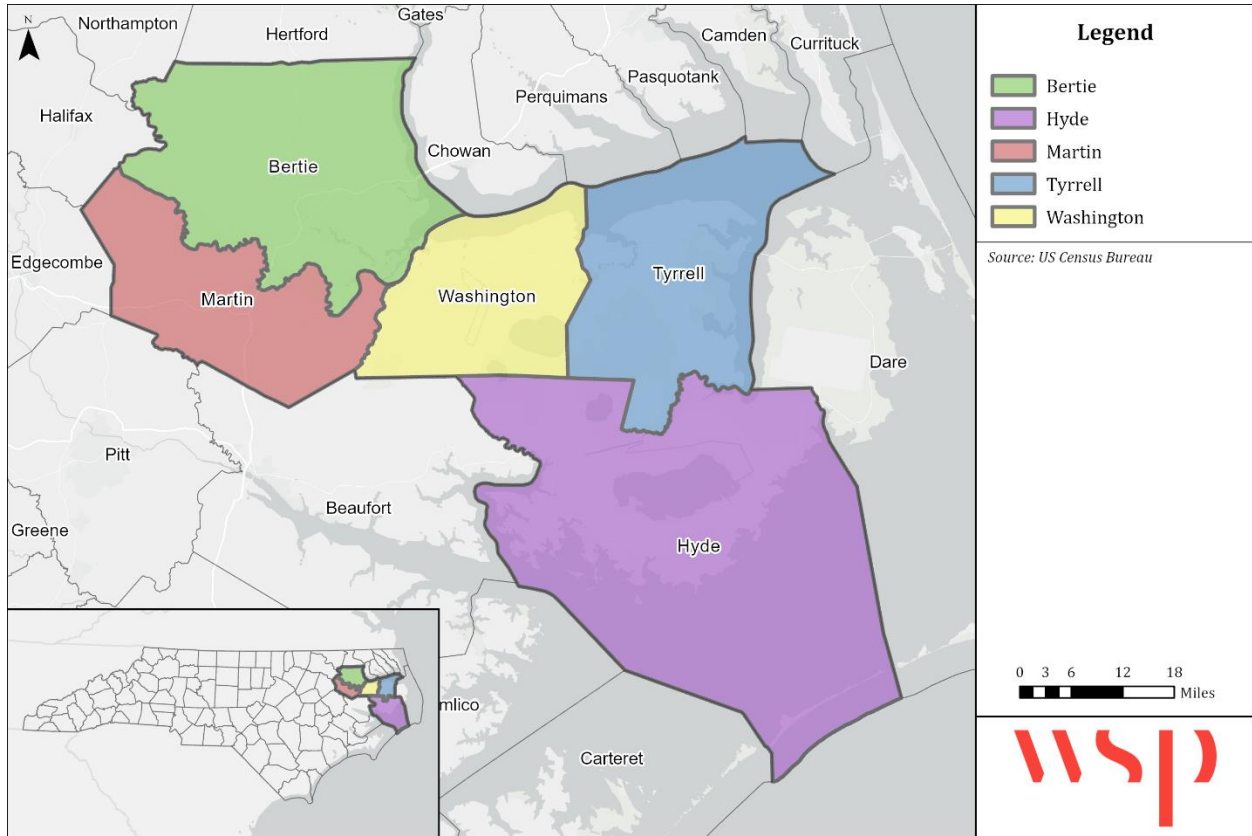
- 3.1 Geography and Environment
- 3.2 Population and Demographics
- 3.3 Historic Properties
- 3.4 Housing
- 3.5 Infrastructure
- 3.6 Current and Future Land Use
- 3.7 Employment and Industry

3.1 REGIONAL CHARACTERISTICS

Bertie, Hyde, Martin, Tyrrell, and Washington counties are located in the Coastal Plain region of eastern North Carolina. Washington County is flanked to the west by Martin County and to the east by Tyrrell County, with Bertie County to the north of Martin County and Hyde County to the south of Tyrrell County (see Figure 3-1). US Highway 64 traverses east to west through Martin, Washington, and Tyrrell counties with US Highway 264 traversing through Hyde County, and US Highway 17 travels north-south through Martin and Bertie counties, then to the east in Bertie County alone. US Highway 13 also travels north-south through Martin and Bertie counties. Other roadway transportation in the area includes NC Highways 12, 32, 34, 42, 45, 94, 99, 125, 142, 171, 305, 308, and 903. Railway transportation in the area is provided by the North Carolina and Virginia Railroad (Bertie County), CSX Railway (Martin County) and Carolina Coastal Railway (Washington County). General aviation airports in the area include Hyde County Airport in Engelhard, Ocracoke Island Airport in Ocracoke (Hyde County), Martin County Airport in Williamston, and Plymouth Municipal Airport in Plymouth (Washington County).

An abundance of water courses surround the area: the Albemarle Sound to the north of Washington and Tyrrell counties; the Alligator and Scuppernong Rivers in Tyrrell County; Intracoastal Waterway to Tyrrell's east; the Roanoke River to Washington's and Martin's north and Bertie's south and west; the Chowan River to the east of Bertie County; Phelps Lake and Pungo Lake in Washington County; Pamlico Sound to the southeast of Hyde County; and Alligator Lake and Lake Mattamuskeet occupying a large percentage of Hyde County's area. The area is also rich in wildlife refuges, with the Roanoke River National Wildlife Refuge in Bertie County and to the north of Martin County, the Mattamuskeet and Swan Quarter National Wildlife Refuges in Hyde County, the Pocosin Lakes National Wildlife Refuge lying in Hyde, Washington and Tyrrell counties, and part of the Alligator River National Wildlife Refuge lying in Hyde and Tyrrell County as well. The area's countryside is enhanced by streams and brooks, natural lakes and ponds, and swampy woodlands.

Figure 3-1 – Northeastern NC Region Location Map



Source: U.S. Census Bureau

Table 3-1 provides the area in square miles for all jurisdictions participating in the Northeastern NC Regional Hazard Mitigation Plan Update.

Table 3-1 – Northeastern NC Region Total Land Area

Jurisdiction	Total Land Area (Square Miles)
Bertie County	741
Askewville	0.6
Aulander	1.5
Colerain	0.3
Kelford	0.5
Lewiston-Woodville	2.0
Powellsville	0.4
Roxobel	1.0
Windsor	2.8
Hyde County	612.3
Martin County	456.4
Bear Grass	0.3
Everetts	0.5
Hamilton	0.5
Hassell	0.3

SECTION 3: PLANNING AREA PROFILE

Jurisdiction	Total Land Area (Square Miles)
Jamesville	1.4
Oak City	0.5
Parmele	1.2
Robersonville	1.2
Williamston	4.4
Tyrrell County	390.8
Columbia	1.2
Washington County	346.4
Creswell	0.6
Plymouth	4.0
Roper	0.9

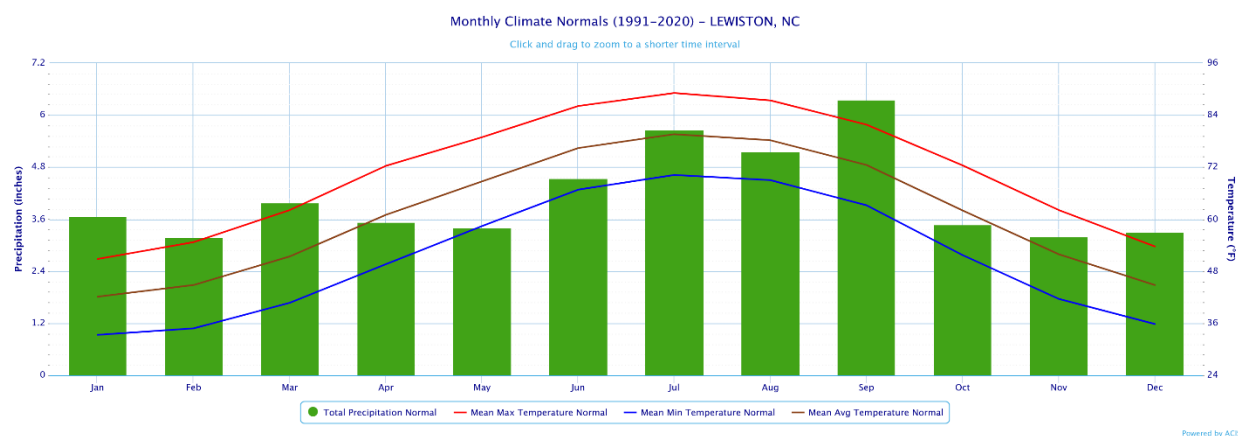
Source: U.S. Census Bureau

The Northeastern NC Region has cool, short winters and long, hot, and humid summers, with peak temperatures occurring in July and August. Afternoon thunderstorms are the main form of precipitation during the summer, with most summer precipitation occurring in July through September. Precipitation is generally adequate for all crops, and the region benefits by a lengthy growing season.

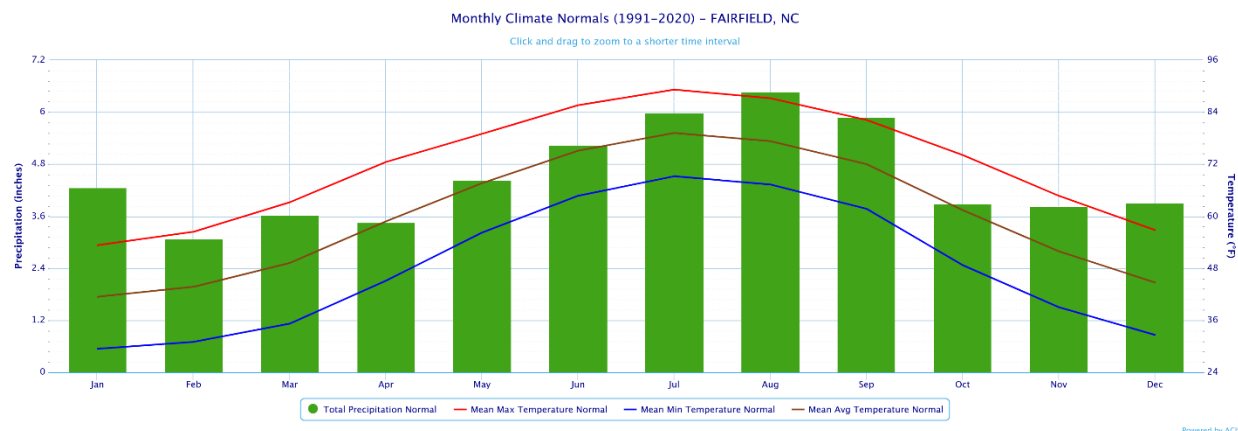
The average temperature in the Northeastern Region hovers around 60 – 61 degrees F. The mean annual maximum temperature is approximately 71 – 72 degrees F and the mean minimum temperature is approximately 48 – 51 degrees F. The highest mean maximum temperature occurs in July and is approximately 89 degrees. The lowest minimum temperature occurs in January and is approximately 29 – 33 degrees F. Rainfall is usually well distributed throughout the year, with an average annual precipitation of 49 – 54 inches. The average snowfall is around 0.6 inches.

Figure 3-2 and Figure 3-3 show the average monthly temperature and precipitation for the Lewiston and Fairfield weather stations, respectively, which approximate temperature and precipitation for the region.

Figure 3-2 – Average Monthly Climate Normals, Lewiston, NC



Source: Northeast Climod 2

Figure 3-3 – Average Monthly Climate Normals, Fairfield, NC

Source: Northeast Climod 2

3.1.1 WETLANDS

The benefits of wetlands are hard to overestimate. They provide critical habitat for many plant and animal species that could not survive in other habitats. They are also critical for water management as they absorb and store vast quantities of storm water, helping reduce floods and recharge aquifers. Not only do wetlands store water like sponges, they also filter and clean water as well, absorbing toxins and other pollutants. Table 3-2 provides a summary of wetland coverage within each County located in the Northeastern NC Region as reported by the U.S. Fish and Wildlife Service's National Wetlands Inventory.

Table 3-2 – Northeastern NC Region, Wetlands Acreage

County	Wetland Acreage
Bertie County	146,601.5
Hyde County	791,296.1
Martin County	72,408.2
Tyrrell County	293,297.8
Washington County	120,445.5
Total	1,424,049.1

Source: U.S. Fish & Wildlife Service, National Wetlands Inventory

Figure 3-4 - Wetlands in Northeastern Region

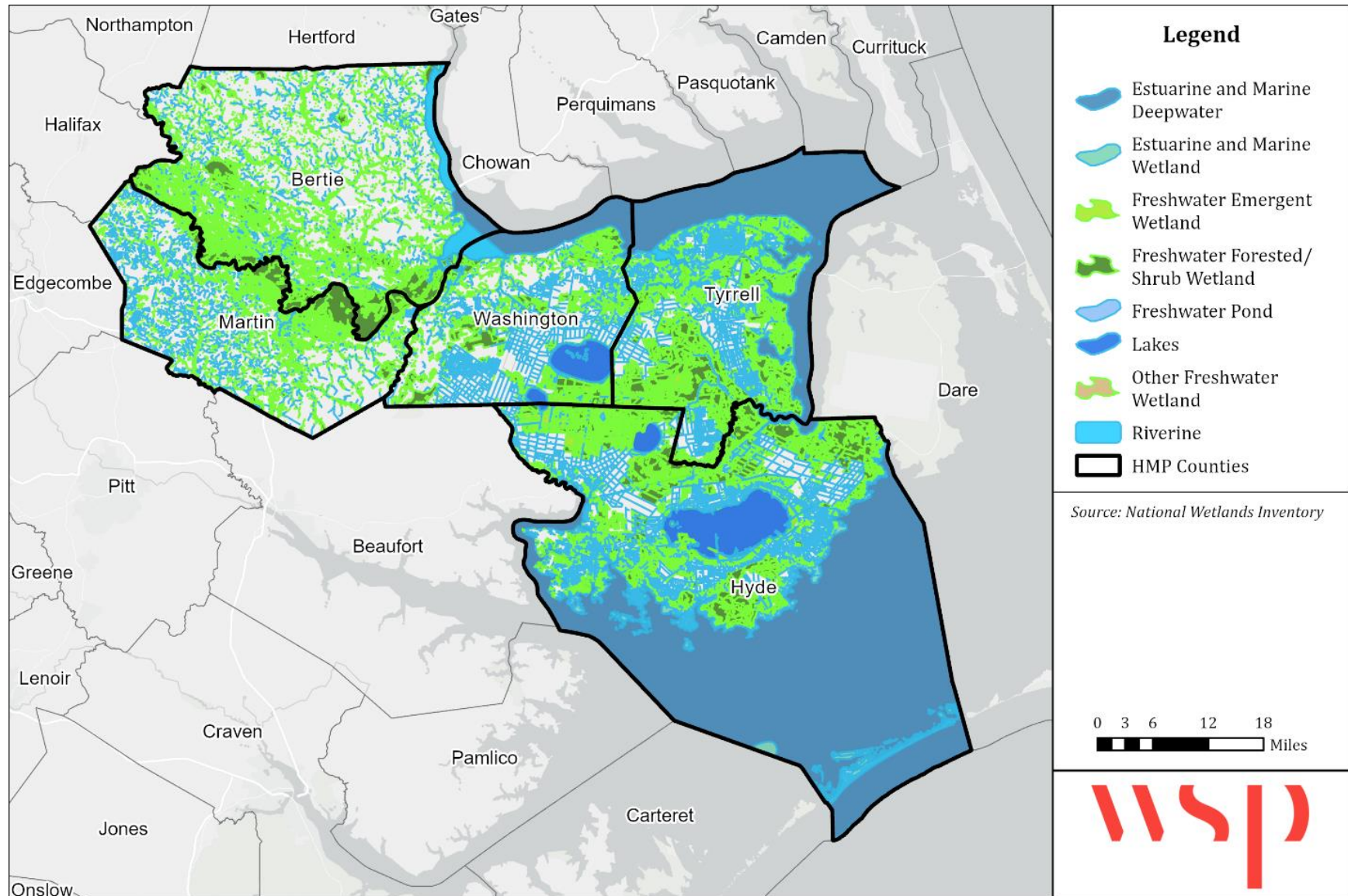
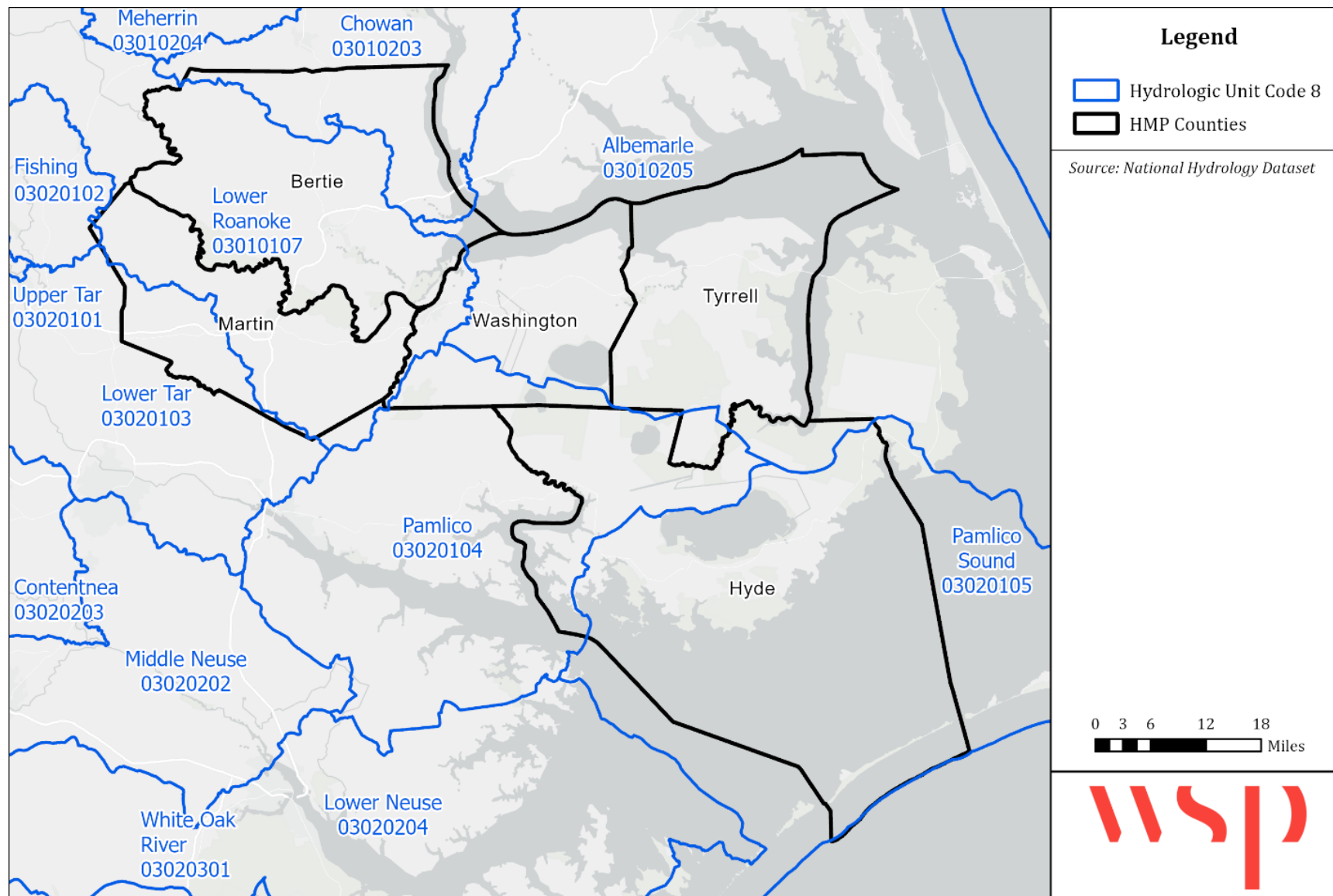


Figure 3-5 – HUC-8 Drainage Basins



3.1.2 PARKS, PRESERVE, AND CONSERVATION

The Northeastern Region is home to parks, preserves, and other natural areas. There are several state and federal natural areas in the region including Alligator River National Wildlife Refuge, Cape Hatteras National Seashore, Gull Rock Game Land, Mattamuskeet National Wildlife Refuge, Pocosin Lakes National Wildlife Refuge, Roanoke River National Wildlife Refuge, and Swanquarter National Wildlife Refuge.

Table 3-3 – Parks and Natural Areas, Northeastern Region

County	Name
Bertie	Aulander Elementary School (under shared use agreement)
	Colerain Elementary School (under shared use agreement)
	Cashie River Campground/Treehouse Village
	Cashie Wetland Walk and Canoe Trail
	Davis Ball Park
	Livermon Park & Mini Zoo
	Roanoke/Cashie River Center & Boardwalk
	West Bertie Elementary School (under shared use agreement)
	Windsor Elementary School (under shared use agreement)
	Riverside Park (Rotary Club Park)
	Williford Park
	Cashie River Campground
	Cashie River Disk Golf Course
	Windsor Tennis Courts
	Windsor Craftsman & Farmers Museum
Hyde	Davis Youth Center/Engelhard Community Park
	Hyde County Health Department Facilities
	Matamuskeet School
	Ocracoke Community Park
	OA Peay School
	Ocracoke Community Center
	Ocracoke Lighthouse
	Pleasant Grove Community Garden
	Ponzer Community Center/Park
	Sladesville Baptist Church
	Swan Quarter Community Park
Martin	Devil's Gut Preserve
	Gaylord Perry Park
	Godwin-Coppage Park
	Hamilton Recreation Park
	Junior League Park
	Kehukee Park
	Maratoc Park
	Park Development (Oak City)
	Roanoke River (TNC/GP Partnership)
	Roanoke River Bottomlands

County	Name
	Robersonville Playfield
	Williamston Youth Park
	Moratoc Park
Tyrrell	Children's Park
	Kiddie Park
	Scuppernong River Boardwalk
Washington	Creswell Town Park
	Pea Ridge Park
	Washington County Recreation Center
	Wilson Street Park

3.1.3 THREATENED AND ENDANGERED SPECIES

The U.S. Fish and Wildlife Service maintains a regular listing of threatened species, endangered species, species of concern, and candidate species for counties across the United States. There are a range of species that are listed throughout the Northeastern NC Region. Table 3-4 provides the status of threatened or endangered species within each participating County.

Table 3-4 – Northeastern Region Threatened and Endangered Species

Group	Common Name	Scientific Name	Federal Status	Counties Identified
Amphibians	Neuse River waterdog	<i>Necturus lewisi</i>	Threatened	M
Birds	Black Rail	<i>Laterallus jamaicensis</i>	Species of Concern	H
Birds	Eastern Black rail	<i>Laterallus jamaicensis ssp. jamaicensis</i>	Threatened	H
Birds	Piping Plover	<i>Chadarius melodus</i>	Threatened	H
Birds	Red-cockaded woodpecker	<i>Dryobates borealis</i>	Threatened	B, M, W
Birds	Roseate tern	<i>Sterna dougallii dougallii</i>	Endangered	H
Birds	Rufa red knot	<i>Calidris canutus rufa</i>	Threatened	B, H, M, W
Clams	Yellow lance	<i>Elliptio lanceolata</i>	Threatened	M
Clams	Atlantic pigtoe	<i>Fusconaia masoni</i>	Threatened	M
Clams	Carolina madtom	<i>Noturus furiosus</i>	Endangered	M
Fishes	Shortnose sturgeon	<i>Acipenser brevirostrum</i>	Endangered	B, H, W
Flowering plants	Sensitive joint-vetch	<i>Aeschynomene virginica</i>	Threatened	H, M, W
Flowering plants	Rough-leaved loosestrife	<i>Lysimachia asperulaefolia</i>	Endangered	H, M, W
Flowering plants	Seabeach amaranth	<i>Amaranthus pumilus</i>	Threatened	H
Insects	Monarch butterfly	<i>Danaus plexippus</i>	Proposed Threatened	B, H, M, W
Mammals	Little brown bat	<i>Myotis lucifugus</i>	Under Review	B, H, M, W
Mammals	Northern Long-Eared Bat	<i>Myotis septentrionalis</i>	Endangered	B, H, M, W
Mammals	Red wolf	<i>Canis rufus</i>	Endangered	B, H, M, W
Mammals	Tricolored bat	<i>Perimyotis subflavus</i>	Proposed Endangered	B, H, M, W
Mammals	West Indian Manatee	<i>Trichechus manatus</i>	Threatened	B, H, M, W
Reptiles	American alligator	<i>Alligator mississippiensis</i>	Threatened	B, H, M, W

Group	Common Name	Scientific Name	Federal Status	Counties Identified
Reptiles	Green sea turtle	<i>Chelonia mydas</i>	Similarity of Appearance (Threatened)	H, M, W
Reptiles	Hawksbill sea turtle	<i>Eretmochelys imbricata</i>	Threatened	H
Reptiles	Hawksbill sea turtle	<i>Eretmochelys imbricata</i>	Endangered	H
Reptiles	Kemp's ridley sea turtle	<i>Lepidochelys kempii</i>	Endangered	H, M, W
Reptiles	Leatherback sea turtle	<i>Dermochelys coriacea</i>	Endangered	H
Reptiles	Loggerhead sea turtle	<i>Caretta caretta</i>	Endangered	H

Source: U.S. Fish & Wildlife Service

Note: B = Bertie, H = Hyde, M = Martin, T = Tyrrell, W = Washington

3.1.4 LAND COVER

The National Oceanographic and Atmospheric Administration's (NOAA) Coastal Change Analysis Program (C-CAP) tracks land cover change for the coastal regions of the United States. Understanding how land cover has changed and is continuing to change is important information for any hazard mitigation planning effort. The information below is meant to serve as a general overview of how the counties within the Albemarle Region have changed overtime.

Table 3-5 shows the percent changes in land cover from one category to another during 1996 to 2021 for all counties located in the Northeast Region.

Table 3-5 – Land Cover Change between 1996 and 2021, Northeast Region

County	Total % Area that Changed	% Net Increase of Developed Area	% Net Increase of Impervious Surface Area	% Net Decrease of Forested Area	% Net Decrease of Total Wetlands
Bertie	21.85%	13.78%	14.07%	-12.84%	-1.71%
Hyde	5.05%	6.71%	8.99%	-12.9%	-0.15%
Tyrrell	6.15%	7.53%	9.76%	-11.51%	-0.23%
Washington	13.02%	16.83%	16.11%	-22.47%	-1.15%

Source: NOAA C-CAP Atlas

3.2 POPULATION AND DEMOGRAPHICS

Participating jurisdictions in the Northeastern Region have experienced moderate population decline over the last several decades. From 2010 to 2023, the Region's total population declined by 15.9 percent. During this period, every county in the Northeastern Region lost population overall; however, some jurisdictions such as Bear Grass, Colerain, Roxobel, Oak City, and unincorporated Martin County experienced notable population growth. Overall, the Northeastern counties lost between approximately 11.1% (Martin County) and 23.4% (Tyrrell County) of their population.

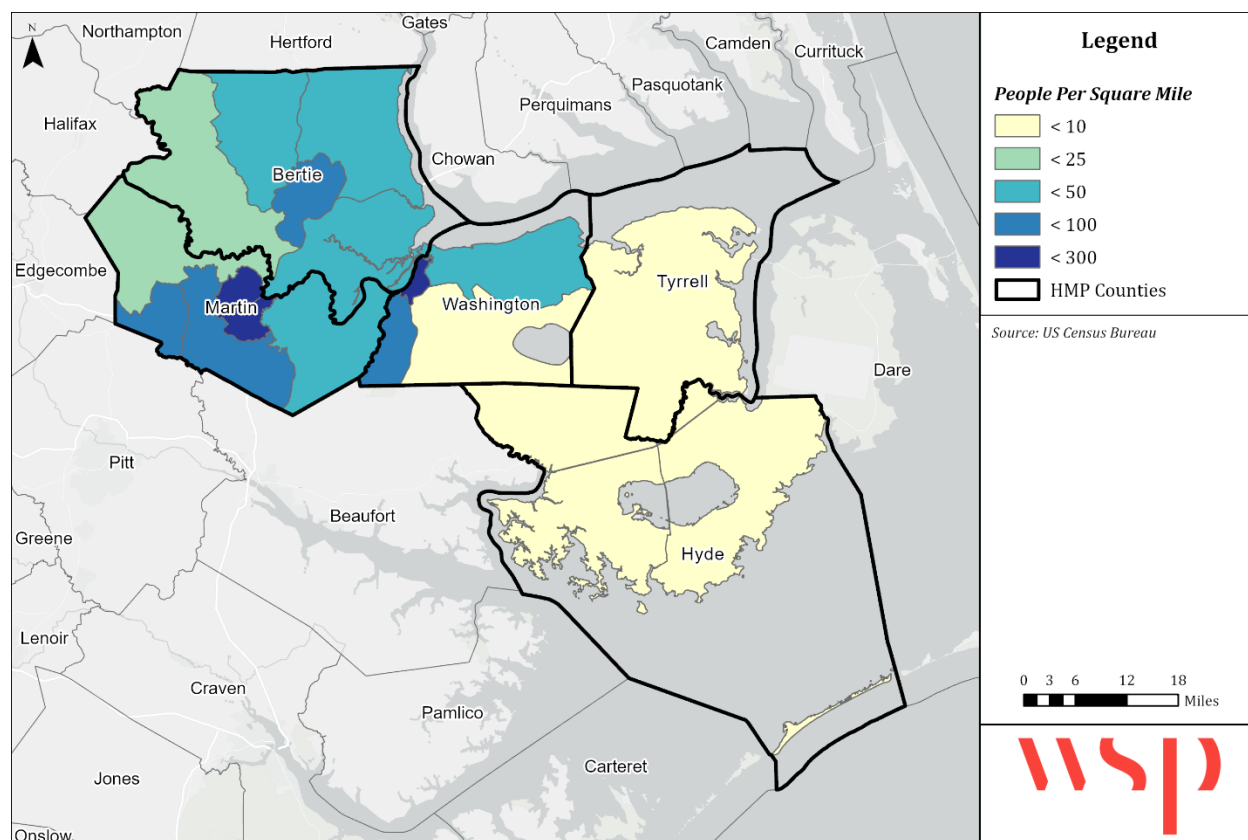
Table 3-6 provides population counts from 2000, 2010, and 2023 for each participating jurisdiction.

Error! Reference source not found. on the following page shows 2023 population density by census tract in persons per square mile.

Table 3-6 – Northeastern Region Population Counts

Jurisdiction	2000 Census Population	2010 Census Population	2023 ACS Population Estimate	Total Change 2010-2023	% Change 2010-2023
Bertie County					
Unincorporated Bertie County	14,821	14,996	11,675	-3,321	-22.1%
Askewville	180	241	152	-89	-36.9%
Aulander	888	895	748	-147	-16.4%
Colerain	221	204	291	87	42.6%
Kelford	245	251	245	-6	-2.4%
Lewiston-Woodville	613	549	466	-83	-15.1%
Powellsville	259	276	141	-135	-48.9%
Roxobel	263	240	347	107	44.6%
Windsor	2,283	3,630	3,417	-213	-5.9%
Subtotal Bertie County	19,773	21,282	17,482	-3,800	-17.9%
Hyde County	5,826	5,810	4,625	-1,185	-20.4%
Martin County					
Unincorporated Martin County	16,068	15,691	18,837	3,146	20.0%
Bear Grass	53	73	94	21	28.8%
Everetts	179	164	158	-6	-3.7%
Hamilton	516	408	183	-225	-55.1%
Hassell	72	84	49	-35	-41.7%
Jamesville	502	491	373	-118	-24.0%
Oak City	339	317	472	155	48.9%
Parmele	290	278	288	10	3.6%
Robersonville	1,731	1,488	1,319	-169	-11.4%
Subtotal Martin County	25,593	24,505	21,773	-2,732	-11.1%
Tyrrell County					
Unincorporated Tyrrell County	3,338	3,516	2,702	-814	-23.2%
Columbia	819	891	674	-217	-24.4%
Subtotal Tyrrell County	4,149	4,407	3,376	-1,031	-23.4%
Washington County					
Unincorporated Washington County	8,725	8,463	6,850	-1,613	-19.1%
Creswell	278	276	205	-71	-25.7%
Plymouth	4,107	3,878	3,264	-614	-15.8%
Roper	613	611	586	-25	-4.1%
Subtotal Washington County	13,723	13,228	10,905	-2,323	-17.6%
Total	69,064	69,232	58,161	-11,071	-15.9%

Source: U.S. Census Bureau, 2023 ACS 5-Year Estimates

Table 3-7 – Population Density, Northeastern Region

According to the 2023 American Community Survey 5-Year Estimates, the median age in the Northeastern Region, ranging from 45.9 in Bertie County to 49.3 in Washington County, is older than the median age of the State of North Carolina (39.4) and the U.S. (39.2). Of the population aged 25 years and older, 83.4% of the population 25 years and older has a high school degree or higher and 15.3% of the population has a bachelor's degree or higher, which is significantly lower than the state average of 36.8%. Approximately, 1.5% of the population speaks English less than very well. This information is further detailed by county in Table 3-8. The racial characteristics of the participating jurisdictions are presented in Table 3-9. The population is almost evenly split between black (46.6%) and white (46.6%) residents.

Table 3-8 – Northeastern Region Demographic Summary, 2023

	Bertie	Hyde	Martin	Tyrrell	Washington
Median Age	45.9	48.5	46.7	46.0	49.3
Educational Attainment					
High school graduate or higher ¹	82.0%	86.8%	83.3%	80.5%	85.6%
Bachelor's degree or higher ¹	17.8%	13.7%	15.1%	14.7%	12.2%
Language Spoken at Home					
Speak language other than English	3.5%	4.6%	3.8%	11.3%	0.6%
Speak English less than "very well" ²	1.7%	2.6%	2.5%	5.3%	0.1%

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

¹Of the population aged 25 and older; ²Of the population that speaks a language other than English at home

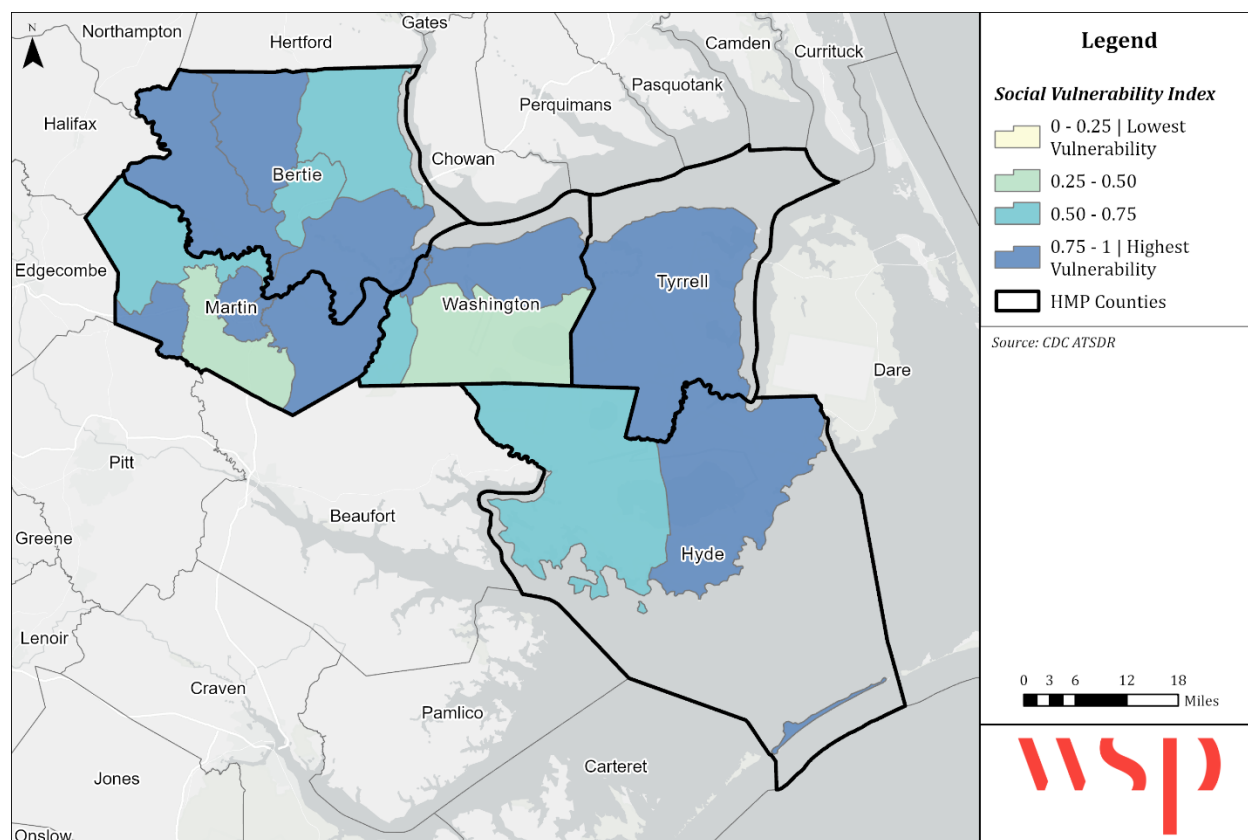
Table 3-9 – Racial Demographics of Northeastern Region, 2023

Jurisdiction	White, %	Black, %	Asian, %	Other Race, %	Two or More Races, %	Persons of Hispanic or Latino Origin*, %
Bertie County	34.7%	60.1%	0.8%	0.5%	2.8%	2.2%
Askewville	60.7%	25.0%	0.0%	1.7%	12.6%	7.7%
Aulander	36.5%	60.7%	0.0%	1.7%	1.1%	1.7%
Colerain	63.6%	35.4%	0.3%	0.0%	0.3%	0.0%
Kelford	8.2%	81.2%	0.0%	4.1%	6.5%	8.2%
Lewiston-Woodville	22.3%	74.9%	0.0%	0.0%	2.6%	1.5%
Powellsville	56.0%	44.0%	0.0%	0.0%	0.0%	0.0%
Roxobel	46.7%	47.3%	0.0%	0.6%	5.5%	1.2%
Hyde County	60.7%	25.0%	0.0%	1.7%	12.6%	7.7%
Martin County	51.6%	41.0%	0.6%	1.4%	5.2%	4.3%
Bear Grass	95.7%	0%	0%	0%	4.3%	0%
Everetts	75.3%	15.2%	0%	0%	8.9%	8.9%
Hamilton	27.3%	70.5%	0%	2.2%	0%	0%
Hassell	6.1%	85.7%	0%	0%	8.2%	0%
Jamesville	70.5%	26.5%	0%	0%	2.9%	3.5%
Oak City	27.3%	71.2%	0%	1.5%	0%	2.1%
Parmele	36.8%	62.5%	0%	0%	0.7%	0%
Robersonville	34.4%	62.9%	0%	0%	2.7%	0.6%
Tyrrell County	56.4%	32.7%	0.9%	5.8%	4.4%	10.0%
Columbia	40.1%	29.8%	0.0%	22.3%	7.9%	32.6%
Washington County	46.6%	49.6%	0.1%	0.2%	3.4%	3.9%
Creswell	25.9%	74.1%	0.0%	0.0%	0.0%	0.0%
Plymouth	29.7%	69.7%	0.3%	0.2%	0.1%	0.4%
Roper	27.1%	66.0%	0.0%	0.0%	6.8%	26.1%

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

*Persons of Hispanic origin may be of any race, so also included in applicable race categories

Figure 3-6 displays social vulnerability information for the Northeastern Region by census tract according to 2023 data and analysis by the Centers for Disease Control and Prevention (CDC). The CDC's Social Vulnerability Index (SVI) indicates the relative vulnerability within census tracts based on 15 social factors: poverty, unemployment, income, education, age, disability, household composition, minority status, language, housing type, and transportation access. Higher social vulnerability is an indicator that a community may be limited in its ability to respond to and recover from hazard events. Therefore, using this SVI information can help the Region and jurisdictions to prioritize pre-disaster aid, allocate emergency preparedness and response resources, and plan for the provision of recovery support.

Figure 3-6 – Social Vulnerability by Census Tract, Northeastern Region

Source: Centers for Disease Control and Prevention (CDC) / Agency for Toxic Substances and Disease Registry (ATSDR) / Geospatial Research, Analysis, and Services Program (GRASP).

3.3 HISTORIC PROPERTIES

As of July 16, 2025, Bertie County had 25 listings on the National Register of Historic Places; Hyde County had 11; Martin County had 29; Tyrrell County had 3; and Washington County had 10. These properties are detailed in Table 3-10.

Table 3-10 – National Register of Historic Places in the Northeastern Region

Reference #	Property Name	Listed Date	Category	City
Bertie County				
03000268	Ashland	4/18/2003	Building	Ashland
79001662	Bertie County Courthouse	5/10/1979	Building	Windsor
04000647	Bertie Memorial Hospital	6/22/2004	Building	Windsor
100002797	Broad Creek Block Ships	8/24/2018	Structure	Plymouth
100004797	Colerain Historic District	4/3/2020	District	Colerain
02001710	Elmwood	1/15/2003	Building	Merry Hill
82003431	Elmwood	6/8/1982	Building	Windsor
82003432	Freeman Hotel	9/9/1982	Building	Windsor
82003425	Garrett-White House	6/28/1982	Building	Colerain
82003427	The Hermitage	6/8/1982	Building	Merry Hill

SECTION 3: PLANNING AREA PROFILE

Reference #	Property Name	Listed Date	Category	City
70000441	Hope Plantation	4/17/1970	Building	Windsor
71000569	Jordan House	8/26/1971	Building	Windsor
71000570	King House	8/26/1971	Building	Windsor
82001280	King-Freeman-Speight House	12/2/1982	Building	Republican
12000213	Lee, William H., House	4/16/2012	Building	Lewiston
82003433	Liberty Hall	6/8/1982	Building	Windsor
82003429	Oaklana	4/15/1982	Building	Roxobel
82003430	Pineview	6/28/1982	Building	Roxobel
86001955	Rhodes Site (31BR90)	8/28/1986	Site	Hamilton
82003434	Rosefield	8/26/1982	Building	Windsor
82003428	Scotch Hall	4/29/1982	Building	Merry Hill
82003426	St. Frances Methodist Church	4/29/1982	Building	Lewiston
86003146	Windsor Historic District	7/29/1991	District	Windsor
71000568	Woodbourne	8/26/1971	Building	Roxobel
98001112	Woodville Historic District	8/28/1998	District	Lewiston- Woodville
Hyde County				
85001670	Credle, George V., House and Cemetery	7/29/1985	District	Rose Bay
100008848	Davis School	4/21/2023	Building	Engelhard
85001448	Fairfield Historic District	7/5/1985	District	Fairfield
79001726	Hyde County Courthouse	5/10/1979	Building	Swan Quarter
78001960	Inkwell	9/1/1978	Building	Lake Landing
86000786	Lake Landing Historic District	3/10/1986	District	Lake Landing
80002849	Lake Mattamuskeet Pump Station	5/28/1980	Structure	Swanquarter
90001465	Ocracoke Historic District	9/28/1990	District	Ocracoke
77000110	Ocracoke Light Station	11/25/1977	Building	Ocracoke
86001641	Swindell, Albin B., House and Store	8/14/1986	Building	Swindell Fork
77001002	Wynne's Folly	12/6/1977	Building	Engelhard
Martin County				
05000352	Bear Grass Primitive Baptist Church	4/28/2005	Building	Bear Grass
05000515	Bear Grass School	6/1/2005	District	Bear Grass
79003335	Biggs, Asa, House and Site	10/10/1979	Building	Williamston
78001962	Burras House	3/30/1978	Building	Jamesville
98000230	Conoho Creek Historic District	3/12/1998	District	Hassell
75001280	Darden Hotel	12/30/1975	Building	Hamilton
05000351	Everetts Christian Church	4/28/2005	Building	Everetts
14000988	Everetts Historic District	12/2/2014	District	Everetts
05000353	First Christian Church	4/28/2005	Building	Robersonville
73001358	Fort Branch Site	6/18/1973	Site	Hamilton
01001134	Griffin, W.W., Farm	10/20/2001	Building	Williamston
80002884	Hamilton Historic District	6/3/1980	District	Hamilton
84000546	Hickory Hill	12/20/1984	Building	Hamilton
84000556	Jamesville Primitive Baptist Church and Cemetery	12/20/1984	Building	Jamesville
82003485	Jones, Jesse Fuller, House	4/29/1982	Building	Spring Green
85002420	Little, W. J., House	9/19/1985	Building	Robersonville

Reference #	Property Name	Listed Date	Category	City
79001733	Martin County Courthouse	5/10/1979	Building	Williamston
05000354	Oak City Christian Church	4/28/2005	Building	Oak City
10000602	Roberson-Everett-Roebuck House	8/30/2010	Building	Robersonville
05000322	Robersonville Primitive Baptist Church	4/20/2005	Building	Robersonville
84000552	Sherrod Farm	12/20/1984	Building	Hamilton
05000355	Skewarkey Primitive Baptist Church	4/28/2005	Building	Williamston
05000324	Smithwick's Creek Primitive Baptist Church	4/20/2005	Building	Farm Life
05000323	Spring Green Primitive Baptist Church	4/20/2005	Building	Hamilton
95001396	Sunny Side Inn	11/29/1995	Building	Williamston
100002049	West Martin School	1/26/2018	Building	Oak City
14000445	Williamston Colored School	7/25/2014	Building	Williamson
95000174	Williamston Commercial Historic District	3/9/1995	District	Williamston
01001095	Williamston Historic District	10/12/2001	District	Williamston
Tyrrell County				
94000219	Columbia Historic District	3/17/1994	District	Columbia
92000078	Scuppernong River Bridge	3/5/1992	Structure	Columbia
79001756	Tyrrell County Courthouse	5/10/1979	Building	Columbia
Washington County				
78001983	Belgrade and St. David's Church	1/26/1978	Building	Creswell
02001112	Creswell Historic District	10/10/2002	District	Creswell
07000932	Davenport House	9/5/2007	Building	Creswell
01000047	Garrett's Island House	2/2/2001	Building	Plymouth
76001348	Latham House	12/12/1976	Building	Plymouth
85000905	Perry-Spruill House	4/25/1985	Building	Plymouth
90002140	Plymouth Historic District	1/16/1991	District	Plymouth
76001349	Rehoboth Methodist Church	5/13/1976	Building	Skinner'sville
70000481	Somerset Place State Historic Site	2/26/1970	Building	Creswell
79001761	Washington County Courthouse	5/10/1979	Building	Plymouth

Source: National Parks Service, National Register of Historic Places, July 2025

3.4 HOUSING CHARACTERISTICS

According to the 2018-2022 ACS 5-Year Estimates, there are approximately 33,492 housing units in the Northeastern Region, of which approximately 79.1% are occupied. Approximately 28.9% of occupied units are renter-occupied. A high percentage of renters is an indicator of higher pre- and post-disaster vulnerability because, according to Cutter, et al. (2003), renters often do not have the financial resources of homeowners, are more transient, are less likely to have information about or access to recovery aid following a disaster and are more likely to require temporary shelter following a disaster.

68 percent of housing units in the Northeastern Region are detached single family homes, and approximately 25 percent are mobile homes, which can be more vulnerable to certain hazards, such as tornadoes and wind storm, especially if they aren't secured with tie downs.

Approximately 54% of all housing units in the region were built prior to 1980. Age can indicate the potential vulnerability of a structure to certain hazards. Counties that participate in the NFIP entered the NFIP between 1985 and 1991, and many of their communities entered in the 2000s. Around 68% of

housing was built prior to 1990. Based on these numbers it can be assumed that greater than half of Northeastern Region's housing was built before any floodplain development restrictions were required.

Figure 3-7 - Housing Characteristics, Northeastern Region, 2010 and 2023

Jurisdiction	Housing Units (2010)	Housing Units (2023)	Housing Units % Change (2010-2023)	Owner-Occupied, % (2023)	Vacant Units, % (2023)	Median Home Value (2023)
Bertie County	9,882	8,988	-9.1%	74.5%	21.9%	\$95,800
Askewville	108	97	-10.2%	74.3%	9.2%	\$150,000
Aulander	450	419	-6.9%	61.2%	9.5%	\$87,600
Colerain	120	135	12.5%	73.2%	17.0%	\$155,800
Kelford	130	168	29.2%	81.9%	16.7%	\$72,900
Lewiston-Woodville	262	215	-17.9%	86.6%	15.3%	-
Powellsville	150	118	-21.3%	91.8%	28.0%	\$120,800
Roxobel	128	136	6.3%	76.8%	8.1%	\$98,900
Windsor	1,193	1,030	-13.7%	58.4%	16.6%	\$111,400
Hyde County	3,347	3,168	-5.4%	71.5%	33.2%	\$119,600
Martin County	11,704	11,100	-5.2%	68.5%	15.7%	\$109,000
Bear Grass	40	39	-2.5%	76.9%	0%	\$98,200
Everetts	88	58	-34.1%	42.6%	6.9%	-
Hamilton	224	151	-32.6%	86.0%	38.4%	\$75,000
Hassell	40	36	-10.0%	0%	25%	-
Jamesville	256	280	9.4%	71.8%	5.8%	\$94,800
Oak City	188	250	33.0%	42.9%	23.6%	\$87,400
Parmelee	145	165	13.8%	81.6%	17.6%	\$81,900
Robersonville	799	819	2.5%	58.2%	22.2%	\$85,900
Tyrrell County	2,068	2,004	-3.1%	78.6%	28.8%	\$138,400
Columbia	433	455	5.1%	41.5%	36.9%	\$120,700
Washington County	6,491	6,045	-6.9%	68.7%	20.1%	\$107,000
Creswell	133	116	-12.8%	42/9%	21.6%	\$119,600
Plymouth	1,856	1,968	6.0%	47.9%	24.2%	\$83,900
Roper	318	378	18.9%	43.9%	24.1%	\$72,100

Source: U.S. Census Bureau 2010 Decennial Census, American Community Survey 2019-2023 5-Year Estimates

Note: 1) Owner-Occupied reported as percent of occupied units; 2) vacant-unit reported as a percent of the total number of housing units.

3.5 INFRASTRUCTURE

3.5.1 TRANSPORTATION

Due to the rural nature of the Northeastern Region, most of the transportation is car centric and depends on US-13, US-17, and US-64. Each county has access to a public or nonprofit demand response bus service. These services typically accommodate the elderly or people with disabilities and offer curb-to-curb transportation service. Due to the region's low-density, fixed route bus service is difficult.

3.5.2 UTILITIES

Electric power for the region is provided by various providers, including Dominion NC, Tideland Electric Membership Corp, and Roanoke Electric Cooperative. The Town of Windsor operates its own electric cooperative. Water is provided by individual counties. In the Northeastern Region, natural gas is provided by Piedmont Natural Gas.

3.6 CURRENT AND FUTURE LAND USE

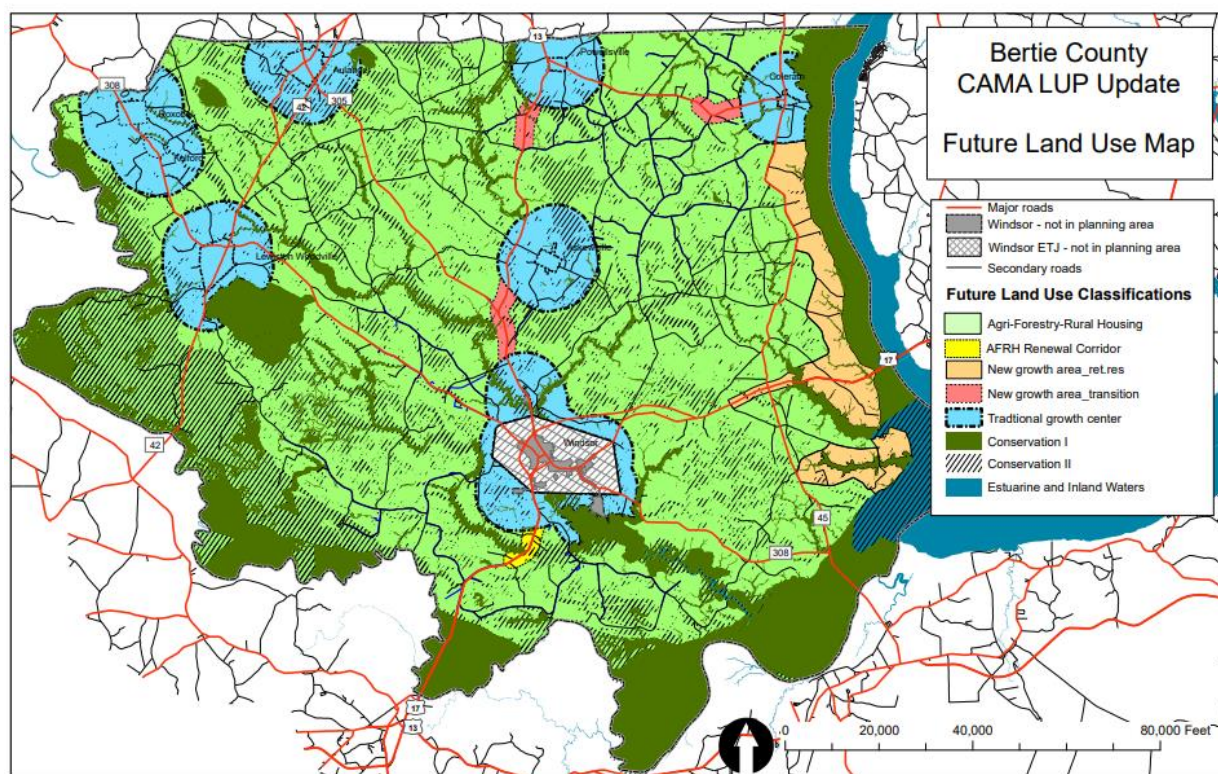
A community's comprehensive plan and future land use map guide development decisions and indicate where growth can be expected to occur based on land suitability and the community's overall vision and priorities. This section summarizes current and future land use and growth and development trends in each participating jurisdiction.

BERTIE COUNTY

In Bertie County, land use, environment, and development regulations are the responsibility of the Bertie County Planning & Inspections Department. Bertie County adopted its most recent land use plan in 2016. The Towns of Roxobel, Kelford, Aulander, Powellsville, Colerain, Lewiston-Woodville, and Askewville fall under the purview of the Bertie County Land Use Plan. The remaining incorporated municipality, Winsor, prepares an individual land use plan.

FUTURE LAND USE

Bertie County's 2016 land use finds that the County and its towns have experienced little land development in recent years. Generally, limited residential and commercial development have occurred. During the planning process, participants identified several goals including satisfactory access for residents and visitors to the planning area's public trust waters, protection of natural areas, and land use and development patterns that mitigate risks to people and property from storms and flooding. Bertie County's future land use map reflects these goals and encourages conservation around the Chowain River as well as new development to offer water access. Figure 3-8 shows future land use in Bertie County per its comprehensive plan.

Figure 3-8 – Future Land Use, Bertie County

Source: Bertie County CAMA Land Use Plan Update, 2016

TOWN OF WINDSOR

The Town of Windsor oversees its own land use plan. The land use plan identifies actions including applying for public access funding to extend the riverwalk on Cashie River, adopting a riverfront zoning district, and pursuing building code enforcement against substandard structures. Additionally, the Town adopted a unified development ordinance in 2011 and amended it in 2020.

HYDE COUNTY

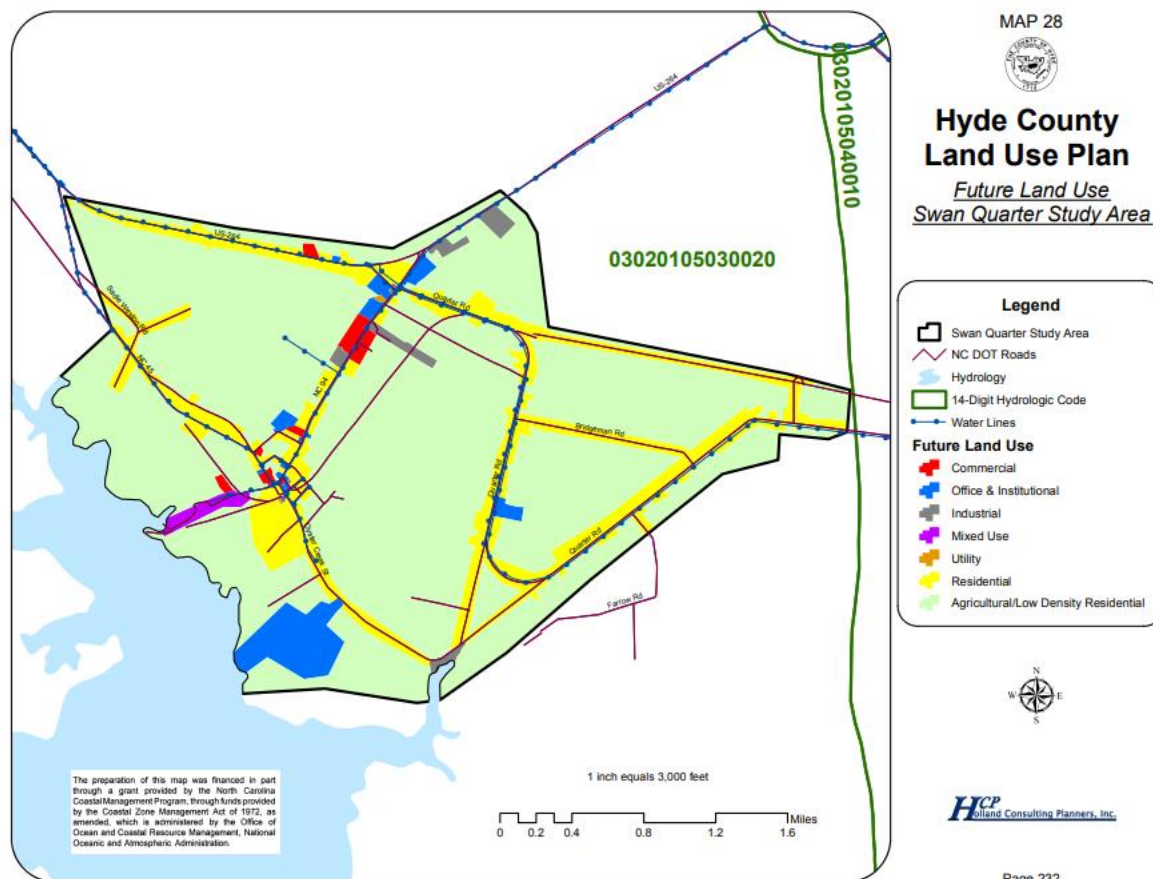
In Hyde County, land use, environment, and development regulations are the responsibility of the Hyde County Office of Planning & Economic Development. Hyde County adopted its most recent land use plan in 2008. In 2011, Hyde County established a Planning Advisory Board for Ocracoke and adopted an Ocracoke Development Ordinance to regulate development on the island, enabling development appropriate to the unique context of Ocracoke which differs significantly from mainland Hyde County. Hyde County is in the process of updating the CAMA Land Use Plan; this update is expected to be completed in 2026.

FUTURE LAND USE

Hyde County's 2008 Land Use Plan creates two separate visions for mainland Hyde County and Ocracoke Island. The first vision, for Hyde County Mainland, focuses on encouraging sustainable economic growth and attracting new industrial and commercial development. The vision for Ocracoke Island seeks to maintain the island's historic assets and traditional occupations while increasing locally-owned businesses and providing affordable housing.

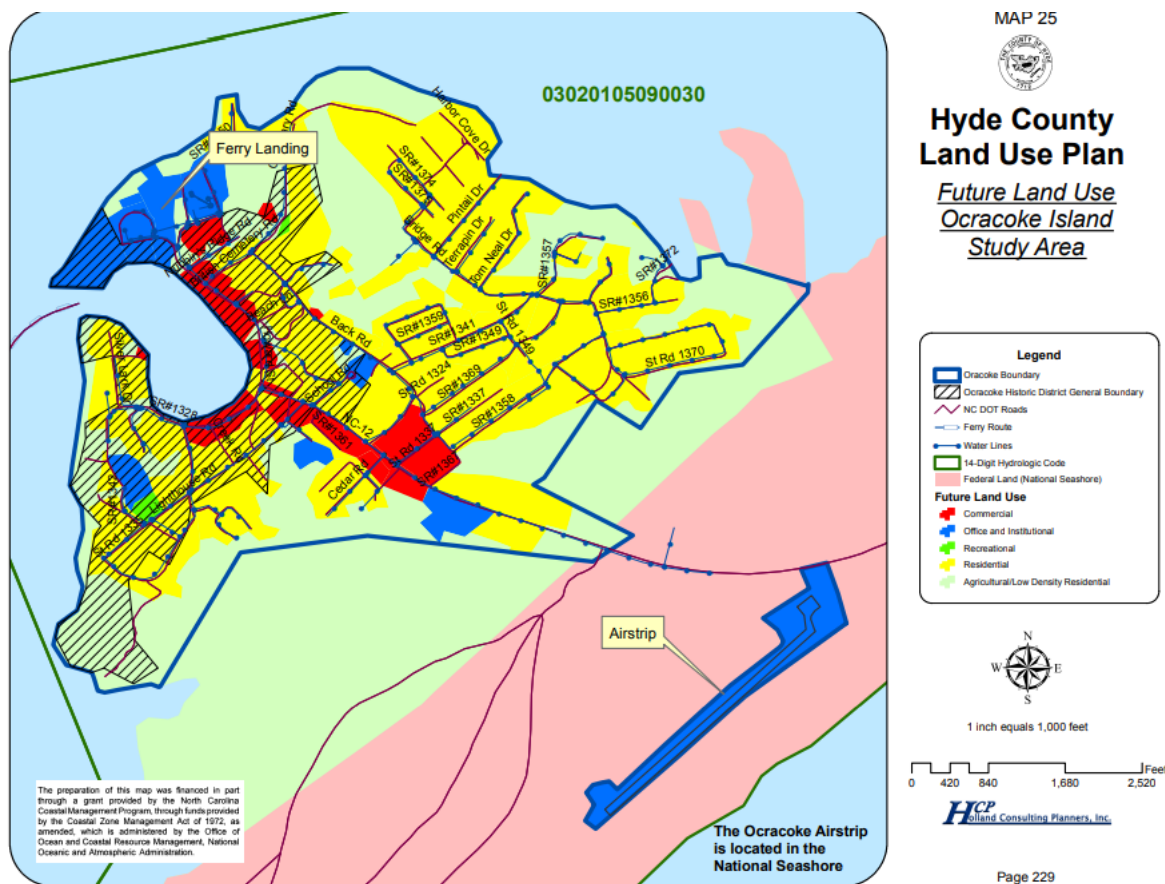
The Hyde County Land Use Plan includes study areas, which represent areas potentially suitable for development in the primarily rural county. Figure 3-9 provides the future land use designations for the Swan Quarter Study Area, and Figure 3-10 provides designations for the Ocracoke Island study area.

Figure 3-9 - Future Land Use Map, Swan Quarter Study Area



Source: Hyde County CAMA Land Use Plan, 2008

Figure 3-10 – Future Land Use Map, Ocracoke Island Study Area



Source: Hyde County CAMA Land Use Plan, 2008

MARTIN COUNTY

The Martin County Inspections Department provides building inspections and permitting services for all of Martin County including its incorporated municipalities. Martin County adopted its most recent comprehensive plan in 2013. The land use plan includes the municipalities of Bear Grass, Everetts, Hamilton, Hassell, Jamesville, Oak City, Parmele, and Robersonville.

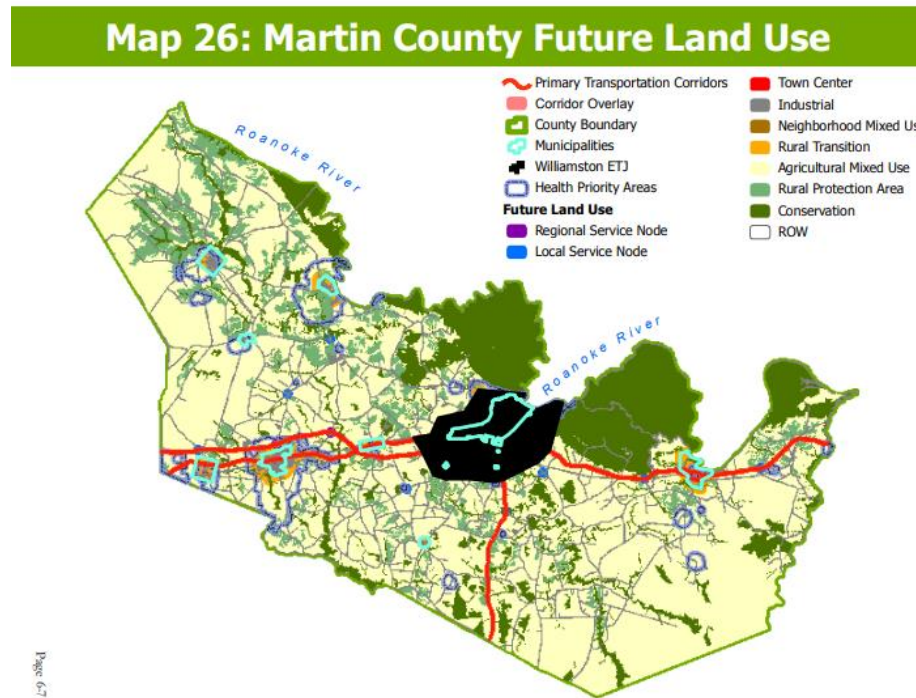
FUTURE LAND USE

Martin County identifies the following future land use categories:

- Regional Service Node: intends to service a regional market area and include a variety of retail sales and services, public and private administrations, etc.
- Local Service Node: represents intensive, defined concentrations of mixed services.
- Industrial: intends to be segregated from other uses where feasible.
- Town Center: provides for a mix of uses associated with traditional core of municipalities in Martin County
- Neighborhood Mixed Use: encourages a mix of uses associated with an urban development pattern
- Rural Transition: maintains rural character while allowing for clusters of development with conservation design.
- Agricultural Mixed Use: preserves agricultural use.

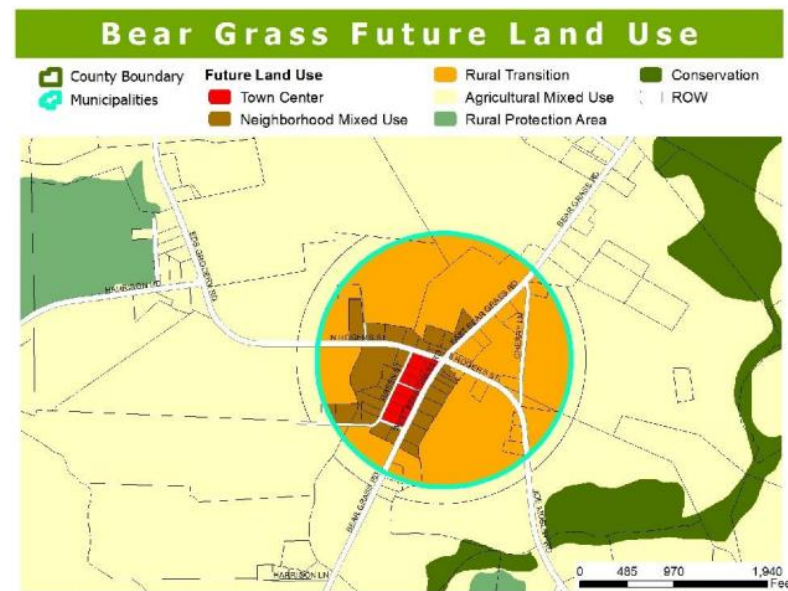
- Rural Protection Area: protects lands with prime farmland soils.
 - Conservation: intends for area to remain in natural state and protects sensitive natural features.
- Figure 3-11 through Figure 3-19 show future land use maps for Martin County and several of its municipalities.

Figure 3-11 – Martin County Future Land Use Map



Source: Martin County Comprehensive Plan with a Health & Wellness Component, 2013

Figure 3-12 – Bear Grass Future Land Use Map



Map 27. Town of Bear Grass Future Land Use

Figure 3-13 – Everetts Future Land Use Map

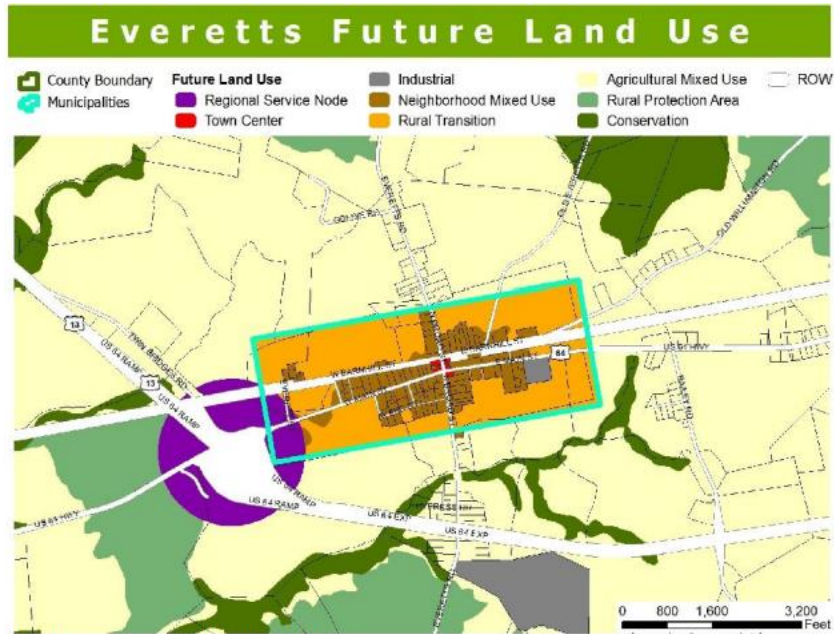


Figure 3-14 – Hamilton Future Land Use Map

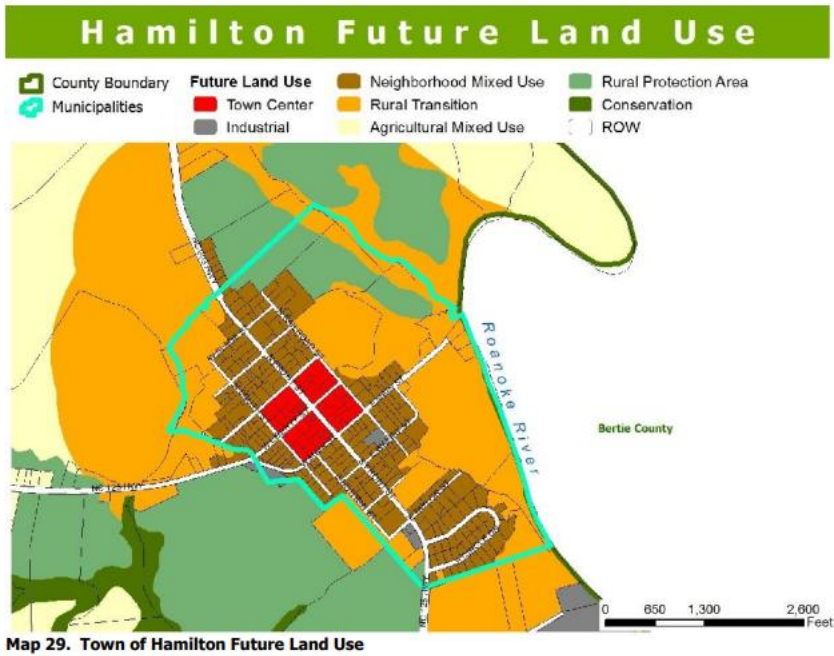
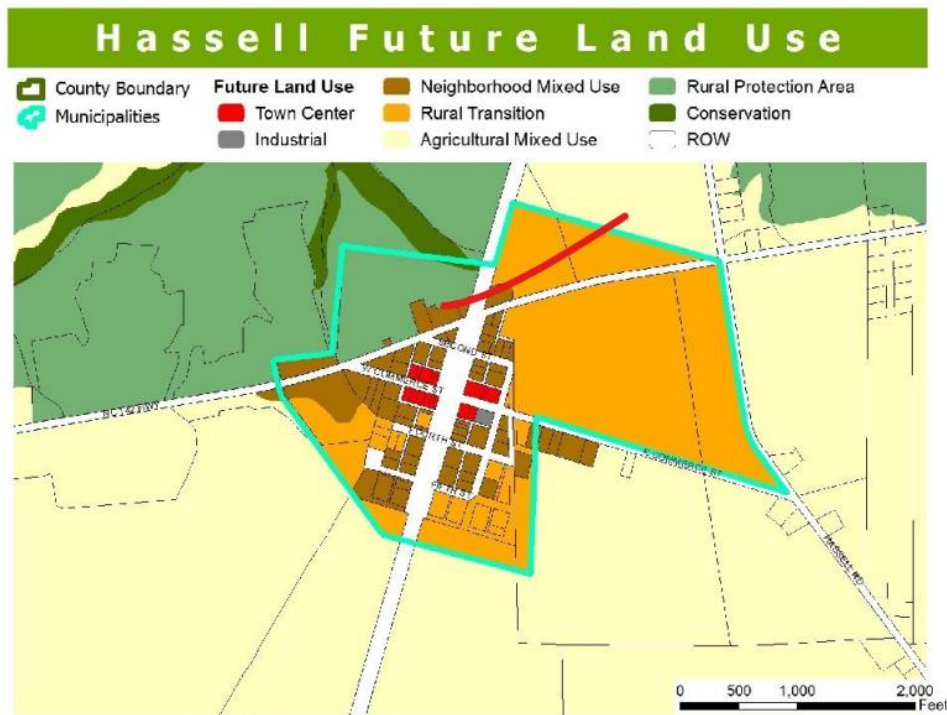
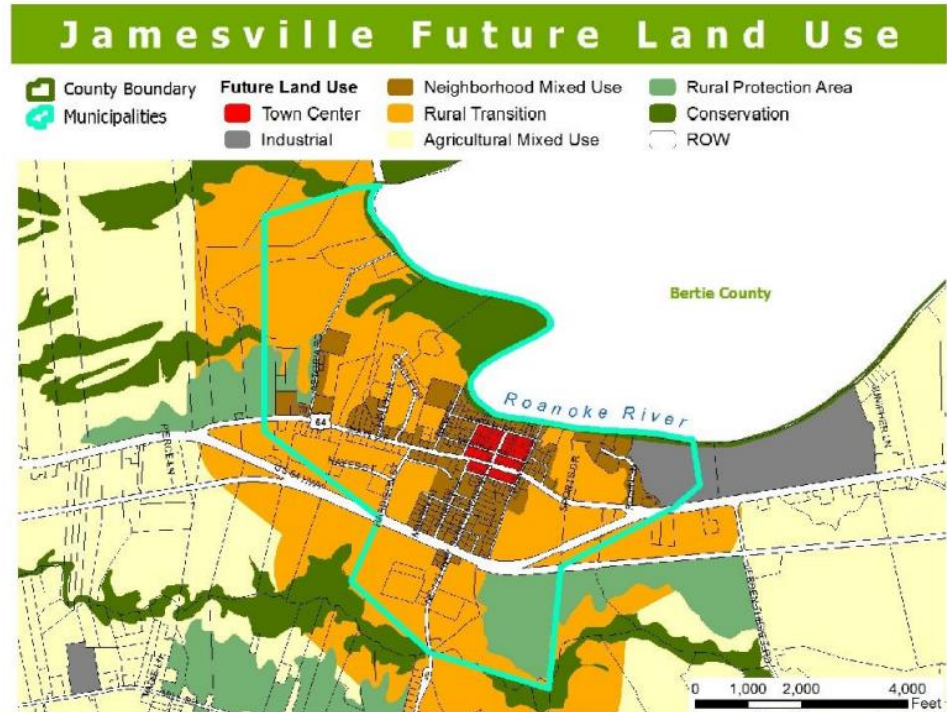


Figure 3-15 – Hassell Future Land Use Map



Map 30. Town of Hassell Future Land Use

Figure 3-16 – Jamesville Future Land Use Map



Map 31. Town of Jamesville Future Land Use

Figure 3-17 – Oak City Future Land Use Map

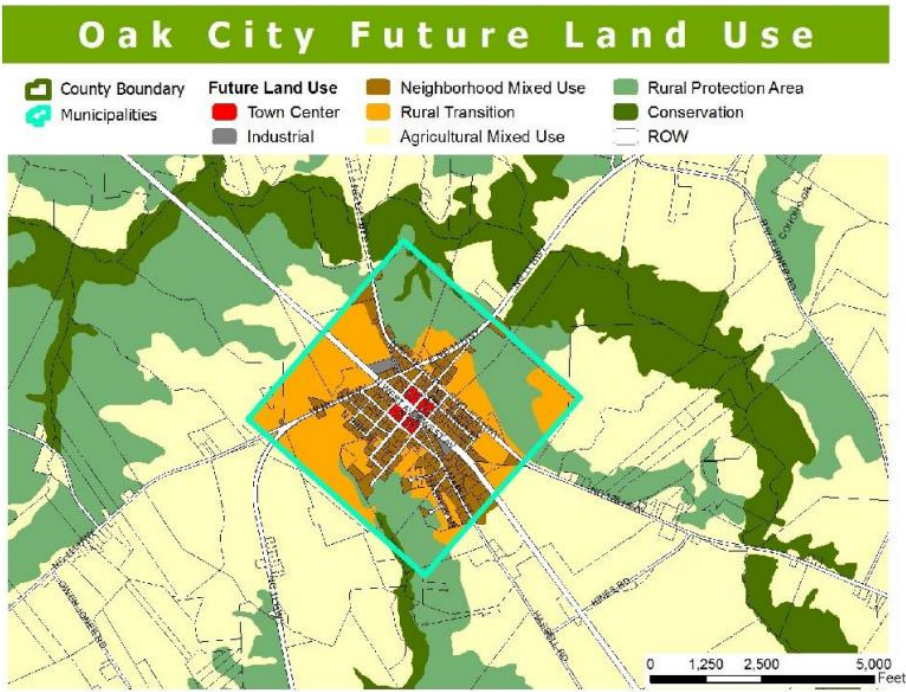


Figure 3-18 – Parmele Future Land Use Map

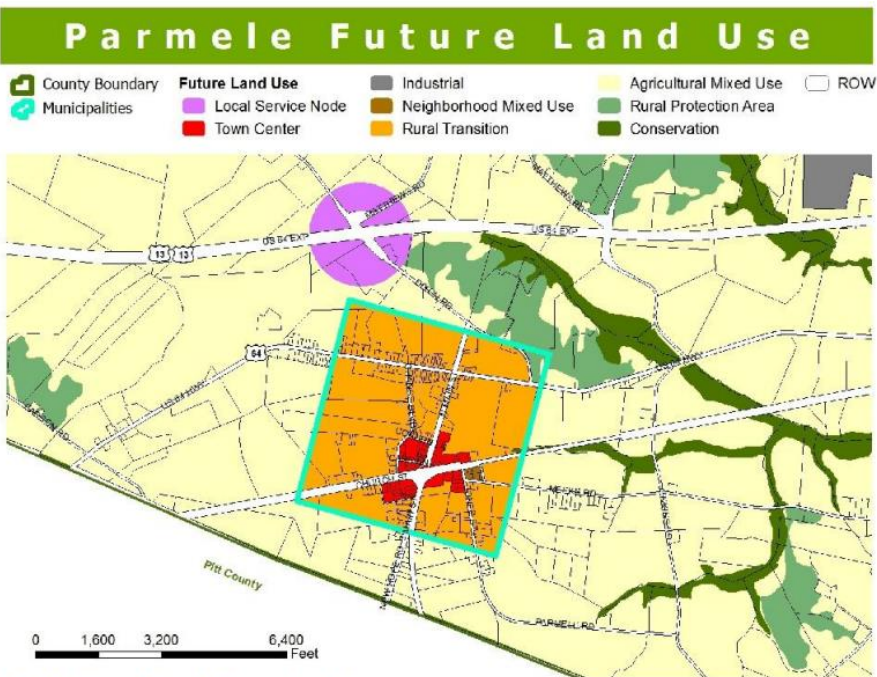
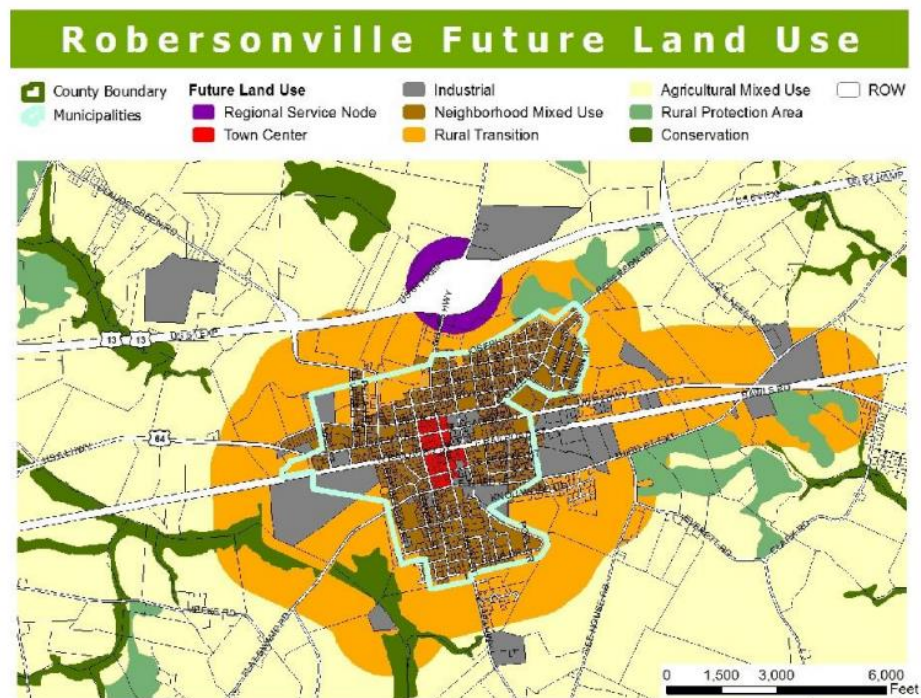


Figure 3-19 – Robersonville Future Land Use Map



Map 34. Town of Robersonville Future Land Use

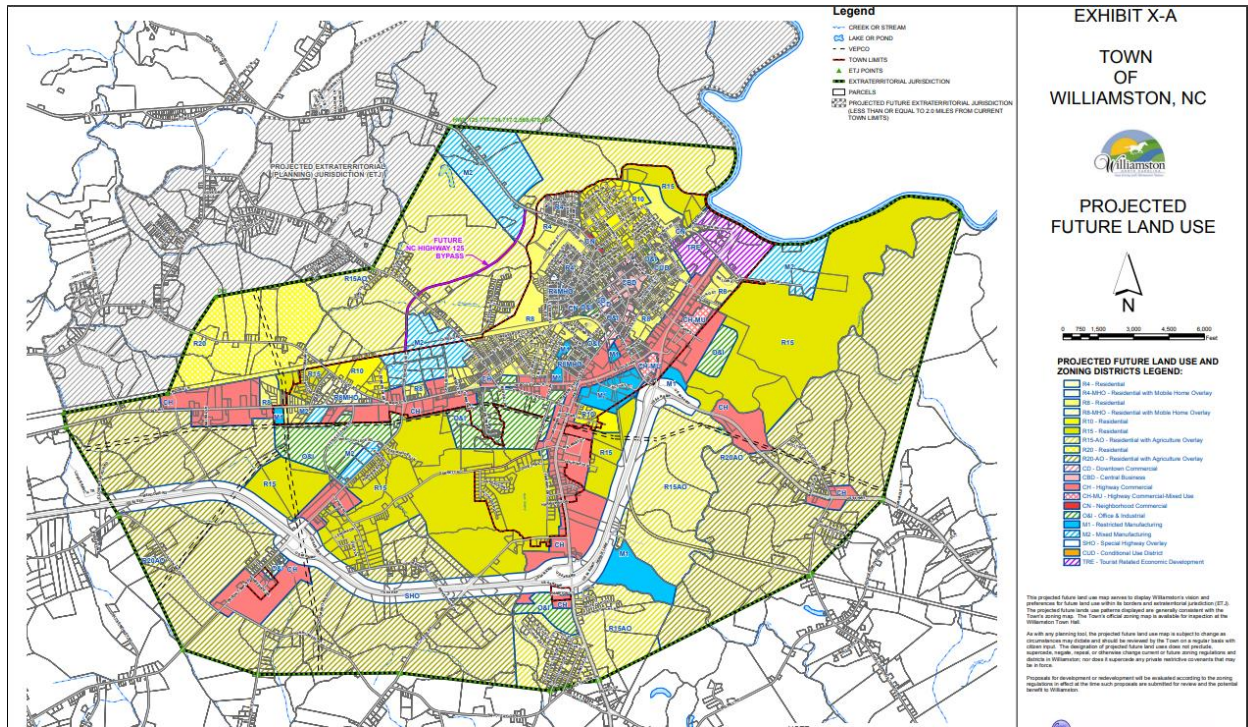
TOWN OF WILLIAMSTON

The Town of Williamston’s Planning Department oversees zoning, subdivision regulation, and land use. The town adopted a new comprehensive plan in 2012.

FUTURE LAND USE

The Town of Williamston’s land use plan seeks to encourage sustainable development concepts while maintaining its small-town character and reinvigorating its downtown. Figure 3-20 shows Williamston’s future land use map.

Figure 3-20 – Town of Williamston, NC Projected Future Land Use Map



Source: Town of Williamston Comprehensive Plan, 2012

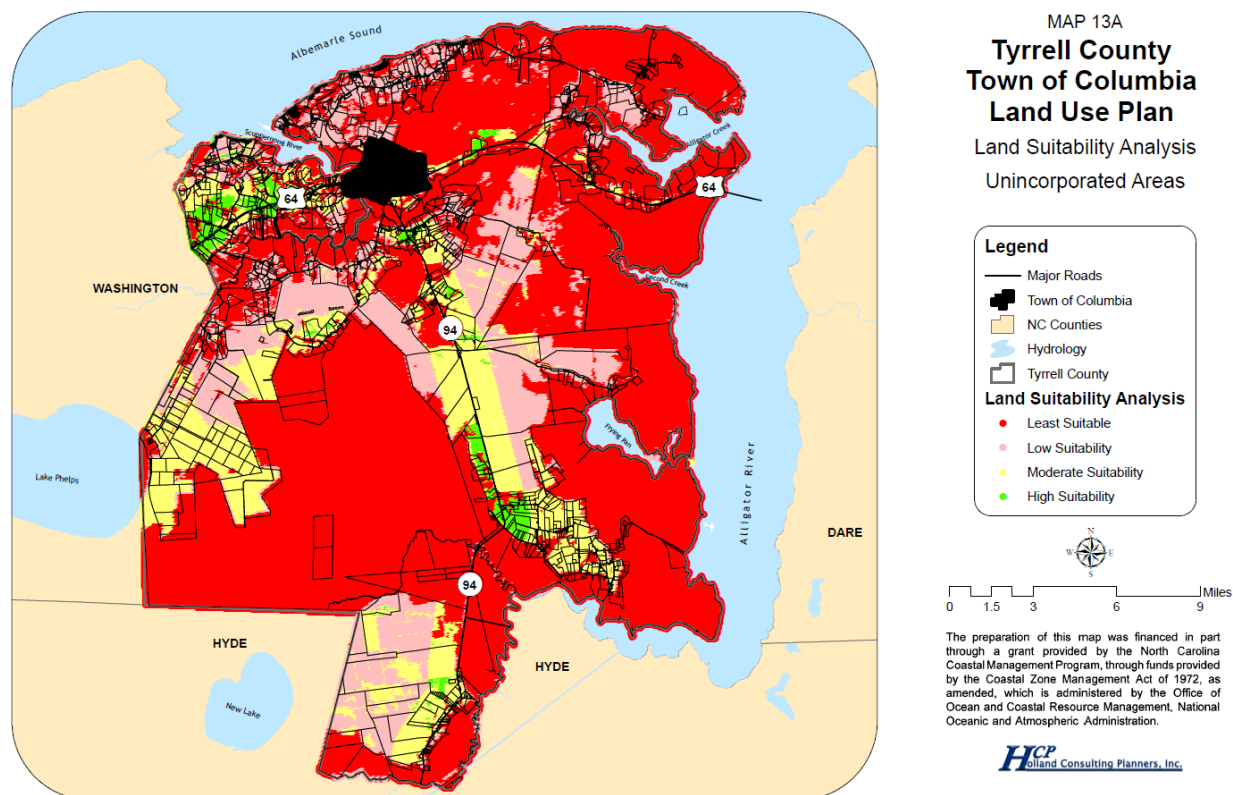
TYRRELL COUNTY

Tyrrell County’s Building Inspections Department handles development regulations. Tyrrell County adopted its comprehensive plan, which includes the Town of Columbia, in December 2009.

FUTURE LAND USE

Tyrrell County’s comprehensive plan envisions a community that maintains its rural character while focusing on the preservation of agriculture, affordable housing, and the protection of environmental resources.

Figure 3-21 – Tyrrell County and Town of Columbia’s Future Land Use Map



Source: Tyrrell County CAMA Core Land Use Plan

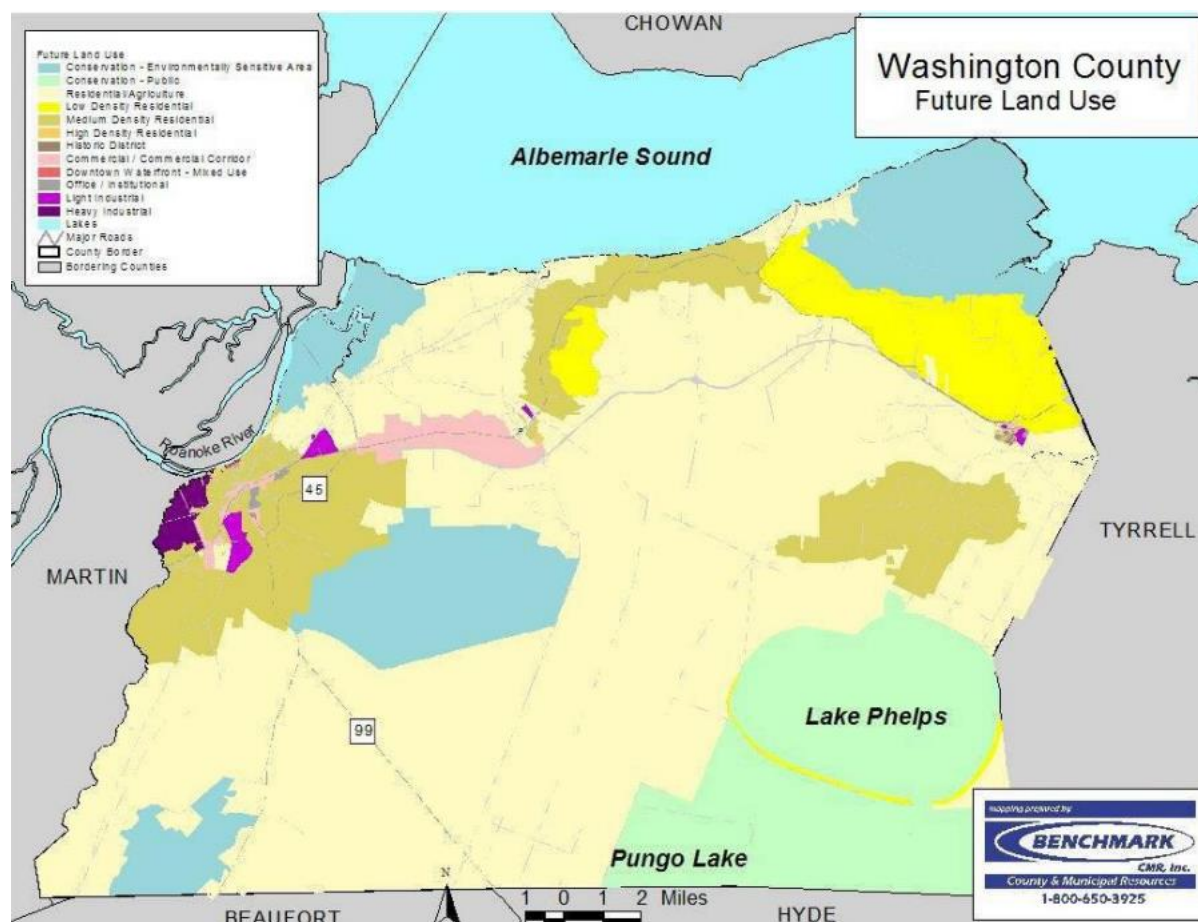
WASHINGTON COUNTY

In Washington County, land use, environment, and development regulations are the responsibility of the Washington County Planning & Inspections Department. Washington County adopted its most recent comprehensive plan in 2009.

FUTURE LAND USE

Washington County features predominantly agriculture and forestry uses. The 2009 plan states that the area most likely to experience development is the interchanges along the Highway 64 corridor and recognizes the potential for residential development along Highway 32 N. Figure 3-22 shows the future land use map from the 2009 plan.

Figure 3-22 – Washington County Future Land Use Map



Source: Washington County Land Use Plan, 2009

TOWN OF PLYMOUTH

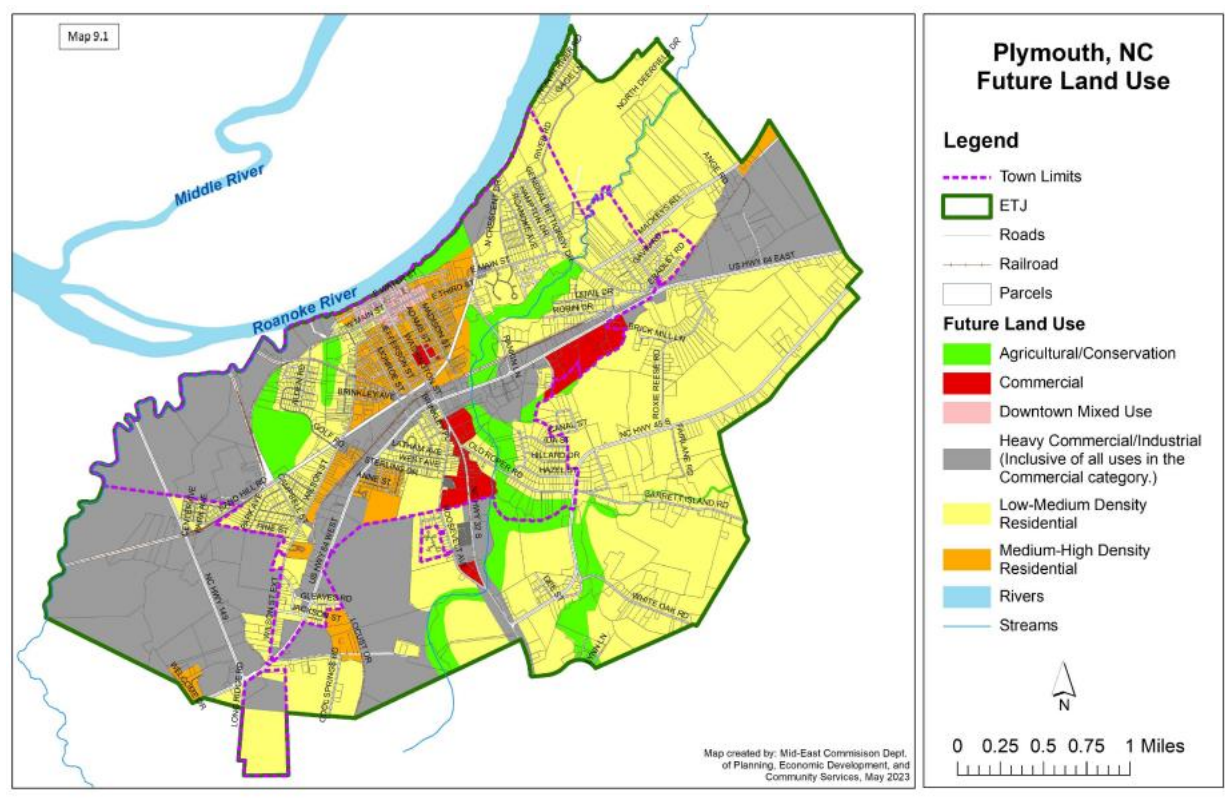
The Town of Plymouth's Planning, Zoning and Building Inspections Department handles zoning, subdivision regulations, and land use. Plymouth adopted its own comprehensive plan, independent of Washington County, in 2024. This land use plan also includes Plymouth's extra-territorial jurisdiction.

FUTURE LAND USE

The Town of Plymouth identifies the following future land use categories:

- Low-medium density residential: single and two-family dwellings with very limited commercial, office, recreational, or public/institutional uses
- Medium-high density residential: single-family and two-family dwellings, multifamily structures, and limited commercial, office, recreational or public uses
- Commercial: light commercial uses
- Downtown Mixed Use: light commercial uses, public uses, tourism, and limited residential uses
- Heavy Commercial/Industrial: all commercial and industrial uses
- Agricultural/Conservation: agriculture forestry, open space, conservation

Figure 3-23 shows Plymouth's future land use map.

Figure 3-23 – Town of Plymouth Future Land Use Map

Source: Town of Plymouth CAMA Comprehensive Plan/Strategic Plan, 2024

3.7 EMPLOYMENT AND INDUSTRY

Per the 2019-2023 American Community Survey 5-Year Estimates, the median household income for the Northeastern Region ranges from \$41,750 in Washington County to \$47,338 in Hyde County. This range is significantly lower than the median household income of \$69,904 in North Carolina during this same time period. However, approximately, 12.8% of the population is considered to be living below the poverty level, which is slightly lower than the rate of poverty for the state of North Carolina, 13.2%.

Table 3-11 shows employment statistics for all participating jurisdictions. Table 3-11 shows occupation statistics for all participating jurisdictions.

Table 3-11 – Employment Statistics for Northeastern Region, 2023

Jurisdiction	Population in Labor Force	Percent Employed*(%)	Percent Not in Labor Force*(%)	Unemployment Rate (%)
Bertie County	6,502	39.7%	56.7%	8.4%
Hyde County	1,683	40.0%	58.8%	3.0%
Martin County	9,965	51.8%	44.2%	7.0%
Tyrrell County	1,231	41.2%	56.5%	5.1%
Washington County	4,486	42.7%	51.3%	11.2%

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

Note: This table reports only the civilian labor force. Population employed, population unemployed, and population not in labor force are reported as a percent of the total population aged 16 years and older.

Table 3-12 – Percent of Employed Population by Occupation for Northeastern Region, 2023

Occupation	Management, business, science and arts (%)	Service (%)	Sales and Office (%)	Natural Resources, Construction, and Maintenance (%)	Production, transportation, and material moving (%)
Bertie County	31.6%	17.8%	16.4%	12.4%	21.8%
Hyde County	43.0%	15.9%	20.9%	6.6%	13.5%
Martin County	31.7%	24.4%	18.5%	8.2%	17.1%
Tyrrell County	36.6%	23.9%	13.6%	19.5%	6.3%
Washington County	23.5%	21.5%	24.3%	16.8%	13.9%

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

Management, business, science, and arts make up the largest share of employment for Bertie, Hyde, Martin, and Tyrrell counties. Service is also a significant occupation type in Martin, Tyrrell, and Washington Counties. Tyrrell and Washington Counties experience a higher percentage of natural resources, construction, and maintenance than the rest of the region, which is likely due to the wildlife refuges located in these counties.

Table 3-13 summarizes the major employers for each County in the Albemarle Region from AccessNC as of the 4th quarter of 2024.

Table 3-13 – Major Employers in 2024, Northeastern Region

Employer	Industry Type	Estimated Employees
Bertie County		
Perdue Farms Incorporated	Manufacturing	1000+
Bertie County Board of Education	Educational Services	250-499
NC Department of Adult Corrections	Public Administration	100-249
County of Bertie	Public Administration	100-249
Packers Sanitation Services Inc	Administrative and Support and Waste Management and Remediation Services	100-249
Pitt County Memorial Hospital	Health Care and Social Assistance	100-249
OSI LLC	Administrative and Support and Waste Management and Remediation Services	100-249
Home Life Care Inc	Health Care and Social Assistance	50-99
Liberty Healthcare Group LLC	Health Care and Social Assistance	50-99
Republic Services Inc	Administrative and Support and Waste Management and Remediation Services	50-99
Avoca Inc	Manufacturing	50-99
Hyde County		
County of Hyde	Public Administration	100-249
Hyde County Board of Education	Educational Services	100-249
Illinois Tool Works Inc	Manufacturing	100-249
NC Department of Adult Corrections	Public Administration	100-249
NC Department of Transportation	Public Administration	50-99
Soulshine Music Corporation	Accommodation and Food Services	50-99
Williams Seafood Inc	Wholesale Trade	50-99
Heron Hospitality LLC	Accommodation and Food Services	50-99

SECTION 3: PLANNING AREA PROFILE

Employer	Industry Type	Estimated Employees
Martin County		
Flagstone Foods LLC	Manufacturing	500-999
Martin County Board of Education	Educational Services	250-499
Wal-Mart Associates Inc	Retail Trade	100-249
County of Martin	Public Administration	100-249
Martin Community College	Educational Services	100-249
Town of Williamston	Public Administration	100-249
Industrial Manufacturing Co LLC	Manufacturing	100-249
Food Lion LLC	Retail Trade	100-249
Home Life Care Inc	Health Care and Social Assistance	100-249
Jackson Foods Inc	Retail Trade	50-99
Martin County Residential Services	Health Care and Social Assistance	50-99
State of NC Dept of Health & Human	Public Administration	50-99
Williamston Nursing Facility Op	Health Care and Social Assistance	50-99
Quality Home Staffing Inc	Health Care and Social Assistance	50-99
Williams Fire Sprinkler Co Inc	Construction	50-99
Tands Inc	Accommodation and Food Services	50-99
Bear Grass Charter School Inc	Educational Services	50-99
State of NC Dept of Agriculture	Public Administration	50-99
NC Department of Transportation	Public Administration	50-99
Deadwood Inc	Accommodation and Food Services	50-99
S & J Foods Inc	Accommodation and Food Services	50-99
Tyrrell County		
Tyrrell County Board of Education	Educational Services	100-249
Capt Charlies Seafood Inc	Manufacturing	50-99
County of Tyrrell	Public Administration	50-99
NC Department of Adult Corrections	Public Administration	50-99
Food Lion LLC	Retail Trade	50-99
Ask Staffing Inc	Administrative and Support and Waste Management and Remediation Services	50-99
Washington County		
Domtar Paper Company LLC	Manufacturing	250-499
Washington County Bd of Education	Educational Services	100-249
County of Washington	Public Administration	100-249
Weyerhaeuser Nr	Manufacturing	100-249
Affinity Health Partners LLC	Health Care and Social Assistance	100-249
Home Life Care Inc	Health Care and Social Assistance	50-99
The Carrolton of Plymouth	Health Care and Social Assistance	50-99
Food Lion LLC	Retail Trade	50-99
District Health Dept Martin- Tyrrel	Public Administration	50-99
Taylor Enterprises Inc	Accommodation and Food Services	50-99

Source: ACCESSNC Employer Profile, 2024 Quarter 4

4 RISK ASSESSMENT

Requirement §201.6(c)(2): [The plan shall include] A risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.

Requirement §201.6(c)(2)(i): [The risk assessment shall include a] description of the type...of all natural hazards that can affect the jurisdiction.

Requirement §201.6(c)(2)(i): [The risk assessment shall include a] description of the...location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.

44 CFR Subsection D §201.6(c)(2)(ii): [The risk assessment shall include a] description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community. Plans approved after October 1, 2008 must also address NFIP insured structures that have been repetitively damaged by floods. The plan should describe vulnerability in terms of:

A) The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas;

(B): An estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(ii)(A) of this section and a description of the methodology used to prepare the estimate; and

(C): Providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.

4.1 OVERVIEW

This section describes the Hazard Identification and Risk Assessment process for the development of the Northeastern NC Regional Hazard Mitigation Plan. It describes how the Region met the requirements of Planning Step 4: Assess the Hazard and Planning Step 5: Assess the Problem from the 10-step planning process.

As defined by FEMA, risk is a combination of hazard, vulnerability, and exposure. “It is the impact that a hazard would have on people, services, facilities, and structures in a community and refers to the likelihood of a hazard event resulting in an adverse condition that causes injury or damage.” This hazard risk assessment covers all of unincorporated Bertie, Martin, Hyde, Tyrrell, and Washington Counties and all incorporated jurisdictions participating in this plan.

The risk assessment process identifies and profiles relevant hazards and assesses the exposure of lives, property, and infrastructure to these hazards. The process allows for a better understanding of the potential risk to natural hazards in the county and provides a framework for developing and prioritizing mitigation actions to reduce risk from future hazard events. This risk assessment followed the methodology described in the FEMA publication Understanding Your Risks—Identifying Hazards and Estimating Losses (FEMA 386-2, 2002), which breaks the assessment down to a four-step process:



Data collected through this process has been incorporated into the following sections of this plan:

- **Section 4.2: Hazard Identification** identifies the natural and human-caused hazards that affect the region.
- **Section 4.3: Risk Assessment Methodology and Assumptions** describes how the risk and vulnerability assessment was conducted and presented.
- **Section 4.4: Asset Inventory** details population, buildings, and critical facilities at risk in the region.
- **Section 4.5: Hazard Profiles, Analysis, and Vulnerability** discusses the threat to the region, describes previous occurrences of hazard events and the likelihood of future occurrences, and assesses the region’s exposure to each hazard profiled, considering assets at risk, critical facilities, and future development trends.
- **Section 4.6: Conclusions on Hazard Risk** summarizes the results of the Priority Risk Index and defines each hazard as a Low, Medium, or High Risk hazard.

4.2 HAZARD IDENTIFICATION

To identify the full range of hazards relevant to the planning area, the HMPC began with a review of the list of hazards identified in the 2023 State Hazard Mitigation Plan and the 2021 Northeastern NC Regional Hazard Mitigation Plan. This review of hazards is summarized in Table 4.1. The HMPC used this process to ensure consistency across hazard mitigation planning efforts. All hazards on the list below were evaluated for inclusion in this plan update and, where appropriate, the hazard list in this plan was updated to be consistent with the State Hazard Mitigation Plan.

Table 4.1 – Full Range of Hazards Evaluated

Hazard	Included in 2023 State HMP?	Included in 2021 Northeastern NC Regional HMP?
Flooding	Yes	Yes
Hurricanes and Coastal Hazards	Yes	Yes (evaluated separately)
Severe Winter Weather	Yes	Yes
Excessive Heat	Yes	Yes
Earthquake	Yes	Yes
Wildfire	Yes	Yes
Dam Failure	Yes	Yes
Levee Failure	No	Yes (evaluated with Dam Failure)
Drought	Yes	Yes
Tornadoes and Thunderstorms	Yes	Yes (evaluated separately)
Landslide	Yes	No
Sinkholes	Yes	Yes
Hazardous Substances	Yes	No
Radiological Emergency	Yes	No
Terrorism	Yes	No
Infectious Disease	Yes	No
Cyber Security	Yes	No
Electromagnetic Pulse	Yes	No

The HMPC evaluated the above list of hazards using existing hazard data, past disaster declarations, local knowledge, and information from the 2023 State Plan and the 2021 Northeastern NC Regional Plan to determine the significance of these hazards to the planning area. Significance was measured in general terms and focused on key criteria such as frequency and resulting damage, which includes deaths and injuries, as well as property and economic damage.

One significant resource in this effort was the National Oceanic and Atmospheric Administration's (NOAA) National Centers for Environmental Information (NCEI) Storm Events Database, which contains an archive by county of storms and other significant weather phenomena having sufficient intensity to cause loss of life, injuries, significant property damage, and/or disruption to commerce. The database also provides a partial record of other significant meteorological events, such as record maximum or minimum temperatures or precipitation that occurs in connection with another event. The database contains records of tornado events since 1950, thunderstorm wind and hail events since 1955, and all other tracked event types since 1996. NCEI receives storm data from the National Weather Service (NWS), which receives their information from a variety of sources, which include but are not limited to county, state and federal emergency management officials, local law enforcement officials, SkyWarn spotters, NWS damage surveys, newspaper clipping services, the insurance industry and the general public, among others.

The NCEI database contains 891 records of severe weather events that occurred in Bertie, Hyde, Martin, Tyrrell, and Washington Counties in the 26-year period from January 1999 through December 2024. Table 4.2 summarizes these events.

Table 4.2 – NCEI Severe Weather Reports for the Northeastern NC Region Counties, Jan 1999 – Dec 2024

Type	# of Events	Property Damage	Crop Damage	Deaths	Injuries
Blizzard	0	\$0	\$0	0	0
Coastal Flood	8	\$0	\$0	0	0
Cold/Wind Chill	0	\$0	\$0	0	0
Drought	17	\$0	\$0	0	0
Excessive Heat	14	\$0	\$0	0	0
Extreme Cold/Wind Chill	0	\$0	\$0	0	0
Flash Flood	61	\$215,000	\$0	1	0
Flood	14	\$10,010,000	\$2,000,000	5	0
Frost/Freeze	8	\$0	\$0	0	0
Hail	132	\$95,000	\$251,000	0	0
Heat	1	\$0	\$0	0	0
Heavy Rain	27	\$0	\$0	0	0
Heavy Snow	23	\$0	\$0	0	0
High Wind	33	\$55,000	\$0	0	0
Hurricane	41	\$53,557,000	\$85,650,000	0	0
Ice Storm	2	\$0	\$0	0	0
Lightning	0	\$0	\$0	0	0
Storm Surge	7	\$61,100,000	\$0	0	0
Strong Wind	6	\$2,000	\$0	0	0
Thunderstorm Wind	272	\$578,800	\$0	0	4
Tornado	53	\$6,464,500	\$1,400,000	14	81
Tropical Storm	61	\$18,988,200	\$51,000,000	0	0
Wildfire	0	\$0	\$0	0	0
Winter Storm	68	\$25,000	\$0	0	0
Winter Weather	43	\$0	\$0	0	0
Total:	891	\$151,090,500	\$140,301,000	20	85

Source: National Center for Environmental Information Events Database, accessed July 2025

Note: Losses reflect totals for all impacted areas for each event.

The HMPC also researched past events that resulted in a federal and/or state emergency or disaster declaration for Bertie, Hyde, Martin, Tyrrell, and Washington Counties in order to identify significant hazards. Federal and/or state disaster declarations may be granted when the Governor certifies that the combined local, county and state resources are insufficient and that the situation is beyond their recovery capabilities. When the local government's capacity has been surpassed, a state disaster declaration may be issued, allowing for the provision of state assistance. If the disaster is so severe that both the local and state government capacities are exceeded, a federal emergency or disaster declaration may be issued allowing for the provision of federal assistance.

Records of designated counties for FEMA major disaster declarations start in 1964. Since then, Bertie, Hyde, Martin, Tyrrell, and Washington Counties have been designated in 20 different major disaster declarations. Table 4.3 summarizes the count of declarations per county, and Table 4.4 provides details for these declarations.

Table 4.3 – Summary of Disaster Declarations by County

County	Major Declarations Received
Bertie	14
Hyde	15
Martin	9
Tyrrell	10
Washington	9

Source: FEMA Disaster Declarations Summary, updated July 9, 2025

Table 4.4 – FEMA Major Disaster Declarations for Northeastern NC Region Counties

County*	Disaster #	Date	Incident Type	Event Title
B, H	4568	10/14/2020	Hurricane	Hurricane Isaias
B, H, M, T, W	4487	3/25/2020	Biological	COVID-19 Pandemic
H, T, W	4465	10/4/2019	Hurricane	Hurricane Dorian
H	4412	1/31/2019	Hurricane	Tropical Storm Michael
B, H, T	4393	9/14/2018	Hurricane	Hurricane Florence
B, H, M, T, W	4285	10/10/2016	Hurricane	Hurricane Matthew
B, H, M, T, W	4019	8/31/2011	Hurricane	Hurricane Irene
B, T	1969	4/19/2011	Severe Storm(s)	Severe Storms, Tornadoes, And Flooding
B, M, T, W	1942	10/14/2010	Severe Storm(s)	Severe Storms, Flooding, And Straight-Line Winds
H	1608	10/7/2005	Hurricane	Hurricane Ophelia
B, H, M, T, W	1490	9/18/2003	Hurricane	Hurricane Isabel
B, H, M, T, W	1292	9/16/1999	Hurricane	Hurricane Floyd Major Disaster Declarations
H	1291	9/9/1999	Hurricane	Hurricane Dennis
B, H, M, T, W	1240	8/27/1998	Hurricane	Hurricane Bonnie
B, H, M	1134	9/6/1996	Hurricane	Hurricane Fran
H	1127	7/18/1996	Hurricane	Hurricane Bertha
B	1087	1/13/1996	Snow	Blizzard of 96
H	818	12/12/1988	Tornado	Severe Storms & Tornadoes
B	699	3/30/1984	Tornado	Severe Storms & Tornadoes
B, M, W	234	2/10/1968	Severe Ice Storm	Severe Ice Storm

Source: FEMA Disaster Declarations Summary, updated July 9, 2025

*County code: B = Bertie, H = Hyde, M = Martin, T = Tyrrell, W = Washington

Using the above information and additional discussion, the HMPC evaluated each hazard’s significance to the planning area in order to decide which hazards to include in this plan update. Some hazard titles have been updated either to better encompass the full scope of a hazard or to assess closely related hazards together. Table 4.5 summarizes the determination made for each hazard.

Table 4.5 – Hazard Evaluation Results

Hazard	Included in this plan update?	Explanation for Decision
Flooding	Yes	The 2021 Northeastern NC plan and 2023 State plan addressed this hazard. Multiple disaster declarations for the region are related to flooding. NCEI reports 110 flood-related events over the past 26 years.
Hurricane and Coastal Hazards	Yes	The 2021 Northeastern NC plan identified hurricanes and tropical storms, which the 2023 State plan groups with coastal hazards. Past disaster declarations and NCEI storm reports indicate hurricanes are a significant hazard for the region. Past hurricane activity and part of the region’s coastal location indicate coastal erosion as a significant hazard.
Severe Winter Weather	Yes	The 2021 Northeastern NC plan and 2023 State plan addressed this hazard. The region has received several past disaster declarations related to this hazard. NCEI reports 144 severe winter weather related events.
Excessive Heat	Yes	The 2021 Northeastern NC plan and 2023 State plan addressed this hazard. NCEI reports 15 heat events for the region.
Earthquake	Yes	The 2021 Northeastern NC plan and 2023 State plan addressed this hazard. The region could face minimal impacts from the Eastern Tennessee Seismic zone and the Charleston fault.
Wildfire	Yes	The 2021 Northeastern NC plan and 2023 State plan addressed this hazard. Most of the planning area is within the Wildland Urban Interface.
Dam & Levee Failure	Yes	The 2023 State plan addressed dam failure and there are multiple dams in the region. The 2021 Northeastern NC plan addressed dam and levee failure. The USACE’s National Levee Database identifies several levees in the region.
Drought	Yes	The 2021 Northeastern NC plan and 2023 State plan addressed this hazard. There have been multiple past instances of severe drought. NCEI reports 17 drought events in the past 26 years.
Tornadoes & Thunderstorms	Yes	The 2021 Northeastern NC plan addressed these hazards, which are combined in the 2023 State plan. NCEI reports 53 tornado events, 311 wind events, and 132 hail events in the past 26 years.
Landslide	No	The 2023 State plan addressed this hazard but did not find significant risk in the eastern portion of the state. The 2021 Northeastern NC plan did not address this hazard.
Sinkholes	Yes	The 2021 Northeastern NC plan addressed this hazard. USGS data shows there is geological basis for sinkhole risk in parts of the region despite it being an unlikely occurrence.

Hazard	Included in this plan update?	Explanation for Decision
Hazardous Substances	Yes	The 2023 State plan addressed this hazard, but the 2021 Northeastern NC did not. The HMPC decided to evaluate this hazard due to transportation of hazardous materials through the region.
Radiological Emergency	No	The 2023 State plan addressed this hazard, but the 2021 Northeastern NC did not. No part of the region falls within the EPZ or IPZ of a nuclear facility.
Terrorism	No	The 2023 State plan addressed this hazard, but the 2021 Northeastern NC did not. The region considers this hazard more appropriately addressed at the State level.
Infectious Disease	No	The 2023 State plan addressed this hazard, but the 2021 Northeastern NC did not. The State HMP reports the entire State is equally at risk, but vulnerability is low across all but one impact category. Infectious disease risk is managed by state and county health departments.
Cyber Security	No	The 2023 State plan addressed this hazard, but the 2021 Northeastern NC did not. The region considers this hazard more appropriately addressed by emergency operations planning and local staff training.
Electromagnetic Pulse	No	The 2023 State plan addressed this hazard, but the 2021 Northeastern NC did not. The region considers this hazard more appropriately addressed at the State level.

The final list of hazards included in this plan are as follows:

- Dam & Levee Failure
- Drought
- Earthquake
- Excessive Heat
- Flooding
- Hurricanes & Coastal Hazards
- Tornadoes & Thunderstorms
- Severe Winter Weather
- Sinkhole
- Wildfire
- Hazardous Substances

4.3 RISK ASSESSMENT METHODOLOGY AND ASSUMPTIONS

The Disaster Mitigation Act of 2000 requires that the HMPC evaluate the risks associated with each of the hazards identified in the planning process. Each hazard was evaluated to determine its probability of future occurrence and potential impact. A vulnerability assessment was conducted for each hazard using either quantitative or qualitative methods depending on the available data, to determine its potential to cause significant human and/or monetary losses. A consequence analysis was also completed for each hazard. Each hazard is profiled in the following format:

HAZARD DESCRIPTION

This section provides a description of the hazard, including discussion of its speed of onset and duration, as well as any secondary effects followed by details specific to the Northeastern NC Region.

LOCATION

This section includes information on the hazard's physical extent, with mapped boundaries where applicable. This section informs the spatial extent assessment category in the Priority Risk Index rating of each hazard.

EXTENT

This section includes information on the hazard magnitude and describes how the severity of the hazard can be measured. Where available, the most severe event on record is used as a frame of reference. This section informs the impact assessment category in the Priority Risk Index rating of each hazard.

HISTORICAL OCCURRENCES

This section contains information on historical events, including the location and consequences of all past events on record within or near the Northeastern NC Region.

PROBABILITY OF FUTURE OCCURRENCE

This section gauges the likelihood of future occurrences based on past events and existing data. The frequency is generally determined by dividing the number of events observed by the number of years on record. This provides the percent chance of the event happening in any given year according to historical occurrence (e.g. 10 winter storm events over a 30-year period equates to a 33 percent chance of experiencing a severe winter storm in any given year). This section informs the probability assessment category in the Priority Risk Index rating of each hazard.

CLIMATE CHANGE

Where applicable, this section discusses how climate change may or may not influence the risk posed by the hazard on the planning area in the future. Resources on climate change projections and potential impacts include the Fourth National Climate Assessment, the Fifth National Climate Assessment, and the North Carolina State Climate Office.

VULNERABILITY ASSESSMENT

This section quantifies, to the extent feasible using best available data, assets at risk to natural hazards and potential loss estimates. People, properties and critical facilities, and environmental assets that are vulnerable to the hazard are identified. Future development is also discussed in this section, including how exposure to the hazard may change in the future or how development may affect hazard risk.

The vulnerability assessments followed the methodology described in the FEMA publication *Understanding Your Risks—Identifying Hazards and Estimating Losses* (FEMA 386-2, 2002). The vulnerability assessment first describes the total vulnerability and values at risk and then discusses vulnerability by hazard. Data used to support this assessment included the following:

- Geographic Information System (GIS) datasets, including building footprints, topography, aerial photography, and transportation layers
- Hazard layer GIS datasets from state and federal agencies
- Written descriptions of inventory and risks provided by the State Hazard Mitigation Plan
- Written descriptions of inventory and risks provided by the previous Northeastern NC Regional Hazard Mitigation Plan

- Exposure and vulnerability estimates provided by the North Carolina Emergency Management (NCEM) IRISK database via the NCEM Risk Management Tool
- Crop insurance claims by cause from USDA's Risk Management Agency

Two distinct risk assessment methodologies were used in the formation of the vulnerability assessment: a quantitative analysis that relies upon best available data and technology and a qualitative analysis that relies on local knowledge and rational decision making.

Vulnerability can be quantified in those instances where there is a known, identified hazard area, such as a mapped floodplain. In these instances, the numbers and types of buildings subject to the identified hazard can be counted and their values tabulated. Where hazard risk cannot be distinctly quantified and modeled, other information can be collected in regard to the hazard area, such as the location of critical facilities, historic structures, and valued natural resources (e.g., an identified wetland or endangered species habitat). Together, this information conveys the vulnerability of that area to that hazard.

NCEM's IRISK database incorporates county building footprint and parcel data. Footprints with an area less than 500 square feet were excluded from the analysis. To determine if a building is in a hazard area, the building footprints were intersected with each of the mapped hazard areas. If a building intersects two or more hazard areas (such as the 1-percent-annual-chance flood zone and the 0.2-percent-annual-chance flood zone), it is counted as being in the hazard area of highest risk. The parcel data provided building value and year built. Building value was used to determine the value of buildings at risk. Year built was used to determine if the building was constructed prior to or after the community had joined the NFIP and had an effective FIRM and building codes enforced.

Census blocks and 2020 Census data were used to determine population at risk. This included the total population, as well as the vulnerable elderly and children age groups. To determine population at risk, the census blocks were intersected with the hazard area. To better determine the actual number of people at risk, the intersecting area of the census block was calculated and divided by the total area of the census block to determine a ratio of area at risk. This ratio was applied to the population of the census block. For example, a census block has a population of 400 people. Five percent of the census block intersects the 1-percent-annual-chance flood hazard area. The ratio estimates that 20 people are then at risk within the 1-percent-annual-chance flood hazard area (5% of the total population for that census block).

Certain assumptions are inherent in any risk assessment. For the Northeastern NC Regional HMP, three primary assumptions were discussed by the HMPC from the beginning of the risk assessment process: (1) that the best readily available data would be used, (2) that the hazard data selected for use is reasonably accurate for mitigation planning purposes, and (3) that the risk assessment will be regional in nature with local, municipal-level data provided where appropriate and practical.

Key methodologies and assumptions made for specific hazards analysis are described in their respective profiles.

PRIORITY RISK INDEX

The conclusions drawn from the hazard profiling and vulnerability assessment process can be used to prioritize all potential hazards to the Northeastern NC Region. The Priority Risk Index (PRI) was applied for this purpose because it provides a standardized numerical value so that hazards can be compared against one another (the higher the PRI value, the greater the hazard risk). PRI values are obtained by assigning varying degrees of risk to five categories for each hazard (probability, impact, spatial extent, warning time, and duration). Each degree of risk was assigned a value (1 to 4) and a weighting factor as summarized in Table 4.6.

The sum of all five risk assessment categories equals the final PRI value, demonstrated in the equation below (the highest possible PRI value is 4.0).

$$\text{PRI} = [(\text{PROBABILITY} \times .30) + (\text{IMPACT} \times .30) + (\text{SPATIAL EXTENT} \times .20) + (\text{WARNING TIME} \times .10) + (\text{DURATION} \times .10)]$$

The purpose of the PRI is to categorize and prioritize all potential hazards for the Mecklenburg County planning area as high, moderate, or low risk. The summary hazard classifications generated through the use of the PRI allows for the prioritization of those high and moderate hazard risks for mitigation planning purposes.

The results of the risk assessment and PRI scoring are provided in Section 4.6 Conclusions on Hazard Risk.

Table 4.6 – Priority Risk Index

RISK ASSESSMENT	LEVEL	DEGREE OF RISK CRITERIA	INDEX	WEIGHT
PROBABILITY What is the likelihood of a hazard event occurring in a given year?	UNLIKELY	LESS THAN 1% ANNUAL PROBABILITY	1	30%
	POSSIBLE	BETWEEN 1 & 10% ANNUAL PROBABILITY	2	
	LIKELY	BETWEEN 10 & 100% ANNUAL PROBABILITY	3	
	HIGHLY LIKELY	100% ANNUAL PROBABILITY	4	
IMPACT In terms of injuries, damage, or death, would you anticipate impacts to be minor, limited, critical, or catastrophic when a significant hazard event occurs?	MINOR	VERY FEW INJURIES, IF ANY. ONLY MINOR PROPERTY DAMAGE & MINIMAL DISRUPTION ON QUALITY OF LIFE. TEMPORARY SHUTDOWN OF CRITICAL FACILITIES.	1	30%
	LIMITED	MINOR INJURIES ONLY. MORE THAN 10% OF PROPERTY IN AFFECTED AREA DAMAGED OR DESTROYED. COMPLETE SHUTDOWN OF CRITICAL FACILITIES FOR > 1 DAY	2	
	CRITICAL	MULTIPLE DEATHS/INJURIES POSSIBLE. MORE THAN 25% OF PROPERTY IN AFFECTED AREA DAMAGED OR DESTROYED. COMPLETE SHUTDOWN OF CRITICAL FACILITIES FOR > 1 WEEK.	3	
	CATASTROPHIC	HIGH NUMBER OF DEATHS/INJURIES POSSIBLE. MORE THAN 50% OF PROPERTY IN AFFECTED AREA DAMAGED OR DESTROYED. COMPLETE SHUTDOWN OF CRITICAL FACILITIES > 30 DAYS.	4	
SPATIAL EXTENT How large of an area could be impacted by a hazard event? Are impacts localized or regional?	NEGLECTIBLE	LESS THAN 1% OF AREA AFFECTED	1	20%
	SMALL	BETWEEN 1 & 10% OF AREA AFFECTED	2	
	MODERATE	BETWEEN 10 & 50% OF AREA AFFECTED	3	
	LARGE	BETWEEN 50 & 100% OF AREA AFFECTED	4	
WARNING TIME Is there usually some lead time associated with the hazard event? Have warning measures been implemented?	MORE THAN 24 HRS	SELF DEFINED	1	10%
	12 TO 24 HRS	SELF DEFINED	2	
	6 TO 12 HRS	SELF DEFINED	3	
	LESS THAN 6 HRS	SELF DEFINED	4	
DURATION How long does the hazard event usually last?	LESS THAN 6 HRS	SELF DEFINED	1	10%
	LESS THAN 24 HRS	SELF DEFINED	2	
	LESS THAN 1 WEEK	SELF DEFINED	3	
	MORE THAN 1 WEEK	SELF DEFINED	4	

4.4 ASSET INVENTORY

4.4.1 POPULATION

Population data is pulled from the American Community Survey (ACS) 2019-2023 ACS 5-year estimates and includes a breakdown of population into two subpopulations considered to be a greater risk than the general population, the elderly and children. Table 4.7 details the population counts and average household size by jurisdiction used for the vulnerability assessment.

Table 4.7 – Population Counts by Jurisdiction, 2023

Jurisdiction	Total Population	Elderly (Age 65 and Over)	Children (Age 5 and Under)	Average Household Size*
Bertie				
Bertie County (Unincorporated Area)	11,675	2,855	417	2.26
Town of Askewville	152	45	12	2.12
Town of Aulander	748	208	117	1.91
Town of Colerain	291	49	9	2.72
Town of Kelford	245	69	15	2.42
Town of Lewiston-Woodville	466	137	24	2.38
Town of Powellsville	141	113	0	1.75
Town of Roxobel	347	66	24	2.38
Town of Windsor	3,417	703	94	2.27
Subtotal Bertie	17,482	4,245	712	2.26
Hyde				
Hyde County (Unincorporated Area)	4,625	1,054	124	1.86
Martin				
Martin County (Unincorporated Area)	13,680	3,396	753	2.30
Town of Bear Grass	94	12	22	2.00
Town of Everetts	158	18	9	2.87
Town of Hamilton	183	84	2	2.27
Town of Hassell	49	30	0	1.81
Town of Jamesville	373	118	8	1.80
Town of Oak City	472	145	30	2.51
Town of Parmele	288	85	0	2.15
Town of Robersonville	1,319	374	52	2.05
Town of Williamston	5,157	1,182	194	2.08
Subtotal Martin	21,773	5,444	1,070	2.30
Tyrrell				
Tyrrell County (Unincorporated Area)	2,702	695	146	2.07
Town of Columbia	674	167	24	2.31
Subtotal Tyrrell	3,376	862	170	2.07

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Jurisdiction	Total Population	Elderly (Age 65 and Over)	Children (Age 5 and Under)	Average Household Size*
Washington				
Washington County (Unincorporated Area)	6,850	1,841	64	2.25
Town of Creswell	205	58	15	2.20
Town of Plymouth	3,264	923	140	2.09
Town of Roper	586	162	22	2.06
Subtotal Washington	10,905	2,984	241	2.25
Region Total	58,161	14,589	2,317	-

Source: U.S. Census Bureau ACS 2019-2023 5-Year Estimates

*Average of renter and owner-occupied average household size. Unincorporated County uses same value as County statistic

4.4.2 PROPERTY

NCEM's IRISK database provided the asset inventory used for this vulnerability assessment. Building counts are detailed in Table 4.8. These values were generated using locally provided building footprint and parcel data as well as data generated by NCEM. The methodology for generating the building asset inventory is described in greater detail in Section 4.3. The IRISK building inventory reflects a more than 12% increase in total building count and in total exposed building value since the development of the 2021 plan. The Planning Area Profile in Section 3 describes recent growth and development and provides context for understanding the degree to which exposure and vulnerability may have increased.

Table 4.8 - Building Counts and Values by Jurisdiction

Jurisdiction	Building Count	Building Value
Bertie		
Bertie County (Unincorporated Area)	11,175	\$621,243,510
Town of Askewville	502	\$21,005,753
Town of Aulander	744	\$31,108,163
Town of Colerain	428	\$23,056,564
Town of Kelford	173	\$4,989,047
Town of Lewiston-Woodville	719	\$24,826,480
Town of Powellsville	171	\$7,040,608
Town of Roxobel	205	\$7,046,776
Town of Windsor	1,815	\$176,378,019
Subtotal Bertie	15,932	\$916,694,920
Hyde		
Hyde County (Unincorporated Area)	5,596	\$620,329,729
Martin		
Martin County (Unincorporated Area)	12,188	\$1,022,040,265
Town of Bear Grass	81	\$8,400,441
Town of Everetts	159	\$6,612,251
Town of Hamilton	292	\$75,407,651
Town of Hassell	70	\$2,608,170

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Jurisdiction	Building Count	Building Value
Town of Jamesville	297	\$87,942,269
Town of Oak City	313	\$19,640,671
Town of Parmele	149	\$7,136,637
Town of Robersonville	901	\$59,034,216
Town of Williamston	4,238	\$1,107,061,602
Subtotal Martin	18,688	\$2,395,884,173
Tyrrell		
Tyrrell County (Unincorporated Area)	2,794	\$197,982,233
Town of Columbia	519	\$44,879,759
Subtotal Tyrrell	3,313	\$242,861,992
Washington		
Washington County (Unincorporated Area)	5,482	\$201,225,974
Town of Creswell	366	\$21,025,348
Town of Plymouth	2,779	\$145,668,064
Town of Roper	611	\$25,251,219
Subtotal Washington	9,238	\$393,170,605
Region Total	52,767	\$4,568,941,419

Source: NCEM IRISK Database

4.4.3 CRITICAL FACILITIES & INFRASTRUCTURE

The IRISK database also identifies Critical Infrastructure and Key Resources (CIKR) buildings as well as High Potential Loss Properties. These properties are detailed in Table 4.9 and Table 4.10, respectively.

Table 4.9 – Critical Infrastructure and Key Resources by Type and Jurisdiction

Jurisdiction	Food and Agriculture	Banking and Finance	Chemical & Hazardous	Commercial	Communications	Critical Manufacturing	EM	Healthcare	Government Facilities	Defense Industrial Base	National Monuments and Icons	Nuclear Reactors, Materials and Waste	Postal and Shipping	Transportation Systems	Energy	Emergency Services	Water	Total
Bertie County																		
Bertie County (Unincorporated Area)	1,719	1	0	443	1	150	0	27	45	0	0	0	0	57	0	3	6	2,452
Town of Askewville	78	2	0	19	0	9	0	0	6	0	0	0	0	4	0	1	0	119
Town of Aulander	19	2	0	50	0	23	0	2	7	0	0	0	0	1	0	0	0	104
Town of Colerain	23	2	0	32	0	19	0	2	9	0	0	0	0	1	0	1	0	89
Town of Kelford	5	0	0	10	0	0	0	2	1	0	0	0	0	0	0	1	0	19

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Jurisdiction	Food and Agriculture	Banking and Finance	Chemical & Hazardous	Commercial	Communications	Critical Manufacturing	EM	Healthcare	Government Facilities	Defense Industrial Base	National Monuments and Icons	Nuclear Reactors, Materials and Waste	Postal and Shipping	Transportation Systems	Energy	Emergency Services	Water	Total
Town of Lewiston-Woodville	28	1	0	61	0	22	0	2	2	0	0	0	0	5	0	1	0	122
Town of Powellsville	2	0	0	14	0	2	0	1	2	0	0	0	0	1	0	1	0	23
Town of Roxobel	10	1	0	30	0	8	0	0	1	0	0	0	0	1	0	1	0	52
Town of Windsor	45	7	0	166	1	69	0	28	37	1	0	0	0	13	1	6	0	374
Bertie Subtotal	1,929	16	0	825	2	302	0	64	110	1	0	0	0	83	1	15	6	3,354
Hyde County																		
Hyde County (Unincorporated Area)	502	53	0	260	0	50	0	5	33	0	0	0	0	0	3	7	18	931
Martin County																		
Martin County (Unincorporated Area)	2,728	1	0	438	0	274	0	12	72	0	0	0	0	92	0	0	7	3,624
Town of Bear Grass	1	0	0	4	0	0	0	0	18	0	0	0	0	3	0	0	0	26
Town of Everetts	7	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	8
Town of Hamilton	0	1	0	31	0	2	0	1	10	0	0	0	0	3	0	0	1	49
Town of Hassell	6	0	0	1	0	0	0	4	0	0	0	0	0	0	0	0	0	11
Town of Jamesville	3	1	0	27	0	8	0	1	18	0	0	0	0	8	0	0	4	70
Town of Oak City	2	0	0	5	0	0	0	0	1	0	0	0	0	3	0	0	0	11
Town of Parmele	5	0	0	11	0	0	0	1	0	0	0	0	0	0	0	0	0	17
Town of Robersonville	5	2	0	59	0	29	0	0	4	0	0	0	0	20	0	0	0	119
Town of Williamston	206	11	0	499	0	116	0	58	139	0	0	0	0	84	1	0	6	1,120
Martin Subtotal	2,963	16	0	1,076	0	429	0	77	262	0	0	0	0	213	1	0	18	5,055
Tyrrell County																		
Tyrrell County (Unincorporated Area)	528	0	0	73	0	2	0	1	23	0	0	0	0	5	0	3	0	635
Town of Columbia	21	2	0	51	0	1	0	3	14	0	0	0	0	4	1	4	0	101
Tyrrell Subtotal	549	2	0	124	0	3	0	4	37	0	0	0	0	9	1	7	0	736
Washington County																		
Washington County (Unincorporated Area)	1,269	0	0	107	0	37	0	4	34	0	0	1	0	6	0	2	8	1,468
Town of Creswell	30	1	0	41	0	5	0	1	11	0	0	1	1	2	0	1	0	94
Town of Plymouth	87	8	0	244	2	31	0	17	42	0	0	0	1	14	0	4	0	450
Town of Roper	48	3	0	38	0	1	0	2	8	0	0	0	2	0	0	1	3	106

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Jurisdiction	Food and Agriculture	Banking and Finance	Chemical & Hazardous	Commercial	Communications	Critical Manufacturing	EM	Healthcare	Government Facilities	Defense Industrial Base	National Monuments and Icons	Nuclear Reactors, Materials and Waste	Postal and Shipping	Transportation Systems	Energy	Emergency Services	Water	Total
Washington Subtotal	1,434	12	0	430	2	74	0	24	95	0	0	2	4	22	0	8	11	2,118
Region Total	7,377	99	0	2,715	4	858	0	174	537	1	0	2	4	327	6	37	53	12,194

Source: NCEM Risk Management Tool

Table 4.10 – High Potential Loss Properties by Use and Jurisdiction

Jurisdiction	Residential	Commercial	Industrial	Government	Agricultural	Religious	Utilities	Total
Bertie County								
Bertie County (Unincorporated Area)	3	8	2	6	0	3	0	22
Town of Askewville	0	0	0	1	0	0	0	1
Town of Aulander	0	0	0	1	0	0	0	1
Town of Colerain	1	0	0	1	0	0	0	2
Town of Kelford	-	-	-	-	-	-	-	-
Town of Lewiston-Woodville	-	-	-	-	-	-	-	-
Town of Powellsville	-	-	-	-	-	-	-	-
Town of Roxobel	-	-	-	-	-	-	-	-
Town of Windsor	0	4	0	6	0	0	0	10
Subtotal	4	12	2	15	0	3	0	36
Hyde County								
Hyde County (Unincorporated Area)	5	4	1	1	14	0	14	39
Martin County								
Martin County (Unincorporated Area)	9	9	5	8	3	3	7	44
Town of Bear Grass	-	-	-	-	-	-	-	-
Town of Everetts	-	-	-	-	-	-	-	-
Town of Hamilton	0	0	0	0	0	0	1	1
Town of Hassell	-	-	-	-	-	-	-	-
Town of Jamesville	0	0	1	3	0	0	4	8
Town of Oak City	-	-	-	-	-	-	-	-
Town of Parmele	-	-	-	-	-	-	-	-
Town of Robersonville	0	0	1	0	0	0	0	1

SECTION 4: RISK ASSESSMENT

Jurisdiction	Residential	Commercial	Industrial	Government	Agricultural	Religious	Utilities	Total
Town of Williamston	3	20	3	17	1	0	3	47
Martin Subtotal	12	29	10	28	4	3	15	101
Tyrrell County								
Tyrrell County (Unincorporated Area)	2	2	0	4	4	0	0	12
Town of Columbia	0	2	0	3	0	0	0	5
Tyrrell Subtotal	2	4	0	7	4	0	0	17
Washington County								
Washington County (Unincorporated Area)	0	0	1	2	0	0	0	3
Town of Creswell	0	0	0	3	0	0	0	3
Town of Plymouth	0	4	0	4	0	1	0	9
Town of Roper	0	0	0	1	0	0	0	1
Washington Subtotal	0	4	1	10	0	1	0	16
Region Total	23	53	14	61	22	7	29	209

Source: NCEM Risk Management Tool

Using the existing CIKR inventory and local data, the HMPC and community staff refined and supplemented the IRISK asset inventory to create the current list of critical facilities, shown in the table below. These assets are considered community lifelines, which are defined by FEMA as the buildings and infrastructure that enable the continuous operation of critical business and government functions and are essential to human health and safety or economic security. Lifelines are the most fundamental services in the community that, when stabilized, enable all other aspects of society to function. These critical facilities are a priority for mitigation planning and were examined against known hazard areas, where possible, in this risk assessment.

Critical facilities are summarized in Table 4.11 and shown by county in Figure 4.1 through Figure 4.5. In total, there are 476 buildings in the region identified as critical facilities. These facilities and infrastructure have a total estimated structure value of \$333,292,324.

Table 4.11 – Critical Facilities, Northeastern NC Region

Jurisdiction	FEMA Lifeline Type								Total
	Safety and Security	Food, Hydration, Shelter	Health and Medical	Energy	Hazardous Materials	Water Systems	Communications	Transportation	
Bertie County (Unincorporated Area)	4	85	2	0	4	23	0	0	118
Town of Askewville	1	1	1	0	0	0	0	0	3
Town of Aulander	2	0	1	0	0	1	0	0	4
Town of Colerain	1	2	1	0	0	0	0	0	4
Town of Kelford	1	0	0	0	0	0	0	0	1
Town of Lewiston-Woodville	2	0	1	0	0	0	0	0	3
Town of Powellsville	1	0	1	0	0	1	0	0	3
Town of Roxobel	1	0	0	0	0	0	0	0	1
Town of Windsor	6	6	4	0	0	4	0	0	20
Bertie County Total	19	94	11	0	4	29	0	0	157
Hyde County (Unincorporated Area)	12	40	4	3	1	12	0	0	72
Hyde County Total	12	40	4	3	1	12	0	0	72
Martin County (Unincorporated Area)	3	8	2	0	2	18	0	0	33
Town of Bear Grass	0	0	0	0	0	0	0	0	0
Town of Everetts	0	0	0	0	0	0	0	0	0
Town of Hamilton	1	0	2	0	0	1	0	0	4
Town of Hassell	0	0	0	0	0	0	0	0	0
Town of Jamesville	1	0	1	0	0	2	0	0	4
Town of Oak City	1	0	1	0	0	0	0	0	2
Town of Parmele	0	0	0	0	0	0	0	0	0
Town of Robersonville	2	0	1	0	1	2	0	0	6
Town of Williamston	4	1	4	0	1	4	0	0	14
Martin County Total	12	9	11	0	4	27	0	0	63
Tyrrell County (Unincorporated Area)	5	23	0	0	0	6	0	0	34
Town of Columbia	5	12	2	0	0	2	0	0	21
Tyrrell County Total	10	35	2	0	0	8	0	0	55
Washington County (Unincorporated Area)	5	74	2	0	3	18	0	0	102
Town of Creswell	1	7	1	0	0	2	0	0	11
Town of Plymouth	3	2	3	0	0	2	0	0	10
Town of Roper	2	0	1	0	0	3	0	0	6
Washington County Total	11	83	7	0	3	25	0	0	129
Northeastern NC Region Total	64	261	35	3	12	101	0	0	476

Figure 4.1 – Bertie County Critical Facilities

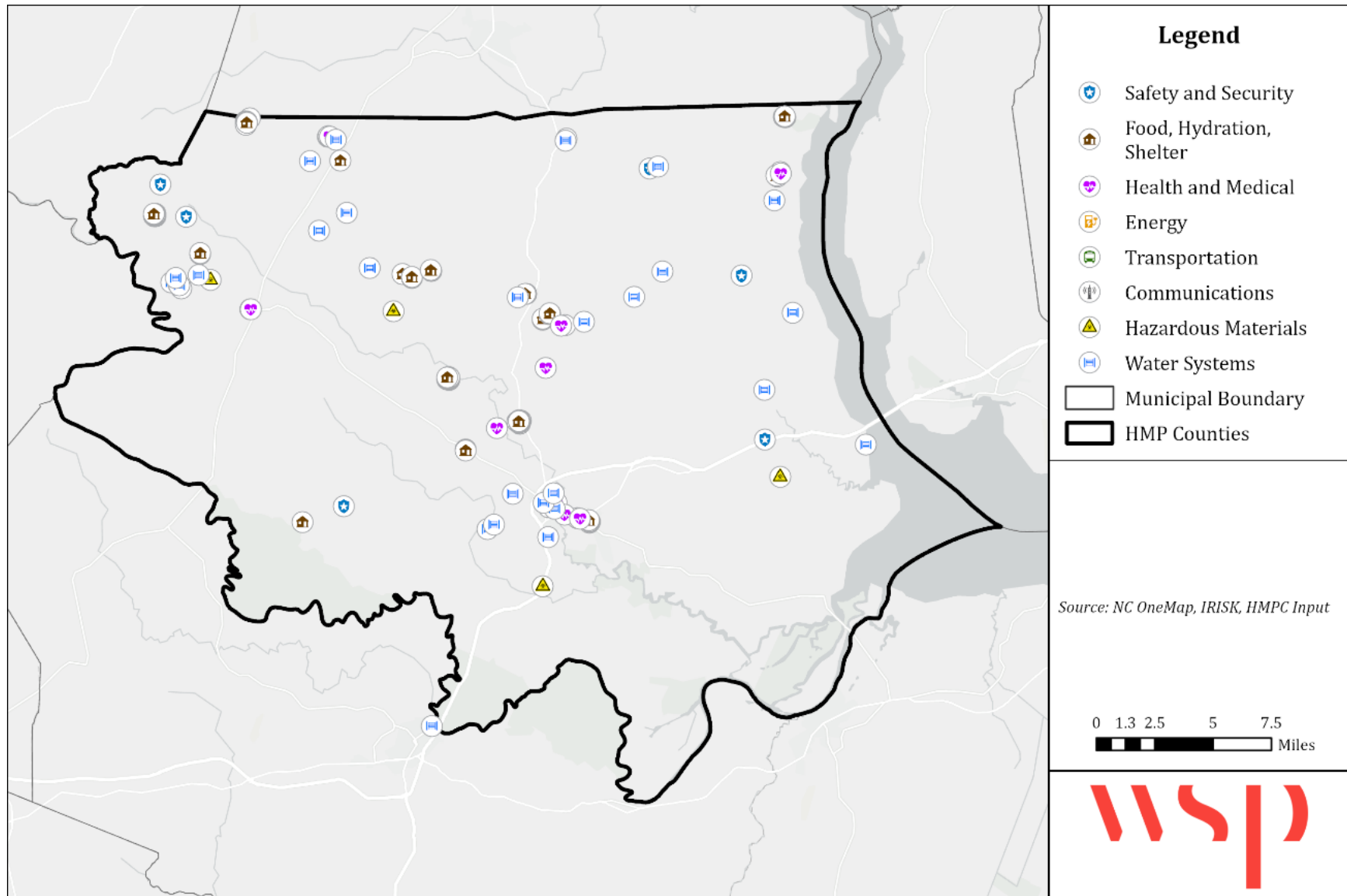


Figure 4.2 – Hyde County Critical Facilities

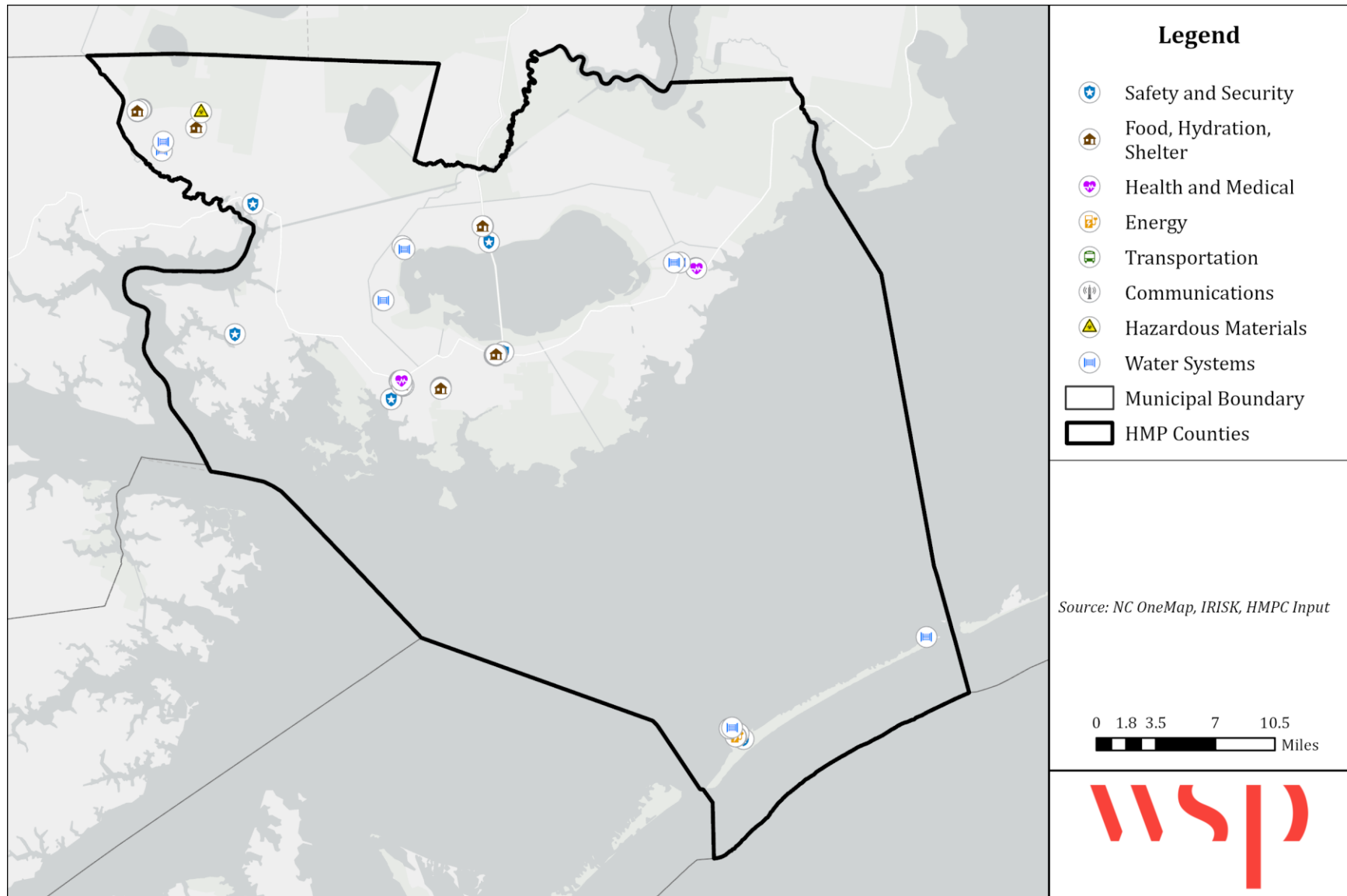


Figure 4.3 – Martin County Critical Facilities

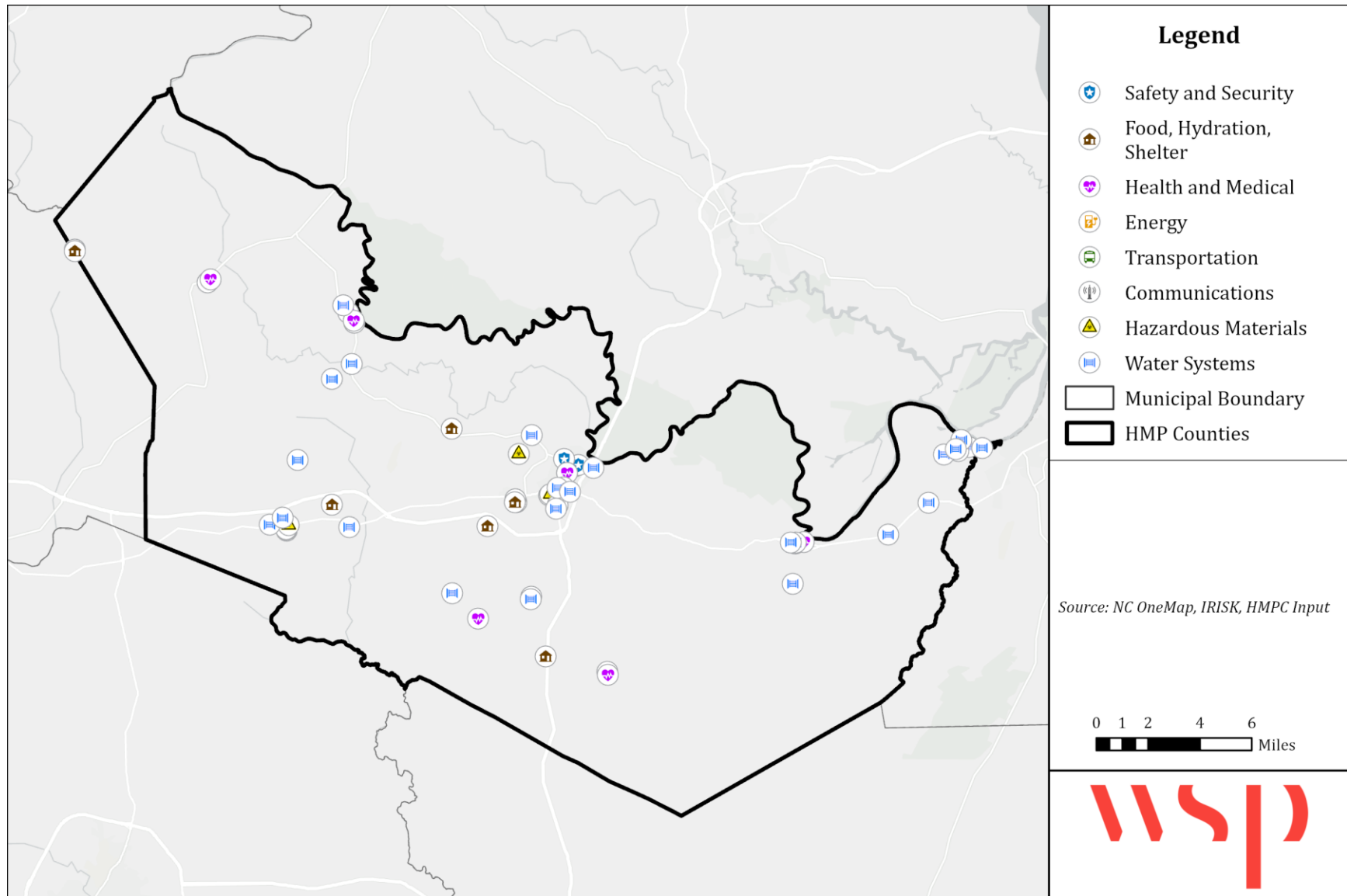


Figure 4.4 – Tyrrell County Critical Facilities

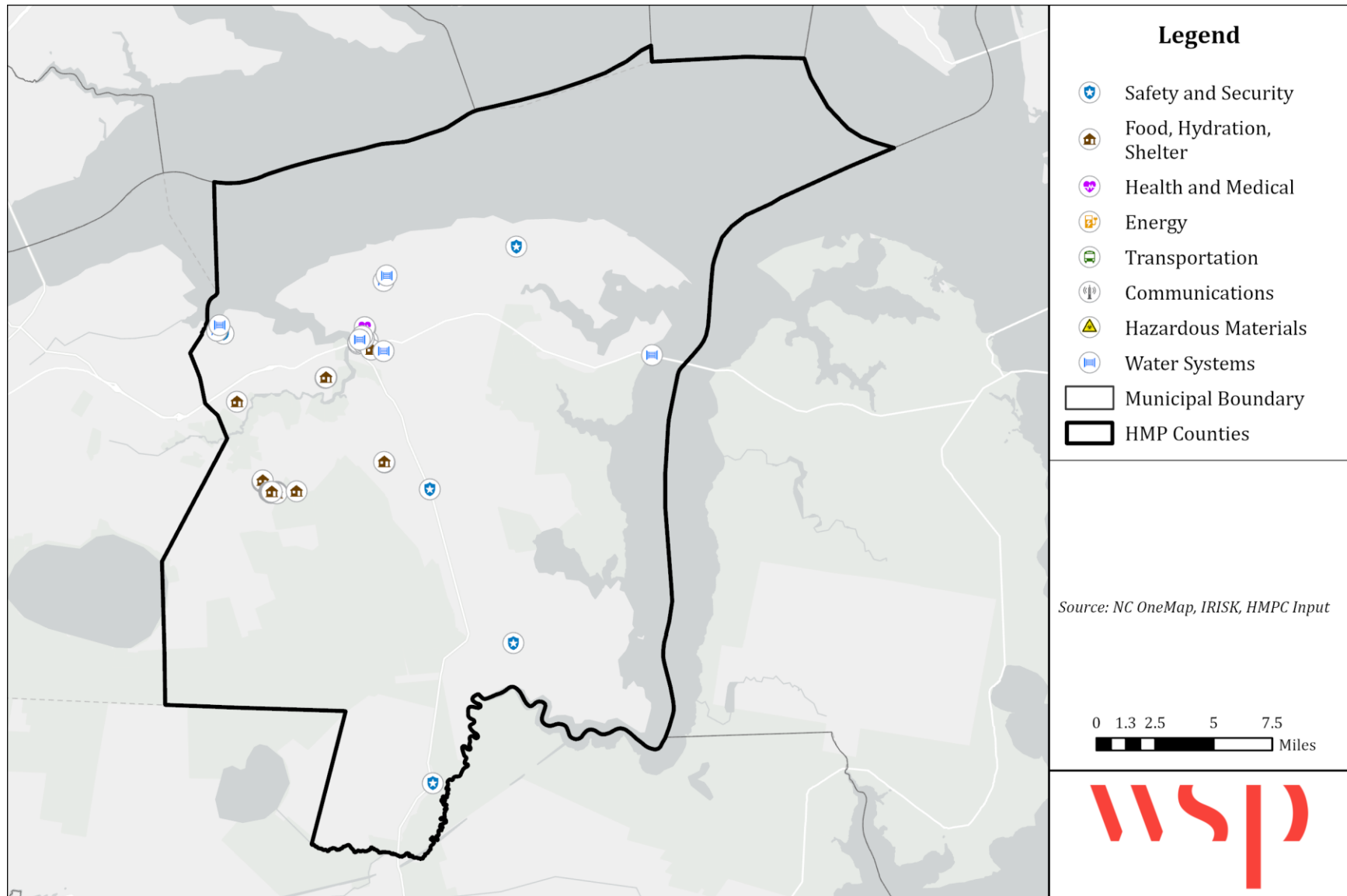
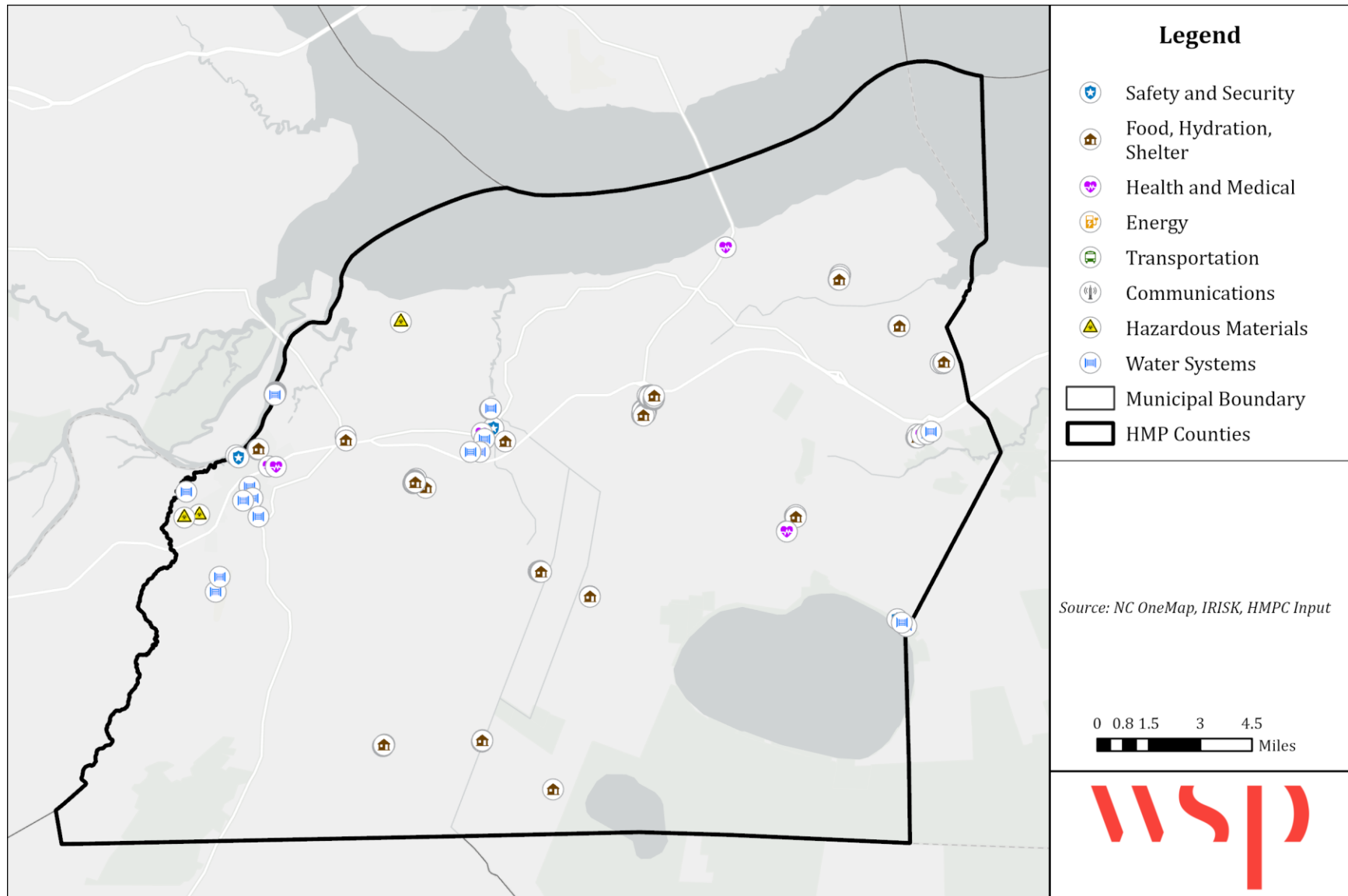


Figure 4.5 - Washington County Critical Facilities



4.4.4 AGRICULTURE

The agricultural industry is also highly vulnerable to natural hazards, which can cause both crop and livestock losses. The exposure of agriculture in the region was measured using the USDA’s 2022 Census of Agriculture, which is the most recent data available as of July 2025. Table 4.12 below summarizes the agricultural exposure in the Northeastern NC Region by county.

Table 4.12 – Summary of Agriculture Exposure by County

County	Number of Farms	Acreage in Farms	Proportion of Total Land Area in Farms	Acreage with Crop Insurance	Estimated Market Value of Land & Buildings
Bertie County	288	161,862	36.2%	92,012 (56.8%)	\$659,041,000
Hyde County	123	112,445	28.7%	85,884 (76.3%)	\$428,871,000
Martin County	286	143,806	49.2%	92,944 (64.6%)	\$432,993,000
Tyrrell County	73	63,761	25.5%	51,794 (81.2%)	\$244,563,000
Washington County	110	76,554	34.5%	67,731 (88.4%)	\$317,833,000

Source: USDA 2022 Census of Agriculture

4.5 HAZARD PROFILES, ANALYSIS, AND VULNERABILITY

4.5.1 DAM & LEVEE FAILURE

HAZARD BACKGROUND

DAM FAILURE

A dam is a barrier constructed across a watercourse that stores, controls, or diverts water. Dams are usually constructed of earth, rock, concrete, or mine tailings. The water impounded behind a dam is referred to as the reservoir and is measured in acre-feet. One acre-foot is the volume of water that covers one acre of land to a depth of one foot. Dams can benefit farmland, provide recreation areas, generate electrical power, and help control erosion and flooding issues. A dam failure is the collapse or breach of a dam that causes downstream flooding. Dam failures may be caused by natural events, manmade events, or a combination. Due to the lack of advance warning, failures resulting from natural events, such as earthquakes or landslides, may be particularly severe. Prolonged rainfall and subsequent flooding are the most common cause of dam failure.

Dam failures usually occur when the spillway capacity is inadequate, and water overtops the dam or when internal erosion in dam foundation occurs (also known as piping). If internal erosion or overtopping causes a full structural breach, a high-velocity, debris-laden wall of water is released and rushes downstream, damaging or destroying anything in its path. Overtopping is the primary cause of earthen dam failure in the United States.

Dam failures can also result from any one or a combination of the following:

- Prolonged periods of rainfall and flooding;
- Inadequate spillway capacity, resulting in excess overtopping flows;
- Internal erosion caused by embankment or foundation leakage or piping;
- Improper maintenance, including failure to remove trees, repair internal seepage problems, replace lost material from the cross-section of the dam and abutments, or maintain gates, valves, and other operational components;
- Improper design, including the use of improper construction materials and construction practices;
- Negligent operation, including the failure to remove or open gates or valves during high flow periods;
- Failure of upstream dams on the same waterway; or
- High winds, which can cause significant wave action and result in substantial erosion.

Water released by a failed dam generates tremendous energy and can cause a flood that is catastrophic to life and property. Dam failures are generally catastrophic if the structure is breached or significantly damaged. A catastrophic dam failure could challenge local response capabilities and require evacuations to save lives. Impacts to life safety will depend on the warning time and the resources available to notify and evacuate the public. Major casualties and loss of life could result, as well as water quality and health issues. Potentially catastrophic effects to roads, bridges, and homes are also of major concern.

Associated water quality and health concerns could also be issues. Dam failures also have the potential to create a water shortage for nearby communities when the impounded lake is lost, which can affect drinking water supply, power generation, or result in crop losses due to lack of water for irrigation. Factors that influence the potential severity of a full or partial dam failure are the amount of water

impounded; the density, type, and value of development and infrastructure located downstream; and the speed of failure.

Dam failure can occur with little warning. Intense storms may produce a flood in a few hours or even minutes for upstream locations. Flash floods occur within six hours of the beginning of heavy rainfall, and dam failure may occur within hours of the first signs of breaching. Other failures and breaches can take much longer to occur, from days to weeks, as a result of debris jams or the accumulation of melting snow.

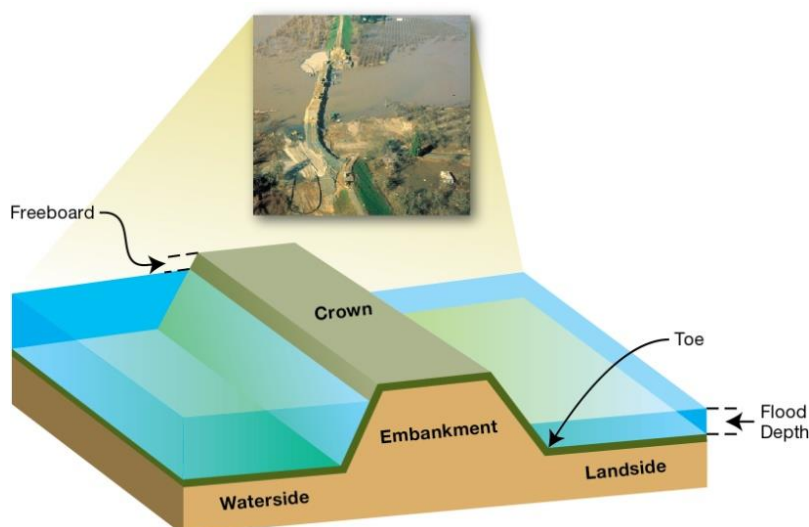
Dam failures are of particular concern because the failure of a large dam has the potential to cause more death and destruction than the failure of any other manmade structure. This is because of the destructive power of the flood wave that would be released by the sudden collapse of a large dam. Dams are innately hazardous structures. Failure or poor operation can result in the release of the reservoir contents—this can include water, mine wastes, or agricultural refuse—causing negative impacts upstream or downstream or at locations far from the dam. Negative impacts of primary concern are loss of human life, property damage, lifeline disruption, and environmental damage.

LEVEE FAILURE

FEMA defines a levee as “a man-made structure, usually an earthen embankment, designed and constructed in accordance with sound engineering practices to contain, control, or divert the flow of water in order to reduce the risk from temporary flooding.” Levee systems consist of levees, floodwalls, and associated structures, such as closure and drainage devices, which are constructed and operated in accordance with sound engineering practices. Levees often have “interior drainage” systems that work in conjunction with the levees to take water from the landward side to the water side. An interior drainage system may include culverts, canals, ditches, storm sewers, and/or pumps.

Levees and floodwalls are constructed from the earth, compacted soil or artificial materials, such as concrete or steel. To protect against erosion and scouring, earthen levees can be covered with grass and gravel or hard surfaces like stone, asphalt, or concrete. Levees and floodwalls are typically built parallel to a waterway, most often a river, in order to reduce the risk of flooding to the area behind it. Figure 4.6 shows the components of a typical levee.

Figure 4.6 – Components of a Typical Levee



Source: FEMA, What is a Levee Fact Sheet, August 2011

Levees provide strong flood protection, but they are not failsafe. Levees are designed to protect against a specific flood level and could be overtopped during severe weather events. Levees reduce, not eliminate, the risk to individuals and structures behind them. A levee system failure or overtopping can create severe flooding and high water velocities. It is important to remember that no levee provides protection from events for which it was not designed, and proper operation and maintenance are necessary to reduce the probability of failure.

For both dam and levee failure events, there is generally very little warning time. A failure may result from heavy rains and flash flooding and occur within hours of the first signs of breaching. The duration of the flood will vary but may last as long as a week.

Warning Time: 4 – Less than six hours

Duration: 3 – Less than one week

LOCATION

DAM FAILURE

The North Carolina Dam Inventory, maintained by North Carolina Department of Environmental Quality, provides a detailed inventory of all dams in the state. As of July 2025, there are 15 dams in the Northeastern NC Region, all of which are rated low hazard. Of the 15 dams, four are located in Bertie County, one is in Hyde County, and ten are in Martin County. There are no dams in Tyrrell or Washington Counties. Table 4.13 details all dams in the Region by county and Figure 4.7 through Figure 4.9 show the location of all dams.

Table 4.13 – Dams in the Northeastern NC Region

Dam Name	NID ID	Condition as of Last Inspection	Max Capacity (Ac-Ft)	Nearest Downstream Location
Bertie County				
Beasley Pond Dam	NC01880	-	16	Colerain
Taylor-Brown Pond Dam	NC01881	-	100	-
Beasley Farm Dam	NC07760	-	-	-
Second Log Dam	NC07761	-	-	-
Hyde County				
COOP Plan Dam	NC05893	Not Rated	-	-
Martin County				
Rainbow Pond Dam	NC01059	-	120	Williamston
Leggett Pond Dam	NC01409	-	55	Williamston
Lilleys Pond Dam Upper	NC03370	-	20	Jamesville
Lilleys Pond Dam Lower	NC03371	-	28	Jamesville
Copeland Pond Dam	NC03372	Poor	91	Williamston
Old Peel Farm Dam	NC03373	-	110	Hamilton
J. E. Griffin Dam	NC03374	-	19	Williamston
Davenport Pond Dam	NC03375	-	76	Plymouth
Knowles Pond Dam	NC03376	-	19	Plymouth
Modlin Pond Dam	NC03377	-	32	-

Source: North Carolina Dam Inventory

Figure 4.7 – Dam Locations in Bertie County

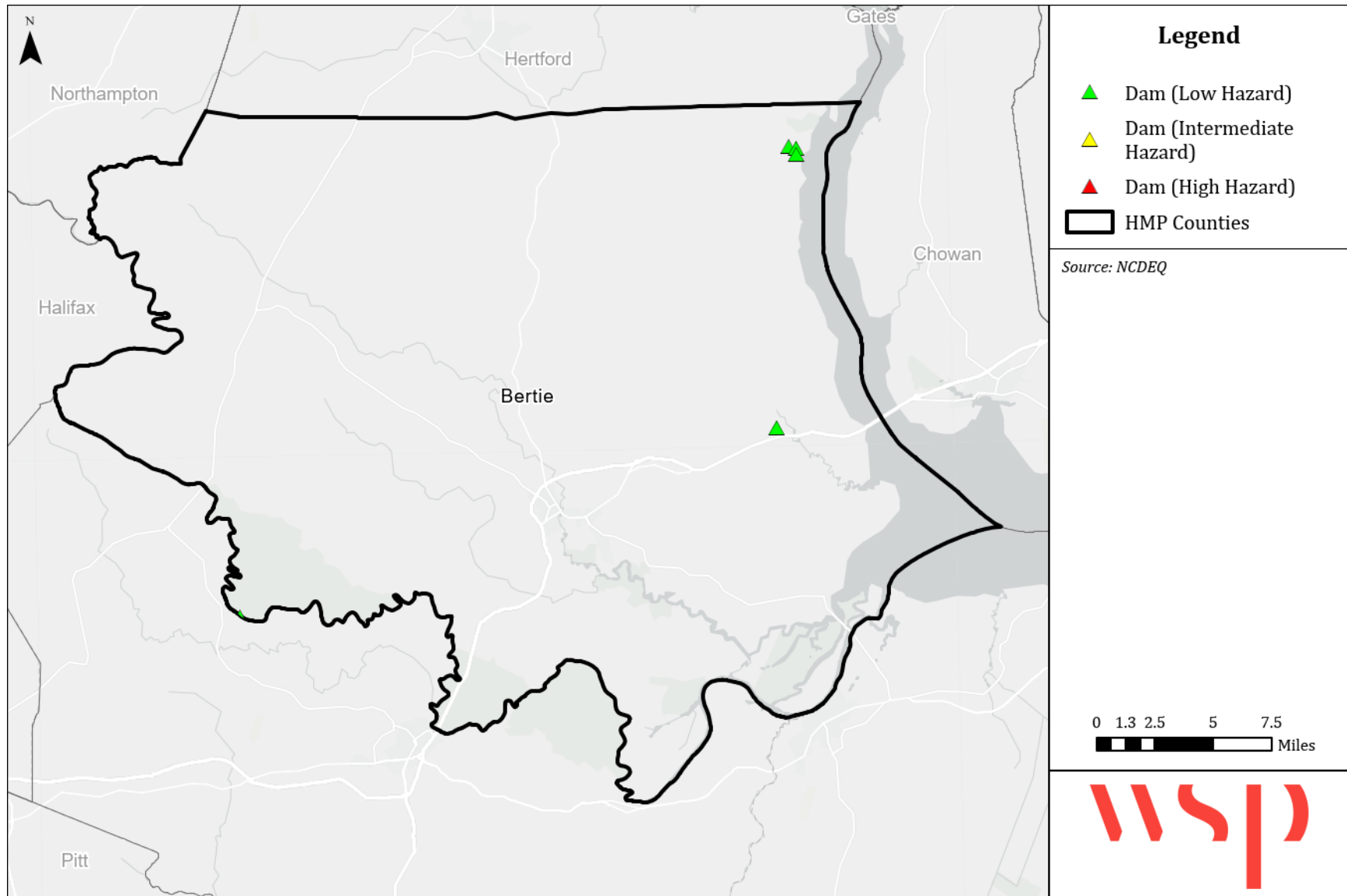


Figure 4.8 - Dam Location in Hyde County

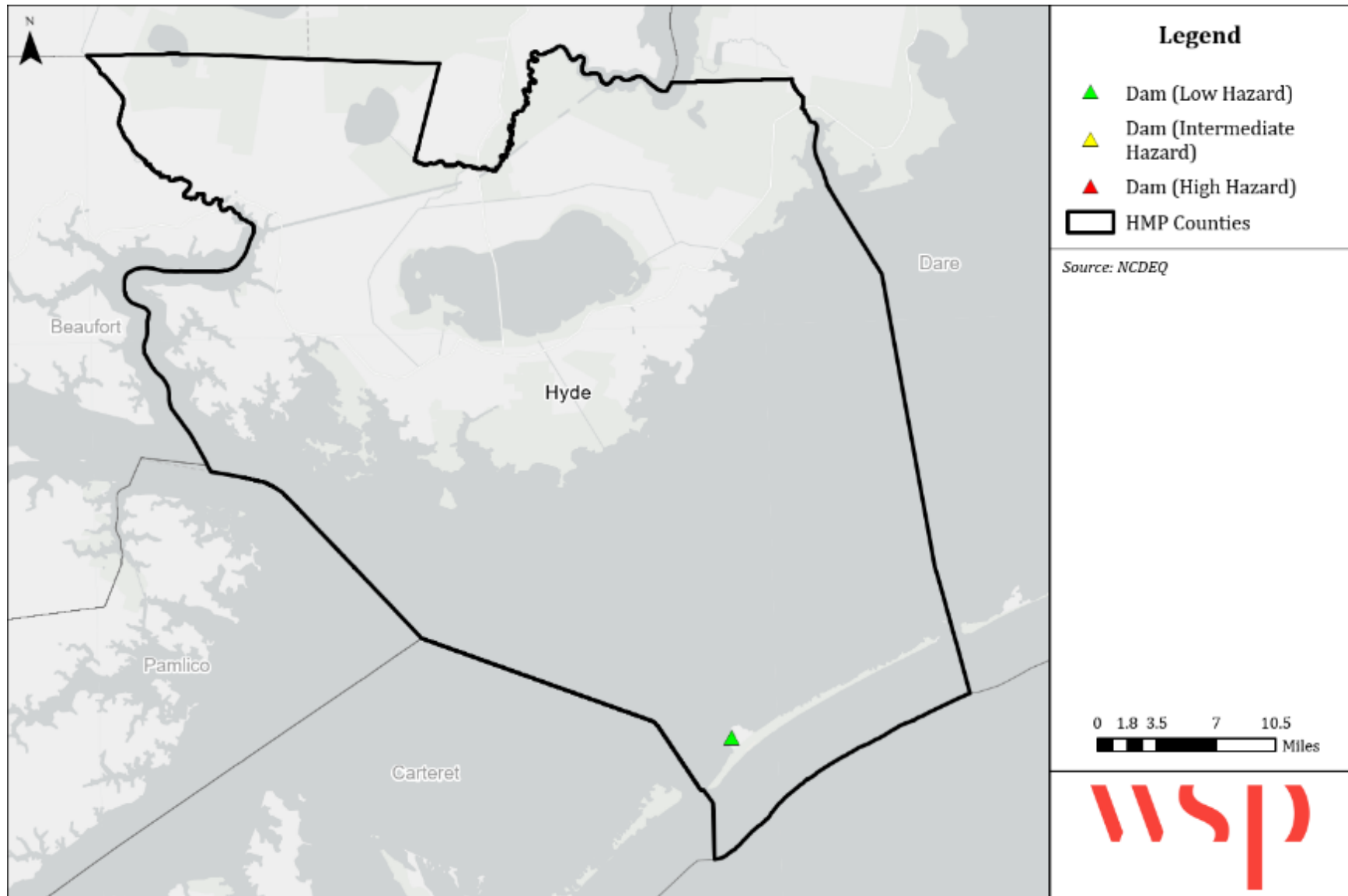
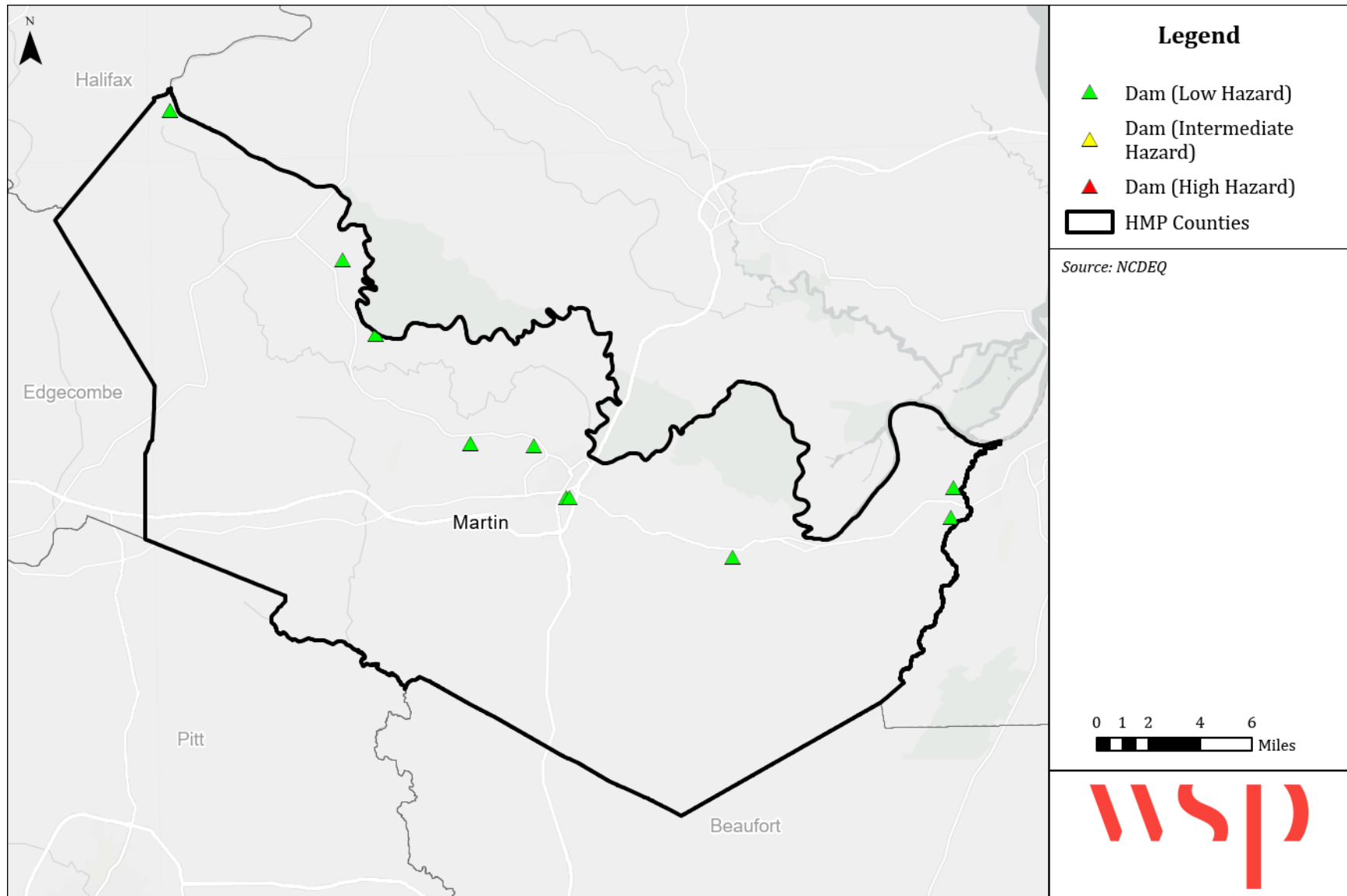


Figure 4.9 – Dam Locations in Martin County

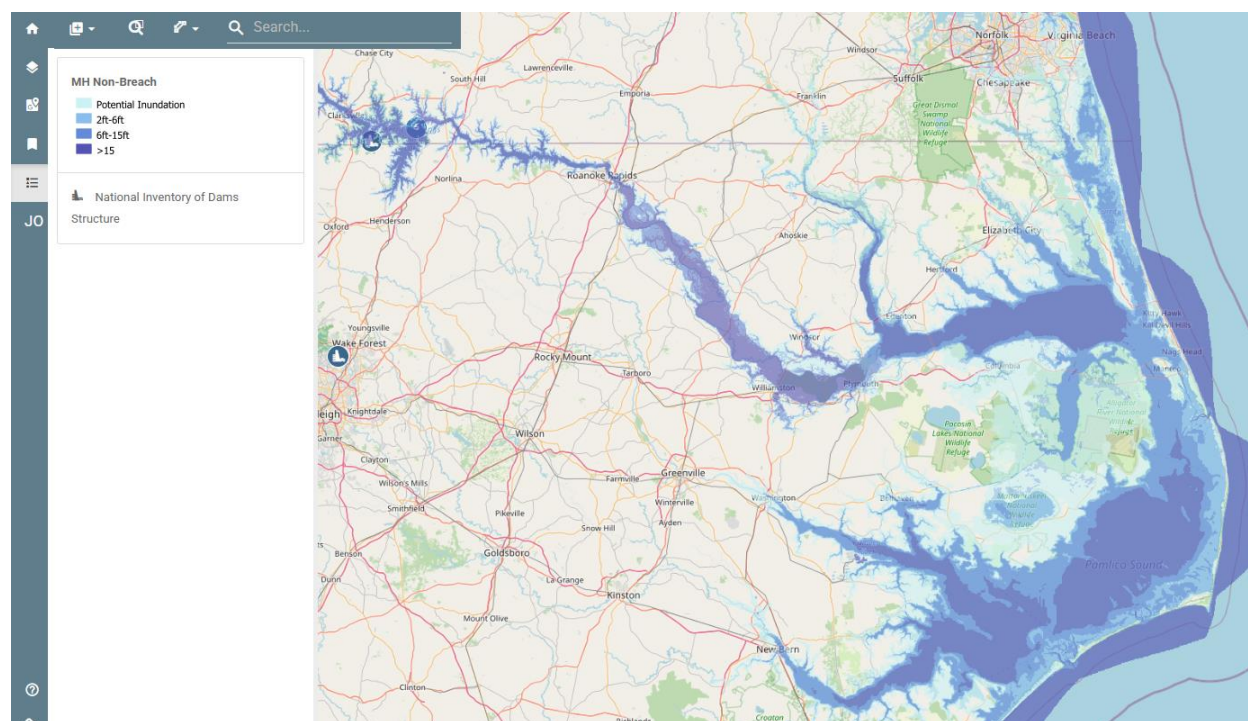


Although there are no high hazard dams within the Northeastern NC region, the region is vulnerable to dam failure flooding from the upstream John H. Kerr Dam. John H. Kerr Dam is located on the Roanoke River in Mecklenburg County, Virginia 18 miles upstream from the Virginia-North Carolina line. A 2001 U.S. Army Corps of Engineers (USACE) Reconnaissance Report notes that “flood releases greater than 8,000 cfs halt forestry operations and adversely affect hunting and fishing and also affect the riparian ecosystem including the vegetative and wildlife communities in the lower Roanoke River Basin. Flood releases greater than 20,000 cfs encroach on farmland and flood some state-maintained farm access roads. Flood releases greater than 35,000 cfs cause minor damage to urban and industrial areas of the cities of Roanoke Rapids and Weldon in addition to increased impacts to crop lands, timber, animal habitat and roadways.”

USACE’s Flood Inundation Mapping Viewer visualizes inundation and modeling data for dams, including breach and non-breach scenarios.

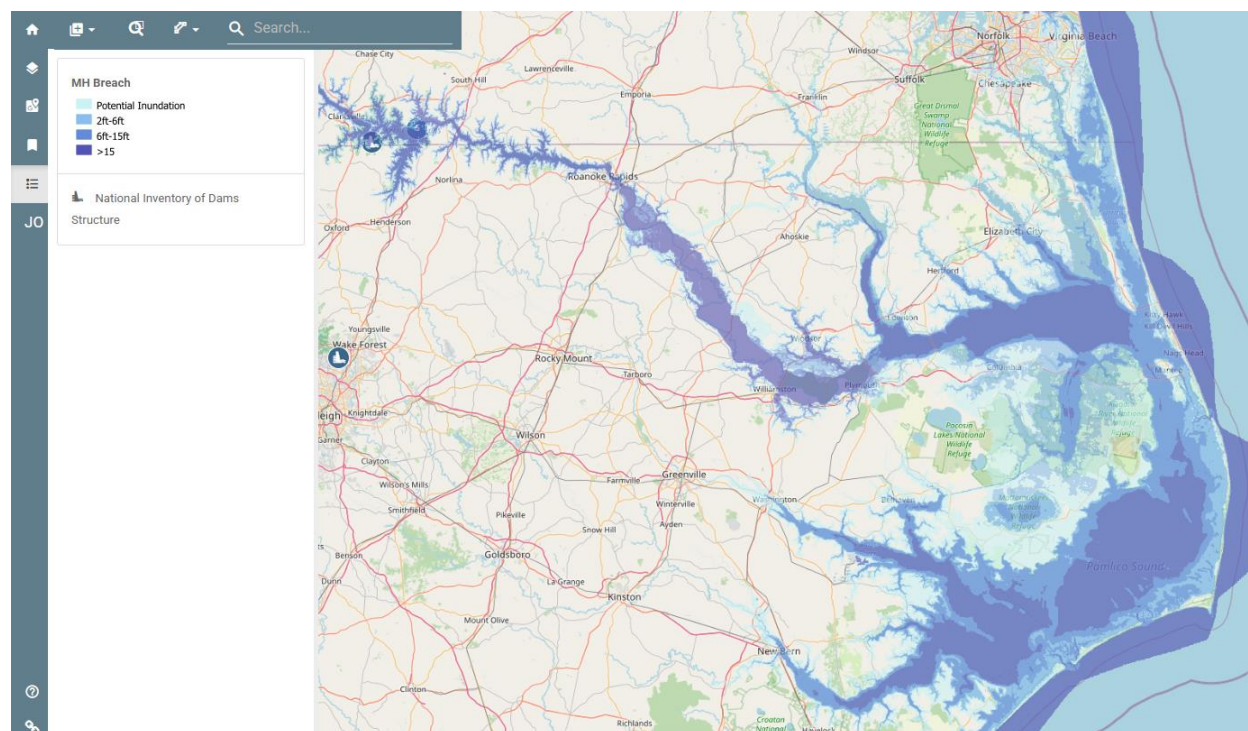
Figure 4.10 shows the downstream flooding from the maximum high without breach scenario. This reflects the maximum high pool in the reservoir, which is a pool level near the top of the dam resulting from heavy rainfall or another significant high-water event. This scenario reflects the dam operating as intended with a maximum high pool, resulting in maximum releases that can cause significant to catastrophic flooding downstream.

Figure 4.10 – Maximum High Non-Breach Scenario Inundation



Source: USACE Flood Inundation Mapping Viewer

Figure 4.11 shows the downstream flooding from the maximum high breach scenario. This reflects the maximum high pool in the reservoir and a breach of the dam, which results in the greatest flooded area, depth of downstream flood waters, and life safety and economic consequences. This scenario reflects the worst case for dam failure inundation for the region.

Figure 4.11 – Maximum High Breach Scenario Inundation

Source: USACE Flood Inundation Mapping Viewer

LEVEE FAILURE

According to the US Army Corps of Engineers' (USACE) National Levee Database (NLD), there are four recognized levees in the Northeastern NC Region, two in Tyrrell County, one in Washington County, and one in Hyde County. These levees are detailed in Table 4.14 and their locations are shown in Figure 4.12.

Table 4.14 – Levees in the Northeastern NC Region

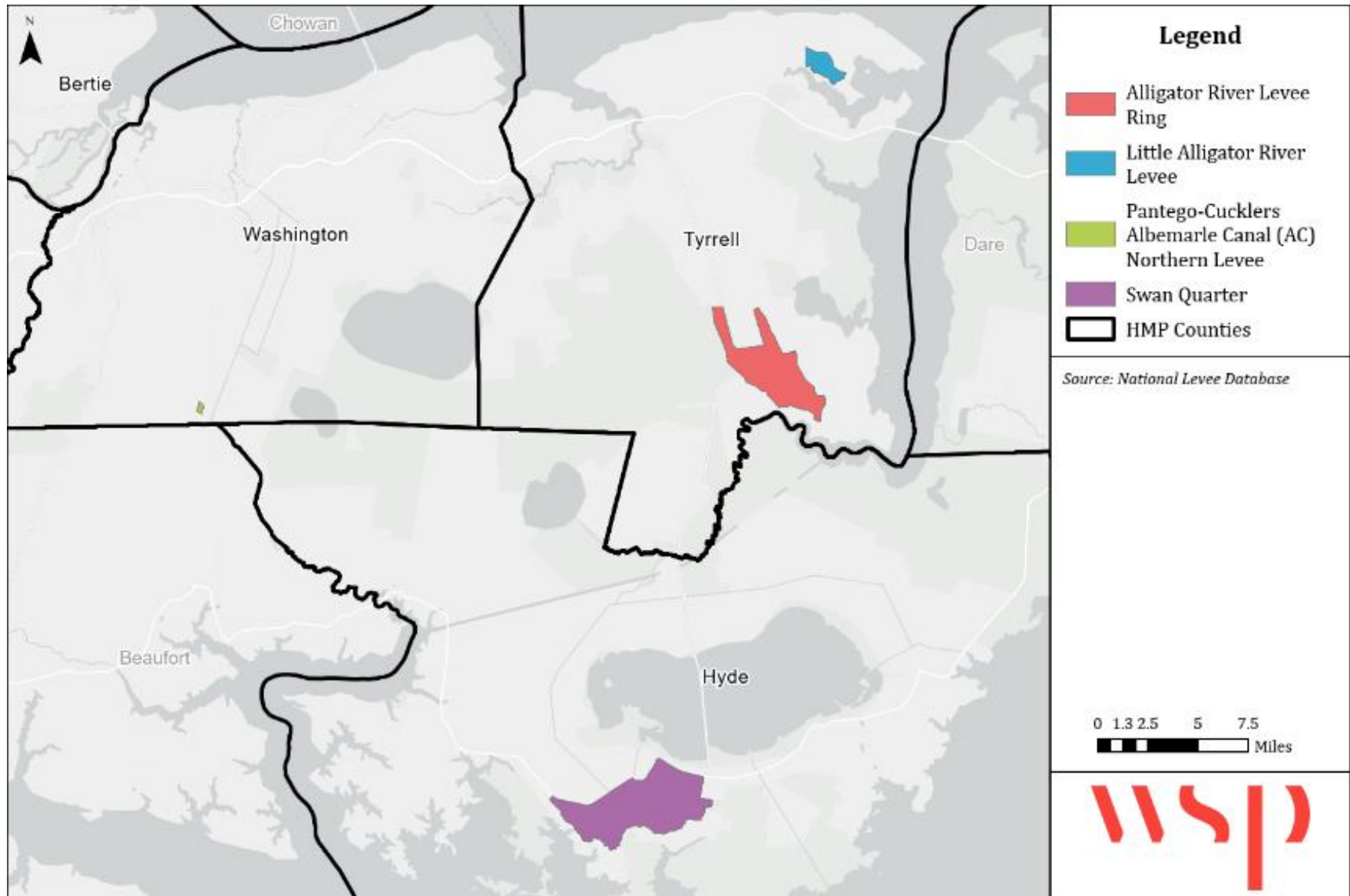
Levee Name	Year Built	Flood Source	Levee Length	People at Risk	Structures at Risk	Property Value
Tyrrell County						
Alligator River Levee Ring	--	Alligator River	22.6 Miles	256	217	\$94M
Little Alligator River Levee 1	--	Little Alligator River	6.6 Miles	2	7	\$4.5M
Washington County						
Pantego-Cuckler Albemarle Canal (AC) Northern Levee	1962	Pantego Creek	0.41 Miles	0	0	\$12,700
Hyde County						
Swan Quarter	--	--	14.6 Miles	1,089	383	\$175.5M

Source: National Levee Database

For the region overall, the spatial extent of dam and levee failure is less than 1% of the planning area.

Spatial Extent: 1 – Negligible

Figure 4.12 - Overview of Levee Locations in the Northeastern NC Region



EXTENT

Each state has definitions and methods to determine the hazard potential of a dam. In North Carolina, dams are regulated by the state if they are 25 feet or more in height and impound 50 acre-feet or more. Dams and impoundments smaller than that may fall under state regulation if it is determined that failure of the dam could result in loss of human life or significant damage to property. The height of a dam is from the highest point on the crest of the dam to the lowest point on the downstream toe, and the storage capacity is the volume impounded at the elevation of the highest point on the crest of the dam.

Dam Safety Program engineers determine the "hazard potential" of a dam, meaning the probable damage that would occur if the structure failed, in terms of loss of human life and economic loss or environmental damage. Dams are assigned one of three classes based on the nature of their hazard potential:

- Class A (Low Hazard) includes dams located where failure may damage uninhabited low value non-residential buildings, agricultural land, or low volume roads.
- Class B (Intermediate Hazard) includes dams located where failure may damage highways or secondary railroads, cause interruption of use or service of public utilities, cause minor damage to isolated homes, or cause minor damage to commercial and industrial buildings. Damage to these structures will be considered minor only when they are located in backwater areas not subjected to the direct path of the breach flood wave; and they will experience no more than 1.5 feet of flood rise due to breaching above the lowest ground elevation adjacent to the outside foundation walls or no more than 1.5 feet of flood rise due to breaching above the lowest floor elevation of the structure.
- Class C (High Hazard) includes dams located where failure will likely cause loss of life or serious damage to homes, industrial and commercial buildings, important public utilities, primary highways, or major railroads.

Table 4.15 – Dam Hazard Classifications

Hazard Classification	Description	Quantitative Guidelines
Low	Interruption of road service, low volume roads	Less than 25 vehicles per day
	Economic damage	Less than \$30,000
Intermediate	Damage to highways, interruption of service	25 to less than 250 vehicles per day
	Economic damage	\$30,000 to less than \$200,000
	Loss of human life*	Probable loss of 1 or more human lives
High	Economic damage	More than \$200,000
	*Probable loss of human life due to breached roadway or bridge on or below the dam	250 or more vehicles per day

Source: NCDENR

The risk classifications for the levees in the region are unknown, however there are approximately 1,347 people and 607 structures worth over \$274 million at risk in the leveed areas. Though the risk of failure is unknown, the exposure within leveed areas suggests failure could have critical impacts. Overall, failure of a dam or levee would affect only a negligible area but could cause death or property damage within the affected area.

Impact: 3 – Critical

HISTORICAL OCCURRENCES

There are no records of damages, deaths, or injuries associated with dam or levee failure in the Northeastern NC Region.

PROBABILITY OF FUTURE OCCURRENCE

Given the limited presence of levees and lack of intermediate or high hazard dams in the Region as well as the absence of any prior incidents, it can be concluded that dam or levee failure is unlikely. However, it is possible that with heavy rain events becoming more frequent and intense, conditions conducive to failures may occur more frequently in the future.

Probability: 1 – Unlikely

CLIMATE CHANGE

Studies have been conducted to investigate the impact of climate change scenarios on dam safety. The safety of dams for the future climate can be based on an evaluation of changes in design floods and the freeboard available to accommodate an increase in flood levels. The results from the studies indicate that the design floods with the corresponding outflow floods and flood water levels will increase in the future, and this increase will affect the safety of the dams in the future. Studies concluded that the total hydrological failure probability of a dam will increase in the future climate and that the extent and depth of flood waters will increase by the future dam break scenario. These changes would likely produce similar impacts on levees.

VULNERABILITY ASSESSMENT

METHODOLOGIES AND ASSUMPTIONS

Dam inundation areas were not available for the identified dams; therefore, a quantitative vulnerability assessment could not be completed. Vulnerability to dam failure discussed below is based on anecdotal evidence and theoretical understanding of potential risks. Levee failure risk is based on risk assessment information provided by the USACE's NLD, where available.

PEOPLE

A person's immediate vulnerability to a dam failure is directly associated with the person's distance downstream of the dam as well as proximity to the stream carrying the floodwater from the failure. For dams that have an Emergency Action Plan (EAP), the vulnerability of loss of life for persons in their homes or on their property may be mitigated by following the EAP evacuation procedures; however, the displaced persons may still incur sheltering costs. For persons located on the river (e.g. for recreation) the vulnerability of loss of life is significant.

People are also vulnerable to the loss of the uses of the lake upstream of a dam following failure. Several uses are minor, such as aesthetics or recreational use. However, some lakes serve as drinking water supplies and their loss could disrupt the drinking water supply and present a public health problem.

The NLD estimates that 1,347 people are at risk to levee failure in the Northeastern NC Region, all located in Tyrrell County and Hyde County.

PROPERTY

Vulnerability of the built environment includes damage to the dam or levee itself and any man-made feature located within the inundation area caused by the failure. Downstream of the dam, vulnerability includes potential damage to homes, personal property, commercial buildings and property, and government owned buildings and property; destruction of bridge or culvert crossings; weakening of bridge supports through scour; and damage or destruction of public or private infrastructure that cross the stream such as water and sewer lines, gas lines and power lines. Water dependent structures on the lake

upstream of the dam, such as docks/piers, floating structures or water intake structures, may be damaged by the rapid reduction in water level during the failure.

Similarly, levee failures can result in inundation and damages to buildings, personal property, and infrastructure. If a levee fails or is overtopped, the resulting flooding may be severe, as the levee then acts as a barrier, preventing drainage of the flood waters. According to NLD, there are 607 buildings at risk in leveed areas in the Northeastern NC Region, worth an estimated \$274 million.

ENVIRONMENT

Aquatic species within the lake will either be displaced or destroyed due to dam failure. The velocity of the flood wave will likely destroy riparian and instream vegetation and destroy wetland function. The flood wave will like cause erosion within and adjacent to the stream. Deposition of eroded deposits may choke instream habitat or disrupt riparian areas. Sediments within the lake bottom and any low oxygen water from within the lake will be dispersed, potentially causing fish kills or releasing heavy metals found in the lake sediment layers.

CONSEQUENCE ANALYSIS

Table 4.16 summarizes the potential negative consequences of dam and levee failure.

Table 4.16 – Consequence Analysis – Dam and Levee Failure

Category	Consequences
Public	Localized impact expected to be severe for inundation area and moderate to light for other adversely affected areas.
Responders	Localized impact expected to limit damage to personnel in the inundation area at the time of the incident.
Continuity of Operations (including Continued Delivery of Services)	Damage to facilities/personnel in the area of the incident may require temporary relocation of some operations. Localized disruption of roads and/or utilities may postpone delivery of some services. Regulatory waivers may be needed locally. Fulfillment of some contracts may be difficult. Impact may reduce deliveries.
Property, Facilities and Infrastructure	Localized impact to facilities and infrastructure in the inundation area of the incident. Some severe damage possible.
Environment	Localized impact expected to be severe for inundation area and moderate to light for other adversely affected areas. Consequences include erosion, water quality degradation, wildlife displacement or destruction, and habitat destruction.
Economic Condition of the Jurisdiction	Local economy and finances adversely affected, possibly for an extended period of time, depending on damage and length of investigation.
Public Confidence in the Jurisdiction's Governance	Localized impact expected to primarily adversely affect only the dam owner and local entities.

HAZARD SUMMARY BY JURISDICTION

The following table summarizes dam and levee failure hazard risk by jurisdiction. Warning time and duration are inherent to the hazard and remain constant across jurisdictions. Spatial extent of any dam failure will be negligible relative to the planning area. There are no historical occurrences of dam or levee failure, so probability is low across all jurisdictions. There are no high or significant hazard dams within the planning area. Jurisdictions with vulnerability to levee failure as quantified by the NLD were assigned

SECTION 4: RISK ASSESSMENT

an impact rating of critical; all other jurisdictions were assigned an impact rating of limited, as there may still be some secondary impacts.

Jurisdiction	Probability	Impact	Spatial Extent	Warning Time	Duration	Score	Priority
Bertie County	1	2	1	4	3	1.8	L
Town of Askewville	1	2	1	4	3	1.8	L
Town of Aulander	1	2	1	4	3	1.8	L
Town of Colerain	1	2	1	4	3	1.8	L
Town of Kelford	1	2	1	4	3	1.8	L
Town of Lewiston-Woodville	1	2	1	4	3	1.8	L
Town of Powellsville	1	2	1	4	3	1.8	L
Town of Roxobel	1	2	1	4	3	1.8	L
Town of Windsor	1	2	1	4	3	1.8	L
Hyde County	1	3	1	4	3	2.1	M
Martin County	1	2	1	4	3	1.8	L
Town of Bear Grass	1	2	1	4	3	1.8	L
Town of Everetts	1	2	1	4	3	1.8	L
Town of Hamilton	1	2	1	4	3	1.8	L
Town of Hassell	1	2	1	4	3	1.8	L
Town of Jamesville	1	2	1	4	3	1.8	L
Town of Oak City	1	2	1	4	3	1.8	L
Town of Parmele	1	2	1	4	3	1.8	L
Town of Robersonville	1	2	1	4	3	1.8	L
Town of Williamston	1	2	1	4	3	1.8	L
Tyrrell County	1	3	1	4	3	2.1	M
Town of Columbia	1	2	1	4	3	1.8	L
Washington County	1	2	1	4	3	1.8	L
Town of Creswell	1	2	1	4	3	1.8	L
Town of Plymouth	1	2	1	4	3	1.8	L
Town of Roper	1	2	1	4	3	1.8	L

4.5.2 DROUGHT

HAZARD BACKGROUND

Drought is a deficiency in precipitation over an extended period. It is a normal, recurrent feature of climate that occurs in virtually all climate zones. The duration of a drought varies widely. There are cases when drought develops relatively quickly and lasts a very short period of time, exacerbated by extreme heat and/or wind, and there are other cases when drought spans multiple years, or even decades. Studying the paleoclimate record is often helpful in identifying when long-lasting droughts have occurred. Common types of droughts are detailed below in Table 4.17.

Table 4.17 – Types of Droughts

Type	Details
Meteorological Drought	Meteorological Drought is based on the degree of dryness (rainfall deficit) and the length of the dry period.
Agricultural Drought	Agricultural Drought is based on the impacts to agriculture by factors such as rainfall deficits, soil water deficits, reduced ground water, or reservoir levels needed for irrigation.
Hydrological Drought	Hydrological Drought is based on the impact of rainfall deficits on the water supply such as stream flow, reservoir and lake levels, and ground water table decline.
Socioeconomic Drought	Socioeconomic drought is based on the impact of drought conditions (meteorological, agricultural, or hydrological drought) on supply and demand of some economic goods. Socioeconomic drought occurs when the demand for an economic good exceeds supply as a result of a weather-related deficit in water supply.
Ecological Drought	Prolonged and widespread deficit in naturally available water supplies – including changes in natural and managed hydrology – that create multiple stresses across ecosystems

The wide variety of disciplines affected by drought, its diverse geographical and temporal distribution, and the many scales drought operates on make it difficult to develop both a definition to describe drought and an index to measure it. Many quantitative measures of drought have been developed in the United States, depending on the discipline affected, the region being considered, and the particular application. Several indices developed by Wayne Palmer, as well as the Standardized Precipitation Index, are useful for describing the many scales of drought.

The U.S. Drought Monitor provides a summary of drought conditions across the United States and Puerto Rico. Often described as a blend of art and science, the Drought Monitor map is updated weekly by combining a variety of data-based drought indices and indicators and local expert input into a single composite drought indicator.

The **Palmer Drought Severity Index (PDSI)** devised in 1965, was the first drought indicator to assess moisture status comprehensively. It uses temperature and precipitation data to calculate water supply and demand, incorporates soil moisture, and is considered most effective for unirrigated cropland. It primarily reflects long-term drought and has been used extensively to initiate drought relief. It is more complex than the Standardized Precipitation Index (SPI) and the Drought Monitor.

The **Standardized Precipitation Index (SPI)** is a way of measuring drought that is different from the Palmer Drought Severity Index (PDSI). Like the PDSI, this index is negative for drought, and positive for wet conditions. But the SPI is a probability index that considers only precipitation, while Palmer's indices

are water balance indices that consider water supply (precipitation), demand (evapotranspiration) and loss (runoff).

The State of North Carolina has a Drought Assessment and Response Plan as an Annex to its Emergency Operations Plan. This plan provides the framework to coordinate statewide response to a drought incident.

Warning Time: 1 – More than 24 hours

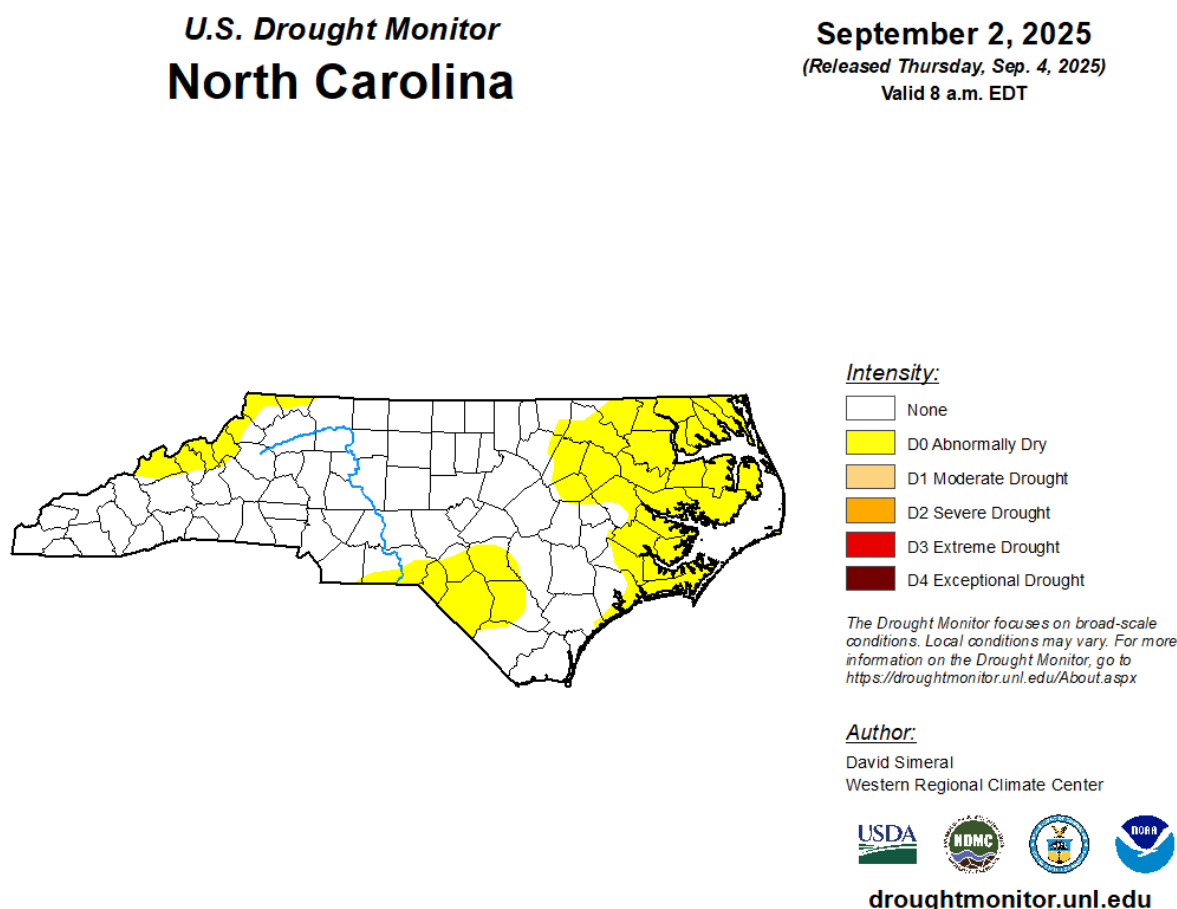
Duration: 4 – More than one week

LOCATION

Drought is a regional hazard that can cover an entire the entire planning area, and in some cases the entire state. The figure below shows the U.S. Drought Monitor’s drought ratings for North Carolina as of September 2, 2025. As of that date, the Northeastern Region was experiencing abnormally dry conditions, or D0 drought. While this map is not an indication of future drought potential, it does illustrate the regional nature of drought conditions.

Spatial Extent: 4 – Large

Figure 4.13 – US Drought Monitor for Week of September 2, 2025



Source: U.S. Drought Monitor

EXTENT

Drought extent can be defined in terms of intensity, using the U.S. Drought Monitor scale. The Drought Monitor Scale measures drought episodes with input from the Palmer Drought Severity Index, the Standardized Precipitation Index, the Keetch-Byram Drought Index, soil moisture indicators, and other inputs as well as information on how drought is affecting people. Figure 4.14 details the classifications used by the U.S. Drought Monitor. A category of D2 (severe) or higher on the U.S. Drought Monitor Scale can typically result in crop or pasture losses, water shortages, and the need to institute water restrictions.

Figure 4.14 – US Drought Monitor Classifications

Category	Description	Possible Impacts	Ranges				
			Palmer Drought Severity Index (PDSI)	CPC Soil Moisture Model (Percentiles)	USGS Weekly Streamflow (Percentiles)	Standardized Precipitation Index (SPI)	Objective Drought Indicator Blends (Percentiles)
D0	Abnormally Dry	Going into drought: - short-term dryness slowing planting, growth of crops or pastures Coming out of drought: - some lingering water deficits - pastures or crops not fully recovered	-1.0 to -1.9	21 to 30	21 to 30	-0.5 to -0.7	21 to 30
D1	Moderate Drought	- Some damage to crops, pastures - Streams, reservoirs, or wells low, some water shortages developing or imminent - Voluntary water-use restrictions requested	-2.0 to -2.9	11 to 20	11 to 20	-0.8 to -1.2	11 to 20
D2	Severe Drought	- Crop or pasture losses likely - Water shortages common - Water restrictions imposed	-3.0 to -3.9	6 to 10	6 to 10	-1.3 to -1.5	6 to 10
D3	Extreme Drought	- Major crop/pasture losses - Widespread water shortages or restrictions	-4.0 to -4.9	3 to 5	3 to 5	-1.6 to -1.9	3 to 5
D4	Exceptional Drought	- Exceptional and widespread crop/pasture losses - Shortages of water in reservoirs, streams, and wells creating water emergencies	-5.0 or less	0 to 2	0 to 2	-2.0 or less	0 to 2

Source: US Drought Monitor

The most severe drought to impact the Northeastern NC Region within the past 20 years occurred between March 2007 and May 2008, during which time Bertie and Martin Counties experienced 50 consecutive weeks of drought conditions, and Hyde, Tyrell and Washington Counties experienced 47 consecutive weeks of drought. Conditions were most severe in Bertie and Martin Counties, where some areas experienced “exceptional” drought conditions. In general, drought is not likely to cause any direct injury or death, but economic impacts of drought can be severe, especially to the agricultural industry.

Impact: 2 – Limited

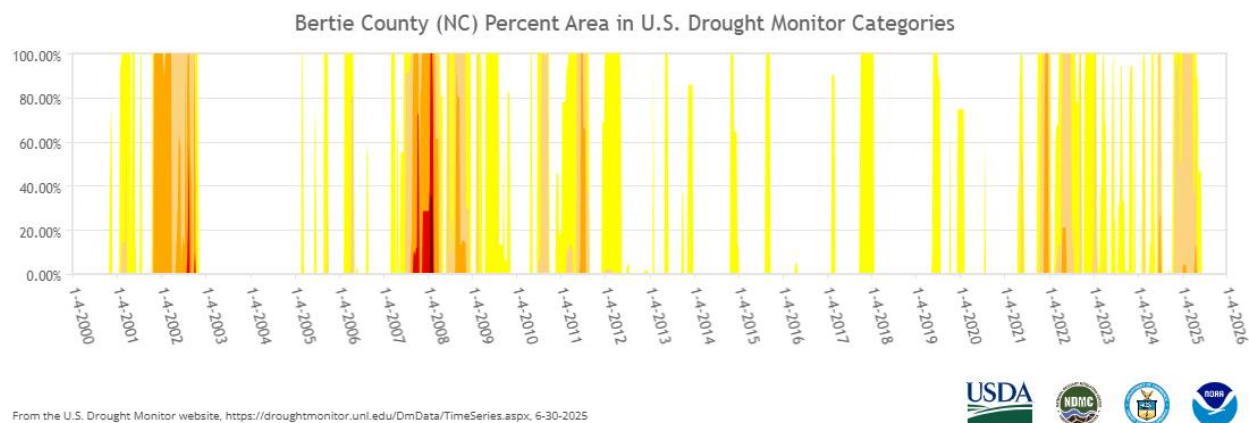
HISTORICAL OCCURRENCES

Figure 4.15 through Figure 4.19 show historical periods where each county was considered in some level of drought condition. The color key shown in Figure 4.14 indicates the intensity of the drought.

BERTIE COUNTY

Between 2000 and 2024, Bertie County was in some level of drought 40.6% of the time. The County recorded 112 weeks of in “severe” drought or worse during this timeframe, including 4 weeks in “exceptional” drought conditions.

Figure 4.15 – US Drought Monitor Historical Trends – Bertie County 2000-2024

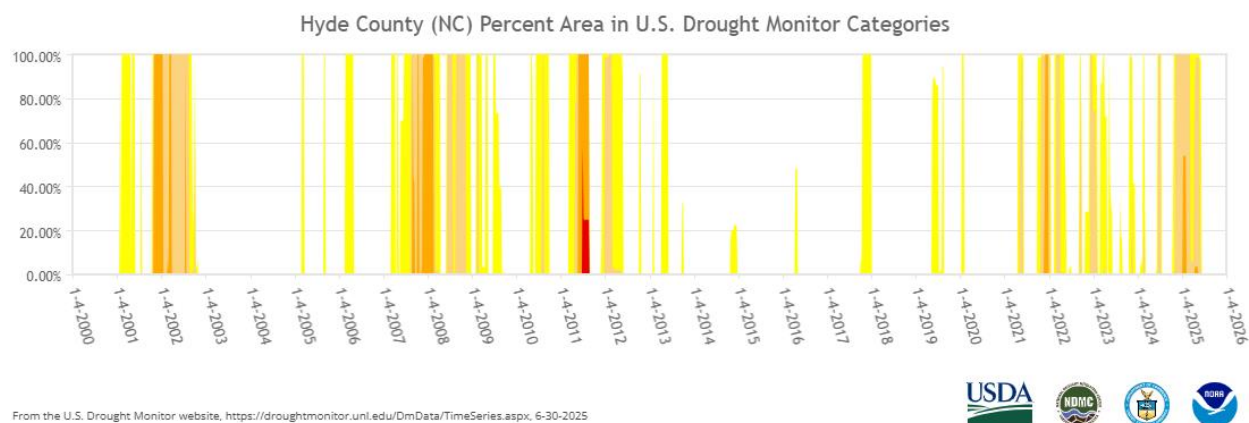


Source: U.S. Drought Monitor

HYDE COUNTY

Between 2000 and 2024, Hyde County was in some level of drought 33.7% of the time. The County recorded 56 weeks in “severe” drought during this timeframe.

Figure 4.16 – US Drought Monitor Historical Trends – Hyde County 2000-2024

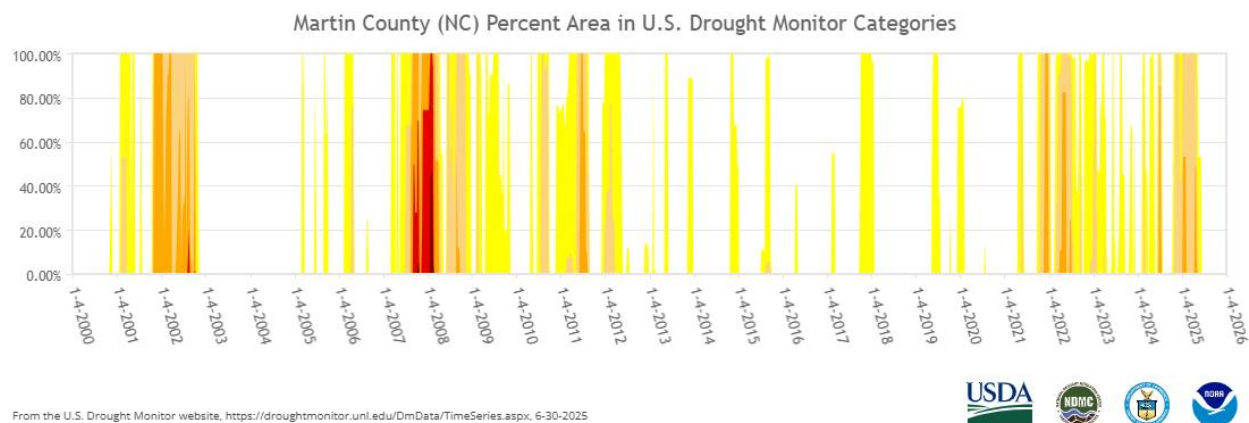


Source: U.S. Drought Monitor

MARTIN COUNTY

Between 2000 and 2024, Martin County was in some level of drought 39.9% of the time. The County recorded 106 weeks in “severe” drought or worse during this timeframe, including 6 weeks with some areas in “exceptional” drought.

Figure 4.17 – US Drought Monitor Historical Trends – Martin County 2000-2024

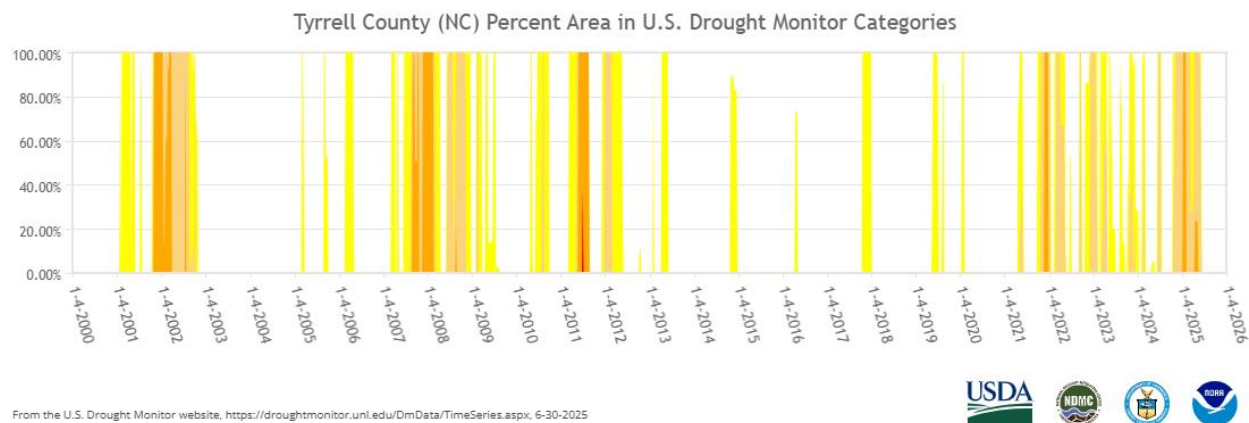


Source: U.S. Drought Monitor

TYRRELL COUNTY

Between 2000 and 2024, Tyrrell County was in some level of drought 33.1% of the time. The County recorded 62 weeks in “severe” drought or worse during this timeframe.

Figure 4.18 – US Drought Monitor Historical Trends – Tyrrell County 2000-2024

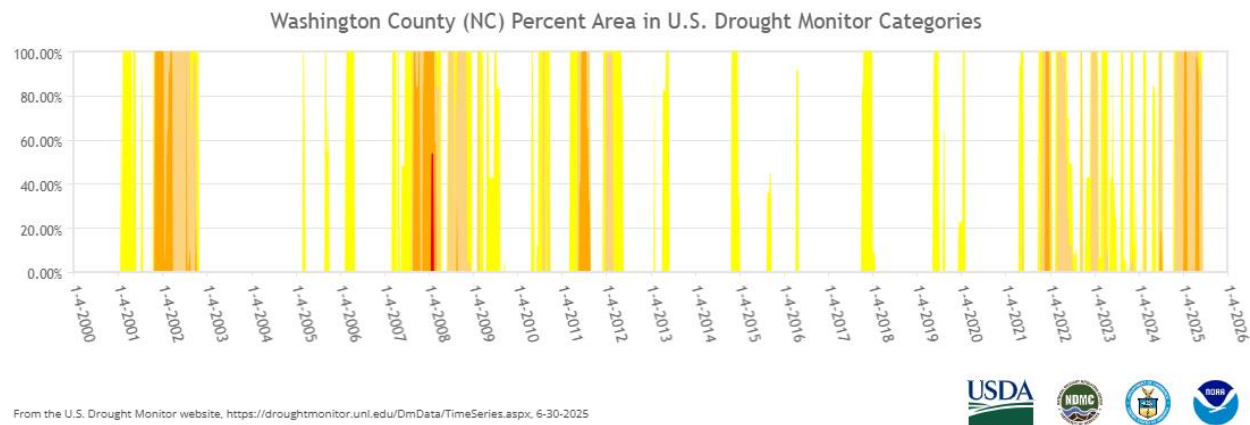


Source: U.S. Drought Monitor

WASHINGTON COUNTY

Between 2000 and 2024, Washington County was in some level of drought 34.9% of the time. The County recorded 76 weeks of in “severe” drought or worse during this timeframe.

Figure 4.19 – US Drought Monitor Historical Trends – Washington County 2000-2024



Source: U.S. Drought Monitor

The National Drought Mitigation Center (NDMC), located at the University of Nebraska in Lincoln, provides a clearinghouse for information on the effects of drought, based on reports from media, observers, impact records, and other sources.

Table 4.18 summarizes the number of impacts reported by category and the years impacts were reported for each category. Note that the Drought Impact Reporter assigns multiple categories to each impact, and that the same impacts were listed for almost every county in the Region, which speaks to the regional nature of drought.

Table 4.18 – Drought Impacts Reported in the Northeastern NC Region, 2009 - 2024

Category	Bertie	Hyde	Martin	Tyrrell	Washington	Years Reported
	Impacts					
Agriculture	3	3	3	2	2	2010, 2012, 2024
Fire	6	9	6	7	7	2011, 2019, 2021, 2024
Relief, Response & Restrictions	8	11	9	8	9	2010, 2012, 2019, 2020, 2021, 2024
Society & Public Health	1	1	1	1	1	2011, 2024
Water Supply & Quality	1	1	2	1	2	2020, 2021

Source: Drought Impact Reporter, <http://droughtreporter.unl.edu>

PROBABILITY OF FUTURE OCCURRENCE

Over the 1,305 weeks with data from 2000 through 2024, the Region spent an average of 476 weeks in some level of drought condition, ranging from abnormally dry to exceptional drought. This equates to a 36.4% chance of drought in any given week. Table 4.19 summarizes historical data by county. The probability of severe drought is lower, with the region averaging 6.3% of the time in severe drought conditions or worse.

Table 4.19 – Historical Weeks in Drought by County, 2000-2024

County	Any Drought Conditions		Severe Drought Conditions	
	Total Weeks	Percent of Time	Total Weeks	Percent of Time
Bertie	530	40.6%	112	8.5%
Hyde	440	33.7%	56	4.3%
Martin	521	39.9%	106	8.1%
Tyrrell	432	33.1%	62	4.7%
Washington	456	34.9%	76	5.8%

Source: US Drought Monitor

Probability: 2 – Possible

CLIMATE CHANGE

The Fourth National Climate Assessment reports that average and extreme temperatures are increasing across the country and average annual precipitation is decreasing in the Southeast. Heavy precipitation events are becoming more frequent, meaning that there will likely be an increase in the average number of consecutive dry days. As temperature is projected to continue rising, evaporation rates are expected to increase, resulting in decreased surface soil moisture levels. Together, these factors suggest that drought will increase in intensity and duration in the Southeast.

The Fifth National Climate Assessment upholds the climate trends reported in the Fourth Assessment and presents additional patterns in the Southeast that exacerbate climate risk and impacts. These patterns include population growth, high proportion of the population with health issues or underlying health conditions, and a large, climate-dependent agricultural sector.

VULNERABILITY ASSESSMENT

METHODOLOGIES AND ASSUMPTIONS

Vulnerability to drought in the Northeastern Region is based on historical occurrences of drought in the planning area and generalized concerns regarding potential drought consequences. Agricultural vulnerability was estimated using data from the USDA Risk Management Agency crop insurance claims, specifically past claims related to drought.

PEOPLE

Drought can affect people’s physical and mental health. For those economically dependent on a reliable water supply, drought may cause anxiety or depression about economic losses, reduced incomes, and other employment impacts. Conflicts may arise over water shortages. People may be forced to pay more for water, food, and utilities affected by increased water costs.

Drought may also cause health problems due to poorer water quality from lower water levels. If accompanied by extreme heat, drought can also result in higher incidents of heat stroke and even loss of human life.

PROPERTY

Drought is unlikely to cause damages to the built environment. However, in areas with shrinking and expansive soils, drought may lead to structural damages.

Drought may also cause severe property loss for the agricultural industry in terms of crop and livestock losses. The USDA's Risk Management Agency (RMA) maintains a database of all paid crop insurance claims. Between 2007-2024, the sum of claims paid for crop damage as a result of drought in the Northeastern NC Region was \$62,038,221, or an average of \$3,446,567 in losses every year. Losses were greatest in Bertie County. Table 4.20 summarizes the regional crop losses due to drought in reported in the RMA system.

Table 4.20 – Crop Losses Resulting from Drought in Northeastern NC Region, 2007-2024

Year	Indemnity Amount
2007	\$3,636,669
2008	\$8,301,875
2009	\$714,906
2010	\$7,116,298
2011	\$17,618,400
2012	\$416,010
2013	\$31,775
2014	\$117,891
2015	\$5,939,106
2016	\$1,926,548
2017	\$18,433
2018	\$223,987
2019	\$2,835,431
2020	\$2,007,198
2021	\$1,143,115
2022	\$4,533,695
2023	\$4,144,020
2024	\$1,312,864
Total	\$62,038,221

Source: USDA Risk Management Agency

Table 4.21 summarizes county-specific data on indemnity amounts, as well as average payout amounts per year. Bertie County suffered the greatest impacts agriculturally from drought, with over \$17 million in payouts over the 18-year timespan.

Table 4.21 – County-Specific Total Crop Losses Resulting from Drought, 2007-2024

County	Indemnity Amount	Average Annual Indemnity
Bertie	\$17,880,668	\$993,370
Hyde	\$7,328,117	\$407,118
Martin	\$19,698,704	\$1,094,372
Tyrrell	\$3,032,608	\$168,478
Washington	\$14,098,084	\$783,227
Total	\$62,038,180	\$3,446,566

Source: USDA Risk Management Agency

ENVIRONMENT

Drought can affect local wildlife by shrinking food supplies and damaging habitats. Sometimes this damage is only temporary, and other times it is irreversible. Wildlife may face increased disease rates due to limited access to food and water. Increased stress on endangered species could cause extinction.

Drought conditions can also provide a substantial increase in wildfire risk. As plants and trees die from a lack of precipitation, increased insect infestations, and diseases—all of which are associated with drought—they become fuel for wildfire. Long periods of drought can result in more intense wildfires, which bring additional consequences for the economy, the environment, and society. Drought may also increase likelihood of wind and water erosion of soils.

CONSEQUENCE ANALYSIS

Table 4.22 summarizes the potential negative consequences of drought.

Table 4.22 – Consequence Analysis – Drought

Category	Consequences
Public	Can cause anxiety or depression about economic losses, conflicts over water shortages, reduced incomes, fewer recreational activities, higher incidents of heat stroke, and fatality.
Responders	Impacts to responders are unlikely. Exceptional drought conditions may impact the amount of water immediately available to respond to wildfires.
Continuity of Operations (including Continued Delivery of Services)	Drought would have minimal impacts on continuity of operations due to the relatively long warning time that would allow for plans to be made to maintain continuity of operations.
Property, Facilities and Infrastructure	Drought has the potential to affect water supply for residential, commercial, institutional, industrial, and government-owned areas. Drought can reduce water supply in wells and reservoirs. Utilities may be forced to increase rates.
Environment	Environmental impacts include strain on local plant and wildlife; increased probability of erosion and wildfire.
Economic Condition of the Jurisdiction	Farmers may face crop losses or increased livestock costs. Businesses that depend on farming may experience secondary impacts. Extreme drought has the potential to impact local businesses in landscaping, recreation and tourism, and public utilities.
Public Confidence in the Jurisdiction's Governance	When drought conditions persist with no relief, local or State governments must often institute water restrictions, which may impact public confidence.

HAZARD SUMMARY BY JURISDICTION

The following table summarizes drought hazard risk by jurisdiction. Drought risk is uniform across the planning area. Warning time, duration and spatial extent are inherent to the hazard and remain constant across jurisdictions. The majority of damages that result from drought are to crops and other agriculture-related activities as well as water-dependent recreation industries. The magnitude of the impacts is typically greater in unincorporated areas; impacts are likely higher in Bertie, Martin, and Hyde, which have experienced the most crop losses due to drought. In developed areas, the magnitude of drought is

SECTION 4: RISK ASSESSMENT

less severe, with lawns and local gardens affected and potential impacts on local water supplies during severe, prolonged drought.

Jurisdiction	Probability	Impact	Spatial Extent	Warning Time	Duration	Score	Priority
Bertie County	2	2	4	1	4	2.5	M
Town of Askewville	2	1	4	1	4	2.2	M
Town of Aulander	2	1	4	1	4	2.2	M
Town of Colerain	2	1	4	1	4	2.2	M
Town of Kelford	2	1	4	1	4	2.2	M
Town of Lewiston-Woodville	2	1	4	1	4	2.2	M
Town of Powellsville	2	1	4	1	4	2.2	M
Town of Roxobel	2	1	4	1	4	2.2	M
Town of Windsor	2	1	4	1	4	2.2	M
Hyde County	2	2	4	1	4	2.5	M
Martin County	2	2	4	1	4	2.5	M
Town of Bear Grass	2	1	4	1	4	2.2	M
Town of Everetts	2	1	4	1	4	2.2	M
Town of Hamilton	2	1	4	1	4	2.2	M
Town of Hassell	2	1	4	1	4	2.2	M
Town of Jamesville	2	1	4	1	4	2.2	M
Town of Oak City	2	1	4	1	4	2.2	M
Town of Parmele	2	1	4	1	4	2.2	M
Town of Robersonville	2	1	4	1	4	2.2	M
Town of Williamston	2	1	4	1	4	2.2	M
Tyrrell County	2	2	4	1	4	2.5	M
Town of Columbia	2	1	4	1	4	2.2	M
Washington County	2	2	4	1	4	2.5	M
Town of Creswell	2	1	4	1	4	2.2	M
Town of Plymouth	2	1	4	1	4	2.2	M
Town of Roper	2	1	4	1	4	2.2	M

4.5.3 EARTHQUAKE

HAZARD BACKGROUND

An earthquake is a movement or shaking of the ground. Most earthquakes are caused by the release of stresses accumulated as a result of the rupture of rocks along opposing fault planes in the Earth's outer crust. These fault planes are typically found along borders of the Earth's 10 tectonic plates. The areas of greatest tectonic instability occur at the perimeters of the slowly moving plates, as these locations are subjected to the greatest strains from plates traveling in opposite directions and at different speeds. Deformation along plate boundaries causes strain in the rock and the consequent buildup of stored energy. When the built-up stress exceeds the rocks' strength a rupture occurs. The rock on both sides of the fracture is snapped, releasing the stored energy and producing seismic waves, generating an earthquake.

Warning Time: 4 – Less than six hours

Duration: 1 – Less than six hours

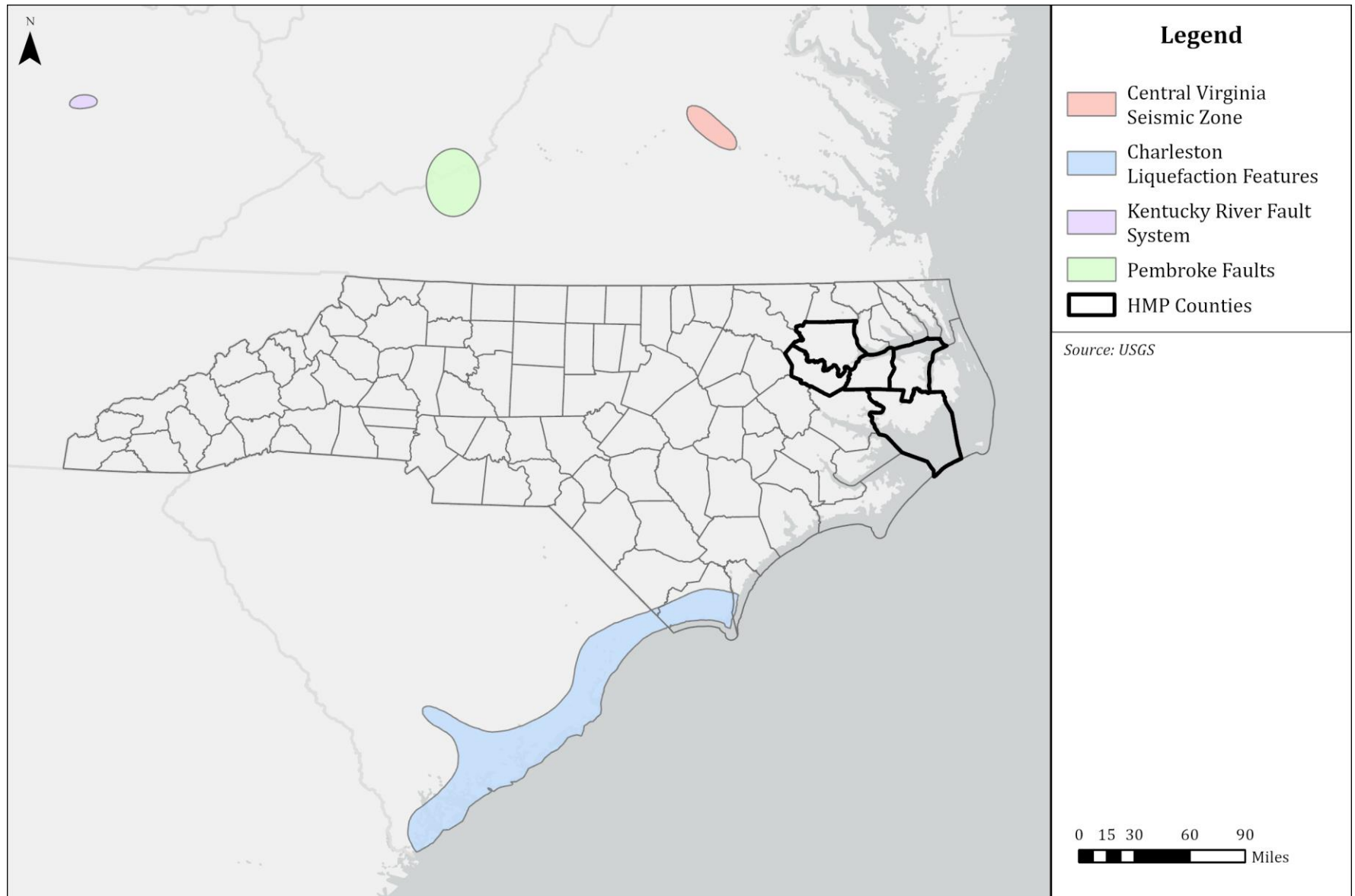
LOCATION

Figure 4.20 reflects the Quaternary faults that present an earthquake hazard for the Northeastern NC Region based on data from the USGS Earthquake Hazards Program.

All of North Carolina is subject to earthquakes, with the western and southern region most vulnerable to a damaging earthquake. The Charleston Fault in South Carolina and New Madrid Fault in Tennessee affect the state. Both faults have generated earthquakes measuring greater than 8.0 on the Richter Scale during the last 200 years. In addition, there are several smaller fault lines in eastern Tennessee and throughout North Carolina that could produce less severe shaking.

Spatial Extent: 4 – Large

Figure 4.20 - US Quaternary Faults



EXTENT

Earthquakes are measured in terms of their magnitude and intensity. The Richter Scale, an open-ended logarithmic scale that describes the energy release of an earthquake through a measure of shock wave amplitude is usually used by the news media when reporting the intensity of earthquakes and is the scale most familiar to the public. However, the USGS now uses moment magnitude, which is an extension of the Richter Scale and is based on physical properties of the earthquake derived from an analysis of all the waveforms recorded from the shaking. Earthquake magnitude is described in Figure 4.21.

A more meaningful measurement is an earthquake's intensity. The intensity scale used by the scientific community in the United States is called the Modified Mercalli Intensity (MMI) scale. The MMI scale is an arbitrary ranking based on observed effects. Table 4.23 shows descriptions for levels of earthquake intensity on the MMI scale compared to the Richter scale. Seismic shaking is typically the greatest cause of losses to structures during earthquakes.

Figure 4.21 – Earthquake Magnitude and Energy Release

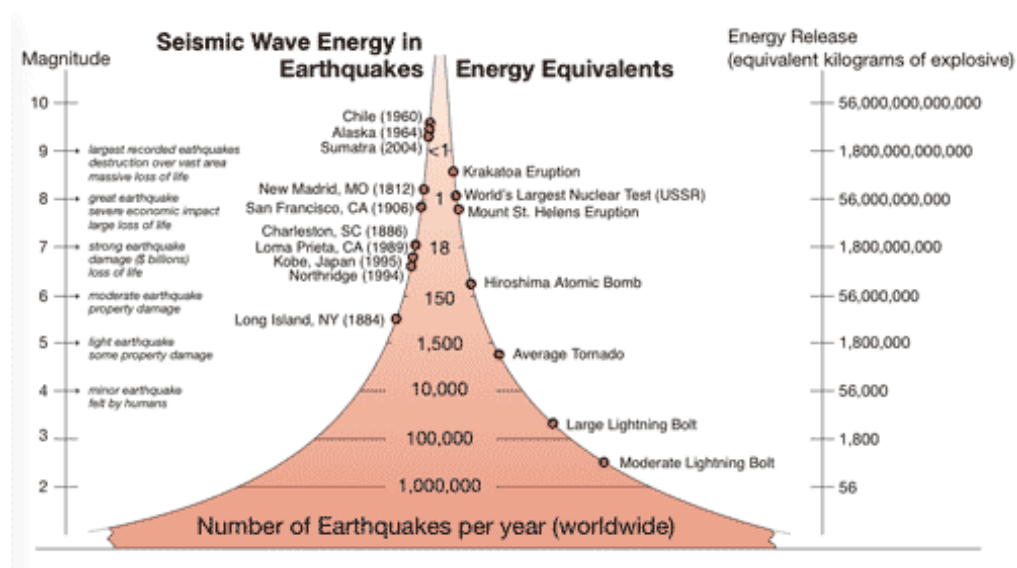


Table 4.23 – Comparison of Richter Scale and Modified Mercalli Intensity (MMI) Scale

MMI	Richter Scale	Felt Intensity
I	0 – 1.9	Not felt. Marginal and long period effects of large earthquakes.
II	2.0 – 2.9	Felt by persons at rest, on upper floors, or favorably placed.
III	3.0 – 3.9	Felt indoors. Hanging objects swing. Vibration like passing of light trucks. Duration estimated. May not be recognized as an earthquake.
IV	4.0 – 4.3	Hanging objects swing. Vibration like passing of heavy trucks. Standing motor cars rock. Windows, dishes, doors rattle. Glasses clink the upper range of IV, wooden walls and frame creak.
V	4.4 – 4.8	Felt outdoors; direction estimated. Sleepers wakened. Liquids disturbed, some spilled. Small unstable objects displaced or upset. Doors swing, close, open. Pendulum clocks stop, start.

MMI	Richter Scale	Felt Intensity
VI	4.9 – 5.4	Felt by all. Many frightened and run outdoors. Persons walk unsteadily. Windows, dishes, glassware broken. Books, etc., fall off shelves. Pictures fall off walls. Furniture moved. Weak plaster and masonry D cracked. Small bells ring. Trees, bushes shaken.
VII	5.5 – 6.1	Difficult to stand. Noticed by drivers of motor cars. Hanging objects quiver. Furniture broken. Damage to masonry D, including cracks. Weak chimneys broken at roof line. Fall of plaster, loose bricks, stones, tiles, cornices. Some cracks in masonry C. Waves on ponds. Small slides and caving in along sand or gravel banks. Large bells ring. Concrete irrigation ditches damaged.
VIII	6.2 – 6.5	Steering of motor cars is affected. Damage to masonry C; partial collapse. Some damage to masonry B. Fall of stucco and some masonry walls. Twisting, fall of chimneys, factory stacks, monuments, towers, elevated tanks. Frame houses moved on foundations. Decayed piling broken off. Branches broken from trees. Changes in flow or temperature of springs and wells. Cracks in wet ground and on steep slopes.
IX	6.6 – 6.9	General panic. Masonry D destroyed; masonry C heavily damaged, sometimes with complete collapse; masonry B seriously damaged. (General damage to foundations.) Serious damage to reservoirs. Underground pipes broken. Conspicuous cracks in ground. In alluvial areas sand and mud ejected, earthquake fountains, sand craters.
X	7.0 – 7.3	Most masonry and frame structures destroyed with their foundations. Some well-built wooden structures and bridges destroyed. Serious damage to dams, dikes, embankments. Large landslides. Water thrown on banks of canals, rivers, lakes, etc. Sand and mud shifted horizontally on beaches and flat land. Rails bent slightly.
XI	7.4 – 8.1	Rails bent greatly. Underground pipelines completely out of service.
XII	> 8.1	Damage nearly total. Large rock masses displaced. Lines of sight and level distorted. Objects thrown in the air.

Source: USGS Earthquake Hazards Program

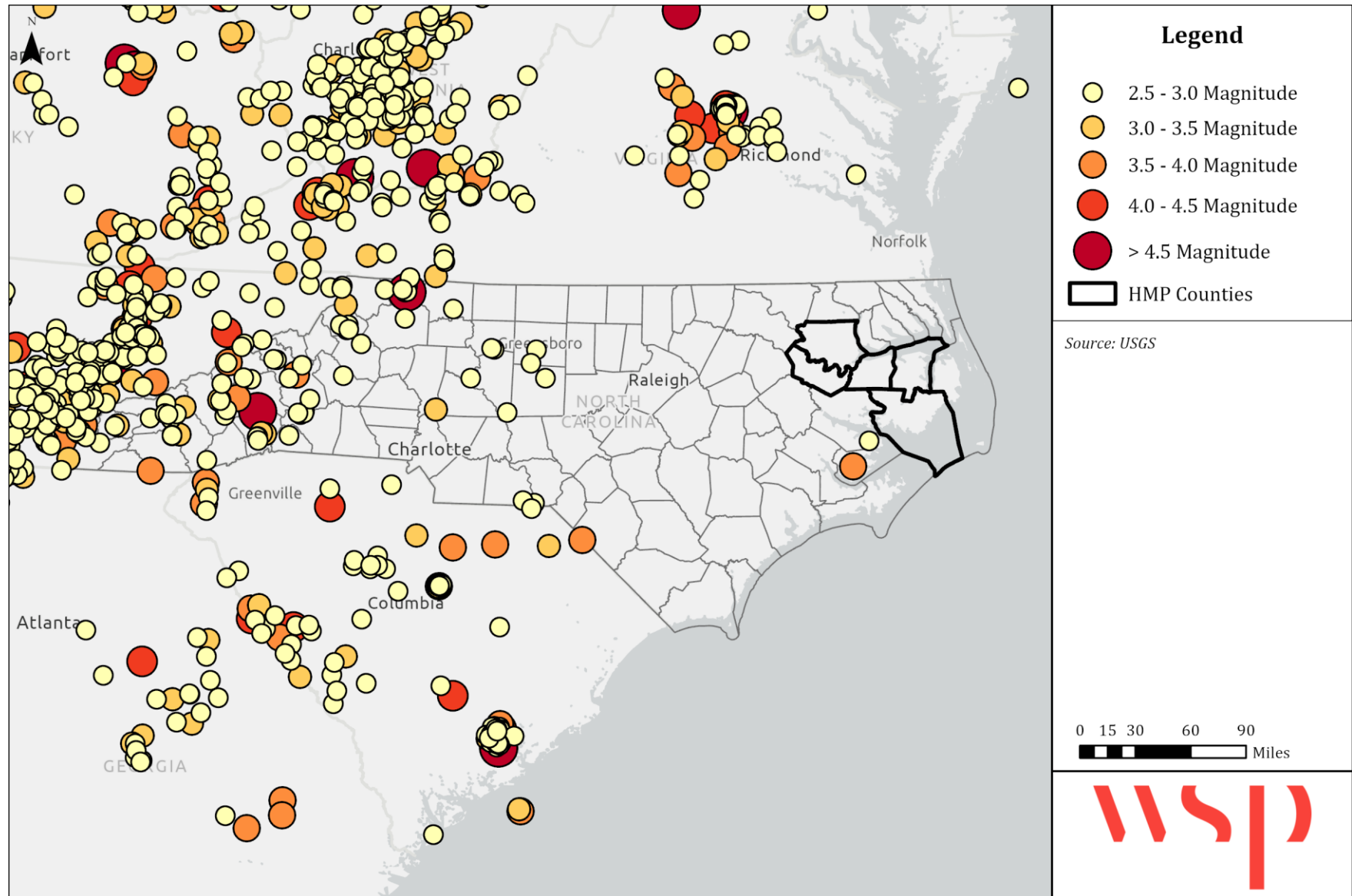
The most severe earthquakes to impact the Northeastern planning area occurred in December of 1875, March 1960, and November of 1969. These earthquakes were estimated to have been felt as a level 4 on the MMI Scale.

Impact: 1 – Minor

HISTORICAL OCCURRENCES

The USGS Earthquake Hazards Program maintains a database of all historical earthquakes of a magnitude 2.5 and greater. Figure 4.22 shows historical earthquakes by magnitude in relation to North Carolina and the Quaternary Faults identified by USGS. This includes events from 1900 to 2024. Based on USGS records, there have not been any earthquakes with epicenters in the Northeastern NC Region during this period.

Figure 4.22 – Historical Earthquakes by Magnitude, 1900-2024



The above map documents all earthquakes that have occurred within North Carolina; however, given the long distances across which earthquake impacts can be felt, these events do not encompass all earthquakes that have affected North Carolina.

PROBABILITY OF FUTURE OCCURRENCE

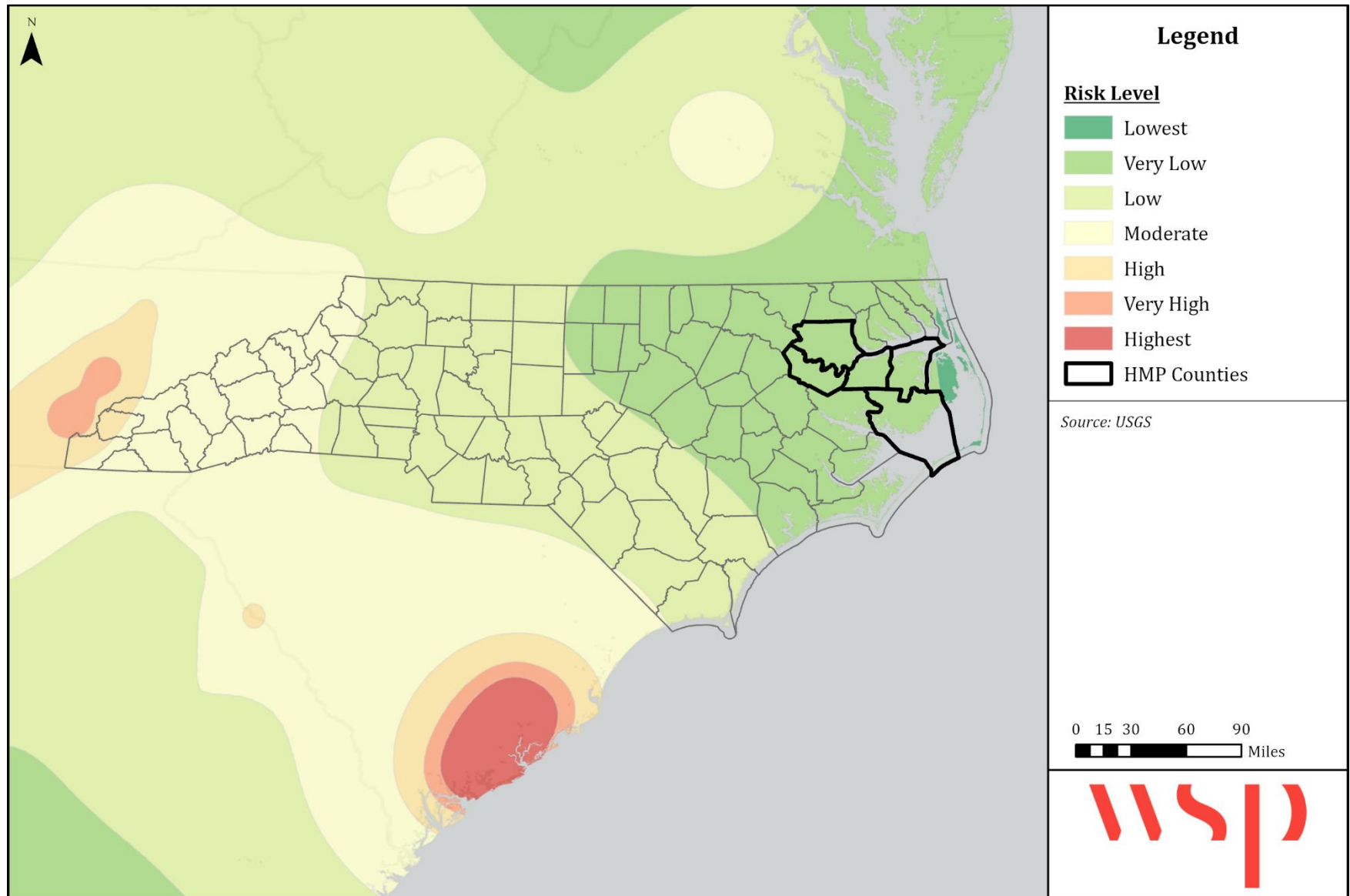
Ground motion is the movement of the earth's surface due to earthquakes or explosions. It is produced by waves generated by a sudden slip on a fault or sudden pressure at the explosive source and travels through the earth and along its surface. Ground motion is amplified when surface waves of unconsolidated materials bounce off of or are refracted by adjacent solid bedrock. The probability of ground motion is depicted in USGS earthquake hazard maps by showing, by contour values, the earthquake ground motions (of a particular frequency) that have a common given probability of being exceeded in 50 years.

Figure 4.23 reflects the seismic hazard for the Northeastern NC Region based on the national USGS map of peak acceleration with two percent probability of exceedance in 50 years, which USGS simplifies into risk ratings from "very low" to "highest". To produce these estimates, the ground motions being considered at a given location are those from all future possible earthquake magnitudes at all possible distances from that location. The ground motion coming from a particular magnitude and distance is assigned an annual probability equal to the annual probability of occurrence of the causative magnitude and distance. The method assumes a reasonable future catalog of earthquakes, based upon historical earthquake locations and geological information on the recurrence rate of fault ruptures. When all the possible earthquakes and magnitudes have been considered, a ground motion value is determined such that the annual rate of its being exceeded has a certain value. Therefore, for the given probability of exceedance, two percent, the locations shaken more frequently will have larger ground motions.

As shown in the map below, the majority of Northeastern NC Region is located within the medium green zone which represents "very low" seismic hazard risk. Based on this data, it can be reasonably assumed that an earthquake event affecting the planning region is unlikely.

Probability: 1 – Unlikely

Figure 4.23 – Seismic Hazard Information for North Carolina



CLIMATE CHANGE

Scientists are beginning to believe there may be a connection between climate change and earthquakes. Changing ice caps and sea-level redistribute weight over fault lines, which could potentially have an influence on earthquake occurrences. However, currently no studies quantify the relationship to a high level of detail, so recent earthquakes should not be linked with climate change.

VULNERABILITY ASSESSMENT

METHODOLOGIES AND ASSUMPTIONS

Population and property at risk to earthquake impacts was estimated using data from the NCEM IRISK database, which was compiled in NCEM's Risk Management Tool.

PEOPLE

Earthquake events in the Northeastern NC Region are unlikely to produce more than mild ground shaking; therefore, injury or death is unlikely. Objects falling from shelves generally pose the greatest threat to safety.

Table 4.24 and Table 4.25 detail the population estimated to be at risk from a 250-year earthquake and a 500-year earthquake, respectively, according to the NCEM IRISK database and ACS 2019-2023 5-Year Estimates data.

Table 4.24 – Estimated Population Impacted by 250-Year Earthquake

Jurisdiction	Total Population	Total Population at Risk		All Elderly Population	Elderly Population at Risk		All Children Population	Children at Risk	
		Number	Percent		Number	Percent		Number	Percent
Bertie									
Unincorporated Bertie County	11,675	4	0.04%	2,855	1	0.03%	417	0	0%
Town of Askewville	152	0	0%	45	0	0%	12	0	0%
Town of Aulander	748	0	0%	208	0	0%	117	0	0%
Town of Colerain	291	0	0%	49	0	0%	9	0	0%
Town of Kelford	245	0	0%	69	0	0%	15	0	0%
Town of Lewiston-Woodville	466	0	0%	137	0	0%	24	0	0%
Town of Powellsville	141	0	0%	113	0	0%	0	0	0%
Town of Roxobel	347	0	0%	66	0	0%	24	0	0%
Town of Windsor	3,417	0	0%	703	0	0%	94	0	0%
Subtotal Bertie	17,482	4	0.04%	4,245	1	0.03%	712	0	0%
Hyde									
Unincorporated Hyde County	4,625	0	0%	1,054	0	0%	124	0	0%
Martin									
Unincorporated Martin County	13,680	34	0.25%	3,396	8	0.24%	753	2	0.21%
Town of Bear Grass	94	0	0%	12	0	0%	22	0	0%
Town of Everetts	158	0	0%	18	0	0%	9	0	0%

SECTION 4: RISK ASSESSMENT

Jurisdiction	Total Population	Total Population at Risk		All Elderly Population	Elderly Population at Risk		All Children Population	Children at Risk	
		Number	Percent		Number	Percent		Number	Percent
Town of Hamilton	183	0	0%	84	0	0%	2	0	0%
Town of Hassell	49	0	0%	30	0	0%	0	0	0%
Town of Jamesville	373	0	0%	118	0	0%	8	0	0%
Town of Oak City	472	0	0%	145	0	0%	30	0	0%
Town of Parmele	288	0	0%	85	0	0%	0	0	0%
Town of Robersonville	1,319	0	0%	374	0	0%	52	0	0%
Town of Williamston	5,157	0	0%	1,182	0	0%	194	0	0%
Subtotal Martin	21,773	34	0.25%	5,444	8	0.24%	1,070	2	0.21%
Tyrrell									
Unincorporated Tyrrell County	2,702	0	0%	695	0	0%	146	0	0%
Town of Columbia	674	0	0%	167	0	0%	24	0	0%
Subtotal Tyrrell	3,376	0	0%	862	0	0%	170	0	0%
Washington									
Unincorporated Washington County	6,850	0	0%	1,841	0	0%	64	0	0%
Town of Creswell	205	0	0%	58	0	0%	15	0	0%
Town of Plymouth	3,264	0	0%	923	0	0%	140	0	0%
Town of Roper	586	0	0%	162	0	0%	22	0	0%
Subtotal Washington	10,905	0	0%	2,984	0	0%	241	0	0%
Region Total	58,161	38	0.07%	14,589	9	0.06%	2,317	2	0.09%

Source: NCEM Risk Management Tool; ACS 2019-2023 5-Year Estimates

Table 4.25 - Estimated Population Impacted by 500-Year Earthquake

Jurisdiction	Total Population	Total Population at Risk		All Elderly Population	Elderly Population at Risk		All Children Population	Children at Risk	
		Number	Percent		Number	Percent		Number	Percent
Bertie									
Unincorporated Bertie County	11,675	11,675	100%	2,855	2,855	100%	417	417	100%
Town of Askewville	152	152	100%	45	45	100%	12	12	100%
Town of Aulander	748	748	100%	208	208	100%	117	117	100%
Town of Colerain	291	291	100%	49	49	100%	9	9	100%
Town of Kelford	245	245	100%	69	69	100%	15	15	100%
Town of Lewiston-Woodville	466	466	100%	137	137	100%	24	24	100%
Town of Powellsville	141	141	100%	113	113	100%	0	0	--
Town of Roxobel	347	347	100%	66	66	100%	24	24	100%

SECTION 4: RISK ASSESSMENT

Jurisdiction	Total Population	Total Population at Risk		All Elderly Population	Elderly Population at Risk		All Children Population	Children at Risk	
		Number	Percent		Number	Percent		Number	Percent
Town of Windsor	3,417	3,417	100%	703	703	100%	94	94	100%
Subtotal Bertie	17,482	17,482	100%	4,245	4,245	100%	712	673	100%
Hyde									
Unincorporated Hyde County	4,625	971	21%	1,054	221	21%	124	26	21%
Martin									
Unincorporated Martin County	13,680	13,680	100%	3,396	3,396	100%	753	753	100%
Town of Bear Grass	94	94	100%	12	12	100%	22	22	100%
Town of Everetts	158	158	100%	18	18	100%	9	9	100%
Town of Hamilton	183	183	100%	84	84	100%	2	2	100%
Town of Hassell	49	49	100%	30	30	100%	0	0	--
Town of Jamesville	373	373	100%	118	118	100%	8	8	100%
Town of Oak City	472	472	100%	145	145	100%	30	30	100%
Town of Parmele	288	288	100%	85	85	100%	0	0	--
Town of Robersonville	1,319	1,319	100%	374	374	100%	52	52	100%
Town of Williamston	5,157	5,157	100%	1,182	1,182	100%	194	194	100%
Subtotal Martin	21,773	21,773	100%	5,444	5,444	100%	1,070	1,070	100%
Tyrrell									
Unincorporated Tyrrell County	2,702	1,135	42%	695	292	42%	146	60	41%
Town of Columbia	674	256	38%	167	84	50%	24	11	44%
Subtotal Tyrrell	3,376	1,391	41%	862	375	44%	170	70	41%
Washington									
Unincorporated Washington County	6,850	3,905	57%	1,841	1,049	57%	64	37	58%
Town of Creswell	205	76	37%	58	21	36%	15	4	25%
Town of Plymouth	3,264	3,264	100%	923	923	100%	140	140	100%
Town of Roper	586	135	23%	162	39	24%	22	4	20%
Subtotal Washington	10,905	6,870	63%	2,984	1,850	62%	241	137	57%
Region Total	58,161	48,487	83%	14,589	12,135	83%	2,317	1,959	85%

Source: NCEM Risk Management Tool; ACS 2019-2023 5-Year Estimates

PROPERTY

In a severe earthquake event, buildings can be damaged by the shaking itself or by the ground beneath them settling to a different level than it was before the earthquake (subsidence). Buildings can even sink into the ground if soil liquefaction occurs. If a structure (a building, road, etc.) is built across a fault, the ground displacement during an earthquake could seriously damage that structure.

Certain building types are particularly vulnerable to earthquake damage: wood-frame multi-unit buildings, single-family homes, mobile homes, and unreinforced masonry buildings. The most susceptible structures are wood-frame, multi-story, mixed-use buildings that have large openings on the first floor for garages or commercial space and housing on the upper floors. During an earthquake, these types of structures could sway or even collapse.

Earthquakes can also cause damages to infrastructure, resulting in secondary hazards. Damages to dams or levees could cause failures and subsequent flooding. Fires can be started by broken gas lines and power lines. Fires can be a serious problem, especially if the water lines that feed the fire hydrants have been damaged as well.

The Northeastern NC Region has not been impacted by an earthquake with more than a moderate intensity, so damage to the built environment is unlikely.

Table 4.26 and Table 4.27 detail the estimated buildings impacted from 250-year and 500-year earthquake events.

SECTION 4: RISK ASSESSMENT

Table 4.26 – Estimated Buildings Impacted by 250-Year Earthquake Event

Jurisdiction	All Buildings	Residential Buildings at Risk			Commercial Buildings at Risk			Public Buildings at Risk			Total Buildings at Risk		
	Num	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages
Bertie													
Unincorporated Bertie County	11,175	3	0%	\$2	53	0%	\$319	2	0%	\$9	58	1%	\$329
Town of Askewville	502	0	0%	\$0	4	1%	\$15	1	0%	\$5	5	1%	\$19
Town of Aulander	744	0	0%	\$0	7	1%	\$179	0	0%	\$0	7	1%	\$179
Town of Colerain	428	0	0%	\$0	7	2%	\$62	0	0%	\$0	7	2%	\$62
Town of Kelford	173	0	0%	\$0	1	1%	\$6	0	0%	\$0	1	1%	\$6
Town of Lewiston-Woodville	719	0	0%	\$0	8	1%	\$310	0	0%	\$0	8	1%	\$310
Town of Powellsville	171	0	0%	\$0	0	0%	\$0	0	0%	\$0	0	0%	\$0
Town of Roxobel	205	0	0%	\$0	11	5%	\$59	1	0%	\$3	12	6%	\$62
Town of Windsor	1,815	0	0%	\$0	26	1%	\$283	0	0%	\$0	26	1%	\$283
Subtotal Bertie	15,932	3	0%	\$2	117	1%	\$1,233	4	0%	\$17	124	1%	\$1,250
Hyde													
Unincorporated Hyde County	5,596	0	0%	\$0	6	0	\$7	0	0%	\$0	6	0%	\$7
Martin													
Unincorporated Martin County	12,188	20	0%	\$1	143	1%	\$3,352	2	0%	\$6	165	1%	\$3,360
Town of Bear Grass	81	0	0%	\$0	0	0%	\$0	0	0%	\$0	0	0%	\$0
Town of Everetts	159	0	0%	\$0	0	0%	\$0	0	0%	\$0	0	0%	\$0
Town of Hamilton	292	0	0%	\$0	1	0%	\$15	1	0%	\$17	2	1%	\$31
Town of Hassell	70	0	0%	\$0	2	3%	\$20	0	0%	\$0	2	3%	\$20
Town of Jamesville	297	0	0%	\$0	2	1%	\$17	0	0%	\$0	2	1%	\$17
Town of Oak City	313	0	0%	\$0	3	1%	\$6	0	0%	\$0	3	1%	\$6
Town of Parmele	149	0	0%	\$0	2	1%	\$2	0	0%	\$0	2	1%	\$2
Town of Robersonville	901	0	0%	\$0	16	2%	\$142	0	0%	\$0	16	2%	\$142
Town of Williamston	4,238	0	0%	\$0	46	1%	\$1,760	1	0%	\$11	47	1%	\$1,771
Subtotal Martin	18,688	20	0%	\$1	215	1%	\$5,314	4	0%	\$34	239	1%	\$5,349

SECTION 4: RISK ASSESSMENT

Jurisdiction	All Buildings	Residential Buildings at Risk			Commercial Buildings at Risk			Public Buildings at Risk			Total Buildings at Risk		
	Num	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages
Tyrrell													
Unincorporated Tyrrell County	2,794	0	0%	\$0	0	0%	\$0	0	0%	\$0	0	0%	\$0
Town of Columbia	519	0	0%	\$0	0	0%	\$0	0	0%	\$0	0	0%	\$0
Subtotal Tyrrell	3,313	0	0%	\$0	0	0%	\$0	0	0%	\$0	0	0%	\$0
Washington													
Unincorporated Washington County	5,482	0	0%	\$0	9	0%	\$46	0	0%	\$0	9	0%	\$46
Town of Creswell	366	0	0%	\$0	1	0%	\$1	0	0%	\$0	1	0%	\$1
Town of Plymouth	2,779	0	0%	\$0	10	0%	\$74	0	0%	\$0	10	0%	\$74
Town of Roper	611	0	0%	\$0	0	0%	\$0	0	0%	\$0	0	0%	\$0
Subtotal Washington	9,238	0	0%	\$0	20	0%	\$121	0	0%	\$0	20	0%	\$121
Region Total	52,767	23	0%	\$3	358	1%	\$6,675	8	0%	\$51	389	1%	\$6,727

Source: NCEM Risk Management Tool

SECTION 4: RISK ASSESSMENT

Table 4.27 – Estimated Buildings Impacted by 500-Year Earthquake Event

Jurisdiction	All Buildings	Residential Buildings at Risk			Commercial Buildings at Risk			Public Buildings at Risk			Total Buildings at Risk		
	Num	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages
Bertie													
Unincorporated Bertie County	11,175	8,732	78%	\$51,618	2,275	20%	\$57,672	158	1%	\$17,407	11,165	100%	\$126,698
Town of Askewville	502	383	76%	\$2,479	107	21%	\$2,272	12	2%	\$1,249	502	100%	\$6,000
Town of Aulander	744	640	86%	\$6,145	90	12%	\$9,019	14	2%	\$2,065	744	100%	\$17,230
Town of Colerain	428	340	79%	\$1,522	74	17%	\$2,963	14	3%	\$980	428	100%	\$5,465
Town of Kelford	173	155	90%	\$1,143	14	8%	\$369	4	2%	\$286	173	100%	\$1,799
Town of Lewiston-Woodville	719	597	83%	\$5,438	106	15%	\$9,156	16	2%	\$1,008	719	100%	\$15,601
Town of Powellsville	171	148	87%	\$1,103	16	9%	\$562	7	4%	\$344	171	100%	\$2,009
Town of Roxobel	205	153	75%	\$1,566	48	23%	\$2,817	4	2%	\$188	205	100%	\$4,570
Town of Windsor	1,815	1,442	79%	\$10,146	307	17%	\$23,190	64	4%	\$18,680	1,813	100%	\$52,016
Subtotal Bertie	15,932	12,590	79%	\$81,160	3,037	19%	\$108,020	293	2%	\$42,207	15,920	100%	\$231,388
Hyde													
Unincorporated Hyde County	5,596	985	18%	\$2,716	736	13%	\$8,862	70	1%	\$3,457	1,791	32%	\$15,034
Martin													
Unincorporated Martin County	12,188	8,559	70%	\$94,198	3,413	28%	\$169,676	208	2%	\$42,407	12,180	100%	\$306,281
Town of Bear Grass	81	55	68%	\$537	7	9%	\$858	19	23%	\$2,810	81	100%	\$4,205
Town of Everetts	159	151	95%	\$1,454	8	5%	\$992	0	0%	\$0	159	100%	\$2,446
Town of Hamilton	292	233	80%	\$2,334	26	9%	\$2,247	32	11%	\$3,393	291	100%	\$7,973
Town of Hassell	70	59	84%	\$601	11	16%	\$749	0	0%	\$0	70	100%	\$1,350
Town of Jamesville	297	228	77%	\$1,691	43	14%	\$6,676	22	7%	\$2,463	293	99%	\$10,830
Town of Oak City	313	302	96%	\$3,608	10	3%	\$777	1	0%	\$501	313	100%	\$4,887
Town of Parmele	149	132	89%	\$1,668	16	11%	\$1,731	1	1%	\$36	149	100%	\$3,435
Town of Robersonville	901	783	87%	\$13,526	107	12%	\$21,749	11	1%	\$2,031	901	100%	\$37,306
Town of Williamston	4,238	3,104	73%	\$32,246	879	21%	\$158,119	247	6%	\$55,758	4,230	100%	\$246,123
Subtotal Martin	18,688	13,606	73%	\$151,863	4,520	24%	\$363,574	541	3%	\$109,399	18,667	100%	\$624,836

SECTION 4: RISK ASSESSMENT

Jurisdiction	All Buildings	Residential Buildings at Risk			Commercial Buildings at Risk			Public Buildings at Risk			Total Buildings at Risk		
	Num	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages
Tyrrell													
Unincorporated Tyrrell County	2,794	899	32%	\$4,117	506	18%	\$4,746	33	1%	\$3,611	1,438	51%	\$12,474
Town of Columbia	519	151	29%	\$642	61	12%	\$2,108	26	5%	\$1,585	238	46%	\$4,336
Subtotal Tyrrell	3,313	1,050	32%	\$4,759	567	17%	\$6,854	59	2%	\$5,196	1,676	51%	\$16,810
Washington													
Unincorporated Washington County	5,482	2,310	42%	\$7,251	1,360	25%	\$11,028	76	1%	\$3,352	3,746	68%	\$21,631
Town of Creswell	366	102	28%	\$417	66	18%	\$1,057	19	5%	\$1,666	187	51%	\$3,141
Town of Plymouth	2,779	2,338	84%	\$5,886	330	12%	\$15,742	105	4%	\$5,854	2,773	100%	\$27,482
Town of Roper	611	119	19%	\$685	79	13%	\$1,544	17	3%	\$1,163	215	35%	\$3,392
Subtotal Washington	9,238	4,869	53%	\$14,239	1,835	20%	\$29,371	217	2%	\$12,035	6,921	75%	\$55,646
Region Total	52,767	33,100	63%	\$254,737	10,695	20%	\$516,681	1,180	2%	\$172,294	44,975	85%	\$943,714

Source: NCEM Risk Management Tool

ENVIRONMENT

An earthquake is unlikely to cause substantial impacts to the natural environment in the Northeastern NC Region. Impacts to the built environment (e.g. ruptured gas line) could damage the surrounding environment. However, this type of damage is unlikely based on historical occurrences.

CONSEQUENCE ANALYSIS

Table 4.28 summarizes the potential negative consequences of earthquake.

Table 4.28 – Consequence Analysis – Earthquake

Category	Consequences
Public	Impact expected to be severe for people who are unprotected or unable to take shelter; moderate to light impacts are expected for those who are protected.
Responders	Responders may be required to enter unstable structures or compromised infrastructure. Adverse impacts are expected to be severe for unprotected personnel and moderate to light for protected personnel.
Continuity of Operations (including Continued Delivery of Services)	Damage to facilities/personnel in the area of the incident may require relocation of operations and lines of succession execution. Disruption of lines of communication and destruction of facilities may extensively postpone delivery of services.
Property, Facilities and Infrastructure	Damage to facilities and infrastructure in the area of the incident may be extensive for facilities, people, infrastructure, and HazMat.
Environment	May cause extensive damage, creating denial or delays in the use of some areas. Remediation may be needed.
Economic Condition of the Jurisdiction	Local economy and finances expected to be adversely affected, possibly for an extended period of time.
Public Confidence in the Jurisdiction's Governance	Ability to respond and recover may be questioned and challenged if planning, response, and recovery are not timely and effective.

HAZARD SUMMARY BY JURISDICTION

The following table summarizes earthquake hazard risk by jurisdiction. Earthquake risk is uniform across the planning area.

Jurisdiction	Probability	Impact	Spatial Extent	Warning Time	Duration	Score	Priority
All Jurisdictions	1	1	4	4	1	1.9	L

4.5.4 EXCESSIVE HEAT

HAZARD BACKGROUND

Per information provided by Ready.gov, in most of the United States extreme heat is defined as a long period (2 to 3 days) of high heat and humidity with temperatures above 90 degrees. As temperatures rise, our bodies naturally cool down by sweating. In extreme heat, the body must work extra hard to maintain a normal temperature and sweating might not be enough to cool down. When this happens, a person's body temperature rises faster than it can cool itself. Additionally, when the humidity is high, as is common during extreme heat events in North Carolina, evaporative cooling through sweating becomes less effective. Heat-related illnesses occur when the body overheats from exposure to high temperatures and in severe cases can cause damage to the brain and other vital organs¹. Heat-related illnesses can also arise from moderate to vigorous physical activity in hot situations.

Extreme heat often results in the highest annual number of deaths among all weather-related disasters. On average, the number of extreme heat days has been increasing each year, putting residents at higher risk of heat-related illnesses. In 2023, more people in the United States died of heat-related illness than any year on record². Per Ready.gov, older adults, children, and people with certain illnesses and chronic conditions are at greater risk from extreme heat; and humidity increases the feeling of heat.

The National Weather Service (NWS) uses the heat index, also known as apparent temperature, to determine when to issue health alerts. The heat index is a measure of how hot it really feels when the relative humidity is considered along with the actual air temperature. In most areas of the country, the NWS generally issues alerts “when the heat index is expected to exceed 105°F -110°F for at least two consecutive days,” but they also work with local partners to determine the most appropriate conditions for a specific geography^{3,4}.

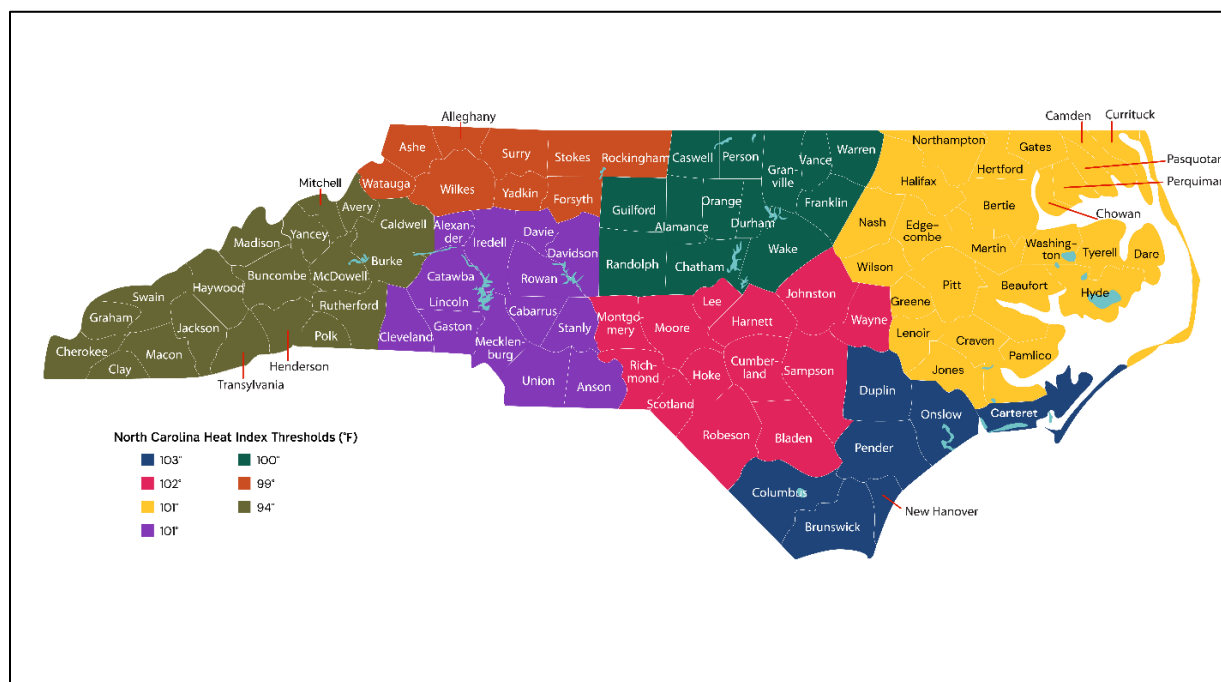
In North Carolina, the Department of Health and Human Services (DHHS) uses [regional temperature thresholds](#) to activate its [Heat Health Alert System](#). The regional thresholds recognize that an area’s typical climate conditions and relevant local factors, such as the proportion of the population engaged in outdoor work, can impact how heat affects the local population. DHHS sends heat alerts to county health departments and Heat Health Alert System subscribers when the daily maximum heat index is forecasted to meet or exceed the heat index threshold for their region. In the Northeastern NC Region, the heat index threshold is 101°F, as shown in Figure 4.24.

¹ www.cdc.gov/disasters/extremeheat/heat_guide.html.

² <https://apnews.com/article/record-heat-deadly-climate-change-humidity-south-11de21a526e1cbe7e306c47c2f12438d>

³ <https://www.weather.gov/safety/heat-index>

⁴ <https://www.weather.gov/safety/heat-wwv>

Figure 4.24 – North Carolina Heat Index Thresholds

Source: https://climate.ncsu.edu/heat_toolkit/thresholds/

The most dangerous place to be during an extreme heat incident is in a permanent home, with little or no air conditioning. Those at greatest risk for heat-related illness include people 65 years of age and older, young children, people with chronic health problems such as heart disease, people who are obese, people who are socially isolated, and people who are on certain medications, such as tranquilizers, antidepressants, sleeping pills, or drugs for Parkinson's disease. However, even young and healthy individuals are susceptible if they participate in strenuous physical activities during hot weather or are not acclimated to hot weather. Table 4.29 lists typical symptoms and health impacts of exposure to extreme heat.

Table 4.29 – Typical Health Impacts of Extreme Heat

Heat Index (HI)	Disorder
80-90° F (HI)	Fatigue possible with prolonged exposure and/or physical activity
90-105° F (HI)	Heatstroke, heat cramps, or heat exhaustion possible with prolonged exposure and/or physical activity
105-130° F (HI)	Heat cramps or heat exhaustion likely, and heat stroke possible with prolonged exposure and/or physical activity

Source: National Weather Service Heat Index Program, www.weather.gov/os/heat/index.shtml

The National Weather Service has a system in place to initiate alert procedures (advisories or warnings) when the Heat Index is expected to have a significant impact on public safety. The expected severity of the heat determines whether advisories or warnings are issued. A common guideline for issuing excessive heat alerts is when the maximum daytime Heat Index is expected to equal or exceed 105 degrees Fahrenheit (°F) and the nighttime minimum Heat Index is 80°F or above for two or more consecutive days. A heat advisory is issued when temperatures reach 105°F and a warning is issued at 115°F.

Impacts of extreme heat are not only focused on human health, as prolonged heat exposure can have devastating impacts on infrastructure as well. Prolonged high heat exposure increases the risk of

pavement deterioration, as well as railroad warping or buckling. High heat also puts a strain on energy systems and consumption, as air conditioners are run at a higher rate and for longer; extreme heat can also reduce transmission capacity over electric systems.

Warning Time: 1 – More than 24 hours

Duration: 3 – Less than one week

LOCATION

The entire planning area is susceptible to high temperatures and incidents of extreme heat.

Spatial Extent: 4 – Large

EXTENT

The extent of extreme heat can be defined by the maximum apparent temperature reached. Apparent temperature is a function of ambient air temperature and relative humidity and is reported as the heat index. The National Weather Service Forecast Office in Raleigh sets the following criteria for heat advisory and excessive heat warning:

- **Heat Advisory** – Heat Index of 105°F to 109°F for 3 hours or more. Can also be issued for lower values 100°F to 104°F for heat lasting several consecutive days
- **Excessive Heat Watch** – Potential for heat index values of 110°F or hotter within 24 to 48 hours. Also issued during prolonged heat waves when the heat index is near 110°F
- **Excessive Heat Warning** – Heat Index of 110°F or greater for any duration

The extent of extreme heat can be defined by the maximum temperature reached. The highest temperature recorded in the Northeastern NC Region is 107°F.

County	Temperature	Location	Date
Bertie	107°F	Lewiston	8/09/2007
Hyde	99°F	Ocracoke	8/18/1975
Martin	101°F	Williamston	6/09/2008
Tyrrell	No weather stations with data in this county		
Washington	103°F	Plymouth 5 E	08/22/1983

Source: North Carolina Climate Office

Impact: 3 – Critical

HISTORICAL OCCURRENCES

According to NOAA, 2019 was North Carolina’s hottest year on record; that record stretches back 123 years to 1895.

The following heat-related incidents were reported by NCEI in the Northeastern Region; these incidents caused no injuries, fatalities, property damage, or crop damage:

July 21, 2011 (Bertie County): An extended period of excessive heat and humidity occurred across most of northeast North Carolina from July 21st to July 23rd. High temperatures ranged from 96 to 103 degrees during the afternoons, with heat index values ranging from 110 to 119. Overnight lows only fell into the lower 70s to lower 80s.

July 5, 2012 (Bertie County): High Pressure centered just to the west of the Middle Atlantic Region produced hot and humid weather over northeast North Carolina from July 5th through July 8th. High temperatures ranged from the mid-90s to lower 100s, and low temperatures ranged from the mid-70s to lower 80s across the area.

July 21, 2019 (Hyde County): An extended heat wave came to an end when heat index values reached as high as 110 to 115 degrees on July 21.

September 3, 2020 (Hyde County): Intense heat and humidity combined to produce heat index values of 110 degrees or higher during the afternoon hours of September 2nd and 3rd.

August 15, 2023 (Hyde, Martin, Washington, and Tyrrell Counties): A three-day heatwave ended with excessive heat being observed across Eastern NC. The heatwave began on Sunday, August 13th, with heat indices of 105 to 100 degrees. This pattern continued on Monday, August 14th with similar values. The heat and humidity intensified on Tuesday, August 15th ahead of a cold front that would move into Eastern NC. Widespread heat indices of 110 to 115 degrees were recorded, with some places even higher than 115 for a short time. The heatwave broke with the cold front moving in and producing widespread showers and thunderstorms during the evening hours.

July 15-16, 2024 (Hyde, Martin, Washington, and Tyrrell Counties): A very hot airmass with temperatures well into the 90s combined with extremely high dewpoints in the upper 70s to low 80s to produce excessively high heat indices generally between 110 and 115 degrees during the daytime hours. The excessive heat affected all of Eastern NC except for the Outer Banks.

The extent of extreme heat can be defined by the maximum temperature reached. Heat index records maintained by the North Carolina Climate Office indicate that the Region regularly experiences heat index temperatures above 100°F. Table 4.30 provides counts of heat index values by threshold recorded from 1999-2024 at the Peanut Belt Research Station in Lewiston, North Carolina, used as an indicator for the Northeastern Region overall. Counts are provided as the number of hours in a given year where the heat index reached or exceeded 100°F. Based on this data, the Northeastern Region experiences an average of 35 hours per year with heat index values above 100°F.

Table 4.30 – Daily Max Temperature, Northeast NC Region, 1999-2024

Year	Heat Index Value				Total
	100-104°F	105-109°F	110-114°F	≥115°F	
1999	0	0	0	0	0
2000	0	0	0	0	0
2001	16	18	0	0	34
2002	38	4	0	0	42
2003	22	7	0	0	29
2004	43	4	0	0	47
2005	81	37	12	2	132
2006	78	31	22	9	140
2007	71	32	11	9	123
2008	85	27	1	0	113
2009	61	18	3	0	82
2010	108	28	15	1	152
2011	51	22	1	0	74
2012	62	38	7	0	107
2013	16	0	0	0	16
2014	16	0	0	0	16
2015	57	8	0	0	65
2016	87	22	1	0	110
2017	26	3	0	0	29
2018	54	3	0	0	57
2019	61	8	0	0	69
2020	61	2	0	0	63

Year	Heat Index Value				Total
	100-104°F	105-109°F	110-114°F	≥115°F	
2021	47	3	0	0	50
2022	68	21	1	0	90
2023	63	9	2	0	74
2024	87	38	11	0	136
Sum	1,376	401	94	23	1,894
Average	25	7	2	0	35

Source: North Carolina Climate Office, Heat Index Climatology Tool

PROBABILITY OF FUTURE OCCURRENCE

Data was gathered from the North Carolina State Climate Office's Climate Thresholds Tool using the Peanut Belt Research Station in Lewiston, North Carolina weather station as an approximation for the Northeastern Region. Between 1999 and 2024, the Northeastern NC Region averaged 17 days per year with heat index temperatures above 100°F.

Probability: 4 – Highly Likely

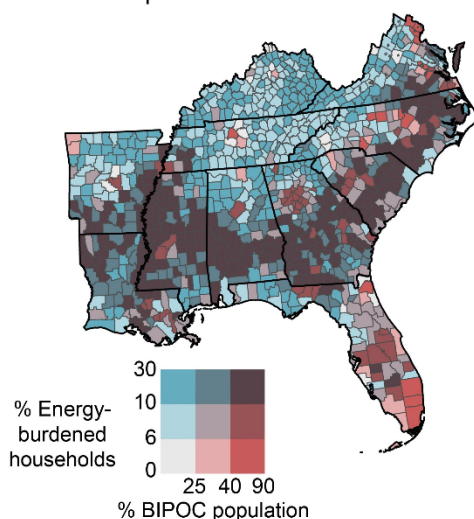
CLIMATE CHANGE

Research shows that average temperatures will continue to rise in the Southeast United States and globally, directly affecting the Northeastern Region in North Carolina. Per the Fifth National Climate Assessment, “The number of extreme warm days (above 95°F) is expected to continue increasing with every increment of global warming” and that “heatwaves in the Southeast are happening more frequently and are occurring during a longer heat season, with some cities also showing increasing trends in their duration and intensity.” Additional heat stresses can be attributed to the urban heat island effect which can increase the temperature of those living in urban environments compared to rural areas. Projected changes in extreme heat days are shown in Figure 4.25.

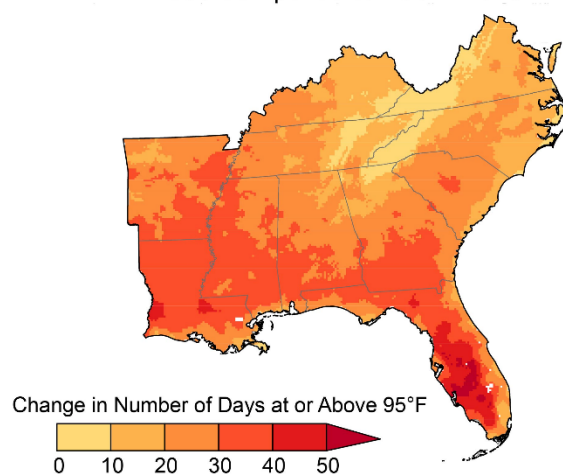
Figure 4.25 – Projected Change in Number of Days Over 95°F

Inequitable Heat Burden and Future Heat Exposure

- a) Energy-burdened households overlap with communities of color



- b) Projected change in extreme heat days, 2050 compared to 1991–2020



Source: USGCRP, 2023: Fifth National Climate Assessment

The State Climate Office of North Carolina’s County-specific climate projections, which are based on the Fifth National Climate Assessment. The Fifth National Climate Assessment also notes that warm nights (minimum temperatures at or above 70°F) in the southeast have increased the most compared to all other continental U.S. regions.

The State Climate Office of North Carolina’s County-specific climate projections, which are based on the Fifth National Climate Assessment, are summarized in Table 4.31 and Table 4.32.

Table 4.31 – Extreme Heat Projections, Days per Year with Maximum Temperatures over 95°F

County	Historical	Best Case Scenario	Worst Case Scenario
Bertie	8	28	39
Hyde	2	9	14
Martin	9	29	40
Tyrrell	4	17	26
Washington	6	24	34

Source: North Carolina Resilience Exchange Climate Projections and Observations

Table 4.32 – Extreme Heat Projections, Nights per Year with Minimum Temperature over 70°F

County	Historical	Best Case Scenario	Worst Case Scenario
Bertie	8	28	39
Hyde	67	96	108
Martin	34	69	83
Tyrrell	50	82	95
Washington	44	77	90

Source: North Carolina Resilience Exchange Climate Projections and Observations

VULNERABILITY ASSESSMENT

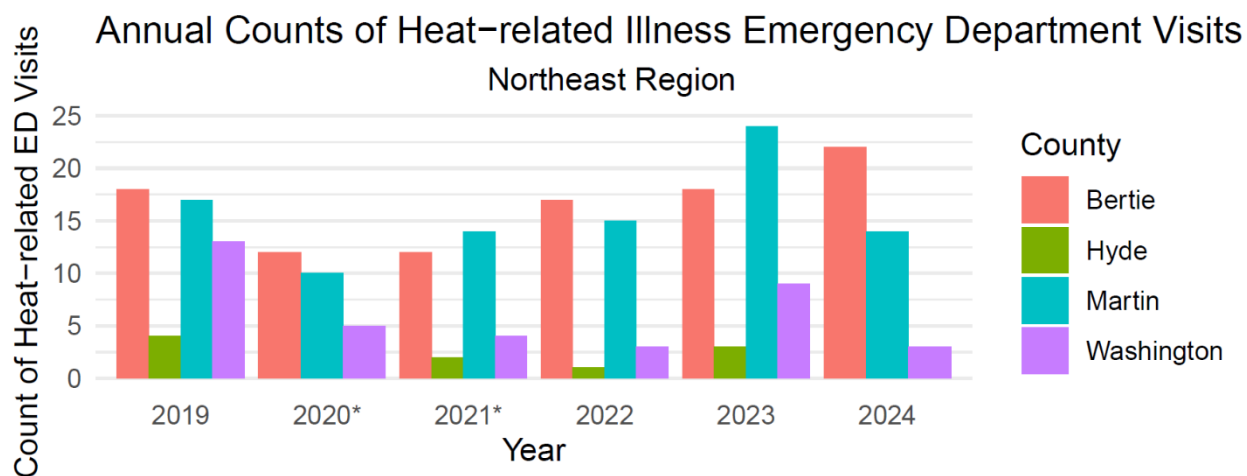
METHODOLOGIES AND ASSUMPTIONS

No data is available to assess the vulnerability of people or property in the planning area to extreme heat.

PEOPLE

Extreme heat can cause heat stroke and even loss of human life. The elderly and the very young are most at risk to the effects of heat. People who are isolated, people who work outdoors and/or do strenuous labor, people with chronic health problems such as heart disease or asthma, people who are obese, and people who are on certain medications, such as tranquilizers, antidepressants, sleeping pills, or drugs for Parkinson’s disease are also more vulnerable to extreme heat.

Using public health syndromic surveillance system data from NC DETECT, Figure 4.26 shows the annual count of emergency department visits for heat-related illness in the Northeastern Region, using public health syndromic surveillance system data from NC DETECT. The annual count of emergency department visits for heat-related illness in Bertie County ranged from 12 visits in 2020 and 2021 to 22 visits in 2024. The annual count of emergency department visits for heat-related illness in Hyde County ranged from 0 visits in 2020 and 2024 to 4 in 2019. The annual count of emergency department visits for heat related illness in Martin County ranged from 10 in 2020, to 24 in 2023. The annual count of emergency department visits for heat related illness in Washington County ranged from 3 in 2024 to 9 in 2023.

Figure 4.26 – Annual Heat-Related Illness Emergency Department Visits, Northeastern Region

*ED visits may be lower in 2020 and 2021 due to the COVID-19 pandemic

Source: North Carolina Disease Event Tracking and Epidemiologic Collection Tool (NC Detect)

PROPERTY

Extreme heat is unlikely to cause significant damages to the built environment. However, road surfaces can be damaged as asphalt softens, and concrete sections may buckle under expansion caused by heat. Train rails may also distort or buckle under the stress of head induced expansion. Power transmission lines may sag from expansion and if contact is made with vegetation the line may short out causing power outages. Additional power demand for cooling also increases power line temperature adding to heat impacts.

Extreme heat can also cause significant agricultural losses. Between 2014-2024, the sum of claims paid for crop damage due to heat in the Northeastern NC Region was \$2,681,485, or an average of \$243,771 in losses every year. Table 4.33 summarizes the crop losses due to drought in reported in the RMA system.

Table 4.33 – Crop Losses Resulting from Heat, 2014-2024

Year	Bertie	Hyde	Martin	Tyrrell	Washington
2014	-	-	-	\$45,336	\$137,505
2015	\$110,972	\$54,862	\$12,445	\$80,127	\$1,290
2016	\$243,805	-	\$15,460	-	\$10,324
2017	\$37,449	-	\$13,475	-	\$35,749
2018	\$18,425	-	\$90,109	-	\$31,779
2019	\$48,037	\$118,509	\$192,198	\$29,921	\$72,403
2020	\$120,393	-	\$26,235	\$24,385	\$31,919
2021	\$18,357	-	\$31,667	-	\$1,248
2022	\$84,521	\$151,574	\$351,959	-	\$13,840
2023	\$147,570	-	\$153,458	\$6,011	-
2024	\$42,001	-	\$74,343	-	\$1,824
Total	\$871,530	\$324,945	\$961,349	\$185,780	\$337,881

Source: USDA Risk Management Agency

ENVIRONMENT

Wild animals are vulnerable to heat disorders similar to humans, including mortality. Vegetation growth will be stunted or plants may be killed if temperatures rise above their tolerance extremes.

CONSEQUENCE ANALYSIS

Table 4.34 summarizes the potential negative consequences of extreme heat.

Table 4.34 – Consequence Analysis – Extreme Heat

Category	Consequences
Public	Extreme heat may cause illness and/or death.
Responders	Consequences may be greater for responders if their work requires exertion and/or wearing heavy protective gear.
Continuity of Operations (including Continued Delivery of Services)	Continuity of operations is not expected to be impacted by extreme heat because warning time for these events is long.
Property, Facilities and Infrastructure	Minor impacts may occur, including possible damages to road surfaces and power lines.
Environment	Environmental impacts include strain on local plant and wildlife, including potential for illness or death.
Economic Condition of the Jurisdiction	Farmers may face crop losses or increased livestock costs.
Public Confidence in the Jurisdiction's Governance	Extreme heat is unlikely to impact public confidence.

HAZARD SUMMARY BY JURISDICTION

The following table summarizes extreme heat hazard risk by jurisdiction. Extreme heat risk does not vary significantly by jurisdiction.

Jurisdiction	Probability	Impact	Spatial Extent	Warning Time	Duration	Score	Priority
<i>All jurisdictions</i>	4	3	4	1	3	3.3	H

4.5.5 FLOODING

HAZARD BACKGROUND

Flooding is defined by the rising and overflowing of water onto normally dry land. As defined by FEMA, a flood is a general and temporary condition of partial or complete inundation of two or more acres of normally dry land area or of two or more properties. Flooding can result from an overflow of inland waters or an unusual accumulation or runoff of surface waters from any source.

Flooding is the most frequent and costly of all natural hazards in the United States and has caused more than 10,000 death(s) since 1900. Approximately 90 percent of presidentially declared disasters result from flood-related natural hazard events. Taken as a whole, more frequent, localized flooding problems that do not meet federal disaster declaration thresholds ultimately cause the majority of damages across the United States.

SOURCES AND TYPES OF FLOODING

Flooding within the Northeastern NC Region can be attributed to three main sources as noted below.

Riverine Flooding: During heavy rainfall events, the primary riverine flooding sources in the Northeastern NC Region are as follows, per each county's effective Flood Insurance Study (FIS):

- **Bertie County:** Cashie River and its tributaries, Cashie Swamp, Chiska Creek, Cricket Swamp, Eastmost Swamp and its tributaries, Jacks Branch, and Salmon Creek and its tributaries.
- **Hyde County:** Pungo River Canal
- **Martin County:** Roanoke River and tributaries, Conoho Creek and tributaries, Ross Swamp, Huskanaw Swamp, Hardison Mill Creek and tributaries, Smithwick Creek, Sweetwater Creek, and other small streams
- **Tyrrell County:** coastal flood sources only
- **Washington County:** Welch Creek, Conaby Creek and its tributary, Kendrick Creek, Beaver Dam Branch and its tributary, and Welch Creek Tributary.

The above-listed rivers and their tributaries are susceptible to overflowing their banks during and following excessive precipitation events. Though less common, riverine flood events (such as the "1%-annual-chance flood") will cause significantly more damage and economic disruption for the area than incidences of localized stormwater flooding.

Although only coastal flood sources are evaluated for Tyrrell County's Flood Insurance Study, the county is also vulnerable to flooding as a result of heavy rainfall over land. Riverine flooding can affect all of the Northeastern NC Region. For example, riverine flooding was present in all counties in the Region, except Tyrrell County, following Hurricane Matthew, per each county's unique Resilient Redevelopment Plan. In Martin County, for example, the Roanoke River reached an elevation of 11.61 feet at Williamston. Hurricane Matthew brought with it a significant amount of rainfall, which caused or contributed to flood levels in the Region.

Coastal Flooding: All lands bordering the coast along the Atlantic Ocean and in low-lying coastal plains are susceptible to tidal effects and flooding. Coastal lands such as sand bars, barrier islands, and deltas provide a buffer zone to help protect human life and real property relative to the sea much as flood plains provide a buffer zone along rivers and other bodies of water. Coastal floods usually occur because of abnormally high tides or tidal waves, storm surge and heavy rains in combination with high tides, and tropical storms and hurricanes.

Wind-driven surge generated in the Atlantic Ocean and pushed into the Pamlico Sound, Albemarle Sound, and other waters is the primary source of flooding in the Region. The areas susceptible to surge flooding are summarized from each county's FIS as follows:

- **Bertie County:** Surge propagates into the Albemarle Sound, which further propagates into the Batchelor Bay, Black Walnut Swamp, the Chowan River, Salmon Creek, and the Roanoke River.
- **Hyde County:** Surge propagates into the Pamlico Sound and further propagates into the Pamlico River, Lake Mattamuskeet, and a multitude of small watercourses where high winds associated with tropical storms can produce high waves.
- **Tyrrell County:** Surge propagates into the Albemarle Sound and propagates further into the coastal waterways.
- **Washington County:** Surge propagates into Pamlico Sound and Albemarle Sound, which further propagates into Maw Creek, Roanoke River, Scuppernong River, and Welch Creek.

Flash Flooding: A flash flood occurs when water levels rise at an extremely fast rate as a result of intense rainfall over a brief period, possibly from slow-moving intense thunderstorms and sometimes combined with rapid snowmelt, ice jam release, frozen ground, saturated soil, or impermeable surfaces. Ice jam flooding is a form of flash flooding that occurs when ice breaks up in moving waterways and then stacks on itself where channels narrow. This creates a natural dam, often causing flooding within minutes of the dam formation. Flash flooding can happen in Special Flood Hazard Areas (SFHAs) as delineated by the National Flood Insurance Program (NFIP) and can also happen in areas not associated with floodplains. Flash flood hazards caused by surface water runoff are most common in urbanized areas, where greater population density generally equates to more impervious surface (e.g., pavement and buildings) which increases the amount of surface water generated.

Flash flooding is a dangerous form of flooding which can reach full peak in only a few minutes. Rapid onset allows little or no time for protective measures. Flash flood waters move at very fast speeds and can move boulders, tear out trees, scour channels, destroy buildings, and obliterate bridges. Flash flooding can result in higher loss of life, both human and animal, than slower developing river and stream flooding.

In certain areas, aging storm sewer systems are not designed to carry the capacity currently needed to handle the increased storm runoff. Typically, the result is water backing into basements, which damages mechanical systems and can create serious public health and safety concerns.

Localized flooding may be caused by the following issues:

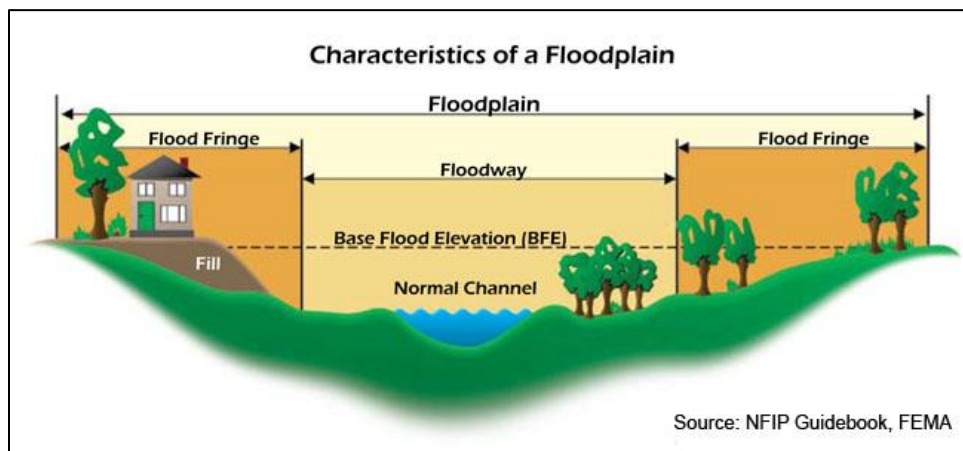
- **Inadequate Capacity** – An undersized/under capacity pipe system can cause water to back-up behind a structure which can lead to areas of ponded water and/or overtopping of banks.
- **Clogged Inlets** – Debris covering the asphalt apron and the top of grate at catch basin inlets may contribute to an inadequate flow of stormwater into the system. Debris within the basin itself may also reduce the efficiency of the system by reducing the carrying capacity.
- **Blocked Drainage Outfalls** – Debris blockage or structural damage at drainage outfalls may prevent the system from discharging runoff, which may lead to a back-up of stormwater within the system.
- **Improper Grade** – Poorly graded asphalt around catch basin inlets may prevent stormwater from entering the catch basin as designed. Areas of settled asphalt may create low spots within the roadway that allow for areas of ponded water.

FLOODING AND FLOODPLAINS

In the case of riverine flooding, the area adjacent to a channel is the floodplain, as shown in Figure 4.27. A floodplain is flat or nearly flat land adjacent to a stream or river that experiences occasional or periodic

flooding. It includes the floodway, which consists of the stream channel and adjacent areas that carry flood flows, and the flood fringe, which are areas covered by the flood, but which do not experience a strong current. Floodplains are made when floodwaters exceed the capacity of the main channel or escape the channel by eroding its banks. When this occurs, sediments (including rocks and debris) are deposited that gradually build up over time to create the floor of the floodplain. Floodplains generally contain unconsolidated sediments, often extending below the bed of the stream.

Figure 4.27 – Characteristics of a Floodplain



In its common usage, the floodplain most often refers to that area that is inundated by the “100-year flood,” which is the flood that has a 1% chance in any given year of being equaled or exceeded. The 500-year flood is the flood that has a 0.2 percent chance of being equaled or exceeded in any given year. The potential for flooding can change and increase through various land use changes and changes to land surface, which result in a change to the floodplain. A change in environment can create localized flooding problems inside and outside of natural floodplains by altering or confining natural drainage channels. These changes are most often created by human activity.

The 1%-annual-chance flood, which is the minimum standard used by most federal and state agencies, is used by the National Flood Insurance Program (NFIP) as the standard for floodplain management and to determine the need for flood insurance. Participation in the NFIP requires adoption and enforcement of a local floodplain management ordinance which is intended to prevent unsafe development in the floodplain, thereby reducing future flood damages. Participation in the NFIP allows for the federal government to make flood insurance available within the community as a financial protection against flood losses. Since floods have an annual probability of occurrence, have a known magnitude, depth and velocity for each event, and in most cases, have a map indicating where they will likely occur, they are in many ways often the most predictable and manageable hazard.

Warning Time: 3 – 6 to 12 hours

Duration: 3 – Less than one week

LOCATION

Regulated floodplains are illustrated on inundation maps called Flood Insurance Rate Maps (FIRMs). It is the official map for a community on which FEMA has delineated both the Special Flood Hazard Areas (SFHAs) and the risk premium zones applicable to the community. SFHAs represent the areas subject to inundation by the 100-year flood event. Structures located within the SFHA have a 26-percent chance of flooding during the life of a standard 30-year mortgage. Flood prone areas were identified within the Northeastern Region using the Effective FIRMs retrieved from NC Flood Risk Information System (FRIS). The current effective FIS reports for Bertie, Martin, Tyrrell, and Washington counties were

revised in 2025. Hyde County's FIS was revised in 2022. Figure 4.28 to Figure 4.32 reflect the effective mapped flood insurance zones by county for the Northeastern NC Region.

Flooding can also occur outside the defined SFHA on smaller tributaries that were not studied by FEMA but that nonetheless may be vulnerable to the 1-percent-annual-chance flood. Additionally, localized stormwater flooding can occur anywhere along stormwater system pipes, channels, culverts, and other infrastructure where inadequate capacity, blocked inlets or outfalls, or improper grade prevent sufficient drainage. This type of flooding is more common in the urbanized areas of the county and extends well beyond the limits of the SFHA.

Spatial Extent: 3 – Moderate

Figure 4.28 – FEMA Flood Hazard Areas in Bertie County

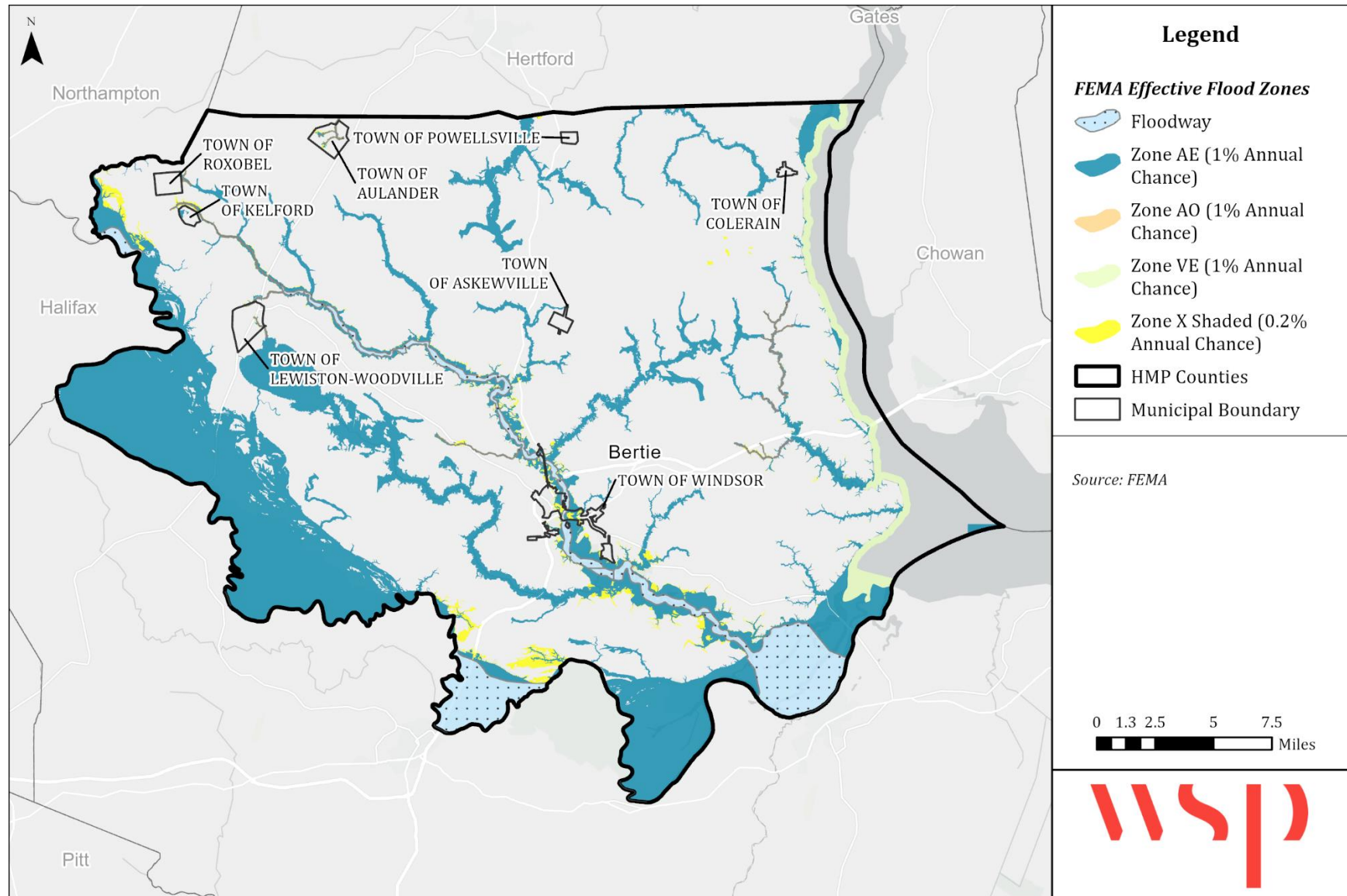


Figure 4.29 – FEMA Flood Hazard Areas in Hyde County

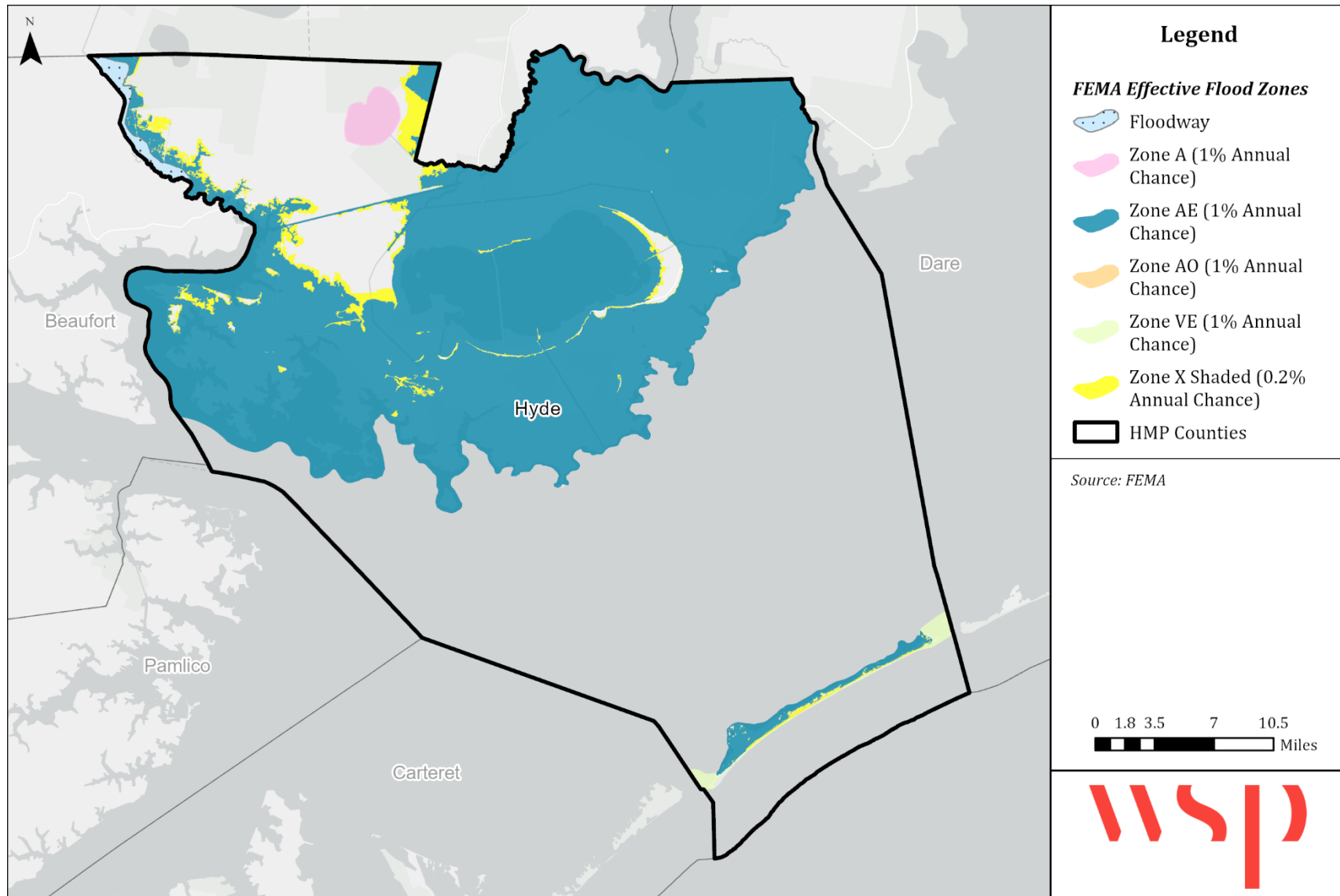


Figure 4.30 - FEMA Flood Hazard Areas in Martin County

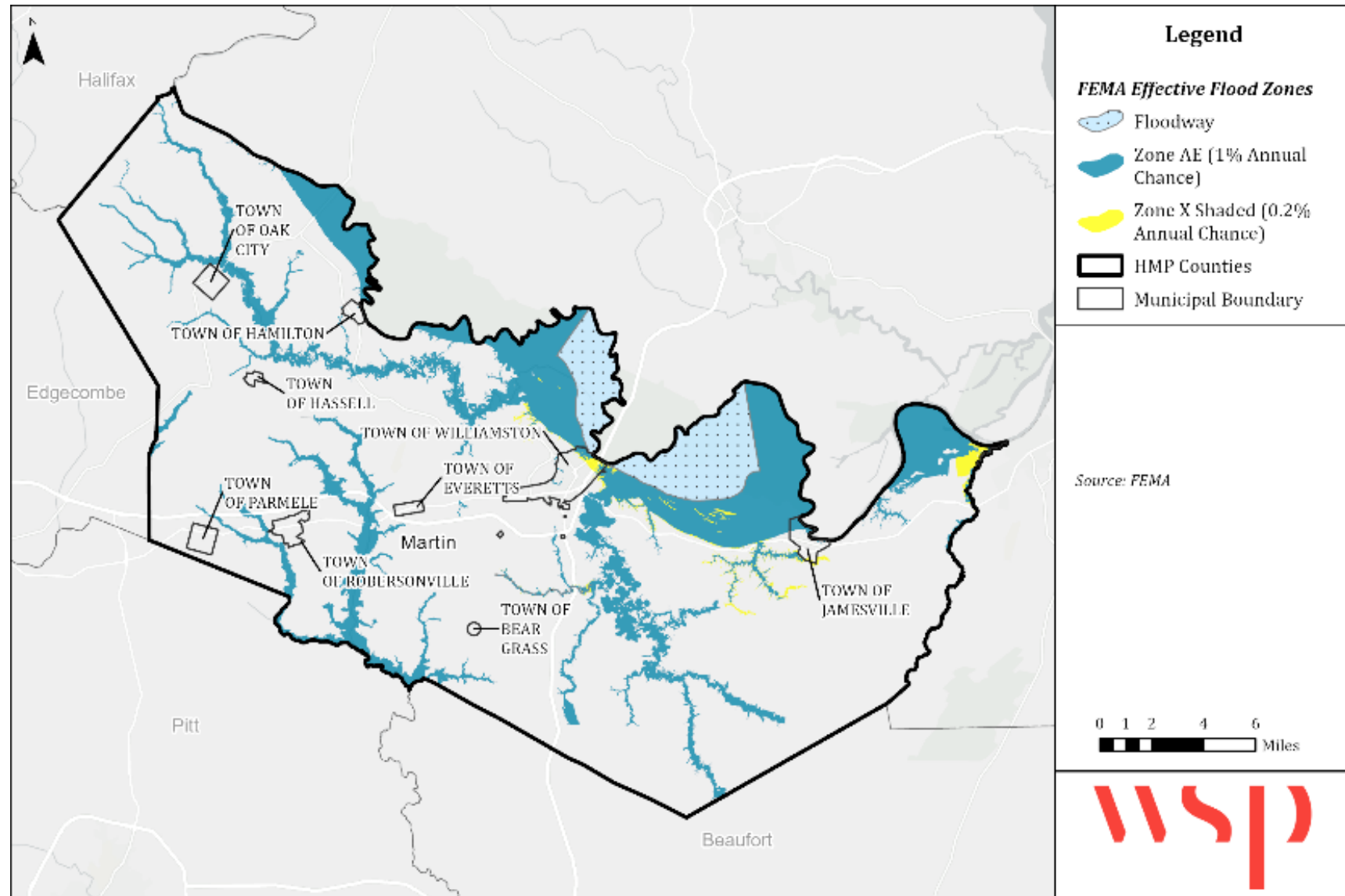


Figure 4.31 - FEMA Flood Hazard Areas in Tyrrell County

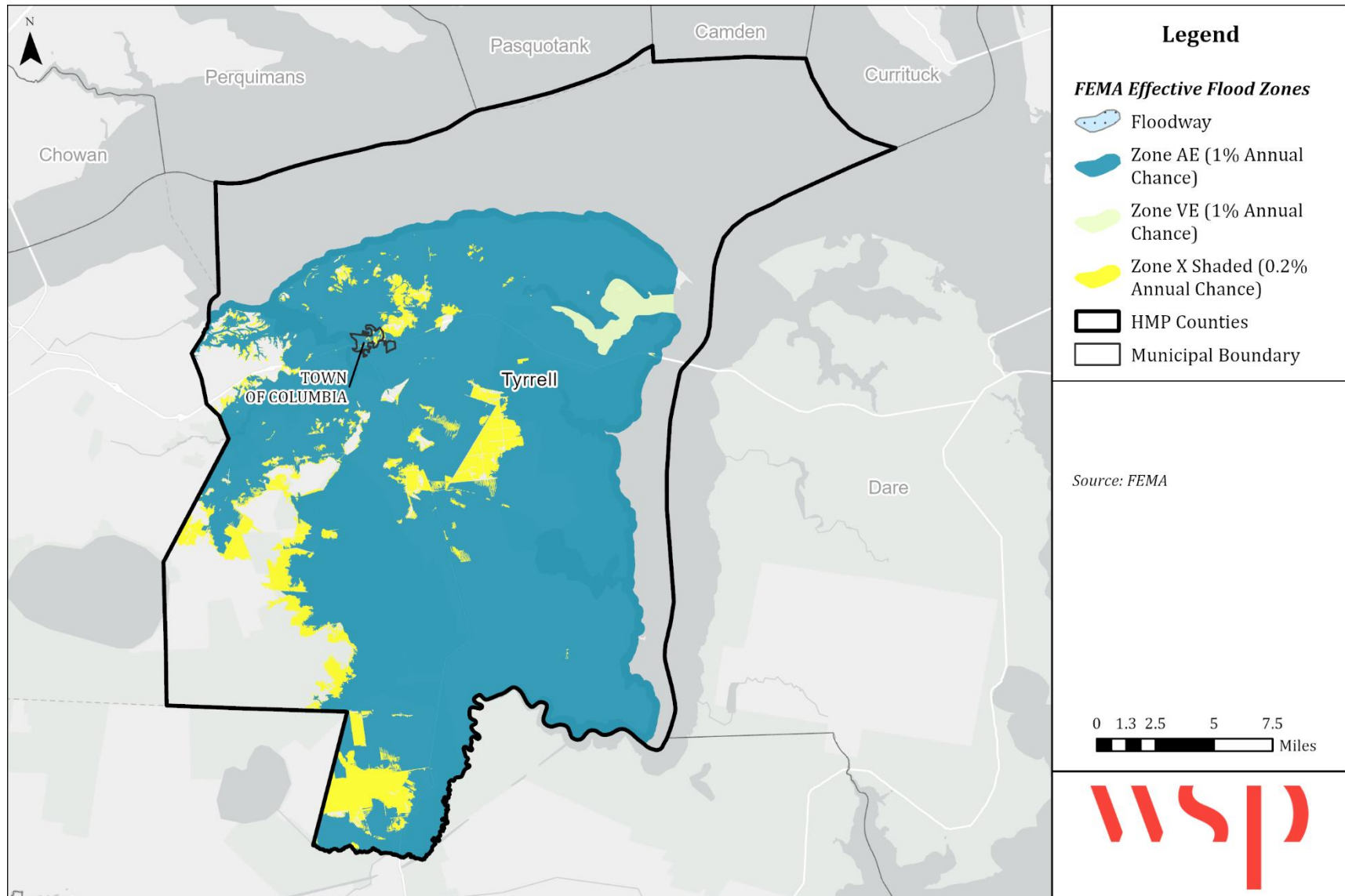
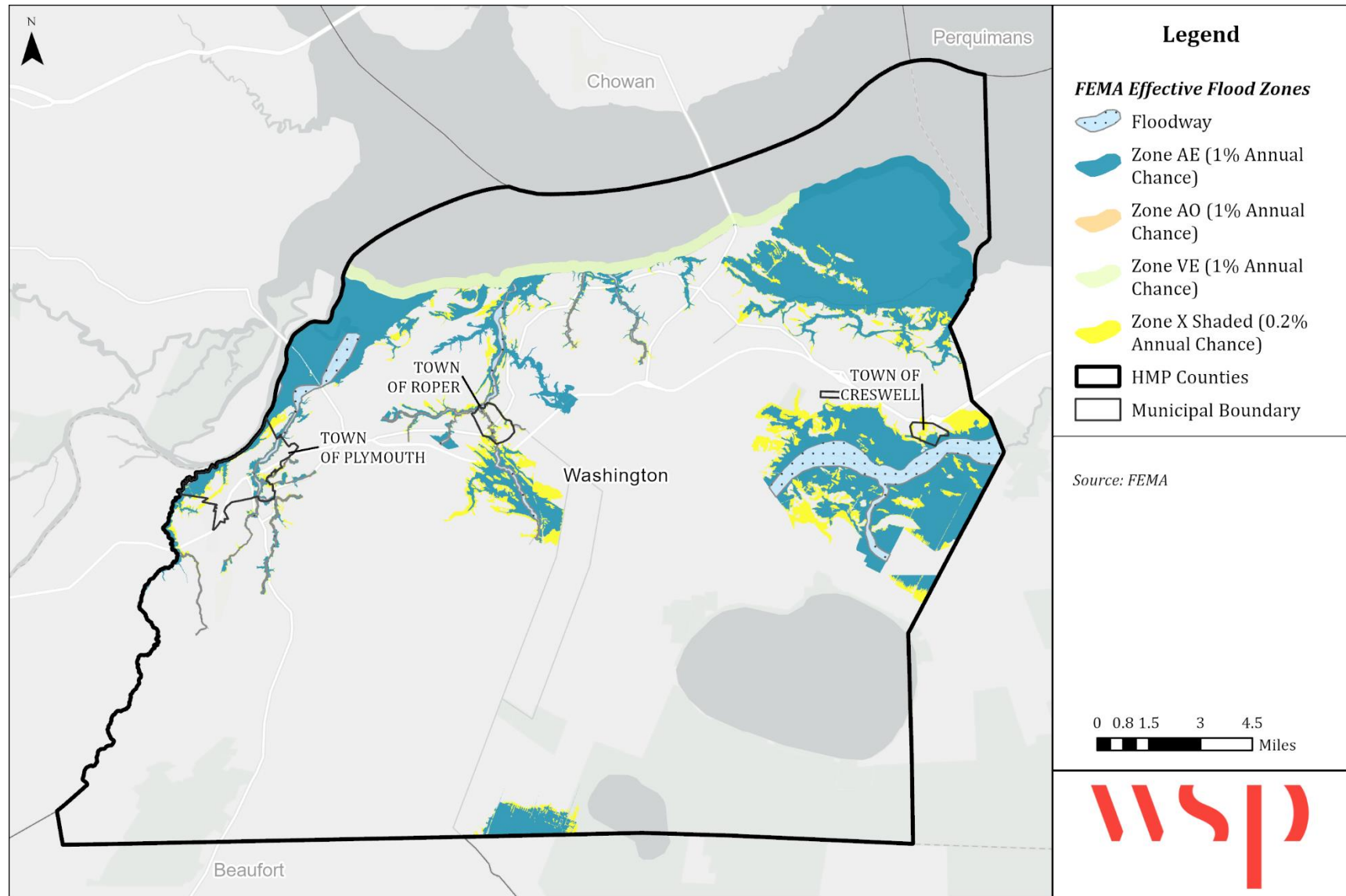


Figure 4.32 – FEMA Flood Hazard Areas in Washington County



EXTENT

Flood extent can be defined by the amount of land in the floodplain and the potential magnitude of flooding as measured by flood height and velocity.

Flood extent for riverine flooding can be defined by the amount of land in the floodplain and the potential magnitude of flooding as measured by flood depth and velocity.

The FIS defines the probability of flooding as flood events of a magnitude which are expected to be equaled or exceeded once on the average during any 100-year period (recurrence intervals). Or considered another way, properties within a 100-year flood zone have a one percent probability of being equaled or exceeded during any given year. Mortgage lenders require that owners of properties with federally backed mortgages located within SFHAs purchase and maintain flood insurance policies on their properties. Consequently, newer and recently purchased properties in the community are typically insured against flooding.

Table 4.35 summarizes the flood insurance zones identified by the Digital FIRM (DFIRM).

Table 4.35 – Mapped Flood Insurance Zones within Northeastern NC Region

Zone	Description
A	Areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. Because detailed analyses are not performed for such areas, no depths or base flood elevations are shown within these zones.
AE	AE Zones, also within the 100-year flood limits, are defined with BFEs that reflect the combined influence of stillwater flood elevations and wave effects less than 3 feet. The AE Zone generally extends from the landward VE zone limit to the limits of the 100-year flood from coastal sources, or until it reaches the confluence with riverine flood sources. The AE Zones also depict the SFHA due to riverine flood sources, but instead of being subdivided into separate zones of differing BFEs with possible wave effects added, they represent the flood profile determined by hydrologic and hydraulic investigations and have no wave effects. The Coastal AE Zone is differentiated from the AE Zone by the Limit of Moderate Wave Action (LiMWA) and includes areas susceptible to wave action between 1.5 to 3 feet.
VE	Zone VE is the flood insurance rate zone that corresponds to the 1% annual chance coastal floodplains that have additional hazards associated with storm waves. Whole-foot Base Flood Elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.
0.2% Annual Chance (Shaded Zone X)	Moderate risk areas within the 0.2-percent-annual-chance floodplain, areas of 1-percent-annual-chance flooding where average depths are less than 1 foot, areas of 1-percent-annual-chance flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 1-percent-annual-chance flood by a levee. No BFEs or base flood depths are shown within these zones. (Zone X (shaded) is used on new and revised maps in place of Zone B.)
Zone X (Unshaded)	Minimal risk areas outside the 1-percent and 0.2-percent-annual-chance floodplains. No BFEs or base flood depths are shown within these zones. Zone X (unshaded) is used on new and revised maps in place of Zone C.

Approximately 35.9% of the Northeastern NC Region within the SFHA. Table 4.36 below summarizes acreage of each county's total area by flood zone on the effective DFIRM.

Table 4.36 – Flood Zone Acreage in Northeastern NC Region County

Flood Zone	Acreage	Percent of Total (%)
Bertie County		
Zone AE	102,537.7	21.6
Zone AE (Floodway)	18,432.1	3.9
Zone AO	0.3	0.0
Zone VE	6,031.3	1.3
Zone X (500-year)	4,749.2	1.0
Zone X Unshaded	327,537.0	69.0
Open Water	15,129.2	3.1
Subtotal	474,416.8	--
Hyde County		
Zone A	5,362.0	0.6
Zone AO	73.5	0.0
Zone AE	368,300.0	41.7
Zone AE (Floodway)	3,995.2	0.5
Zone VE	2,837.5	0.3
Zone X (500-year)	15,848.5	1.8
Zone X Unshaded	90,762.2	10.3
Open Water	396,083.0	44.8
Subtotal	883,262.0	--
Martin County		
Zone AE	50,848.9	17.4
Zone AE (Floodway)	12,575.7	4.3
Zone X (500-year)	1,901.8	0.7
Zone X Unshaded	226,968.4	77.7
Subtotal	292,294.8	--
Tyrrell County		
Zone AE	209,301.6	54.8
Zone VE	3,517.3	0.9
Zone X (500-year)	20,836.0	5.5
Zone X Unshaded	37,299.9	9.7
Open Water	110,827.1	29.0
Subtotal	381,781.8	--
Washington County		
Zone AE	34,336.8	12.7
Zone AE (Floodway)	4,600.9	1.7
Zone AO	13.4	0.0
Zone VE	2,917.1	1.1
Zone X (500-year)	7,005.2	2.6
Zone X Unshaded	195,401.7	72.4
Open Water	25,745.3	9.5
Subtotal	270,020.3	--

SECTION 4: RISK ASSESSMENT

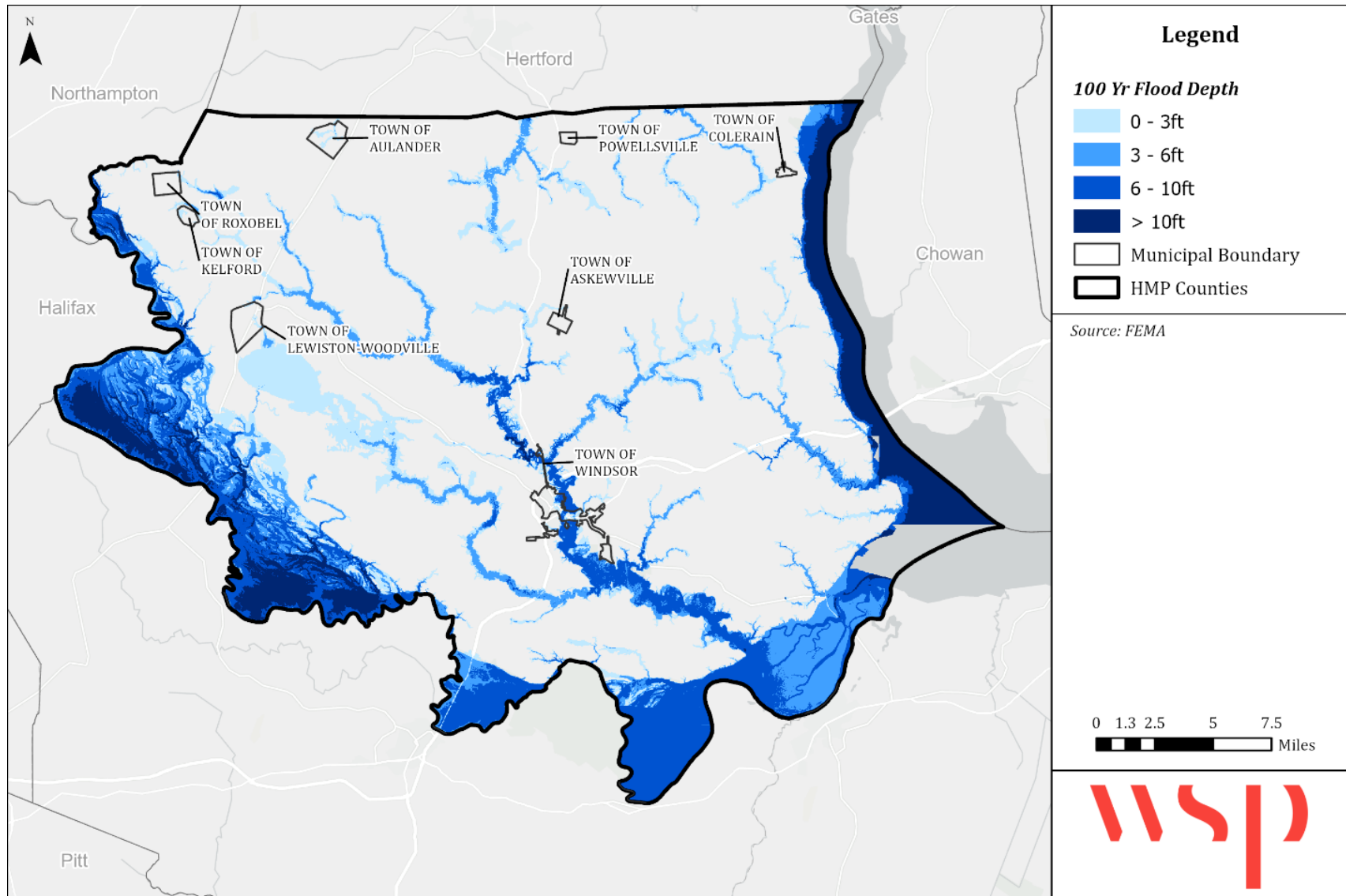
Flood Zone	Acreage	Percent of Total (%)
Northeastern NC Region		
Zone A	5,362.0	0.2
Zone AE	765,325.0	33.2
Zone AE (Floodway)	39,603.9	1.7
Zone VE	15,303.20	0.7
Zone AO	87.2	0.0
Zone X (500-year)	50,340.70	2.2
Zone X Unshaded	877,969.20	38.1
Open Water	547,784.60	23.8
Total	2,301,775.6	--

Source: FEMA Effective DFIRM

Property damages correlate to the depth of flooding that impacts a property. Data is not available to measure flood depth beyond the SFHA, but it is important to note that damaging floods can and do occur outside the SFHA. Figure 4.33 through Figure 4.37 show the depth of flooding predicted to result from a 1% annual chance flood within the Northeastern Region.

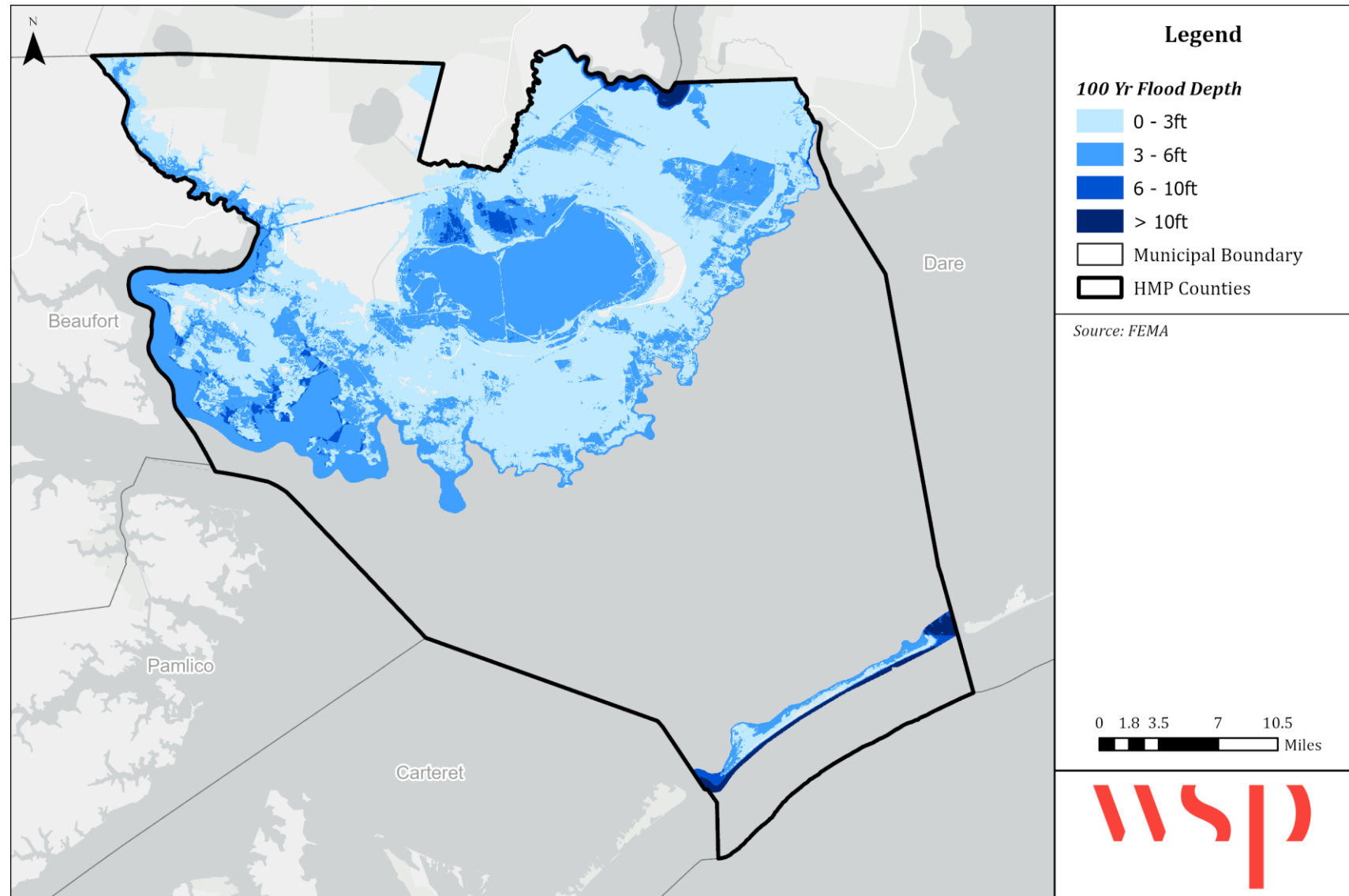
Impact: 3 – Critical

Figure 4.33 – Flood Depth, 100-Year Floodplain, Bertie County



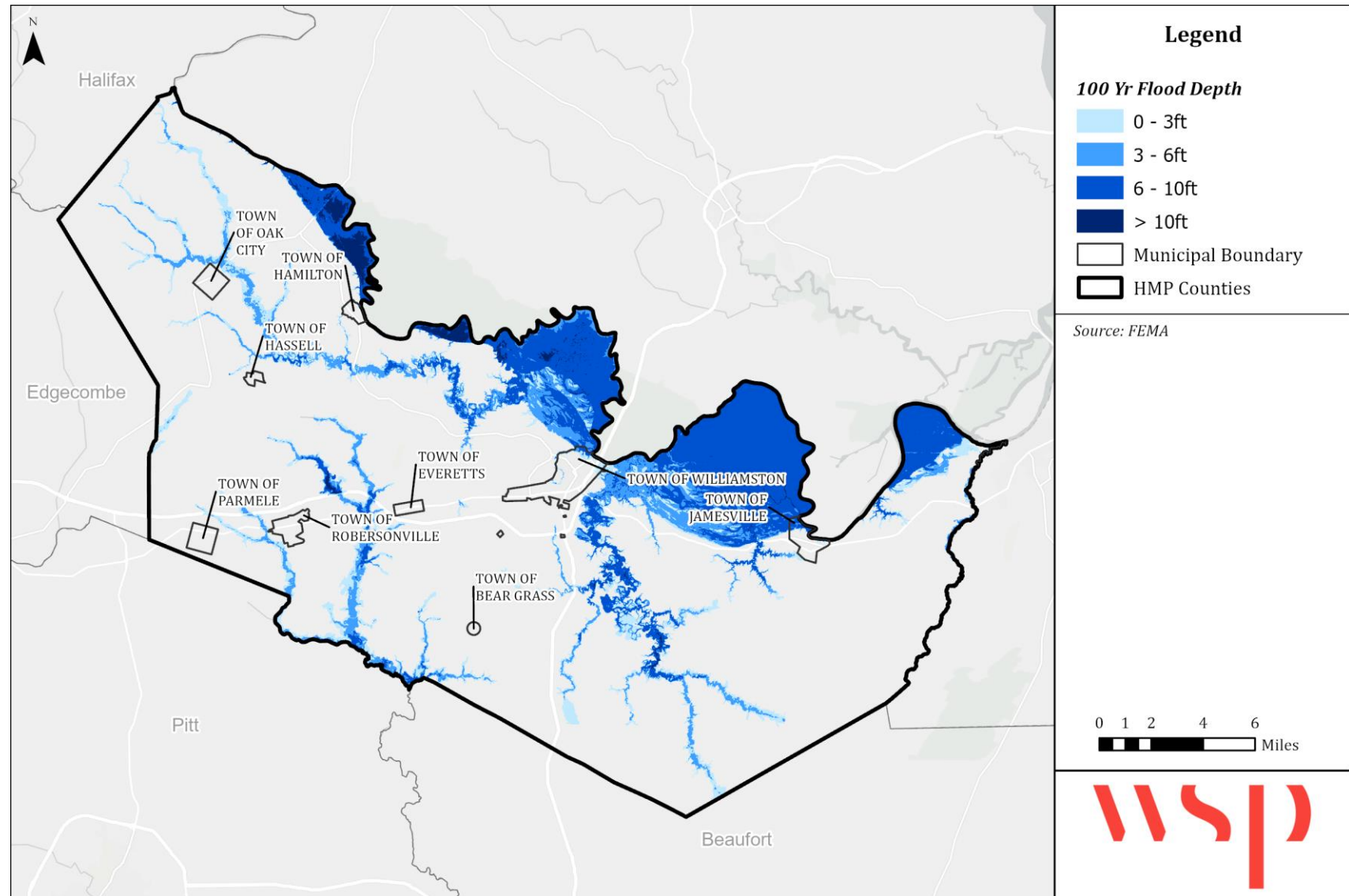
Source: FEMA Effective DFIRM

Figure 4.34 – Flood Depth, 100-Year Floodplain, Hyde County



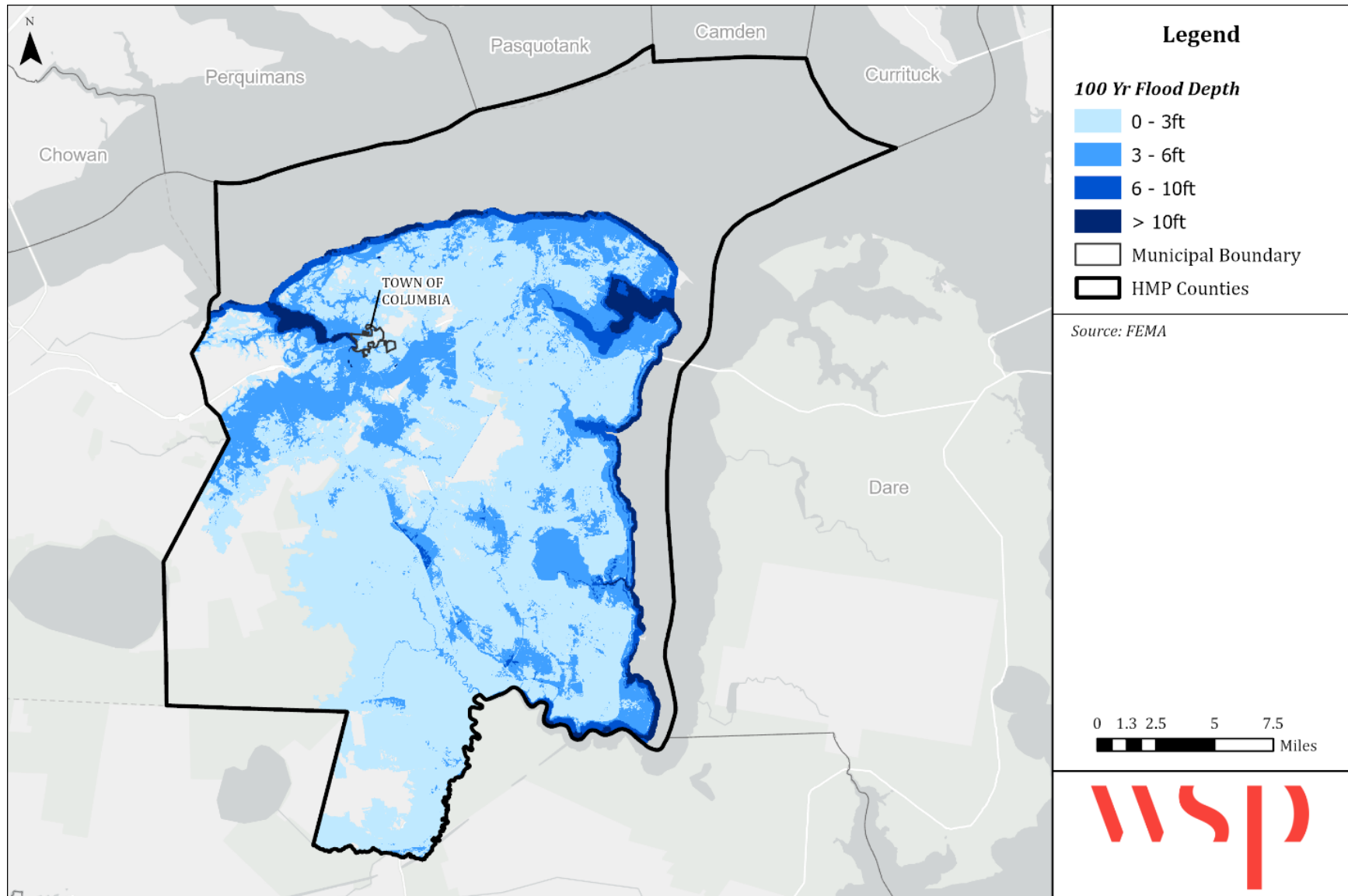
Source: FEMA Effective DFIRM

Figure 4.35 – Flood Depth, 100-Year Floodplain, Martin County



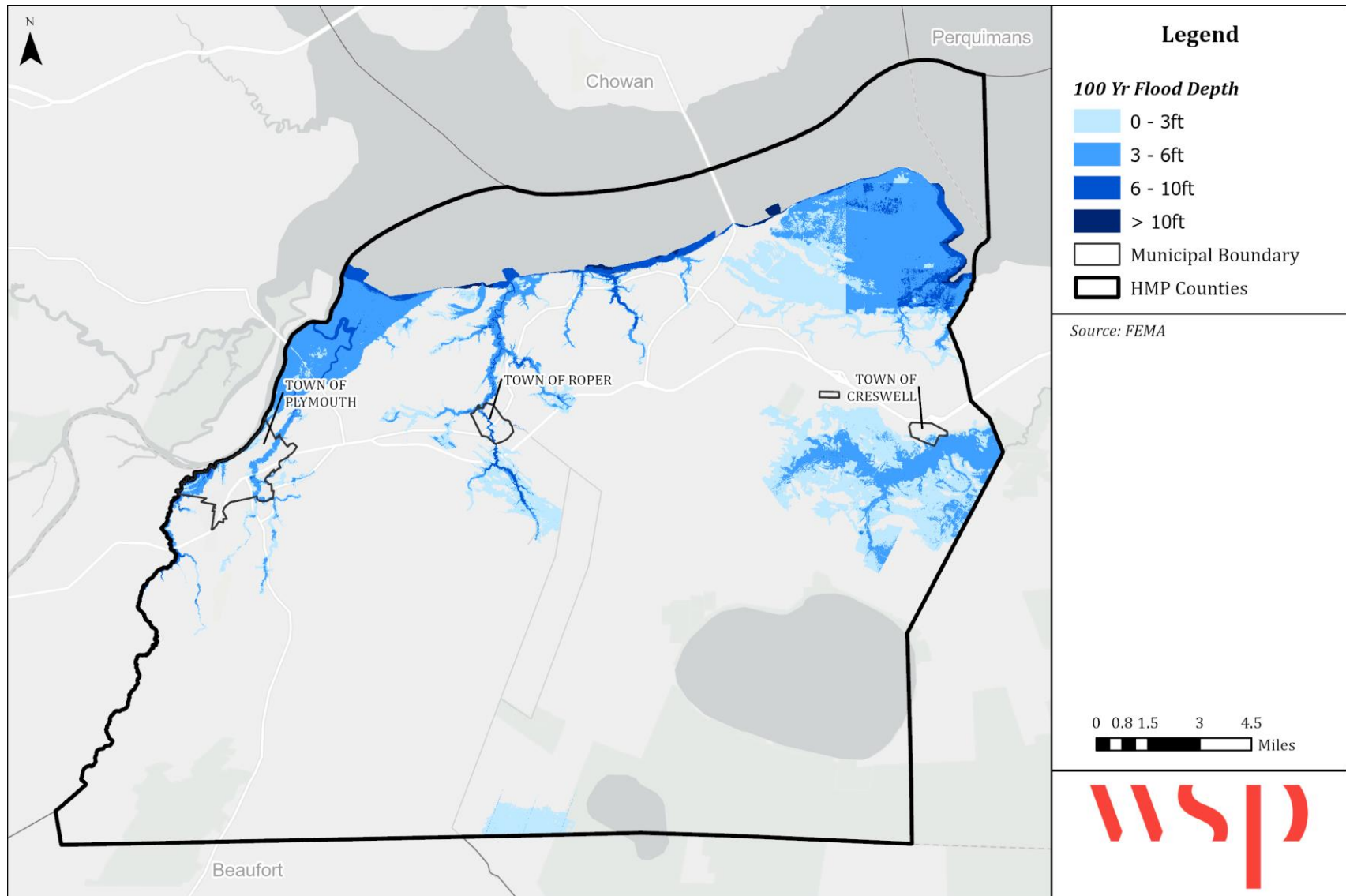
Source: FEMA Effective DFIRM

Figure 4.36 – Flood Depth, 100-Year Floodplain, Tyrrell County



Source: FEMA Effective DFIRM

Figure 4.37 – Flood Depth, 100-Year Floodplain, Washington County



Source: FEMA Effective DFIRM

HISTORICAL OCCURRENCES

According to NCEI, 80 recorded flood events affected the planning area from 1999 to 2024 causing an estimated \$10,225,000 in property damage, \$2,000,000 in crop damage, and 6 deaths. Table 4.37 summarizes these historical occurrences of flooding by county and event type identified from 1999 through 2018 by NCEI Storm Events database. It should be noted that only those historical occurrences listed in the NCEI database are shown here and that other, unrecorded or unreported events may have occurred within the planning area during this timeframe. Further, only reported damages are shown here and further damages may have occurred but gone unreported. Incidents of storm surge are reported under the Hurricane and Tropical Storm profile in Section 4.5.7.

Table 4.37 – NCEI Records of Flooding, 1999-2024

Type	Event Count	Deaths/ Injuries	Property Damage	Crop Damage
Bertie				
Flash Flood	22	1/0	\$5,000	\$0
Flood	7	0/0	\$10,000,000	\$1,000,000
Heavy Rain	22	0/0	\$0	\$0
Hyde				
Coastal Flood	7	0/0	\$0	\$0
Flash Flood	8	0/0	\$0	\$0
Flood	2	0/0	\$0	\$0
Heavy Rain	2	0/0	\$0	\$0
Martin				
Flash Flood	21	0/0	\$210,000	\$0
Flood	2	0/0	\$0	\$0
Heavy Rain	1	0/0	\$0	\$0
Tyrrell				
Coastal Flood	1	0/0	\$0	\$0
Flash Flood	2	0/0	\$0	\$0
Washington				
Flash Flood	7	0/0	\$0	\$0
Flood	2	5/0	\$10,000	\$1,000,000
Region Total				
Coastal Flood	8	0/0	\$0	\$0
Flash Flood	60	1/0	\$215,000	\$0
Flood	13	5/0	\$10,010,000	\$2,000,000
Heavy Rain	25	0/0	\$0	\$0
Total	106	6/0	\$10,225,000	\$2,000,000

Source: NCEI

Table 4.38 provides a summary of this historical information by location. Many of the events attributed to the region are countywide or cover large portions of a given county. Similarly, though some events have associated starting locations identified, the event may have covered a larger area including multiple jurisdictions. Still, this list provides an indication of areas that may be particularly flood prone.

SECTION 4: RISK ASSESSMENT
Table 4.38 – Summary of Historical Flood Occurrences by Location, 1999-2024

Location	Event Count	Deaths/Injuries	Property Damage	Crop Damage
Bertie				
Askewville	3	0/0	\$0	\$0
Aulander	4	0/0	\$0	\$0
Bertie	2	0/0	\$5,000	\$0
Burden	2	0/0	\$0	\$0
Colerain	1	0/0	\$0	\$0
Countywide	3	1/0	\$0	\$0
Drew	3	0/0	\$4,000,000	\$1,000,000
Ellis Store	3	0/0	\$0	\$0
Grabtown	1	0/0	\$0	\$0
Kelford	1	0/0	\$0	\$0
Lewiston	3	0/0	\$0	\$0
Merry Hill	1	0/0	\$0	\$0
Perrytown	1	0/0	\$0	\$0
Powellsville	1	0/0	\$0	\$0
Quitsna	1	0/0	\$1,000,000	\$0
Republican	1	0/0	\$0	\$0
Roxobel	1	0/0	\$0	\$0
Windsor	19	0/0	\$5,000,000	\$0
Woodard	1	0/0	\$0	\$0
Subtotal Bertie	52	1/0	\$10,005,000	\$1,000,000
Hyde				
Engelhard	1	0/0		
Hyde (Zone)	5	0/0	\$0	\$0
Ocracoke	4	0/0	\$0	\$0
Ocracoke Is Arpt	3	0/0	\$0	\$0
Ocracoke Island	2	0/0	\$0	\$0
Sladesville	2	0/0	\$0	\$0
Swanquarter	1	0/0	\$0	\$0
Subtotal Hyde	18	0/0	\$0	\$0
Martin				
Martin (Zone)	1	0/0	\$51,000	\$0
Bear Grass	1	0/0	\$0	\$0
Countywide	8	0/0	\$200,000	\$0
Jamesville	2	0/0	\$0	\$0
Oak City	1	0/0	\$0	\$0
Robersonville	1	0/0	\$0	\$0
Swain	1	0/0	\$0	\$0
Williamston	7	0/0	\$10,000	\$0
Williamston Arpt	2	0/0	\$0	\$0
Williamston Hrrs Arp	1	0/0	\$0	\$0
Subtotal Martin	24	0/0	\$210,000	\$0
Tyrrell				
Tyrrell (Zone)	1	0/0	\$0	\$0

SECTION 4: RISK ASSESSMENT

Location	Event Count	Deaths/Injuries	Property Damage	Crop Damage
Columbia	1	0/0	\$0	\$0
Kilkenny	1	0/0	\$0	\$0
Subtotal Tyrrell	3	0/0	\$0	\$0
Washington				
Countywide	3	0/0	\$0	\$0
Creswell	1	0/0	\$0	\$0
Plymouth	2	0/0	\$0	\$0
Roper	1	0/0	\$0	\$0
Scuppernong	1	5/0	\$10,000	\$1,000,000
Wenona	1	0/0	\$0	\$0
Subtotal Washington	9	5/0	\$10,000	\$1,000,000
Region Total	106	6/0	\$10,225,000	\$2,000,000

Source: NCEI

The following event narratives are provided in the NCEI Storm Events Database and illustrate the impacts of flood events on the Region:

September 14-16, 1999 – Rainfall associated with Hurricane Floyd caused flash flooding as it fell on soils already saturated by 3 weeks of rain across the region. Rivers, creeks, and streams were still swollen and near flood stage from Tropical Storm Dennis which impacted the region less than two weeks prior. In Martin County, rainfall totals ranged from 6 inches to nearly 11 inches. Southwest Bertie County saw as much as 18 inches of rain. The additional runoff from Floyd produced some of the worst flooding the state had seen. Many rivers rose to over 15 feet above flood stage. Many roads were flooded or washed out. A number of high-water rescues had to be conducted. One person perished due to flash flooding in Bertie County. There was also enormous structural, housing, and crop losses due to the flooding, although none was reported in NCEI in the Northeastern NC Region.

June 15, 2011 – The remnants of Tropical Storm Allison dropped 12 to 16 inches of rain across Martin County causing widespread, dangerous flooding. Nearly all primary and secondary roads were closed and flooding reached up to 25 homes causing \$200,000 in damage. The worst of the flooding occurred during the early evening hours. Askewville in Bertie County reported 8.5 inches of water. Many roads across the Region were closed and several homes were evacuated due to high water.

September 29-30, 2010 – The combination of a deep flow of tropical moisture spreading northward along the east coast, and a near stationary frontal boundary over the region resulted in heavy rain across much of northeast North Carolina from Wednesday morning, September 29th, into Thursday night September 30th. Rainfall amounts ranged from four to thirteen inches over the area. The rain fell on already saturated ground leaving to flash flooding across the region especially in low lying areas. Several roads were flooded and impassable with minor damage to a few homes. In Washington County, many acres of crops were damaged. High water did minor damage to a few homes along Highway 64 from near Plymouth to Scuppernong. Five deaths were directly attributed to the flooding in Washington County when a vehicle hydroplaned on the highway, went off the right side of the road, ran down a small hill, hit an embankment and flipped over into a flooded canal where the occupants drowned. Total damages from flooding across the region were reported in NCEI at \$20,000 with agricultural losses of \$1 million.

September 19-21, 2016 – The combination of a stalled frontal boundary and the remnant low pressure area that was Tropical Storm Julia produced heavy rain across much of northeast North Carolina from Monday, September 19th into Thursday, September 22nd. Rainfall totals generally ranged from 6 to 17 inches across the county. Windsor reported 17 inches of rain and widespread flooding. The Cashie River exceeded major flood stage. Numerous homes and businesses were flooded and damaged and numerous

roads were flooded and closed. The event caused \$4,000,000 in property damages and \$1,000,000 in crop damages in Bertie County.

October 8, 2016 – The combination of a cold front moving through the Mid-Atlantic and Hurricane Matthew tracking northeast just off the North Carolina and Virginia coasts, produced heavy rain across northeast North Carolina from Saturday, October 8th into Sunday, October 9th. Rainfall totals generally ranged from 6 to 12 inches. This rain led to significant flash flooding over much of the Northeastern NC Region. Many roads were washed out and impassable for days from the serious flash flooding. The Cashie River exceeded major flood stage, and flooding continued through October 13th. In the Northeastern NC Region, this event caused \$6 million in damage, as reported by NCEI.

January 9, 2024 - Late on the evening of January 9, 2024, a strong cold front moved east across the Carolinas and was accompanied by a line of severe thunderstorms. A period of strong southerly winds (not associated with thunderstorms) developed ahead of the cold front, followed by widespread strong to damaging winds associated with the line of thunderstorms. The strong onshore winds also led to coastal flooding, especially across the Outer Banks from Ocracoke north. The NC DOT reported Highway 12 was closed on Ocracoke Island between the Pony Pens and the Ferry Terminal.

PROBABILITY OF FUTURE OCCURRENCE

By definition of the 100-year flood event, SFHAs are defined as those areas that will be inundated by the flood event having a 1-percent chance of being equaled or exceeded in any given year. Properties located in these areas have a 26 percent chance of flooding over the life of a 30-year mortgage. The 500-year flood area is defined as those areas that will be inundated by the flood event having a 0.2-percent chance of being equaled or exceeded in any given year; it is not the flood that will occur once every 500 years.

The Region is also at risk to other magnitudes of flooding and other types of flooding, such as stormwater floods, storm surge, and other tidal flooding, which have varying probabilities. According to past records, annual probability of flooding varies across the participating counties from 15% to 100% likelihood of flooding in any given year. For the Region as a whole, future flooding is considered likely. However, exposure to flood hazards varies across jurisdictions, and probability of flooding is lower in those jurisdictions without any land in the SFHA, which includes Bear Grass, Colerain, Everetts, Hassell, Powellsville, Oak City, Parmele, and Robersonville.

Probability: 3 – Likely

CLIMATE CHANGE

Per the 2023 North Carolina Hazard Mitigation Plan, changing climate and weather patterns, environmental conditions, and urban and rural development may affect the frequency and intensity of flooding. Historical data and climate projections provided by the State Climate Office of North Carolina on the North Carolina Resilience Exchange website indicate that the region is expected to experience more days with extreme precipitation (2 inches or more of precipitation) shown in Table 4.39.

Table 4.39 – Number of Days with Extreme Precipitation (2+ inches)

County	Historical ¹	Best Case Scenario ²	Worst Case Scenario ³
Bertie County	12	15	17
Hyde County	28	32	33
Martin County	15	18	19
Tyrrell County	17	21	22
Washington County	15	18	20

1. Days with 2 or more inches of precipitation on average between 1983-2014

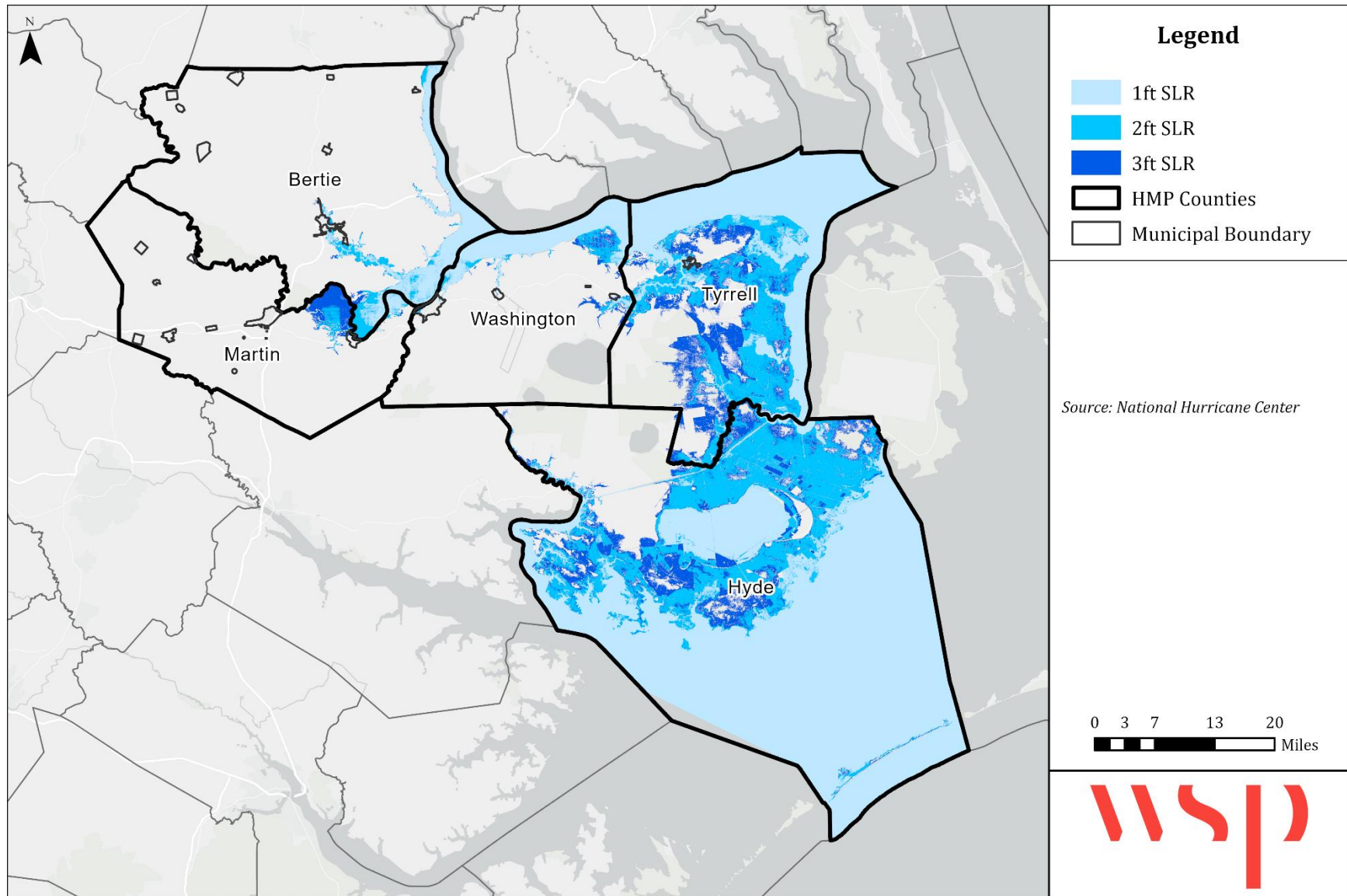
2. Projected days with 2 or more inches of precipitation between 2045-2074 under a low emissions scenario

3. Projected days with 2 or more inches of precipitation between 2045-2074 under a high emissions scenario

This increased likelihood of extreme precipitation events due to climate change will result in greater risks of flash flooding and coastal flooding.

Additionally, sea level rise will inundate low-lying coastal areas and exacerbate other flood risks, especially storm surge and coastal flooding. Based on data from NOAA and the North Carolina Resilience Exchange, the Northeastern NC region will experience 1.1 – 1.3 ft of sea level rise from 2020-2060. Areas projected to experience inundation due to sea level rise are shown in Figure 4.38.

Figure 4.38 – Sea Level Rise Projected Impacts



VULNERABILITY ASSESSMENT

This section provides an assessment of vulnerability to flooding by jurisdiction and flood return period.

METHODOLOGIES AND ASSUMPTIONS

Population and property at risk to flooding was estimated using data from the NCEM IRISK database, which was compiled in NCEM's Risk Management Tool.

As a subset of the building vulnerability analysis, exposure of pre-FIRM structures was also estimated. Table 4.40 below provides the NFIP entry date for each participating jurisdiction, which was used to determine which buildings were constructed pre-FIRM. Pre-FIRM structures were built prior to the adoption of flood protection building standards and are therefore assumed to be at greater risk to the flood hazard.

Table 4.40 – NFIP Initial FIRM Dates

NFIP Entry Date	Jurisdiction
09/29/78	Bertie County (Unincorporated Area)
02/04/09	Town of Askewville
02/04/09	Town of Aulander
02/04/09	Town of Colerain
02/04/09	Town of Kelford
02/04/09	Town of Lewiston-Woodville
02/04/09	Town of Powellsville
09/20/74	Town of Roxobel
09/20/74	Town of Windsor
12/27/74	Hyde County (Unincorporated Area)
11/29/74	Martin County (Unincorporated Area)
09/19/07	Town of Bear Grass
09/19/07	Town of Everetts
05/05/78	Town of Hamilton
09/19/07	Town of Hassell
09/19/07	Town of Jamesville
09/19/07	Town of Oak City
09/19/07	Town of Parmele
06/07/74	Town of Robersonville
12/28/74	Town of Williamston
02/08/74	Town of Columbia
01/10/75	Tyrrell County (Unincorporated Area)
06/09/78	Town of Creswell
05/20/77	Town of Plymouth
06/09/78	Town of Roper
06/14/74	Washington County (Unincorporated Area)

Source: Federal Emergency Management Agency Community Status Book Report: Communities Participating in the National Flood Program, July 2025

Note: The Towns of Askewville, Lewiston Woodville, Powellsville, Everetts, and Parmele do not participate in the NFIP. Askewville and Lewiston Woodville have less than 5% of their land in high-risk flood zones. Powellsville, Everetts, and Parmele are located entirely in the low-risk unshaded Zone X flood zone.

If the NFIP entry date for a given community is between January and June, buildings constructed the same year as the entry date are considered to be post-FIRM (e.g., if the NFIP entry date is 02/01/1991, buildings constructed in 1990 and before are pre-FIRM. Buildings constructed from 1991 to the present are post-FIRM.). If the NFIP entry date is between July and December, then the following year applies for the year-built cut-off (e.g., if the NFIP entry date is 12/18/2007, buildings constructed in the year 2007 and before are pre-FIRM, 2008 and newer are post-FIRM).

PEOPLE

Flood events pose many threats to public health and safety. While such problems are often not reported, three general types of health hazards accompany floods: physical hazards from the water itself, environmental hazards in the aftermath of the flood, and long-term psychological hazards. These common health and safety hazards are detailed below:

- **Contaminated water:** Floodwaters carry anything that was on the ground that the upstream runoff picked up, including dirt, oil, animal waste, and lawn, farm and industrial chemicals. Pastures and areas where farm animals are kept or where their waste is stored can contribute polluted waters to the receiving streams. Floodwater also saturates the ground, which leads to infiltration into sanitary sewer lines, or wastewater treatment plants may be flooded or overloaded. When wastewater treatment plants are flooded, there is nowhere for the sewage to flow. Infiltration and lack of treatment can lead to overloaded sewer lines that can back up into low-lying areas and homes. Even when it is diluted by flood waters, raw sewage can be a breeding ground for bacteria such as *E. coli* and other disease-causing agents. Private sewer and septic systems may also introduce pollutants into floodwaters. Private wells may become contaminated through infiltration of polluted water. Given the many potential sources of contamination, direct or indirect contact with floodwaters poses a significant health risk for contraction of infectious disease.
- **Debris:** During a flood, debris carried by floodwater can cause physical injury from impact. During the recovery process, people may often need to clear debris out of their properties but may encounter dangers such as sharp materials or rusty nails that pose a risk of tetanus.
- **Unsafe food:** If floodwaters come into contact with food items, that food may no longer be safe for consumption due to the potential contaminants in the floodwaters. Foods stored in cardboard, plastic bags, jars, bottles, and paper packaging may all be subject to contamination. Even if foods don't come into direct contact with floodwater, the introduction of mold and mildew from flooding may cause foods to spoil faster. Additionally, power outages may cause refrigerated and frozen foods to spoil.
- **Mosquitos and animals:** After most of the water has receded, stagnant pools can become breeding grounds for mosquitoes, which may carry infectious diseases such as West Nile virus or St. Louis encephalitis. Wild animals such as snakes or rodents may be carried by floodwater or lose their habitat and seek shelter in buildings. Snakes may also be swimming in floodwaters seeking higher ground. People may be at risk of bites or disease if they come in contact with these animals or animal carcasses.
- **Mold and mildew:** Areas of a building that were exposed to excessive moisture can breed mold and mildew. Molds can start to grow in only 24 to 48 hours and will continue to grow without steps to dry out and disinfect the affected surface. Some molds are allergens, while others can produce harmful mycotoxins. Exposure to mold can cause respiratory problems; nasal and sinus congestion; eye, nose, and throat irritation; aches and pains; and effects on the nervous system. Infants, children, immunocompromised individuals, elderly adults, pregnant women, and individuals with respiratory conditions are all at higher risk.
- **Reentering a flooded building:** Health hazards may occur when heating ducts in a forced air system are not properly cleaned after inundation. When the furnace or air conditioner is turned on, the

sediments left in the ducts are circulated throughout the building and breathed in by the occupants. If the public water systems lose pressure, public water supplies may be contaminated, and a boil order may be issued to protect people and animals from contaminated water.

- **Mental stress:** Long-term psychological impacts can result after having been through a flood and seeing one's home damaged and personal belongings destroyed. The cost and labor needed to repair a flood-damaged home can also put a severe strain on people, especially individuals who were unprepared and uninsured. There is also a long-term problem for those who know that their homes can be flooded again. The resulting stress on floodplain residents takes its toll in the form of aggravated physical and mental health problems.

Floods can also result in injuries and fatalities. Individuals face particularly high risk when driving through flooded streets, or from being washed away by floodwaters on foot. NCEI reports six fatalities in the Northeastern Region caused by flood events.

Table 4.41 through Table 4.45 details the population at risk from various flood events, according to data from the NCEM IRISK database and ACS 2019-2023 5-Year Estimate. Note that development and population growth have occurred since the original analysis for the IRISK dataset was performed, therefore actual population at risk is likely higher.

Table 4.41 – Population Impacted by the 10 Year Flood Event

Jurisdiction	Total Population	Total Population at Risk		All Elderly Population	Elderly Population at Risk		All Children Population	Children at Risk	
		Number	Percent		Number	Percent		Number	Percent
Bertie									
Unincorporated Bertie County	11,675	234	2%	2,855	57	2%	417	4	1%
Town of Askewville	152	5	3%	45	1	3%	12	0	0%
Town of Aulander	748	52	7%	208	13	6%	117	9	8%
Town of Colerain	291	0	0%	49	0	0%	9	0	0%
Town of Kelford	245	34	14%	69	0	0%	15	0	0%
Town of Lewiston-Woodville	466	5	1%	137	0	0%	24	0	0%
Town of Powellsville	141	0	0%	113	0	0%	0	0	0%
Town of Roxobel	347	0	0%	66	0	0%	24	0	0%
Town of Windsor	3,417	34	1%	703	7	1%	94	0	0%
Subtotal Bertie	17,482	364	2%	4,245	78	2%	712	14	2%
Hyde									
Unincorporated Hyde County	4,625	2,174	47%	1,054	495	47%	124	58	47%
Martin									
Unincorporated Martin County	13,680	137	1%	3,396	34	1%	753	8	1%
Town of Bear Grass	94	0	0%	12	0	0%	22	0	0%
Town of Everetts	158	0	0%	18	0	0%	9	0	0%
Town of Hamilton	183	0	0%	84	0	0%	2	0	0%
Town of Hassell	49	0	0%	30	0	0%	0	0	0%

SECTION 4: RISK ASSESSMENT

Jurisdiction	Total Population	Total Population at Risk		All Elderly Population	Elderly Population at Risk		All Children Population	Children at Risk	
		Number	Percent		Number	Percent		Number	Percent
Town of Jamesville	373	0	0%	118	0	0%	8	0	0%
Town of Oak City	472	0	0%	145	0	0%	30	0	0%
Town of Parmele	288	0	0%	85	0	0%	0	0	0%
Town of Robersonville	1,319	0	0%	374	0	0%	52	0	0%
Town of Williamston	5,157	103	2%	1,182	24	2%	194	4	2%
Subtotal Martin	21,773	240	1%	5,444	58	1%	1,070	12	1%
Tyrrell									
Unincorporated Tyrrell County	2,702	1,054	39%	695	271	39%	146	58	40%
Town of Columbia	674	425	63%	167	84	50%	24	0	0%
Subtotal Tyrrell	3,376	1,479	44%	862	355	41%	170	58	34%
Washington									
Unincorporated Washington County	6,850	617	9%	1,841	167	9%	64	6	9%
Town of Creswell	205	64	31%	58	17	30%	15	4	25%
Town of Plymouth	3,264	65	2%	923	19	2%	140	0	0%
Town of Roper	586	12	2%	162	3	2%	22	0	0%
Subtotal Washington	10,905	758	7%	2,984	205	7%	241	10	4%
Region Total	58,161	5,015	9%	14,589	1,191	8%	2,317	152	7%

Source: NCEM Risk Management Tool

Table 4.42 – Population Impacted by the 25 Year Flooding Event

Jurisdiction	Total Population	Total Population at Risk		All Elderly Population	Elderly Population at Risk		All Children Population	Children at Risk	
		Number	Percent		Number	Percent		Number	Percent
Bertie									
Unincorporated Bertie County	11,675	234	2%	2,855	57	2%	417	8	2%
Town of Askewville	152	8	5%	45	2	5%	12	0	0%
Town of Aulander	748	75	10%	208	21	10%	117	9	8%
Town of Colerain	291	0	0%	49	0	0%	9	0	0%
Town of Kelford	245	34	14%	69	0	0%	15	0	0%
Town of Lewiston-Woodville	466	5	1%	137	0	0%	24	0	0%
Town of Powellsville	141	0	0%	113	0	0%	0	0	0%
Town of Roxobel	347	0	0%	66	0	0%	24	0	0%
Town of Windsor	3,417	103	3%	703	21	3%	94	6	6%

SECTION 4: RISK ASSESSMENT

Jurisdiction	Total Population	Total Population at Risk		All Elderly Population	Elderly Population at Risk		All Children Population	Children at Risk	
		Number	Percent		Number	Percent		Number	Percent
Subtotal Bertie	17,482	459	3%	4,245	101	2%	712	23	3%
Hyde									
Unincorporated Hyde County	4,625	2,590	56%	1,054	590	56%	124	69	56%
Martin									
Unincorporated Martin County	13,680	137	1%	3,396	34	1%	753	8	1%
Town of Bear Grass	94	0	0%	12	0	0%	22	0	0%
Town of Everetts	158	0	0%	18	0	0%	9	0	0%
Town of Hamilton	183	0	0%	84	0	0%	2	0	0%
Town of Hassell	49	0	0%	30	0	0%	0	0	0%
Town of Jamesville	373	0	0%	118	0	0%	8	0	0%
Town of Oak City	472	0	0%	145	0	0%	30	0	0%
Town of Parmele	288	0	0%	85	0	0%	0	0	0%
Town of Robersonville	1,319	0	0%	374	0	0%	52	0	0%
Town of Williamston	5,157	155	3%	1,182	35	3%	194	6	3%
Subtotal Martin	21,773	292	1%	5,444	69	1%	1,070	14	1%
Tyrrell									
Unincorporated Tyrrell County	2,702	1,648	61%	695	424	61%	146	91	62%
Town of Columbia	674	593	88%	167	167	100%	24	23	94%
Subtotal Tyrrell	3,376	2,241	66%	862	591	69%	170	114	67%
Washington									
Unincorporated Washington County	6,850	959	14%	1,841	258	14%	64	9	14%
Town of Creswell	205	74	36%	58	21	36%	15	4	25%
Town of Plymouth	3,264	98	3%	923	28	3%	140	0	0%
Town of Roper	586	12	2%	162	3	2%	22	0	0%
Subtotal Washington	10,905	1,143	11%	2,984	310	10%	241	13	5%
Region Total	58,161	6,725	12%	14,589	1,661	11%	2,317	233	10%

Source: NCEM Risk Management Tool; ACS 2019-2023 5-Year Estimate

Table 4.43 – Population Impacted by a 50-Year Flood Event

Jurisdiction	Total Population	Total Population at Risk		All Elderly Population	Elderly Population at Risk		All Children Population	Children at Risk	
		Number	Percent		Number	Percent		Number	Percent
Bertie									
Unincorporated Bertie County	11,675	350	3%	2,855	86	3%	417	13	3%

SECTION 4: RISK ASSESSMENT

Jurisdiction	Total Population	Total Population at Risk		All Elderly Population	Elderly Population at Risk		All Children Population	Children at Risk	
		Number	Percent		Number	Percent		Number	Percent
Town of Askewville	152	8	5%	45	2	5%	12	0	0%
Town of Aulander	748	82	11%	208	27	13%	117	9	8%
Town of Colerain	291	0	0%	49	0	0%	9	0	0%
Town of Kelford	245	34	14%	69	0	0%	15	0	0%
Town of Lewiston-Woodville	466	5	1%	137	0	0%	24	0	0%
Town of Powellsville	141	0	0%	113	0	0%	0	0	0%
Town of Roxobel	347	0	0%	66	0	0%	24	0	0%
Town of Windsor	3,417	171	5%	703	35	5%	94	6	6%
Subtotal Bertie	17,482	650	4%	4,245	150	4%	712	28	4%
Hyde									
Unincorporated Hyde County	4,625	2,729	59%	1,054	622	59%	124	73	59%
Martin									
Unincorporated Martin County	13,680	137	1%	3,396	34	1%	753	8	1%
Town of Bear Grass	94	0	0%	12	0	0%	22	0	0%
Town of Everetts	158	0	0%	18	0	0%	9	0	0%
Town of Hamilton	183	0	0%	84	0	0%	2	0	0%
Town of Hassell	49	0	0%	30	0	0%	0	0	0%
Town of Jamesville	373	0	0%	118	0	0%	8	0	0%
Town of Oak City	472	0	0%	145	0	0%	30	0	0%
Town of Parmele	288	0	0%	85	0	0%	0	0	0%
Town of Robersonville	1,319	0	0%	374	0	0%	52	0	0%
Town of Williamston	5,157	155	3%	1,182	35	3%	194	6	3%
Subtotal Martin	21,773	292	1%	5,444	69	1%	1,070	13	1%
Tyrrell									
Unincorporated Tyrrell County	2,702	1,891	70%	695	487	70%	146	101	69%
Town of Columbia	674	593	88%	167	167	100%	24	0	0%
Subtotal Tyrrell	3,376	2,485	74%	862	654	76%	170	101	59%
Washington									
Unincorporated Washington County	6,850	1233	18%	1,841	331	18%	64	12	18%
Town of Creswell	205	82	40%	58	23	40%	15	8	50%
Town of Plymouth	3,264	131	4%	923	37	4%	140	0	0%
Town of Roper	586	29	5%	162	6	4%	22	0	0%
Subtotal Washington	10,905	1,475	14%	2,984	398	13%	241	19	8%
Region Total	58,161	7,631	13%	14,589	1,893	13%	2,317	234	10%

Source: NCEM Risk Management Tool; ACS 2019-2023 5-Year Estimate

SECTION 4: RISK ASSESSMENT

Table 4.44 – Population Impacted by 100-Year Flood Event

Jurisdiction	Total Population	Total Population at Risk		All Elderly Population	Elderly Population at Risk		All Children Population	Children at Risk	
		Number	Percent		Number	Percent		Number	Percent
Bertie									
Unincorporated Bertie County	11,675	467	4%	2,855	114	4%	417	17	4%
Town of Askewville	152	11	7%	45	3	7%	12	2	13%
Town of Aulander	748	112	15%	208	33	16%	117	20	17%
Town of Colerain	291	0	0%	49	0	0%	9	0	0%
Town of Kelford	245	34	14%	69	0	0%	15	0	0%
Town of Lewiston-Woodville	466	5	1%	137	0	0%	24	0	0%
Town of Powellsville	141	0	0%	113	0	0%	0	0	0%
Town of Roxobel	347	0	0%	66	0	0%	24	0	0%
Town of Windsor	3,417	239	7%	703	49	7%	94	6	6%
Subtotal Bertie	17,482	868	5%	4,245	200	5%	712	44	6%
Hyde									
Unincorporated Hyde County	4,625	2,868	62%	1,054	653	62%	124	77	62%
Martin									
Unincorporated Martin County	13,680	274	2%	3,396	68	2%	753	15	2%
Town of Bear Grass	94	0	0%	12	0	0%	22	0	0%
Town of Everetts	158	0	0%	18	0	0%	9	0	0%
Town of Hamilton	183	0	0%	84	0	0%	2	0	0%
Town of Hassell	49	0	0%	30	0	0%	0	0	0%
Town of Jamesville	373	0	0%	118	0	0%	8	0	0%
Town of Oak City	472	0	0%	145	0	0%	30	0	0%
Town of Parmele	288	0	0%	85	0	0%	0	0	0%
Town of Robersonville	1,319	0	0%	374	0	0%	52	0	0%
Town of Williamston	5,157	206	4%	1,182	47	4%	194	8	4%
Subtotal Martin	21,773	480	2%	5,444	115	2%	1,070	23	2%
Tyrrell									
Unincorporated Tyrrell County	2,702	2054	76%	695	528	76%	146	111	76%
Town of Columbia	674	674	100%	167	167	100%	24	24	100%
Subtotal Tyrrell	3,376	2,728	81%	862	695	81%	170	135	79%
Washington									
Unincorporated Washington County	6,850	1,713	25%	1,841	460	25%	64	16	25%
Town of Creswell	205	90	44%	58	26	45%	15	8	50%

SECTION 4: RISK ASSESSMENT

Jurisdiction	Total Population	Total Population at Risk		All Elderly Population	Elderly Population at Risk		All Children Population	Children at Risk	
		Number	Percent		Number	Percent		Number	Percent
Town of Plymouth	3,264	196	6%	923	55	6%	140	0	0%
Town of Roper	586	47	8%	162	11	7%	22	0	0%
Subtotal Washington	10,905	2,045	19%	2,984	553	19%	241	24	10%
Region Total	58,161	8,989	15%	14,589	2,216	15%	2,317	303	13%

Source: NCEM Risk Management Tool; ACS 2019-2023 5-Year Estimate

Table 4.45 - Population Impacted by the 500 Year River Flooding

Jurisdiction	Total Population	Total Population at Risk		All Elderly Population	Elderly Population at Risk		All Children Population	Children at Risk	
		Number	Percent		Number	Percent		Number	Percent
Bertie									
Unincorporated Bertie County	11,675	584	5%	2,855	143	5%	417	21	5%
Town of Askewville	152	11	7%	45	3	7%	12	2	13%
Town of Aulander	748	135	18%	208	40	19%	117	20	17%
Town of Colerain	291	3	1%	49	0	0%	9	0	0%
Town of Kelford	245	34	14%	69	0	0%	15	0	0%
Town of Lewiston-Woodville	466	14	3%	137	5	4%	24	0	0%
Town of Powellsville	141	0	0%	113	0	0%	0	0	0%
Town of Roxobel	347	0	0%	66	0	0%	24	0	0%
Town of Windsor	3,417	718	21%	703	148	21%	94	23	24%
Subtotal Bertie	17,482	1,498	9%	4,245	339	8%	712	65	9%
Hyde									
Unincorporated Hyde County	4,625	2,960	64%	1,054	675	64%	124	78	63%
Martin									
Unincorporated Martin County	13,680	410	3%	3,396	102	3%	753	23	3%
Town of Bear Grass	94	0	0%	12	0	0%	22	0	0%
Town of Everetts	158	0	0%	18	0	0%	9	0	0%
Town of Hamilton	183	0	0%	84	0	0%	2	0	0%
Town of Hassell	49	0	0%	30	0	0%	0	0	0%
Town of Jamesville	373	0	0%	118	0	0%	8	0	0%
Town of Oak City	472	0	0%	145	0	0%	30	0	0%
Town of Parmele	288	0	0%	85	0	0%	0	0	0%
Town of Robersonville	1,319	0	0%	374	0	0%	52	0	0%

SECTION 4: RISK ASSESSMENT

Jurisdiction	Total Population	Total Population at Risk		All Elderly Population	Elderly Population at Risk		All Children Population	Children at Risk	
		Number	Percent		Number	Percent		Number	Percent
Town of Williamston	5,157	309	6%	1,182	71	6%	194	12	6%
Subtotal Martin	21,773	720	3%	5,444	173	3%	1,070	34	3%
Tyrrell									
Unincorporated Tyrrell County	2,702	2,135	79%	695	549	79%	146	114	78%
Town of Columbia	674	674	100%	167	167	100%	24	0	0%
Subtotal Tyrrell	3,376	2,809	83%	862	716	83%	170	114	67%
Washington									
Unincorporated Washington County	6,850	6,165	90%	1,841	1,638	89%	64	64	100%
Town of Creswell	205	37	18%	58	10	18%	15	5	33%
Town of Plymouth	3,264	1,240	38%	923	351	38%	140	56	40%
Town of Roper	586	223	38%	162	62	38%	22	9	40%
Subtotal Washington	10,905	7,665	70%	2,984	2,061	69%	241	134	55%
Region Total	58,161	15,652	27%	14,589	3,964	27%	2,317	425	18%

Source: NCEM Risk Management Tool; ACS 2019-2023 5-Year Estimate

PROPERTY

Residential, commercial, and public buildings, as well as critical infrastructure such as transportation, water, energy, and communication systems may be damaged or destroyed by flood waters. The increased number of flood days will likely cause additional flood-related property damage, although it is unclear exactly what this will look like. Homes, businesses, and vehicles will be susceptible to increased water damage.

Properties within the SFHA are estimated to have a one percent probability of being exposed to flooding equaling or exceeding the base flood during any given year. Mortgage lenders require that owners of properties with federally backed mortgages located within SFHAs purchase and maintain flood insurance policies on their properties. Consequently, newer and recently purchased properties in the community are typically insured against flooding. Regardless of insurance status, pre-FIRM properties, those built before the community's first FIRM, may be more vulnerable to flood damage because they were built prior to the enforcement of flood damage prevention regulations. These properties may be a priority for mitigation.

Table 4.42 through Table 4.51 detail the property at risk and loss estimates from various flood events, according to data from the NCEM IRISK database. Actual property at risk is likely higher due to the amount of development that has occurred since the original analysis for the IRISK dataset was performed.

The damage estimates for the 1% annual chance flood event total \$60,424,600, which equates to a loss ratio of less than 1 percent. The loss ratio is the damage estimate divided by the total potential exposure (i.e., total value of all buildings in the planning area), displayed as a percentage of value at risk. FEMA considers loss ratios greater than 10% to be significant and an indicator a community may have more difficulties recovering from an event.

Critical facility exposure to the 1% annual chance flood was also evaluated. Based on a comparison of critical facility locations to the FEMA flood hazard areas, 87 critical facilities are exposed to the 1% annual chance flood, and 52 facilities are exposed to the 0.2% annual chance flood. All other identified critical facilities are located in the unshaded X, which reflects low flood risk. Table 4.46 summarizes critical facility exposure to the 1% annual chance flood event by county and FEMA lifeline. Details on critical facility exposure are provided in the community annexes.

Table 4.46 – Critical Facility Exposure in the SFHA by County

FEMA Lifeline	Number of Facilities at Risk					Total
	Bertie	Hyde	Martin	Tyrrell	Washington	
Safety & Security	0	10	0	8	0	18
Food, Hydration, Shelter	0	14	0	17	4	35
Health & Medical	2	3	0	2	0	7
Water Systems	2	4	4	5	9	24
Energy	0	3	0	0	0	3
Total	4	34	4	32	13	87

SECTION 4: RISK ASSESSMENT

Table 4.47 – Buildings Impacted by the 10-Year Flood Event

Jurisdiction	All Buildings	Number of Pre-FIRM Buildings at Risk		Residential Buildings at Risk			Commercial Buildings at Risk			Public Buildings at Risk			Total Buildings at Risk		
	Num	Num	% of Total	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages
Bertie															
Unincorporated Bertie County	11,175	14	0	131	1	\$351,600	5	0	\$442,348	1	0	\$102,242	137	1	\$896,190
Town of Askewville	502	14	3	13	3	\$83,032	1	0	\$463	0	0	\$0	14	3	\$83,495
Town of Aulander	744	47	6	47	6	\$61,291	0	0	\$0	0	0	\$0	47	6	\$61,291
Town of Colerain	428	1	0	0	0	\$0	1	0	\$3	0	0	\$0	1	0	\$3
Town of Kelford	173	18	10	22	13	\$18,058	0	0	\$0	0	0	\$0	22	13	\$18,058
Town of Lewiston-Woodville	719	3	0	3	0	\$2,972	0	0	\$0	0	0	\$0	3	0	\$2,972
Town of Powellsville	171	0	0	0	0	\$0	0	0	\$0	0	0	\$0	0	0	\$0
Town of Roxobel	205	0	0	0	0	\$0	0	0	\$0	0	0	\$0	0	0	\$0
Town of Windsor	1,815	0	0	10	1	\$9,036	1	0	\$13	0	0	\$0	11	1	\$9,049
Subtotal Bertie	15,932	97	1	226	1	\$525,989	8	0	\$442,827	1	0	\$102,242	235	1	\$1,071,058
Hyde															
Hyde County (Unincorporated Area)	5,596	1,577	28	2,217	40	\$16,085,231	147	3	\$1,434,679	19	0	\$507,546	2,383	43	\$18,027,456
Martin															
Martin County (Unincorporated Area)	12,188	45	0	45	0	\$77,479	0	0	\$0	0	0	\$0	45	0	\$77,479
Town of Bear Grass	81	0	0	0	0	\$0	0	0	\$0	0	0	\$0	0	0	\$0
Town of Everetts	159	0	0	0	0	\$0	0	0	\$0	0	0	\$0	0	0	\$0
Town of Hamilton	292	0	0	0	0	\$0	0	0	\$0	0	0	\$0	0	0	\$0
Town of Hassell	70	0	0	0	0	\$0	0	0	\$0	0	0	\$0	0	0	\$0

SECTION 4: RISK ASSESSMENT

Jurisdiction	All Buildings	Number of Pre-FIRM Buildings at Risk		Residential Buildings at Risk			Commercial Buildings at Risk			Public Buildings at Risk			Total Buildings at Risk		
	Num	Num	% of Total	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages
Town of Jamesville	297	1	0	1	0	\$5,194	0	0	\$0	0	0	\$0	1	0	\$5,194
Town of Oak City	313	0	0	0	0	\$0	0	0	\$0	0	0	\$0	0	0	\$0
Town of Parmele	149	0	0	0	0	\$0	0	0	\$0	0	0	\$0	0	0	\$0
Town of Robersonville	901	0	0	0	0	\$0	0	0	\$0	0	0	\$0	0	0	\$0
Town of Williamston	4,238	68	2	68	2	\$543,719	0	0	\$0	0	0	\$0	68	2	\$543,719
Subtotal Martin	18,688	114	1	114	1	\$626,392	0	0	\$0	0	0	\$0	114	1	\$626,392
Tyrrell															
Tyrrell County (Unincorporated Area)	519	207	40	256	49	\$211,215	0	0	\$0	0	0	\$0	256	49	\$211,215
Town of Columbia	2,794	599	21	853	31	\$761,385	0	0	\$0	0	0	\$0	853	31	\$761,385
Subtotal Tyrrell	3,313	806	24	1,109	33	\$972,600	0	0	\$0	0	0	\$0	1,109	33	\$972,600
Washington															
Washington County (Unincorporated Area)	5,482	198	4	367	7	\$2,825,521	65	1	\$1,371,316	3	0	\$45,531	435	8	\$4,242,369
Town of Creswell	366	48	13	84	23	\$62,897	0	0	\$0	0	0	\$0	84	23	\$62,897
Town of Plymouth	2,779	29	1	39	1	\$89,187	3	0	\$2,662	0	0	\$0	42	2	\$91,849
Town of Roper	611	7	1	8	1	\$4,045	1	0	\$24	0	0	\$0	9	1	\$4,069
Subtotal Washington	9,238	282	3	498	5	\$2,981,650	69	1	\$1,374,002	3	0	\$45,531	570	6	\$4,401,184
Region Total	52,767	2,876	5	4,164	8	\$21,191,862	224	0	\$3,251,508	23	0	\$655,319	4,411	8	\$25,098,690

Source: NCEM Risk Management Tool

SECTION 4: RISK ASSESSMENT

Table 4.48 – Buildings Impacted by the 25 Year River Flooding

Jurisdiction	All Buildings	Number of Pre-FIRM Buildings at Risk		Residential Buildings at Risk			Commercial Buildings at Risk			Public Buildings at Risk			Total Buildings at Risk		
	Num	Num	% of Total	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages
Bertie															
Unincorporated Bertie County	11,175	15	0	203	2	\$542,954	6	0	\$469,871	1	0	\$102,242	210	2	\$1,115,066
Town of Askewville	502	18	4	17	3	\$105,375	1	0	\$1,147	0	0	\$0	18	4	\$106,522
Town of Aulander	744	62	8	62	8	\$83,925	0	0	\$0	0	0	\$0	62	8	\$83,925
Town of Colerain	428	1	0	0	0	\$0	1	0	\$71	0	0	\$0	1	0	\$71
Town of Kelford	173	21	12	25	14	\$22,188	0	0	\$0	0	0	\$0	25	14	\$22,188
Town of Lewiston-Woodville	719	5	1	5	1	\$5,788	0	0	\$0	0	0	\$0	5	1	\$5,788
Town of Powellsville	171	0	0	0	0	\$0	0	0	\$0	0	0	\$0	0	0	\$0
Town of Roxobel	205	0	0	0	0	\$0	0	0	\$0	0	0	\$0	0	0	\$0
Town of Windsor	1,815	6	0	44	2	\$84,536	6	0	\$6,245	0	0	\$0	50	3	\$90,781
Subtotal Bertie	15,932	128	1	356	2	\$844,766	14	0	\$477,334	1	0	\$102,242	371	2	\$1,424,341
Hyde															
Hyde County (Unincorporated Area)	5,596	1,859	33	2,626	47	\$22,450,430	174	3	\$1,972,868	23	0	\$633,652	2,823	50	\$25,056,951
Martin															
Martin County (Unincorporated Area)	12,188	64	1	61	1	\$108,281	3	0	\$2,441	0	0	\$0	64	1	\$110,722
Town of Bear Grass	81	0	0	0	0	\$0	0	0	\$0	0	0	\$0	0	0	\$0
Town of Everetts	159	0	0	0	0	\$0	0	0	\$0	0	0	\$0	0	0	\$0
Town of Hamilton	292	0	0	0	0	\$0	0	0	\$0	0	0	\$0	0	0	\$0
Town of Hassell	70	0	0	0	0	\$0	0	0	\$0	0	0	\$0	0	0	\$0

SECTION 4: RISK ASSESSMENT

Jurisdiction	All Buildings	Number of Pre-FIRM Buildings at Risk		Residential Buildings at Risk			Commercial Buildings at Risk			Public Buildings at Risk			Total Buildings at Risk		
	Num	Num	% of Total	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages
Town of Jamesville	297	1	0	1	0	\$7,567	0	0	\$0	0	0	\$0	1	0	\$7,567
Town of Oak City	313	0	0	0	0	\$0	0	0	\$0	0	0	\$0	0	0	\$0
Town of Parmele	149	0	0	0	0	\$0	0	0	\$0	0	0	\$0	0	0	\$0
Town of Robersonville	901	0	0	0	0	\$0	0	0	\$0	0	0	\$0	0	0	\$0
Town of Williamston	4,238	90	2	90	2	\$704,993	0	0	\$0	0	0	\$0	90	2	\$704,993
Subtotal Martin	18,688	155	1	152	1	\$820,841	3	0	\$2,441	0	0	\$0	155	1	\$823,282
Tyrrell															
Tyrrell County (Unincorporated Area)	519	933	33	1,326	47	\$1,583,430	3	0	\$8,812	0	0	\$0	1,329	48	\$1,592,242
Town of Columbia	2,794	292	56	347	67	\$385,854	0	0	\$0	0	0	\$0	347	67	\$385,854
Subtotal Tyrrell	3,313	1,225	37	1,673	50	\$1,969,284	3	0	\$8,812	0	0	\$0	1,676	51	\$1,978,096
Washington															
Washington County (Unincorporated Area)	5,482	296	5	551	10	\$3,316,067	69	1	\$1,468,379	3	0	\$75,373	623	11	\$4,859,819
Town of Creswell	366	58	16	98	27	\$118,537	0	0	\$0	0	0	\$0	98	27	\$118,537
Town of Plymouth	2,779	49	2	68	2	\$183,644	3	0	\$5,385	0	0	\$0	71	3	\$189,029
Town of Roper	611	13	2	13	2	\$8,068	2	0	\$229	0	0	\$0	15	2	\$8,297
Subtotal Washington	9,238	416	5	730	8	\$3,626,316	74	1	\$1,473,993	3	0	\$75,373	807	9	\$5,175,682
Region Total	52,767	3,783	7	5,537	10	\$29,711,637	268	1	\$3,935,448	27	0	\$811,267	5,832	11	\$34,458,352

SECTION 4: RISK ASSESSMENT

Table 4.49 – Buildings Impacted by the 50 Year River Flooding

Jurisdiction	All Buildings	Number of Pre-FIRM Buildings at Risk		Residential Buildings at Risk			Commercial Buildings at Risk			Public Buildings at Risk			Total Buildings at Risk		
	Num	Num	% of Total	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages
Bertie															
Unincorporated Bertie County	11,175	18	0	232	2	\$701,265	6	0	\$486,972	1	0	\$105,945	239	2	\$1,294,182
Town of Askewville	502	19	4	18	4	\$117,791	1	0	\$1,452	0	0	\$0	19	4	\$119,243
Town of Aulander	744	73	10	73	10	\$114,080	0	0	\$0	0	0	\$0	73	10	\$114,080
Town of Colerain	428	1	0	0	0	\$0	1	0	\$207	0	0	\$0	1	0	\$207
Town of Kelford	173	22	13	26	15	\$23,722	0	0	\$0	0	0	\$0	26	15	\$23,722
Town of Lewiston-Woodville	719	5	1	5	1	\$5,788	0	0	\$0	0	0	\$0	5	1	\$5,788
Town of Powellsville	171	0	0	0	0	\$0	0	0	\$0	0	0	\$0	0	0	\$0
Town of Roxobel	205	0	0	0	0	\$0	0	0	\$0	0	0	\$0	0	0	\$0
Town of Windsor	1,815	21	1	72	4	\$151,055	10	1	\$31,818	0	0	\$0	82	5	\$182,873
Subtotal Bertie	15,932	159	1	426	3	\$1,113,701	18	0	\$520,449	1	0	\$105,945	445	3	\$1,740,095
Hyde															
Hyde County (Unincorporated Area)	5,596	1,972	35	2,770	49	\$26,226,575	189	3	\$2,338,439	24	0	\$700,916	2,983	53	\$29,265,930
Martin															
Martin County (Unincorporated Area)	12,188	81	1	77	1	\$151,720	4	0	\$7,033	0	0	\$0	81	1	\$158,753
Town of Bear Grass	81	0	0	0	0	\$0	0	0	\$0	0	0	\$0	0	0	\$0
Town of Everetts	159	0	0	0	0	\$0	0	0	\$0	0	0	\$0	0	0	\$0
Town of Hamilton	292	0	0	0	0	\$0	0	0	\$0	0	0	\$0	0	0	\$0
Town of Hassell	70	0	0	0	0	\$0	0	0	\$0	0	0	\$0	0	0	\$0

SECTION 4: RISK ASSESSMENT

Jurisdiction	All Buildings	Number of Pre-FIRM Buildings at Risk		Residential Buildings at Risk			Commercial Buildings at Risk			Public Buildings at Risk			Total Buildings at Risk		
	Num	Num	% of Total	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages
Town of Jamesville	297	1	0	1	0	\$9,471	0	0	\$0	0	0	\$0	1	0	\$9,471
Town of Oak City	313	0	0	0	0	\$0	0	0	\$0	0	0	\$0	0	0	\$0
Town of Parmele	149	0	0	0	0	\$0	0	0	\$0	0	0	\$0	0	0	\$0
Town of Robersonville	901	0	0	0	0	\$0	0	0	\$0	0	0	\$0	0	0	\$0
Town of Williamston	4,238	98	2	96	2	\$763,903	2	0	\$1,242	0	0	\$0	98	2	\$765,144
Subtotal Martin	18,688	180	1	174	1	\$925,094	6	0	\$8,275	0	0	\$0	180	1	\$933,368
Tyrrell															
Tyrrell County (Unincorporated Area)	519	329	63	382	74	\$572,561	2	0	\$576	0	0	\$0	384	74	\$573,137
Town of Columbia	2,794	1,060	38	1,505	54	\$2,430,725	4	0	\$15,137	0	0	\$0	1,509	54	\$2,445,862
Subtotal Tyrrell	3,313	1,389	42	1,887	57	\$3,003,286	6	0	\$15,713	0	0	\$0	1,893	57	\$3,018,999
Washington															
Washington County (Unincorporated Area)	5,482	544	6	958	10	\$4,259,647	78	1	\$1,550,729	3	0	\$94,828	1,039	11	\$5,905,204
Town of Creswell	366	66	18	109	30	\$207,378	0	0	\$0	0	0	\$0	109	30	\$207,378
Town of Plymouth	2,779	65	2	90	3	\$245,506	3	0	\$6,039	0	0	\$0	93	3	\$251,545
Town of Roper	611	21	3	23	4	\$20,165	2	0	\$448	0	0	\$0	25	4	\$20,613
Subtotal Washington	9,238	392	7	736	13	\$3,786,598	73	1	\$1,544,242	3	0	\$94,828	812	15	\$5,425,668
Region Total	52,767	4,244	8	6,215	12	\$35,528,303	297	1	\$4,433,605	28	0	\$901,689	6,540	12	\$40,863,596

SECTION 4: RISK ASSESSMENT

Table 4.50 – Buildings Impacted by the 100 Year River Flooding

Jurisdiction	All Buildings	Number of Pre-FIRM Buildings at Risk		Residential Buildings at Risk			Commercial Buildings at Risk			Public Buildings at Risk			Total Buildings at Risk		
	Num	Num	% of Total	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages
Bertie															
Unincorporated Bertie County	11,175	51	0	364	3	\$2,238,277	28	0	\$689,224	1	0	\$109,663	393	4	\$3,037,165
Town of Askewville	502	28	6	27	5	\$136,030	1	0	\$1,679	0	0	\$0	28	6	\$137,709
Town of Aulander	744	93	13	93	13	\$153,115	0	0	\$0	0	0	\$0	93	13	\$153,115
Town of Colerain	428	3	1	1	0	\$176	2	0	\$800	0	0	\$0	3	1	\$976
Town of Kelford	173	22	13	26	15	\$24,521	0	0	\$0	0	0	\$0	26	15	\$24,521
Town of Lewiston-Woodville	719	5	1	5	1	\$5,788	0	0	\$0	0	0	\$0	5	1	\$5,788
Town of Powellsville	171	0	0	0	0	\$0	0	0	\$0	0	0	\$0	0	0	\$0
Town of Roxobel	205	0	0	0	0	\$0	0	0	\$0	0	0	\$0	0	0	\$0
Town of Windsor	1,815	34	2	103	6	\$276,511	15	1	\$92,190	1	0	\$5,046	119	7	\$373,747
Subtotal Bertie	15,932	236	1	619	4	\$2,834,418	46	0	\$783,893	2	0	\$114,709	667	4	\$3,733,021
Hyde															
Hyde County (Unincorporated Area)	5,596	2,108	38	2,906	52	\$36,048,602	250	4	\$3,485,070	36	1	\$971,060	3,192	57	\$40,504,732
Martin															
Martin County (Unincorporated Area)	12,188	203	2	186	2	\$629,269	17	0	\$121,038	0	0	\$0	203	2	\$750,308
Town of Bear Grass	81	0	0	0	0	\$0	0	0	\$0	0	0	\$0	0	0	\$0
Town of Everetts	159	0	0	0	0	\$0	0	0	\$0	0	0	\$0	0	0	\$0
Town of Hamilton	292	0	0	0	0	\$0	0	0	\$0	0	0	\$0	0	0	\$0
Town of Hassell	70	0	0	0	0	\$0	0	0	\$0	0	0	\$0	0	0	\$0

SECTION 4: RISK ASSESSMENT

Jurisdiction	All Buildings	Number of Pre-FIRM Buildings at Risk		Residential Buildings at Risk			Commercial Buildings at Risk			Public Buildings at Risk			Total Buildings at Risk		
	Num	Num	% of Total	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages
Town of Jamesville	297	3	1	1	0	\$25,811	2	1	\$44,017	0	0	\$0	3	1	\$69,828
Town of Oak City	313	0	0	0	0	\$0	0	0	\$0	0	0	\$0	0	0	\$0
Town of Parmele	149	0	0	0	0	\$0	0	0	\$0	0	0	\$0	0	0	\$0
Town of Robersonville	901	0	0	0	0	\$0	0	0	\$0	0	0	\$0	0	0	\$0
Town of Williamston	4,238	129	3	125	3	\$911,731	4	0	\$26,682	0	0	\$0	129	3	\$938,414
Subtotal Martin	18,688	335	2	312	2	\$1,566,811	23	0	\$191,737	0	0	\$0	335	2	\$1,758,550
Tyrrell															
Tyrrell County (Unincorporated Area)	519	365	70	409	79	\$1,441,220	10	2	\$70,480	2	0	\$3,716	421	81	\$1,515,416
Town of Columbia	2,794	1,145	41	1,633	58	\$5,383,581	21	1	\$124,222	2	0	\$5,012	1,656	59	\$5,512,816
Subtotal Tyrrell	3,313	1,510	46	2,042	62	\$6,824,801	31	1	\$194,702	4	0	\$8,728	2,077	63	\$7,028,232
Washington															
Washington County (Unincorporated Area)	5,482	530	10	1,019	19	\$4,785,087	84	2	\$1,636,861	3	0	\$97,488	1,106	20	\$6,519,436
Town of Creswell	366	78	21	120	33	\$367,275	3	1	\$1,080	0	0	\$0	123	34	\$368,355
Town of Plymouth	2,779	94	3	145	5	\$461,989	4	0	\$6,273	0	0	\$0	149	5	\$468,262
Town of Roper	611	34	6	38	6	\$39,723	3	0	\$4,289	0	0	\$0	41	7	\$44,012
Subtotal Washington	9,238	736	8	1,322	14	\$5,654,074	94	1	\$1,648,503	3	0	\$97,488	1,419	15	\$7,400,065
Region Total	52,767	4,925	9	7,201	14	\$52,928,706	444	1	\$6,303,905	45	0	\$1,191,985	7,690	15	\$60,424,600

SECTION 4: RISK ASSESSMENT

Table 4.51 – Buildings Impacted by the 500 Year River Flooding

Jurisdiction	All Buildings	Number of Pre-FIRM Buildings at Risk		Residential Buildings at Risk			Commercial Buildings at Risk			Public Buildings at Risk			Total Buildings at Risk		
	Num	Num	% of Total	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages
Bertie															
Unincorporated Bertie County	11,175	52	0	472	4	\$6,726,797	54	0	\$1,666,411	1	0	\$111,536	527	5	\$8,504,744
Town of Askewville	502	28	6	27	5	\$161,788	1	0	\$2,045	0	0	\$0	28	6	\$163,833
Town of Aulander	744	117	16	116	16	\$229,101	1	0	\$836	0	0	\$0	117	16	\$229,937
Town of Colerain	428	5	1	3	1	\$2,502	2	0	\$1,459	0	0	\$0	5	1	\$3,961
Town of Kelford	173	22	13	26	15	\$27,344	0	0	\$0	0	0	\$0	26	15	\$27,344
Town of Lewiston-Woodville	719	15	2	16	2	\$12,202	0	0	\$0	0	0	\$0	16	2	\$12,202
Town of Powellsville	171	0	0	0	0	\$0	0	0	\$0	0	0	\$0	0	0	\$0
Town of Roxobel	205	0	0	0	0	\$0	0	0	\$0	0	0	\$0	0	0	\$0
Town of Windsor	1,815	43	2	300	17	\$2,727,892	79	4	\$2,300,908	11	1	\$306,770	390	21	\$5,335,570
Subtotal Bertie	15,932	282	2	960	6	\$9,887,626	137	1	\$3,971,659	12	0	\$418,306	1,109	7	\$14,277,591
Hyde															
Hyde County (Unincorporated Area)	5,596	2,266	40	2,978	53	\$55,329,209	385	7	\$6,573,018	54	1	\$1,656,226	3,417	61	\$63,558,453
Martin															
Martin County (Unincorporated Area)	12,188	333	3	255	2	\$8,103,405	79	1	\$5,611,225	0	0	\$0	334	3	\$13,714,631
Town of Bear Grass	81	0	0	0	0	\$0	0	0	\$0	0	0	\$0	0	0	\$0
Town of Everetts	159	0	0	0	0	\$0	0	0	\$0	0	0	\$0	0	0	\$0
Town of Hamilton	292	0	0	0	0	\$0	0	0	\$0	0	0	\$0	0	0	\$0
Town of Hassell	70	0	0	0	0	\$0	0	0	\$0	0	0	\$0	0	0	\$0
Town of Jamesville	297	3	1	1	0	\$59,741	2	1	\$129,697	0	0	\$0	3	1	\$189,438
Town of Oak City	313	0	0	0	0	\$0	0	0	\$0	0	0	\$0	0	0	\$0

SECTION 4: RISK ASSESSMENT

Jurisdiction	All Buildings	Number of Pre-FIRM Buildings at Risk		Residential Buildings at Risk			Commercial Buildings at Risk			Public Buildings at Risk			Total Buildings at Risk		
	Num	Num	% of Total	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages
Town of Parmele	149	0	0	0	0	\$0	0	0	\$0	0	0	\$0	0	0	\$0
Town of Robersonville	901	0	0	0	0	\$0	0	0	\$0	0	0	\$0	0	0	\$0
Town of Williamston	4,238	220	5	195	5	\$4,588,173	15	0	\$2,441,695	8	0	\$513,936	218	5	\$7,543,804
Subtotal Martin	18,688	556	3	451	2	\$12,751,319	96	1	\$8,182,617	8	0	\$513,936	555	3	\$21,447,873
Tyrrell															
Tyrrell County (Unincorporated Area)	519	1,378	49	1,702	61	\$28,741,727	306	11	\$1,978,122	21	1	\$409,763	2,029	73	\$31,129,612
Town of Columbia	2,794	446	86	417	80	\$8,310,551	65	13	\$2,618,328	34	7	\$1,883,678	516	99	\$12,812,557
Subtotal Tyrrell	3,313	1,824	55	2,119	64	\$37,052,278	371	11	\$4,596,450	55	2	\$2,293,441	2,545	77	\$43,942,169
Washington															
Washington County (Unincorporated Area)	5,482	817	15	1,476	27	\$8,155,613	162	3	\$2,018,098	5	0	\$155,269	1,643	30	\$10,328,979
Town of Creswell	366	177	48	245	67	\$1,420,748	10	3	\$79,817	3	1	\$9,766	258	70	\$1,510,332
Town of Plymouth	2,779	353	13	413	15	\$2,337,638	22	1	\$434,101	2	0	\$20,805	437	16	\$2,792,544
Town of Roper	611	165	27	195	32	\$374,702	4	1	\$2,674	0	0	\$0	199	33	\$377,376
Subtotal Washington	9,238	1,512	16	2,329	25	\$12,288,701	198	2	\$2,534,690	10	0	\$185,840	2,537	27	\$15,009,231
Region Total	52,767	6,440	12	8,837	17	\$127,309,133	1,187	2	\$25,858,434	139	0	\$5,067,749	10,163	19	\$158,235,317

REPETITIVE LOSS ANALYSIS

A repetitive loss property is a property for which two or more flood insurance claims of more than \$1,000 have been paid by the NFIP within any 10-year period since 1978. An analysis of repetitive loss was completed to examine repetitive losses within the region. Table 4.52 summarizes repetitive loss properties by jurisdiction as identified by FEMA through the NFIP.

According to February 2024 NFIP records, there are a total of 455 repetitive loss properties within the Northeastern NC Region, of which 50 percent are insured. There are 32 properties on the list classified as severe repetitive loss properties. A severe repetitive loss property is classified as such if it has four or more separate claim payments of more than \$5,000 each (including building and contents payments) or two or more separate claim payments (building only) where the total of the payments exceeds the current value of the property. Additionally, the majority of repetitive loss properties (90.5%) are residential.

Table 4.52 – Repetitive Loss Properties by Jurisdiction

Jurisdiction	Total Number of Properties	Residential Properties	Total Number of Insured Properties	Total Number of Losses	Severe Repetitive Loss Properties
Bertie County	20	16	7	48	1
Town of Aulander	2	2	2	5	0
Town of Windsor	79	48	37	213	11
Hyde County	221	185	105	620	16
Martin County	6	4	3	12	0
Town of Williamston	1	0	0	2	0
Tyrrell County	61	97	39	148	1
Town of Columbia	43	39	22	107	2
Washington County	14	14	10	32	0
Town of Creswell	1	1	1	3	0
Town of Plymouth	7	6	3	17	1
Total	455	412	229	1207	32

Source: FEMA/ISO

Note: Communities in the planning area are not listed here if they do not have any repetitive losses.

ENVIRONMENT

During a flood event, chemicals and other hazardous substances may end up contaminating local water bodies. Flooding kills animals and in general disrupts the ecosystem. Snakes and insects may also make their way to the flooded areas.

Floods can also cause significant erosion, which can alter streambanks and deposit sediment, changing the flow of streams and rivers and potentially reducing the drainage capacity of those waterbodies.

CONSEQUENCE ANALYSIS

Table 4.53 summarizes the potential detrimental consequences of flooding.

Table 4.53 – Consequence Analysis - Flooding

Category	Consequences
Public	Localized impact expected to be severe for incident areas and moderate to light for other adversely affected areas.
Responders	First responders are at risk when attempting to rescue people from their homes. They are subject to the same health hazards as the public. Flood waters may prevent access to areas in need of response, or the flood may prevent access to the critical facilities themselves which may prolong response time. Damage to personnel will generally be localized to those in the flood areas at the time of the incident and is expected to be limited.
Continuity of Operations (including Continued Delivery of Services)	Floods can severely disrupt normal operations, especially when there is a loss of power. Damage to facilities in the affected area may require temporary relocation of some operations. Localized disruption of roads, facilities, and/or utilities caused by incident may postpone delivery of some services.
Property, Facilities and Infrastructure	Buildings and infrastructure, including transportation and utility infrastructure, may be damaged or destroyed. Impacts are expected to be localized to the area of the incident. Severe damage is possible.
Environment	Chemicals and other hazardous substances may contaminate local water bodies. Wildlife and livestock deaths possible. The localized impact is expected to be severe for incident areas and moderate to light for other areas affected by the flood or HazMat spills. Flood may also adversely affect water quality by increasing nutrient and sediment loads in waterbodies.
Economic Condition of the Jurisdiction	Local economy and finances will be adversely affected, possibly for an extended period of time. During floods (especially flash floods), roads, bridges, farms, houses and automobiles are destroyed. Additionally, the local government must deploy firemen, police and other emergency response personnel and equipment to help the affected area. It may take years for the affected communities to be re-built and business to return to normal.
Public Confidence in the Jurisdiction's Governance	Ability to respond and recover may be questioned and challenged if planning, response, and recovery are not timely and effective.

HAZARD SUMMARY BY JURISDICTION

The following table summarizes flood hazard risk by jurisdiction. Flood hazards associated with riverine flooding, coastal flooding and storm surge, high tide flooding, flash flooding, and stormwater flooding can impact the region. Spatial extent was assigned based on the percent of each jurisdiction's land area in the SFHA and thus exposed to a high risk of flooding, with additional consideration given to potential area at risk to other sources and magnitudes of flooding. Most communities were assigned a probability of likely; communities without any land area in the SFHA were assigned a probability of possible.

Jurisdiction	Probability	Impact	Spatial Extent	Warning Time	Duration	Score	Priority
Bertie County	3	3	3	3	3	3.0	H
Town of Askewville	3	3	2	3	3	2.8	H
Town of Aulander	3	3	3	3	3	3.0	H
Town of Colerain	2	3	1	3	3	2.3	M
Town of Kelford	3	3	3	3	3	3.0	H

SECTION 4: RISK ASSESSMENT

Jurisdiction	Probability	Impact	Spatial Extent	Warning Time	Duration	Score	Priority
Town of Lewiston-Woodville	3	3	2	3	3	2.8	H
Town of Powellsville	2	3	1	3	3	2.3	M
Town of Roxobel	3	3	2	3	3	2.8	H
Town of Windsor	3	3	3	3	3	3.0	H
Hyde County	3	3	3	3	3	3.0	H
Martin County	3	3	3	3	3	3.0	H
Town of Bear Grass	2	3	1	3	3	2.3	M
Town of Everetts	2	3	1	3	3	2.3	M
Town of Hamilton	3	3	2	3	3	2.8	H
Town of Hassell	2	3	1	3	3	2.3	M
Town of Jamesville	3	3	3	3	3	3.0	H
Town of Oak City	2	3	1	3	3	2.3	M
Town of Parmele	2	3	1	3	3	2.3	M
Town of Robersonville	2	3	1	3	3	2.3	M
Town of Williamston	3	3	2	3	3	2.8	H
Tyrrell County	3	3	4	3	3	3.2	H
Town of Columbia	3	3	4	3	3	3.2	H
Washington County	3	3	3	3	3	3.0	H
Town of Creswell	3	3	3	3	3	3.0	H
Town of Plymouth	3	3	3	3	3	3.0	H
Town of Roper	3	3	3	3	3	3.0	H

4.5.6 HURRICANES & COASTAL HAZARDS

HAZARD BACKGROUND

Hurricanes and tropical storms are classified as cyclones and defined as any closed circulation developing around a low-pressure center in which the winds rotate counterclockwise in the Northern Hemisphere (or clockwise in the Southern Hemisphere) and whose diameter averages 10 to 30 miles across. A tropical cyclone refers to any such circulation that develops over tropical waters. Tropical cyclones act as a “safety-valve,” limiting the continued build-up of heat and energy in tropical regions by maintaining the atmospheric heat and moisture balance between the tropics and the pole-ward latitudes. The primary damaging forces associated with these storms are high-level sustained winds, heavy precipitation, and tornadoes.

The key energy source for a tropical cyclone is the release of latent heat from the condensation of warm water. Their formation requires a low-pressure disturbance, warm sea surface temperature, rotational force from the spinning of the earth, and the absence of wind shear in the lowest 50,000 feet of the atmosphere. The majority of hurricanes and tropical storms form in the Atlantic Ocean, Caribbean Sea, and Gulf of Mexico during the official Atlantic hurricane season, which encompasses the months of June through November. The peak of the Atlantic hurricane season is in early to mid-September and the average number of storms that reach hurricane intensity per year in the Atlantic basin is about six.

The greatest potential for loss of life related to a hurricane is from the storm surge. Storm surge is water that is pushed toward the shore by the force of the winds swirling around the storm as shown in Figure 4.39. This advancing surge combines with the normal tides to create the hurricane storm tide, which can increase the mean water level to heights impacting roads, homes and other critical infrastructure. In addition, wind driven waves are superimposed on the storm tide. This rise in water level can cause severe flooding in coastal areas, particularly when the storm tide coincides with the normal high tides.

The maximum potential storm surge for a location depends on several different factors. Storm surge is a very complex phenomenon because it is sensitive to the slightest changes in storm intensity, forward speed, size (radius of maximum winds-RMW), angle of approach to the coast, central pressure (minimal contribution in comparison to the wind), and the shape and characteristics of coastal features such as bays and estuaries. Other factors which can impact storm surge are the width and slope of the continental shelf and the depth of the ocean bottom. A narrow shelf, or one that drops steeply from the shoreline and subsequently produces deep water close to the shoreline, tends to produce a lower surge but higher and more powerful storm waves. Much of the North Carolina coast has a narrow continental shelf, with mile-deep waters generally only 20-30 miles off the coast.

Figure 4.39 – Components of Hurricane Storm Surge

Source: NOAA/The COMET Program

Damage during hurricanes may also result from inland flooding from associated heavy rainfall. For example, Hurricane Floyd, which made landfall as a Category 2 storm, caused the worst inland flooding disaster in North Carolina's history. Rainfall amounts exceeded 20 inches in certain locales, and 67 counties sustained damages.

Similar to hurricanes, nor'easters are ocean storms capable of causing substantial damage to coastal areas in the Eastern United States due to their strong winds and heavy surf. Nor'easters are named for the winds that blow in from the northeast and drive the storm up the East Coast along the Gulf Stream, a band of warm water that lies off the Atlantic coast. They are caused by the interaction of the jet stream with horizontal temperature gradients and generally occur during the fall and winter months when moisture and cold air are plentiful.

Nor'easters are known for dumping heavy amounts of rain and snow, producing hurricane-force winds, and creating high surf that causes severe beach erosion and coastal flooding. There are two main components to a nor'easter: (1) a Gulf Stream low-pressure system (counter-clockwise winds) generated off the southeastern U.S. coast, gathering warm air and moisture from the Atlantic, and pulled up the East Coast by strong northeasterly winds at the leading edge of the storm; and (2) an Arctic high-pressure system (clockwise winds) which meets the low-pressure system with cold, arctic air blowing down from Canada. When the two systems collide, the moisture and cold air produce a mix of precipitation and can produce dangerously high winds and heavy seas. As the low-pressure system deepens, the intensity of the winds and waves increases and can cause serious damage to coastal areas as the storm moves northeast.

Warning Time: 1 – More than 24 hours

Duration: 3 – Less than one week

EROSION

Due to its location with on estuarine and marine coastal areas, the Northeastern NC Region is exposed to coastal erosion. Coastal erosion is a process whereby large storms, flooding, strong wave action, sea level rise, and human activities, such as inappropriate land use, alterations, and shore protection structures, wear away the beaches and bluffs along the coast. Erosion undermines and often destroys homes,

businesses, and public infrastructure and can have long-term economic and social consequences. According to NOAA, coastal erosion is responsible for approximately \$500 million per year in coastal property loss in the United States, including damage to structures and loss of land. To mitigate coastal erosion, the federal government spends an average of \$150 million every year on beach nourishment and other shoreline erosion control measures.

Coastal erosion has both natural causes and causes related to human activities. Gradual coastal erosion/replenishment results naturally from the impacts of tidal longshore currents. Severe coastal erosion can occur over a very short period of time when the state is impacted by hurricanes, tropical storms and other weather systems. Sand is continually removed by longshore currents in some areas, but it is also continually replaced by sand carried in by the same type of currents. Structures such as piers or sea walls, jetties, and navigational inlets may interrupt the movement of sand. Sand can become “trapped” in one place by these types of structures. The currents will, of course, continue to flow, though depleted of sand trapped elsewhere. With significant amounts of sand trapped in the system, the continuing motion of currents (now deficient in sand) results in erosion. In this way, human construction activities that result in the unnatural trapping of sand have the potential to result in significant coastal erosion.

Erosion rates and potential impacts are highly localized. In undeveloped areas, these high erosion rates may not be likely to cause significant concern, but in some heavily populated locations, one or two feet of erosion may be considered catastrophic (NOAA, 2014).

Estuaries are partially enclosed, coastal water bodies where freshwater meets saltwater from the ocean. They are influenced by tides but still protected from the full force of ocean waves. Estuaries are often referred to as bays or sounds. Estuarine coastlines can experience erosion through short-term processes, such as tides, storms, wind, and boat wakes, as well as long-term processes, such as sea level rise. Many variables determine the rate of estuarine erosion including shoreline type, geographic location and size of the associated estuary, the type and abundance of vegetation, and the frequency and intensity of storms. Estuarine erosion is problematic as more development occurs along estuarine shorelines. Unfortunately, data on estuarine erosion rates is not available, which makes it difficult to identify and address problem areas.

Warning Time: 1 – More than 24 hours

Duration: 1 – Less than 6 hours

LOCATION

HURRICANES AND TROPICAL STORMS

Hurricanes and tropical storms can impact the entire Northeastern NC Region. Wind impacts can affect the region uniformly, while storm surge impacts are more limited, affecting areas along coastal and estuarine shorelines and reaching further inland depending on the height of the surge.

Figure 4.40 through Figure 4.44 show the estimated extent of surge by storm category according to NOAA SLOSH data. As shown in these maps, Hyde, Tyrrell, and Washington Counties are most vulnerable to storm surge impacts.

Spatial Extent: 4 – Large

EROSION

Erosion can occur along any shoreline in the region. While erosion is likely to be more frequent and severe along the Atlantic coast, erosion of estuarine shorelines can also occur. In the Northeastern NC Region, Hyde County is the location facing the greatest exposure to erosion.

Figure 4.45 on the following page shows the locations where shoreline change data to measure erosion and accretion rates along the North Carolina coast has been compiled by the USGS. Long-term coastal erosion rates have been most severe along the northern portions of Hyde County's Atlantic coastline.

Spatial Extent: 1 – Negligible

Figure 4.40 – Category 1 Storm Surge Inundation

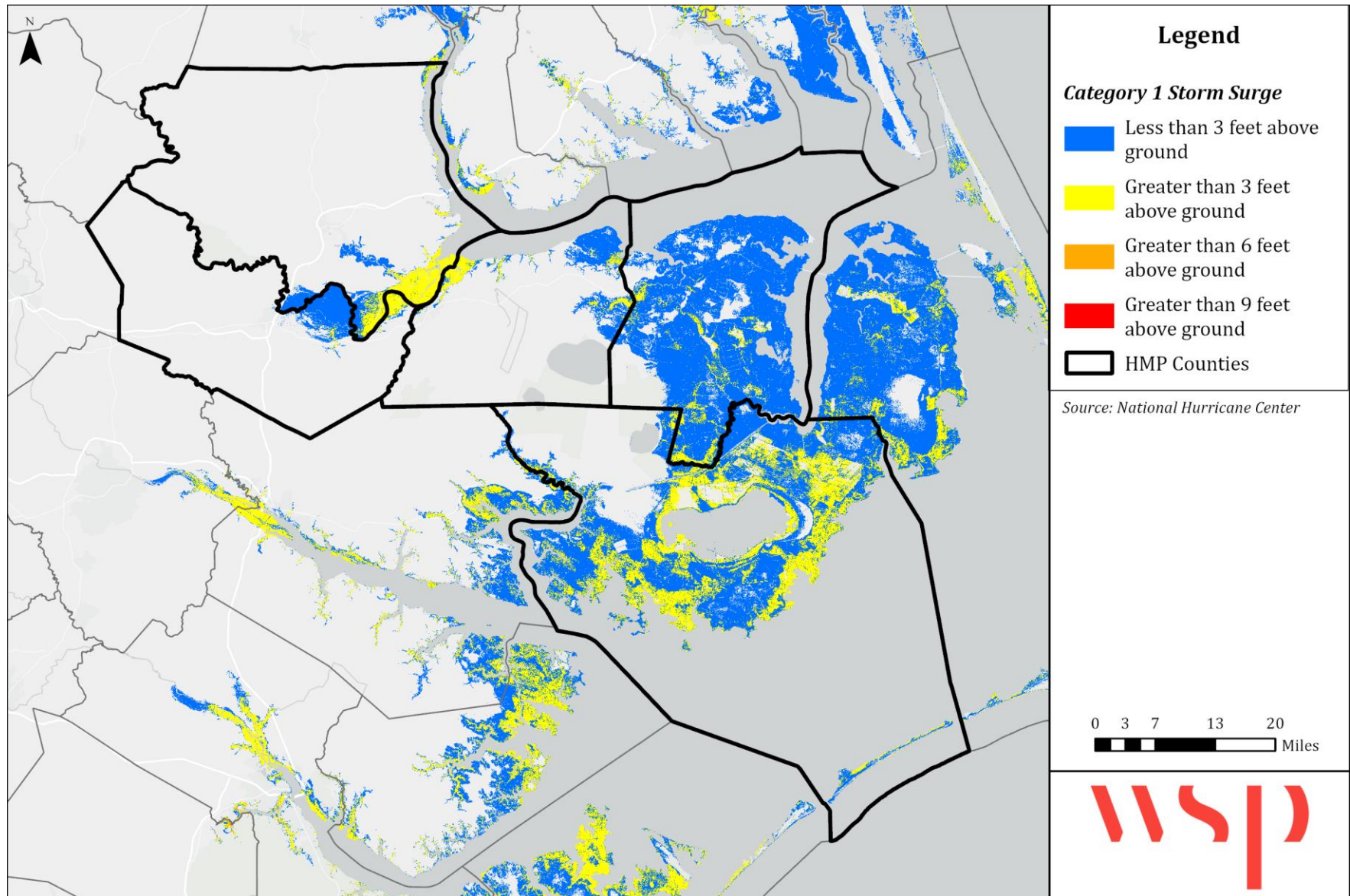


Figure 4.41 – Category 2 Storm Surge Inundation

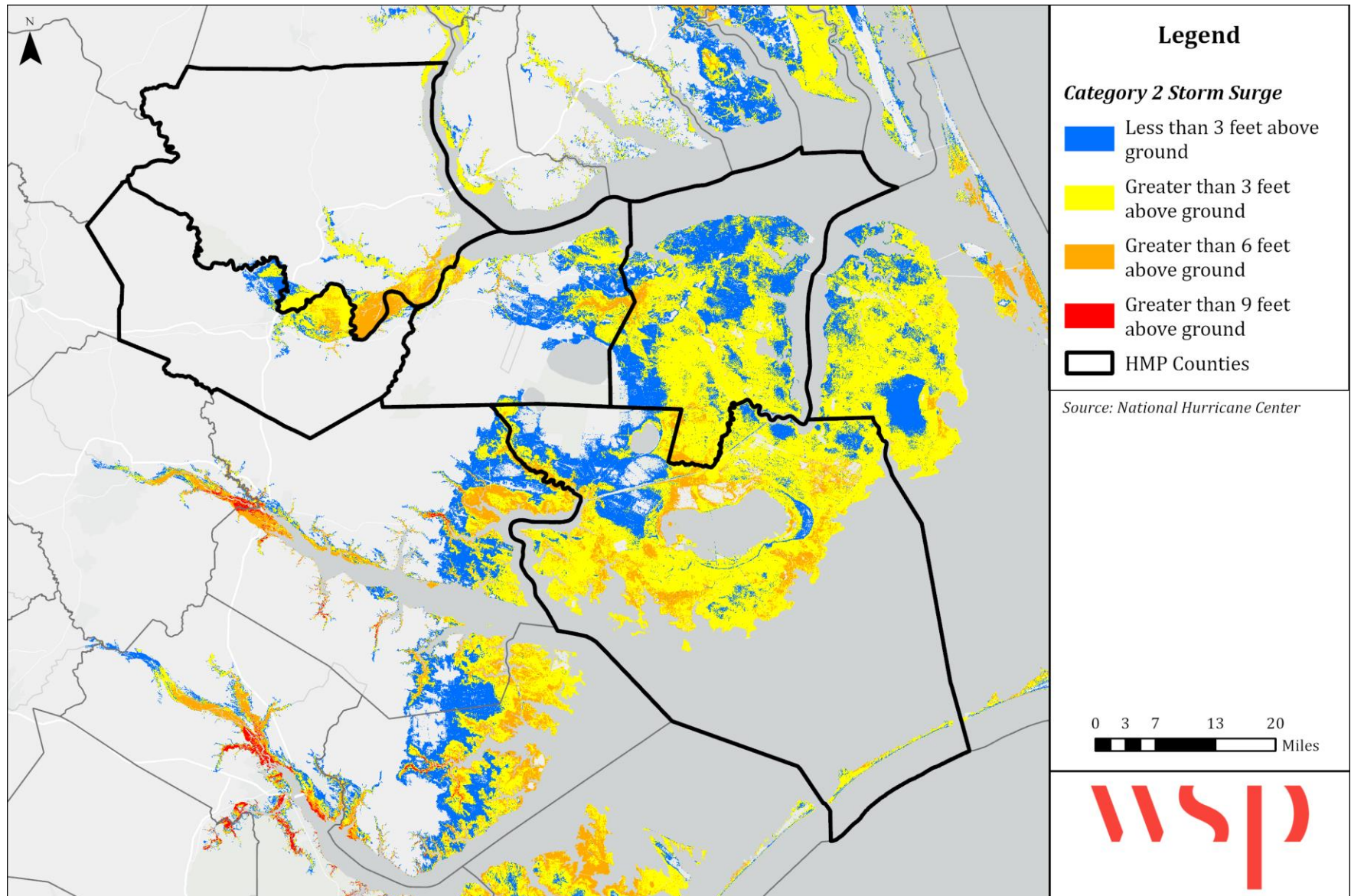


Figure 4.42 – Category 3 Storm Surge Inundation

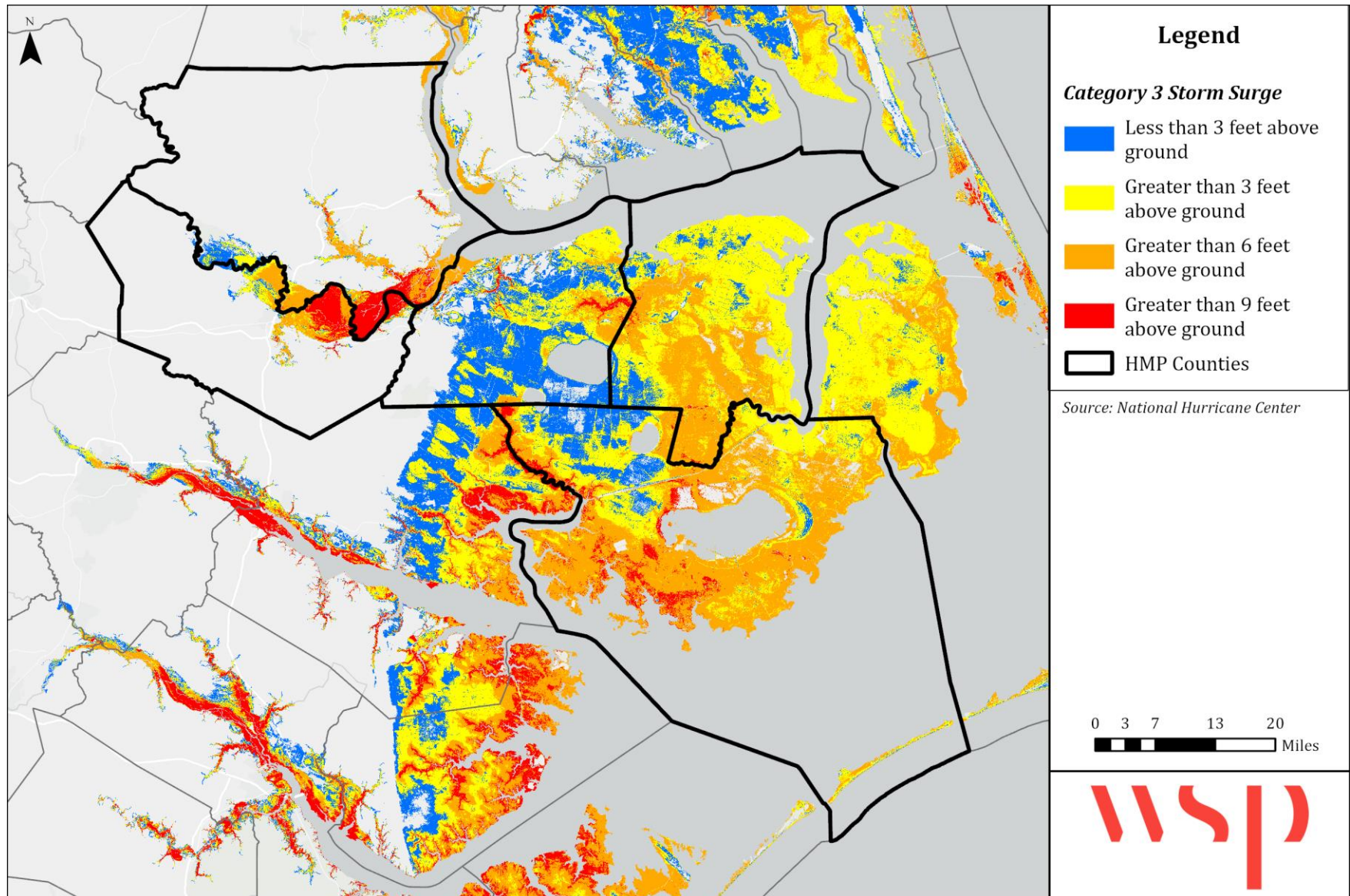


Figure 4.43 – Category 4 Storm Surge Inundation

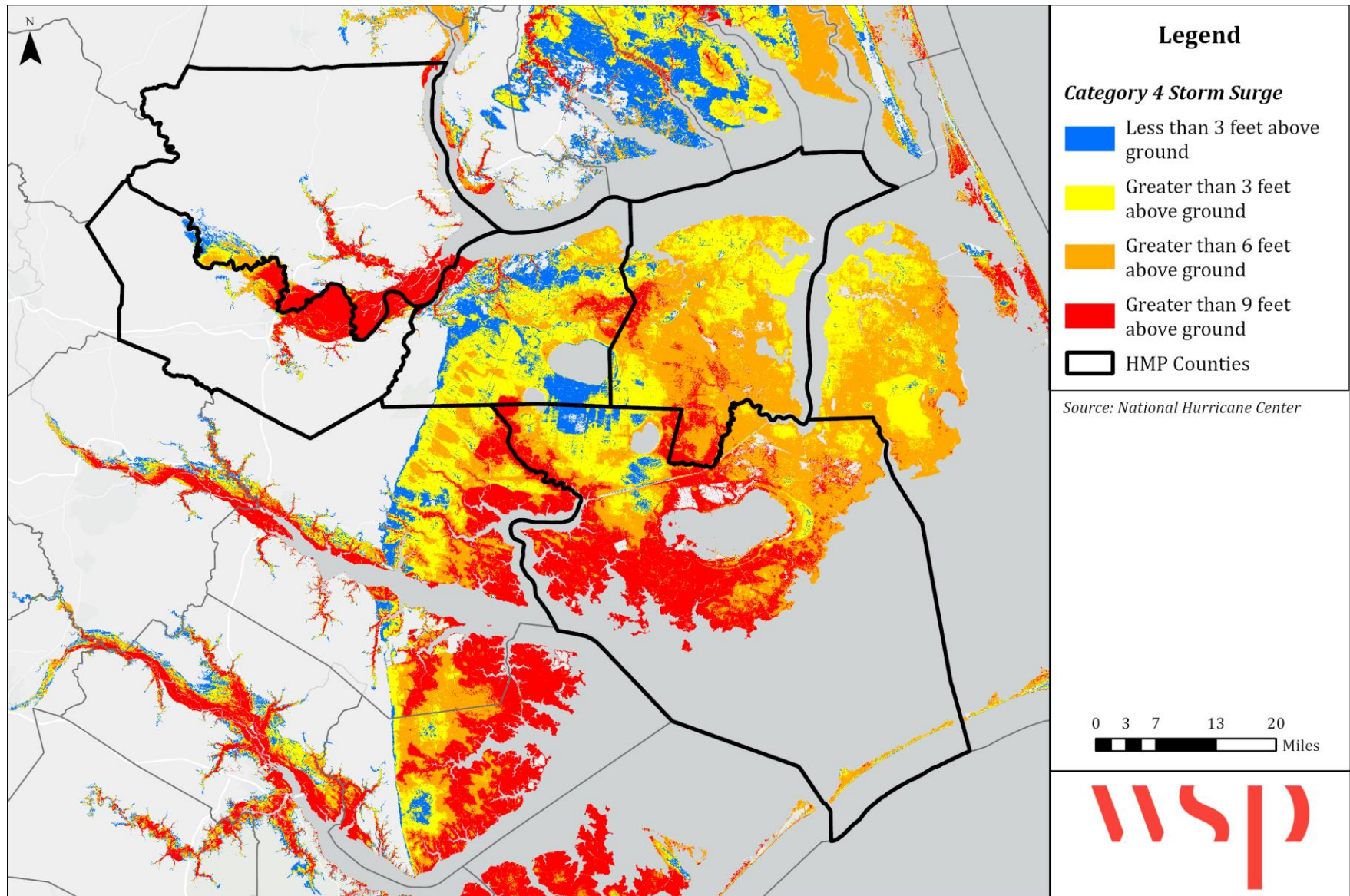


Figure 4.44 – Category 5 Storm Surge Inundation

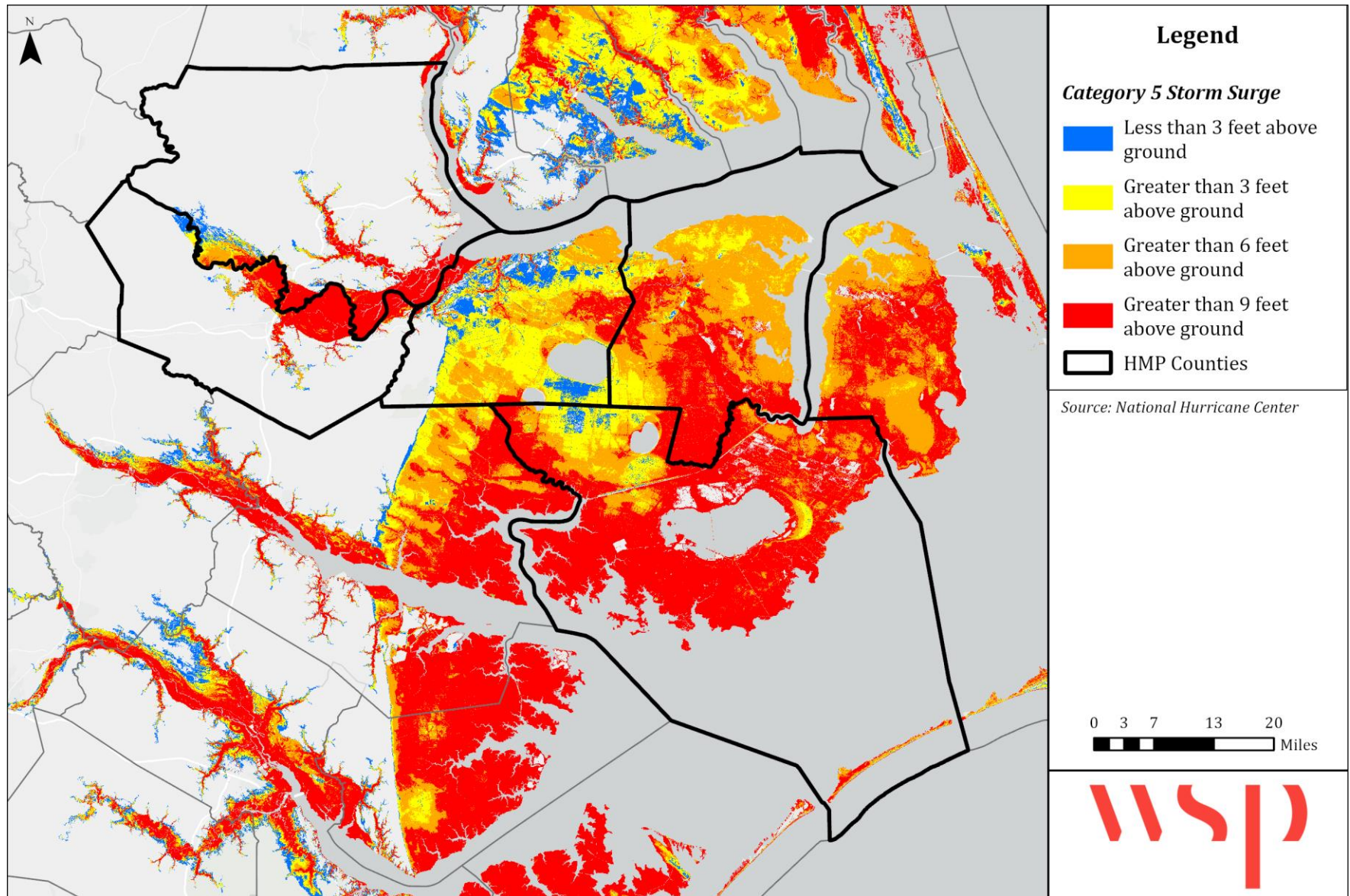
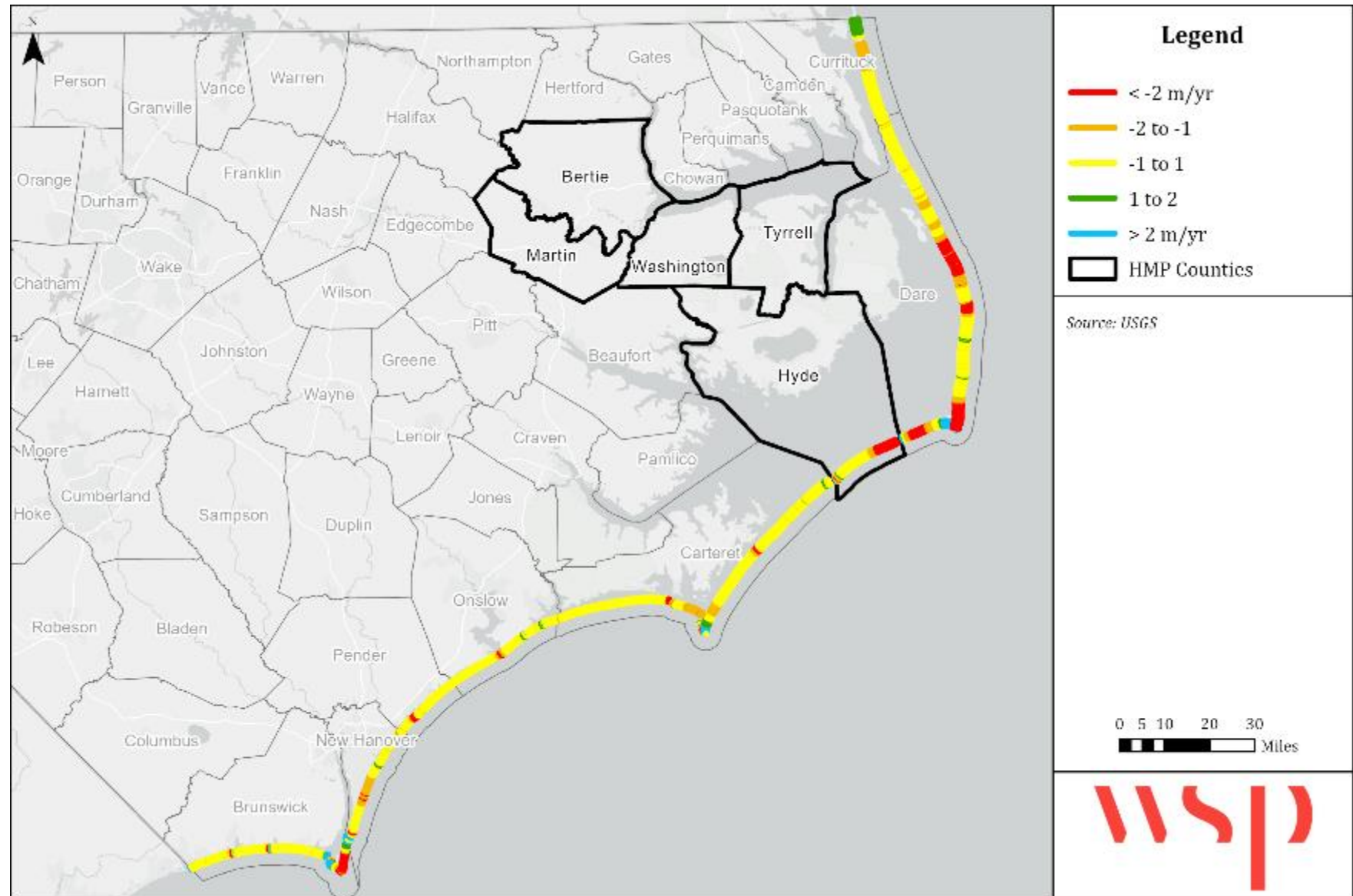


Figure 4.45 - Shoreline Change Along the North Carolina Coast



EXTENT

HURRICANES & TROPICAL STORMS

As an incipient hurricane develops, barometric pressure (measured in millibars or inches) at its center falls and winds increase. If the atmospheric and oceanic conditions are favorable, it can intensify into a tropical depression. When maximum sustained winds reach or exceed 39 miles per hour, the system is designated a tropical storm, given a name, and is closely monitored by the National Hurricane Center in Miami, Florida. When sustained winds reach or exceed 74 miles per hour the storm is deemed a hurricane. Hurricane intensity is further classified by the Saffir-Simpson Scale, detailed in Table 4.54, which rates hurricane intensity on a scale of 1 to 5, with 5 being the most intense.

Table 4.54 – Saffir-Simpson Scale

Category	Maximum Sustained Wind Speed (MPH)	Types of Damage
1	74-95	Very dangerous winds will produce some damage; Well-constructed frame homes could have damage to roof, shingles, vinyl siding and gutters. Large branches of trees will snap, and shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last a few to several days.
2	96-110	Extremely dangerous winds will cause extensive damage; Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or uprooted and block numerous roads. Near-total power loss is expected with outages that could last from several days to weeks.
3	111-129	Devastating damage will occur; Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes.
4	130-156	Catastrophic damage will occur; Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.
5	157 +	Catastrophic damage will occur; A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months.

Source: National Hurricane Center

The Saffir-Simpson Scale categorizes hurricane intensity linearly based upon maximum sustained winds and barometric pressure, which are combined to estimate potential damage. Categories 3, 4, and 5 are classified as “major” hurricanes and, while hurricanes within this range comprise only 20 percent of total

tropical cyclone landfalls, they account for over 70 percent of the damage in the United States. Table 4.55 describes the damage that could be expected for each category of hurricane. Damage during hurricanes may also result from spawned tornadoes, storm surge, and inland flooding associated with heavy rainfall that usually accompanies these storms.

Table 4.55 – Hurricane Damage Classifications

Storm Category	Damage Level	Description of Damages	Photo Example
1	MINIMAL	No real damage to building structures. Damage primarily to unanchored mobile homes, shrubbery, and trees. Also, some coastal flooding and minor pier damage.	
2	MODERATE	Some roofing material, door, and window damage. Considerable damage to vegetation, mobile homes, etc. Flooding damages piers and small craft in unprotected moorings may break their moorings.	
3	EXTENSIVE	Some structural damage to small residences and utility buildings, with a minor amount of curtainwall failures. Mobile homes are destroyed. Flooding near the coast destroys smaller structures, with larger structures damaged by floating debris. Terrain may be flooded well inland.	
4	EXTREME	More extensive curtainwall failures with some complete roof structure failure on small residences. Major erosion of beach areas. Terrain may be flooded well inland.	
5	CATASTROPHIC	Complete roof failure on many residences and industrial buildings. Some complete building failures with small utility buildings blown over or away. Flooding causes major damage to lower floors of all structures near the shoreline. Massive evacuation of residential areas may be required.	

Source: National Hurricane Center; Federal Emergency Management Agency

Located on the coast and along estuarine areas, the Northeastern NC Region is susceptible to every category of hurricane.

Impact: 4 – Catastrophic

EROSION

Overall, coastal erosion has a limited impact on the Region. Erosion events may cause property damage when severe but are unlikely to cause injury or death. Erosion is limited to areas along the coastline and surf zone. The magnitude of erosion can be measured as a rate of change from a measured previous condition. As part of their Digital Shoreline Analysis System version 4.3, USGS has developed short and long-term linear regression rate calculations as a metric for shoreline change, measured in meters per year. However, this data is not available for estuarine shorelines. Despite data limitations, the HMPC recognized that erosion is a general hazard of concern for the Region’s coastlines. Table 4.56 details

shoreline length as well as shoreline access structure and stabilization structures along the shoreline in each county in the Region per the North Carolina Division of Coastal Management.

Table 4.56 – Shoreline Length and Shoreline Structures

County	Estuarine Shoreline (miles)	Count of Shoreline Access Structures	Count of Stabilization Structures
Bertie	296.5	153	189
Hyde	785.9	478	374
Martin	-	-	-
Tyrrell	260.6	199	229
Washington	77.1	161	162

Source: NC Division of Coastal Management Estuarine Shoreline Mapping Project, 2012

Per this data, Hyde County has the greatest length of shoreline and has the most structures along the shoreline. Overall, the HMPC considered the impact erosion would have on these structures to be limited and the total area at risk negligible relative to the planning area as a whole.

Impact: 2 – Limited

HISTORICAL OCCURRENCES

HURRICANES & TROPICAL STORMS

According to the Office of Coastal Management's Tropical Cyclone Storm Segments data, which is a subset of the International Best Track Archive for Climate Stewardship (IBTrACS) dataset, 101 hurricanes and tropical storms have passed within 50 miles of the Northeastern NC Region since 1900. These storm tracks are shown in Figure 4.46. The date, storm name, storm category, and maximum wind speed of each event are detailed in Table 4.57.

Figure 4.46 – Hurricane/Tropical Storm Tracks within 50 miles of Northeastern NC Region, 1900-2023

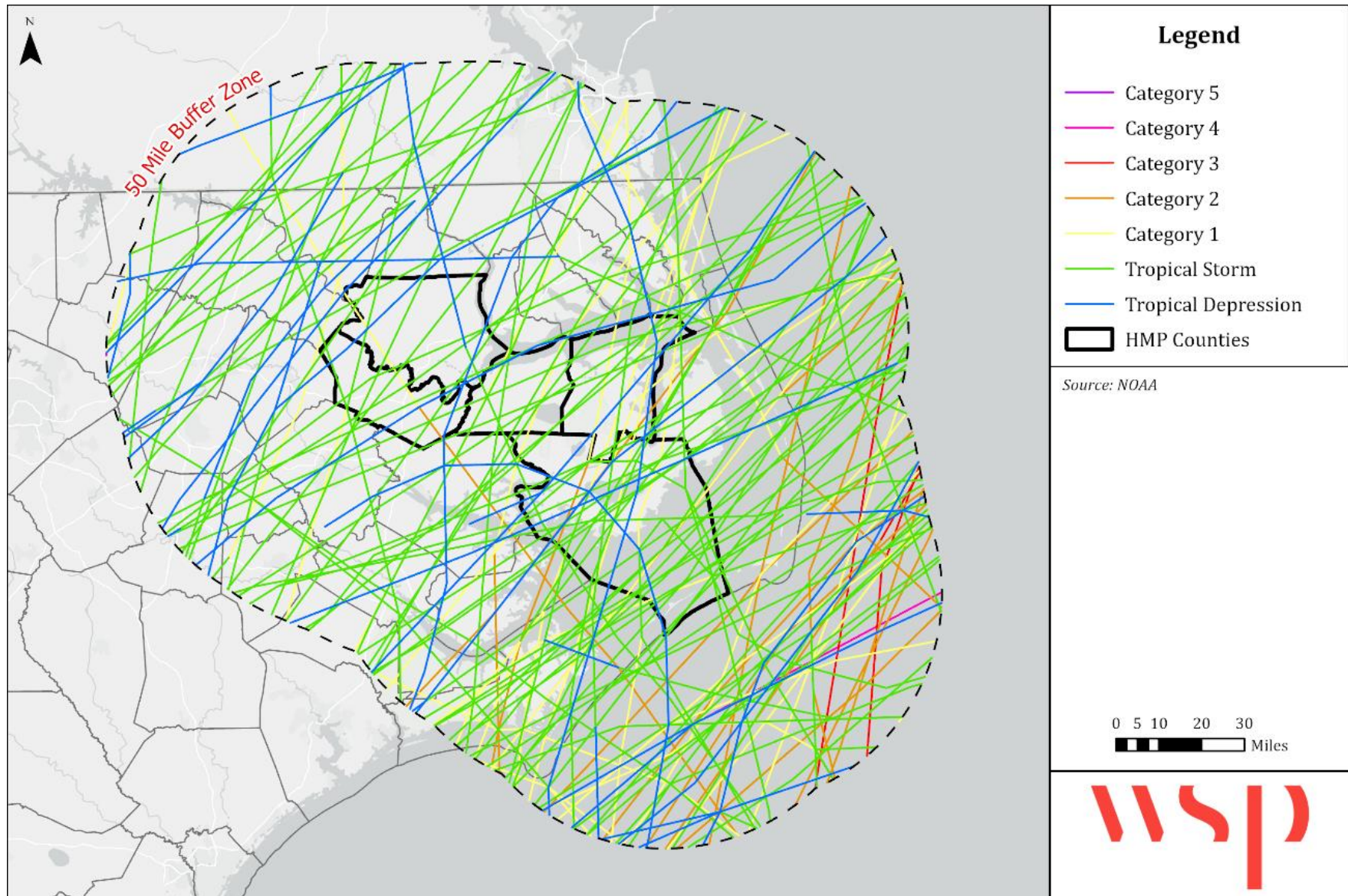


Table 4.57 – Hurricane/Tropical Storm Tracks within 50 Miles of Northeastern NC Region, 1900-2023

Date	Storm Name	Max Storm Category*	Max Wind Speed (mph)*
10/13/1900	Unnamed	Extratropical Storm	40
7/11/1901	Unnamed	Category 1	81
9/18/1901	Unnamed	Tropical Storm	40
9/14/1904	Unnamed	Tropical Storm	69
6/29/1907	Unnamed	Extratropical Storm	58
5/29/1908	Unnamed	Category 1	75
7/31/1908	Unnamed	Category 1	81
9/1/1908	Unnamed	Tropical Storm	52
8/28/1910	Unnamed	Extratropical Storm	46
10/20/1910	Unnamed	Tropical Storm	63
6/15/1912	Unnamed	Extratropical Storm	46
9/3/1913	Unnamed	Category 1	86
5/16/1916	Unnamed	Tropical Storm	40
9/6/1916	Unnamed	Tropical Storm	40
8/24/1918	Unnamed	Category 1	75
8/26/1924	Unnamed	Category 2	104
9/17/1924	Unnamed	Extratropical Storm	52
9/30/1924	Unnamed	Extratropical Storm	69
12/2/1925	Unnamed	Extratropical Storm	75
9/19/1928	Unnamed	Extratropical Storm	81
9/12/1930	Unnamed	Category 1	92
9/16/1932	Unnamed	Extratropical Storm	58
8/23/1933	Unnamed	Category 2	104
9/16/1933	Unnamed	Category 2	109
9/3/1934	Unnamed	Tropical Storm	46
9/8/1934	Unnamed	Category 1	92
9/6/1935	Unnamed	Tropical Storm	58
7/31/1937	Unnamed	Tropical Storm	63
10/11/1942	Unnamed	Extratropical Storm	52
8/2/1944	Unnamed	Tropical Storm	69
9/14/1944	Unnamed	Category 3	121
10/20/1944	Unnamed	Extratropical Storm	52
6/25/1945	Unnamed	Category 1	75
7/6/1946	Unnamed	Tropical Storm	52
7/7/1946	Unnamed	Tropical Storm	52
10/10/1946	Unnamed	Extratropical Storm	40
9/25/1947	Unnamed	Extratropical Storm	40
8/24/1949	Unnamed	Category 2	104
8/14/1953	Barbara	Category 1	92
5/29/1954	Unnamed	Tropical Storm	46
8/31/1954	Carol	Category 2	109
10/15/1954	Hazel	Category 4	132
8/12/1955	Connie	Category 2	98

SECTION 4: RISK ASSESSMENT

Date	Storm Name	Max Storm Category*	Max Wind Speed (mph)*
9/19/1955	Ione	Category 2	109
9/27/1956	Flossy	Extratropical Storm	58
10/17/1956	Unnamed	Extratropical Storm	58
9/27/1958	Helene	Category 4	138
7/10/1959	Cindy	Tropical Storm	46
8/2/1959	Unnamed	Tropical Storm	46
7/30/1960	Brenda	Tropical Storm	63
9/12/1960	Donna	Category 2	104
9/14/1961	Unnamed	Tropical Storm	40
8/28/1962	Alma	Category 1	75
9/1/1964	Cleo	Tropical Storm	46
9/14/1964	Dora	Tropical Storm	58
10/16/1964	Isbell	Category 1	75
9/16/1967	Doria	Tropical Storm	63
10/20/1968	Gladys	Category 1	81
8/28/1971	Doria	Tropical Storm	63
9/30/1971	Ginger	Category 1	86
6/22/1972	Agnes	Tropical Storm	52
6/29/1975	Amy	Tropical Storm	40
10/27/1975	Hallie	Tropical Storm	52
8/20/1981	Dennis	Tropical Storm	69
6/19/1982	Subtrop: Unnamed	Subtropical Storm	69
9/14/1984	Diana	Tropical Storm	58
9/27/1985	Gloria	Category 2	104
11/22/1985	Kate	Tropical Storm	52
8/18/1986	Charley	Category 1	81
8/19/1991	Bob	Category 2	109
9/25/1992	Danielle	Tropical Storm	63
8/31/1993	Emily	Category 3	115
6/6/1995	Allison	Extratropical Storm	46
6/19/1996	Arthur	Tropical Storm	46
7/13/1996	Bertha	Category 1	75
10/8/1996	Josephine	Extratropical Storm	52
7/24/1997	Danny	Tropical Storm	46
8/27/1998	Bonnie	Category 2	98
9/4/1998	Earl	Extratropical Storm	58
9/4/1999	Dennis	Tropical Storm	69
9/16/1999	Floyd	Category 2	104
10/18/1999	Irene	Category 2	109
9/24/2000	Helene	Tropical Storm	46
9/10/2002	Gustav	Tropical Storm	63
10/12/2002	Kyle	Tropical Storm	46
9/18/2003	Isabel	Category 2	104
8/3/2004	Alex	Category 2	98

SECTION 4: RISK ASSESSMENT

Date	Storm Name	Max Storm Category*	Max Wind Speed (mph)*
8/14/2004	Charley	Tropical Storm	69
9/15/2005	Ophelia	Category 1	86
6/14/2006	Alberto	Extratropical Storm	40
9/1/2006	Ernesto	Tropical Storm	58
6/3/2007	Barry	Extratropical Storm	46
9/9/2007	Gabrielle	Tropical Storm	58
7/20/2008	Cristobal	Tropical Storm	52
9/6/2008	Hanna	Tropical Storm	69
8/27/2011	Irene	Category 1	86
6/7/2013	Andrea	Extratropical Storm	46
7/4/2014	Arthur	Category 2	98
6/7/2016	Colin	Extratropical Storm	52
9/3/2016	Hermine	Extratropical Storm	69
10/9/2016	Matthew	Category 1	81
8/30/2017	Unnamed	Tropical Storm	38
10/12/2018	Michael	Tropical Storm	55
9/7/2019	Dorian	Category 2	90
10/21/2019	Nestor	Tropical Storm	40
5/19/2020	Arthur	Tropical Storm	45
7/10/2020	Fay	Tropical Storm	35
8/5/2020	Isaias	Tropical Storm	60
6/22/2021	Claudette	Tropical Storm	40
7/9/2021	Elsa	Tropical Storm	45
9/24/2023	Ophelia	Tropical Storm	60

*Reports the most intense category and wind speed that occurred within 50 miles of the Northeastern NC Region, not for the storm event overall.

Source: Office of Coastal Management, 2025. <https://marinecadastre.gov/data/>

The above list of storms is not an exhaustive list of hurricanes that have affected the Northeastern NC Region. Several storms, including Hurricane Earl and Hurricane Sandy, have passed further than 50 miles away from the Northeastern NC Region yet had strong enough wind or rain impacts to affect the region. NCEI records hurricane and tropical storm events across the region by county and zone; therefore, one event that impacts all four counties in the region is recorded for each county. During the 26-year period from 1999 through 2024, NCEI records 102 hurricane and tropical storm reports across 32 separate days. These events are summarized in Table 4.58 by storm. All death, injury, and damage records were combined from all counties/zones. Where property damage estimates were broken out by type, NCEI reports only the value of wind-related damages. Event narratives following this table provide a fuller scope of the impacts from selected events.

Table 4.58 - Recorded Hurricane/Tropical Storm Winds in Northeastern NC Counties, 1999-2024

Date	Storm	Deaths/ Injuries	Property Damage	Crop Damage
8/30 - 9/1/1999	Hurricane Dennis	0/0	\$5,000	\$19,000,000
9/14 - 9/15/1999	Hurricane Floyd	0/0	\$8,824,000	\$55,200,000
10/16 - 10/17/1999	Hurricane Irene	0/0	\$3,000	\$0
9/10/2002	Tropical Storm Gustav	0/0	\$55,000	\$0

SECTION 4: RISK ASSESSMENT

Date	Storm	Deaths/ Injuries	Property Damage	Crop Damage
9/17 - 9/18/2003	Hurricane Isabel	0/0	\$14,500,000	\$0
8/3/2004	Hurricane Alex	0/0	\$5,000,000	\$0
8/14/2004	Tropical Storm Charley	0/0	\$175,000	\$450,000
9/13/2005	Hurricane Ophelia	0/0	\$50,000	\$0
8/31/2006	Tropical Storm Ernesto	0/0	\$65,000	\$0
7/20/2008	Tropical Storm Cristobal	0/0	\$0	\$0
9/5/2008	Tropical Storm Hannah	0/0	\$30,000	\$0
9/2/2010	Hurricane Earl	0/0	\$24,200	\$2,000,000
8/26 - 8/27/2011	Hurricane Irene	0/0	\$89,300,000	\$60,000,000
10/28/2012	Hurricane Sandy	0/0	\$100,000	\$0
6/6/2013	Tropical Storm Andrea	0/0	\$0	\$0
7/3 - 7/4/2014	Hurricane Arthur	0/0	\$0	\$0
9/2/2016	Hurricane Hermine	0/0	\$0	\$0
10/8/2016	Hurricane Matthew	0/0	\$0	\$0
9/13/2018	Hurricane Florence	0/0	\$14,984,000	\$0
10/11/2018	Hurricane Michael	0/0	\$0	\$0
9/5-9/6/2019	Hurricane Dorian	0/0	\$15,000	\$0
8/4/2020	Hurricane Isaias	0/0	\$500,000	\$0
7/8/2021	Tropical Storm Elsa	0/0	\$15,000	\$0
9/30/2022	Hurricane Ian	0/0	\$0	\$0
9/23/2023	Tropical Storm Ophelia	0/0	\$0	\$0
8/8/2024	Tropical Storm Debby	0/0	\$0	\$0
Total		0/0	\$72,545,200	\$136,650,000

Source: NCEI

September 14-15, 1999 – Hurricane Floyd caused massive record flooding across inland sections of eastern North Carolina. At its peak on the morning of September 13th, the winds were 155 mph and the central pressure bottomed out at 921 mb. September 14th the first outer rainbands began affecting eastern North Carolina and in turn, reports of flooding began filtering into the National Weather Service office in Morehead City/Newport (MHX). At least 40 official shelters were open across the county warning area. Severe weather and rainfall preceded landfall. Estimates were near 6 to 10 inches with isolated areas of 12 to 15 inches. Hurricane Floyd made landfall on the morning of September 16th near North Topsail Beach as a category 2 hurricane. The eye moved northeast over Jacksonville, New Bern, Washington, and Plymouth and continued over the eastern shores of Virginia. As the hurricane moved over the eastern coast of North Carolina, it accelerated and weakened. It lost its tropical characteristics early on the 17th.

Similar to rainfall, the strongest ocean storm surges occurred west and northwest of the eye. Ocean storm surges were about 4 to 6 feet above normal, generally affecting Onslow, Carteret, and Hyde Counties. This caused extensive beach erosion on the south facing beaches. Ocracoke Island officials reported at least 10 new dune breaks along Highway 12. Along the Albemarle Sound, storm tides were about 5 to 6 feet above normal. The Pamlico River storm tides were around 6 to 8 feet above normal. Water levels were especially high in Hyde County. Extreme flooding was experienced across most counties. Inland flooding exceeded Hurricane Bertha, Fran, Bonnie, and Dennis combined. Most counties reported their worst flooding ever. The Roanoke River in Williamston rose to nearly 3 feet above its flood stage. Unbelievable numbers of homes were covered with water and over half a million customers throughout the county warning area were without power. In the Northeastern NC region, as reported by NCEI, wind

associated with Floyd caused \$8,824,000 in property damages and over \$55 million in crop damages, however there were no reported fatalities or injuries.

September 17-18, 2003 – Hurricane Isabel made landfall early in the afternoon on September 18th as a category two hurricane across Core Banks in extreme eastern Carteret County. Isabel moved north northwest near 20 mph across eastern North Carolina during the afternoon. Areas mainly near and east of the storm center experienced significant wind and storm surge effects. Major ocean over wash and beach erosion occurred along the North Carolina Outer Banks where waves up to 20 feet accompanied a 6-to-8-foot storm surge. Eastern Carteret, eastern Pamlico, southern Craven, Beaufort, and Hyde counties experienced significant storm surge damage with hundreds of homes flooded in most of these counties. Storm surges from 2 to 6 feet occurred across Hyde County with the highest water levels recorded in Swan Quarter in the southwest part of the county where hundreds of homes and businesses flooded. Wind damage was more significant across Hyde, Washington, Tyrell, Martin, and the Outer Banks counties where wind gusts of around 100 mph occurred. Hurricane force winds resulted in structural damage to homes. Numerous trees and power lines were downed across these areas resulting in a loss of electricity for several weeks in some locations. Isabel will be remembered for the extensive power outages in northeast North Carolina, and permanent change to the landscape from all the fallen trees and storm surge. Winds associated with Hurricane Isabel caused \$14.5 million in damages in the Northeastern NC Region.

August 26-27, 2011 – Hurricane Irene made landfall near Cape Lookout as a large category 1 storm. Due to the large size of the hurricane, strong damaging winds, major storm surge, and flooding rains were experienced across much of eastern North Carolina. Across the Northeastern NC Region, winds gusted to 50 to 60 miles per hour, resulting in downed trees and power lines with power outages. A 3 to 5-foot surge occurring along the Albemarle Sound including Plymouth. Winds also resulted in total water level rises including wave action of 11 to 14 feet causing several dune breaches across highway 12 in Ocracoke. Sound-side surge was minimal, only up to 2-feet however on mainland Hyde County surge was 5 to 6-feet. Rainfall ranged from 7 to 8 inches in Hyde County up to 13 inches in Bertie County and 14 inches in Martin County. Low-lying roads experienced flooding and significant damage occurred to structures and crops across the region. Much of the region experienced extensive power outages. Additionally, two hurricanes – an EF1 near Creswell, and an EF2 near Columbia, touched down, adding to the damage, particularly to manufactured homes.

September 13, 2018 – Hurricane Florence was a long-lived Cape Verde hurricane and the wettest tropical cyclone on record in the Carolinas. By the evening of September 13, Florence had been downgraded to a Category 1 hurricane. Hurricane Florence made landfall near Wrightsville Beach early on Saturday September 15 and weakened further as it slowly moved inland. Thousands of downed trees caused widespread power outages to nearly all of eastern North Carolina. The historic legacy of Hurricane Florence will be record-breaking storm surge of 9 to 13 feet and widespread devastating rainfall of 20 to 30 inches, locally up to 36 inches, which produced catastrophic and life-threatening flooding. In the Northeastern NC Region, rainfall was generally 3 to 8 inches, with a storm total of 7.53 inches in Williamston. Winds gusted up to 62 miles per hour. The gusty winds combined with saturated ground led to some downed trees with and power outages. Property damages totaled almost \$15 million across the region.

August 4, 2020 – Hurricane Isaias originated from a vigorous tropical wave off the coast of Africa that was first identified by the National Hurricane Center on July 23, 2020. The tropical wave gradually became more organized and became Tropical Storm Isaias on July 30. Isaias marked the earliest ninth named storm on record, surpassing 2005's Hurricane Irene by eight days. Isaias strengthened into a Category 1 hurricane the next day, reaching a peak intensity of 85 mph. On August 1, the storm made landfall on North Andros, Bahamas and subsequently weakened to a tropical storm before paralleling the east coast of Florida and Georgia. As it approached the Carolina coastline, it re-intensified to a hurricane

shortly before making landfall near Ocean Isle Beach, North Carolina, at 11:10 PM EDT on August 3 as a Category 1 hurricane and proceeded to accelerate up the East Coast of the United States. Across eastern North Carolina, Isaias produced tropical storm force winds, pockets of heavy rainfall, minor storm surge and tornadoes.

September 23, 2023 – Tropical Storm Ophelia made landfall in Emerald Island, NC (in the southeast part of the state) at 6:20 AM on Saturday, 9/23 as a tropical storm with 70 mph winds. Ophelia gradually weakened (and lost tropical characteristics) as it tracked northward toward the Wakefield CWA during the day on Saturday. Ophelia tracked northward roughly along the I-95 corridor during the afternoon and evening hours on Saturday, reaching the Richmond Metro Area while weakening to a depression. Ophelia became a post-tropical cyclone shortly thereafter and exited to the north/northeast on Sunday. Northeast winds gusted as high as 50-65 mph near the VA/NC coast well in advance of Ophelia Friday evening into early Saturday morning (due to a tight gradient between high pressure over New England and the tropical storm to the south), with 25-45 mph gusts farther inland. Winds turned to the SE near the coast on Saturday and a few gusts to 40-45 mph were observed (while winds remained northeast inland west of the low track).

In addition to wind impacts, the Northeastern NC Region has experienced storm surge from hurricane and tropical storm events, affecting Hyde, Tyrrell, and Washington Counties. Table 4.59 summarizes all recorded storm surge events from NCEI between 1999 and 2024. These events caused over \$61 million in property damage. Narrative records on storm surge impacts are provided below.

Table 4.59 – Recorded Storm Surge Events in Northeastern NC Counties, 1999-2024

Date	Location	Deaths/ Injuries	Property Damage	Crop Damage
5/6/2005	EASTERN HYDE (ZONE)	0/0	\$0	\$0
7/20/2008	EASTERN HYDE (ZONE)	0/0	\$0	\$0
8/26/2011	WESTERN HYDE (ZONE)	0/0	\$40,000,000	\$0
8/26/2011	TYRRELL (ZONE)	0/0	\$20,000,000	\$0
8/26/2011	WASHINGTON (ZONE)	0/0	\$1,000,000	\$0
8/26/2011	EASTERN HYDE (ZONE)	0/0	\$0	\$0
10/28/2012	EASTERN HYDE (ZONE)	0/0	\$100,000	\$0
Total		0/0	\$61,100,000	\$0

Source: NCEI

May 6, 2005 – An unseasonable and strong Nor'easter buffeted the North Carolina coast on the 6th with damaging wind gusts, torrential rain, high surf, and coastal flooding. Winds were sustained as high as 45 to 55 mph with wind gusts to 80 mph across coastal counties of Eastern North Carolina. Water levels rose four to six feet above normal along Pamlico Sound, and the lower reaches of the Neuse River.

August 26, 2011 (Hurricane Irene) – Hurricane Irene made landfall during the morning of the 27th, near Cape Lookout, as a large category 1 hurricane on the Saffir/Simpson Hurricane Wind Scale. Due to the large size of the hurricane, strong damaging winds, major storm surge, and flooding rains were experienced across much of eastern North Carolina. Millions of dollars in damages were reported across the area. Storm surge damages were estimated at 240 million dollars. The highest storm surges of 8-11 feet occurred along the Pamlico Sound, and the lower reaches of the Neuse and Pamlico Rivers on the 27th. In western Hyde County, winds gusting above hurricane force resulted in sound-side storm surge of 5 to 6 feet with minor to moderate structural damage. In eastern Hyde, winds gusting above hurricane force resulted in total water level rises including wave action of 11 to 14 feet causing several dune breaches across highway 12 in Ocracoke. Sound-side surge was minimal up to 2 feet. Winds gusted up to

hurricane force resulting in a 3-to-5-foot surge along the Albemarle Sound including the Columbia area in Tyrrell County and Plymouth in Washington County.

October 28, 2012 (Hurricane Sandy) – Maximum wind gusts were estimated from 50 mph in mainland Hyde County to 60 mph in Outer Banks Hyde County. Storm surge ranged from 1 foot across mainland Hyde County in Engelhard to 3 feet sound-side in Ocracoke. Minor to moderate beach erosion occurred due to large breaking waves. Several homes were flooded due to sound-side surge. Damages were estimated at one hundred thousand dollars due to storm surge.

EROSION

Though it can be exacerbated by major storms, erosion is an ongoing occurrence. The characteristics of a shoreline can impact the rate at which erosion occurs. According to a Soundfront Series report on Shoreline Erosion by NC Division of Coastal Management, North Carolina Sea Grant, and North Carolina State University, Tyrrell County has primarily low-bank shorelines for which erosion is typically very severe, while high-bank shorelines, for which erosion rates are high, are most common in Bertie County.

The Soundfront Series report also presents historical erosion rates by county from a 1975 USDA-SCS study. The study examined shoreline positions based on aerial photography available over a range of years between 1949 and 1970. Table 4.60 summarizes these statistics for the Northeastern NC Region coastal counties.

Table 4.60 – Summary of Historical Shoreline Erosion Data

County	Length of Shoreline Studied	Portion of Shoreline Eroding	Time Period Studied	Average Bank Height	Average Erosion Rate
Bertie	27 mi	73%	32 yrs	15.7 ft	0.9 ft/yr
Hyde	235 mi	100%	25 yrs	0.8 ft	3.0 ft/yr
Tyrrell	90 mi	100%	22 yrs	1.6 ft	2.0 ft/yr
Washington	26 mi	96%	32 yrs	4.5 ft	4.5 ft/yr

Source: 1975 USDA-SCS study referenced in Soundfront Series Shoreline Erosion Report

While newer data is not readily available, the above statistics indicate that as of 1970 all coastal counties in the Northeastern NC Region were experiencing erosion along at least some portion of their shoreline.

PROBABILITY OF FUTURE OCCURRENCE

HURRICANES & TROPICAL STORMS

Substantial hurricane damage is most likely to be expected in the easternmost counties of the state; however, hurricane and tropical storm-force winds have significantly impacted areas far inland. In the 26-year period from 1999 through 2024, 26 separate hurricanes and tropical storms have impacted the Northeastern NC Region according to records in NCEI, which equates to a 100 percent annual probability of hurricane winds impacting the planning area in any given year. This probability does not account for impacts from hurricane rains and storm surge, which may also be severe in the region. The probability of a hurricane or tropical storm impacting the Northeastern NC Region is highly likely.

Probability: 4 – Highly Likely

EROSION

Erosion and accretion are natural processes that are likely to continue to occur. Although data on historical erosion rates is only available for ocean shorelines, erosion is expected to continue affecting estuarine shorelines as well. The likelihood of significant instances of erosion will likely be tied to the occurrence of hurricane, tropical storm, and nor'easter events.

Probability: 4 – Highly Likely

CLIMATE CHANGE

Changing climate and weather conditions may increase the number and frequency of future hurricane events. Hurricanes and other coastal storms may result in increased flooding, injuries, deaths, and extreme property loss. According to the US Government Accountability Office, national storm losses from changing frequency and intensity of storms is projected to increase anywhere from \$4-6 billion in the near future.

According to NOAA, weather extremes will likely cause more frequent, stronger storms in the future due to rising surface temperatures. NOAA models predict that while there may be less frequent, low-category storm events (Tropical Storms, Category 1 Hurricanes), there will be more high-category storm events (Category 4 and 5 Hurricanes) in the future. This means that there may be fewer hurricanes overall in any given year, but when hurricanes do form, it is more likely that they will become large storms that can create massive damage.

Given that climate change is expected to make heavy rain events and tropical storms and hurricanes more frequent and intense, the erosion typically caused by these storms can be expected to occur more frequently. Additionally, sea level rise along the North Carolina coast will likely result in an increase in storm surge flooding and eroded shorelines.

VULNERABILITY ASSESSMENT

METHODOLOGIES AND ASSUMPTIONS

Property at risk to hurricanes was estimated using data from the NCEM IRISK database, which was compiled in NCEM's Risk Management Tool. The vulnerability data displayed below is for wind-related damages. Hurricanes may also cause substantial damages from heavy rains and subsequent flooding, which is addressed in Section 4.5.6 Flooding.

PEOPLE

The very young, the elderly and the handicapped are especially vulnerable to harm from hurricanes. For those who are unable to evacuate for medical reasons, there should be provision to take care of special-needs patients and those in hospitals and nursing homes. Many of these patients are either oxygen-dependent, insulin-dependent, or in need of intensive medical care. There is a need to provide ongoing treatment for these vulnerable citizens, either on the coast or by air evacuation to upland hospitals. The stress from disasters such as a hurricane can result in immediate and long-term physical and emotional health problems among victims.

Erosion is unlikely to have any direct impact on the health or safety of individuals. However, it may cause indirect harm by weakening structures and by changing landscapes in ways that increase risk of other hazard impacts. For example, streambank erosion can cause sedimentation that decreases the stream's capacity and forces floodwaters to overtop the banks.

PROPERTY

General damages to property are both direct (what the winds associated with hurricanes physically destroy) and indirect, which focuses on additional costs, damages and losses attributed to secondary hazards spawned by the hurricane, or due to the damages caused by the storm. Depending on the size and strength of the hurricane, associated winds are capable of damaging and eventually destroying almost anything. Construction practices and building codes can help maximize the resistance of structures to damage.

Secondary impacts of damage due to hurricane winds often result from damage to infrastructure. Downed power and communications transmission lines, coupled with disruptions to transportation, create difficulties in reporting and responding to emergencies. These impacts of a hurricane put tremendous strain on a community. In the immediate aftermath of a hurricane, the focus is on emergency services.

Hurricanes and tropical storm winds can also cause agricultural damages. For the Northeastern NC Region, USDA RMA reports losses of \$55,979,499 from 2010-2023 due to hurricanes and tropical storms, which equates to an average annual loss of \$3,998,535. Table 4.61 summarizes insured crop losses due to hurricanes and tropical storms reported in the RMA system by county.

Table 4.61 – Crop Losses Due to Hurricanes and Tropical Storms, 2010-2024

Year	Bertie	Hyde	Martin	Tyrrell	Washington	Total
2010	-	\$8,245	\$1,036	-	\$102,128	\$111,409
2011	\$6,869,770	\$2,688,139	\$10,723,635	\$752,728	\$3,260,288	\$24,294,560
2012	-	\$371,342	\$22,501	\$100,765	\$4,169	\$498,777
2014	\$92,306	\$2,733,202	\$443,721	\$541,813	\$73,282	\$3,884,324
2015	-	-	\$456	\$41,183	\$104,944	\$146,583
2016	\$275,952	\$929,758	\$1,898,592	\$228,312	\$1,124,709	\$4,457,323
2017	\$264,073	\$94,150	\$110,787	\$27,632	-	\$496,642
2018	\$512,937	\$1,385,474	\$1,993,115	\$131,618	\$1,689,414	\$5,712,558
2019	\$697,767	\$508,426	\$1,369,743	\$262,146	\$961,832	\$3,799,914
2020	\$1,220,484	\$1,706,466	\$2,140,722	\$1,306,385	\$2,459,887	\$8,833,944
2022	\$117,692	\$136,285	\$50,011	\$755	\$42,073	\$346,816
2023	\$213,985	\$2,460,075	\$409,829	\$42,005	\$270,755	\$3,396,649
Total	\$10,264,966	\$13,021,562	\$19,164,148	\$3,435,342	\$10,093,481	\$55,979,499

Source: USDA Risk Management Agency

Table 4.62 through Table 4.66 detail buildings at risk and provide damage estimates across all jurisdictions for the 25-, 50-, 100-, 300-, and 700-year hurricane wind events. All scenarios impacted approximately the same number of buildings but with varying severity of damage.

The damage estimates for the 100-year hurricane wind event total \$171,501,824, which equates to a loss ratio of 3.7 percent. The loss ratio is the damage estimate divided by the total potential exposure (i.e., total value of all buildings in the planning area), displayed as a percentage of value at risk. FEMA considers loss ratios greater than 10% to be significant and an indicator a community may have more difficulties recovering from an event. These damage estimates account for only wind impacts and actual damages would likely be higher due to flooding. Therefore, the Region would likely experience a higher overall loss ratio from the 100-year hurricane event and face difficulty recovering from such an event.

SECTION 4: RISK ASSESSMENT

Table 4.62 – Buildings at Risk from 25-Year Hurricane Winds

Jurisdiction	All Buildings	Residential Buildings at Risk			Commercial Buildings at Risk			Public Buildings at Risk			Total Buildings at Risk		
	Num	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages
Bertie													
Unincorporated Bertie County	11,175	8,686	78%	\$1,722,040	2,275	20%	\$366,666	158	1%	\$94,427	11,119	99%	\$2,183,133
Town of Askewville	502	383	76%	\$72,583	107	21%	\$7,553	12	2%	\$5,563	502	100%	\$85,700
Town of Aulander	744	640	86%	\$122,743	90	12%	\$14,485	14	2%	\$1,745	744	100%	\$138,973
Town of Colerain	428	333	78%	\$107,731	74	17%	\$25,244	14	3%	\$2,049	421	98%	\$135,023
Town of Kelford	173	150	87%	\$9,513	14	8%	\$104	4	2%	\$123	168	97%	\$9,740
Town of Lewiston-Woodville	719	597	83%	\$120,947	106	15%	\$7,189	16	2%	\$1,306	719	100%	\$129,442
Town of Powellsville	171	148	87%	\$38,973	16	9%	\$782	7	4%	\$564	171	100%	\$40,319
Town of Roxobel	205	153	75%	\$14,207	48	23%	\$639	4	2%	\$205	205	100%	\$15,051
Town of Windsor	1,815	1,442	79%	\$306,043	307	17%	\$45,222	64	4%	\$18,750	1,813	100%	\$370,016
Subtotal Bertie	15,932	12,532	79%	\$2,514,780	3,037	19%	\$467,884	293	2%	\$124,732	15,862	100%	\$3,107,397
Hyde													
Unincorporated Hyde County	5,596	4,272	76%	\$6,561,262	747	13%	\$570,476	97	2%	\$139,143	5,116	91%	\$7,270,881
Martin													
Unincorporated Martin County	12,188	8,559	70%	\$3,711,344	3,414	28%	\$838,055	208	2%	\$258,896	12,181	100%	\$4,808,294
Town of Bear Grass	81	55	68%	\$20,178	7	9%	\$1,362	19	23%	\$7,358	81	100%	\$28,897
Town of Everetts	159	151	95%	\$44,989	8	5%	\$660	0	0%	\$0	159	100%	\$45,649
Town of Hamilton	292	233	80%	\$85,146	26	9%	\$5,108	32	11%	\$16,212	291	100%	\$106,466
Town of Hassell	70	59	84%	\$24,231	11	16%	\$1,392	0	0%	\$0	70	100%	\$25,623

SECTION 4: RISK ASSESSMENT

Jurisdiction	All Buildings	Residential Buildings at Risk			Commercial Buildings at Risk			Public Buildings at Risk			Total Buildings at Risk		
	Num	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages
Town of Jamesville	297	228	77%	\$87,403	43	14%	\$23,728	22	7%	\$6,800	293	99%	\$117,930
Town of Oak City	313	302	96%	\$150,074	10	3%	\$923	1	0%	\$3,759	313	100%	\$154,756
Town of Parmele	149	132	89%	\$56,943	16	11%	\$6,905	1	1%	\$624	149	100%	\$64,472
Town of Robersonville	901	783	87%	\$424,249	107	12%	\$37,097	11	1%	\$3,894	901	100%	\$465,240
Town of Williamston	4,238	3,104	73%	\$1,309,456	880	21%	\$406,676	247	6%	\$300,507	4,231	100%	\$2,016,640
Subtotal Martin	18,688	13,606	73%	\$5,914,013	4,522	24%	\$1,321,906	541	3%	\$598,050	18,669	100%	\$7,833,967
Tyrrell													
Unincorporated Tyrrell County	2,794	2,012	72%	\$1,156,247	508	18%	\$112,745	42	2%	\$447,542	2,562	92%	\$1,716,535
Town of Columbia	519	408	79%	\$164,889	66	13%	\$853,042	34	7%	\$81,950	508	98%	\$1,099,881
Subtotal Tyrrell	3,313	2,420	73%	\$1,321,136	574	17%	\$965,787	76	2%	\$529,492	3,070	93%	\$2,816,416
Washington													
Unincorporated Washington County	5,482	3,940	72%	\$1,299,502	1,354	25%	\$131,493	84	2%	\$11,296	5,378	98%	\$1,442,290
Town of Creswell	366	274	75%	\$122,834	68	19%	\$16,177	22	6%	\$10,147	364	99%	\$149,158
Town of Plymouth	2,779	2,338	84%	\$441,705	330	12%	\$94,085	105	4%	\$16,063	2,773	100%	\$551,854
Town of Roper	611	505	83%	\$103,133	81	13%	\$3,966	20	3%	\$59,217	606	99%	\$166,316
Subtotal Washington	9,238	7,057	76%	\$1,967,174	1,833	20%	\$245,721	231	3%	\$96,723	9,121	99%	\$2,309,618
Region Total	52,767	39,887	76%	\$18,278,365	10,713	20%	\$3,571,774	1,238	2%	\$1,488,140	51,838	98%	\$23,338,279

Source: NCEM Risk Management Tool

SECTION 4: RISK ASSESSMENT

Table 4.63 – Buildings at Risk from 50-Year Hurricane Winds

Jurisdiction	All Buildings	Residential Buildings at Risk			Commercial Buildings at Risk			Public Buildings at Risk			Total Buildings at Risk		
	Num	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages
Bertie													
Unincorporated Bertie County	11,175	8,687	78%	\$4,645,960	2,275	20%	\$1,585,388	158	1%	\$324,211	11,120	100%	\$6,555,559
Town of Askewville	502	383	76%	\$181,733	107	21%	\$21,250	12	2%	\$20,041	502	100%	\$223,025
Town of Aulander	744	640	86%	\$343,141	90	12%	\$46,667	14	2%	\$5,813	744	100%	\$395,621
Town of Colerain	428	333	78%	\$260,185	74	17%	\$74,281	14	3%	\$8,302	421	98%	\$342,768
Town of Kelford	173	155	90%	\$88,732	14	8%	\$1,630	4	2%	\$1,742	173	100%	\$92,103
Town of Lewiston-Woodville	719	597	83%	\$314,961	106	15%	\$33,607	16	2%	\$5,234	719	100%	\$353,802
Town of Powellsville	171	148	87%	\$92,286	16	9%	\$3,186	7	4%	\$2,501	171	100%	\$97,974
Town of Roxobel	205	153	75%	\$67,651	48	23%	\$4,155	4	2%	\$603	205	100%	\$72,408
Town of Windsor	1,815	1,442	79%	\$791,216	307	17%	\$140,620	64	4%	\$52,360	1,813	100%	\$984,196
Subtotal Bertie	15,932	12,538	79%	\$6,785,865	3,037	19%	\$1,910,784	293	2%	\$420,807	15,868	100%	\$9,117,456
Hyde													
Unincorporated Hyde County	5,596	4,272	76%	\$19,657,721	747	13%	\$1,906,100	97	2%	\$576,418	5,116	91%	\$22,140,239
Martin													
Unincorporated Martin County	12,188	8,559	70%	\$9,355,294	3,414	28%	\$3,106,569	208	2%	\$1,025,067	12,181	100%	\$13,486,930
Town of Bear Grass	81	55	68%	\$61,592	7	9%	\$7,438	19	23%	\$32,701	81	100%	\$101,730
Town of Everetts	159	151	95%	\$106,488	8	5%	\$3,122	0	0%	\$0	159	100%	\$109,610
Town of Hamilton	292	233	80%	\$204,454	26	9%	\$23,207	32	11%	\$71,585	291	100%	\$299,246
Town of Hassell	70	59	84%	\$73,277	11	16%	\$6,054	0	0%	\$0	70	100%	\$79,331
Town of Jamesville	297	228	77%	\$222,224	43	14%	\$97,079	22	7%	\$27,216	293	99%	\$346,519
Town of Oak City	313	302	96%	\$472,120	10	3%	\$4,137	1	0%	\$13,473	313	100%	\$489,730
Town of Parmele	149	132	89%	\$133,794	16	11%	\$26,104	1	1%	\$2,756	149	100%	\$162,654

SECTION 4: RISK ASSESSMENT

Jurisdiction	All Buildings	Residential Buildings at Risk			Commercial Buildings at Risk			Public Buildings at Risk			Total Buildings at Risk		
	Num	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages
Town of Robersonville	901	783	87%	\$1,080,212	107	12%	\$161,484	11	1%	\$16,097	901	100%	\$1,257,794
Town of Williamston	4,238	3,104	73%	\$3,196,195	880	21%	\$1,621,501	247	6%	\$1,175,961	4,231	100%	\$5,993,657
Subtotal Martin	18,688	13,606	73%	\$14,905,650	4,522	24%	\$5,056,695	541	3%	\$2,364,856	18,669	100%	\$22,327,201
Tyrrell													
Unincorporated Tyrrell County	2,794	2,012	72%	\$3,124,105	508	18%	\$376,755	42	2%	\$1,393,875	2,562	92%	\$4,894,736
Town of Columbia	519	408	79%	\$416,225	66	13%	\$1,416,129	34	7%	\$205,662	508	98%	\$2,038,016
Subtotal Tyrrell	3,313	2,420	73%	\$3,540,330	574	17%	\$1,792,884	76	2%	\$1,599,537	3,070	93%	\$6,932,752
Washington													
Unincorporated Washington County	5,482	3,940	72%	\$3,965,716	1,354	25%	\$550,365	84	2%	\$59,084	5,378	98%	\$4,575,165
Town of Creswell	366	274	75%	\$271,007	68	19%	\$54,036	22	6%	\$44,561	364	99%	\$369,603
Town of Plymouth	2,779	2,338	84%	\$1,123,077	330	12%	\$259,467	105	4%	\$60,059	2,773	100%	\$1,442,602
Town of Roper	611	505	83%	\$499,495	81	13%	\$39,439	20	3%	\$324,947	606	99%	\$863,881
Subtotal Washington	9,238	7,057	76%	\$5,859,295	1,833	20%	\$903,307	231	3%	\$488,651	9,121	99%	\$7,251,251
Region Total	52,767	39,893	76%	\$50,748,861	10,713	20%	\$11,569,770	1,238	2%	\$5,450,269	51,844	98%	\$67,768,899

Source: NCEM Risk Management Tool

SECTION 4: RISK ASSESSMENT

Table 4.64 – Buildings at Risk from 100-Year Hurricane Winds

Jurisdiction	All Buildings	Residential Buildings at Risk			Commercial Buildings at Risk			Public Buildings at Risk			Total Buildings at Risk		
	Num	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages
Bertie													
Unincorporated Bertie County	11,175	8,687	78%	\$10,780,288	2,275	20%	\$3,415,225	158	1%	\$888,639	11,120	100%	\$15,084,152
Town of Askewville	502	383	76%	\$406,976	107	21%	\$59,742	12	2%	\$51,259	502	100%	\$517,977
Town of Aulander	744	640	86%	\$373,372	90	12%	\$48,108	14	2%	\$7,766	744	100%	\$429,246
Town of Colerain	428	333	78%	\$651,823	74	17%	\$203,545	14	3%	\$36,582	421	98%	\$891,950
Town of Kelford	173	155	90%	\$88,732	14	8%	\$1,630	4	2%	\$1,742	173	100%	\$92,103
Town of Lewiston-Woodville	719	597	83%	\$809,831	106	15%	\$135,813	16	2%	\$20,955	719	100%	\$966,598
Town of Powellsville	171	148	87%	\$228,770	16	9%	\$13,010	7	4%	\$10,782	171	100%	\$252,562
Town of Roxobel	205	153	75%	\$146,168	48	23%	\$14,301	4	2%	\$2,400	205	100%	\$162,870
Town of Windsor	1,815	1,442	79%	\$1,731,487	307	17%	\$437,926	64	4%	\$175,260	1,813	100%	\$2,344,673
Subtotal Bertie	15,932	12,538	79%	\$15,217,447	3,037	19%	\$4,329,300	293	2%	\$1,195,385	15,868	100%	\$20,742,131
Hyde													
Unincorporated Hyde County	5,596	4,272	76%	\$45,187,537	747	13%	\$4,580,006	97	2%	\$1,496,087	5,116	91%	\$51,263,630
Martin													
Unincorporated Martin County	12,188	8,559	70%	\$27,833,738	3,414	28%	\$8,345,614	208	2%	\$2,613,795	12,181	100%	\$38,793,146
Town of Bear Grass	81	55	68%	\$220,222	7	9%	\$35,750	19	23%	\$125,582	81	100%	\$381,554
Town of Everetts	159	151	95%	\$260,424	8	5%	\$15,295	0	0%	\$0	159	100%	\$275,718
Town of Hamilton	292	233	80%	\$623,975	26	9%	\$87,340	32	11%	\$237,361	291	100%	\$948,676
Town of Hassell	70	59	84%	\$272,882	11	16%	\$22,119	0	0%	\$0	70	100%	\$295,001
Town of Jamesville	297	228	77%	\$669,521	43	14%	\$326,569	22	7%	\$101,555	293	99%	\$1,097,644
Town of Oak City	313	302	96%	\$1,802,044	10	3%	\$16,984	1	0%	\$36,827	313	100%	\$1,855,854

SECTION 4: RISK ASSESSMENT

Jurisdiction	All Buildings	Residential Buildings at Risk			Commercial Buildings at Risk			Public Buildings at Risk			Total Buildings at Risk		
	Num	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages
Town of Parmele	149	132	89%	\$394,238	16	11%	\$74,437	1	1%	\$9,391	149	100%	\$478,066
Town of Robersonville	901	783	87%	\$3,492,852	107	12%	\$531,794	11	1%	\$56,613	901	100%	\$4,081,259
Town of Williamston	4,238	3,104	73%	\$9,083,018	880	21%	\$5,581,770	247	6%	\$3,397,745	4,231	100%	\$18,062,534
Subtotal Martin	18,688	13,606	73%	\$44,652,914	4,522	24%	\$15,037,672	541	3%	\$6,578,869	18,669	100%	\$66,269,452
Tyrrell													
Unincorporated Tyrrell County	2,794	2,012	72%	\$8,863,183	508	18%	\$1,095,899	42	2%	\$3,493,840	2,562	92%	\$13,452,922
Town of Columbia	519	408	79%	\$1,324,564	66	13%	\$2,158,923	34	7%	\$572,700	508	98%	\$4,056,187
Subtotal Tyrrell	3,313	2,420	73%	\$10,187,747	574	17%	\$3,254,822	76	2%	\$4,066,540	3,070	93%	\$17,509,109
Washington													
Unincorporated Washington County	5,482	3,940	72%	\$8,780,886	1,354	25%	\$1,380,379	84	2%	\$203,838	5,378	98%	\$10,365,102
Town of Creswell	366	274	75%	\$719,992	68	19%	\$163,459	22	6%	\$183,434	364	99%	\$1,066,885
Town of Plymouth	2,779	2,338	84%	\$2,432,206	330	12%	\$669,881	105	4%	\$204,589	2,773	100%	\$3,306,677
Town of Roper	611	505	83%	\$574,937	81	13%	\$78,953	20	3%	\$324,947	606	99%	\$978,838
Subtotal Washington	9,238	7,057	76%	\$12,508,021	1,833	20%	\$2,292,672	231	3%	\$916,808	9,121	99%	\$15,717,502
Region Total	52,767	39,893	76%	\$127,753,666	10,713	20%	\$29,494,472	1,238	2%	\$14,253,689	51,844	98%	\$171,501,824

Source: NCEM Risk Management Tool

SECTION 4: RISK ASSESSMENT

Table 4.65 – Buildings at Risk from 300-Year Hurricane Winds

Jurisdiction	All Buildings	Residential Buildings at Risk			Commercial Buildings at Risk			Public Buildings at Risk			Total Buildings at Risk		
	Num	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages
Bertie													
Unincorporated Bertie County	11,175	8,687	78%	\$28,020,989	2,275	20%	\$9,388,713	158	1%	\$2,445,708	11,120	100%	\$39,855,409
Town of Askewville	502	383	76%	\$966,231	107	21%	\$166,230	12	2%	\$118,630	502	100%	\$1,251,091
Town of Aulander	744	640	86%	\$1,996,116	90	12%	\$461,103	14	2%	\$76,292	744	100%	\$2,533,512
Town of Colerain	428	333	78%	\$1,821,016	74	17%	\$514,118	14	3%	\$137,099	421	98%	\$2,472,233
Town of Kelford	173	155	90%	\$537,159	14	8%	\$25,739	4	2%	\$30,973	173	100%	\$593,871
Town of Lewiston-Woodville	719	597	83%	\$2,153,830	106	15%	\$460,824	16	2%	\$76,634	719	100%	\$2,691,288
Town of Powellsville	171	148	87%	\$633,295	16	9%	\$48,710	7	4%	\$40,813	171	100%	\$722,818
Town of Roxobel	205	153	75%	\$984,249	48	23%	\$209,174	4	2%	\$32,831	205	100%	\$1,226,255
Town of Windsor	1,815	1,442	79%	\$4,053,850	307	17%	\$1,379,084	64	4%	\$644,278	1,813	100%	\$6,077,211
Subtotal Bertie	15,932	12,538	79%	\$41,166,735	3,037	19%	\$12,653,695	293	2%	\$3,603,258	15,868	100%	\$57,423,688
Hyde													
Unincorporated Hyde County	5,596	4,272	76%	\$142,831,041	747	13%	\$14,920,901	97	2%	\$5,929,926	5,116	91%	\$163,681,868
Martin													
Unincorporated Martin County	12,188	8,559	70%	\$137,857,868	3,414	28%	\$32,171,745	208	2%	\$9,740,666	12,181	100%	\$179,770,278
Town of Bear Grass	81	55	68%	\$1,081,924	7	9%	\$222,363	19	23%	\$414,523	81	100%	\$1,718,810
Town of Everetts	159	151	95%	\$780,423	8	5%	\$62,661	0	0%	\$0	159	100%	\$843,084
Town of Hamilton	292	233	80%	\$2,079,501	26	9%	\$275,374	32	11%	\$663,637	291	100%	\$3,018,512
Town of Hassell	70	59	84%	\$866,446	11	16%	\$72,293	0	0%	\$0	70	100%	\$938,738
Town of Jamesville	297	228	77%	\$5,050,093	43	14%	\$2,375,825	22	7%	\$790,896	293	99%	\$8,216,814
Town of Oak City	313	302	96%	\$5,832,639	10	3%	\$60,738	1	0%	\$99,062	313	100%	\$5,992,439

SECTION 4: RISK ASSESSMENT

Jurisdiction	All Buildings	Residential Buildings at Risk			Commercial Buildings at Risk			Public Buildings at Risk			Total Buildings at Risk		
	Num	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages
Town of Parmele	149	132	89%	\$1,269,895	16	11%	\$194,611	1	1%	\$27,487	149	100%	\$1,491,993
Town of Robersonville	901	783	87%	\$11,542,515	107	12%	\$1,502,194	11	1%	\$178,883	901	100%	\$13,223,592
Town of Williamston	4,238	3,104	73%	\$28,732,757	880	21%	\$17,037,244	247	6%	\$8,638,741	4,231	100%	\$54,408,741
Subtotal Martin	18,688	13,606	73%	\$195,094,061	4,522	24%	\$53,975,048	541	3%	\$20,553,895	18,669	100%	\$269,623,001
Tyrrell													
Unincorporated Tyrrell County	2,794	2,012	72%	\$25,718,123	508	18%	\$2,922,962	42	2%	\$8,113,775	2,562	92%	\$36,754,860
Town of Columbia	519	408	79%	\$3,940,843	66	13%	\$3,416,572	34	7%	\$1,595,472	508	98%	\$8,952,886
Subtotal Tyrrell	3,313	2,420	73%	\$29,658,966	574	17%	\$6,339,534	76	2%	\$9,709,247	3,070	93%	\$45,707,746
Washington													
Unincorporated Washington County	5,482	3,940	72%	\$32,904,452	1,354	25%	\$4,151,740	84	2%	\$993,204	5,378	98%	\$38,049,396
Town of Creswell	366	274	75%	\$1,819,409	68	19%	\$428,484	22	6%	\$584,838	364	99%	\$2,832,732
Town of Plymouth	2,779	2,338	84%	\$13,390,305	330	12%	\$3,879,138	105	4%	\$1,824,940	2,773	100%	\$19,094,383
Town of Roper	611	505	83%	\$3,731,025	81	13%	\$700,548	20	3%	\$1,133,405	606	99%	\$5,564,978
Subtotal Washington	9,238	7,057	76%	\$51,845,191	1,833	20%	\$9,159,910	231	3%	\$4,536,387	9,121	99%	\$65,541,489
Region Total	52,767	39,893	76%	\$460,595,994	10,713	20%	\$97,049,088	1,238	2%	\$44,332,713	51,844	98%	\$601,977,792

Source: NCEM Risk Management Tool

SECTION 4: RISK ASSESSMENT

Table 4.66 – Buildings at Risk from 700-Year Hurricane Winds

Jurisdiction	All Buildings	Residential Buildings at Risk			Commercial Buildings at Risk			Public Buildings at Risk			Total Buildings at Risk		
	Num	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages
Bertie													
Unincorporated Bertie County	11,175	8,687	78%	\$62,487,845	2,275	20%	\$18,536,965	158	1%	\$6,022,872	11,120	100%	\$87,047,682
Town of Askewville	502	383	76%	\$2,253,001	107	21%	\$412,288	12	2%	\$269,692	502	100%	\$2,934,981
Town of Aulander	744	640	86%	\$4,841,565	90	12%	\$1,373,648	14	2%	\$220,925	744	100%	\$6,436,139
Town of Colerain	428	333	78%	\$4,503,254	74	17%	\$1,163,007	14	3%	\$377,711	421	98%	\$6,043,972
Town of Kelford	173	155	90%	\$1,249,322	14	8%	\$72,074	4	2%	\$88,244	173	100%	\$1,409,640
Town of Lewiston-Woodville	719	597	83%	\$5,106,975	106	15%	\$1,228,357	16	2%	\$226,509	719	100%	\$6,561,840
Town of Powellsville	171	148	87%	\$1,580,897	16	9%	\$143,732	7	4%	\$122,715	171	100%	\$1,847,345
Town of Roxobel	205	153	75%	\$2,245,168	48	23%	\$538,367	4	2%	\$83,751	205	100%	\$2,867,286
Town of Windsor	1,815	1,442	79%	\$9,702,064	307	17%	\$3,773,262	64	4%	\$1,992,493	1,813	100%	\$15,467,819
Subtotal Bertie	15,932	12,538	79%	\$93,970,091	3,037	19%	\$27,241,700	293	2%	\$9,404,912	15,868	100%	\$130,616,704
Hyde													
Unincorporated Hyde County	5,596	4,272	76%	\$209,478,896	747	13%	\$24,520,957	97	2%	\$9,556,632	5,116	91%	\$243,556,485
Martin													
Unincorporated Martin County	12,188	8,559	70%	\$266,355,295	3,414	28%	\$61,629,400	208	2%	\$18,635,224	12,181	100%	\$346,619,918
Town of Bear Grass	81	55	68%	\$1,907,515	7	9%	\$323,301	19	23%	\$1,046,498	81	100%	\$3,277,314
Town of Everetts	159	151	95%	\$2,199,571	8	5%	\$176,210	0	0%	\$0	159	100%	\$2,375,781
Town of Hamilton	292	233	80%	\$5,444,388	26	9%	\$675,685	32	11%	\$1,602,231	291	100%	\$7,722,305
Town of Hassell	70	59	84%	\$1,970,921	11	16%	\$188,668	0	0%	\$0	70	100%	\$2,159,588

SECTION 4: RISK ASSESSMENT

Jurisdiction	All Buildings	Residential Buildings at Risk			Commercial Buildings at Risk			Public Buildings at Risk			Total Buildings at Risk		
	Num	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages
Town of Jamesville	297	228	77%	\$8,119,358	43	14%	\$4,799,469	22	7%	\$1,554,791	293	99%	\$14,473,617
Town of Oak City	313	302	96%	\$13,559,288	10	3%	\$165,548	1	0%	\$242,744	313	100%	\$13,967,580
Town of Parmele	149	132	89%	\$3,265,251	16	11%	\$452,192	1	1%	\$68,109	149	100%	\$3,785,552
Town of Robersonville	901	783	87%	\$29,262,172	107	12%	\$3,664,927	11	1%	\$473,730	901	100%	\$33,400,829
Town of Williamston	4,238	3,104	73%	\$74,252,037	880	21%	\$42,560,484	247	6%	\$19,668,013	4,231	100%	\$136,480,535
Subtotal Martin	18,688	13,606	73%	\$406,335,796	4,522	24%	\$114,635,884	541	3%	\$43,291,340	18,669	100%	\$564,263,019
Tyrrell													
Unincorporated Tyrrell County	2,794	2,012	72%	\$47,422,810	508	18%	\$5,489,709	42	2%	\$15,992,567	2,562	92%	\$68,905,086
Town of Columbia	519	408	79%	\$9,230,661	66	13%	\$5,783,387	34	7%	\$3,826,442	508	98%	\$18,840,489
Subtotal Tyrrell	3,313	2,420	73%	\$56,653,471	574	17%	\$11,273,096	76	2%	\$19,819,009	3,070	93%	\$87,745,575
Washington													
Unincorporated Washington County	5,482	3,940	72%	\$69,070,832	1,354	25%	\$8,380,397	84	2%	\$2,396,603	5,378	98%	\$79,847,832
Town of Creswell	366	274	75%	\$3,939,166	68	19%	\$990,855	22	6%	\$1,499,836	364	99%	\$6,429,856
Town of Plymouth	2,779	2,338	84%	\$30,019,989	330	12%	\$8,367,344	105	4%	\$4,202,278	2,773	100%	\$42,589,611
Town of Roper	611	505	83%	\$8,425,783	81	13%	\$1,460,821	20	3%	\$1,929,206	606	99%	\$11,815,810
Subtotal Washington	9,238	7,057	76%	\$111,455,770	1,833	20%	\$19,199,417	231	3%	\$10,027,923	9,121	99%	\$140,683,109
Region Total	52,767	39,893	76%	\$877,894,024	10,713	20%	\$196,871,054	1,238	2%	\$92,099,816	51,844	98%	\$1,166,864,892

Source: NCEM Risk Management Tool

ENVIRONMENT

Hurricane winds can cause massive damage to the natural environment, uprooting trees and other debris within the storm's path. Animals can either be killed directly by the storm or impacted indirectly through changes in habitat and food availability caused by high winds, storm surge, and intense rainfall.

Endangered species can be dramatically impacted. Forests can be completely defoliated by strong winds.

Erosion can change the shape and characteristics of coastal shorelines and riverine floodplains. Eroded material may clog waterways and decrease drainage capacity. Erosion can also negatively impact water quality by increasing sediment loads in waterways.

CONSEQUENCE ANALYSIS

Table 4.67 summarizes the potential negative consequences of hurricanes and coastal hazards.

Table 4.67 – Consequence Analysis – Hurricane and Coastal Hazards

Category	Consequences
Public	Impacts include injury or death, loss of property, outbreak of diseases, mental trauma and loss of livelihoods. Power outages and flooding are likely to displace people from their homes. Water can become polluted such that if consumed, diseases and infection can be easily spread. Residential, commercial, and public buildings, as well as critical infrastructure such as transportation, water, energy, and communication systems may be damaged or destroyed, resulting in cascading impacts on the public. Erosion is unlikely to impact public health and safety.
Responders	Localized impact expected to limit damage to personnel in the inundation area at the time of the incident. Erosion is unlikely to require immediate response or rescue operations.
Continuity of Operations (including Continued Delivery of Services)	Damage to facilities/personnel from flooding or wind may require temporary relocation of some operations. Operations may be interrupted by power outages. Disruption of roads and/or utilities may postpone delivery of some services. Regulatory waivers may be needed locally. Fulfillment of some contracts may be difficult. Impact may reduce deliveries. Erosion is unlikely to impact public continuity of operations.
Property, Facilities and Infrastructure	Structural damage to buildings may occur; loss of glass windows and doors by high winds and debris; loss of roof coverings, partial wall collapses, and other damages requiring significant repairs are possible in a major (category 3 to 5) hurricane. Erosion can result in property damage if it is severe enough or if scour occurs that undermines the integrity of structural foundations.
Environment	Hurricanes can devastate wooded ecosystems and remove all the foliage from forest canopies, and they can change habitats so drastically that the indigenous animal populations suffer as a result. Specific foods can be taken away as high winds will often strip fruits, seeds and berries from bushes and trees. Secondary impacts may occur; for example, high winds and debris may result in damage to an above-ground fuel tank, resulting in a significant chemical spill. Erosion can increase sediment loads in waterbodies and change riverine and coastal topography.

SECTION 4: RISK ASSESSMENT

Category	Consequences
Economic Condition of the Jurisdiction	Local economy and finances adversely affected, possibly for an extended period of time, depending on damages. Intangible impacts also likely, including business interruption and additional living expenses. Severe erosion can negatively impact tourist economies. Dredging projects to counter sedimentation buildup from erosion are costly.
Public Confidence in the Jurisdiction's Governance	Likely to impact public confidence due to possibility of major event requiring substantial response and long-term recovery effort. Erosion is unlikely to impact public confidence.

HAZARD SUMMARY BY JURISDICTION

HURRICANES & TROPICAL STORMS

The following table summarizes hurricane and tropical storm hazard risk by jurisdiction. Most aspects of hurricane risk do not vary substantially by jurisdiction. While hurricanes have the possibility of being catastrophic across all jurisdictions, certain areas may be even more vulnerable. Mobile home units are more vulnerable to wind damage; therefore, Bertie and Tyrrell Counties, which have higher rates of mobile homes, may experience more severe impacts. Inland areas may experience less damage due to storm surge commonly associated with hurricanes and tropical storms.

Jurisdiction	Probability	Impact	Spatial Extent	Warning Time	Duration	Score	Priority
All Jurisdictions	4	4	4	1	3	3.6	H

EROSION

The following table summarizes erosion risk by jurisdiction. Risk to coastal erosion varies across the region and is highest in the region's unincorporated areas along coastal and estuarine shorelines. Inland areas may still experience moderate erosion, but it is less likely than in coastal areas.

Jurisdiction	Probability	Impact	Spatial Extent	Warning Time	Duration	Score	Priority
Unincorporated Bertie County	4	2	1	4	1	2.5	M
Town of Askewville	1	1	1	4	1	1.3	L
Town of Aulander	1	1	1	4	1	1.3	L
Town of Colerain	3	2	1	4	1	2.2	M
Town of Kelford	1	1	1	4	1	1.3	L
Town of Lewiston-Woodville	1	1	1	4	1	1.3	L
Town of Powellsville	1	1	1	4	1	1.3	L
Town of Roxobel	1	1	1	4	1	1.3	L
Town of Windsor	1	1	1	4	1	1.3	L
Unincorporated Hyde County	4	2	2	4	1	2.7	M
Unincorporated Martin County	3	2	1	4	1	2.2	M
Town of Bear Grass	1	1	1	4	1	1.3	L

SECTION 4: RISK ASSESSMENT

Jurisdiction	Probability	Impact	Spatial Extent	Warning Time	Duration	Score	Priority
Town of Everetts	1	1	1	4	1	1.3	L
Town of Hamilton	3	2	1	4	1	2.2	M
Town of Hassell	1	1	1	4	1	1.3	L
Town of Jamesville	3	2	1	4	1	2.2	M
Town of Oak City	1	1	1	4	1	1.3	L
Town of Parmele	1	1	1	4	1	1.3	L
Town of Robersonville	1	1	1	4	1	1.3	L
Town of Williamston	2	2	1	4	1	1.9	L
Unincorporated Tyrrell County	4	2	1	4	1	2.5	M
Town of Columbia	4	2	1	4	1	2.5	M
Washington County	4	2	1	4	1	2.5	M
Town of Creswell	2	2	1	4	1	1.9	L
Town of Plymouth	4	2	1	4	1	2.5	M
Town of Roper	2	1	1	4	1	1.6	L

4.5.7 TORNADOES & THUNDERSTORMS

HAZARD BACKGROUND

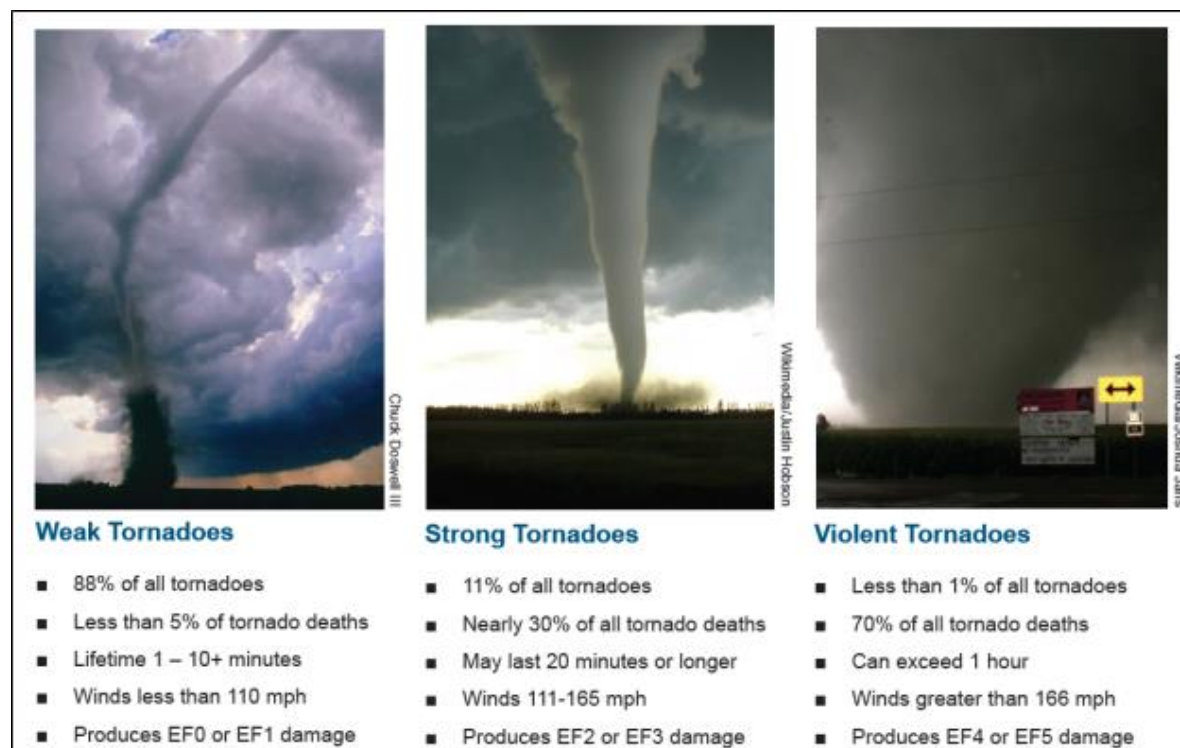
TORNADOES

According to the Glossary of Meteorology (AMS 2000), a tornado is "a violently rotating column of air, pendant from a cumuliform cloud or underneath a cumuliform cloud, and often (but not always) visible as a funnel cloud." Tornadoes can appear from any direction. Most move from southwest to northeast, or west to east. Some tornadoes have changed direction or even backtracked.

Tornadoes are commonly produced by land falling tropical cyclones. Those making landfall along the Gulf coast traditionally produce more tornadoes than those making landfall along the Atlantic coast. Tornadoes that form within hurricanes are more common in the right front quadrant with respect to the forward direction but can occur in other areas as well. According to the NHC, about 10% of the tropical cyclone-related fatalities are caused by tornadoes. Tornadoes are more likely to be spawned within 24 hours of landfall and are usually within 30 miles of the tropical cyclone's center.

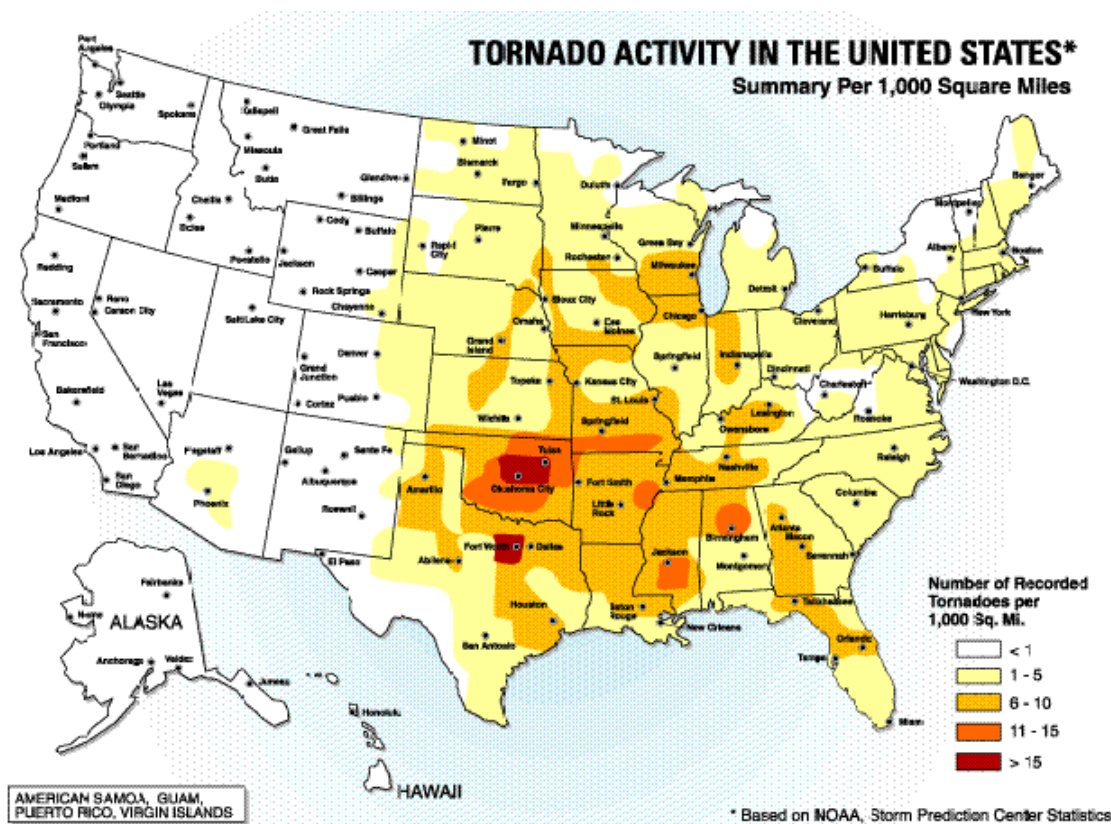
Tornadoes have the potential to produce winds in excess of 200 mph (EF5 on the Enhanced Fujita Scale) and can be very expansive – some in the Great Plains have exceeded two miles in width. Tornadoes associated with tropical cyclones, however, tend to be of lower intensity (EF0 to EF2) and much smaller in size than ones that form in the Great Plains.

Figure 4.47 – Tornado by Severity



Source: NOAA National Weather Service

Figure 4.48 shows tornado activity in the United States based on the number of recorded tornadoes per 1,000 square miles. North Carolina has averaged 1 to 5 tornadoes per 1,000 square miles.

Figure 4.48 – Tornado Activity in the U.S.**Figure 1.1** The number of tornadoes recorded per 1,000 square miles

Source: American Society of Civil Engineers

*Warning Time: 4 – Less than 6 hours**Duration: 1 – Less than 6 hours***THUNDERSTORM WINDS**

Thunderstorms result from the rapid upward movement of warm, moist air. They can occur inside warm, moist air masses and at fronts. As the warm, moist air moves upward, it cools, condenses, and forms cumulonimbus clouds that can reach heights of greater than 35,000 ft. As the rising air reaches its dew point, water droplets and ice form and begin falling the long distance through the clouds towards earth's surface. As the droplets fall, they collide with other droplets and become larger. The falling droplets create a downdraft of air that spreads out at earth's surface and causes strong winds associated with thunderstorms.

There are four ways in which thunderstorms can organize: single cell, multi-cell cluster, multi-cell lines (squall lines), and supercells. Even though supercell thunderstorms are most frequently associated with severe weather phenomena, thunderstorms most frequently organize into clusters or lines. Warm, humid conditions are favorable for the development of thunderstorms. The average single cell thunderstorm is approximately 15 miles in diameter and lasts less than 30 minutes at a single location. However, thunderstorms, especially when organized into clusters or lines, can travel intact for distances exceeding 600 miles.

Thunderstorms are responsible for the development and formation of many severe weather phenomena, posing great hazards to the population and landscape. Damage that results from thunderstorms is mainly inflicted by downburst winds, large hailstones, and flash flooding caused by heavy precipitation. Stronger thunderstorms are capable of producing tornadoes and waterspouts. While conditions for thunderstorm conditions may be anticipated within a few hours, severe conditions are difficult to predict. Regardless of severity, storms generally pass within a few hours.

Warning Time: 4 – Less than six hours

Duration: 1 – Less than six hours

LIGHTNING

Lightning is a sudden electrical discharge released from the atmosphere that follows a course from cloud to ground, cloud to cloud, or cloud to surrounding air, with light illuminating its path. Lightning's unpredictable nature causes it to be one of the most feared weather elements.

All thunderstorms produce lightning, which often strikes outside of the area where it is raining and is known to fall more than 10 miles away from the rainfall area. When lightning strikes, electricity shoots through the air and causes vibrations creating the sound of thunder. A bolt of lightning can reach temperatures approaching 50,000 degrees Fahrenheit. Nationwide, lightning kills 75 to 100 people each year. Lightning strikes can also start building and wildland fires, and damage electrical systems and equipment.

The watch/warning time for a given storm is usually a few hours. There is no warning time for any given lightning strike. Lightning strikes are instantaneous. Storms that cause lightning usually pass within a few hours.

Warning Time: 4 – Less than six hours

Duration: 1 – Less than six hours

HAIL

According to NOAA, hail is precipitation that is formed when updrafts in thunderstorms carry raindrops upward into extremely cold areas of the atmosphere causing them to freeze. The raindrops form into small frozen droplets and then continue to grow as they come into contact with super-cooled water which will freeze on contact with the frozen rain droplet. This frozen rain droplet can continue to grow and form hail. As long as the updraft forces can support or suspend the weight of the hailstone, hail can continue to grow.

At the time when the updraft can no longer support the hailstone, it will fall down to the earth. For example, a ¼" diameter or pea sized hail requires updrafts of 24 mph, while a 2 ¾" diameter or baseball sized hail requires an updraft of 81 mph. The largest hailstone recorded in the United States was found in Vivian, South Dakota on July 23, 2010; it measured eight inches in diameter, almost the size of a soccer ball. While soccer-ball-sized hail is the exception, even small pea sized hail can do damage.

Hailstorms in North Carolina cause damage to property, crops, and the environment, and kill and injure livestock. In the United States, hail causes more than \$1 billion in damage to property and crops each year. Much of the damage inflicted by hail is to crops. Even relatively small hail can shred plants to ribbons in a matter of minutes. Vehicles, roofs of buildings and homes, and landscaping are the other things most commonly damaged by hail. Hail has been known to cause injury to humans; occasionally, these injuries can be fatal.

The onset of thunderstorms with hail is generally rapid. However, advancements in meteorological forecasting allow for some warning. Storms usually pass in a few hours.

Warning Time: 4 – Less than six hours

Duration: 1 – Less than six hours

LOCATION

TORNADOES

Tornadoes and thunderstorms can occur anywhere in the region and do not have a defined vulnerability zone. Tornadoes typically impact a small area, but damage may be extensive. Tornado locations are completely random, meaning risk to tornado is not increased in one area of the county versus another. Tornadoes can be spawned by tropical cyclones; however, these tornadoes typically occur up to 2 days before and as many as 3 days after landfall of the tropical cyclone.

Spatial Extent: 2 – Small

THUNDERSTORM WINDS

Thunderstorm wind, lightning, and hail events do not have a defined vulnerability zone. The scope of wind, lightning and hail is generally defined to the footprint of its associated thunderstorm. Given the general size and movement of thunderstorm events, thunderstorm winds from one event may impact a large portion of the planning area. The entirety of the Northeastern Region shares equal risk to the threat of severe weather.

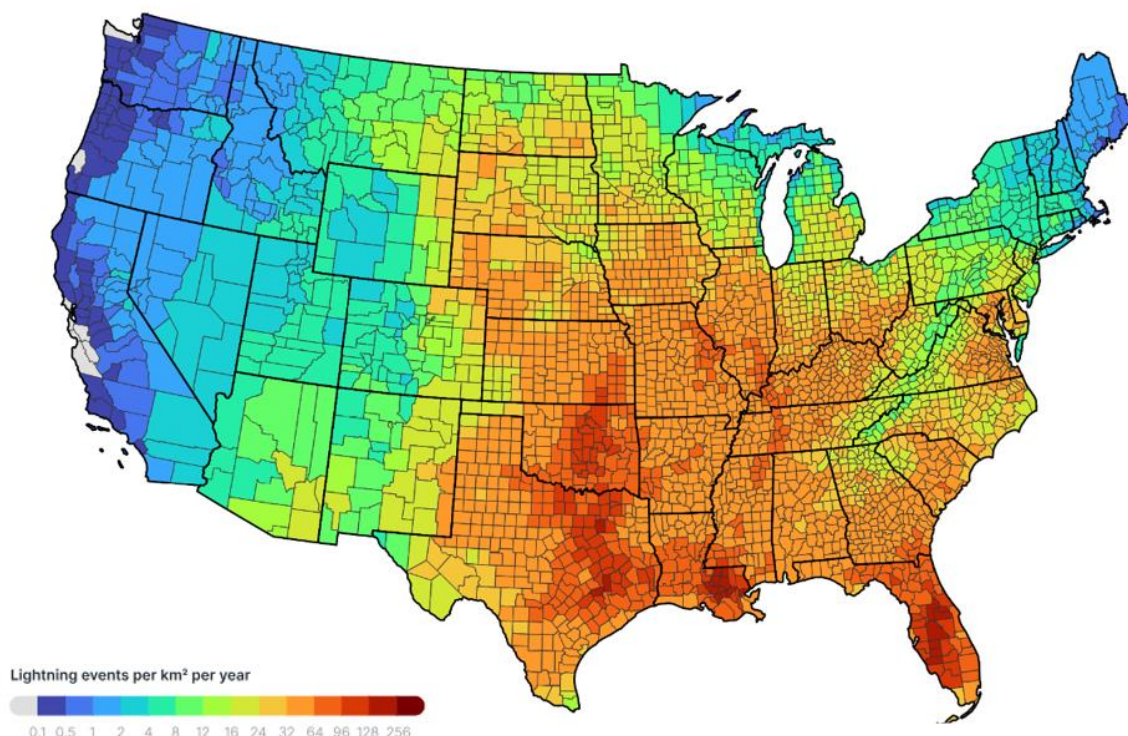
Spatial Extent: 4 – Large

LIGHTNING AND HAIL

The scope of lightning and hail is generally confined to the footprint of its associated thunderstorm. However, large-scale hail tends to occur in a more localized area within the storm, and lightning strikes and associated damages are highly localized and occur randomly. It should be noted that while lightning is most often affiliated with severe thunderstorms, it may also strike outside of heavy rain and might occur as far as 10 miles away from any rainfall. The entirety of the Northeastern Region is uniformly exposed to each of these hazards.

According to the Vaisala flash density map, shown in Figure 4.49, the majority of the Northeastern NC Region is located in an area that experiences between 16 and 64 lightning flashes per square mile per year. It should be noted that future lightning occurrences may exceed these figures.

Spatial Extent: 1 – Negligible

Figure 4.49 – Lightning Flash Density (2016-2022)

Source: Vaisala

EXTENT

TORNADOES

Prior to February 1, 2007, tornado intensity was measured by the Fujita (F) scale. This scale was revised and is now the Enhanced Fujita (EF) scale. Both scales are sets of wind estimates (not measurements) based on damage. The new scale provides more damage indicators (28) and associated degrees of damage, allowing for more detailed analysis, better correlation between damage and wind speed. It is also more precise because it takes into account the materials affected and the construction of structures damaged by a tornado. Table 4.68 shows the wind speeds associated with the enhanced Fujita scale ratings and the damage that could result at different levels of intensity.

Table 4.68 – Enhanced Fujita Scale

EF Number	3 Second Gust (mph)	Damage
0	65-85	Light damage. Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over.
1	96-110	Moderate damage. Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken.

EF Number	3 Second Gust (mph)	Damage
2	111-135	Considerable damage. Roofs torn off well-constructed houses; foundations of frame homes shifted; mobile homes completely destroyed; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
3	136-165	Severe damage. Entire stories of well-constructed houses destroyed; severe damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations blown away some distance.
4	166-200	Devastating damage. Well-constructed houses and whole frame houses completely leveled; cars thrown and small missiles generated.
5	Over 200	Incredible damage. Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 m; high-rise buildings have significant structural deformation; incredible phenomena will occur.

Source: NWS Storm Prediction Center

The most intense tornado to pass through the Northeastern NC Region in the past 20 years was an EF3 in April 2011. This tornado resulted in 12 fatalities, 55 injuries and \$2,250,000 in property damage – the most of any tornado in the region.

Impact: 3 – Critical

THUNDERSTORM WINDS

The magnitude of a thunderstorm event can be defined by the storm's maximum wind speed and its impacts. NCEI divides wind events into several types including High Wind, Strong Wind, Thunderstorm Wind, Tornado and Hurricane. For this severe weather risk assessment, High Wind, Strong Wind and Thunderstorm Wind data was collected. Hurricane Wind and Tornadoes are addressed as individual hazards. The following definitions come from the NCEI Storm Data Preparation document.

- **High Wind** – Sustained non-convective winds of 40mph or greater lasting for one hour or longer or winds (sustained or gusts) of 58 mph for any duration on a widespread or localized basis.
- **Strong Wind** – Non-convective winds gusting less than 58 mph, or sustained winds less than 40 mph, resulting in a fatality, injury, or damage.
- **Thunderstorm Wind** – Winds, arising from convection (occurring within 30 minutes of lightning being observed or detected), with speeds of at least 58 mph, or winds of any speed (non-severe thunderstorm winds below 58 mph) producing a fatality, injury or damage.

The strongest recorded thunderstorm wind event in the region occurred on March 5, 2008, with a measured gust of 90 mph in Kelford. The event caused \$25,000 in property damage, including a destroyed mobile home. A roof was also blown off a house and several outbuildings were destroyed.

Impact: 2 – Limited

LIGHTNING

Lightning is measured by the Lightning Activity Level (LAL) scale, created by the National Weather Service to define lightning activity into a specific categorical scale. The LAL is a common parameter that is part of fire weather forecasts nationwide.

Table 4.69 – Lightning Activity Level Scale

Lightning Activity Level Scale	
LAL 1	No thunderstorms
LAL 2	Isolated thunderstorms. Light rain will occasionally reach the ground. Lightning is very infrequent, 1 to 5 cloud to ground lightning strikes in a five-minute period
LAL 3	Widely scattered thunderstorms. Light to moderate rain will reach the ground. Lightning is infrequent, 6 to 10 cloud to ground strikes in a five-minute period
LAL 4	Scattered thunderstorms. Moderate rain is commonly produced. Lightning is frequent, 11 to 15 cloud to ground strikes in a five-minute period
LAL 5	Numerous thunderstorms. Rainfall is moderate to heavy. Lightning is frequent and intense, greater than 15 cloud to ground strikes in a five-minute period
LAL 6	Dry lightning (same as LAL 3 but without rain). This type of lightning has the potential for extreme fire activity and is normally highlighted in fire weather forecasts with a Red Flag warning

Source: National Weather Service

With the right conditions in place, the entire county is susceptible to each lightning activity level as defined by the LAL. Most lightning strikes cause limited damage to specific structures in a limited area, and cause very few injuries or fatalities, and minimal disruption on quality of life.

Impact: 1 – Minor

HAIL

The National Weather Service classifies hail by diameter size, and corresponding everyday objects to help relay scope and severity to the population. Table 4.70 indicates the hailstone measurements utilized by the National Weather Service.

Table 4.70 – Hailstone Measurement Comparison Chart

Average Diameter	Corresponding Household Object
.25 inch	Pea
.5 inch	Marble/Mothball
.75 inch	Dime/Penny
.875 inch	Nickel
1.0 inch	Quarter
1.5 inch	Ping-pong ball
1.75 inch	Golf ball
2.0 inch	Hen egg
2.5 inch	Tennis ball
2.75 inch	Baseball
3.00 inch	Teacup
4.00 inch	Grapefruit
4.5 inch	Softball

Source: National Weather Service

The Tornado and Storm Research Organization (TORRO) has further described hail sizes by their typical damage impacts. Table 4.71 describes typical intensity and damage impacts of the various sizes of hail.

Table 4.71 – Tornado and Storm Research Organization Hailstorm Intensity Scale

Intensity Category	Diameter (mm)	Diameter (inches)	Size Description	Typical Damage Impacts
Hard Hail	5-9	0.2-0.4	Pea	No damage
Potentially Damaging	10-15	0.4-0.6	Mothball	Slight general damage to plants, crops
Significant	16-20	0.6-0.8	Marble, grape	Significant damage to fruit, crops, vegetation
Severe	21-30	0.8-1.2	Walnut	Severe damage to fruit and crops, damage to glass and plastic structures, paint and wood scored
Severe	31-40	1.2-1.6	Pigeon's egg > squash ball	Widespread glass damage, vehicle bodywork damage
Destructive	41-50	1.6-2.0	Golf ball > Pullet's egg	Wholesale destruction of glass, damage to tiled roofs, significant risk of injuries
Destructive	51-60	2.0-2.4	Hen's egg	Bodywork of grounded aircraft dented, brick walls pitted
Destructive	61-75	2.4-3.0	Tennis ball > cricket ball	Severe roof damage, risk of serious injuries
Destructive	76-90	3.0-3.5	Large orange > softball	Severe damage to aircraft bodywork
Super Hailstorms	91-100	3.6-3.9	Grapefruit	Extensive structural damage. Risk of severe or even fatal injuries to people caught in the open
Super Hailstorms	>100	4.0+	Melon	Extensive structural damage. Risk of severe or even fatal injuries to people caught in the open

Source: Tornado and Storm Research Organization (TORRO), Department of Geography, Oxford Brookes University

It should be noted that in addition to hail diameter, factors including number and density of hailstones, hail fall speed, and surface wind speeds affect severity.

The average hailstone size recorded between 1999 and 2018 in the Northeastern NC Region was a little over 1" in diameter. The largest hailstones recorded during this period were 4.25", recorded on only one occasion. The worst instance occurred on May 9, 2003, in Colerain, where many vehicles and homes suffered damages.

Impact: 1 – Minor

HISTORICAL OCCURRENCES

TORNADOES

NCEI storm reports were reviewed from 1999 through 2024 to assess whether recent trends varied from the longer historical record. According to NCEI, the Northeastern NC Region experienced 53 tornado incidents between 1999 and 2024, causing 14 fatalities, 81 injuries, \$6.5 million in property damage and \$1.4 million in crop damage. Table 4.72 shows historical tornadoes in the Northeastern NC Region during this time period. Figure 4.50 reflects the tracks of past tornadoes that passed through the Region from 1950 through 2024 according to data from the NOAA/NWS Storm Prediction Center.

SECTION 4: RISK ASSESSMENT**Table 4.72 – Recorded Tornadoes in Northeastern NC Region, 1999-2024**

Location	Date	Time	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
Creswell	9/15/1999	1820	F0	0	0	\$0	\$0
Swanquarter	9/15/1999	1825	F0	0	0	\$0	\$0
Windsor	9/15/1999	1840	F0	0	0	\$2,000	\$0
Williamston	2/14/2000	607	F0	0	0	\$0	\$0
Aulander	9/24/2001	1700	F0	0	0	\$20,000	\$0
Williamston	5/13/2002	2025	F0	0	0	\$30,000	\$0
Ocracoke	9/10/2002	1105	F0	0	0	\$1,000	\$0
Colerain	5/9/2003	1650	F0	0	0	\$5,000	\$0
Plymouth	5/9/2003	1742	F1	0	0	\$250,000	\$1,400,000
Jamesville	6/4/2004	1435	F0	0	0	\$0	\$0
Columbia	6/4/2004	1715	F1	0	1	\$75,000	\$0
Columbia	6/11/2004	2200	F0	0	0	\$0	\$0
Rose Bay	8/14/2004	1440	F0	0	0	\$0	\$0
Columbia	8/14/2004	1515	F0	0	0	\$15,000	\$0
Oak City	9/27/2004	1900	F1	0	0	\$100,000	\$0
Roper	5/14/2006	1606	F0	0	0	\$10,000	\$0
Robersonville	5/14/2006	1946	F0	0	0	\$0	\$0
Columbia	5/14/2006	2025	F1	0	0	\$75,000	\$0
Williamston	2/18/2008	450	EF1	0	0	\$100,000	\$0
Cahaba	4/20/2008	1805	EF0	0	0	\$3,000	\$0
Panzer	4/28/2008	1640	EF0	0	0	\$0	\$0
Trap	5/9/2008	729	EF2	0	0	\$50,000	\$0
Lewiston	5/11/2008	1725	EF2	0	2	\$1,000,000	\$0
Aulander	9/26/2008	953	EF0	0	0	\$75,000	\$0
Parmele	11/15/2008	430	EF1	0	0	\$50,000	\$0
Plymouth	9/29/2010	2115	EF0	0	0	\$0	\$0
Askewville	4/16/2011	1755	EF3	12	55	\$2,250,000	\$0
Colerain	4/16/2011	1805	EF2	0	8	\$250,000	\$0
Williamston Arpt	4/16/2011	1809	EF0	0	0	\$10,000	\$0
Jerry	4/16/2011	2001	EF1	0	0	\$400,000	\$0
Williamston	4/26/2011	1315	EF0	0	0	\$500	\$0
Darden	4/28/2011	1530	EF0	0	0	\$0	\$0
Scuppernong	8/26/2011	2112	EF0	0	0	\$75,000	\$0
Columbia	8/26/2011	2255	EF2	0	0	\$150,000	\$0
Jerry	9/29/2011	310	EF1	0	1	\$20,000	\$0
Wenona	3/21/2012	1000	EF0	0	0	\$0	\$0
Gurlock	7/10/2012	1640	EF0	0	0	\$0	\$0
Ponzer	4/7/2014	1500	EF1	0	0	\$50,000	\$0
Edenhouse	4/25/2014	1820	EF2	0	0	\$5,000	\$0
Hamilton	7/3/2014	1950	EF1	0	0	\$26,000	\$0
Columbia	6/4/2015	100	EF0	0	0	\$5,000	\$0
Williamston	6/13/2015	1650	EF1	0	0	\$5,000	\$0
Colerain	2/24/2016	1454	EF0	0	0	\$25,000	\$0

SECTION 4: RISK ASSESSMENT

Location	Date	Time	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
Cremo	3/31/2017	1715	EF1	0	0	\$250,000	\$0
Mt Gould	5/5/2017	627	EF0	0	0	\$5,000	\$0
Gum Neck	5/23/2017	1716	EF1	0	0	\$0	\$0
Swindell	9/13/2018	1004	EF1	0	0	\$0	\$0
San Souci	9/14/2018	903	EF0	0	0	\$2,000	\$0
Beasley	4/13/2020	905	EF0	0	0	\$0	\$0
Jamesville	8/30/2020	2302	EF1	0	0	\$0	\$0
Woodard	8/04/2020	0015	EF3	2	14	\$1,000,000	\$0
Swanquarter	7/08/2021	1353	EFU	0	0	\$0	\$0
Woodard	7/03/2023	1434	EF0	0	0	\$75,000	\$0
Total				14	81	\$6,464,500	\$1,400,000

Source: NCEI

Specific incidents with some level of impact include:

May 9, 2003: A tornado producing F1 damage was reported 2 miles northeast of Plymouth moved east northeast to Roper causing 1.4 million dollars in damage to crops, and \$250,000 in damage to property, including several farm homes, and other farm structures.

May 11, 2008: Scattered severe thunderstorms produced damaging winds, large hail and one tornado across portions of northeast North Carolina. The tornado first touched down about two miles north-northwest of Lewiston Woodville. The tornado path then continued east-northeast across the county producing EF0 to EF2 damage. The tornado path ended as EF0 damage about one mile south of Powellsville. In total, the tornado caused 2 injuries and \$1 million in property damages. Damage included EF0 damage, demolishing a porch attached to a mobile home and snapping several trees, EF1 damage, downing numerous trees, damaging several trailers, brick homes, mobile homes, and EF2 damage, which destroyed several mobile homes and demolished a church.

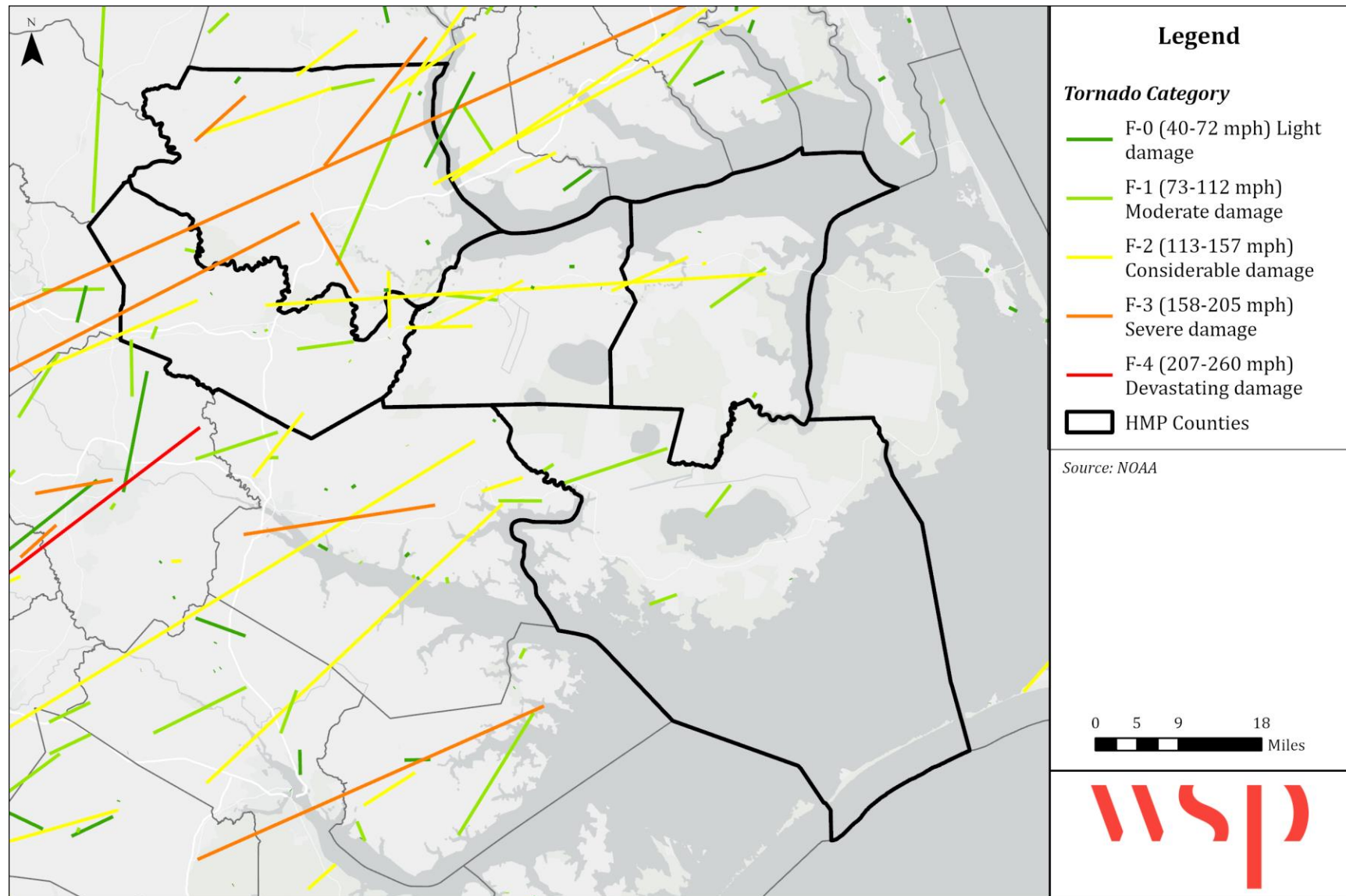
April 16, 2011: One of the largest tornado outbreaks ever observed across eastern North Carolina occurred during the afternoon and evening of April 16th, 2011. Several powerful super-cell thunderstorms developed ahead of an approaching cold front. Conditions ahead of the front were favorable for tornadoes and altogether 12 tornadoes were reported across the Newport/Morehead City warning area. These tornadoes combined to produce over 40 million dollars in damages. In the Northeastern NC Region, four different tornadoes touched down causing 12 fatalities, 63 injuries, and \$2.9 million in damages ranging from EF0 to EF3. The most damaging tornado first touched down about one mile south of Askewville, producing minor tree and building damage. The tornado began producing significant damage on the east side of Askewville, where numerous structures and several mobile homes sustained major damage or were destroyed. The tornado then tracked continuously for nearly 19 miles finally lifting east of Harrellsville. For much of the tornado's life, the path width was one half to nearly three quarters of a mile wide. EF2 and EF3 damage was widespread from just east of Askewville northeast to about 3 miles west of Colerain, then gradually decreased as the tornado crossed into Hertford County. Numerous homes were destroyed, and many others suffered varying degrees of damage. Overall, this one tornado accounted for all of the fatalities, 55 of the injuries, and \$2,250,000 worth of damages to the region.

A distinct separation in the damage paths northwest of Colerain suggested that a second tornado formed just northwest of Colerain and tracked northeast nearly parallel to the original tornado. North of Colerain, the tornado tracked parallel to Route 45 for about 1 mile then continued northeast into southeast Hertford County just west of the Chowan River. In the Bertie County portion of the tornado, several homes and

other buildings were damaged. Poultry houses and other farm equipment were also damaged. Many trees were downed or snapped off. This split left 8 injuries and \$250,000 in damages in its wake.

August 8, 2020: The center of Tropical Storm Isaias tracked north just inland of the Middle Atlantic Coast from late Monday night, August 3rd through Tuesday morning, August 4th. Outer bands north and east of the Tropical Storm produced three tornadoes across portions of northeast North Carolina. A damage survey conducted by the NWS Wakefield office found a path of storm damage consistent with an EF3 tornado. The tornado touched down near the intersection of Knowles Lane and Middle Track Road. It then tracked to the north northwest and reached its strongest point just south of the town of Woodard as it crossed Morning Road, where its width increased to just over one third of a mile and it reached EF3 intensity. The tornado completely destroyed several mobile homes and stick built houses in this area. It flattened seven single-wide and double-wide mobile homes, leaving unrecognizable bits of debris. The fatalities and injuries occurred in the vicinity of Morning Road. The tornado weakened to EF1 intensity as it approached the west side of the town of Windsor, but it did damage a farm on Highway 306. The tornado then lifted just before reaching Governors Road about 2 miles northwest of Windsor.

Figure 4.50 - Tornado Paths Through Northeastern NC Region, 1950-2024



THUNDERSTORM WINDS

Between January 1, 1999 and December 31, 2024, the NCEI recorded 311 separate incidents of high winds, strong winds, and thunderstorm winds, occurring on 163 separate days. These events caused \$635,800 in recorded property damage, and 2 injuries, with no recorded fatalities or crop damages. The recorded gusts averaged 60 mph, with the highest gust recorded at 89.8 mph. Of these events, 78 caused property damage. Wind gusts with property damage recorded averaged \$8,151 in damage. The largest damage estimate, approximately \$70,000 was caused by a 69-mph gust on January 7, 2009 in Williamston. All incidents causing property damage are recorded below:

Table 4.73 – Recorded Wind Events with Property Damages in Northeastern NC Region, 1999-2024

Location	Date	Time	Wind Speed (mph)	Fatalities	Injuries	Property Damage
Williamston	5/20/2000	2215	71	0	0	\$10,000
Roper	5/27/2000	2223	-	0	0	\$30,000
Bear Grass	5/27/2000	2245	-	0	0	\$10,000
Colerain	8/16/2000	2040	58	0	0	\$5,000
Merry Hill	8/18/2000	1750	58	0	0	\$3,000
Williamston	5/22/2001	2015	61	0	0	\$10,000
Columbia	4/25/2002	2000	-	0	0	\$5,000
Windsor	5/13/2002	2035	-	0	0	\$2,000
Lewiston	7/10/2002	1850	-	0	0	\$2,000
Windsor	11/11/2002	1230	-	0	0	\$2,000
Colerain	5/9/2003	1710	58	0	0	\$15,000
Aulander	6/7/2003	1736	58	0	0	\$2,000
Ocracoke	12/11/2003	27	63	0	0	\$10,000
Windsor	5/2/2004	1440	58	0	0	\$2,000
Countywide	3/8/2005	1200	75	0	1	\$50,000
Williamston	3/8/2005	1115	58	0	0	\$25,000
Countywide	3/8/2005	1140	63	0	0	\$25,000
Countywide	3/8/2005	1212	75	0	0	\$25,000
Windsor	9/17/2005	2235	58	0	0	\$2,000
Aulander	1/14/2006	225	58	0	0	\$4,000
Jamesville	4/3/2006	1125	69	0	0	\$10,000
Buena Vista	7/28/2006	1900	58	0	0	\$2,000
Windsor	7/28/2006	2115	58	0	0	\$2,000
Kelford	3/5/2008	100	90	0	0	\$25,000
Cremo	5/11/2008	1752	58	0	0	\$2,000
Trap	5/11/2008	1757	58	0	0	\$2,000
Colerain	5/11/2008	1800	58	0	0	\$2,000
Colerain	6/1/2008	1610	58	0	0	\$1,000
Cremo	6/1/2008	1822	58	0	0	\$1,000
Bertie (Zone)	12/31/2008	1723	46	0	0	\$1,000
Williamston	1/7/2009	1021	69	0	0	\$70,000
Bertie (Zone)	1/7/2009	2015	58	0	0	\$5,000

SECTION 4: RISK ASSESSMENT

Location	Date	Time	Wind Speed (mph)	Fatalities	Injuries	Property Damage
Woodville	4/6/2009	1130	60	0	0	\$25,000
Fairfield	5/29/2009	1505	63	0	0	\$2,000
Windsor	9/28/2009	2000	58	0	0	\$2,000
Martin (Zone)	2/10/2010	815	52	0	0	\$500
Woodville	6/16/2010	1614	58	0	0	\$2,000
Colerain	6/16/2010	1631	58	0	0	\$2,000
Merry Hill	8/12/2010	1608	58	0	0	\$2,000
Cremo	5/23/2011	1922	58	0	0	\$2,000
Windsor	6/27/2011	1515	58	0	0	\$2,000
Cahaba	6/27/2011	1550	58	0	0	\$2,000
Burden	7/20/2011	1600	58	0	0	\$2,000
Aulander	7/1/2012	1533	58	0	0	\$1,000
Woodard	7/24/2012	1635	58	0	0	\$2,000
Williamston	1/31/2013	203	69	0	0	\$20,000
Robersonville	1/31/2013	147	69	0	0	\$5,000
Windsor	1/31/2013	230	60	0	0	\$2,000
Martin (Zone)	3/6/2013	1300	49	0	0	\$500
Colerain	6/13/2013	1730	58	0	0	\$2,000
Bear Grass	6/13/2013	1803	58	0	0	\$300
Windsor	4/25/2014	1730	58	0	0	\$3,000
Creswell	6/5/2014	1250	64	0	0	\$4,000
Trap	6/19/2014	1925	58	0	0	\$2,000
Colerain	7/15/2014	1410	58	0	0	\$5,000
Fairfield	2/16/2016	946	69	0	0	\$5,000
Lake Comfort	2/16/2016	943	69	0	0	\$3,000
Robersonville	7/8/2016	1925	75	0	0	\$10,000
Bertie (Zone)	10/8/2016	1800	58	0	0	\$50,000
Midway	3/31/2017	1055	58	0	0	\$3,000
Trap	3/31/2017	1728	58	0	0	\$1,000
Bertie	6/5/2017	1553	58	0	0	\$30,000
Powellsville	6/5/2017	1600	58	0	0	\$3,000
Kelford	6/20/2019	1600	58	0	0	\$2,000
Woodville	6/20/2019	1603	58	0	0	\$2,000
Colerain	7/22/2019	1830	58	0	0	\$1,000
Bertie	8/23/2019	1625	58	0	0	\$2,000
Republican	7/28/2020	1702	58	0	0	\$3,000
Burden	3/28/2021	1510	58	0	0	\$1,000
Buena vista	3/28/2021	1530	58	0	0	\$2,000
Cremo	4/7/2022	1720	58	0	1	\$30,000
Roxobel	5/6/2022	2055	58	0	0	\$23,500
Roxobel	6/17/2022	1855	58	0	0	\$3,000
Ellis store	7/16/2022	1908	58	0	0	\$1,000
Quitsna	7/3/2023	1400	58	0	0	\$3,000

SECTION 4: RISK ASSESSMENT

Location	Date	Time	Wind Speed (mph)	Fatalities	Injuries	Property Damage
Woodville	8/7/2023	2000	58	0	0	\$1,000
Kelford	5/27/2024	1600	58	0	0	\$2,000
Powellsville	5/27/2024	1630	58	0	0	\$2,000
Total				0	2	\$635,800

Source: NCEI

LIGHTNING

According to NCEI data, there were no lightning strikes reported between 1999 and 2025. It should be noted that this indicates no damaging lightning strikes, causing injury, fatality, or property damage, were recorded. However, lightning strikes certainly occurred and will continue to occur in the future, and the possibility of future damages remains.

HAIL

NCEI records 132 separate hail incidents across 76 days between 1999 and 2025 in the Northeastern NC Region. Of these, four events were reported to have directly caused property damage, and two events were reported to have directly caused crop damage; there were no reported deaths, or injuries. The largest diameter hail recorded in the Region was 4.25 inches; hail this size fell on May 9, 2003 in Colerain. The average hail size in all storms was a little over one inch in diameter. Table 4.74 summarizes hail occurrences by county from 1999 through 2025.

Table 4.74 - Summary of Hail Occurrences by County, 1999-2025

County	Number of Occurrences	Average Hail Diameter	Total Property Damage	Total Crop Damage
Bertie County	23	1.55"	\$95,000	\$251,000
Hyde County	20	1.28"	\$0	\$0
Martin County	55	1.07"	\$0	\$0
Tyrrell County	9	0.92"	\$0	\$0
Washington County	25	1.02"	\$0	\$0
Total	132	1.16"	\$95,000	\$251,000

The following narratives provide detail on select hailstorms from the above list of NCEI recorded events:

June 15, 2000 – Hail caused \$1,000 in damage to tobacco fields.

May 9, 2003 – Hail of up to 4.25" in diameter fell in Colerain, causing \$20,000 in property damages to vehicles and homes.

July 24, 2009 – A cold front and upper-level disturbance combined to produce widespread severe thunderstorms across the area mainly during the afternoon hours. The storm led to baseball size hail and tree limbs down on Highway 45 five miles southwest of Pungo Lake.

May 31, 2019 - Baseball size hail was reported. Hail damage occurred to homes and vehicles. Also, widespread crop damage was reported.

PROBABILITY OF FUTURE OCCURRENCE

Based on historical occurrences recorded by NCEI for the 26-year period from 1999 through 2024, Northeastern Region averages 12 days with thunderstorm wind events per year. Over this same period, no lightning events were reported.

Over the 26-year period from 1999 through 2024, the Northeastern Region experienced 132 reported hail incidents; this averages to 5.1 reported incidents per year somewhere in the planning area.

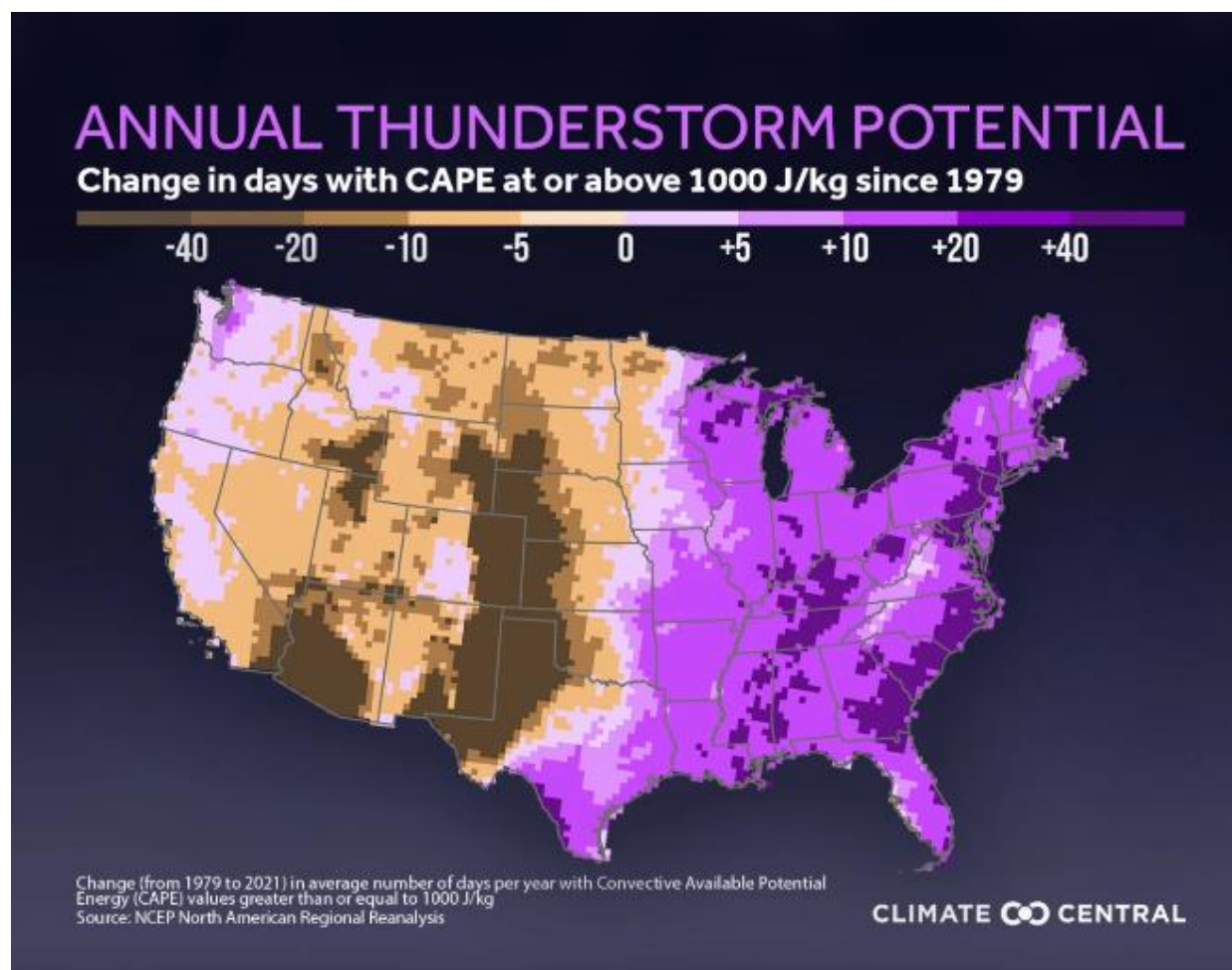
Over this same period, 53 tornado incidents were reported, which equates to 2.0 reported incidents per year somewhere in the planning area. However, only seven of these past tornado events were a magnitude EF2 or greater; therefore, the annual probability of a significant tornado event is approximately 27 percent.

Based on these historical occurrences, there is a 100% chance that the Region will experience severe weather each year. The probability of a damaging impacts is highly likely.

Probability: 4 – Highly Likely

CLIMATE CHANGE

According to the National Aeronautics and Space Administration (NASA), thunderstorm events in the future are likely to become more frequent in the southeast as a result of weather extremes. Thunderstorm potential is measured by an index that NASA created called the Convective Available Potential Energy (CAPE) index. This measures how warm and moist the air is, which is a major contributing factor in thunderstorm/tornado formation. Between 1979 and 2021, the Northeastern Region experienced 40+ more days on average with CAPE at or above 1000 J/kg, which is considered a high cape value. Figure 4.51 below shows the change in days with high potential for thunderstorms nationwide.

Figure 4.51 – Change in Days with High Thunderstorm Potential from 1979 to 2021

Source: NCEP North American Regional Reanalysis, Climate Central 2022

NASA projects that by the period of 2072-2099, the CAPE in the southeastern United States will increase dramatically. Parts of North Carolina are in an area that will likely experience the greatest increase in CAPE in the United States, and the entire state is likely to experience at least some increase.

For a thunderstorm to become a supercell event, meaning that it produces more severe weather like large hail, damaging winds, and tornadoes, it relies on not only warm moist air, but also wind at different levels moving in different directions at different speed (wind shear). As the planet warms, wind shear, unlike warm, moist air, is expected to decrease. Therefore, it is difficult to predict if more supercell thunderstorm events and the tornadoes they can bring with them are more likely to occur.

Additionally, while supercell events are associated with tornadoes, only about 20% of supercell thunderstorms produce tornadoes. To complicate things further, no one fully understands how tornadoes are formed. Therefore, there is no identified conclusion on how climate change will impact tornadoes.

The relationship between hail and climate change is also unclear, however, a 2022 study shows that climate change could increase severe and/or significant spring hailstorms within the Central U.S. (Fan, et.al, 2022). Lightning has a more direct correlation with increasing temperatures as it occurs more frequently when the temperature is hotter than when it is colder. Romps, et. al postulate that lightning will increase by 12% for every degree of rise in global average air temperature.

VULNERABILITY ASSESSMENT

METHODOLOGIES AND ASSUMPTIONS

Population and property at risk to wind events was estimated using data from the NCEM IRISK database, which was compiled in NCEM’s Risk Management Tool.

PEOPLE

People and populations exposed to the elements are most vulnerable to severe weather. A common hazard associated with wind events is falling trees and branches. Risk of being struck by lightning is greater in open areas, at higher elevations, and on the water. Lightning can also cause cascading hazards, including power loss. Loss of power could critically impact those relying on energy to service, including those that need powered medical devices. Additionally, the ignition of fires is always a concern with lightning strikes.

The availability of sheltered locations such as basements, buildings constructed using hail-resistant materials and methods, and public storm shelters, all reduce the exposure of the population. Individuals who work outdoors may face increased risk during severe weather events. Residents living in mobile homes are also more vulnerable to hail events due to the lack of shelter locations and the vulnerability of the housing unit to damages. Table 4.75 summarizes estimates of mobile home units in the Northeastern NC Region by county as of 2023. Based on these figures, vulnerability is high in Bertie and Tyrrell Counties.

Table 4.75 – Mobile Home Units in the Northeastern NC Region, 2023

County	Occupied Mobile Home Units	Total Occupied Housing Units	Percent of Occupied Housing
Bertie County	2,141	7,024	30.5%
Hyde County	449	2,115	21.2%
Martin County	2,020	9,361	21.6%
Tyrrell County	430	1,426	30.2%
Washington County	1,263	4,832	26.1%

Source: American Community Survey 2019-2023 5-Year Estimates

Between 1999 and 2024, the NCEI records no fatalities and 2 injuries attributed to wind events in the Region. There are no injuries or fatalities attributed to hail or lightning. NCEI records 14 deaths and 81 injuries attributed to tornadoes during this same time.

PROPERTY

Property damage caused by lightning usually occurs in one of two ways – either by direct damages through fires ignited by lightning, or by secondary impacts due to power loss. There was no damage recorded due to lightning in the region, but often property damage is due to structure fires.

General damages to property from hail are direct, including destroyed windows, dented cars, and building, roof and siding damage in areas exposed to hail. Hail can also cause enough damage to cars to cause them to be totaled. The level of damage is commensurate with both a material’s ability to withstand hail impacts, and the size of the hailstones that are falling. Construction practices and building codes can help maximize the resistance of the structures to damage. Large amounts of hail may need to be physically cleared from roadways and sidewalks, depending on accumulation. Hail can cause other cascading impacts, including power loss. During the 26-year span from 1999 and 2024, NCEI reported

\$95,000 in damages caused by hail in the Northeastern NC Region, which equates to an annualized loss of \$3,653.

According to PolicyGenius, North Carolina had one of the highest numbers of hail loss claims (25,026) in the U.S. in 2019. It should be noted that property damage due to hail is usually insured loss, with damages covered under most major comprehensive insurance plans. Because of this, hail losses are notoriously underreported by the NCEI. It is difficult to find an accurate repository of hail damages in the Northeastern Region, thus the NCEI is still used to form a baseline.

When strong enough, wind events can cause significant direct damage to buildings and infrastructure. NCEI reports \$635,800 in property losses due to wind events over 26 years (1999-2024). The average impact from wind per incident in the Northeastern Region is \$2,044. NCEM's IRISK database estimates damages from increasing magnitudes of wind events, detailed in Table 4.76 through Table 4.80. Note that these tables sum the total estimated damage should every exposed property in each jurisdiction be impacted by an event of the given magnitude. Therefore, these tables are not an approximation of the total damages that would occur from an event of each magnitude because a thunderstorm wind event would not uniformly impact the entire Region. These tables should only be used to understand potential damages relative to storms of varying degrees of severity.

General damages to property are both direct (what the tornado physically destroys) and indirect (additional costs, damages, and losses attributed to secondary hazards spawned by the tornado or due to the damages caused by the tornado). Depending on its size and path, a tornado is capable of damaging and eventually destroying almost anything. During a 26-year span between 1999 and 2024, tornadoes caused \$6,464,500 in damage in the Northeastern Region, averaging \$121,971 per event. Construction practices and building codes can help maximize the resistance of the structures to damage. Estimated building damages for different tornado magnitudes are detailed in Table 4.81 to

Table 4.85.

SECTION 4: RISK ASSESSMENT

Table 4.76 – Estimated Buildings Impacted by 25-Year Thunderstorm Winds

Jurisdiction	All Buildings	Residential Buildings at Risk			Commercial Buildings at Risk			Public Buildings at Risk			Total Buildings at Risk		
	Num	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages
Bertie													
Unincorporated Bertie County	11,175	8,687	78	\$3,813,289	2,275	20	\$1,179,630	158	1	\$244,303	11,120	100	\$5,237,222
Town of Askewville	502	383	76	\$119,371	107	21	\$12,675	12	2	\$11,038	502	100	\$143,084
Town of Aulander	744	640	86	\$213,639	90	12	\$26,606	14	2	\$3,071	744	100	\$243,316
Town of Colerain	428	333	78	\$260,185	74	17	\$74,281	14	3	\$8,302	421	98	\$342,768
Town of Kelford	173	155	90	\$56,944	14	8	\$751	4	2	\$800	173	100	\$58,496
Town of Lewiston-Woodville	719	597	83	\$197,387	106	15	\$15,634	16	2	\$2,561	719	100	\$215,583
Town of Powellsville	171	148	87	\$92,286	16	9	\$3,186	7	4	\$2,501	171	100	\$97,974
Town of Roxobel	205	153	75	\$89,222	48	23	\$6,342	4	2	\$1,182	205	100	\$96,746
Town of Windsor	1,815	1,442	79	\$510,714	307	17	\$79,617	64	4	\$30,700	1,813	100	\$621,030
Subtotal Bertie	15,932	12,538	79	\$5,353,037	3,037	19	\$1,398,722	293	2	\$304,458	15,868	100	\$7,056,219
Hyde													
Unincorporated Hyde County	5,596	4,272	76	\$3,125,895	747	13	\$271,402	97	2	\$61,732	5,116	91	\$3,459,030
Martin													
Unincorporated Martin County	12,188	8,559	70	\$5,822,792	3,414	28	\$1,677,736	208	2	\$513,063	12,181	100	\$8,013,592
Town of Bear Grass	81	55	68	\$34,849	7	9	\$3,245	19	23	\$15,917	81	100	\$54,011
Town of Everetts	159	151	95	\$70,472	8	5	\$1,402	0	0	\$0	159	100	\$71,875
Town of Hamilton	292	233	80	\$130,777	26	9	\$11,143	32	11	\$35,593	291	100	\$177,512
Town of Hassell	70	59	84	\$40,806	11	16	\$3,020	0	0	\$0	70	100	\$43,825
Town of Jamesville	297	228	77	\$138,533	43	14	\$49,931	22	7	\$13,612	293	99	\$202,076

SECTION 4: RISK ASSESSMENT

Jurisdiction	All Buildings	Residential Buildings at Risk			Commercial Buildings at Risk			Public Buildings at Risk			Total Buildings at Risk		
	Num	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages
Town of Oak City	313	302	96	\$258,034	10	3	\$1,974	1	0	\$7,441	313	100	\$267,449
Town of Parmele	149	132	89	\$86,425	16	11	\$13,943	1	1	\$1,372	149	100	\$101,739
Town of Robersonville	901	783	87	\$664,458	107	12	\$80,141	11	1	\$8,108	901	100	\$752,708
Town of Williamston	4,238	3,104	73	\$2,045,892	880	21	\$826,991	247	6	\$621,069	4,231	100	\$3,493,952
Subtotal Martin	18,688	13,606	73	\$9,293,038	4,522	24	\$2,669,526	541	3	\$1,216,175	18,669	100	\$13,178,739
Tyrrell													
Unincorporated Tyrrell County	519	408	79	\$164,889	66	13	\$853,042	34	7	\$81,950	508	98	\$1,099,881
Town of Columbia	2,794	2,012	72	\$1,156,247	508	18	\$112,745	42	2	\$447,542	2,562	92	\$1,716,535
Subtotal Tyrrell	3,313	2,420	73	\$1,321,136	574	17	\$965,787	76	2	\$529,492	3,070	93	\$2,816,416
Washington													
Unincorporated Washington County	5,482	3,940	72	\$2,099,303	1,354	25	\$188,534	84	2	\$20,683	5,378	98	\$2,308,520
Town of Creswell	366	274	75	\$122,834	68	19	\$16,177	22	6	\$10,147	364	99	\$149,158
Town of Plymouth	2,779	2,338	84	\$1,109,789	330	12	\$257,118	105	4	\$60,059	2,773	100	\$1,426,966
Town of Roper	611	505	83	\$254,141	81	13	\$18,655	20	3	\$150,020	606	99	\$422,816
Subtotal Washington	9,238	7,057	76	\$3,586,067	1,833	20	\$480,484	231	3	\$240,909	9,121	99	\$4,307,460
Region Total	52,767	39,893	76	\$22,679,173	10,713	20	\$5,785,921	1,238	2	\$2,352,766	51,844	98	\$30,817,864

Source: NCEM Risk Management Tool

SECTION 4: RISK ASSESSMENT

Table 4.77 – Estimated Buildings Impacted by 50-Year Thunderstorm Winds

Jurisdiction	All Buildings	Residential Buildings at Risk			Commercial Buildings at Risk			Public Buildings at Risk			Total Buildings at Risk		
	Num	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages
Bertie													
Unincorporated Bertie County	11,175	8,687	78	\$6,005,165	2,275	20	\$1,981,754	158	1	\$412,402	11,120	100	\$8,399,321
Town of Askewville	502	383	76	\$191,956	107	21	\$21,559	12	2	\$20,041	502	100	\$233,556
Town of Aulander	744	640	86	\$343,141	90	12	\$46,667	14	2	\$5,813	744	100	\$395,621
Town of Colerain	428	333	78	\$406,792	74	17	\$125,382	14	3	\$18,305	421	98	\$550,480
Town of Kelford	173	155	90	\$88,732	14	8	\$1,630	4	2	\$1,742	173	100	\$92,103
Town of Lewiston-Woodville	719	597	83	\$314,961	106	15	\$33,607	16	2	\$5,234	719	100	\$353,802
Town of Powellsville	171	148	87	\$143,453	16	9	\$6,633	7	4	\$5,400	171	100	\$155,486
Town of Roxobel	205	153	75	\$146,168	48	23	\$14,301	4	2	\$2,400	205	100	\$162,870
Town of Windsor	1,815	1,442	79	\$791,216	307	17	\$140,620	64	4	\$52,360	1,813	100	\$984,196
Subtotal Bertie	15,932	12,538	79	\$8,431,584	3,037	19	\$2,372,153	293	2	\$523,697	15,868	100	\$11,327,435
Hyde													
Unincorporated Hyde County	5,596	4,272	76	\$5,281,330	747	13	\$534,540	97	2	\$142,780	5,116	91	\$5,958,649
Martin													
Unincorporated Martin County	12,188	8,559	70	\$9,367,387	3,414	28	\$3,322,055	208	2	\$933,408	12,181	100	\$13,622,850
Town of Bear Grass	81	55	68	\$61,592	7	9	\$7,438	19	23	\$32,701	81	100	\$101,730
Town of Everetts	159	151	95	\$106,488	8	5	\$3,122	0	0	\$0	159	100	\$109,610
Town of Hamilton	292	233	80	\$204,454	26	9	\$23,207	32	11	\$71,585	291	100	\$299,246
Town of Hassell	70	59	84	\$73,277	11	16	\$6,054	0	0	\$0	70	100	\$79,331
Town of Jamesville	297	228	77	\$222,224	43	14	\$97,079	22	7	\$27,216	293	99	\$346,519
Town of Oak City	313	302	96	\$472,120	10	3	\$4,137	1	0	\$13,473	313	100	\$489,730
Town of Parmele	149	132	89	\$133,794	16	11	\$26,104	1	1	\$2,756	149	100	\$162,654
Town of Robersonville	901	783	87	\$1,080,212	107	12	\$161,484	11	1	\$16,097	901	100	\$1,257,794

SECTION 4: RISK ASSESSMENT

Jurisdiction	All Buildings	Residential Buildings at Risk			Commercial Buildings at Risk			Public Buildings at Risk			Total Buildings at Risk		
	Num	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages
Town of Williamston	4,238	3,104	73	\$3,196,195	880	21	\$1,621,501	247	6	\$1,175,961	4,231	100	\$5,993,657
Subtotal Martin	18,688	13,606	73	\$14,917,743	4,522	24	\$5,272,181	541	3	\$2,273,197	18,669	100	\$22,463,121
Tyrrell													
Unincorporated Tyrrell County	2,794	408	79	\$164,889	66	13	\$853,042	34	7	\$81,950	508	98	\$1,099,881
Town of Columbia	519	2,012	72	\$1,156,247	508	18	\$112,745	42	2	\$447,542	2,562	92	\$1,716,535
Subtotal Tyrrell	3,313	2,420	73	\$1,321,136	574	17	\$965,787	76	2	\$529,492	3,070	93	\$2,816,416
Washington													
Unincorporated Washington County	5,482	274	75	\$122,834	68	19	\$16,177	22	6	\$10,147	364	99	\$149,158
Town of Creswell	366	2,338	84	\$1,109,789	330	12	\$257,118	105	4	\$60,059	2,773	100	\$1,426,966
Town of Plymouth	2,779	505	83	\$254,141	81	13	\$18,655	20	3	\$150,020	606	99	\$422,816
Town of Roper	611	3,940	72	\$2,099,303	1,354	25	\$188,534	84	2	\$20,683	5,378	98	\$2,308,520
Subtotal Washington	9,238	7,057	76	\$3,586,067	1,833	20	\$480,484	231	3	\$240,909	9,121	99	\$4,307,460
Region Total	52,767	39,893	76	\$22,679,173	10,713	20	\$5,785,921	1,238	2	\$2,352,766	51,844	98	\$30,817,864

Source: NCEM Risk Management Tool

SECTION 4: RISK ASSESSMENT

Table 4.78 – Estimated Buildings Impacted by 100-Year Thunderstorm Winds

Jurisdiction	All Buildings	Residential Buildings at Risk			Commercial Buildings at Risk			Public Buildings at Risk			Total Buildings at Risk		
	Num	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages
Bertie													
Unincorporated Bertie County	11,175	8,687	78	\$9,524,072	2,275	20	\$3,261,783	158	1	\$750,661	11,120	100	\$13,536,516
Town of Askewville	502	383	76	\$406,483	107	21	\$59,742	12	2	\$51,259	502	100	\$517,485
Town of Aulander	744	640	86	\$532,939	90	12	\$81,305	14	2	\$11,404	744	100	\$625,648
Town of Colerain	428	333	78	\$651,823	74	17	\$203,545	14	3	\$36,582	421	98	\$891,950
Town of Kelford	173	155	90	\$136,862	14	8	\$3,545	4	2	\$3,906	173	100	\$144,313
Town of Lewiston-Woodville	719	597	83	\$503,785	106	15	\$70,631	16	2	\$10,853	719	100	\$585,269
Town of Powellsville	171	148	87	\$228,770	16	9	\$13,010	7	4	\$10,782	171	100	\$252,562
Town of Roxobel	205	153	75	\$236,919	48	23	\$31,506	4	2	\$5,005	205	100	\$273,430
Town of Windsor	1,815	1,442	79	\$1,199,424	307	17	\$251,875	64	4	\$95,895	1,813	100	\$1,547,194
Subtotal Bertie	15,932	12,538	79	\$13,421,077	3,037	19	\$3,976,942	293	2	\$976,347	15,868	100	\$18,374,367
Hyde													
Unincorporated Hyde County	5,596	4,272	76	\$10,456,583	747	13	\$1,101,793	97	2	\$335,475	5,116	91	\$11,893,851
Martin													
Unincorporated Martin County	12,188	8,559	70	\$16,361,441	3,414	28	\$5,719,113	208	2	\$1,636,422	12,181	100	\$23,716,976
Town of Bear Grass	81	55	68	\$115,412	7	9	\$17,418	19	23	\$67,833	81	100	\$200,663
Town of Everetts	159	151	95	\$163,426	8	5	\$7,368	0	0	\$0	159	100	\$170,794
Town of Hamilton	292	233	80	\$347,208	26	9	\$47,036	32	11	\$135,687	291	100	\$529,932
Town of Hassell	70	59	84	\$141,329	11	16	\$12,167	0	0	\$0	70	100	\$153,497
Town of Jamesville	297	228	77	\$379,631	43	14	\$184,156	22	7	\$54,755	293	99	\$618,542
Town of Oak City	313	302	96	\$928,212	10	3	\$8,720	1	0	\$22,795	313	100	\$959,728
Town of Parmele	149	132	89	\$151,325	16	11	\$30,151	1	1	\$5,171	149	100	\$186,647
Town of Robersonville	901	783	87	\$1,903,536	107	12	\$302,768	11	1	\$31,058	901	100	\$2,237,362

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Jurisdiction	All Buildings	Residential Buildings at Risk			Commercial Buildings at Risk			Public Buildings at Risk			Total Buildings at Risk		
	Num	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages
Town of Williamston	4,238	3,104	73	\$5,263,857	880	21	\$3,109,774	247	6	\$2,067,938	4,231	100	\$10,441,569
Subtotal Martin	18,688	13,606	73	\$25,755,377	4,522	24	\$9,438,671	541	3	\$4,021,659	18,669	100	\$39,215,710
Tyrrell													
Unincorporated Tyrrell County	2,794	2,012	72	\$5,004,499	508	18	\$581,246	42	2	\$2,251,609	2,562	92	\$7,837,354
Town of Columbia	519	408	79	\$742,839	66	13	\$1,759,611	34	7	\$346,524	508	98	\$2,848,974
Subtotal Tyrrell	3,313	2,420	73	\$5,747,338	574	17	\$2,340,857	76	2	\$2,598,133	3,070	93	\$10,686,328
Washington													
Unincorporated Washington County	5,482	3,940	72	\$5,268,617	1,354	25	\$660,782	84	2	\$91,530	5,378	98	\$6,020,929
Town of Creswell	366	274	75	\$271,007	68	19	\$54,036	22	6	\$44,561	364	99	\$369,603
Town of Plymouth	2,779	2,338	84	\$2,432,206	330	12	\$669,881	105	4	\$204,589	2,773	100	\$3,306,677
Town of Roper	611	505	83	\$567,141	81	13	\$78,186	20	3	\$324,947	606	99	\$970,275
Subtotal Washington	9,238	7,057	76	\$8,538,971	1,833	20	\$1,462,885	231	3	\$665,627	9,121	99	\$10,667,484
Region Total	52,767	39,893	76	\$63,919,346	10,713	20	\$18,321,148	1,238	2	\$8,597,241	51,844	98	\$90,837,740

Source: NCEM Risk Management Tool

SECTION 4: RISK ASSESSMENT

Table 4.79 – Estimated Buildings Impacted by 300-Year Thunderstorm Winds

Jurisdiction	All Buildings	Residential Buildings at Risk			Commercial Buildings at Risk			Public Buildings at Risk			Total Buildings at Risk		
	Num	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages
Bertie													
Unincorporated Bertie County	11,175	8,687	78	\$19,989,342	2,275	20	\$6,655,631	158	1	\$1,549,707	11,120	100	\$28,194,680
Town of Askewville	502	383	76	\$634,335	107	21	\$103,086	12	2	\$79,799	502	100	\$817,219
Town of Aulander	744	640	86	\$1,287,553	90	12	\$263,488	14	2	\$42,725	744	100	\$1,593,766
Town of Colerain	428	333	78	\$1,821,016	74	17	\$514,118	14	3	\$137,099	421	98	\$2,472,233
Town of Kelford	173	155	90	\$344,559	14	8	\$14,535	4	2	\$17,084	173	100	\$376,179
Town of Lewiston-Woodville	719	597	83	\$1,351,932	106	15	\$266,159	16	2	\$42,844	719	100	\$1,660,935
Town of Powellsville	171	148	87	\$386,718	16	9	\$26,983	7	4	\$22,496	171	100	\$436,197
Town of Roxobel	205	153	75	\$625,331	48	23	\$122,071	4	2	\$19,050	205	100	\$766,452
Town of Windsor	1,815	1,442	79	\$2,661,637	307	17	\$811,377	64	4	\$350,509	1,813	100	\$3,823,523
Subtotal Bertie	15,932	12,538	79	\$29,102,423	3,037	19	\$8,777,448	293	2	\$2,261,313	15,868	100	\$40,141,184
Hyde													
Unincorporated Hyde County	5,596	4,272	76	\$27,091,314	747	13	\$3,157,185	97	2	\$1,110,168	5,116	91	\$31,358,667
Martin													
Unincorporated Martin County	12,188	8,559	70	\$48,486,862	3,414	28	\$13,119,915	208	2	\$4,254,459	12,181	100	\$65,861,235
Town of Bear Grass	81	55	68	\$425,288	7	9	\$73,611	19	23	\$245,584	81	100	\$744,483
Town of Everetts	159	151	95	\$455,010	8	5	\$34,042	0	0	\$0	159	100	\$489,052
Town of Hamilton	292	233	80	\$1,179,273	26	9	\$163,780	32	11	\$413,891	291	100	\$1,756,944
Town of Hassell	70	59	84	\$511,796	11	16	\$42,772	0	0	\$0	70	100	\$554,568
Town of Jamesville	297	228	77	\$1,220,826	43	14	\$587,955	22	7	\$192,051	293	99	\$2,000,832
Town of Oak City	313	302	96	\$3,401,765	10	3	\$34,506	1	0	\$61,551	313	100	\$3,497,822
Town of Parmele	149	132	89	\$394,238	16	11	\$74,437	1	1	\$9,391	149	100	\$478,066
Town of Robersonville	901	783	87	\$4,553,918	107	12	\$653,771	11	1	\$58,835	901	100	\$5,266,523

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Jurisdiction	All Buildings	Residential Buildings at Risk			Commercial Buildings at Risk			Public Buildings at Risk			Total Buildings at Risk		
	Num	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages
Town of Williamston	4,238	3,104	73	\$16,614,852	880	21	\$10,206,415	247	6	\$5,590,794	4,231	100	\$32,412,062
Subtotal Martin	18,688	13,606	73	\$77,243,828	4,522	24	\$24,991,204	541	3	\$10,826,556	18,669	100	\$113,061,587
Tyrrell													
Unincorporated Tyrrell County	2,794	408	79	\$1,324,564	66	13	\$2,158,923	34	7	\$572,700	508	98	\$4,056,187
Town of Columbia	519	2,012	72	\$9,962,065	508	18	\$1,136,544	42	2	\$5,145,964	2,562	92	\$16,244,572
Subtotal Tyrrell	3,313	2,420	73	\$11,286,629	574	17	\$3,295,467	76	2	\$5,718,664	3,070	93	\$20,300,759
Washington													
Unincorporated Washington County	5,482	3,940	72	\$12,730,286	1,354	25	\$1,734,339	84	2	\$308,145	5,378	98	\$14,772,771
Town of Creswell	366	274	75	\$719,992	68	19	\$163,459	22	6	\$183,434	364	99	\$1,066,885
Town of Plymouth	2,779	2,338	84	\$3,708,421	330	12	\$1,088,703	105	4	\$384,492	2,773	100	\$5,181,616
Town of Roper	611	505	83	\$1,448,424	81	13	\$268,498	20	3	\$639,059	606	99	\$2,355,981
Subtotal Washington	9,238	7,057	76	\$18,607,123	1,833	20	\$3,254,999	231	3	\$1,515,130	9,121	99	\$23,377,253
Region Total	52,767	39,893	76	\$163,331,317	10,713	20	\$43,476,303	1,238	2	\$21,431,831	51,844	98	\$228,239,450

Source: NCEM Risk Management Tool

SECTION 4: RISK ASSESSMENT

Table 4.80 – Estimated Buildings Impacted by 700-Year Thunderstorm Winds

Jurisdiction	All Buildings	Residential Buildings at Risk			Commercial Buildings at Risk			Public Buildings at Risk			Total Buildings at Risk		
	Num	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages
Bertie													
Unincorporated Bertie County	11,175	8,687	78	\$35,675,007	2,275	20	\$11,370,942	158	1	\$2,901,999	11,120	100	\$49,947,948
Town of Askewville	502	383	76	\$1,338,798	107	21	\$228,418	12	2	\$167,576	502	100	\$1,734,792
Town of Aulander	744	640	86	\$1,996,116	90	12	\$461,103	14	2	\$76,292	744	100	\$2,533,512
Town of Colerain	428	333	78	\$3,019,884	74	17	\$819,509	14	3	\$250,352	421	98	\$4,089,745
Town of Kelford	173	155	90	\$537,159	14	8	\$25,739	4	2	\$30,973	173	100	\$593,871
Town of Lewiston-Woodville	719	597	83	\$2,153,830	106	15	\$460,824	16	2	\$76,634	719	100	\$2,691,288
Town of Powellsville	171	148	87	\$1,050,370	16	9	\$93,023	7	4	\$78,319	171	100	\$1,221,711
Town of Roxobel	205	153	75	\$984,249	48	23	\$209,174	4	2	\$32,831	205	100	\$1,226,255
Town of Windsor	1,815	1,442	79	\$4,060,375	307	17	\$1,379,084	64	4	\$644,278	1,813	100	\$6,083,736
Subtotal Bertie	15,932	12,538	79	\$50,815,788	3,037	19	\$15,047,816	293	2	\$4,259,254	15,868	100	\$70,122,858
Hyde													
Unincorporated Hyde County	5,596	4,272	76	\$56,435,553	747	13	\$6,021,227	97	2	\$2,304,075	5,116	91	\$64,760,855
Martin													
Unincorporated Martin County	12,188	8,559	70	\$90,101,864	3,414	28	\$23,216,173	208	2	\$6,891,234	12,181	100	\$120,209,271
Town of Bear Grass	81	55	68	\$752,772	7	9	\$129,147	19	23	\$414,523	81	100	\$1,296,442
Town of Everetts	159	151	95	\$780,423	8	5	\$62,661	0	0	\$0	159	100	\$843,084
Town of Hamilton	292	233	80	\$2,079,501	26	9	\$275,374	32	11	\$663,637	291	100	\$3,018,512
Town of Hassell	70	59	84	\$866,446	11	16	\$72,293	0	0	\$0	70	100	\$938,738
Town of Jamesville	297	228	77	\$2,074,323	43	14	\$974,953	22	7	\$322,560	293	99	\$3,371,837
Town of Oak City	313	302	96	\$5,832,639	10	3	\$60,738	1	0	\$99,062	313	100	\$5,992,439
Town of Parmele	149	132	89	\$1,269,895	16	11	\$194,611	1	1	\$27,487	149	100	\$1,491,993
Town of Robersonville	901	783	87	\$11,542,515	107	12	\$1,502,194	11	1	\$178,883	901	100	\$13,223,592

SECTION 4: RISK ASSESSMENT

Jurisdiction	All Buildings	Residential Buildings at Risk			Commercial Buildings at Risk			Public Buildings at Risk			Total Buildings at Risk		
	Num	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages
Town of Williamston	4,238	3,104	73	\$28,732,757	880	21	\$17,037,244	247	6	\$8,638,741	4,231	100	\$54,408,741
Subtotal Martin	18,688	13,606	73	\$144,033,135	4,522	24	\$43,525,388	541	3	\$17,236,127	18,669	100	\$204,794,649
Tyrrell													
Unincorporated Tyrrell County	2,794	2,012	72	\$21,929,557	508	18	\$2,593,772	42	2	\$7,892,803	2,562	92	\$32,416,132
Town of Columbia	519	408	79	\$3,940,843	66	13	\$3,416,572	34	7	\$1,595,472	508	98	\$8,952,886
Subtotal Tyrrell	3,313	2,420	73	\$25,870,400	574	17	\$6,010,344	76	2	\$9,488,275	3,070	93	\$41,369,018
Washington													
Unincorporated Washington County	5,482	3,940	72	\$22,388,573	1,354	25	\$2,925,590	84	2	\$634,941	5,378	98	\$25,949,105
Town of Creswell	366	274	75	\$1,317,041	68	19	\$320,957	22	6	\$383,390	364	99	\$2,021,389
Town of Plymouth	2,779	2,338	84	\$8,910,251	330	12	\$2,699,706	105	4	\$1,194,371	2,773	100	\$12,804,328
Town of Roper	611	505	83	\$2,423,243	81	13	\$477,045	20	3	\$886,788	606	99	\$3,787,077
Subtotal Washington	9,238	7,057	76	\$35,039,108	1,833	20	\$6,423,298	231	3	\$3,099,490	9,121	99	\$44,561,899
Region Total	52,767	39,893	76	\$312,193,984	10,713	20	\$77,028,073	1,238	2	\$36,387,221	51,844	98	\$425,609,279

Source: NCEM Risk Management Tool

SECTION 4: RISK ASSESSMENT

Table 4.81 – Estimated Buildings Impacted by EF0 Tornado

Jurisdiction	All Buildings	Residential Buildings at Risk			Commercial Buildings at Risk			Public Buildings at Risk			Total Buildings at Risk		
	Num	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages
Bertie													
Unincorporated Bertie County	11,175	8,732	78	\$53,269,580	2,275	20	\$27,744,583	158	1	\$3,976,050	11,165	100	\$84,990,213
Town of Askewville	502	383	76	\$2,106,365	107	21	\$1,034,690	12	2	\$196,967	502	100	\$3,338,023
Town of Aulander	744	640	86	\$3,820,597	90	12	\$1,778,305	14	2	\$215,956	744	100	\$5,814,859
Town of Colerain	428	340	79	\$2,295,641	74	17	\$811,412	14	3	\$218,778	428	100	\$3,325,832
Town of Kelford	173	155	90	\$824,341	14	8	\$74,665	4	2	\$27,780	173	100	\$926,786
Town of Lewiston-Woodville	719	597	83	\$3,428,849	106	15	\$1,476,018	16	2	\$108,304	719	100	\$5,013,171
Town of Powellsville	171	148	87	\$932,172	16	9	\$122,071	7	4	\$69,809	171	100	\$1,124,052
Town of Roxobel	205	153	75	\$992,205	48	23	\$421,680	4	2	\$26,224	205	100	\$1,440,109
Town of Windsor	1,815	1,442	79	\$9,549,610	307	17	\$5,023,765	64	4	\$2,069,488	1,813	100	\$16,642,863
Subtotal Bertie	15,932	12,590	79	\$77,219,360	3,037	19	\$38,487,189	293	2	\$6,909,356	15,920	100	\$122,615,908
Hyde													
Unincorporated Hyde County	5,596	4,362	78	\$28,056,098	747	13	\$7,986,043	98	2	\$979,642	5,207	93	\$37,021,783
Martin													
Unincorporated Martin County	12,188	8,559	70	\$74,156,091	3,414	28	\$36,758,249	208	2	\$6,150,278	12,181	100	\$117,064,618
Town of Bear Grass	81	55	68	\$422,294	7	9	\$108,561	19	23	\$487,853	81	100	\$1,018,707
Town of Everetts	159	151	95	\$1,181,914	8	5	\$81,744	0	0	\$0	159	100	\$1,263,658
Town of Hamilton	292	233	80	\$1,661,760	26	9	\$437,985	32	11	\$438,536	291	100	\$2,538,281
Town of Hassell	70	59	84	\$474,434	11	16	\$181,008	0	0	\$0	70	100	\$655,442
Town of Jamesville	297	228	77	\$1,772,123	43	14	\$1,521,717	22	7	\$625,539	293	99	\$3,919,379
Town of Oak City	313	302	96	\$2,760,723	10	3	\$95,284	1	0	\$45,911	313	100	\$2,901,918
Town of Parmele	149	132	89	\$952,416	16	11	\$272,389	1	1	\$10,680	149	100	\$1,235,485
Town of Robersonville	901	783	87	\$8,054,065	107	12	\$3,571,639	11	1	\$142,226	901	100	\$11,767,930

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Jurisdiction	All Buildings	Residential Buildings at Risk			Commercial Buildings at Risk			Public Buildings at Risk			Total Buildings at Risk		
	Num	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages
Town of Williamston	4,238	3,104	73	\$25,961,933	880	21	\$28,753,243	247	6	\$7,358,417	4,231	100	\$62,073,594
Subtotal Martin	18,688	13,606	73	\$117,397,753	4,522	24	\$71,781,819	541	3	\$15,259,440	18,669	100	\$204,439,012
Tyrrell													
Unincorporated Tyrrell County	519	408	79	\$2,693,382	66	13	\$1,444,059	34	7	\$925,316	508	98	\$5,062,757
Town of Columbia	2,794	2,073	74	\$13,871,088	510	18	\$4,216,480	43	2	\$1,600,664	2,626	94	\$19,688,232
Subtotal Tyrrell	3,313	2,481	75	\$16,564,470	576	17	\$5,660,539	77	2	\$2,525,980	3,134	95	\$24,750,989
Washington													
Unincorporated Washington County	5,482	4,026	73	\$22,895,407	1,361	25	\$7,478,735	84	2	\$663,392	5,471	100	\$31,037,534
Town of Creswell	366	274	75	\$1,358,217	68	19	\$588,562	22	6	\$535,142	364	99	\$2,481,920
Town of Plymouth	2,779	2,338	84	\$11,964,764	330	12	\$4,213,446	105	4	\$996,821	2,773	100	\$17,175,031
Town of Roper	611	505	83	\$2,398,785	81	13	\$521,167	20	3	\$366,645	606	99	\$3,286,597
Subtotal Washington	9,238	7,143	77	\$38,617,173	1,840	20	\$12,801,910	231	3	\$2,562,000	9,214	100	\$53,981,082
Region Total	52,767	40,182	76	\$277,854,854	10,722	20	\$136,717,500	1,240	2	\$28,236,418	52,144	99	\$442,808,774

SECTION 4: RISK ASSESSMENT

Table 4.82 – Buildings Impacted by EFI Tornado

Jurisdiction	All Buildings	Residential Buildings at Risk			Commercial Buildings at Risk			Public Buildings at Risk			Total Buildings at Risk		
	Num	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages
Bertie													
Unincorporated Bertie County	11,175	8,732	78	\$381,257,551	2,275	20	\$183,497,651	158	1	\$22,271,315	11,165	100	\$587,026,516
Town of Askewville	502	383	76	\$14,982,162	107	21	\$6,803,769	12	2	\$1,256,760	502	100	\$23,042,692
Town of Aulander	744	640	86	\$27,349,682	90	12	\$12,403,744	14	2	\$1,319,930	744	100	\$41,073,356
Town of Colerain	428	340	79	\$16,712,953	74	17	\$5,236,774	14	3	\$1,201,797	428	100	\$23,151,524
Town of Kelford	173	155	90	\$5,905,413	14	8	\$421,410	4	2	\$223,644	173	100	\$6,550,466
Town of Lewiston-Woodville	719	597	83	\$24,545,159	106	15	\$9,763,352	16	2	\$846,369	719	100	\$35,154,880
Town of Powellsville	171	148	87	\$6,741,263	16	9	\$667,284	7	4	\$543,703	171	100	\$7,952,251
Town of Roxobel	205	153	75	\$7,166,368	48	23	\$2,620,127	4	2	\$211,281	205	100	\$9,997,775
Town of Windsor	1,815	1,442	79	\$69,128,368	307	17	\$32,199,142	64	4	\$15,640,758	1,813	100	\$116,968,268
Subtotal Bertie	15,932	12,590	79	\$553,788,919	3,037	19	\$253,613,253	293	2	\$43,515,557	15,920	100	\$850,917,728
Hyde													
Unincorporated Hyde County	5,596	4,362	78	\$203,253,342	747	13	\$50,742,150	98	2	\$6,293,525	5,207	93	\$260,289,017
Martin													
Unincorporated Martin County	12,188	8,559	70	\$536,455,645	3,414	28	\$242,491,355	208	2	\$34,691,567	12,181	100	\$813,638,567
Town of Bear Grass	81	55	68	\$3,071,047	7	9	\$740,692	19	23	\$2,084,187	81	100	\$5,895,926
Town of Everetts	159	151	95	\$8,549,364	8	5	\$413,632	0	0	\$0	159	100	\$8,962,997
Town of Hamilton	292	233	80	\$12,046,509	26	9	\$2,676,281	32	11	\$3,535,695	291	100	\$18,258,485
Town of Hassell	70	59	84	\$3,487,568	11	16	\$819,914	0	0	\$0	70	100	\$4,307,483
Town of Jamesville	297	228	77	\$12,864,254	43	14	\$10,230,982	22	7	\$2,794,164	293	99	\$25,889,400
Town of Oak City	313	302	96	\$20,251,439	10	3	\$528,828	1	0	\$370,155	313	100	\$21,150,421
Town of Parmele	149	132	89	\$6,938,100	16	11	\$1,718,932	1	1	\$86,108	149	100	\$8,743,139

SECTION 4: RISK ASSESSMENT

Jurisdiction	All Buildings	Residential Buildings at Risk			Commercial Buildings at Risk			Public Buildings at Risk			Total Buildings at Risk		
	Num	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages
Town of Robersonville	901	783	87	\$58,384,712	107	12	\$23,229,057	11	1	\$1,059,275	901	100	\$82,673,044
Town of Williamston	4,238	3,104	73	\$187,876,594	880	21	\$183,621,299	247	6	\$49,207,346	4,231	100	\$420,705,239
Subtotal Martin	18,688	13,606	73	\$849,925,232	4,522	24	\$466,470,972	541	3	\$93,828,497	18,669	100	\$1,410,224,701
Tyrrell													
Unincorporated Tyrrell County	2,794	2,073	74	\$98,822,093	510	18	\$27,991,401	43	2	\$11,162,112	2,626	94	\$137,975,606
Town of Columbia	519	408	79	\$19,429,887	66	13	\$9,191,509	34	7	\$4,920,600	508	98	\$33,541,996
Subtotal Tyrrell	3,313	2,481	75	\$118,251,980	576	17	\$37,182,910	77	2	\$16,082,712	3,134	95	\$171,517,602
Washington													
Unincorporated Washington County	5,482	4,026	73	\$164,193,137	1,361	25	\$51,074,004	84	2	\$4,309,223	5,471	100	\$219,576,364
Town of Creswell	366	274	75	\$9,662,280	68	19	\$3,555,773	22	6	\$2,558,507	364	99	\$15,776,560
Town of Plymouth	2,779	2,338	84	\$86,819,686	330	12	\$26,205,635	105	4	\$6,532,316	2,773	100	\$119,557,637
Town of Roper	611	505	83	\$17,270,252	81	13	\$3,046,499	20	3	\$2,063,709	606	99	\$22,380,460
Subtotal Washington	9,238	7,143	77	\$277,945,355	1,840	20	\$83,881,911	231	3	\$15,463,755	9,214	100	\$377,291,021
Region Total	52,767	40,182	76	\$2,003,164,828	10,722	20	\$891,891,196	1,240	2	\$175,184,046	52,144	99	\$3,070,240,069

SECTION 4: RISK ASSESSMENT

Table 4.83 – Buildings Impacted by EF2 Tornado

Jurisdiction	All Buildings	Residential Buildings at Risk			Commercial Buildings at Risk			Public Buildings at Risk			Total Buildings at Risk		
	Num	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages
Bertie													
Unincorporated Bertie County	11,175	8,732	78	\$381,257,551	2,275	20	\$183,497,651	158	1	\$22,271,315	11,165	100	\$587,026,516
Town of Askewville	502	383	76	\$14,982,162	107	21	\$6,803,769	12	2	\$1,256,760	502	100	\$23,042,692
Town of Aulander	744	640	86	\$27,349,682	90	12	\$12,403,744	14	2	\$1,319,930	744	100	\$41,073,356
Town of Colerain	428	340	79	\$16,712,953	74	17	\$5,236,774	14	3	\$1,201,797	428	100	\$23,151,524
Town of Kelford	173	155	90	\$5,905,413	14	8	\$421,410	4	2	\$223,644	173	100	\$6,550,466
Town of Lewiston-Woodville	719	597	83	\$24,545,159	106	15	\$9,763,352	16	2	\$846,369	719	100	\$35,154,880
Town of Powellsville	171	148	87	\$6,741,263	16	9	\$667,284	7	4	\$543,703	171	100	\$7,952,251
Town of Roxobel	205	153	75	\$7,166,368	48	23	\$2,620,127	4	2	\$211,281	205	100	\$9,997,775
Town of Windsor	1,815	1,442	79	\$69,128,368	307	17	\$32,199,142	64	4	\$15,640,758	1,813	100	\$116,968,268
Subtotal Bertie	15,932	12,590	79	\$553,788,919	3,037	19	\$253,613,253	293	2	\$43,515,557	15,920	100	\$850,917,728
Hyde													
Unincorporated Hyde County	5,596	4,362	78	\$203,253,342	747	13	\$50,742,150	98	2	\$6,293,525	5,207	93	\$260,289,017
Martin													
Unincorporated Martin County	12,188	8,559	70	\$536,455,645	3,414	28	\$242,491,355	208	2	\$34,691,567	12,181	100	\$813,638,567
Town of Bear Grass	81	55	68	\$3,071,047	7	9	\$740,692	19	23	\$2,084,187	81	100	\$5,895,926
Town of Everetts	159	151	95	\$8,549,364	8	5	\$413,632	0	0	\$0	159	100	\$8,962,997
Town of Hamilton	292	233	80	\$12,046,509	26	9	\$2,676,281	32	11	\$3,535,695	291	100	\$18,258,485
Town of Hassell	70	59	84	\$3,487,568	11	16	\$819,914	0	0	\$0	70	100	\$4,307,483
Town of Jamesville	297	228	77	\$12,864,254	43	14	\$10,230,982	22	7	\$2,794,164	293	99	\$25,889,400
Town of Oak City	313	302	96	\$20,251,439	10	3	\$528,828	1	0	\$370,155	313	100	\$21,150,421
Town of Parmele	149	132	89	\$6,938,100	16	11	\$1,718,932	1	1	\$86,108	149	100	\$8,743,139

SECTION 4: RISK ASSESSMENT

Jurisdiction	All Buildings	Residential Buildings at Risk			Commercial Buildings at Risk			Public Buildings at Risk			Total Buildings at Risk		
	Num	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages
Town of Robersonville	901	783	87	\$58,384,712	107	12	\$23,229,057	11	1	\$1,059,275	901	100	\$82,673,044
Town of Williamston	4,238	3,104	73	\$187,876,594	880	21	\$183,621,299	247	6	\$49,207,346	4,231	100	\$420,705,239
Subtotal Martin	18,688	13,606	73	\$849,925,232	4,522	24	\$466,470,972	541	3	\$93,828,497	18,669	100	\$1,410,224,701
Tyrrell													
Unincorporated Tyrrell County	2,794	2,073	74	\$98,822,093	510	18	\$27,991,401	43	2	\$11,162,112	2,626	94	\$137,975,606
Town of Columbia	519	408	79	\$19,429,887	66	13	\$9,191,509	34	7	\$4,920,600	508	98	\$33,541,996
Subtotal Tyrrell	3,313	2,481	75	\$118,251,980	576	17	\$37,182,910	77	2	\$16,082,712	3,134	95	\$171,517,602
Washington													
Unincorporated Washington County	5,482	4,026	73	\$164,193,137	1,361	25	\$51,074,004	84	2	\$4,309,223	5,471	100	\$219,576,364
Town of Creswell	366	274	75	\$9,662,280	68	19	\$3,555,773	22	6	\$2,558,507	364	99	\$15,776,560
Town of Plymouth	2,779	2,338	84	\$86,819,686	330	12	\$26,205,635	105	4	\$6,532,316	2,773	100	\$119,557,637
Town of Roper	611	505	83	\$17,270,252	81	13	\$3,046,499	20	3	\$2,063,709	606	99	\$22,380,460
Subtotal Washington	9,238	7,143	77	\$277,945,355	1,840	20	\$83,881,911	231	3	\$15,463,755	9,214	100	\$377,291,021
Region Total	52,767	40,182	76	\$2,003,164,828	10,722	20	\$891,891,196	1,240	2	\$175,184,046	52,144	99	\$3,070,240,069

SECTION 4: RISK ASSESSMENT

Table 4.84 – Buildings Impacted by EF3 Tornado

Jurisdiction	All Buildings	Residential Buildings at Risk			Commercial Buildings at Risk			Public Buildings at Risk			Total Buildings at Risk		
	Num	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages
Bertie													
Unincorporated Bertie County	11,175	8,732	78	\$768,458,987	2,275	20	\$340,727,082	158	1	\$106,009,533	11,165	100	\$1,215,195,601
Town of Askewville	502	383	76	\$31,626,965	107	21	\$13,023,908	12	2	\$6,615,805	502	100	\$51,266,678
Town of Aulander	744	640	86	\$65,856,997	90	12	\$31,142,477	14	2	\$6,580,430	744	100	\$103,579,904
Town of Colerain	428	340	79	\$36,013,595	74	17	\$13,889,726	14	3	\$5,866,533	428	100	\$55,769,854
Town of Kelford	173	155	90	\$11,805,927	14	8	\$1,295,681	4	2	\$1,287,235	173	100	\$14,388,844
Town of Lewiston-Woodville	719	597	83	\$48,932,974	106	15	\$25,455,859	16	2	\$4,823,505	719	100	\$79,212,338
Town of Powellsville	171	148	87	\$14,695,541	16	9	\$2,432,967	7	4	\$3,095,044	171	100	\$20,223,552
Town of Roxobel	205	153	75	\$14,748,969	48	23	\$8,433,595	4	2	\$1,216,183	205	100	\$24,398,746
Town of Windsor	1,815	1,442	79	\$148,979,627	307	17	\$98,898,176	64	4	\$88,090,307	1,813	100	\$335,968,111
Subtotal Bertie	15,932	8,732	78	\$768,458,987	2,275	20	\$340,727,082	158	1	\$106,009,533	11,165	100	\$1,215,195,601
Hyde													
Unincorporated Hyde County	5,596	4,362	78	\$434,131,508	747	13	\$108,731,001	98	2	\$32,927,250	5,207	93	\$575,789,759
Martin													
Unincorporated Martin County	12,188	8,559	70	\$1,156,368,747	3,414	28	\$633,433,670	208	2	\$171,784,632	12,181	100	\$1,961,587,050
Town of Bear Grass	81	55	68	\$6,458,538	7	9	\$2,115,962	19	23	\$8,531,390	81	100	\$17,105,890
Town of Everetts	159	151	95	\$17,654,128	8	5	\$1,784,693	0	0	\$0	159	100	\$19,438,821
Town of Hamilton	292	233	80	\$25,062,391	26	9	\$7,516,476	32	11	\$20,353,963	291	100	\$52,932,830
Town of Hassell	70	59	84	\$7,599,557	11	16	\$1,934,310	0	0	\$0	70	100	\$9,533,867

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Jurisdiction	All Buildings	Residential Buildings at Risk			Commercial Buildings at Risk			Public Buildings at Risk			Total Buildings at Risk		
	Num	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages
Town of Jamesville	297	228	77	\$29,421,920	43	14	\$26,889,459	22	7	\$11,868,405	293	99	\$68,179,784
Town of Oak City	313	302	96	\$43,829,079	10	3	\$1,841,216	1	0	\$2,130,872	313	100	\$47,801,168
Town of Parmele	149	132	89	\$14,675,167	16	11	\$4,597,706	1	1	\$495,696	149	100	\$19,768,570
Town of Robersonville	901	783	87	\$131,609,190	107	12	\$62,764,339	11	1	\$5,934,052	901	100	\$200,307,581
Town of Williamston	4,238	3,104	73	\$439,339,411	880	21	\$532,685,617	247	6	\$264,299,991	4,231	100	\$1,236,325,020
Subtotal Martin	18,688	13,606	73	\$1,872,018,128	4,522	24	\$1,275,563,448	541	3	\$485,399,001	18,669	100	\$3,632,980,581
Tyrrell													
Unincorporated Tyrrell County	2,794	2,073	74	\$214,496,894	510	18	\$52,182,114	43	2	\$61,008,277	2,626	94	\$327,687,284
Town of Columbia	519	408	79	\$43,275,328	66	13	\$27,406,644	34	7	\$23,572,956	508	98	\$94,254,929
Subtotal Tyrrell	3,313	2,481	75	\$257,772,222	576	17	\$79,588,758	77	2	\$84,581,233	3,134	95	\$421,942,213
Washington													
Unincorporated Washington County	5,482	4,026	73	\$331,731,830	1,361	25	\$98,664,044	84	2	\$22,865,514	5,471	100	\$453,261,388
Town of Creswell	366	274	75	\$20,151,492	68	19	\$9,248,512	22	6	\$11,440,342	364	99	\$40,840,346
Town of Plymouth	2,779	2,338	84	\$205,305,786	330	12	\$83,836,678	105	4	\$34,794,931	2,773	100	\$323,937,395
Town of Roper	611	505	83	\$38,598,947	81	13	\$10,713,565	20	3	\$10,210,564	606	99	\$59,523,076
Subtotal Washington	9,238	40,182	76	\$4,300,829,495	10,722	20	\$2,201,645,477	1,240	2	\$905,803,410	52,144	99	\$7,408,278,386
Region Total	52,767	40,182	76	\$2,003,164,828	10,722	20	\$891,891,196	1,240	2	\$175,184,046	52,144	99	\$3,070,240,069

SECTION 4: RISK ASSESSMENT

Table 4.85 – Buildings Impacted by EF4 Tornado

Jurisdiction	All Buildings	Residential Buildings at Risk			Commercial Buildings at Risk			Public Buildings at Risk			Total Buildings at Risk		
	Num	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages
Bertie													
Unincorporated Bertie County	11,175	8,732	78	\$769,487,844	2,275	20	\$345,241,988	158	1	\$113,613,674	11,165	100	\$1,228,343,506
Town of Askewville	502	383	76	\$31,892,548	107	21	\$13,185,714	12	2	\$6,992,095	502	100	\$52,070,358
Town of Aulander	744	640	86	\$67,039,519	90	12	\$31,552,255	14	2	\$6,985,303	744	100	\$105,577,077
Town of Colerain	428	340	79	\$36,086,141	74	17	\$14,246,293	14	3	\$6,313,269	428	100	\$56,645,703
Town of Kelford	173	155	90	\$11,805,927	14	8	\$1,359,061	4	2	\$1,333,428	173	100	\$14,498,416
Town of Lewiston-Woodville	719	597	83	\$48,932,974	106	15	\$26,132,153	16	2	\$5,007,384	719	100	\$80,072,511
Town of Powellsville	171	148	87	\$14,771,161	16	9	\$2,603,741	7	4	\$3,213,838	171	100	\$20,588,740
Town of Roxobel	205	153	75	\$14,748,969	48	23	\$8,863,429	4	2	\$1,259,798	205	100	\$24,872,196
Town of Windsor	1,815	1,442	79	\$149,578,249	307	17	\$102,384,091	64	4	\$91,685,770	1,813	100	\$343,648,110
Subtotal Bertie	15,932	12,590	79	\$1,144,343,332	3,037	19	\$545,568,725	293	2	\$236,404,559	15,920	100	\$1,926,316,617
Hyde													
Unincorporated Hyde County	5,596	4,362	78	\$435,190,008	747	13	\$112,027,852	98	2	\$34,756,431	5,207	93	\$581,974,291
Martin													
Unincorporated Martin County	12,188	8,559	70	\$1,161,592,560	3,414	28	\$650,224,873	208	2	\$184,214,730	12,181	100	\$1,996,032,163
Town of Bear Grass	81	55	68	\$6,458,538	7	9	\$2,193,646	19	23	\$9,615,950	81	100	\$18,268,134
Town of Everetts	159	151	95	\$17,654,128	8	5	\$1,941,353	0	0	\$0	159	100	\$19,595,482
Town of Hamilton	292	233	80	\$25,062,391	26	9	\$7,765,889	32	11	\$21,083,451	291	100	\$53,911,731
Town of Hassell	70	59	84	\$7,599,557	11	16	\$1,985,681	0	0	\$0	70	100	\$9,585,239

SECTION 4: RISK ASSESSMENT

Jurisdiction	All Buildings	Residential Buildings at Risk			Commercial Buildings at Risk			Public Buildings at Risk			Total Buildings at Risk		
	Num	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages
Town of Jamesville	297	228	77	\$29,696,193	43	14	\$27,401,172	22	7	\$13,241,080	293	99	\$70,338,445
Town of Oak City	313	302	96	\$43,829,079	10	3	\$1,953,541	1	0	\$2,207,243	313	100	\$47,989,863
Town of Parmele	149	132	89	\$14,675,167	16	11	\$4,778,720	1	1	\$513,462	149	100	\$19,967,349
Town of Robersonville	901	783	87	\$132,708,570	107	12	\$64,399,794	11	1	\$6,183,546	901	100	\$203,291,911
Town of Williamston	4,238	3,104	73	\$444,841,940	880	21	\$553,007,881	247	6	\$278,034,701	4,231	100	\$1,275,884,522
Subtotal Martin	18,688	13,606	73	\$1,884,118,123	4,522	24	\$1,315,652,550	541	3	\$515,094,163	18,669	100	\$3,714,864,839
Tyrrell													
Unincorporated Tyrrell County	2,794	2,073	74	\$216,763,263	510	18	\$52,771,423	43	2	\$63,925,527	2,626	94	\$333,460,212
Town of Columbia	519	408	79	\$43,649,322	66	13	\$28,648,828	34	7	\$25,486,485	508	98	\$97,784,635
Subtotal Tyrrell	3,313	2,481	75	\$260,412,585	576	17	\$81,420,251	77	2	\$89,412,012	3,134	95	\$431,244,847
Washington													
Unincorporated Washington County	5,482	4,026	73	\$331,975,173	1,361	25	\$99,030,973	84	2	\$24,121,566	5,471	100	\$455,127,712
Town of Creswell	366	274	75	\$20,295,192	68	19	\$9,683,208	22	6	\$12,589,583	364	99	\$42,567,982
Town of Plymouth	2,779	2,338	84	\$207,878,918	330	12	\$87,652,445	105	4	\$36,673,800	2,773	100	\$332,205,163
Town of Roper	611	505	83	\$38,973,915	81	13	\$11,348,864	20	3	\$10,951,882	606	99	\$61,274,661
Subtotal Washington	9,238	7,143	77	\$599,123,198	1,840	20	\$207,715,490	231	3	\$84,336,831	9,214	100	\$891,175,518
Region Total	52,767	40,182	76	\$4,323,187,246	10,722	20	\$2,262,384,868	1,240	2	\$960,003,996	52,144	99	\$7,545,576,112

Severe weather can also cause significant agricultural losses. Between 2007-2024, the sum of claims paid for crop damage due to hail and wind damages in the Region was \$5,027,134 or an average of \$279,285 in losses annually. Bertie and Martin Counties were responsible for most of these claims. Table 4.86 summarizes crop losses due to severe weather by year, and Table 4.87 shows the total crop losses due to severe weather by county, as reported in the RMA system.

Table 4.86 – Crop Losses Resulting from Hail & Wind by Year, 2007-2024

Year	Hail Indemnity Amount	Wind Indemnity Amount
2007	\$0	\$161,266
2008	\$73,092	\$368,531
2009	\$5,900	\$205,500
2010	\$7,197	\$27,696
2011	\$18,032	\$143,749
2012	\$158,889	\$240,087
2013	\$7,030	\$227,167
2014	\$54,763	\$475,867
2015	\$9,314	\$191,986
2016	\$0	\$653,568
2017	\$0	\$194,393
2018	\$98,858	\$288,219
2019	\$199,903	\$191,650
2020	\$31,574	\$79,705
2021	\$1,808	\$18,824
2022	\$612,857	\$196,041
2023	\$10,899	\$11,640
2024	\$31,261	\$29,868
Total	\$1,321,377	\$3,705,757

Source: USDA Risk Management Agency

Table 4.87 – Crop Losses Resulting from Hail & Wind by County, 2007-2024

County	Hail Indemnity Amount	Wind Indemnity Amount
Bertie	\$229,766	\$1,066,034
Hyde	\$28,992	\$264,108
Martin	\$384,330	\$1,902,227
Tyrrell	\$38,349	\$163,340
Washington	\$639,940	\$310,048
Total	\$1,321,377	\$3,705,757

Source: USDA Risk Management Agency

ENVIRONMENT

The main environmental impact from wind is damage to trees or crops. Wind events can also bring down power lines, which could cause a fire and result in even greater environmental impacts. Lightning may also result in the ignition of wildfires. This is part of a natural process, however, and the environment will return to its original state in time.

Hail can cause extensive damage to the natural environment, pelting animals, trees and vegetation with hailstones. Melting hail can also increase both river and flash flood risk.

CONSEQUENCE ANALYSIS

Table 4.88 summarizes the potential negative consequences of tornadoes and thunderstorms.

Table 4.88 – Consequence Analysis – Tornadoes & Thunderstorms

Category	Consequences
Public	Injuries and fatalities are possible. Individuals who cannot take shelter are most vulnerable as well as those in unsecured buildings like mobile homes. Injury may also result from debris or damaged buildings.
Responders	Responders may be hindered by storm impacts; damages may block access to affected areas or make it dangerous to enter affected buildings or areas.
Continuity of Operations (including Continued Delivery of Services)	Potential impacts to continuity of operations may result if personnel are harmed or if critical systems or resources are damaged. Delays in providing services may result.
Property, Facilities and Infrastructure	Possibility of structure fire ignition; potential for disruptions in power and communications infrastructure; destruction and/or damage to any exposed property, especially windows, cars and siding; mobile homes see increased risk. The weakest tornadoes, EFO, can cause minor roof damage, while strong tornadoes can destroy frame buildings and even badly damage steel reinforced concrete structures. Buildings are vulnerable to direct impact from tornado winds and wind-borne debris.
Environment	Potential fire ignition from lightning; hail damage to wildlife and foliage; Downed trees and damages to vegetation are likely during tornadoes. Debris may be thrown great distances and end up in natural areas, with potential impacts on habitats. If hazardous materials facilities are impacted, chemical releases may occur and would require remediation.
Economic Condition of the Jurisdiction	Lightning damage contingent on target; can severely impact/destroy critical infrastructure and other economic drivers. Economic impacts are contingent on tornado's path, but a tornado can severely impact/destroy critical infrastructure and other economic drivers, halt economic activity, or cause direct losses to businesses.
Public Confidence in the Jurisdiction's Governance	Public confidence is not generally affected by thunderstorm events, however public confidence in the jurisdiction's governance may be influenced by severe tornado events if response and recovery are not timely and effective.

HAZARD SUMMARY BY JURISDICTION

The following table summarizes severe weather hazard risk by jurisdiction. Most aspects of severe weather risk do not vary substantially by jurisdiction; however, wind and hail impacts may be greater in more highly developed areas with higher exposure in terms of both property and population density. Additionally, mobile home units are more vulnerable to wind damage. Mobile home units comprise approximately 30% of the housing mix of Bertie County and Tyrrell County; therefore, these areas may face more severe impacts from wind. Martin County and Bertie County also experienced high agricultural losses, so the unincorporated areas of these counties were rated higher for impact.

SECTION 4: RISK ASSESSMENT

TORNADOES

Jurisdiction	Probability	Impact	Spatial Extent	Warning Time	Duration	Score	Priority
All Jurisdictions	3	3	2	4	1	2.7	M

THUNDERSTORM WIND

Jurisdiction	Probability	Impact	Spatial Extent	Warning Time	Duration	Score	Priority
Bertie County	4	2	4	4	1	3.1	H
Town of Askewville	4	1	4	4	1	2.8	M
Town of Aulander	4	1	4	4	1	2.8	M
Town of Colerain	4	1	4	4	1	2.8	M
Town of Kelford	4	1	4	4	1	2.8	M
Town of Lewiston-Woodville	4	1	4	4	1	2.8	M
Town of Powellsville	4	1	4	4	1	2.8	M
Town of Roxobel	4	1	4	4	1	2.8	M
Town of Windsor	4	1	4	4	1	2.8	M
Hyde County	4	1	4	4	1	2.8	M
Martin County	4	2	4	4	1	3.1	H
Town of Bear Grass	4	1	4	4	1	2.8	M
Town of Everetts	4	1	4	4	1	2.8	M
Town of Hamilton	4	1	4	4	1	2.8	M
Town of Hassell	4	1	4	4	1	2.8	M
Town of Jamesville	4	1	4	4	1	2.8	M
Town of Oak City	4	1	4	4	1	2.8	M
Town of Parmele	4	1	4	4	1	2.8	M
Town of Robersonville	4	1	4	4	1	2.8	M
Town of Williamston	4	1	4	4	1	2.8	M
Tyrrell County	4	2	4	4	1	3.1	H
Town of Columbia	4	1	4	4	1	2.8	M
Washington County	4	1	4	4	1	2.8	M
Town of Creswell	4	1	4	4	1	2.8	M
Town of Plymouth	4	1	4	4	1	2.8	M
Town of Roper	4	1	4	4	1	2.8	M

LIGHTNING

Jurisdiction	Probability	Impact	Spatial Extent	Warning Time	Duration	Score	Priority
All Jurisdictions	4	1	1	4	1	2.2	M

HAIL

Jurisdiction	Probability	Impact	Spatial Extent	Warning Time	Duration	Score	Priority
All Jurisdictions	4	1	1	4	1	2.2	M

4.5.8 SEVERE WINTER WEATHER

HAZARD BACKGROUND

A winter storm can range from a moderate snow over a period of a few hours to blizzard conditions with blinding wind-driven snow that lasts for several days. Events may include snow, sleet, freezing rain, or a mix of these wintry forms of precipitation. Some winter storms might be large enough to affect several states, while others might affect only localized areas. Occasionally, heavy snow might also cause significant property damages, such as roof collapses on older buildings.

All winter storm events have the potential to present dangerous conditions to the affected area. Larger snowfalls pose a greater risk, reducing visibility due to blowing snow and making driving conditions treacherous. A heavy snow event is defined by the National Weather Service as an accumulation of 4 or more inches in 12 hours or less. A blizzard is the most severe form of winter storm. It combines low temperatures, heavy snow, and winds of 35 miles per hour or more, which reduces visibility to a quarter mile or less for at least 3 hours. Winter storms are often accompanied by sleet, freezing rain, or an ice storm. Such freeze events are particularly hazardous as they create treacherous surfaces.

Ice storms are defined as storms with significant amounts of freezing rain and are a result of cold air damming (CAD). CAD is a shallow, surface-based layer of relatively cold, stably stratified air entrenched against the eastern slopes of the Appalachian Mountains. With warmer air above, falling precipitation in the form of snow melts, then becomes either super-cooled (liquid below the melting point of water) or re-freezes. In the former case, super-cooled droplets can freeze on impact (freezing rain), while in the latter case, the re-frozen water particles are ice pellets (or sleet). Sleet is defined as partially frozen raindrops or refrozen snowflakes that form into small ice pellets before reaching the ground. They typically bounce when they hit the ground and do not stick to the surface. Sleet does accumulate like snow, posing similar problems and has the potential to accumulate into a layer of ice on surfaces. Freezing rain, conversely, usually sticks to the ground, creating a sheet of ice on the roadways and other surfaces. All winter storm elements – snow, low temperatures, sleet, ice, etcetera – have the potential to cause significant hazard to a community. Even small accumulations can down power lines and tree limbs and create hazardous driving conditions. Furthermore, communication and power may be disrupted for days.

Advancements in meteorology and forecasting usually allow for mostly accurate forecasting a few days in advance of an impending storm. Most storms have a duration of a few hours; however, impacts can last a few days after the initial incident until cleanup is completed.

Warning Time: 1 – More than 24 hours

Duration: 3 – Less than one week

LOCATION

The entirety of North Carolina is susceptible to winter storm and freeze events. Some ice and winter storms may be large enough to affect several states, while others might affect limited, localized areas. Severe winter weather is usually a countywide or regional hazard, impacting a large portion of the planning area at the same time. The degree of exposure typically depends on the normal expected severity of local winter weather. The risk of severe winter storm occurring is uniform across the Region.

Spatial Extent: 4 – Large

EXTENT

NOAA uses the Regional Snowfall Index (RSI) to assess the societal impact of winter storms in the six easternmost regions in the United States. The index makes use of population and regional differences to

assess the impact of snowfall. For example, areas which receive very little snowfall on average may be more adversely affected than other regions, resulting in a higher severity.

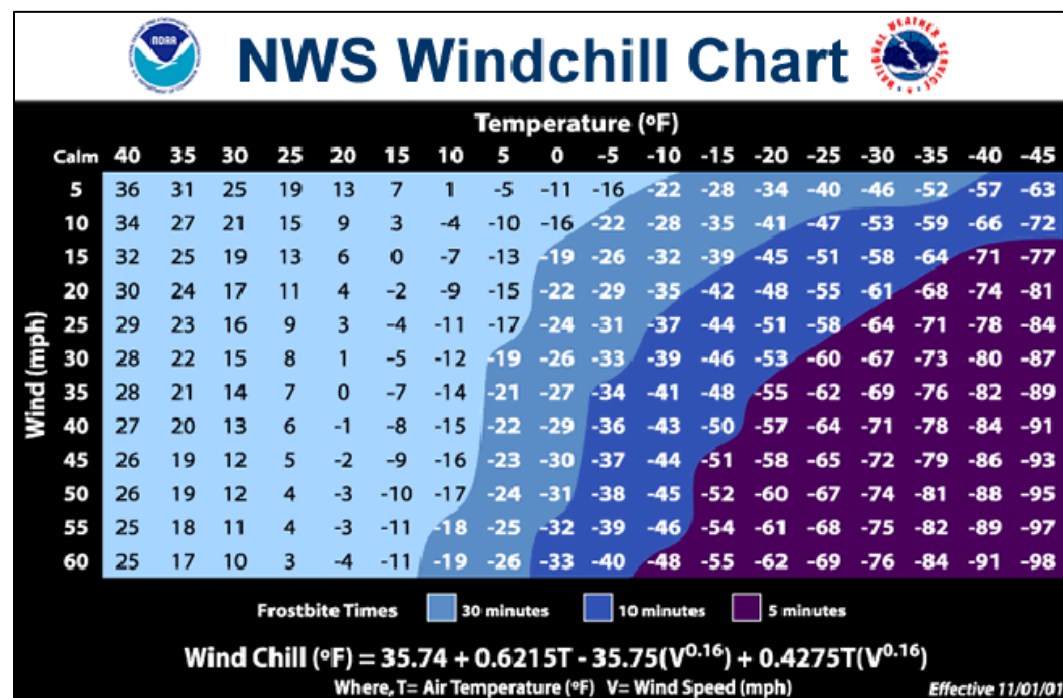
Table 4.89 – Regional Snowfall Index (RSI) Values

Category	RSI Value	Description
1	1-3	Notable
2	3-6	Significant
3	6-10	Major
4	10-18	Crippling
5	18+	Extreme

Source: NOAA

Severe winter storms often involve a mix of hazardous weather conditions. The magnitude of an event can be defined based on the severity of each of the involved factors, including precipitation type, precipitation accumulation amounts, temperature, and wind. The NWS Wind Chill Temperature Index, shown in Figure 4.52, provides a formula for calculating the dangers of winter winds and freezing temperatures.

Figure 4.52 – NWS Wind Chill Temperature Index



Source: <http://www.nws.noaa.gov/om/winter/windchill.shtml>

Table 4.90 notes greatest recorded one-day snowfall totals for each county in the Northeastern NC Region.

Table 4.90 – Greatest One-Day Snowfall by County

County	Inches	Location	Date
Bertie	11.5 in.	Lewiston	February 6, 1980
Hyde	9.0 in.	Ocracoke	January 24, 2003
Martin	17.0 in.	Williamston	March 3, 1980

County	Inches	Location	Date
Tyrrell	12.0 in.	Columbia	February 6, 1980
Washington	10.5 in.	Plymouth	February 6, 1980

Source: North Carolina Climate Office

The most significant recorded snow depth over the last 20 years took place in January 2018, with recorded depths of 7 inches occurring in Bertie County. Additionally, Hyde County experienced their second highest one-day snowfall record in January 2025 with 6 inches of snow reported in Ocracoke.

The entirety of North Carolina is susceptible to winter storm and freeze events. Some ice and winter storms may be large enough to affect several states, while others might affect limited, localized areas. The degree of exposure typically depends on the normal expected severity of local winter weather. The Northeastern NC Region is accustomed to moderate winter weather as a result of a nor'easter originating in the Gulf Stream and producing frozen precipitation. Given the atmospheric nature of the hazard, the entire planning area has uniform exposure to a winter storm.

Impact: 1 – Minor

HISTORICAL OCCURRENCES

To get a full picture of the range of impacts of a severe winter storm, data for the following weather types as defined by the National Weather Service (NWS) Raleigh Forecast Office and tracked by NCEI were collected:

- **Blizzard** – A winter storm which produces the following conditions for 3 consecutive hours or longer: (1) sustained winds or frequent gusts 30 knots (35 mph) or greater, and (2) falling and/or blowing snow reducing visibility frequently to less than 1/4 mile.
- **Cold/Wind Chill** – Period of low temperatures or wind chill temperatures reaching or exceeding locally/regionally defined advisory conditions of 0°F to -14°F with wind speeds 10 mph (9 kt) or greater.
- **Extreme Cold/Wind Chill** – A period of extremely low temperatures or wind chill temperatures reaching or exceeding locally/regionally defined warning criteria, defined as wind chill -15°F or lower with wind speeds 10 mph (9 kt) or greater.
- **Frost/Freeze** – A surface air temperature of 32°F or lower, or the formation of ice crystals on the ground or other surfaces, for a period of time long enough to cause human or economic impact, during the locally defined growing season.
- **Heavy Snow** – Snow accumulation meeting or exceeding 12 and/or 24-hour warning criteria of 3 and 4 inches, respectively.
- **Ice Storm** – Ice accretion meeting or exceeding locally/regionally defined warning criteria of ¼ inch or greater resulting in significant, widespread power outages, tree damage and dangerous travel. Issued only in those rare instances where just heavy freezing rain is expected and there will be no "mixed bag" precipitation meaning no snow, sleet or rain.
- **Sleet** – Sleet accumulations meeting or exceeding locally/regionally defined warning criteria of ½ inch or more.
- **Winter Storm** – A winter weather event that has more than one significant hazard and meets or exceeds locally/regionally defined 12 and/or 24-hour warning criteria for at least one of the precipitation elements. Defined by NWS Raleigh Forecast Office as snow accumulations 3 inches or greater in 12 hours (4 inches or more in 24 hours); Freezing rain accumulations ¼ inch (6 mm) or greater; Sleet accumulations ½ inch (13 mm) or more. Issued when there is at least a 60% forecast confidence of any one of the three criteria being met.

- **Winter Weather** – A winter precipitation event that causes a death, injury, or a significant impact to commerce or transportation, but does not meet locally/regionally defined warning criteria.

Summarized impacts from data collected for the years 1999 through 2024 are included in Table 4.91. As reported, the Northeastern NC Region experienced \$25,000 in property damage and no crop damage resulting from the 144 severe winter weather incidents recorded across 74 separate days. While property and crop damage were not recorded for these incidents, they may have occurred and are possible impacts of future events. The region also experienced no fatalities or injuries from the impacts of severe winter storm, though these types of impacts are possible in future events. No blizzard, cold/wind chill, extreme cold/wind chill, or sleet events were recorded.

Table 4.91 – Total Severe Winter Storm Impacts in Northeastern NC, 1999-2024

Event Type	Event Count	Total Fatalities	Total Injuries	Total Property Damage	Total Crop Damage
Bertie County					
Winter Storm	19	0	0	\$25,000	\$0
Winter Weather	18	0	0	\$0	\$0
Frost/Freeze	4	0	0	\$0	\$0
Hyde County					
Winter Storm	13	0	0	\$0	\$0
Winter Weather	8	0	0	\$0	\$0
Heavy Snow	7	0	0	\$0	\$0
Frost/Freeze	1	0	0	\$0	\$0
Martin County					
Winter Storm	15	0	0	\$0	\$0
Winter Weather	7	0	0	\$0	\$0
Ice Storm	1	0	0	\$0	\$0
Heavy Snow	5	0	0	\$0	\$0
Frost/Freeze	1	0	0	\$0	\$0
Tyrrell County					
Winter Storm	9	0	0	\$0	\$0
Winter Weather	4	0	0	\$0	\$0
Heavy Snow	5	0	0	\$0	\$0
Frost/Freeze	1	0	0	\$0	\$0
Washington County					
Winter Storm	12	0	0	\$0	\$0
Winter Weather	6	0	0	\$0	\$0
Ice Storm	1	0	0	\$0	\$0
Heavy Snow	6	0	0	\$0	\$0
Frost/Freeze	1	0	0	\$0	\$0
Northeastern NC Region					
Winter Storm	68	0	0	\$25,000	\$0
Winter Weather	43	0	0	\$0	\$0
Ice Storm	2	0	0	\$0	\$0
Heavy Snow	23	0	0	\$0	\$0

SECTION 4: RISK ASSESSMENT

Event Type	Event Count	Total Fatalities	Total Injuries	Total Property Damage	Total Crop Damage
Frost/Freeze	8	0	0	\$0	\$0
Region Total	144	0	0	\$25,000	\$0

Source: NCEI

Impacts in the Northeastern NC Region by incident are recorded in Table 4.92.

Table 4.92 – Recorded Severe Winter Storm Impacts in the Northeastern NC Region, 1999-2024

Date	Event Type	Fatalities	Injuries	Property Damage	Crop Damage
1/24/2000	Winter Storm	0	0	\$0	\$0
12/3/2000	Heavy Snow	0	0	\$0	\$0
12/3/2000	Winter Storm	0	0	\$25,000	\$0
1/2/2002	Winter Storm	0	0	\$0	\$0
1/2/2002	Winter Storm	0	0	\$0	\$0
1/3/2002	Winter Storm	0	0	\$0	\$0
1/16/2003	Winter Storm	0	0	\$0	\$0
1/23/2003	Winter Storm	0	0	\$0	\$0
1/23/2003	Winter Storm	0	0	\$0	\$0
11/30/2003	Frost/Freeze	0	0	\$0	\$0
1/9/2004	Winter Storm	0	0	\$0	\$0
1/9/2004	Winter Weather	0	0	\$0	\$0
1/25/2004	Winter Storm	0	0	\$0	\$0
1/25/2004	Winter Storm	0	0	\$0	\$0
1/26/2004	Winter Storm	0	0	\$0	\$0
2/15/2004	Winter Storm	0	0	\$0	\$0
2/16/2004	Winter Weather	0	0	\$0	\$0
2/26/2004	Winter Weather	0	0	\$0	\$0
3/23/2004	Frost/Freeze	0	0	\$0	\$0
4/6/2004	Frost/Freeze	0	0	\$0	\$0
12/19/2004	Winter Weather	0	0	\$0	\$0
12/20/2004	Winter Weather	0	0	\$0	\$0
12/26/2004	Winter Storm	0	0	\$0	\$0
12/26/2004	Winter Storm	0	0	\$0	\$0
1/19/2005	Winter Weather	0	0	\$0	\$0
1/20/2005	Winter Weather	0	0	\$0	\$0
1/21/2005	Winter Weather	0	0	\$0	\$0
2/20/2006	Winter Weather	0	0	\$0	\$0
2/1/2007	Winter Weather	0	0	\$0	\$0
11/21/2008	Winter Weather	0	0	\$0	\$0
1/20/2009	Heavy Snow	0	0	\$0	\$0
1/20/2009	Winter Weather	0	0	\$0	\$0
1/20/2009	Heavy Snow	0	0	\$0	\$0
1/30/2010	Winter Storm	0	0	\$0	\$0
1/30/2010	Heavy Snow	0	0	\$0	\$0
2/12/2010	Heavy Snow	0	0	\$0	\$0
2/13/2010	Winter Weather	0	0	\$0	\$0

SECTION 4: RISK ASSESSMENT

Date	Event Type	Fatalities	Injuries	Property Damage	Crop Damage
3/2/2010	Winter Weather	0	0	\$0	\$0
12/16/2010	Winter Weather	0	0	\$0	\$0
12/25/2010	Winter Storm	0	0	\$0	\$0
12/26/2010	Heavy Snow	0	0	\$0	\$0
1/22/2011	Heavy Snow	0	0	\$0	\$0
2/9/2011	Winter Storm	0	0	\$0	\$0
2/10/2011	Heavy Snow	0	0	\$0	\$0
1/25/2013	Winter Weather	0	0	\$0	\$0
2/16/2013	Winter Weather	0	0	\$0	\$0
1/21/2014	Winter Weather	0	0	\$0	\$0
1/28/2014	Winter Storm	0	0	\$0	\$0
1/28/2014	Winter Storm	0	0	\$0	\$0
2/11/2014	Winter Storm	0	0	\$0	\$0
2/12/2014	Winter Weather	0	0	\$0	\$0
3/3/2014	Winter Weather	0	0	\$0	\$0
2/16/2015	Ice Storm	0	0	\$0	\$0
2/16/2015	Winter Storm	0	0	\$0	\$0
2/24/2015	Winter Weather	0	0	\$0	\$0
2/25/2015	Winter Storm	0	0	\$0	\$0
2/25/2015	Winter Storm	0	0	\$0	\$0
1/22/2016	Winter Weather	0	0	\$0	\$0
2/12/2016	Winter Weather	0	0	\$0	\$0
2/12/2016	Winter Storm	0	0	\$0	\$0
4/5/2016	Frost/Freeze	0	0	\$0	\$0
4/10/2016	Frost/Freeze	0	0	\$0	\$0
1/7/2017	Winter Storm	0	0	\$0	\$0
1/7/2017	Winter Storm	0	0	\$0	\$0
1/7/2017	Winter Storm	0	0	\$0	\$0
1/3/2018	Winter Storm	0	0	\$0	\$0
1/3/2018	Winter Storm	0	0	\$0	\$0
1/17/2018	Winter Weather	0	0	\$0	\$0
1/17/2018	Winter Weather	0	0	\$0	\$0
12/9/2018	Winter Weather	0	0	\$0	\$0
2/20/2020	Winter Storm	0	0	\$0	\$0
1/28/2021	Winter Storm	0	0	\$0	\$0
1/28/2021	Winter Weather	0	0	\$0	\$0
1/21/2022	Winter Storm	0	0	\$0	\$0

Source: NCEI

Several storm impacts from NCEI are summarized below:

December 3, 2000 - A winter storm struck parts of northeast North Carolina. The storm struck a relatively small area, but the locations that had snow received impressive totals. Some specific snow totals were as follows: Aulander 15"; Woodland, Winton, and Murfreesboro 13"; Rich Square and Como 12"; Gatesville 11"; Windsor and Conway 10"; Eure and Milwaukee 9"; Edenton, Ahoskie, and Moyock 8"; South Mills and Sunbury 7"; Severn 6"; and Weeksville and Seaboard 5". Local law enforcement

reported numerous traffic accidents, but no injuries were recorded. NCEI reports \$25,000 in property damages in Bertie County.

January 23, 2003 – A major winter storm affected eastern North Carolina on January 23, 2003. The storm dumped the highest amounts of snow east of highway 17 across the area known as the Outer Banks, where 8 to 12 inches of snow fell with isolated amounts up to 14 inches, including the counties of eastern Carteret, Dare and, and Hyde counties. This was the largest one-day snowfall on the Outer Banks in over a decade. Snowfall amounts from 4 to 8 inches fell across central sections of the county warning area including Craven, Pamlico, Beaufort, and Tyrrell counties. Other western counties received 2 to 4-inch snowfall amounts.

December 26, 2004 – A winter storm produced a narrow band of six to as much as eleven inches of snow across interior northeast North Carolina. The snow caused very hazardous driving conditions, which resulted in numerous accidents. The highest amounts were reported at Gatesville in Gates County 11", Sunbury in Gates County 11", Gates in Gates County 10", Ahoskie in Hertford County 9.5", Pendleton in Northampton County 8.5", Murfreesboro in Hertford County 8", Askewville in Bertie County 7.5", and Lasker in Northampton County 6".

January 28, 2014 – Weak low pressure developed to the south of eastern North Carolina on January 28th then lifted northeast offshore of the coast on January 29th. Widespread light wintry precipitation developed during the morning of January 28th, becoming heavier and more widespread through the afternoon as it spread north and east. The wintry weather lasted through the night of January 28th before finally ending during the morning of January 29th. Mainly snow was reported over the northern sections with 4 to 7 inches of accumulations. Over the southern tier the precipitation fell as a mix of sleet and freezing rain, with a little snow at the end. Sleet accumulated up to 2 inches in spots with 1/4 to 1/2 inch of freezing rain, heaviest over the southern Outer Banks. Roads became snow and ice covered during the event and persisted for a couple days. Many schools were closed for four days. Snow and sleet fell across the region through the morning of January 29th. Snow mixed with sleet at times and in total accumulated up to 7 inches in Bertie and Washington Counties. Power outages were reported for many residents as power lines were downed from the ice and gusty winds. Roads were icy for several days during and after the event.

January 17, 2018 – Low pressure deepening off the North Carolina coast produced significant snowfall over most of eastern North Carolina during the late evening of January 17th through the early morning of January 18th. Snowfall over the region ranged from less than 1 inch over the southwest tier to 8 inches or more over the north coast. There was one weather related traffic fatality reported in Washington county on the morning of January 18th.

January 21, 2022 – A cold front moved through the area late in the day of January 20th. As the front moved through rain changed over to a wintry mix of snow, sleet and freezing rain on the evening of January 20th through early morning on the 21st before ending. Significant amounts of ice fell toward the Crystal Coast, with a general 2 to 6 of snow mixed with sleet farther north and west. The icing amounts of a quarter to a half of an inch toward the Crystal Coast were the highest amounts of ice this area has experienced, over the widest area, since the late 1990s.

HMPC members also noted a severe ice storm that downed power lines across the coastal plain and caused widespread, long-term power outages. An event narrative from NC State Climate Office is below:

January 9-13, 1968 – A period of freezing rain, sleet, and snow during which outdoor surfaces in almost all areas of North Carolina became heavily coated with ice. In a large area east and south of Raleigh, poles and lines were broken to the extent that several entire counties were without electricity or telephone for periods of one to five days. One of several telephone companies affected reported losses in mid-category five; one power company reported costs in category six with 2,000 linemen working on repairs for several days and night. Trees and shrubs were broken over an even larger area. Throughout most of

the state, traffic was severely curtailed. No deaths or injuries are known to have resulted from the direct action of the weather, but at least five people were killed in weather-related traffic accidents, and thousands required hospital treatment for injuries received in traffic accidents or in falls on the ice. Widespread lack of power caused some economic losses and a great deal of discomfort. There was much loss of time from school and business closings. A few roofs fell from the weight of ice.

The Northeastern NC Region received one emergency declaration and two presidential disaster declarations since 1968 for incidents related to severe winter storms. These declarations were made for Bertie, Hyde, Martin, and Washington Counties. As a state, North Carolina received eight disaster declarations related to severe winter storms during this timeframe.

Table 4.93 – Emergency & Disaster Declarations in Northeastern NC Region for Severe Winter Storms

Disaster Number	Date	Disaster Type	Incident Start	Incident End
234	1968	Severe Ice Storm	2/10/1968	2/10/1968
3110	1993	Severe Snow and Winter Storm	3/13/1993	3/17/1993
1087	1996	Snow	1/6/1996	1/12/1996

Source: FEMA, July 9, 2025

PROBABILITY OF FUTURE OCCURRENCE

NCEI records 74 separate days with severe winter weather related events during the 26-year period from 1999 through 2024, which equates to an average of almost 3 days with winter weather per year or more than 100 percent likelihood of an occurrence in any given year.

Probability: 4 – Highly Likely

CLIMATE CHANGE

According to the 2023 North Carolina Hazard Mitigation Plan, there is uncertainty associated with climate change impacts on future severe winter storms. Global temperature rise could cause shorter and warmer winters in many areas; however, the likelihood of dangerously low temperatures may increase due to continuing trends of temperature extremes. Warmer winters, however, mean that precipitation that would normally fall as snow may begin to fall as rain or freezing rain instead.

VULNERABILITY ASSESSMENT

PEOPLE

Winter storms are considered deceptive killers because most deaths are indirectly related to the storm event. The leading cause of death during winter storms is from automobile or other transportation accidents due to poor visibility and/or slippery roads. Additionally, exhaustion and heart attacks caused by overexertion may result from winter storms.

Power outages during very cold winter storm conditions can also create potentially dangerous situations. Elderly people account for the largest percentage of hypothermia victims. In addition, if the power is out for an extended period, residents are forced to find alternative means to heat their homes. The danger arises from carbon monoxide released from improperly ventilated heating sources such as space or kerosene heaters, furnaces, and blocked chimneys. House fires also occur more frequently in the winter due to lack of proper safety precautions when using an alternative heating source.

The HMPC noted that power outages during periods of freezing temperatures is a serious risk to safety in the region, particularly because many households are reliant on electric heat.

PROPERTY

According to reported data of storm impacts recorded by the NCEI, between 1999 and 2018, the Northeastern NC Region experienced minimal – \$25,000 – property damage related to the impacts of severe winter storm. Losses due to severe winter weather may not have been reported but should be expected during severe winter weather incidents.

Potential losses associated with winter storms include the cost of the removal of snow from roadways, debris cleanup, and indirect losses from power outages, lost productivity, and other factors. Additionally, severe ice is often associated with winter storms; and an icy roadway on a bridge or at a busy intersection, for example, threatens the safety of residents and visitors. Ice accumulation can also cause power outages and have a significant impact on public utilities.

ENVIRONMENT

Winter storm events may include ice or snow accumulation on trees which can cause large limbs, or even whole trees, to snap and potentially fall on buildings, cars, or power lines. This potential for winter debris creates a dangerous environment to be outside in; significant injury or fatality may occur if a large limb snaps while a local resident is out driving or walking underneath it.

CONSEQUENCE ANALYSIS

Table 4.94 summarizes the potential negative consequences of severe winter weather.

Table 4.94 – Consequence Analysis – Severe Winter Weather

Category	Consequences
Public	Localized impact expected to be severe for affected areas and moderate to light for other less affected areas.
Responders	Adverse impact expected to be severe for unprotected personnel and moderate to light for trained, equipped, and protected personnel.
Continuity of Operations (including Continued Delivery of Services)	Localized disruption of roads and/or utilities caused by incident may postpone delivery of some services.
Property, Facilities and Infrastructure	Localized impact to facilities and infrastructure in the areas of the incident. Power lines and roads most adversely affected.
Environment	Environmental damage to trees, bushes, etc.
Economic Condition of the Jurisdiction	Local economy and finances may be adversely affected, depending on damage.
Public Confidence in the Jurisdiction's Governance	Ability to respond and recover may be questioned and challenged if planning, response, and recovery not timely and effective.

HAZARD SUMMARY BY JURISDICTION

The following table summarizes severe winter weather risk by jurisdiction. Severe winter storm risk does not vary substantially by jurisdiction because these events are typically regional in nature.

Jurisdiction	Probability	Impact	Spatial Extent	Warning Time	Duration	Score	Priority
All Jurisdictions	4	1	4	1	3	2.7	M

4.5.9 SINKHOLE

HAZARD BACKGROUND

Sinkholes are a natural and common geologic feature in areas with underlying limestone and other rock types that are soluble in natural water. Most limestone is porous, allowing the acidic water of rain to percolate through their strata, dissolving some limestone and carrying it away in solution. Over time, this persistent erosional process can create extensive underground voids and drainage systems in much of the carbonate rocks. Collapse of overlying sediments into the underground cavities produces sinkholes.

The three general types of sinkholes are: subsidence, solution, and collapse. Collapse sinkholes are most common in areas where the overburden (the sediments and water contained in the unsaturated zone, surficial aquifer system, and the confining layer above an aquifer) is thick, but the confining layer is breached or absent. Collapse sinkholes can form with little warning and leave behind a deep, steep sided hole. Subsidence sinkholes form gradually where the overburden is thin and only a veneer of sediments is overlying the limestone. Solution sinkholes form where no overburden is present and the limestone is exposed at land surface.

Sinkholes occur in many shapes, from steep-walled holes to bowl or cone shaped depressions. Sinkholes can be dramatic because the land generally stays intact for a while until the underground spaces get too big. If there is not enough support for the land above the spaces, then a sudden collapse of the land surface can occur. Under natural conditions, sinkholes form slowly and expand gradually. However, human activities such as dredging, constructing reservoirs, diverting surface water, and pumping groundwater can accelerate the rate of sinkhole expansions, resulting in the abrupt formation of collapse sinkholes.

Although a sinkhole can form without warning, specific signs can signal potential development:

- Slumping or falling fenceposts, trees, or foundations;
- Sudden formation of small ponds;
- Wilting vegetation;
- Discolored well water; and/or
- Structural cracks in walls, floors.

Sinkhole formation can be accelerated by urbanization. Development increases water usage, alters drainage pathways, overloads the ground surface, and redistributes soil. According to FEMA, the number of human-induced sinkholes has doubled since 1930, insurance claims for damages as a result of sinkholes has increased 1,200 percent from 1987 to 1991, costing nearly \$100 million.

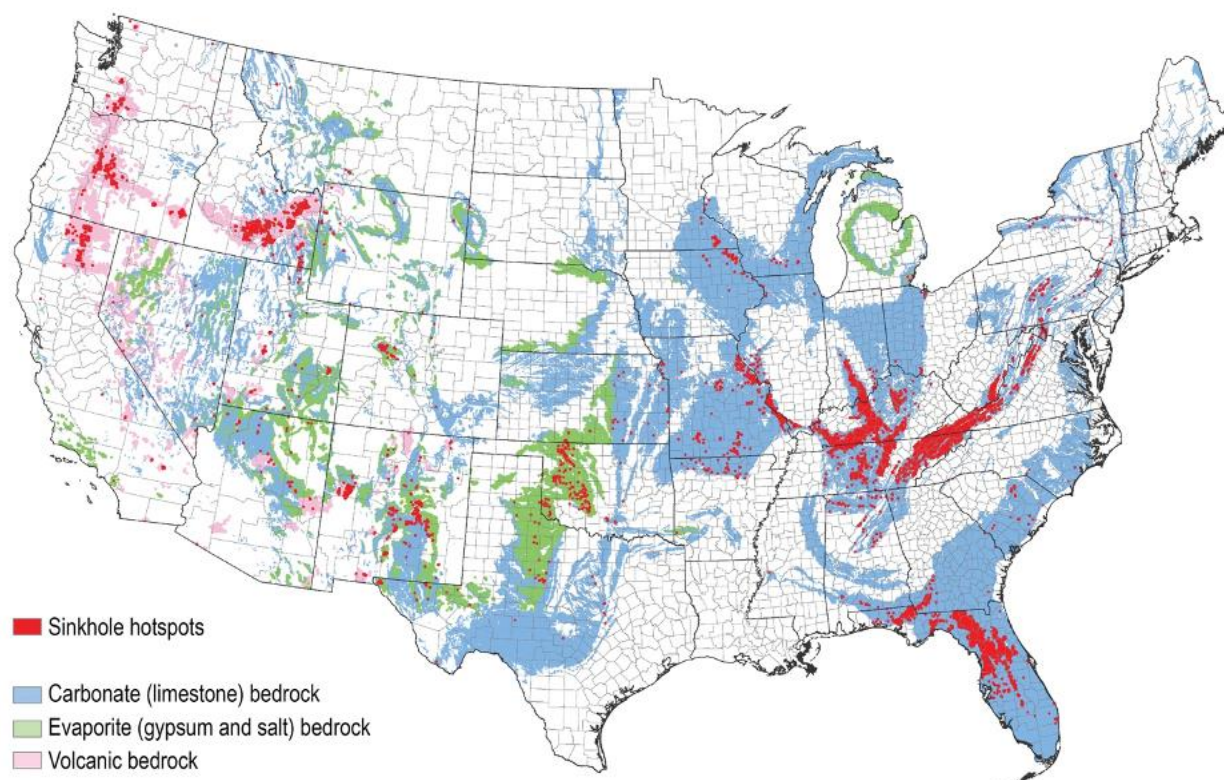
Warning Time: 4 – Less than six hours

Duration: 1 – Less than six hours

LOCATION

According to the North Carolina Department of Environmental Quality (NC DEQ), in North Carolina sinkholes mainly occur in the coastal plain. NC DEQ does not specifically identify vulnerability in any counties in the Northeastern NC region, but it does note sinkhole occurrence in counties adjacent to the region. Additionally, USGS's Karst Map of the Conterminous United States, Figure 4.53, shows karst areas in Eastern North Carolina, including Bertie, Washington, and Tyrrell counties. However, the map does not identify any sinkhole hotspots in the Northeastern Region.

Spatial Extent: 1 – Negligible

Figure 4.53 – Karst Map of the Conterminous United States – 2020

Source: USGS

EXTENT

Sinkholes are relatively unpredictable, causing greater impacts when they do occur. They can range dramatically in size, from a few feet wide to hundreds of acres wide and from less than 1 foot to more than 100 feet deep. Sinkholes can also vary in shape. Some are shaped like shallow bowls or saucers while others have vertical walls. In North Carolina, sinkholes sometimes hold water and form natural ponds. There is no formal scale for measuring the extent of sinkholes.

Sinkholes can have dramatic effects if they occur in urban settings, particularly when infrastructure, such as roads, or buildings are on top of the cavity, causing catastrophic damage. They can also contaminate water resources and have been known to swallow up vehicles, swimming pools, parts of roadways, and even buildings.

Impact: 2 – Limited

PAST OCCURRENCES

There are limited records of sinkholes in the Northeastern NC region. Records reported here were found in local news reports and are likely only a sample of past occurrences.

August 2011 – A sinkhole formed in U.S. 264 at the Dare-Hyde County line, closing the highway to traffic in both directions.

April 2013 – A sinkhole in Bertie County was reported to WITN local news, but this report was not confirmed.

April 2013 – A sinkhole was reported in Martin County on Lee Road, which spanned the width of the road and required that the road be closed. This sinkhole was approximately two feet in diameter and three feet deep.

PROBABILITY OF FUTURE OCCURRENCE

Sinkholes are a potential occurrence in localized areas of the Northeastern NC region based on geologic conditions. Future occurrence of sinkholes may be impacted by weather events, including heavy rain, as well as human activity, including increased development and groundwater pumping. There are two known recent occurrences of sinkhole that blocked roadways and required emergency repair. Though small events due occur, the region is unlikely to experience a significant sinkhole event, therefore the probability of future sinkhole events is considered possible.

Probability: 2 – Possible

CLIMATE CHANGE

Direct effects from global warming and climate change such as an increase in droughts, floods and hurricanes could contribute to an increase in sinkholes. Climate change raises the likelihood of extreme weather, meaning the torrential rain and flooding conditions which often lead to the exposure of sinkholes are likely to become increasingly common. Certain events such as a hurricane following a period of drought can trigger a sinkhole due to low levels of groundwater combined with a heavy influx of rain. As discussed in Sections 4.5.2 Drought, 4.5.5 Flood, and 4.5.6 Hurricane, potential increases in these contributing events are possible. Therefore, an increase in the occurrence of sinkholes in the future is possible.

VULNERABILITY ASSESSMENT

PEOPLE

A person's vulnerability is directly related to the speed in which the sinkhole opens and the person being above the sinkhole. Records exist for deaths associated with sinkholes opening beneath homes while occupants were present or from motor vehicle deaths when drivers could not avoid driving into the sinkhole before protective barriers were in place. However, there are not records of such severe events in the Northeastern NC region.

PROPERTY

Similar to people, property's vulnerability to a sinkhole is dependent on a variety of factors including the speed at which the sinkhole develops. Property above a large sinkhole that suddenly collapses can suffer catastrophic damages ranging from cracked foundations to damaged roadways and totaled vehicles.

ENVIRONMENT

Sinkholes are unlikely to cause substantial impacts to the natural environment. Natural areas that are damaged will recover quickly.

CONSEQUENCE ANALYSIS

Table 4.95 summarizes the potential negative consequences of sinkhole.

Table 4.95 – Consequence Analysis – Sinkhole

Category	Consequences
Public	Impacts are expected to be minimal to the larger population. Impacts for those effected could cause anxiety or depression about economic and property losses and personal injury.
Responders	First responders will be impacted similarly to other events that have advance warning.
Continuity of Operations (including Continued Delivery of Services)	Continuity of operations is generally not disrupted by sinkholes.
Property, Facilities and Infrastructure	Although sinkhole extents are localized, buildings located on or adjacent to a sinkhole are susceptible to foundation damage or building collapse. If the building is located close enough to the sinkhole it can be completely destroyed or in worst cases, completely collapse into the sinkhole. Remediation costs can be high due to costly foundation shoring or cost of stabilization of the sinkhole itself.
Environment	Sinkholes are natural occurring process and local plants and animals adjust quickly. Many naturally occurring sinkholes fill with rainwater creating new aquatic habitat.
Economic Condition of the Jurisdiction	Sinkholes located in open areas or that impact only small numbers of buildings, while having a high impact to the local property owner, do not have substantial impacts to the economy. Sinkholes that open up in major traffic thoroughfares can include significant impact to daily work traffic and flow of goods.
Public Confidence in the Jurisdiction's Governance	Sinkholes are relatively unpredictable, however if a sinkhole occurs after a recent inspection and causes harm to people or property, the public may lose confidence in the jurisdiction's ability to manage a future sinkhole event.

HAZARD SUMMARY BY JURISDICTION

The following table summarizes sinkhole hazard risk by jurisdiction. Sinkhole hazard risk does not vary substantially by jurisdiction. Jurisdictions with known recent sinkhole occurrences and/or that fall within a karst area were given a probability rating of 2; all others were given a probability rating of 1. However, the overall hazard priority for sinkhole remains low for all jurisdictions.

Jurisdiction	Probability	Impact	Spatial Extent	Warning Time	Duration	PRI Score	Priority
Bertie County	2	1	1	4	1	1.6	L
Town of Askewville	2	1	1	4	1	1.6	L
Town of Aulander	2	1	1	4	1	1.6	L
Town of Colerain	2	1	1	4	1	1.6	L
Town of Kelford	2	1	1	4	1	1.6	L
Town of Lewiston-Woodville	2	1	1	4	1	1.6	L
Town of Powellsville	2	1	1	4	1	1.6	L
Town of Roxobel	2	1	1	4	1	1.6	L
Town of Windsor	2	1	1	4	1	1.6	L
Hyde County	2	1	1	4	1	1.6	L

SECTION 4: RISK ASSESSMENT

Jurisdiction	Probability	Impact	Spatial Extent	Warning Time	Duration	PRI Score	Priority
Martin County	2	1	1	4	1	1.6	L
Town of Bear Grass	1	1	1	4	1	1.3	L
Town of Everetts	1	1	1	4	1	1.3	L
Town of Hamilton	1	1	1	4	1	1.3	L
Town of Hassell	1	1	1	4	1	1.3	L
Town of Jamesville	1	1	1	4	1	1.3	L
Town of Oak City	1	1	1	4	1	1.3	L
Town of Parmele	1	1	1	4	1	1.3	L
Town of Robersonville	1	1	1	4	1	1.3	L
Town of Williamston	1	1	1	4	1	1.3	L
Tyrrell County	2	1	1	4	1	1.6	L
Town of Columbia	2	1	1	4	1	1.6	L
Washington County	2	1	1	4	1	1.6	L
Town of Creswell	2	1	1	4	1	1.6	L
Town of Plymouth	2	1	1	4	1	1.6	L
Town of Roper	2	1	1	4	1	1.6	L

4.5.10 WILDFIRE

HAZARD BACKGROUND

A wildfire is an uncontained fire that spreads through the environment. Wildfires have the ability to consume large areas, including infrastructure, property, and resources. When massive fires, or conflagrations, develop near populated areas, evacuations possibly ensue. Not only do the flames impact the environment, but the massive volumes of smoke spread by certain atmospheric conditions also impact the health of nearby populations. There are three general types of fire spread that are recognized.

- **Ground fires** – burn organic matter in the soil beneath surface litter and are sustained by glowing combustion.
- **Surface fires** – spread with a flaming front and burn leaf litter, fallen branches and other fuels located at ground level.
- **Crown fires** – burn through the top layer of foliage on a tree, known as the canopy or crown fires. Crown fires, the most intense type of fire and often the most difficult to contain, need strong winds, steep slopes and a heavy fuel load to continue burning.

Generally, wildfires are started by humans, either through arson or carelessness. Fire intensity is controlled by both short-term weather conditions and longer-term vegetation conditions. During intense fires, understory vegetation, such as leaves, small branches, and other organic materials that accumulate on the ground, can become additional fuel for the fire. The most explosive conditions occur when dry, gusty winds blow across dry vegetation.

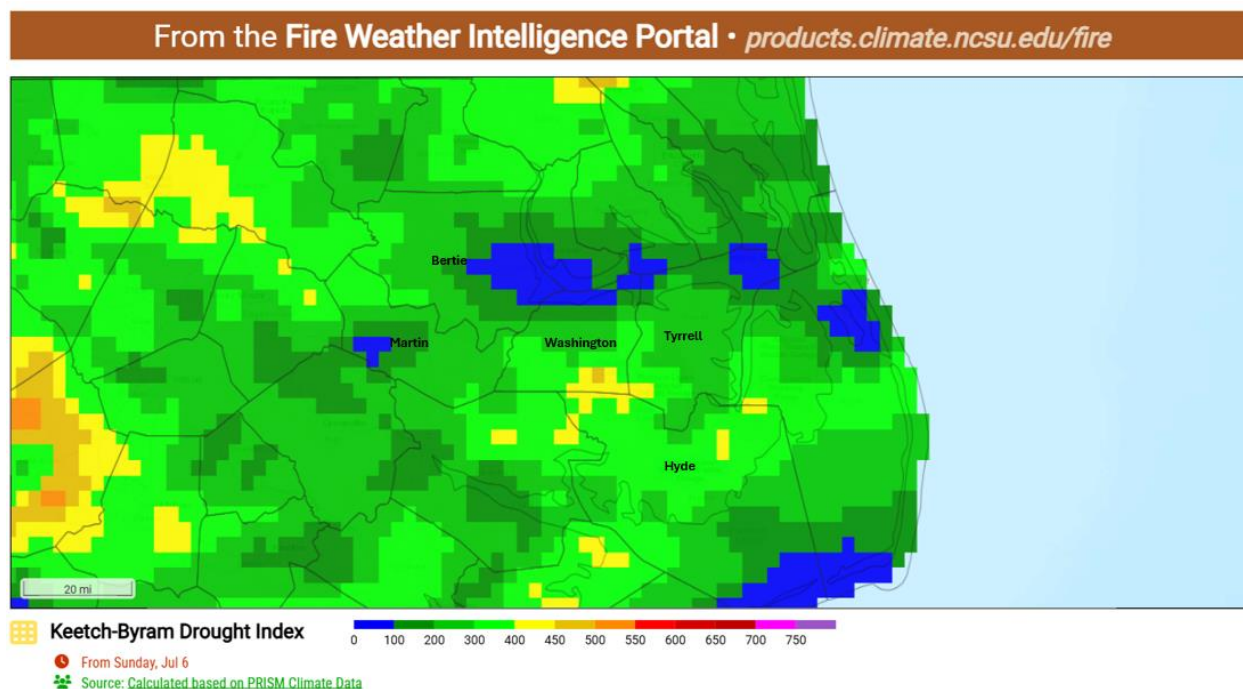
Weather plays a major role in the birth, growth and death of a wildfire. In support of forecasting for fire weather, the National Weather Service Fire Weather Program emerged in response to a need for weather support to large and dangerous wildfires. This service is provided to federal and state land management agencies for the prevention, suppression, and management of forest and rangeland fires.

The Northeastern NC Region experiences a variety of wildfire conditions found in the Keetch-Byram Drought Index, which is described in Table 4.96. The Keetch-Byram Drought Index (KBDI) for July 6, 2024, is shown in Figure 4.54. The KBDI for the Northeastern Region at this time was 100-400 for most of the region; however, Washington County experienced 400-500 in its southeastern area.

Table 4.96 – Keetch-Byram Index Fire Danger Rating System

KBDI	Description
0-200	Soil and fuel moisture are high. Most fuels will not readily ignite or burn. However, with sufficient sunlight and wind, cured grasses and some light surface fuels will burn in spots and patches.
200-400	Fires more readily burn and will carry across an area with no gaps. Heavier fuels will still not readily ignite and burn. Also, expect smoldering and the resulting smoke to carry into and possibly through the night.
400-600	Fire intensity begins to significantly increase. Fires will readily burn in all directions exposing mineral soils in some locations. Larger fuels may burn or smolder for several days creating possible smoke and control problems.
600-800	Fires will burn to mineral soil. Stumps will burn to the end of underground roots and spotting will be a major problem. Fires will burn through the night and heavier fuels will actively burn and contribute to fire intensity.

Figure 4.54 – Keetch-Byram Drought Index, July 2025



Source: North Carolina State Climate Office

Warning Time: 4 – Less than six hours

Duration: 3 – Less than one week

LOCATION

The location of wildfire risk can be defined by the acreage of Functional Wildland Urban Interface (WUI). The Functional WUI is described as the classification of the land near buildings into zones that describe the wildfire risk mitigation activities appropriate for each zone. Buildings used in producing the Functional WUI are defined as greater than 40 square meters. There are five Functional WUI categories recognized. There are five Functional WUI categories recognized.

- **Direct Exposure:** Burnable land cover within 75m of a building. Buildings in this zone are exposed to ignition from convective and radiative heat from a wildfire, embers, and adjacent burning structures/outbuildings.
- **Indirect Exposure:** Nonburnable land cover within 75m of a building and less than 1,530m from a 500-ha contiguous block of wildland fuel. Buildings in this zone are exposed to ignition from embers and/or adjacent burning structures
- **Critical Fireshed:** The burnable land cover from which a wildfire can reach a significant number of buildings within a single burning period.
- **Little-to-no Exposure:** Non-burnable land cover within 75m of a building and more than 1530m from a 500-ha contiguous block of wildland fuel. Buildings in this zone are relatively safe from ember ignition and building-to-building spread.
- **Sources of Ember Load to Buildings:** Burnable land cover more than 75m from a building that produces embers capable of reaching nearby buildings. Ember production is a function of fire type and intensity; ember travel is a function of wind speed and direction. Ember modeling is based on fire modeling based on gridded historical climatology.

The Southern Wildfire Risk Assessment (SWRA) estimates that 72.9% percent of the Northeastern Region is within the critical fireshed and 2.7% percent of the region is in direct exposure to the Functional WUI. The expansion of residential development out into rural landscapes increases the potential for wildland fire threat to public safety and the potential for damage to forest resources and dependent industries. Incorporated towns in the region experience a significantly higher percentage of land that is in direct exposure to the WUI than the unincorporated land within each county.

Table 4.97 through Table 4.102 detail the extent of the Functional WUI by jurisdiction in the Northeastern Region. Figure 4.55 shows the location of the functional wildland urban interface in the Northeastern Region.

Spatial Extent: 3 – Moderate

Table 4.97 – Functional Wildland Urban Interface, Northeastern Region

	Functional Wildland Urban Interface (WUI) Category	Acres	Percent
	Direct Exposure	40,551	2.7%
	Indirect Exposure	45,539	3.0%
	Critical Fireshed	1,103,122	72.9%
	Sources of Ember Load to Buildings	142,079	9.4%
	Little to No Exposure	51	0.003%
	Water	181,383	12.0%
	Total	1,512,725	100%

Source: Southern Wildfire Risk Assessment

Table 4.98 – Functional Wildland Urban Interface, Bertie County

	Functional Wildland Urban Interface (WUI) Category	Acres	Percent
	Direct Exposure	14,368	3.2%
	Indirect Exposure	12,951	2.9%
	Critical Fireshed	370,915	81.7%
	Sources of Ember Load to Buildings	42,432	9.3%
	Little to No Exposure	0	0.0%
	Water	13,465	3.0%
	Total	454,126	100%

Source: Southern Wildfire Risk Assessment

Table 4.99 – Functional Wildland Interface, Hyde County

	Functional Wildland Urban Interface (WUI) Category	Acres	Percent
	Direct Exposure	3,789	1%
	Indirect Exposure	5,301	1%
	Critical Fireshed	220,779	61%
	Sources of Ember Load to Buildings	22,302	6%
	Little to No Exposure	0	0%
	Water	111,404	31%
	Total	363,575	100%

Source: Southern Wildfire Risk Assessment

Table 4.100 – Functional Wildland Interface, Martin County

	Functional Wildland Urban Interface (WUI) Category	Acres	Percent
	Direct Exposure	12,647	4.4%
	Indirect Exposure	16,585	5.8%
	Critical Fireshed	212,774	74.5%
	Sources of Ember Load to Buildings	41,955	14.7%
	Little to No Exposure	0	0.0%
	Water	1,518	0.5%
	Total	285,478	100.0%

Source: Southern Wildfire Risk Assessment

Table 4.101 – Functional Wildland Interface, Tyrrell County

	Functional Wildland Urban Interface (WUI) Category	Acres	Percent
	Direct Exposure	2,889	1.6%
	Indirect Exposure	3,061	1.6%
	Critical Fireshed	138,009	74.2%
	Sources of Ember Load to Buildings	13,623	7.3%
	Little to No Exposure	4	0.0%
	Water	28,446	15.3%
	Total	186,033	100%

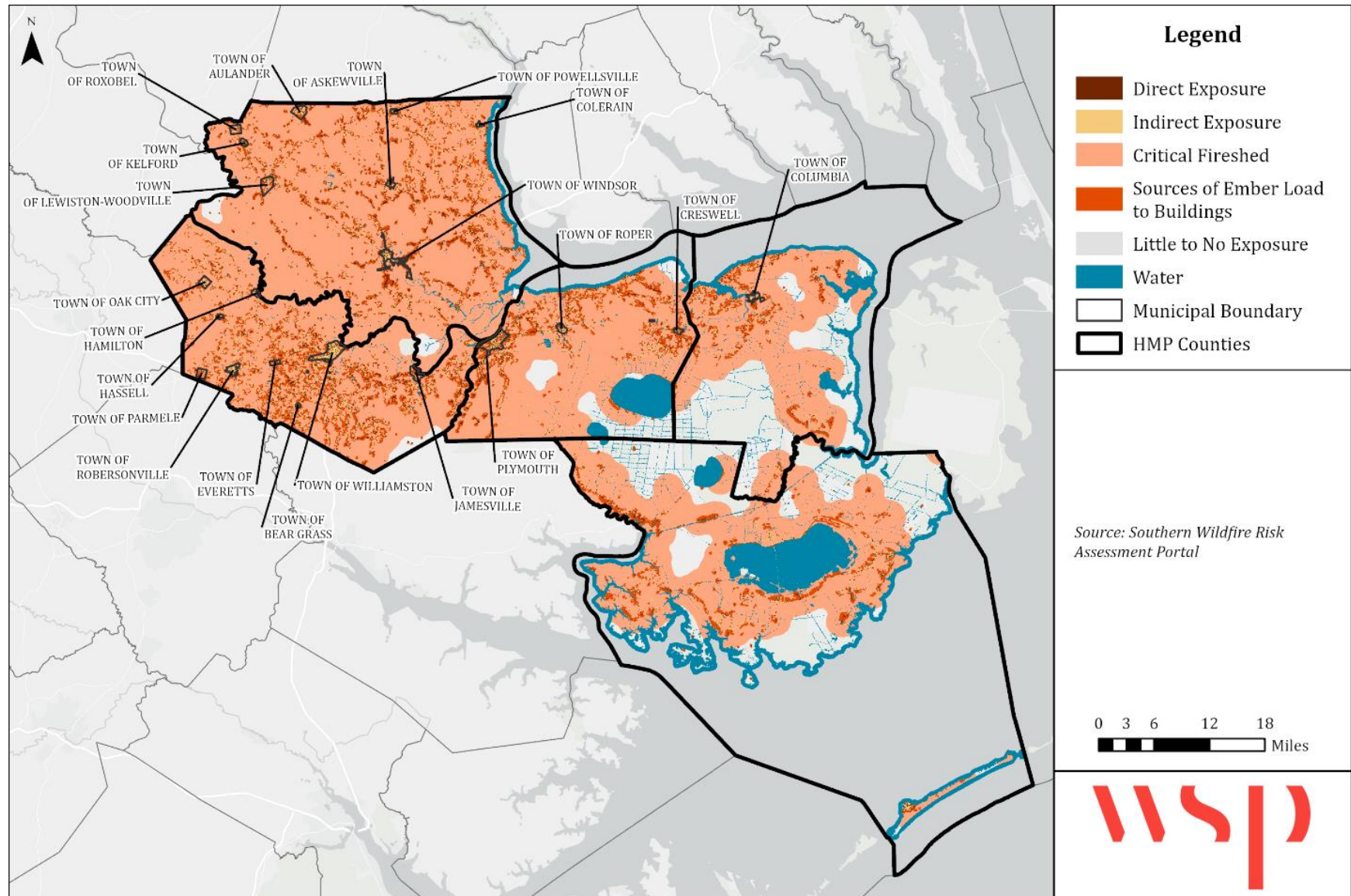
Source: Southern Wildfire Risk Assessment

Table 4.102 – Functional Wildland Interface, Washington County

	Functional Wildland Urban Interface (WUI) Category	Acres	Percent
	Direct Exposure	6,858	3.1%
	Indirect Exposure	7,641	3.4%
	Critical Fireshed	160,645	71.9%
	Sources of Ember Load to Buildings	21,767	9.7%
	Little to No Exposure	47	0.0%
	Water	26,550	11.9%
	Total	223,506	100.0%

Source: Southern Wildfire Risk Assessment

Figure 4.55 – Functional Wildland Urban Interface, Northeastern Region



EXTENT

Wildfire extent can be defined by the fire's intensity and measured by the Characteristic Fire Intensity Scale, which identifies areas where significant fuel hazards which could produce dangerous fires exist. Fire Intensity ratings identify where significant fuel hazards and dangerous fire behavior potential exist based on fuels, topography, and a weighted average of four percentile weather categories. The Fire Intensity Scale consists of five classes, as defined by Southern Wildfire Risk Assessment. 0.3 percent of the region may experience up to a Class 5 Fire Intensity, which has great potential for harm or damage to life and property. However, Hyde County is the county in the region that contains Class 5 Fire Intensity. 17.3 percent of the region may experience up to a Class 4 or Class 4.5 Fire Intensity, which poses significant harm or damage to life and property. 10.3 percent of the county may experience Class 3 Fire Intensity, which has potential for harm to life and property but is easier to suppress with dozer and plows. The remainder of the county is either non-burnable (36.1%) or would face a Class 1 or Class 2 Fire Intensity, which are easily suppressed.

The Fire Intensity Scale consists of five classes, as defined by Southern Wildfire Risk Assessment and shown in Table 4.103. Table 4.104 through Table 4.109 detail fire intensity for the Northeastern NC Region. Figure 4.56 shows the potential fire intensity across the Northeastern NC Region.

Table 4.103 – Fire Intensity Scale

Class	Description
1, Very Low	Very small, discontinuous flames, usually less than 1 foot in length; very low rate of spread; no spotting. Fires are typically easy to suppress by firefighters with basic training and non-specialized equipment.
2, Low	Small flames, usually less than two feet long; small amount of very short-range spotting possible. Fires are easy to suppress by trained firefighters with protective equipment and specialized tools.
3, Moderate	Flames up to 8 feet in length; short-range spotting is possible. Trained firefighters will find these fires difficult to suppress without support from aircraft or engines, but dozer and plows are generally effective. Increasing potential for harm or damage to life and property.
4, High	Large Flames, up to 30 feet in length; short-range spotting common; medium range spotting possible. Direct attack by trained firefighters, engines, and dozers is generally ineffective, indirect attack may be effective. Significant potential for harm or damage to life and property.
5, Very High	Very large flames up to 150 feet in length; profuse short-range spotting, frequent long-range spotting; strong fire-induced winds. Indirect attack marginally effective at the head of the fire. Great potential for harm or damage to life and property.

Source: Southern Wildfire Risk Assessment

Impact: 2 – Limited

Table 4.104 – Characteristic Fire Intensity, Northeastern Region

	Characteristic Fire Intensity Scale Category	Acres	Percent
	Non-burnable	637,422	36.1%
	1 Lowest Intensity	258,149	14.6%
	1.5	162,239	9.2%
	2 Low	130,675	7.4%
	2.5	84,811	4.8%
	3 Moderate	134,342	7.6%
	3.5	47,941	2.7%
	4 High	213,450	12.1%
	4.5	91,406	5.2%
	5 Highest Intensity	5,393	0.3%
	> 5	0	0.0%
	Total	1,765,828	100%

Source: Southern Wildfire Risk Assessment

Table 4.105 – Characteristic Fire Intensity by Jurisdiction, Bertie County

	Characteristic Fire Intensity Scale Category	Acres	Percent
	Non-burnable	120,514	26%
	1 Lowest Intensity	95,157	21%
	1.5	32,708	7%
	2 Low	52,136	11%
	2.5	59,123	13%
	3 Moderate	63,350	14%
	3.5	11,844	3%
	4 High	25,757	6%
	4.5	299	0%
	5 Highest Intensity	0	0%
	> 5	0	0%
	Total	460,883	100%

Source: Southern Wildfire Risk Assessment

Table 4.106 – Characteristic Fire Intensity by Jurisdiction, Hyde County

	Characteristic Fire Intensity Scale Category	Acres	Percent
	Non-burnable	204,722	41%
	1 Lowest Intensity	37,515	8%
	1.5	30,496	6%
	2 Low	31,468	6%
	2.5	2,150	0%
	3 Moderate	15,147	3%
	3.5	4,557	1%
	4 High	88,783	18%
	4.5	73,095	15%
	5 Highest Intensity	5,393	1%
	> 5	0	0%
	Total	493,326	100%

Source: Southern Wildfire Risk Assessment

Table 4.107 – Characteristic Fire Intensity, Martin County

	Characteristic Fire Intensity Scale Category	Acres	Percent
	Non-burnable	96,242	33%
	1 Lowest Intensity	55,810	19%
	1.5	27,487	9%
	2 Low	17,895	6%
	2.5	16,067	5%
	3 Moderate	36,992	13%
	3.5	19,935	7%
	4 High	21,503	7%
	4.5	372	0%
	5 Highest Intensity	0	0%
	> 5	0	0%
	Total	292,298	100%

Source: Southern Wildfire Risk Assessment

Table 4.108 – Characteristic Fire Intensity, Tyrrell County

	Characteristic Fire Intensity Scale Category	Acres	Percent
	Non-burnable	93,008	34%
	1 Lowest Intensity	47,081	17%
	1.5	46,352	17%
	2 Low	17,443	6%
	2.5	2,848	1%
	3 Moderate	4,825	2%
	3.5	3,046	1%
	4 High	46,501	17%
	4.5	12,653	5%
	5 Highest Intensity	0	0%
	> 5	0	0%
	Total	273,757	100%

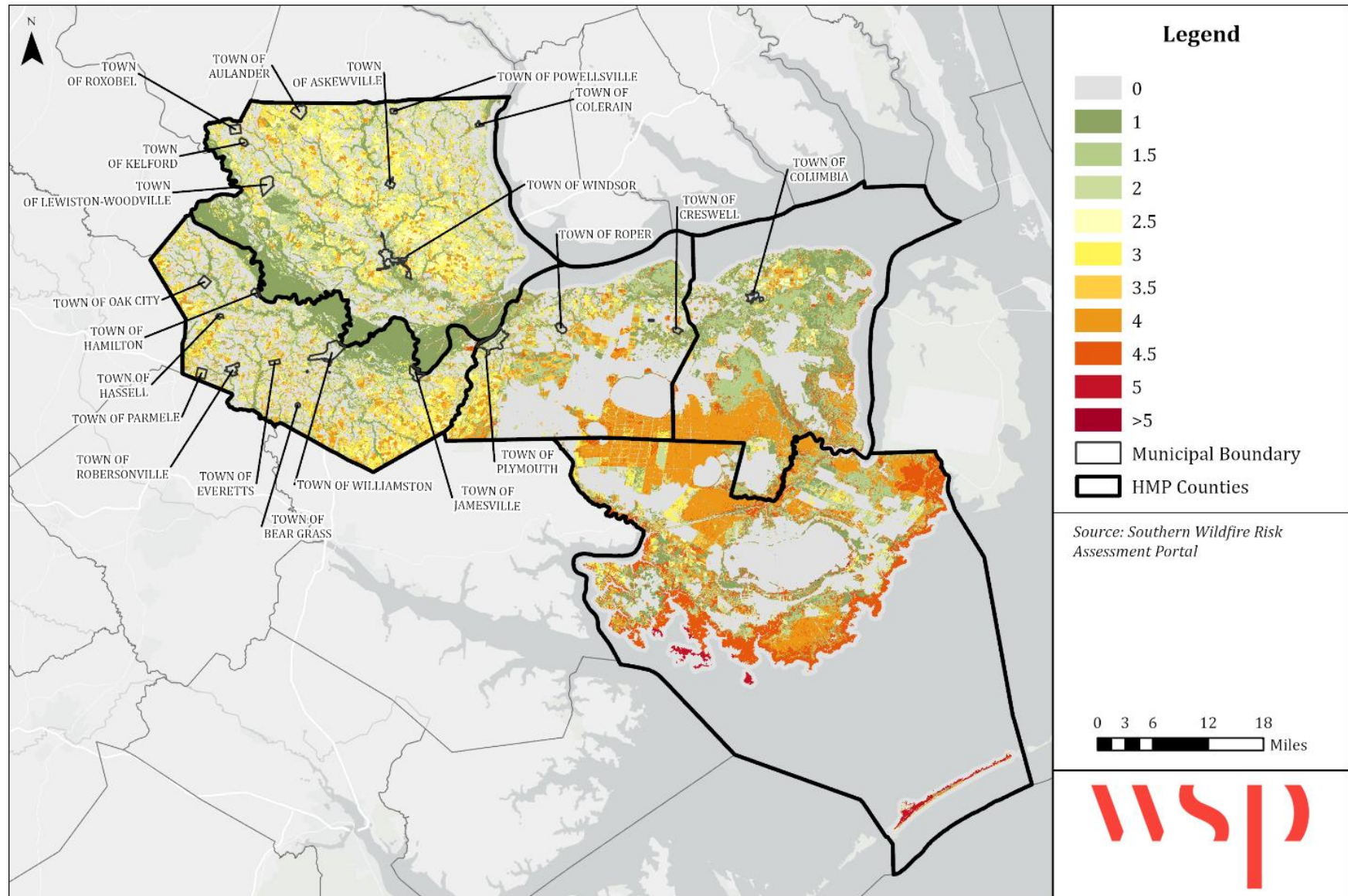
Source: Southern Wildfire Risk Assessment

Table 4.109 – Characteristic Fire Intensity, Washington County

	Characteristic Fire Intensity Scale Category	Acres	Percent
	Non-burnable	122,936	50%
	1 Lowest Intensity	22,586	9%
	1.5	25,196	10%
	2 Low	11,733	5%
	2.5	4,623	2%
	3 Moderate	14,028	6%
	3.5	8,559	3%
	4 High	30,906	13%
	4.5	4,987	2%
	5 Highest Intensity	0	0%
	> 5	0	0%
	Total	245,551	100%

Source: Southern Wildfire Risk Assessment

Figure 4.56 – Characteristic Fire Intensity, Northeastern NC Region



HISTORICAL OCCURRENCES

Table 4.110 lists past occurrences of wildfire in the Northeastern NC Region since 1999 as provided by the North Carolina Forest Service (NCFS) in July 2025. This data only accounts for occurrences within unincorporated areas within the region, which fall under the NCFS jurisdiction, as well as larger events in incorporated areas where local fire departments requested NCFS support for fire suppression. Actual number of fires and acreage burned are higher than what can be reported here.

Table 4.110 – Records for Wildfire in the Northeastern NC Region, 1999-2024

Year	Wildfire Count	Acres Burned	Average Acreage Burned
1999	76	223.4	2.94
2000	76	630.7	8.30
2001	156	846.8	5.43
2002	106	518.8	4.89
2003	32	161.3	5.04
2004	56	324.4	5.79
2005	59	156.9	2.66
2006	105	435.3	4.15
2007	153	825.8	5.40
2008	141	18,284.6	129.68
2009	104	508.0	4.88
2010	82	290.5	3.54
2011	126	534.0	4.24
2012	73	166.8	2.28
2013	70	206.9	2.96
2014	60	254.8	4.25
2015	74	169.4	2.29
2016	54	6,958.3	128.86
2017	103	176.0	1.71
2018	72	43.8	0.61
2019	105	147.24	1.40
2020	74	63.78	0.86
2021	100	284.23	2.84
2022	119	2,454.45	20.62
2023	72	5,582.75	77.53
2024	79	261.58	3.31
Total	2,327	40,510.5	17.40

Source: NC Forest Service

In 2008 and 2016, the Northeastern NC Region saw an exceptional number of acres burned, averaging 129.68 and 128.86 per fire event, respectively. The region experienced drought in 2008, and acres burned were higher on average across all counties in the region, with impacts most severe in Hyde County. In 2008, over 16,500 acres burned in Hyde County, and in 2016 almost 7,000 acres burned.

In June 2008, a record-breaking fire started at the Pocosin Lakes National Wildlife Refuge and spread to privately owned rural land in Hyde, Tyrrell, and Washington Counties. The Whipping Creek fire started as two smaller fires in April 2016, and Hyde County officials were forced to shut down a 30-mile stretch of U.S. Highway 264. Despite its large size, the fire occurred where no people or communities were

threatened, according to the North Carolina Forestry Service. In 2022, a wildfire began in private land in Carolina Ranch near the Pocosin Lakes National Wildlife Refuge in Hyde County and burned around 1,940 acres.

On average, the Northeastern NC Region experiences 89.5 fires, and 1,558 acres burned annually from fires that require the North Carolina Forest Service to respond. Actual number of fires and acreage burned is likely higher because smaller fires within jurisdictional boundaries are managed by local fire departments. During HMPC discussions, a NCFS representative noted that the Northeastern NC Region is prone to long-lasting fires, which can be taxing on response resources.

PROBABILITY OF FUTURE OCCURRENCE

The Southern Wildfire Risk Assessment provides a Burn Probability analysis which signifies the likelihood of a wildfire burning a specific location within a set time frame - commonly represented as the chance of burning during one calendar year or wildfire season. According to the SWRA, Burn Probability can be expressed as a fraction (ex. 0.005) or odds (1-in-200) and is based on fire behavior modeling across thousands of simulations of possible fire seasons. In each simulation, factors contributing to the probability of a fire occurring, including weather and ignition likelihood are varied based on patterns derived from observations in recent decades. It is not predictive and does not reflect any currently forecasted weather or fire danger conditions. Burn Probability does not say anything about the intensity of fire if it occurs. The Burn Probability for the Northeastern NC Region and its respective counties is presented in Table 4.111 through Table 4.116 and illustrated in Figure 4.57.

The Northeastern Region has a relatively low to moderate burn probability, with about 1.1 percent of the region experiencing a higher burn probability. The majority of the area with higher burn probability is found in Hyde County. Areas of moderate to high burn probability have a comparatively higher probability of experiencing a wildfire.

Probability: 3 – Likely

Table 4.111 – Burn Probability, Northeastern NC Region

	Burn Probability Category	Acres	Percent
	0	195,272	11.1%
	>0 - 0.0001000	229,493	13.0%
	0.0001000 - 0.0002154	306,942	17.4%
	0.0002154 - 0.0004642	384,413	21.8%
	0.0004642 - 0.0010000	316,285	17.9%
	0.0010000 - 0.0021544	234,792	13.3%
	0.0021544 - 0.0046416	78,346	4.4%
	0.0046416 - 0.0100000	19,803	1.1%
	0.0100000 - 0.0215443	473	0.0%
	0.0215443 - 0.0464159	0	0.0%
	0.0464159 - 0.1000000	0	0.0%
	>0.1000000	0	0.0%
	Total	1,765,815	100%

Source: Southern Wildfire Risk Assessment

Table 4.112 – Burn Probability, Bertie County

	Burn Probability Category	Acres	Percent
	0	13,465	3%
	>0 - 0.0001000	35,180	8%
	0.0001000 - 0.0002154	134,118	29%
	0.0002154 - 0.0004642	145,115	31%
	0.0004642 - 0.0010000	108,863	24%
	0.0010000 - 0.0021544	24,130	5%
	0.0021544 - 0.0046416	13	0%
	0.0046416 - 0.0100000	0	0%
	0.0100000 - 0.0215443	0	0%
	0.0215443 - 0.0464159	0	0%
	0.0464159 - 0.1000000	0	0%
	>0.1000000	0	0%
	Total	460,883	100%

Source: Southern Wildfire Risk Assessment

Table 4.113 – Burn Probability, Hyde County

	Burn Probability Category	Acres	Percent
	0	111,752	23%
	>0 - 0.0001000	48,460	10%
	0.0001000 - 0.0002154	20,611	4%
	0.0002154 - 0.0004642	47,148	10%
	0.0004642 - 0.0010000	69,739	14%
	0.0010000 - 0.0021544	106,973	22%
	0.0021544 - 0.0046416	68,380	14%
	0.0046416 - 0.0100000	19,789	4%
	0.0100000 - 0.0215443	473	0%
	0.0215443 - 0.0464159	0	0%
	0.0464159 - 0.1000000	0	0%
	>0.1000000	0	0%
	Total	493,326	100%

Source: Southern Wildfire Risk Assessment

Table 4.114 – Burn Probability, Martin County

	Burn Probability Category	Acres	Percent
	0	1,518	1%
	>0 - 0.0001000	50,153	17%
	0.0001000 - 0.0002154	107,521	37%
	0.0002154 - 0.0004642	76,358	26%
	0.0004642 - 0.0010000	41,093	14%
	0.0010000 - 0.0021544	15,500	5%
	0.0021544 - 0.0046416	158	0%
	0.0046416 - 0.0100000	0	0%
	0.0100000 - 0.0215443	0	0%
	0.0215443 - 0.0464159	0	0%
	0.0464159 - 0.1000000	0	0%
	>0.1000000	0	0%
	Total	292,299	100%

Source: Southern Wildfire Risk Assessment

Table 4.115 – Burn Probability, Tyrrell County

	Burn Probability Category	Acres	Percent
	0	31,167	11%
	>0 - 0.0001000	39,036	14%
	0.0001000 - 0.0002154	17,211	6%
	0.0002154 - 0.0004642	66,238	24%
	0.0004642 - 0.0010000	57,986	21%
	0.0010000 - 0.0021544	53,043	19%
	0.0021544 - 0.0046416	9,063	3%
	0.0046416 - 0.0100000	14	0%
	0.0100000 - 0.0215443	0	0%
	0.0215443 - 0.0464159	0	0%
	0.0464159 - 0.1000000	0	0%
	>0.1000000	0	0%
	Total	273,757	100%

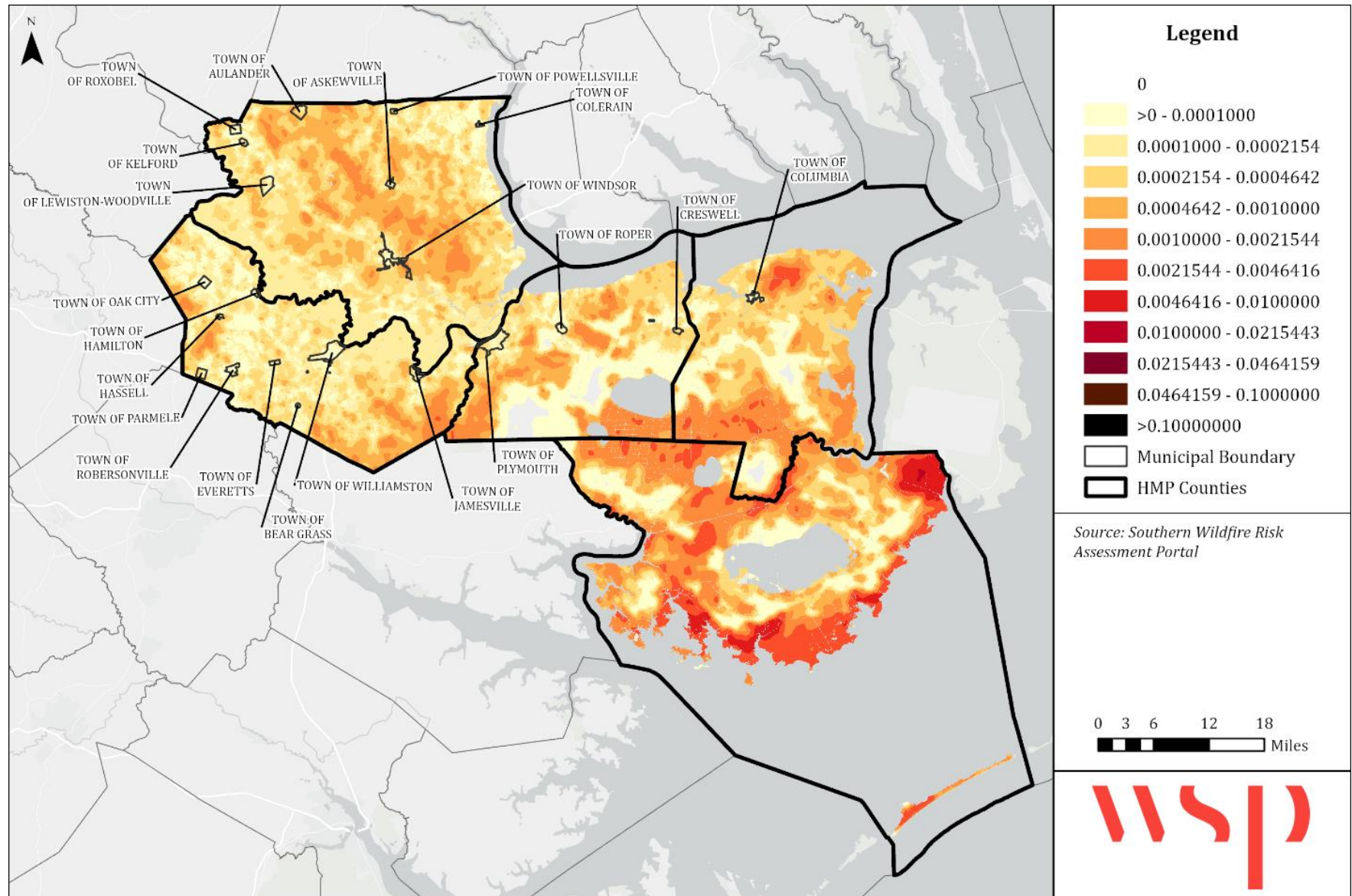
Source: Southern Wildfire Risk Assessment

Table 4.116 – Burn Probability, Washington County

	Burn Probability Category	Acres	Percent
	0	37,370	15%
	>0 - 0.0001000	56,664	23%
	0.0001000 - 0.0002154	27,481	11%
	0.0002154 - 0.0004642	49,554	20%
	0.0004642 - 0.0010000	38,604	16%
	0.0010000 - 0.0021544	35,146	14%
	0.0021544 - 0.0046416	732	0%
	0.0046416 - 0.0100000	0	0%
	0.0100000 - 0.0215443	0	0%
	0.0215443 - 0.0464159	0	0%
	0.0464159 - 0.1000000	0	0%
	>0.1000000	0	0%
	Total	245,550	100%

Source: Southern Wildfire Risk Assessment

Figure 4.57 – Burn Probability, Northeastern NC Region



CLIMATE CHANGE

The North Carolina Climate Science Report predicts that conditions conducive to wildfire occurrence will likely increase in the future due to future increases in annual and seasonal average temperatures and associated increases in drying rates. Additionally, future droughts are very likely to be warmer, increasing the drying rate of fuels and leading to higher wildfire likelihood. However, changes in other climate elements that affect wildfire likelihood are uncertain.

VULNERABILITY ASSESSMENT

METHODOLOGIES AND ASSUMPTIONS

Population and property at risk to wildfire was estimated using data from the NCEM IRISK database, which was compiled in NCEM's Risk Management Tool.

Within IRISK, wildfire hazard areas were determined using the Wildland Fire Susceptibility Index (WFSI). The following parameters were applied:

- Areas with a WFSI value of 0.01 – 0.05 were considered to be at moderate risk.
- Areas with a WFSI value greater than 0.05 were considered to be at high risk.
- Areas with a WFSI value less than 0.01 were considered to not be at risk.

The WFSI integrates the probability of an acre igniting and the expected final fire size based on the rate of spread in four weather percentile categories into a single measure of wildland fire susceptibility. Due to some necessary assumptions, mainly fuel homogeneity, it is not the true probability. But since all areas of the state have this value determined consistently, it allows for comparison and ordination of areas of the state as to the likelihood of an acre burning.

PEOPLE

Wildfire can cause fatalities and human health hazards. Ensuring procedures are in place for rapid warning and evacuation are essential to reducing vulnerability. Table 4.117 details the population estimated to be at risk to wildfire according to the NCEM IRISK database.

Table 4.117 – Estimated Population Impacted by Wildfire

Jurisdiction	Total Population	Total Population at Risk		All Elderly Population	Elderly Population at Risk		All Children Population	Children at Risk	
		Number	Percent		Number	Percent		Number	Percent
Bertie									
Unincorporated Bertie County	11,675	4,904	42%	2,855	1,199	42%	417	175	42%
Town of Askewville	152	116	76%	45	34	76%	12	9	75%
Town of Aulander	748	7	1%	208	0	0%	117	0	0%
Town of Colerain	291	81	28%	49	13	27%	9	2	25%
Town of Kelford	245	0	0%	69	0	0%	15	0	0%
Town of Lewiston-Woodville	466	93	20%	137	26	19%	24	5	20%
Town of Powellsville	141	113	80%	113	76	67%	0	0	0%
Town of Roxobel	347	0	0%	66	0	0%	24	0	0%

SECTION 4: RISK ASSESSMENT

Jurisdiction	Total Population	Total Population at Risk		All Elderly Population	Elderly Population at Risk		All Children Population	Children at Risk	
		Number	Percent		Number	Percent		Number	Percent
Town of Windsor	3,417	683	20%	703	141	20%	94	17	18%
Subtotal Bertie	17,482	5,997	34%	4,245	1,489	35%	712	208	.29%
Hyde									
Unincorporated Hyde County	4,625	1,711	37%	1,054	390	37%	124	46	37%
Martin									
Unincorporated Martin County	13,680	3,420	25%	3,396	849	25%	753	188	25%
Town of Bear Grass	94	75	80%	12	12	100%	22	22	100%
Town of Everetts	158	63	40%	18	9	50%	9	0	0%
Town of Hamilton	183	0	0%	84	0	0%	2	0	0%
Town of Hassell	49	12	25%	30	0	0%	0	0	0%
Town of Jamesville	373	119	32%	118	39	33%	8	4	50%
Town of Oak City	472	0	0%	145	0	0%	30	0	0%
Town of Parmele	288	52	18%	85	16	19%	0	0	25%
Town of Robersonville	1,319	106	8%	374	22	6%	52	0	0%
Town of Williamston	5,157	774	15%	1,182	177	15%	194	29	15%
Subtotal Martin	21,773	4,621	21%	5,444	1,125	21%	1,070	243	23%
Tyrrell									
Unincorporated Tyrrell County	2,702	1,567	58%	695	403	58%	146	85	58%
Town of Columbia	674	425	63%	167	84	50%	24	0	0%
Subtotal Tyrrell	3,376	1,992	59%	862	487	56%	170	85	50%
Washington									
Unincorporated Washington County	6,850	5,343	78%	1,841	1,436	78%	64	51	79%
Town of Creswell	205	182	89%	58	52	89%	15	15	100%
Town of Plymouth	3,264	2,970	91%	923	840	91%	140	140	100%
Town of Roper	586	416	71%	162	115	71%	22	18	80%
Subtotal Washington	10,905	8,912	82%	2,984	2,443	82%	241	223	93%
Region Total	58,161	23,233	40%	14,589	5,934	41%	2,317	805	35%

Source: NCEM Risk Management Tool; ACS 2019-2023 5-Year Estimate

PROPERTY

Wildfire can cause direct property losses, including damage to buildings, vehicles, landscaped areas, agricultural lands, and livestock. Construction practices and building codes can increase fire resistance and fire safety of structures. Techniques for reducing vulnerability to wildfire include using street design to ensure accessibility to fire trucks, incorporating fire resistant materials in building construction, and using landscaping practices to reduce flammability and the ability for fire to spread.

Table 4.118 details the buildings at risk to wildfire in the Northeastern NC Region.

SECTION 4: RISK ASSESSMENT

Table 4.118 – Estimated Buildings Impacted by Wildfire

Jurisdiction	All Buildings	Residential Buildings at Risk			Commercial Buildings at Risk			Public Buildings at Risk			Total Buildings at Risk		
	Num	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages
Bertie													
Unincorporated Bertie County	11,175	3,647	33%	\$323,237,774	763	7%	\$124,502,648	83	1%	\$75,073,561	4,493	40%	\$522,813,983
Town of Askewville	502	292	58%	\$24,758,416	71	14%	\$8,709,268	10	2%	\$6,727,871	373	74%	\$40,195,555
Town of Aulander	744	8	1%	\$743,850	4	1%	\$2,758,440	0	0%	\$0	12	2%	\$3,502,289
Town of Colerain	428	97	23%	\$9,505,529	6	1%	\$1,830,289	9	2%	\$4,070,965	112	26%	\$15,406,783
Town of Kelford	173	0	0%	\$0	0	0%	\$0	0	0%	\$0	0	0%	\$0
Town of Lewiston-Woodville	719	119	17%	\$9,975,586	12	2%	\$2,608,708	2	0%	\$720,771	133	18%	\$13,305,065
Town of Powellsville	171	121	71%	\$11,768,545	12	7%	\$2,181,581	4	2%	\$2,238,531	137	80%	\$16,188,657
Town of Roxobel	205	0	0%	\$0	0	0%	\$0	0	0%	\$0	0	0%	\$0
Town of Windsor	1,815	279	15%	\$22,758,263	31	2%	\$9,302,435	13	1%	\$6,608,400	323	18%	\$38,669,099
Subtotal Bertie	15,932	4,563	29%	\$402,747,963	899	6%	\$151,893,369	121	1%	\$95,440,099	5,583	35%	\$650,081,431
Hyde													
Unincorporated Hyde County	5,596	1,726	31%	\$170,630,885	294	5%	\$47,008,764	44	1%	\$14,270,325	2,064	37%	\$231,909,974
Martin													
Unincorporated Martin County	12,188	2,092	17%	\$256,675,462	657	5%	\$115,142,563	48	0%	\$49,524,689	2,797	23%	\$421,342,714
Town of Bear Grass	81	42	52%	\$4,575,853	6	7%	\$2,089,679	16	20%	\$8,997,112	64	79%	\$15,662,644
Town of Everetts	159	61	38%	\$7,246,695	1	1%	\$24,189	0	0%	\$0	62	39%	\$7,270,885
Town of Hamilton	292	0	0%	\$0	0	0%	\$0	0	0%	\$0	0	0%	\$0
Town of Hassell	70	8	11%	\$780,243	1	1%	\$42,815	0	0%	\$0	9	13%	\$823,058

SECTION 4: RISK ASSESSMENT

Jurisdiction	All Buildings	Residential Buildings at Risk			Commercial Buildings at Risk			Public Buildings at Risk			Total Buildings at Risk		
	Num	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages	Num	% of Total	Estimated Damages
Town of Jamesville	297	76	26%	\$11,590,900	4	1%	\$2,383,513	10	3%	\$9,499,997	90	30%	\$23,474,410
Town of Oak City	313	0	0%	\$0	0	0%	\$0	0	0%	\$0	0	0%	\$0
Town of Parmele	149	23	15%	\$2,359,397	0	0%	\$0	0	0%	\$0	23	15%	\$2,359,397
Town of Robersonville	901	65	7%	\$8,327,967	5	1%	\$920,636	0	0%	\$0	70	8%	\$9,248,603
Town of Williamston	4,238	461	11%	\$62,830,045	174	4%	\$72,851,022	64	2%	\$117,840,833	699	16%	\$253,521,900
Subtotal Martin	18,688	2,828	15%	\$354,386,562	848	5%	\$193,454,417	138	1%	\$185,862,631	3,814	20%	\$733,703,611
Tyrrell													
Unincorporated Tyrrell County	2,794	1,255	45%	\$124,399,257	229	8%	\$24,628,657	28	1%	\$30,388,310	1,512	54%	\$179,416,223
Town of Columbia	519	241	46%	\$25,662,629	20	4%	\$6,934,356	13	3%	\$10,971,164	274	53%	\$43,568,149
Subtotal Tyrrell	3,313	1,496	45%	\$150,061,886	249	8%	\$31,563,013	41	1%	\$41,359,474	1,786	54%	\$222,984,372
Washington													
Unincorporated Washington County	5,482	3,162	58%	\$256,589,430	777	14%	\$56,536,137	74	1%	\$21,327,627	4,013	73%	\$334,453,194
Town of Creswell	366	244	67%	\$18,161,501	56	15%	\$6,545,082	22	6%	\$12,849,739	322	88%	\$37,556,322
Town of Plymouth	2,779	2,124	76%	\$192,514,428	274	10%	\$76,204,933	95	3%	\$35,173,608	2,493	90%	\$303,892,969
Town of Roper	611	358	59%	\$27,955,039	55	9%	\$9,339,041	16	3%	\$10,020,756	429	70%	\$47,314,835
Subtotal Washington	9,238	5,888	64%	\$495,220,398	1,162	13%	\$148,625,193	207	2%	\$79,371,730	7,257	79%	\$723,217,320
Region Total	52,767	16,501	31%	\$1,573,047,694	3,452	7%	\$572,544,756	551	1%	\$416,304,259	20,504	39%	\$2,561,896,708

Source: NCEM Risk Management Tool

Table 4.119 details critical infrastructure and key resources at risk by sector. The sectors facing the greatest risk to wildfire in Northeastern NC Region are energy, commercial facilities, government facilities, and food and agriculture.

Table 4.119 – CIKR at Risk to Wildfire

Sector	Number of Buildings at Risk	Estimated Damages
Banking and Finance	30	\$7,859,553
Commercial Facilities	923	\$337,441,244
Communications	2	\$205,453
Critical Manufacturing	214	\$81,585,808
Emergency Services	15	\$8,449,512
Energy	1	\$500,000,000
Food and Agriculture	2,431	\$187,519,286
Government Facilities	271	\$269,681,645
Healthcare and Public Health	55	\$63,560,516
Nuclear Reactors, Materials and Waste	2	\$352,540
Postal and Shipping	3	\$1,600,000
Transportation Systems	92	\$33,909,558
Water	15	\$60,656,600
All Categories	4,054	\$1,552,821,715

Source: NCEM Risk Management Tool

Table 4.120 summarizes critical facilities in the WUI with direct exposure to wildfire risk according to WUI data from the Southern Wildfire Risk Assessment portal.

Table 4.120 – Critical Facilities with Direct Exposure to Wildfire by County

FEMA Lifeline	Number of Facilities at Risk					Total
	Bertie	Hyde	Martin	Tyrrell	Washington	
Safety & Security	3	1	0	3	3	10
Food, Hydration, Shelter	16	5	2	8	23	54
Health & Medical	3	0	0	0	2	5
Water Systems	2	4	8	0	4	18
Total	24	10	10	11	32	87

ENVIRONMENT

Wildfires have the potential to destroy forest and forage resources and damage natural habitats. Wildfire can also damage agricultural crops on private land. Wildfire is part of a natural process, however, and the environment will return to its original state in time.

CONSEQUENCE ANALYSIS

Table 4.121 summarizes the potential detrimental consequences of wildfire.

Table 4.121 – Consequence Analysis - Wildfire

Category	Consequences
Public	In addition to the potential for fatalities, wildfire and the resulting diminished air quality pose health risks. Exposure to wildfire smoke can cause serious health problems within a community, including asthma attacks and pneumonia, and can worsen chronic heart and lung diseases. Vulnerable populations include children, the elderly, people with respiratory problems or with heart disease. Even healthy citizens may experience minor symptoms, such as sore throats and itchy eyes.
Responders	Public and firefighter safety is the first priority in all wildland fire management activities. Wildfires are a real threat to the health and safety of the emergency services. Most fire-fighters in rural areas are 'retained'. This means that they are part-time and can be called away from their normal work to attend to fires.
Continuity of Operations (including Continued Delivery of Services)	Wildfire events can result in a loss of power which may impact operations. Downed trees, power lines and damaged road conditions may prevent access to critical facilities and/or emergency equipment.
Property, Facilities and Infrastructure	Wildfires frequently damage community infrastructure, including roadways, communication networks and facilities, power lines, and water distribution systems. Restoring basic services is critical and a top priority. Efforts to restore roadways include the costs of maintenance and damage assessment teams, field data collection, and replacement or repair costs. Direct impacts to municipal water supply may occur through contamination of ash and debris during the fire, destruction of aboveground distribution lines, and soil erosion or debris deposits into waterways after the fire. Utilities and communications repairs are also necessary for equipment damaged by a fire. This includes power lines, transformers, cell phone towers, and phone lines.
Environment	Wildfires cause damage to the natural environment, killing vegetation and animals. The risk of floods and debris flows increases after wildfires due to the exposure of bare ground and the loss of vegetation. In addition, the secondary effects of wildfires, including erosion, landslides, introduction of invasive species, and changes in water quality, are often more disastrous than the fire itself.
Economic Condition of the Jurisdiction	Wildfires can have significant short-term and long-term effects on the local economy. Wildfires, and extreme fire danger, may reduce recreation and tourism in and near the fires. If aesthetics are impaired, local property values can decline. Extensive fire damage to trees can significantly alter the timber supply, both through a short-term surplus from timber salvage and a longer-term decline while the trees regrow. Water supplies can be degraded by post-fire erosion and stream sedimentation.
Public Confidence in the Jurisdiction's Governance	Wildfire events may cause issues with public confidence because they have very visible impacts on the community. Public confidence in the jurisdiction's governance may be influenced by mitigation and preparation efforts, warning, response activities, and recovery efforts.

HAZARD SUMMARY BY JURISDICTION

The following table summarizes wildfire hazard risk by jurisdiction. Warning time and duration do not vary by jurisdiction. Spatial extent ratings were based on the proportion of area within the WUI. Impact ratings were based on fire intensity data from SWRA. Jurisdictions with significant clusters of moderate to high fire intensity were assigned a rating of 3; all other jurisdictions were assigned a rating of 2. Probability ratings were determined based on burn probability data from SWRA. Jurisdictions with clusters of moderate burn probability were assigned a rating of 3; all others were assigned a probability of 2.

Jurisdiction	Probability	Impact	Spatial Extent	Warning Time	Duration	Score	Priority
Bertie County	3	3	3	4	3	3.1	H
Town of Askewville	2	3	3	4	3	2.8	M
Town of Aulander	2	3	3	4	3	2.8	M
Town of Colerain	2	2	3	4	3	2.5	M
Town of Kelford	2	2	4	4	3	2.7	M
Town of Lewiston-Woodville	2	2	4	4	3	2.7	M
Town of Powellsville	2	2	4	4	3	2.7	M
Town of Roxobel	2	2	4	4	3	2.7	M
Town of Windsor	2	2	4	4	3	2.7	M
Hyde County	3	3	3	4	3	3.1	H
Martin County	3	3	3	4	3	3.1	H
Town of Bear Grass	2	2	4	4	3	2.7	M
Town of Everetts	2	2	4	4	3	2.7	M
Town of Hamilton	2	2	4	4	3	2.7	M
Town of Hassell	2	2	4	4	3	2.7	M
Town of Jamesville	2	2	4	4	3	2.7	M
Town of Oak City	2	2	4	4	3	2.7	M
Town of Parmele	2	2	4	4	3	2.7	M
Town of Robersonville	2	2	4	4	3	2.7	M
Town of Williamston	2	2	4	4	3	2.7	M
Tyrrell County	3	3	3	4	3	3.1	H
Town of Columbia	2	3	4	4	3	3	H
Washington County	3	3	3	4	3	3.1	H
Town of Creswell	2	2	4	4	3	2.7	M
Town of Plymouth	2	2	4	4	3	2.7	M
Town of Roper	2	2	4	4	3	3.1	H

4.5.11 HAZARDOUS SUBSTANCES

HAZARD BACKGROUND

Generally, a hazardous material is a substance or combination of substances which, because of quantity, concentration, or physical, chemical, or infectious characteristics, may either cause or significantly contribute to an increase in mortality or serious illness. Hazardous materials may also pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed. Hazardous material incidents can occur while a hazardous substance is stored at a fixed facility, or while the substance is being transported along a road corridor or railroad line or via an enclosed pipeline or other linear infrastructure.

The U.S. Department of Transportation (DOT), U.S. Environmental Protection Agency (EPA) and the Occupational Safety and Health Administration (OSHA) all have responsibilities relating to the transportation, storage, and use of hazardous materials and waste. The Right to Know Network (RTK NET), maintained by the EPA's National Response Center (NRC), is a primary source of information on the use and storage of hazardous materials, as well as data regarding spills and releases.

Hazardous materials are typically divided into the following classes:

- Explosives
- Compressed gases: flammable, non-flammable compressed, poisonous
- Flammable or combustible liquids
- Flammable solids: spontaneously combustible, dangerous when wet
- Oxidizers and organic peroxides
- Toxic materials: poisonous material, infectious agents
- Radioactive material
- Corrosive material: destruction of human skin, corrodes steel

It is common to see hazardous materials releases as escalating incidents resulting from other hazards such as floods, wildfires, and earthquakes that may cause containment systems to fail or affect transportation infrastructure. The release of hazardous materials can greatly complicate or even eclipse the response to the natural hazards disaster that caused the spill.

FIXED HAZARDOUS MATERIALS INCIDENT

A fixed hazardous materials incident is the accidental release of chemical substances or mixtures during production or handling at a fixed facility. While these incidents can sometimes involve large quantities of materials, their locations can be more easily predicted and monitored.

TRANSPORTATION HAZARDOUS MATERIALS INCIDENT

A transportation hazardous materials incident is the accidental release of chemical substances or mixtures during transport. Transportation hazardous materials incidents can occur during highway or air transport. Highway accidents involving hazardous materials pose a great potential for public exposures. Both nearby populations and motorists can be impacted and become exposed by accidents and releases. If airplanes carrying hazardous cargo crash or otherwise leak contaminated cargo, populations and the environment in the impacted area can become exposed.

PIPELINE INCIDENT

A pipeline transportation incident occurs when a break in a pipeline creates the potential for an explosion or leak of a dangerous substance (oil, gas, etc.) possibly requiring evacuation. An underground pipeline incident can be caused by environmental disruption, accidental damage, or sabotage. Incidents can range from a small, slow leak to a large rupture where an explosion is possible. Inspection and maintenance of the pipeline system along with marked gas line locations and an early warning and response procedure can lessen the risk to those near the pipelines.

Warning Time Score: 4 – Less than six hours

Duration Score: 2 – Less than 24 hours

LOCATION

The Toxic Release Inventory (TRI) Program run by the U.S. Environmental Protection Agency (EPA) maintains a database of industrial facilities across the country and the type and quantity of toxic chemicals they release. The program also tracks pollution prevention activities, and which facilities are reducing toxic releases. The Toxic Release Inventory reports 6 sites with hazardous materials in the Region; three in Bertie County, two in Martin County, and one in Washington County. TRI sites are listed in Table 4.122 and are shown in Figure 4.58.

Spatial Extent: 2 – Small

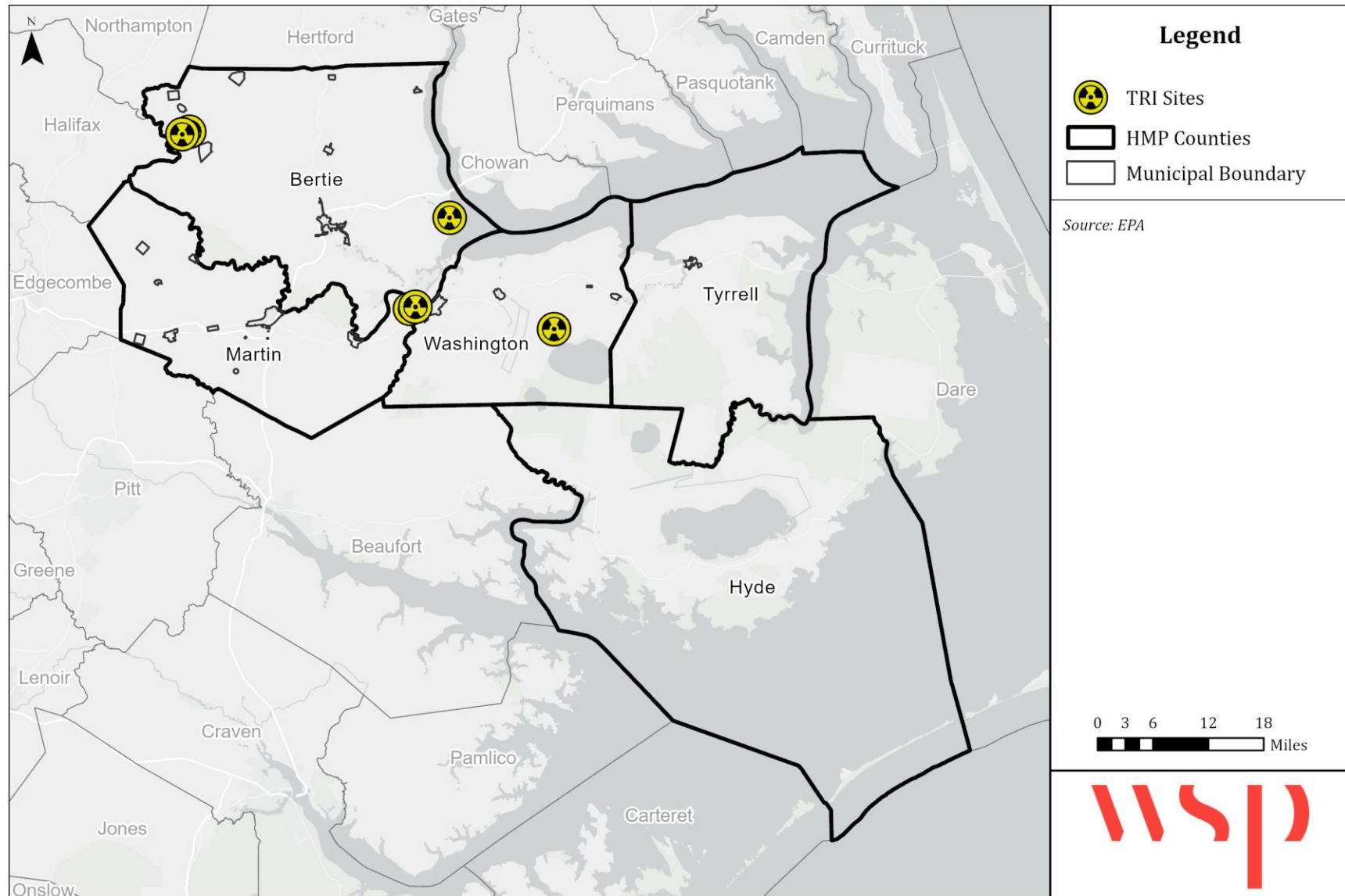
Table 4.122 – Toxic Release Inventory Sites, Northeastern Region

Facility Name	Jurisdiction	Industry Sector	Chemicals Present
Avoca LLC	Merry Hill	Food	n-Hexane, Methanol, Chloroform
Darling Ingredients Inc.	Lewiston Woodville	Food	Ammonia
Domtar Paper Co LLC- Plymouth Mill	Plymouth	Paper	Ammonia, Formic acid, Catechol, Vanadium compounds, Manganese compounds, Hydrogen sulfide, Dioxin, Methanol, Zinc compounds, Nitrate compounds, Acetaldehyde, Cresol, Phenol, Lead compounds, Formaldehyde, Nitric acid, Polycyclic aromatic compounds, Chlorine dioxide, Hydrochloric acid, Barium compounds, Chlorine, Mercury compounds
Murphy Brown LLC New Colony Feed Mill	Creswell	Food	Copper and Copper Compounds, Zinc (fume or dust)
Perdue Foods LLC - Lewiston Processing Plant	Lewiston Woodville	Food	Hydrogen sulfide, Peracetic acid, Ammonia, Nitrate compounds
Weyerhaeuser Nr Co - Lumber Technologies	Plymouth	Wood Products	Methanol
Region Total: 6			

Source: US EPA Toxic Release Inventory

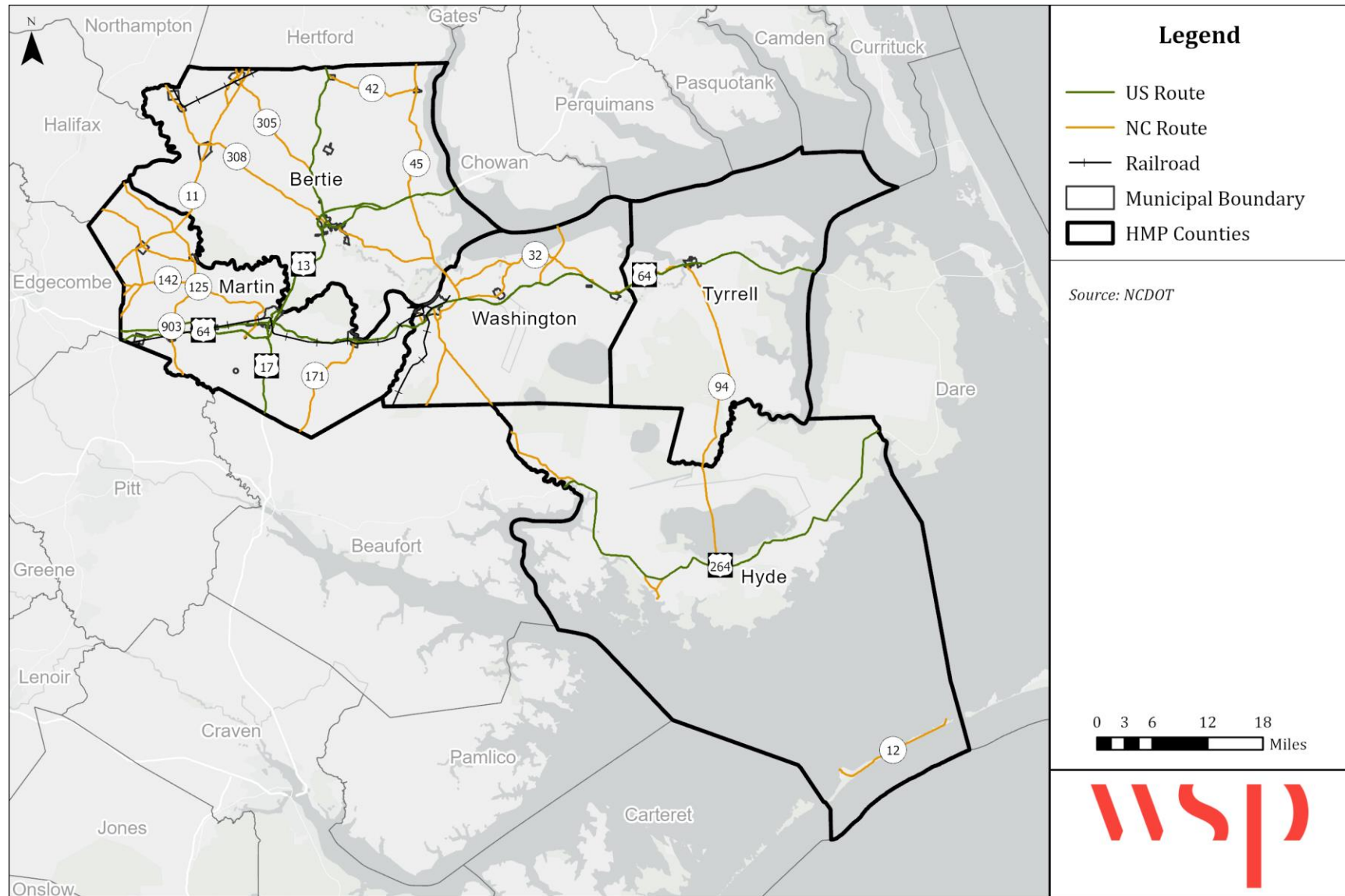
Transportation incidents that release hazardous substances are most likely to occur along major transportation corridors such as highways, interstates, or railways. However, transportation incidents can occur throughout the Region. All major transportation corridors located in the planning area are shown in Figure 4.58 below.

Figure 4.58 – Major Hazardous Materials Facilities in the Northeastern Region



Source: EPA Toxic Release Inventory

Figure 4.59 – Major Transportation Corridors, Northeastern Region



Source: NCDOT

HISTORICAL OCCURRENCES

The USDOT's PHMSA maintains a database of reported hazardous materials incidents since 1989. According to PHMSA records, there were 31 recorded releases in the Region from 1990 to 2024. These releases are listed in Table 4.123. Of these events, 8 (25%) were flagged as serious incidents, shown in Table 4.123. Of the total incidents to occur in the planning area, these events caused an estimated \$1,461,307 in damages with all incidents occurring on highways and roads except for one incident which occurred on the railroad.

Of the total incidents to occur in the Northeastern Region, 16 percent occurred in Bertie County, 3 percent in Hyde County, 22 percent in Martin County, and 58 percent in Washington County. It is important to note that there were no PHMSA incident reports recorded in Tyrrell County during this time period.

Table 4.123 – Annual Reported Hazardous Materials Incidents, 1990-2024, Northeastern Region

Year	Bertie	Hyde	Martin	Washington	Region Total
1990	0	0	1	1	2
1991	0	0	0	0	0
1992	0	0	0	0	0
1993	0	0	1	1	2
1994	0	0	0	0	0
1995	0	0	1	2	3
1996	0	0	1	1	2
1997	0	0	0	0	0
1998	1	0	0	0	1
1999	0	0	0	0	0
2000	0	0	1	2	3
2001	0	0	0	1	1
2002	0	0	0	1	1
2003	0	0	0	0	0
2004	0	0	1	1	2
2005	1	0	0	0	1
2006	1	0	0	2	3
2007	0	0	0	1	1
2008	0	0	0	4	4
2009	0	1	0	0	1
2010	1	0	0	0	1
2011	0	0	0	0	0
2012	0	0	0	0	0
2013	0	0	0	0	0
2014	0	0	0	0	0
2015	0	0	0	0	0
2016	0	0	0	1	1
2017	1	0	0	0	1
2018	0	0	0	0	0
2019	0	0	0	0	0
2020	0	0	0	0	0
2021	0	0	0	0	0

SECTION 4: RISK ASSESSMENT

Year	Bertie	Hyde	Martin	Washington	Region Total
2022	0	0	0	0	0
2023	0	0	1	0	1
2024	0	0	0	0	0
Total	5	1	7	18	31
Avg/Year	0.14	0.02	0.2	0.5	0.88

Source: PHMSA Incident Reports, Office of Hazardous Materials Safety, Incident Reports Database Search

The most common materials spilled in the planning area are Class 3 (Flammable Combustible Liquids) and Class 8 (Corrosive). Figure 4.60 describes all nine hazard classes.

Figure 4.60 – Hazardous Materials Classes



Source: U.S. Department of Transportation

EXTENT

The magnitude of a hazardous materials incident can be defined by the material type, the amount released, and the location of the release. The U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA), which records hazardous material incidents across the country, defines a “serious incident” as a hazardous materials incident that involves:

- a fatality or major injury caused by the release of a hazardous material,
- the evacuation of 25 or more persons as a result of release of a hazardous material or exposure to fire,
- a release or exposure to fire which results in the closure of a major transportation artery,
- the alteration of an aircraft flight plan or operation,
- the release of radioactive materials from Type B packaging,
- the release of over 11.9 galls or 88.2 pounds of a severe marine pollutant, or
- the release of a bulk quantity (over 199 gallons or 882 pounds) of a hazardous material.

The release or spill of hazardous materials can also require different emergency responses depending on the amount, type, and location of the spill incident. Potential losses can vary greatly for hazardous

material incidents. For even a small incident, there are cleanup and disposal costs. In a larger scale incident, cleanup can be extensive and protracted. There can be deaths or injuries requiring doctor's visits and hospitalization, disabling chronic injuries, soil and water contamination can occur, necessitating costly remediation. Evacuations can disrupt home and business activities. Large-scale incidents can easily reach \$1 million or more in direct damages, with clean-ups that can last for years.

Impact: 3 – Critical

PROBABILITY OF FUTURE OCCURRENCE

Based on historical occurrences, there have been 31 hazardous materials release in the 35-year period from 1990 through 2024. While the number of incidents varies from year to year, the overall trend shows no increase or decrease in the number. Thus, the planning area can expect 0.88 hazardous materials incidents a year. The majority of these incidents may occur in Bertie, Martin, and Washington Counties where there are larger transportation corridors.

However, the number of serious incidents is significantly lower: only 8 in 35 years or an average of 0.2 serious incidents per year. This means that based on historical data, there is a 22 percent annual chance of the planning area experiencing a damaging hazardous materials incident.

Probability: 3 – Likely

CLIMATE CHANGE

Climate change is not expected to impact hazardous materials incidents.

VULNERABILITY ASSESSMENT

The impacts of a hazardous materials incident vary based on the type and quantity of material released, as well as the location, time of day, and weather conditions.

METHODOLOGIES AND ASSUMPTIONS

Vulnerability to hazardous materials incidents was assessed based on past occurrences in the region and nationally and the known behavior of these materials.

PEOPLE

Hazardous materials incidents can cause injuries, hospitalizations, and even death to people nearby. People living near hazardous facilities and along transportation routes may be at a higher risk of exposure, particularly those living or working downstream and downwind from such facilities. For example, a toxic spill or a release of an airborne chemical near a populated area can lead to significant evacuations and have a high potential for loss of life. Individuals working with or transporting hazardous materials are also at heightened risk.

In addition to the immediate health impacts of releases, a handful of studies have found long term health impacts such as increased incidence of certain cancers and birth defects among people living near certain chemical facilities. However there has not been sufficient research done on the subject to allow detailed analysis.

The primary economic impact of hazardous material incidents results from lost business, delayed deliveries, property damage, and potential contamination. Large and publicized hazardous material-related events can deter tourists and could potentially discourage residents and businesses. Economic effects from major transportation corridor closures can be significant.

PROPERTY

The property impacts of a fixed hazardous facility, such as a chemical processing facility is typically localized to the property where the incident occurs. The impact of a small spill (i.e. liquid spill) may also be limited to the extent of the spill and remediated if needed. While cleanup costs from major spills can be significant, they do not typically cause significant long-term impacts to property.

Impacts of hazardous material incidents on critical facilities are most often limited to the area or facility where they occurred, such as at a transit station, airport, fire station, hospital, or railroad. However, they can cause long-term traffic delays and road closures resulting in major delays in the movement of goods and services. These impacts can spread beyond the planning area to affect neighboring counties, or vice-versa. While cleanup costs from major spills can be significant, they do not typically cause significant long-term impacts to critical facilities.

ENVIRONMENT

Hazardous material incidents may affect a small area at a regulated facility or cover a large area outside such a facility. Widespread effects occur when hazardous materials contaminate the groundwater and eventually the municipal water supply, or they migrate to a major waterway or aquifer.

CONSEQUENCE ANALYSIS

Table 4.124 summarizes the potential detrimental consequences of hazardous materials incident.

Table 4.124 – Consequence Analysis – Hazardous Materials Incident

Category	Consequences
Public	Contact with hazardous materials could cause serious illness or death. Those living and working closest to hazardous materials sites face the greatest risk of exposure. Exposure may also occur through contamination of food or water supplies.
Responders	Responders face similar risks as the general public but a heightened potential for exposure to hazardous materials.
Continuity of Operations (including Continued Delivery of Services)	A hazardous materials incident may cause temporary road closures or other localized impacts but is unlikely to affect continuity of operations.
Property, Facilities and Infrastructure	Some hazardous materials are flammable, explosive, and/or corrosive, which could result in structural damages to property. Impacts would be highly localized.
Environment	Consequences depend on the type of material released. Possible ecological impacts include loss of wildlife, loss of habitat, and degradation of air and/or water quality.
Economic Condition of the Jurisdiction	Clean up, remediation, and/or litigation costs may apply. Long-term economic damage is unlikely.
Public Confidence in the Jurisdiction's Governance	A hazardous materials incident may affect public confidence if the environmental or health impacts are enduring.

HAZARD SUMMARY BY JURISDICTION

The table below summarizes hazardous materials incident risk by jurisdiction. Probability was determined based on past incidents. All other factors do not vary by jurisdiction.

Jurisdiction	Probability	Impact	Spatial Extent	Warning Time	Duration	Score	Priority
Bertie County	3	3	2	4	2	2.8	M
Town of Askewville	2	3	2	4	2	2.5	M
Town of Aulander	2	3	2	4	2	2.5	M
Town of Colerain	2	3	2	4	2	2.5	M
Town of Kelford	2	3	2	4	2	2.5	M
Town of Lewiston-Woodville	2	3	2	4	2	2.5	M
Town of Powellsville	2	3	2	4	2	2.5	M
Town of Roxobel	2	3	2	4	2	2.5	M
Town of Windsor	2	3	2	4	2	2.5	M
Hyde County	1	3	2	4	2	2.2	M
Martin County	3	3	2	4	2	2.8	M
Town of Bear Grass	2	3	2	4	2	2.5	M
Town of Everetts	2	3	2	4	2	2.5	M
Town of Hamilton	2	3	2	4	2	2.5	M
Town of Hassell	2	3	2	4	2	2.5	M
Town of Jamesville	2	3	2	4	2	2.5	M
Town of Oak City	2	3	2	4	2	2.5	M
Town of Parmele	2	3	2	4	2	2.5	M
Town of Robersonville	2	3	2	4	2	2.5	M
Town of Williamston	2	3	2	4	2	2.5	M
Tyrrell County	1	3	2	4	2	2.2	M
Town of Columbia	1	3	2	4	2	2.2	M
Washington County	3	3	2	4	2	2.8	M
Town of Creswell	2	3	2	4	2	2.5	M
Town of Plymouth	3	3	2	4	2	2.8	M
Town of Roper	2	3	2	4	2	2.5	M

4.6 CONCLUSIONS ON HAZARD RISK

PRIORITY RISK INDEX

As discussed in Section 4.3 Risk Assessment Methodology and Assumptions, the Priority Risk Index was used to rate each hazard on a set of risk criteria and determine an overall standardized score for each hazard. The conclusions drawn from this process are summarized below by classifying hazards into three categories—high, medium, or low risk—based on the assigned risk value. For some hazards, PRI ratings vary by jurisdiction. In these cases, the overall PRI rating reflects the highest risk that applies to the region.

General assumptions for high, moderate, and low risk hazards are described below, and hazard risk ratings are summarized in Table 4.125.

- **High Risk** – Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread.
- **Medium Risk** – Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **Low Risk** – Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal. This is not a priority hazard.

Table 4.125 – Summary of Hazard Risk Classification

High Risk (≥ 3.0)	Excessive Heat Flooding Hurricane & Coastal Hazards
Moderate Risk (2.0 – 2.9)	Dam & Levee Failure Drought Tornadoes & Thunderstorms Severe Winter Weather Wildfire
Low Risk (< 2.0)	Earthquake Sinkhole

Table 4.126 summarizes the degree of risk assigned to each identified hazard using the PRI method. Where PRI ratings varied by jurisdiction, the range is shown. Additionally, where a hazard encompasses several sub-hazards, the PRI rating for each sub-hazard is provided.

Table 4.126 – Summary of PRI Results

Hazard	Probability	Impact	Spatial Extent	Warning Time	Duration	PRI Score
Dam & Levee Failure ¹	Unlikely	Limited-Critical	Negligible	Less than 6 hrs	Less than 1 week	2.1
Drought ¹	Possible	Minor-Limited	Large	More than 24 hrs	More than 1 week	2.2
Earthquake	Unlikely	Minor	Large	Less than 6 hrs	Less than 6 hrs	1.9
Excessive Heat	Highly Likely	Critical	Large	More than 24 hrs	Less than 1 week	3.3
Flooding ¹	Possible-Likely	Critical	Negligible-Moderate	6 to 12 hours	Less than 1 week	3.0
Hurricanes & Tropical Storms ²	Highly Likely	Catastrophic	Large	More than 24 hrs	Less than 1 week	3.6
Coastal Erosion ^{1,2}	Unlikely-Highly Likely	Minor-Limited	Negligible-Small	More than 24 hrs	Less than 6 hrs	2.4
Tornado ³	Likely	Critical	Small	Less than 6 hrs	Less than 6 hrs	2.7
Thunderstorm Winds ^{1,3}	Highly Likely	Minor-Limited	Large	Less than 6 hrs	Less than 6 hrs	3.1
Lightning ³	Highly Likely	Minor	Negligible	Less than 6 hrs	Less than 6 hrs	2.2
Hail ³	Highly Likely	Minor	Negligible	Less than 6 hrs	Less than 6 hrs	2.2
Severe Winter Weather	Highly Likely	Minor	Large	More than 24 hrs	Less than 1 week	2.7
Sinkhole ¹	Unlikely-Possible	Limited	Negligible	Less than six hrs	Less than six hrs	1.6
Wildfire ¹	Possible-Likely	Limited-Critical	Moderate-Large	Less than 6 hrs	Less than 1 week	2.8
Hazardous Substances	Likely	Critical	Small	Less than 6 hrs	Less than 24 hrs	2.8

¹Note: PRI ratings for this hazard vary by jurisdiction. The range of ratings are shown here.

²Note: This is a sub-hazard of the Hurricanes and Coastal Hazards section. The overall hazard rating is an average of these sub-hazards.

³Note: This is a sub-hazard of the Tornadoes & Thunderstorms hazard. The overall hazard rating is an average of these sub-hazards.

5 CAPABILITY ASSESSMENT

This section discusses the capability of the Northeastern NC region to implement hazard mitigation activities. It consists of the following four subsections:

- 5.1 Overview
 - 5.2 Conducting the Capability Assessment
 - 5.3 Capability Assessment Findings
 - 5.4 Conclusions on Local Capability
-

5.1 OVERVIEW

The purpose of conducting a capability assessment is to determine the ability of a local jurisdiction to implement a comprehensive mitigation strategy, and to identify potential opportunities for establishing or enhancing specific mitigation policies, programs, or projects. As in any planning process, it is important to try to establish which goals, objectives, and actions are feasible, based on an understanding of the organizational capacity of those agencies or departments tasked with their implementation. A capability assessment helps to determine which mitigation actions are practical and likely to be implemented over time given a local government's planning and regulatory framework, level of administrative and technical support, amount of fiscal resources, and current political climate.

A capability assessment has two primary components: 1) an inventory of a local jurisdiction's relevant plans, ordinances, and programs already in place; and 2) an analysis of its capacity to carry them out. Careful examination of local capabilities will detect any existing gaps, shortfalls, or weaknesses with ongoing government activities that could hinder proposed mitigation activities and possibly exacerbate community hazard vulnerability. The capability assessment also highlights the positive mitigation measures already in place or being implemented at the local government level, which should continue to be supported and enhanced through future mitigation efforts.

The capability assessment completed for the Northeastern NC region serves as a critical planning step toward developing an effective mitigation strategy. Coupled with the risk assessment, the capability assessment helps identify and target effective goals, objectives, and mitigation actions that are realistically achievable under given local conditions.

5.2 CONDUCTING THE CAPABILITY ASSESSMENT

This capability assessment was originally developed using feedback from the HMPC in 2021 through a detailed Local Capability Self-Assessment worksheet and was updated based on best available data in 2025. The self-assessment requested information on a variety of "capability indicators" such as existing local plans, policies, programs, or ordinances that contribute to and/or hinder the region's ability to implement hazard mitigation actions. Other indicators included information related to the region's fiscal, administrative, and technical capabilities, such as access to local budgetary and personnel resources for mitigation purposes, and existing education and outreach programs that can be used to promote mitigation. Communities were also asked to comment on the current political climate with respect to hazard mitigation, an important consideration for any local planning or decision-making process.

The survey results provided an extensive and consolidated inventory of existing local plans, ordinances, programs, and resources in place or under development. In completing the survey, local officials were also asked to qualitatively rate their jurisdiction's specific capabilities. The survey instrument thereby not

only helps accurately assess the degree of local capability, but it also serves as a good source of introspection for counties and local jurisdictions that want to improve their capabilities. Identified gaps, weaknesses, or conflicts can be recast as opportunities for specific actions to be proposed as part of the mitigation strategy.

The information provided in response to the survey questionnaire was incorporated into a database for further analysis. A general scoring methodology was then applied to quantify each jurisdiction's overall capability. According to the scoring system, each capability indicator was assigned a point value based on its relevance to hazard mitigation. Additional points were added based on the jurisdiction's self-assessment of their own planning and regulatory capability, administrative and technical capability, fiscal capability, education and outreach capability, and political capability.

Using this scoring methodology, a total score and an overall capability rating of "High," "Moderate," or "Limited" could be determined according to the total number of points received. These classifications are designed to provide nothing more than a general assessment of local government capability. In combination with the narrative responses provided by local officials, the results of this capability assessment provide critical information for developing an effective and meaningful mitigation strategy.

5.3 CAPABILITY ASSESSMENT FINDINGS

The findings of the capability assessment are summarized in this plan to provide insight into the relevant capacity of the Northeastern NC region to implement hazard mitigation activities. All information is based upon the input provided by local government officials through the Local Capability Self-Assessment and subsequent updates by the planning team and the HMPC.

5.3.1 PLANNING AND REGULATORY CAPABILITY

Planning and regulatory capability is based on the implementation of plans, ordinances, and programs that demonstrate a local jurisdiction's commitment to guiding and managing growth, development, and redevelopment in a responsible manner, while maintaining the general welfare of the community. It includes emergency response and mitigation planning, comprehensive land use planning, and transportation planning. Regulatory capability also includes the enforcement of zoning or subdivision ordinances and building codes that regulate how land is developed and structures are built, as well as protecting environmental, historic, and cultural resources in the community. Although some conflicts can arise, these planning initiatives generally present significant opportunities to integrate hazard mitigation principles and practices into the local decision-making process.

Table 5.1 provides a summary of the relevant local plans, ordinances, and programs already in place or under development for the Northeastern NC region. A checkmark (✓) indicates that the given item is currently in place and being implemented. A plus sign (+) indicates that a jurisdiction is covered for that item under a county-implemented version. Each of these local plans, ordinances, and programs should be considered available mechanisms for incorporating the requirements of the Hazard Mitigation Plan. This information will help identify opportunities to address gaps, weaknesses, or conflicts with other initiatives and integrate the implementation of this plan with existing planning mechanisms where appropriate.

SECTION 5: CAPABILITY ASSESSMENT
Table 5.1 – Relevant Plans, Ordinances, and Programs

Jurisdiction	Hazard Mitigation Plan	Comprehensive Land Use Plan	Floodplain Management Plan	Open Space Management Plan	Stormwater Management Plan	Emergency Operations Plan	SARA Title III Plan	Radiological Emergency Plan	Continuity of Operations Plan	Evacuation Plan	Disaster Recovery Plan	Capital Improvements Plan	Economic Development Plan	Historic Preservation Plan	Transportation Plan	Flood Damage Prevention Ordinance	Zoning Ordinance	Subdivision Ordinance	Site Plan Review Requirements	Unified Development Ordinance	Post-Disaster Redevelopment Ordinance	Building Code	Fire Code	Community Wildfire Protection Plan	National Flood Insurance Program	Community Rating System
Bertie County	✓	✓		✓		✓	✓		✓	✓	✓		✓		✓	✓		✓	✓			✓	✓		✓	
Town of Askewville	✓	+				+	+		+	+	+				+	✓	✓	✓	✓			✓	✓			
Town of Aulander	✓	+				+	+		+	+	+				+	✓	✓	✓	✓			✓	✓		✓	
Town of Colerain	✓	+				+	+		+	+	+				+	✓	✓	✓	✓			✓	✓		✓	
Town of Kelford	✓	+				+	+		+	+	+				+	✓	✓	✓	✓			✓	✓		✓	
Town of Lewiston-Woodville	✓	+				+	+		+	+	+				+	✓	✓	✓	✓			✓	✓			
Town of Powellsville	✓	+				+	+		+	+	+				+	✓	✓	✓	✓			✓	✓			
Town of Roxobel	✓	✓				+	+		+	+	+				+	✓	✓	✓	✓			✓	✓		✓	
Town of Windsor	✓	✓				+	+		+	+	+				+	✓	✓	✓	✓	✓		✓	✓		✓	
Hyde County	✓	✓		✓		✓	✓		✓	✓	✓				✓	✓		✓	✓			✓	✓		✓	✓
Martin County	✓	✓				✓	✓		✓	✓	✓		✓		✓	✓		✓	✓	✓		✓	✓		✓	
Town of Bear Grass	✓	+				+	+		+	+	+				+	✓	✓	✓	✓			✓	✓		✓	
Town of Everetts	✓	+				+	+		+	+	+				+	✓	✓	✓	✓			✓	✓			

SECTION 5: CAPABILITY ASSESSMENT

Jurisdiction	Hazard Mitigation Plan	Comprehensive Land Use Plan	Floodplain Management Plan	Open Space Management Plan	Stormwater Management Plan	Emergency Operations Plan	SARA Title III Plan	Radiological Emergency Plan	Continuity of Operations Plan	Evacuation Plan	Disaster Recovery Plan	Capital Improvements Plan	Economic Development Plan	Historic Preservation Plan	Transportation Plan	Flood Damage Prevention Ordinance	Zoning Ordinance	Subdivision Ordinance	Site Plan Review Requirements	Unified Development Ordinance	Post-Disaster Redevelopment Ordinance	Building Code	Fire Code	Community Wildfire Protection Plan	National Flood Insurance Program	Community Rating System
Town of Hamilton	✓	+				+	+		+	+	+		+		+	✓	✓	✓	✓			✓	✓		✓	
Town of Hassell	✓	+				+	+		+	+	+				+	✓	✓	✓	✓			✓	✓		✓	
Town of Jamesville	✓	+				+	+		+	+	+				+	✓	✓	✓	✓			✓	✓		✓	
Town of Oak City	✓	+				+	+		+	+	+				+	✓	✓	✓	✓			✓	✓		✓	
Town of Parmele	✓	+				+	+		+	+	+				+	✓	✓	✓	✓			✓	✓			
Town of Robersonville	✓	+				+	+		+	+	+		+		+	✓	✓	✓	✓			✓	✓		✓	
Town of Williamston	✓	✓				+	+		+	+	+	✓	+		+	✓	✓	✓	✓			✓	✓		✓	
Tyrrell County	✓	✓				✓	✓		✓	✓	✓				✓	✓		✓	✓			✓	✓		✓	
Town of Columbia	✓	+				+	+		+	+	+				+	✓	✓	✓	✓			✓	✓		✓	
Washington County	✓	✓				✓	✓		✓	✓	✓	✓			✓	✓	✓	✓	✓			✓	✓		✓	✓
Town of Creswell	✓					+	+		+	+	+				+	✓	✓	✓	✓			✓	✓		✓	✓
Town of Plymouth	✓	✓				+	+		+	+	+				+	✓	✓	✓	✓			✓	✓		✓	✓
Town of Roper	✓					+	+		+	+	+				+	✓	✓	✓	✓			✓	✓			✓

Source: Local Capability Assessment Survey & 2025 research

A more detailed discussion on the region's planning and regulatory capability follows, along with the incorporation of additional information based on the narrative comments provided by local officials in response to the survey questionnaire.

5.3.1.1 EMERGENCY MANAGEMENT

Hazard mitigation is widely recognized as one of the four primary phases of emergency management, as is shown in Figure 5.1. In reality, mitigation is interconnected with all other phases and is an essential component of effective preparedness, response, and recovery. Opportunities to reduce potential losses through mitigation practices are most often implemented before a disaster event, such as through the elevation of flood-prone structures or by regular enforcement of policies that regulate development. However, mitigation opportunities can also be identified during immediate preparedness or response activities, such as installing storm shutters in advance of a hurricane. Furthermore, incorporating mitigation during the long-term recovery and redevelopment process following a disaster event is what enables a community to become more resilient.

Figure 5.1 – The Four Phases of Emergency Management



Planning for each phase is a critical part of a comprehensive emergency management program and a key to the successful implementation of hazard mitigation actions.

HAZARD MITIGATION PLAN

A 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.

- All participating jurisdictions in this regional planning effort have previously been covered by the Northeastern NC Regional Hazard Mitigation Plan.
- In addition to the official local hazard mitigation plan, several communities have participated in mitigation and resilience planning efforts that involve risk and vulnerability assessment and mitigation or resilience action development. Bertie County, Aulander, Windsor, Hyde County (Ocracoke), Washington County, Creswell, and Plymouth have participated in the North Carolina Division of Coastal Management's Resilient Coastal Communities Program and developed Resilience Strategies through that program. The Albemarle Commission and the Mid-East Commission worked with the former North Carolina Office of Recovery and Resiliency's RISE Program to develop the

Albemarle Regional Resilience Portfolio and the Mid-East Regional Resilience Portfolio which contain regional resilience projects relevant to the Northeastern NC Region.

DISASTER RECOVERY PLAN

A disaster recovery plan serves to guide the physical, social, environmental, and economic recovery and reconstruction process following a disaster event. In many instances, hazard mitigation principles and practices are incorporated into local disaster recovery plans with the intent of capitalizing on opportunities to break the cycle of repetitive disaster losses. Disaster recovery plans can also lead to the preparation of disaster redevelopment policies and ordinances to be enacted following a hazard event.

- All participating jurisdictions have a disaster recovery plan in place or are covered under a county plan (5 jurisdictions have one in place; 21 covered under a county plan).
- Following NC Disaster Recovery Act of 2016, each county, in partnership with the N.C. Office of Recovery & Resiliency, developed a resilient redevelopment plan that includes housing, economic, infrastructure, and environmental strategies for recovery and resilience.

EMERGENCY OPERATIONS PLAN

An emergency operations plan outlines responsibilities and how resources will be deployed during and following an emergency or disaster.

- All participating jurisdictions have an emergency operations plan either in place or are covered under a county plan (5 jurisdictions have one in place; 21 covered under a county plan).

CONTINUITY OF OPERATIONS PLAN

A continuity of operations plan establishes a chain of command, line of succession, and plans for backup or alternate emergency facilities in case of an extreme emergency or disaster event.

- All participating jurisdictions have a continuity of operations plan either in place or are covered under a county plan (5 jurisdictions have one in place; 21 covered under a county plan).

5.3.1.2 GENERAL PLANNING

The implementation of hazard mitigation activities often involves agencies and individuals beyond the emergency management profession. Stakeholders may include local planners, public works officials, economic development specialists, and others. In many instances, concurrent local planning efforts will help to achieve or complement hazard mitigation goals, even though they may not be designed as such. The Local Capability Self-Assessment asked questions regarding general planning capabilities and the degree to which hazard mitigation is integrated into other ongoing planning efforts in the region.

COMPREHENSIVE/GENERAL PLAN

A comprehensive land use plan, or general plan, establishes the overall vision for what a community wants to be and serves as a guide for future governmental decision making. Typically, a comprehensive plan contains sections on demographic conditions, land use, transportation elements, and community facilities. Given the broad nature of the plan and its regulatory standing in many communities, the integration of hazard mitigation measures into the comprehensive plan can enhance the likelihood of achieving risk reduction goals, objectives, and actions.

- 24 of the 26 participating jurisdictions have a comprehensive land use plan in place.

CAPITAL IMPROVEMENTS PLAN

A capital improvements plan guides the scheduling of spending on public improvements. A capital improvements plan can serve as an important mechanism for guiding future development away from identified hazard areas. Limiting public spending in hazardous areas is one of the most effective long-term mitigation actions available to local governments.

- 2 of the 26 participating jurisdictions have a capital improvements plan in place.

HISTORIC PRESERVATION PLAN

A historic preservation plan is intended to preserve historic structures or districts within a community. An often-overlooked aspect of the historic preservation plan is the assessment of buildings and sites located in areas subject to natural hazards, and the identification of ways to reduce future damages. This may involve retrofitting or relocation techniques that account for the need to protect buildings that do not meet current building standards or are within a historic district that cannot easily be relocated out of harm's way.

- None of the participating jurisdictions have an historic preservation plan in place or under development.

ZONING ORDINANCE

Zoning represents the primary means by which land use is controlled by local governments. As part of a community's police power, zoning is used to protect the public health, safety, and welfare of those in a given jurisdiction that maintains zoning authority. A zoning ordinance is the mechanism through which zoning is typically implemented. Since zoning regulations enable municipal governments to limit the type and density of development, a zoning ordinance can serve as a powerful tool when applied in identified hazard areas.

- 22 of the 26 participating jurisdictions have a zoning ordinance in place. Several jurisdictions developed zoning ordinances over the last five years to comply with State Chapter 160D. Bertie, Hyde, Martin, and Tyrrell Counties do not have zoning ordinances.

SUBDIVISION ORDINANCE

A subdivision ordinance is intended to regulate the development of residential, commercial, industrial, or other uses, including associated public infrastructure, as land is subdivided into buildable lots for sale or future development. Subdivision design that accounts for natural hazards can dramatically reduce the exposure of future development.

- All participating jurisdictions have a subdivision ordinance in place.

BUILDING CODES, PERMITTING, AND INSPECTIONS

Building codes regulate construction standards. In many communities, permits and inspections are required for new construction. Decisions regarding the adoption of building codes (that account for hazard risk), the type of permitting process required both before and after a disaster, and the enforcement of inspection protocols all affect the level of hazard risk faced by a community.

- All participating jurisdictions have building codes in place.

The adoption and enforcement of building codes by local jurisdictions is routinely assessed through the Building Code Effectiveness Grading Schedule (BCEGS) program, developed by the Insurance Services Office, Inc. (ISO). In North Carolina, the North Carolina Department of Insurance assesses the building codes in effect in a particular community and how the community enforces its building codes, with special emphasis on mitigation of losses from natural hazards. North Carolina has limitations regarding building codes and mandates statewide code enforcement.

The results of BCEGS assessments are routinely provided to ISO's member private insurance companies, which in turn may offer ratings credits for new buildings constructed in communities with strong BCEGS classifications. The expectation is that communities with well-enforced, up-to-date codes should experience fewer disaster-related losses, and as a result should have lower insurance rates.

In conducting the assessment, ISO collects information related to personnel qualification and continuing education, as well as number of inspections performed per day. This type of information combined with local building codes is used to determine a grade for that jurisdiction. The grades range from 1 to 10, with a BCEGS grade of 1 representing exemplary commitment to building code enforcement, and a grade of 10 indicating less than minimum recognized protection. In North Carolina, the average BCEGS grade is 4 for both commercial and residential building.

5.3.1.3 FLOODPLAIN MANAGEMENT

Flooding represents the greatest natural hazard facing the nation, yet the tools available to reduce the impacts associated with flooding are among the most developed when compared to other hazard-specific mitigation techniques. In addition to approaches that cut across hazards such as education, outreach, and the training of local officials, the National Flood Insurance Program (NFIP) contains specific regulatory measures that enable government officials to determine where and how growth occurs relative to flood hazards. Participation in the NFIP is voluntary for local governments; however, program participation is strongly encouraged by FEMA as a first step for implementing and sustaining an effective hazard mitigation program. It is therefore used as part of this capability assessment as a key indicator for measuring local capability.

To participate in the NFIP, a county or municipality must adopt a local flood damage prevention ordinance that requires established minimum building standards in the floodplain. These standards require that all new buildings and substantial improvements to existing buildings be protected from damage by a 100-year flood event and that new development in the floodplain not exacerbate existing flood problems or increase damage to other properties.

A key service provided by the NFIP is the mapping of identified flood hazard areas. Once completed, the Flood Insurance Rate Maps (FIRMs) are used to assess flood hazard risk, regulate construction practices, and set flood insurance rates. FIRMs are an important source of information to educate residents, government officials, and the private sector about the likelihood of flooding in their community. Current effective FIRMs are dated between 2009 and 2025. Each community's current effective FIRM is listed in Table 5.2.

Table 5.2 also provides NFIP policy and claim information for each participating jurisdiction in the Northeastern NC region. Overall, in the last five years, the number of active policies has decreased by 38 percent and insurance in force has decreased by 30 percent, while the number of total closed paid losses has increased by 43 percent and the value of total losses paid has increased by 77 percent.

Of the 26 jurisdictions, 21 participate in the NFIP and will continue to comply with all required provisions of the program. Floodplain management is managed through zoning ordinances, building code restrictions, and building inspection programs. The jurisdictions will coordinate with NCEM and FEMA to develop maps and regulations related to Special Flood Hazard Areas within their jurisdictional boundaries and, through a consistent monitoring process, will design and improve their floodplain management program in a way that reduces the risk of flooding to people and property.

The Towns of Askewville, Lewiston Woodville, Powellsville, Everetts, and Parmele do not participate in the NFIP because they have little to no land in high-risk flood zones. Details on flood zone acreage by community are provided in the county annexes.

COMMUNITY RATING SYSTEM

An additional indicator of floodplain management capability is active participation in the Community Rating System (CRS). The CRS is an incentive-based program that encourages communities to undertake defined flood mitigation activities that go beyond the minimum requirements of the NFIP. Each of the CRS mitigation activities is assigned a point value. As a community earns points and reaches identified thresholds, they can apply for an improved CRS class. Class ratings, which range from 10 to 1 and

increase on 500-point increments, are tied to flood insurance premium reductions. Every class improvement earns an additional 5 percent discount for NFIP policyholders, with a starting discount of 5 percent for Class 9 communities and a maximum possible discount of 45 percent for Class 1 communities.

Community participation in the CRS is voluntary. Any community that is in full compliance with the rules and regulations of the NFIP may apply to FEMA for a CRS classification better than class 10. The CRS application process has been greatly simplified over the past several years, based on community comments intended to make the CRS more user friendly, and extensive technical assistance available for communities who request it.

- 5 of 26 participating jurisdictions in the Northeastern NC Region participate in the CRS. Washington County is a CRS Class 7 community and Creswell, Plymouth, Roper, and Hyde County are CRS Class 8 communities.

FLOODPLAIN MANAGEMENT PLAN

A floodplain management plan (or a flood mitigation plan) provides a framework for action regarding corrective and preventative measures to reduce flood-related impacts.

- None of the 26 participating jurisdictions have a floodplain management plan in place. However, this hazard mitigation plan follows the 10 steps of the CRS Activity 510 Floodplain Management Plan process and provides a similar framework for flood mitigation; therefore, all jurisdictions have planned for floodplain management through this process.

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Table 5.2 – NFIP Policy and Claim Information

Jurisdiction	Date Joined NFIP	CRS Class	Current Effective Map Date	NFIP Policies in Force	Insurance in Force	Closed Losses	Total Payments
Bertie County	12/04/85	-	01/17/25	45	\$10,522,000	101	\$2,519,821
Town of Askewville	<i>Not participating</i>	-	01/17/25	0	0	0	0
Town of Aulander	02/04/09	-	08/03/09	5	\$512,000	9	\$70,372
Town of Colerain	10/23/14	-	01/17/25	1	\$350,000	0	0
Town of Kelford	05/24/12	-	08/03/09	1	\$70,000	0	0
Town of Lewiston-Woodville	<i>Not participating</i>	-	01/17/25	0	0	0	0
Town of Powellsville	<i>Not participating</i>	-	08/03/09	0	0	0	0
Town of Roxobel	02/04/09	-	08/03/09	0	\$0	0	0
Town of Windsor	07/18/77	-	01/17/25	64	\$10,960,000	305	\$10,696,473
Hyde County	02/04/87	8	06/15/22	819	\$189,978,000	1,765	\$44,869,696
Martin County	07/16/91	-	01/17/25	28	\$6,824,000	22	\$270,080
Town of Bear Grass	09/11/07	-	01/17/25	0	0	0	0
Town of Everetts	<i>Not participating</i>	-	01/17/25	0	0	0	0
Town of Hamilton	05/05/81	-	02/04/09	0	0	1	\$26,019
Town of Hassell	10/12/07	-	01/17/25	0	0	0	0
Town of Jamesville	10/12/07	-	02/04/09	0	0	0	0
Town of Oak City	12/18/07	-	01/17/25	0	0	0	0
Town of Parmele	<i>Not participating</i>	-	01/17/25	0	0	0	0
Town of Robersonville	07/01/87	-	01/17/25	4	\$1,187,000	5	\$39,838
Town of Williamston	08/19/87	-	01/17/25	32	\$7,186,900	14	\$229,349
Tyrrell County	08/19/85	-	01/17/25	224	\$40,016,000	131	\$4,883,771
Town of Columbia	08/05/85	-	01/17/25	68	\$11,909,000	195	\$4,133,497
Washington County	08/19/85	7	01/17/25	87	\$21,154,000	98	\$1,358,045
Town of Creswell	08/19/85	8	01/17/25	88	\$1,518,000	6	\$25,575
Town of Plymouth	08/19/85	8	01/17/25	40	\$11,448,000	48	\$1,302,048
Town of Roper	08/05/85	8	01/17/25	7	\$1,729,000	5	\$83,20
Region Total	-	-	-	1,513	\$315,363,900.00	2,705	\$70,424,584.00

Source: FEMA Community Status Book, November 2025; NFIP Policy Statistics via FEMA Community Information System

Note: Powellsville, Bear Grass, Everetts, Parmele have no SFHA. Lewiston-Woodville has minimal SFHA.

SUBSTANTIAL DAMAGE PROCEDURES

The NFIP requires that participating communities regulate and enforce substantial damage and substantial improvement procedures such that, at a minimum, buildings that are damaged to 50 percent or more of their market value or improved by 50 percent or more of their market value are required to be brought into compliance with flood damage prevention regulations for new development, such as being elevated to the freeboard requirement. Procedures followed by the participating jurisdictions in the Northeastern NC Region are outlined below.

The communities' Floodplain Administrators are responsible for managing and enforcing substantial damage requirements and making substantial damage determinations for existing buildings and structures, as outlined in each communities' flood damage prevention ordinance. Below is a list of each community's Floodplain Administrator:

- Bertie County and incorporated jurisdictions, minus Windsor: Planning Director
- Town of Windsor: Zoning Administrator
- Hyde County: Building Inspector
- Martin County and all incorporated jurisdictions: Martin County Building Inspector
- Washington County, Town of Creswell, Town of Roper, Tyrrell County, and Town of Columbia: Washington County Planning Director
- Town of Plymouth: Town Manager

In all communities in the region, substantial damage and substantial improvement determinations are made during the permitting process for repairs or improvements. For applications for building permits to improve buildings and structures, including alterations, movement, enlargement, replacement, repair, change of occupancy, additions, rehabilitations, renovations, substantial improvements, repairs of substantial damage, and any other improvement of or work on such buildings and structures, the Floodplain Administrator, in coordination with the Building Official, shall follow the procedures outlined below:

- Estimate the market value, or require the applicant to obtain an appraisal of the market value prepared by a qualified independent appraiser, of the building or structure before the start of construction of the proposed work; in the case of repair, the market value of the building or structure shall be the market value before the damage occurred and before any repairs are made;
- Compare the cost to perform the improvement, the cost to repair a damaged building to its pre-damaged condition, or the combined costs of improvements and repairs, if applicable, to the market value of the building or structure;
- Determine and document whether the proposed work constitutes substantial improvement or repair of substantial damage; and
- Notify the applicant if it is determined that the work constitutes substantial improvement or repair of substantial damage and that compliance with the flood resistant construction requirements of the NC Building Code and the flood damage prevention ordinance is required.

Post-disaster, substantial damages are identified during the damage assessment process, which is led by each county's Emergency Management department. Initial damage assessments are collected and tabulated using Survey123. Structures with major damage or worse are flagged and teams organized by tax assessors offices use data on market value to make an initial substantial damage determination. Enforcement and/or appeal occurs during the permitting process for repairs.

OPEN SPACE MANAGEMENT PLAN

An open space management plan is designed to preserve, protect, and restore largely undeveloped lands in their natural state, and to expand or connect areas in the public domain such as parks, greenways, and other outdoor recreation areas. In many instances open space management practices are consistent with the goals of reducing hazard losses, such as the preservation of wetlands or other flood-prone areas in their natural state in perpetuity.

- 2 of the 26 participating jurisdictions have an open space management plan in place.

STORMWATER MANAGEMENT PLAN

A stormwater management plan is designed to address flooding associated with stormwater runoff. The stormwater management plan is typically focused on design and construction measures that are intended to reduce the impact of more frequently occurring minor urban flooding.

- None of the 26 participating jurisdictions have a stormwater management plan in place.

5.3.2 ADMINISTRATIVE AND TECHNICAL CAPABILITY

The ability of a local government to develop and implement mitigation projects, policies, and programs is directly tied to its ability to direct staff time and resources for that purpose. Administrative capability can be evaluated by determining how mitigation-related activities are assigned to local departments and if there are adequate personnel resources to complete these activities. The degree of intergovernmental coordination among departments will also affect administrative capability for the implementation and success of proposed mitigation activities.

Technical capability can generally be evaluated by assessing the level of knowledge and technical expertise of local government employees, such as personnel skilled in using geographic information systems (GIS) to analyze and assess community hazard vulnerability. The Local Capability Self-Assessment was used to capture information on administrative and technical capability through the identification of available staff and personnel resources.

Table 5.3 provides a summary of the Local Capability Self-Assessment results for the region with regard to relevant staff and personnel resources. A checkmark indicates the presence of a staff member(s) in that jurisdiction with the specified knowledge or skill.

Administrative capability is fairly low across the region. Most smaller communities rely on the county for administrative assistance. Many county and town staff members serve multiple roles for their communities. However, one notable administrative strength is that the counties and towns in the region are highly collaborative.

One improvement in administrative capability over the last five years is that Hyde County, Washington County, Creswell, and Roper, and Tyrrell County and Columbia have been designated as Community Disaster Resilience Zones (CDRZs), which means they have advantages in some federal grant programs, as well as some administrative support from the North Carolina Office of Resilience. Additionally, all communities are covered by statewide mutual aid agreements.

Table 5.3 – Relevant Staff/Personnel Resources

Jurisdiction	Planners with knowledge of land development and land management practices	Engineers or professionals trained in construction practices related to buildings and/or infrastructure	Planners or engineers with an understanding of natural and/or human-caused hazards	Building Official	Emergency manager	Floodplain manager	Land surveyors	Scientist familiar with the hazards of the community	Staff with education or expertise to assess the community vulnerability to hazards	Personnel skilled in Geographic Information Systems (GIS) and/or HAZUS	Resource development staff or grant writers	Maintenance programs to reduce risk	Warning systems/services	Mutual Aid Agreements
Bertie County	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓
Town of Askewville													✓	✓
Town of Aulander													✓	
Town of Colerain													✓	✓
Town of Kelford													✓	
Town of Lewiston-Woodville													✓	
Town of Powellsville													✓	
Town of Roxobel													✓	
Town of Windsor												✓	✓	✓
Hyde County				✓	✓	✓			✓	✓	✓	✓	✓	✓
Martin County		✓		✓	✓	✓			✓	✓		✓	✓	✓
Town of Bear Grass													✓	
Town of Everetts													✓	
Town of Hamilton													✓	
Town of Hassell													✓	
Town of Jamesville													✓	✓
Town of Oak City													✓	
Town of Parmele													✓	
Town of Robersonville													✓	✓
Town of Williamston		✓	✓							✓			✓	✓

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Jurisdiction	Planners with knowledge of land development and land management practices	Engineers or professionals trained in construction practices related to buildings and/or infrastructure	Planners or engineers with an understanding of natural and/or human-caused hazards	Building Official	Emergency manager	Floodplain manager	Land surveyors	Scientist familiar with the hazards of the community	Staff with education or expertise to assess the community vulnerability to hazards	Personnel skilled in Geographic Information Systems (GIS) and/or HAZUS	Resource development staff or grant writers	Maintenance programs to reduce risk	Warning systems/services	Mutual Aid Agreements
Tyrrell County				✓	✓	✓			✓			✓	✓	✓
Town of Columbia													✓	✓
Washington County		✓		✓	✓	✓			✓	✓		✓	✓	✓
Town of Creswell												✓	✓	
Town of Plymouth												✓	✓	
Town of Roper												✓	✓	

Source: Local Capability Assessment Survey

5.3.3 FISCAL CAPABILITY

The ability of a local government to implement mitigation actions is often dependent on the amount of money available. This may take the form of outside grant funding awards or locally based revenue and financing. The costs associated with mitigation policy and project implementation vary widely. In some cases, policies are tied primarily to staff time or administrative costs associated with the creation and monitoring of a given program. In other cases, direct expenses are linked to an actual project such as the acquisition of flood-prone houses, which can require a substantial commitment from local, state, and federal funding sources.

The Local Capability Self-Assessment was used to capture information on the region's fiscal capability through the identification of locally available financial resources.

Table 5.4 provides a summary of the results for the region with regard to relevant fiscal resources. A checkmark (✓) indicates that the given fiscal resource is locally available for hazard mitigation purposes (including match funds for state and federal mitigation grant funds).

Table 5.4 – Relevant Fiscal Resources

Jurisdiction	Capital Improvement Programming	Community Development Block Grants (CDBG)	Special Purpose Taxes	Gas/Electric Utility Fees	Water/Sewer Fees	Stormwater Utility Fees	Development Impact Fees	General Obligation Bonds	Revenue Bonds	Special Tax Bonds
Bertie County		✓			✓					
Town of Askewville										
Town of Aulander										
Town of Colerain										
Town of Kelford										
Town of Lewiston-Woodville										
Town of Powellsville										
Town of Roxobel										
Town of Windsor		✓		✓	✓					
Hyde County		✓			✓					
Martin County					✓					
Town of Bear Grass										
Town of Everetts										
Town of Hamilton										
Town of Hassell										
Town of Jamesville					✓					
Town of Oak City					✓					
Town of Parmele										

Jurisdiction	Capital Improvement Programming	Community Development Block Grants (CDBG)	Special Purpose Taxes	Gas/Electric Utility Fees	Water/Sewer Fees	Stormwater Utility Fees	Development Impact Fees	General Obligation Bonds	Revenue Bonds	Special Tax Bonds
Town of Robersonville					✓					
Town of Williamston	✓				✓					
Tyrrell County		✓	✓		✓				✓	
Town of Columbia					✓					
Washington County					✓					
Town of Creswell										
Town of Plymouth										
Town of Roper										

Source: Local Capability Assessment Survey

5.3.4 EDUCATION AND OUTREACH CAPABILITY

This type of local capability refers to education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information. Examples include natural disaster or safety related school programs; participation in community programs such as Firewise or StormReady; and activities conducted as part of hazard awareness campaigns such as a Tornado Awareness Month.

Table 5.5 provides a summary of the results for the region with regard to relevant education and outreach resources. A checkmark (✓) indicates that the given resource is locally available for hazard mitigation purposes.

There are no Firewise USA Sites in the region because there are not communities large enough to organize around this effort.

Martin, Hyde, Tyrrell, and Washington Counties are all StormReady communities. Hyde County is also a TsunamiReady community.

Table 5.5 – Education and Outreach Resources

Jurisdiction	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Natural disaster or safety related school programs	StormReady certification	Firewise USA Sites certification	Public-private partnership initiatives addressing disaster-related issues
Bertie County	✓	✓	✓			✓
Town of Askewville						
Town of Aulander						
Town of Colerain						
Town of Kelford						
Town of Lewiston-Woodville						
Town of Powellsville						
Town of Roxobel						
Town of Windsor	✓	✓				✓
Hyde County	✓	✓		✓		✓
Martin County	✓	✓	✓	✓		
Town of Bear Grass						
Town of Everetts						
Town of Hamilton						
Town of Hassell						
Town of Jamesville						
Town of Oak City						
Town of Parmele						
Town of Robersonville						
Town of Williamston		✓				
Tyrrell County	✓	✓	✓	✓		✓
Town of Columbia	✓	✓	✓			
Washington County	✓	✓	✓	✓		
Town of Creswell	✓	✓				
Town of Plymouth	✓	✓				
Town of Roper	✓	✓				

Source: Local Capability Assessment Survey

5.3.5 MITIGATION CAPABILITY

This type of local capability refers to the mitigation strategies and actions that are developed by the communities in this plan.

Table 5.6 provides a summary of the results for the planning area with regard to relevant mitigation resources. A checkmark (✓) indicates that the given resource is locally available for hazard mitigation purposes.

Table 5.6 – Mitigation Resources

Jurisdiction	Do you apply for mitigation grant funding?	Do you perform reconstruction projects?	Do you perform building elevations?	Do you perform acquisitions?
Bertie County	✓		✓	✓
Town of Askewville				
Town of Aulander				
Town of Colerain				
Town of Kelford				
Town of Lewiston-Woodville				
Town of Powellsville				
Town of Roxobel				
Town of Windsor	✓		✓	✓
Hyde County	✓	✓	✓	✓
Martin County	✓			
Town of Bear Grass				
Town of Everetts				
Town of Hamilton				
Town of Hassell				
Town of Jamesville				
Town of Oak City				
Town of Parmele				
Town of Robersonville				
Town of Williamston				
Tyrrell County	✓	✓	✓	✓
Town of Columbia			✓	
Washington County	✓	✓	✓	✓
Town of Creswell		✓		
Town of Plymouth	✓			
Town of Roper				

5.3.6 POLITICAL CAPABILITY

One of the most difficult capabilities to evaluate involves the political will of a jurisdiction to enact meaningful policies and projects designed to reduce the impact of future hazard events. Hazard mitigation may not be a local priority, or it may conflict with or be seen as an impediment to other goals of the community, such as growth and economic development. Therefore, the local political climate must be considered in designing mitigation strategies, as it could be the most difficult hurdle to overcome in accomplishing their adoption and implementation.

The Local Capability Self-Assessment was used to capture information on political capability of the region. Survey respondents were asked to rate political support as they perceive it and identify general examples of local political capability, such as guiding development away from identified hazard areas, restricting public investments or capital improvements within hazard areas, or enforcing local development standards that go beyond minimum state or federal requirements (e.g., building codes, floodplain management, etc.). The comments provided by the participating jurisdictions are listed below:

HMPC representatives from all participating jurisdictions responded that political leaders are at least potentially willing to implement mitigation measures, though these measures must compete with other local needs for limited funding. Several of the participating jurisdictions have some local standards that exceed state requirements. Bertie County has the most restrictive freeboard requirement with the County and all its municipalities requiring a five-foot freeboard. Hyde County requires three feet of freeboard for 1% and 0.2% zones and 9 feet NAVD 1988 for residential buildings on the Island of Ocracoke.

5.3.7 LOCAL SELF-ASSESSMENT RATING

In addition to the inventory and analysis of specific local capabilities, the Local Capability Self-Assessment asked counties and local jurisdictions within the Northeastern NC region to assign a rating of their perceived capability across each of the capability categories and overall as either “limited,” “moderate,” or “high.” Table 5.7 summarizes the results of the self-assessment ratings for each community in the Northeastern NC Region.

Table 5.7 – Self-Assessment of Capability

Jurisdiction	Plans, Ordinances, Codes and Programs	Administrative and Technical Capability	Fiscal Capability	Education and Outreach Capability	Mitigation Capability	Political Capability	Overall Capability
Bertie County	Moderate	Limited	Moderate	Moderate	Moderate	Moderate	Moderate
Town of Askewville	Limited	Limited	Limited	Limited	Limited	Limited	Limited
Town of Aulander	Limited	Limited	Limited	Limited	Limited	Limited	Limited
Town of Colerain	Limited	Limited	Limited	Limited	Limited	Limited	Limited
Town of Kelford	Limited	Limited	Limited	Limited	Limited	Limited	Limited
Town of Lewiston-Woodville	Limited	Limited	Limited	Limited	Limited	Limited	Limited
Town of Powellsville	Limited	Limited	Limited	Limited	Limited	Limited	Limited

Jurisdiction	Plans, Ordinances, Codes and Programs	Administrative and Technical Capability	Fiscal Capability	Education and Outreach Capability	Mitigation Capability	Political Capability	Overall Capability
Town of Roxobel	Limited	Limited	Limited	Limited	Limited	Limited	Limited
Town of Windsor	Moderate	Limited	Moderate	Moderate	Moderate	Moderate	Moderate
Hyde County	Moderate	Limited	Moderate	Moderate	High	Moderate	Moderate
Martin County	Moderate	Limited	Moderate	Moderate	Moderate	Moderate	Moderate
Town of Bear Grass	Limited	Limited	Limited	Limited	Limited	Limited	Limited
Town of Everetts	Limited	Limited	Limited	Limited	Limited	Limited	Limited
Town of Hamilton	Limited	Limited	Limited	Limited	Limited	Limited	Limited
Town of Hassell	Limited	Limited	Limited	Limited	Limited	Limited	Limited
Town of Jamesville	Moderate	Limited	Limited	Limited	Limited	Limited	Limited
Town of Oak City	Moderate	Limited	Limited	Limited	Limited	Limited	Limited
Town of Parmele	Limited	Limited	Limited	Limited	Limited	Limited	Limited
Town of Robersonville	Moderate	Limited	Limited	Limited	Limited	Limited	Limited
Town of Williamston	Moderate	Limited	Limited	Limited	Limited	Limited	Limited
Tyrrell County	Limited	Limited	Limited	Limited	Moderate	Limited	Limited
Town of Columbia	Limited	Limited	Limited	Limited	Limited	Limited	Limited
Washington County	Moderate	Limited	Moderate	Moderate	Moderate	Moderate	Moderate
Town of Creswell	Limited	Limited	Limited	Limited	Limited	Limited	Limited
Town of Plymouth	Moderate	Limited	Moderate	Moderate	Moderate	Moderate	Moderate
Town of Roper	Limited	Limited	Limited	Limited	Limited	Limited	Limited

Source: Local Capability Assessment Survey

5.4 CONCLUSIONS ON LOCAL CAPABILITY

To form meaningful conclusions on the assessment of local capability, a quantitative scoring methodology was designed and applied to results of the Local Capability Assessment Survey. This methodology attempts to assess the overall level of capability of the Northeastern NC region to implement hazard mitigation actions.

Table 5.8 shows the results of the capability assessment using the designed scoring methodology. The capability score is based solely on the information provided by local officials in response to the Local Capability Self-Assessment and subsequent updates by the planning team. According to the assessment, the average local capability score for all responding jurisdictions is 56, which falls into the Low capability ranking.

Table 5.8 – Capability Assessment Results

Jurisdiction	Overall Capability Score	Overall Capability Rating
Bertie County	86	Moderate
Town of Askewville	43	Low
Town of Aulander	43	Low
Town of Colerain	46	Low
Town of Kelford	43	Low
Town of Lewiston-Woodville	43	Low
Town of Powellsville	43	Low
Town of Roxobel	43	Low
Town of Windsor	76	Moderate
Hyde County	78	Moderate
Martin County	67	Low
Town of Bear Grass	49	Low
Town of Everetts	46	Low
Town of Hamilton	49	Low
Town of Hassell	49	Low
Town of Jamesville	54	Low
Town of Oak City	51	Low
Town of Parmele	46	Low
Town of Robersonville	54	Low
Town of Williamston	62	Low
Tyrrell County	79	Moderate
Town of Columbia	59	Low
Washington County	85	Moderate
Town of Creswell	57	Low
Town of Plymouth	62	Low
Town of Roper	56	Low

Source: Local Capability Assessment Survey, NCEM Risk Management Tool

As previously discussed, one of the reasons for conducting a capability assessment is to examine local capabilities to detect any existing gaps or weaknesses within ongoing government activities that could hinder proposed mitigation activities and possibly exacerbate community hazard vulnerability. These gaps have been identified, for each jurisdiction, in the tables found throughout this section. The participating jurisdictions used the capability assessment as part of the basis for the mitigation actions that are identified in Section 7; therefore, each jurisdiction addresses their ability to expand on and improve their existing capabilities through the identification of their mitigation actions.

6 MITIGATION STRATEGY

Requirement §201.6(c)(3): [The plan shall include] a mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.

This section describes the process for developing the mitigation strategy for the Northeastern NC Regional Hazard Mitigation Plan. It describes how the Region met the requirements for Planning Step 6 (Set Goals), Planning Step 7 (Review Possible Activities), and Planning Step 8 (Draft an Action Plan). This section includes the following sub-sections:

- 6.1 Goals and Objectives
- 6.2 Identification & Analysis of Mitigation Activities

6.1 GOALS AND OBJECTIVES

Requirement §201.6(c)(3)(i): [The mitigation strategy section shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

Goal setting builds upon the findings of Section 4, which documents the hazards and associated risks that threaten the Northeastern NC Region, and Section 5, which evaluates the capacity of the Region to reduce the impact of those hazards. The intent of goal setting is to identify areas where feasible actions can be taken or improvements to existing capabilities can be made so that community vulnerability is reduced. Goals are also necessary to guide the review of possible mitigation measures. This plan needs to make sure that recommended actions are consistent with what is appropriate for the Region. Mitigation goals need to reflect community priorities and should be consistent with other local plans.

- **Goals** are general guidelines that explain what is to be achieved. They are usually broad-based policy type statements, long term and represent global visions. Goals help define the benefits that the plan is trying to achieve.
- **Objectives** are short term aims that, when combined, form a strategy or course of action to meet a goal. Unlike goals, objectives are specific and measurable.

6.1.1 COORDINATION WITH OTHER PLANNING EFFORTS

The goals of this plan need to be consistent with and complement the goals of other local planning efforts. The primary planning documents that the goals of this plan should complement and be consistent with are the participating jurisdictions' comprehensive plans. Comprehensive plans are important because they are developed and designed to guide future growth within their communities. Keeping the Hazard Mitigation Plan and Comprehensive Plans consistent ensures that land development is done with awareness and understanding of hazard risk and that mitigation projects complement rather than contradict community development objectives.

6.1.2 GOAL SETTING

At the second planning meeting, the HMPC reviewed and discussed the goals from the 2021 plan. The HMPC largely approved of the existing goals but agreed on some revisions to improve overall clarity, reorganize objectives, and include verbiage regarding property protection measures and pre-disaster public education.

The revised goals and objectives of this plan update are detailed below in Section 6.1.3.

6.1.3 RESULTING GOALS AND OBJECTIVES

The HMPC agreed upon four general goals with specific objectives in support of each goal. The refined goals and objectives are as follows:

Goal 1 – Promote the public health, safety, and general welfare of residents and minimize public and private losses due to natural hazards through local land development regulations, capital improvements, planning/investment, and proactive long-range planning.

Objective 1.1: Reduce the length of time that local infrastructure systems are deemed inoperable due to the impacts of natural hazards.

Objective 1.2: Preserve open space in floodplain areas.

Objective 1.3: Reduce flooding and erosion vulnerability through land development initiatives, maintenance, and improvement of storm drainage.

Objective 1.4: Reduce the risk of damage from wildfires (including under fires) to existing and future development.

Goal 2 – Pursue funds to reduce the risk of natural hazards to existing developments where such hazards are clearly identified and the mitigation efforts are cost-effective.

Objective 2.1: Work toward compliance with all State and Federal planning and regulatory requirements including standards for Local Emergency Operations Plans, Flood Damage Prevention Ordinances, Continuity of Operations Plans.

Objective 2.2: Improve floodplain management, including through participation in the Community Rating System, where appropriate.

Objective 2.3: Implement property protection projects and structural projects that protect existing development from hazards.

Goal 3 – Effectively expedite post-disaster reconstruction through the implementation of mitigation strategies and intergovernmental coordination.

Objective 3.1: Improve all participating jurisdictions' general hazard mitigation capability.

Objective 3.2: Ensure effective local/interagency communication and response during disaster events.

Goal 4 – Provide education to citizens that empowers them to protect themselves and their families from natural hazards.

Objective 4.1: Ensure adequate warning and notification relating to hazards including efforts to establish well publicized, accessible shelter facilities that meet national standards for safety and supply.

Objective 4.2: Improve public awareness and understanding of local vulnerability to hazards including providing education on hazard risks and mitigation opportunities and improving disaster warning/post-disaster information efforts.

6.2 IDENTIFICATION AND ANALYSIS OF MITIGATION ACTIVITIES

Requirement §201.6(c)(3)(ii): [The mitigation strategy section shall include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure. All plans approved by FEMA after October 1, 2008, must also address the jurisdiction's participation in the NFIP, and continued compliance with NFIP requirements, as appropriate.

To identify and select mitigation projects that support the mitigation goals and objectives, the risks and vulnerabilities associated with all hazards identified in Section 4 Risk Assessment were evaluated for mitigation opportunities. The HMPC analyzed viable mitigation options that supported the identified goals and objectives, addressed key problems, risks, or vulnerabilities, and aligned with other local plans and efforts. The HMPC was provided with the following list of mitigation categories which are utilized as part of the CRS planning process but are also applicable to multi-hazard mitigation. Acronyms used in the Mitigation Action Plans to identify each action's category are listed in parentheses.

- Prevention (P)
- Property Protection (PP)
- Natural Resource Protection (NRP)
- Emergency Services (ES)
- Structural Projects (SP)
- Public Information and Outreach (PIO)

The HMPC was also provided with examples of potential mitigation actions for each of the above categories. The HMPC was instructed to consider both future and existing buildings in evaluating possible mitigation actions. Facilitated discussions took place to examine and analyze the options. The HMPC also considered which actions from the previous plan that were not already completed should be continued in this action plan.

More details on mitigation alternatives considered by the HMPC are provided in Appendix C.

6.2.1 PRIORITIZATION PROCESS

In the process of identifying continuing and new mitigation actions, the HMPC was provided with a set of prioritization criteria to assist in deciding why one recommended action might be more important, more effective, or more likely to be implemented than another. The prioritization criteria were grouped into three categories: Suitability, Risk Reduction, and Cost. The criteria for the prioritization process included the following:

Suitability

- Appropriateness of Action
- Community Acceptance
- Technical and Administrative Feasibility

- Environmental Impact
- Legal Conformance
- Consistency with Existing Plans and Other Community Goals

Risk Reduction

- Scope of Benefits
- Potential to Save Lives
- Importance of Benefits
- Level of Inconvenience or Unintended Consequence
- Losses Avoided
- Number of People to Benefit

Cost

- Estimate of Upfront Cost
- Estimate of Ongoing Cost
- Benefit to Cost Ratio
- Financing Availability
- Affordability
- Elimination of Repetitive Damages

In accordance with the DMA requirements, an emphasis was placed on the importance of a benefit-cost analysis in determining action priority, as reflected in the prioritization criteria above. For each action, the HMPC considered the benefit-cost analysis in terms of:

- Ability of the action to address the problem
- Contribution of the action to save life or property
- Available technical and administrative resources for implementation
- Availability of funding and perceived cost-effectiveness

The consideration of these criteria helped to prioritize and refine mitigation actions but did not constitute a full benefit-cost analysis. The cost-effectiveness of any mitigation alternative will be considered in greater detail through performing benefit-cost project analyses when seeking FEMA mitigation grant funding for eligible actions associated with this plan.

Using these prioritization criteria, the HMPC assigned each action a ranking of High, Medium, or Low priority. The prioritization ranking for each mitigation action considered by the HMPC is provided in Section 7 Mitigation Action Plans.

7 MITIGATION ACTION PLANS

Requirement §201.6(c)(3)(iii): [The mitigation strategy section shall include an] action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.

This section provides the mitigation action plan for each participating jurisdiction, grouped by county. To improve regional coordination and increase capability to implement projects, many actions are multi-jurisdictional but will be led by the respective county.

The following acronyms are used to identify potential funding sources for each action:

- FEMA – Federal Emergency Management Agency
- NCDEQ – North Carolina Department of Environmental Quality
- NCDOT – North Carolina Department of Transportation
- NCDPS – North Carolina Department of Public Safety
- NFIP – National Flood Insurance Program
- USDA – United States Department of Agriculture

The following acronyms are used to identify the mitigation category for each action:

- P – Prevention
- PP – Property Protection
- NRP – Natural Resource Protection
- SP – Structural Projects
- ES – Emergency Services
- PIO – Public Information & Outreach

Table 7.1 – Mitigation Action Plan, Bertie County

Action #	Description	Applicable Jurisdictions	Hazards Addressed	Priority	Goal & Objective	Category	Lead/Participating Agencies	Estimated Cost	Potential Funding Sources	Implementation Schedule	2025 Status	Status Comments/Explanation
B2	Continue to develop a Geographic Information System (GIS) to map current land uses and to map proposed future land uses (CAMA Land Use Plan Update) as an aid in assessing community vulnerability.	Bertie County, Askewville, Aulander, Colerain, Kelford, Lewiston-Woodville, Powellsville, Roxobel, Windsor	All Hazards	Med	2.2, 3.1	P	Bertie County Planning Department Bertie County Emergency Management Municipal Administrations	Staff Time	General Fund, NCDPS	2 to 3 years	Carry Forward	Updated flood data has been included in County GIS system, as have utility lines, fire districts, and fire stations. Remains a priority to develop a GIS layer for land use.
B4	Accomplish the following during the next CAMA Land Use Plan update: - Establish more specific growth guidelines and policies and specifically delineate sensitive environmental areas for protection; - Adopt a more limited policy on the types of uses allowed within flood hazard areas; - Adopt a policy to not extend public services and utilities into flood hazard or other environmentally sensitive areas to discourage growth.	Bertie County, Askewville, Aulander, Colerain, Kelford, Lewiston-Woodville, Powellsville, Roxobel, Windsor	All Hazards	Med	2.2, 1.1, 1.2	PP	Bertie County Planning Department Bertie County Administration Municipal Administrations	\$45,000	General Fund, NCDPS, NCDEQ	3 to 5 years	Carry Forward	No progress to report. This remains a priority and Bertie County is still seeking funding to update the CAMA Land Use Plan.
B5	Consider adopting a zoning ordinance that: - Establishes zoning districts and sets standards for future development. - Includes standards for clustering of residential lot development to help preserve flood hazard areas from development. - Includes a flood hazard overlay zone to ensure that inappropriate development is adequately controlled.	Bertie County	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	Med	1.2	PP	Bertie County Planning Department Bertie County Board of Commissioners	\$75,000	General Fund	3 to 5 years	Carry Forward	Bertie County is still considering developing and adopting Countywide zoning regulations but would like to update the CAMA Land Use Plan first to inform this. ECU students prepared a study and draft ordinance for the Highway 17 area.
B8	Identify repetitive flood loss properties and other high risk properties for acquisition and relocation. Seek Federal and State funding (voluntary program).	Bertie County, Askewville, Aulander, Colerain, Kelford, Lewiston-Woodville, Powellsville, Roxobel, Windsor	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	Med	2.3, 1.2	SP	Bertie County Administration Bertie County Board of Commissioners Municipal Administrations	Staff Time	General Fund, NCDPS	2025-2030	Carry Forward	Bertie County and Town of Windsor have completed HMGP grants for acquisitions and elevations. Will continue to look for opportunities to protect additional properties.

Action #	Description	Applicable Jurisdictions	Hazards Addressed	Priority	Goal & Objective	Category	Lead/Participating Agencies	Estimated Cost	Potential Funding Sources	Implementation Schedule	2025 Status	Status Comments/Explanation
B9	Establish a countywide Stormwater Management Program to improve and maintain stormwater drainage systems countywide.	Bertie County, Askewville, Aulander, Colerain, Kelford, Lewiston-Woodville, Powellsville, Roxobel, Windsor	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	High	1.3	SP	Bertie County Administration Municipal Administrations	To Be Determined	General Fund, NCDPS	1 year	Carry Forward	Coordinating committee not established and drainage needs to be addressed on a countywide level. Specific drainage issues have been identified. Bertie County and Town of Windsor have received a grant to address drainage improvements in Hoggard Mill Pond.
B10	Maintain a coordinated debris inspection and removal program.	Bertie County, Askewville, Aulander, Colerain, Kelford, Lewiston-Woodville, Powellsville, Roxobel, Windsor	Flooding, Hurricanes & Tropical Storm, Severe Winter Storm, Extreme Heat, Earthquake, Wildfire, Dam & Levee Failure, Severe Weather, Tornado	High	3.2	ES	Bertie County Board of Commissioners Bertie County Emergency Management Municipal Administrations	Staff Time	General Fund, NCDPS, FEMA	2025-2030	Carry Forward	Bertie County will continue to maintain a post disaster debris management contractor. The County will review this contract and update it annually prior to hurricane season.
B12	Advise/assist property owners in retrofitting homes and businesses.	Bertie County, Askewville, Aulander, Colerain, Kelford, Lewiston-Woodville, Powellsville, Roxobel, Windsor	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	High	4.2	PIO	Bertie County Planning Department Municipal Administrations	Staff Time	General Fund	2025-2030	Carry Forward	The Bertie County Planning and Inspection Department works closely with property owners and builders to retrofit homes to minimize future flood damages. County coordinates with NRCS to offer advice on drainage issues.
B13	Acquire generators or other forms of redundant power supply to ensure that critical facilities and infrastructure remain operational where normal power supply is not available.	Bertie County, Askewville, Aulander, Colerain, Kelford, Lewiston-Woodville, Powellsville, Roxobel, Windsor	All Hazards	High	1.1	PP	Bertie County Emergency Management American Red Cross Bertie County School System Municipal Administrations	To Be Determined	General Fund, NCDPS	1 to 3 years	Carry Forward	Priority facilities in need of backup generators include: County Admin Building, two EMS substations, all schools, all fire departments, and new 911 Center

Action #	Description	Applicable Jurisdictions	Hazards Addressed	Priority	Goal & Objective	Category	Lead/Participating Agencies	Estimated Cost	Potential Funding Sources	Implementation Schedule	2025 Status	Status Comments/Explanation
B14	Work to improve the emergency notification system in an effort to increase awareness regarding the locations of shelters and evacuation routes during natural hazard events.	Bertie County, Askewville, Aulander, Colerain, Kelford, Lewiston-Woodville, Powellsville, Roxobel, Windsor	All Hazards	High	4.1	PIO	Bertie County Emergency Management Municipal Administrations	Staff Time	General Fund	2025-2030	Carry Forward	Bertie County, along with other counties in the region, uses HyperReach emergency notification system. Additional improvements to support emergency notifications will be pursued as funding becomes available.
B15	Seek grant funding for eligible mitigation opportunities which may include but are not limited to: acquisition/elevation (addressed above), mitigation/reconstruction, and wet/dry floodproofing to residential and non-residential structures. Funding may also be utilized for redundant power to critical facilities, wind retrofits to critical facilities, storm shelters and other activities that reduce the loss of life and property.	Bertie County, Askewville, Aulander, Colerain, Kelford, Lewiston-Woodville, Powellsville, Roxobel, Windsor	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	Med	1.1, 2.3	PP, SP	Bertie County Administration Municipal Administrations	To Be Determined	NCDPS, FEMA	2025-2030	Carry Forward	County has received grants for drainage improvements and property protection. County has contracted with a consultant to identify and apply for grant funding.
B16	Work to implement all strategies and recommendations outlined within the Bertie County Hurricane Matthew Resilient Redevelopment Plan.	Bertie County	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	Low	2.3, 1.1	SP	Bertie County Administration Municipal Administrations	To Be Determined	General Fund, NCDPS, FEMA	5 years	Carry Forward	Drainage study completed. County will work to identify and implement other projects that are still a priority.
B17	Create or Update Community Wildfire Protection Plans in each fire district.	Bertie County, Askewville, Aulander, Colerain, Kelford, Lewiston-Woodville, Powellsville, Roxobel, Windsor	Wildfire	Med	1.4	P	Bertie County Emergency Management, Fire Departments, NC Forest Service	To Be Determined	Grant Funds	5 years	New	
B18	Acquire additional emergency response equipment to support emergency management operations, including lights, command trailer, and portable generators.	Bertie County	All Hazards	High	3.4, 4.1	ES	Bertie County Emergency Management	To Be Determined	General Fund, NCDPS, FEMA	5 years	New	

Table 7.2 – Mitigation Action Plan, Hyde County

Action #	Description	Hazards Addressed	Priority	Goal & Objective	Category	Lead/Participating Agencies	Estimated Cost	Potential Funding Sources	Implementation Schedule	2025 Status	Status Comments/Explanation
H1	Promote the availability of flood insurance available through the National Flood Insurance Program (NFIP) using the following means: - Post on county website - Provide information on building permit applications - Make available at the library on the mainland in Engelhard and on Ocracoke Island.	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	Med	4.2	PIO	Hyde County Administration, Hyde County Building Inspections	Staff Time	General Fund, NCDPS	2025-2030	Carry Forward	Hyde County continues to promote the availability of federally subsidized flood insurance available to all County residents. Particular attention is given to those citizens that are not located within the defined special flood hazard area but are still potentially subject to flood damage.
H2	Continue to maintain, operate, and carry out all activities outlined within the Swan Quarter Watershed Project Operation and Maintenance Checklist. This effort includes ensuring functionality of the Swan Quarter Dike.	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	High	1.3	PP, SP	Hyde County Administration, Hyde County Soil & Water, Hyde County Water & Flood Control Manager, SQ Watershed Steering Committee	Staff Time	General Fund, NCDPS, HMGP	2025-2030	Carry Forward	Hyde County continues to monitor the status of the Swan Quarter flood control system and associated maintenance protocols. In addition, Hyde County continues to apply for grant and private funding to improve the functionality of the flood control system through the installation of additional pumps and culvert resizing and replacement for feeder canals. Pre-storm and post-storm assessments of the flood-control system will continue to be standard protocol as outlined in our SQ Watershed Operations and Maintenance Plan.
H3	Continue to maintain and map GIS-based data related to floodplain management and mitigation. These efforts will involve maintaining the most recent Flood Insurance Rate Maps (FIRMS), as well as GIS locations for each property either acquired or mitigated under through current and past Mitigation Grant Projects.	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	Med	4.2, 2.2	PIO	Hyde County Administration	Staff Time	General Fund	2 to 3 years	Carry Forward	Hyde County has the most current FIRMS mapped within its GIS system and will continue to update the GIS database, to work in concert with the information provided in this plan, to be utilized for guidance regarding development policy and regulation.
H4	Make a variety of materials related to flood insurance, flood protection, floodplain management, increased cost of compliance coverage, information on floodplains, and listings of qualified contractors familiar with floodproofing and elevation techniques, available through various methods including: - Placing materials in the county library - Disseminating information to local contractors	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	Med	4.2	PIO	Hyde County Administration	Staff Time	General Fund, NCDPS	2025-2030	Carry Forward	The Hyde County Building Inspections Department continues to maintain materials associated with floodplain protection that are available to County residents.

Action #	Description	Hazards Addressed	Priority	Goal & Objective	Category	Lead/Participating Agencies	Estimated Cost	Potential Funding Sources	Implementation Schedule	2025 Status	Status Comments/Explanation
H5	Continue to proactively seek out grant funding through NCEM and FEMA for mitigation of repetitive loss properties (RLPs) and high risk properties from future flooding events. The county will continue maintaining a list of RLPs, and on an annual basis, will apply for funding for all structures that meet cost-benefit thresholds as defined by FEMA. The priority will be for the elevation of structures. Hyde County will also work with homeowners in marginalized communities to address living conditions and provide housing repairs as needed to fortify existing structures until elevation funding is made available.	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	High	1.1, 2.3	PP	Hyde County Administration and Grants Management, Planning & Economic Development	Staff Time	General Fund, NCDPS, FEMA, CDBG, NC Housing Finance, HMGP	2025-2030	Carry Forward	Hyde County continues to utilize funding to address the treatment of repetitive loss properties through both annual funding cycles, as well as through post disaster funding. Hyde will also continue to apply for CDBG funding, NCFA Urgent Repair Program funds and any other available funding sources.
H6	Review the vulnerability of all critical facilities identified in this plan as a component of annual county Emergency Operations Plan updates. This effort will involve an assessment of whether facilities are readily accessible before, during, or after a natural hazard event has transpired. The county will also consider all information and data outlined in this plan when making determinations on the location of all future critical facilities.	All Hazards	High	4.1, 3.2	ES	Hyde County Emergency Services Hyde County Administration	Staff Time	General Fund	1 to 3 years	Carry Forward	Hyde County continues to work to fortify all critical facilities with elevations and generators. Hyde County will update their Emergency Operations Plan, as well as hold annual tabletop exercises and other trainings.
H7	Continue to participate in and support the Disaster Assistance Working Group (DAWG). This effort includes maintaining a mutual aid agreement with DAWG, which makes all available Hyde County resources available to participating counties in the event of a disaster. Coordination of all county resources in concert with DAWG will be handled through the group's E-Plan web based portal. All resources are updated as a component of the NC State Resource Management System.	All Hazards	High	3.2	ES	Hyde County Emergency Services Disaster Assistance Working Group	Staff Time	General Fund, NCDPS	2025-2030	Carry Forward	Hyde County continues to support the efforts of the Disaster Assistance Working Group and the group's efforts to further emergency service effectiveness throughout the region.

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Action #	Description	Hazards Addressed	Priority	Goal & Objective	Category	Lead/Participating Agencies	Estimated Cost	Potential Funding Sources	Implementation Schedule	2025 Status	Status Comments/Explanation
H8	Continue to support the efforts of Tideland Electric and NCDOT in maintaining the county's right-of-ways and utility easements. This effort involves the trimming and pruning of trees that pose an imminent threat to the county's limited infrastructure system as well as supporting Tideland and NCDOT across Hatteras Inlet and NC DOT Hwy 12 which is the supply of Ocracoke Island's electricity, telecommunications and transportation to the mainland. Maintaining clear access into and out of the county, as well as protection of the county's electrical and communications networks, is critical to effective response during natural hazard events.	Flooding, Hurricanes & Coastal Hazards, Severe Winter Storm, Earthquake, Wildfire, Dam & Levee Failure, Severe Weather, Tornado	High	1.1	P	Hyde County Emergency Services Electric Service Providers	Staff Time	General Fund, Electric Service Providers	2025-2030	Carry Forward	Hyde County continues to work closely with all utility providers to ensure that right of ways and utility easements are properly maintained in an effort to minimize damage associated with natural hazard events. Additionally, utility providers attend the Control Group meetings before and after natural disasters and are involved with long term resilience planning related to access to Ocracoke Island via the North End from Hatteras for transportation, utilities and telecommunications.
H9	In an effort to inform and educate citizens about county efforts to increase public safety and mitigate private property losses and other government functions, Hyde County will hold an annual Citizen Hyde class for interested individuals. Presenters include but are not limited to Sheriff, EMS, Building Inspections, Emergency Management and Grants Management. Additionally, Emergency Mgmt, EMS, Sheriff and Administration staff will present information related to students in the local schools.	All Hazards	High	4.2	PIO	Hyde County Emergency Services Hyde County Administration	Staff Time	General Fund	2025-2030	Carry Forward	Action revised. Hyde County will continue to disseminate information associated with emergency services through their Citizen Hyde academy.
H10	Continue to work closely with NCDPS, NCDOT, the American Red Cross, and DAWG in addressing emergency evacuation and sheltering needs throughout the county. Due to limited resources and high vulnerability, Hyde County must often rely on resources available throughout the region. This effort is bolstered by the regional coordination efforts available through DAWG.	All Hazards	High	4.1	ES	Hyde County Emergency Services	Staff Time	General Fund, American Red Cross	2025-2030	Carry Forward	Hyde County continues to work closely with the American Red Cross to address the issue of shelter openings and evacuation. These two processes must be closely coordinated.
H11	Continue to participate in the Community Rating System (CRS) made available through the NFIP Program. This effort will involve continuing to provide detailed information regarding properties located within flood hazard areas as outlined under CRS Manual Section 322.a through 322.g.	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	High	2.2	PP	Hyde County Administration	Staff Time	General Fund, NCDPS	2025-2030	Carry Forward	Hyde County will continue to maintain its current Community Rating System program. The County's current rating will be reviewed and improved when feasible through the County's required five-year audit.

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Action #	Description	Hazards Addressed	Priority	Goal & Objective	Category	Lead/Participating Agencies	Estimated Cost	Potential Funding Sources	Implementation Schedule	2025 Status	Status Comments/Explanation
H12	Acquire generators or other forms of redundant power supply to ensure that critical facilities and infrastructure remain operational where normal power supply is not available.	All Hazards	Med	1.1, 3.2	PP	Hyde County Emergency Services	To Be Determined	General Fund, NCDPS, FEMA	2 to 5 years	Carry Forward	Hyde County will continue to look for opportunities to establish permanent pad mount generators in an effort to ensure a redundant power supply at critical and community facilities including but not limited to the Government Center, Emergency Operations Center, EMS Stations on the mainland and Ocracoke, the Ocracoke Community Center and Davis School.
H13	Develop a Comprehensive Water Management Plan to monitor the County’s water supply and impose water restriction measures as deemed necessary during extreme drought conditions.	Drought, Extreme Heat	High	1.1	NRP	Hyde County Soil & Water Hyde County Administration, Hyde County Health, Hyde County Water Department, Cooperative Extension	Staff Time	General Fund	2020-2025	Carry Forward	No progress to report. Hyde County will begin to look closer at our public water supply and ways to protect that water supply for the future.

Action #	Description	Hazards Addressed	Priority	Goal & Objective	Category	Lead/Participating Agencies	Estimated Cost	Potential Funding Sources	Implementation Schedule	2025 Status	Status Comments/Explanation
H14	Actively working with Federal, State, local and private partners to identify mitigation measures and secure funding via grants to alleviate flooding. These efforts should focus on the following areas: • Upgrade Fairfield Drainage District #17 • Improve Mattamuskeet Association Flood Protection System • Continue to partner with local land owners to install drainage infrastructure through private funding and low interest loans • Enlarge/replace culverts in Swan Quarter along town ditch • Install stationary water pump on Landing Road as part of the Swan Quarter Watershed • Contract for large scale stream snagging/clearing • Continue to complete projects as adopted through the Resilient Coastal Communities Program through the NC Division of Coastal Management including but not limited to those outlined in the Ocracoke Stormwater Management Plan. • Continue to work with a Community Action Team for the Lake Landing Community through the Resilient Coastal Communities Program through the NC Division of Coastal Management to develop a resiliency plan for those communities with a list of projects and goals for those areas. Hyde County will work with the CAT team to develop those goals and will then seek funding to carry those projects to fruition. • Continue to address transportation needs to Ocracoke Island including issues related to the North End Ferry Terminal, Highway 12 and dredging of navigational channels. • Continue to support all drainage districts and private landowners with technical assistance to complete drainage infrastructure projects. • Continue to aggressively apply for housing elevations funds, critical facility funds, and telecommunication funding.	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	High	1.3	SP	Hyde County Administration, Hyde Soil and Water, Hyde Emergency Mgmt., Hyde County Grants Management	To Be Determined	General Fund, NCDPS, FEMA, NC Soil & Water	5 years	Carry Forward	Hyde County will work with all available grant funding agencies along with our Congressional and State Delegations to apply for funding to carry out the projects indicated plus new projects that will increase resiliency across our communities.

Action #	Description	Hazards Addressed	Priority	Goal & Objective	Category	Lead/Participating Agencies	Estimated Cost	Potential Funding Sources	Implementation Schedule	2025 Status	Status Comments/Explanation
H15	Hyde County will work cooperatively with the Davis Ventures Nonprofit group, who currently holds a long-term lease for the Davis Building, owned by Hyde County and on the National Historic Preservation Registry, to create a Resiliency Hub. This Resiliency Hub will be a place where community information is disseminated through workshops and community events and will serve as a post disaster facility to supply the community with needs including but not limited to water, commodities, electrical charging stations, cool down stations, basic first aid, and volunteer organization outreach to aid in storm response and recovery.	Flooding, Hurricane & Tropical Storm, Dam & Levee Failure	High	3.2, 4.2	PIO	Hyde County Admin, Grants Mgmt, Emergency Mgmt,	To Be Determined	NCDPS, NC DEQ, CDBG	2025-2030	New	Hyde County has been working with the Davis Ventures group to restore the Davis Building for ten years and has most recently repaired the roof system, windows and building envelope through NCORR funding. As this project concludes, a new focus will be given to restore the gymnasium and associated bathrooms to provide a space for a resiliency hub.
H16	Hyde County will continue to address septic system and sanitary district capacity, operations and efficiency through partnerships and supplying technical resources and grant management support. Hyde County will work with NCDEQ to develop a Revolving Loan for Hyde County Property owners to receive no to low interest loans to replace and/or repair existing marginal systems. Marginal systems create dangerous and unsanitary conditions during storm events. Additionally, Hyde County will support its 3 Sanitary Districts with technical support and will partner with them on grant funded projects to increase their capacity and efficiency as well.	Flood, Hurricane & Tropical Storm	High	1.1, 2.3	PP, SP	Hyde County Admin, Grants Mgmt, Emergency Mgmt, Hyde County Health Dept., DEQ	To Be Determined	NC DEQ CDBG HMGP	2025-2030	New	Hyde County has been working with our Community Disaster Resiliency Zone staff through FEMA to develop this project in conjunction with NC DEQ. An application for funding has been submitted and Hyde is currently working with its partners to develop the program. Additionally, Hyde has partnered with DEQ to provide training to the Sanitary Districts and has added capacity to the Engelhard Sanitary District through CDBG Grant projects.

Action #	Description	Hazards Addressed	Priority	Goal & Objective	Category	Lead/Participating Agencies	Estimated Cost	Potential Funding Sources	Implementation Schedule	2025 Status	Status Comments/Explanation
H17	Hyde County will work with Motorola Solutions to provide pricing and a project plan to replace Hyde County’s existing Hatteras-to-Ocracoke Point-to-Point (PTP) microwave backhaul network with a new Aviat Networks microwave backhaul system. This upgrade will significantly enhance the reliability, capacity, and resilience of the county’s communications infrastructure, which supports critical services including public safety, emergency response, and VIPER system connectivity. Motorola has selected Aviat Networks due to their proven compliance with VIPER statewide P25 network specifications, strong product performance, and cost effectiveness.	Flooding, Hurricane & Coastal Hazards, Tornadoes & Thunderstorms	High	3.2	ES	Hyde County Admin, Sheriff’s Office, Emergency Mgmt, NCDPS, NCEM	\$1,088,108	Hyde County General Fund, NCGA appropriations	2025-2027	New	The new system design features all-indoor Aviat microwave transceivers engineered to provide 99.999% end-to-end two-way annual reliability, meeting the data capacity requirements for both Hyde County and VIPER sites. The project includes engineering, installation, optimization, FCC coordination, licensing, and a first-year warranty, as well as new antenna and line installations on the Ocracoke Water Tank to support Hyde County’s VHF Paging, Fire, and EMS repeaters. Field path studies and site walks will be conducted to confirm initial design profiles. The overall project will align Hyde County’s network infrastructure with the state’s broader VIPER and Dare County network topology, providing multiple redundant paths for future communication resilience.

Action #	Description	Hazards Addressed	Priority	Goal & Objective	Category	Lead/Participating Agencies	Estimated Cost	Potential Funding Sources	Implementation Schedule	2025 Status	Status Comments/Explanation
H18	Hyde County will continue to focus efforts on the Ocracoke Resilient Infrastructure Initiative which is outlined through a formal resolution by the BOC to address transportation and access to Ocracoke Island. Project components include but are not limited to dredging of channels, beach nourishment/sandbags/hard stabilization structures to fortify and protect the South Dock NCDOT Ferry Basin, NC Hwy 12 on the northern end of the island and long term strategic planning for roadway alternatives.	Flooding, Hurricane & Coastal Hazards, Tornadoes & Thunderstorms	High	1.1, 2.3	SP	Hyde County Administration/ Water and Flood Control	To Be Determined	NC General Assembly, US Congress, NC Div. of Coastal Management, NCDOT Hwy and Ferry Divisions, Federal Hwy Administration	2025-2030	New	The Resolution Requesting Immediate Action at Federal and State Levels to Provide Reliable and Sustainable Transportation to and from Ocracoke Island through Investment in Resilient Transportation Infrastructure urges coordinated action to secure long-term, dependable access for Ocracoke Island residents, businesses, and visitors. The resolution outlines the urgent need for resilient transportation solutions following repeated closures of NC Highway 12 and ferry route disruptions, including a seven-day access breach in March 2024. The Hyde County Board of Commissioners calls for federal and state investment in dredging and channel maintenance, completion of NCDOT's sandbag replacement project, initiation of a beach nourishment study and project for the Highway 12 "hot spot" area, and evaluation of roadway alternatives to improve long-term resilience. The resolution further requests investment in ferry vessels, ramps, and stabilization of the NCDOT South Dock Terminal, along with a coordinated feasibility analysis combining the South Dock and Highway 12 corridor to ensure a sustainable and comprehensive transportation network for Ocracoke Island.
H19	Create or Update Community Wildfire Protection Plans in each fire district.	Wildfire	Med	1.4	P	Hyde County Emergency Services, Fire Departments, NC Forest Service	To Be Determined	Grant Funds	5 years	New	N/A

Table 7.3 – Mitigation Action Plan, Martin County

Action #	Description	Applicable Jurisdictions	Hazards Addressed	Priority	Goal & Objective	Category	Lead/Participating Agencies	Estimated Cost	Potential Funding Sources	Implementation Schedule	2025 Status	Status Comments/Explanation
M1	Continue to develop a county-wide Geographic Information System (GIS). This system will include a comprehensive land use inventory that will be used for improving upon future hazard mitigation vulnerability analysis.	Martin Co., Bear Grass, Everetts, Hamilton, Hassell, Jamesville, Oak City, Parmele, Robersonville, Williamston	All Hazards	Medium	4.2, 3.1	PP	Martin County Administration Martin County Emergency Management Municipal Administrations	Staff Time	General Fund	2 to 3 years	Carry Forward	County GIS mapping is established and new data continues to be integrated to improve performance and information.
M2	Monitor development rates and issues over the next five years. If the county feels that it is the appropriate time to establish either limited or county-wide zoning regulations, then this effort will be initiated.	Martin Co.	All Hazards	Low	1.3, 2.2	P	Martin County Board of Commissioners Martin County Administration	\$70,000	General Fund, NCDPS, NCDEQ	3 to 5 years	Carry Forward	The County has and will continue to adopt ordinances influencing development in specific disciplines as the need becomes apparent. (ie: UDO adopted; Solar development ordinance currently in the works.)
M3	Continue to monitor Flood Damage Prevention Ordinances and update as deemed necessary due to local conditions or as directed by FEMA and/or NCEM. Additionally, the county will consider increasing the freeboard requirement.	Martin Co., Bear Grass, Hamilton, Hassell, Jamesville, Oak City, Robersonville, Williamston	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	High	2.1	P	Martin County Administration Municipal Administrations	Staff Time	General Fund, NCDPS	2020-2025	Carry Forward	Martin County will continue to review the County's Flood Damage Prevention Ordinance annually to address any necessary changes.
M4	Work in conjunction with the Regional HMPC on dealing with county drainage issues. This effort will involve an inventory of stormwater "hot spots." Following identification of drainage concerns, the county will work to address each issue on a case-by-case basis.	Martin Co., Bear Grass, Everetts, Hamilton, Hassell, Jamesville, Oak City, Parmele, Robersonville, Williamston	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	High	1.3	SP	Martin County Administration Northeastern NC Regional HMPC	Staff Time	General Fund, NCDPS	2020-2025	Carry Forward	County has established drainage improvements of blue line streams through our local Soil & Water office, which uses grants to contract out clearing of these streams.
M5	Continue to maintain a post-disaster debris management contract with a qualified service provider. The county will review this contract on an annual basis.	Martin Co., Bear Grass, Everetts, Hamilton, Hassell, Jamesville, Oak City, Parmele, Robersonville, Williamston	Flooding, Hurricanes & Coastal Hazards, Severe Winter Storm, Earthquake, Wildfire, Dam & Levee Failure, Severe Weather, Tornado	High	3.2	ES	Martin County Board of Commissioners Martin County Emergency Management Municipal Administrations	Staff Time	NCDPS, FEMA	2020-2025	Carry Forward	Martin County will continue to review annually the County's Post Disaster Debris Management Contract. The terms and provider will be reviewed and changes made when deemed necessary.

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Action #	Description	Applicable Jurisdictions	Hazards Addressed	Priority	Goal & Objective	Category	Lead/Participating Agencies	Estimated Cost	Potential Funding Sources	Implementat ion Schedule	2025 Status	Status Comments/Explanation
M6	Work closely with county Emergency Management and the Regional HMPC to ensure that adequate evacuation procedures are in place. This effort will involve the establishment of a public outreach campaign to ensure that the public is aware of the proper procedures.	Martin Co., Bear Grass, Everetts, Hamilton, Hassell, Jamesville, Oak City, Parmele, Robersonville, Williamston	Flooding, Hurricanes & Coastal Hazards, Earthquake, Wildfire, Dam & Levee Failure, Tornado	High	3.2, 4.2	PIO	Martin County Emergency Management Municipal Administrations	Staff Time	General Fund	1 year	Carry Forward	Martin County will establish a dialogue with the regional partners to improve upon evacuation and emergency notification protocols.
M7	Maintain information on flood damage protection techniques for dissemination to citizens and property owners. Additionally, provide guidance to individuals looking for options relating to the elevation or retrofitting of homes. Make these materials available at the local library.	Martin Co., Bear Grass, Everetts, Hamilton, Hassell, Jamesville, Oak City, Parmele, Robersonville, Williamston	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	High	4.2	PIO	Martin County Building Inspections Municipal Administrations	Staff Time	General Fund, NCDPS	2020-2025	Carry Forward	The Martin County Planning and Inspections Department works closely with property owners and builders to retrofit homes in an effort to minimize future flood damages.
M8	Work closely on addressing mitigation needs, including the identification of structural mitigation projects and the establishment of new mitigation policies and initiatives.	Martin Co., Bear Grass, Everetts, Hamilton, Hassell, Jamesville, Oak City, Parmele, Robersonville, Williamston	All Hazards	High	1.1, 2.3	SP	Martin County Administration Municipal Administrations	Staff Time	General Fund, NCDPS	2020-2025	Carry Forward	Martin County will continue to identify projects that may be eligible for funding through either annual or post disaster mitigation funding. Projects for improvement have been identified through a local mitigation contractor with funding through CDBG
M9	Seek grant funding for eligible mitigation opportunities which may include but are not limited to: acquisition/elevation (addressed above), mitigation/reconstruction, and wet/dry floodproofing to residential and non-residential structures. Funding may also be utilized for redundant power to critical facilities, wind retrofits to critical facilities, storm shelters and other activities that reduce the loss of life and property.	Martin Co., Bear Grass, Everetts, Hamilton, Hassell, Jamesville, Oak City, Parmele, Robersonville, Williamston	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	High	1.1, 2.3	PP, SP	Martin County Administration Municipal Administrations	To be determined	General Fund, NCDPS, FEMA	2020-2025	Carry Forward	Martin County, as well as participating municipal jurisdictions, will continue to maintain a listing of vulnerable and/or repetitive loss properties and work to identify treatment options as funding becomes available.

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Action #	Description	Applicable Jurisdictions	Hazards Addressed	Priority	Goal & Objective	Category	Lead/Participating Agencies	Estimated Cost	Potential Funding Sources	Implementat ion Schedule	2025 Status	Status Comments/Explanation
M10	Work to implement all strategies and recommendations outlined within the Martin County Hurricane Matthew Resilient Redevelopment Plan.	Martin Co., Bear Grass, Everetts, Hamilton, Hassell, Jamesville, Oak City, Parmele, Robersonville, Williamston	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	Low	1.1, 2.3	PP, SP, P	Martin County Administration Municipal Administrations	To be determined	General Fund, NCDPS, NCDEQ, FEMA	5 years	Carry Forward	Will continue to pursue implementation of relevant projects from this plan.
M11	Acquire generators or other forms of redundant power supply to ensure that critical facilities and infrastructure remain operational where normal power supply is not available.	Martin Co., Bear Grass, Everetts, Hamilton, Hassell, Jamesville, Oak City, Parmele, Robersonville, Williamston	All Hazards	Medium	1.1	PP	Martin County Emergency Management Municipal Administrations	To be determined	General Fund, NCDPS, FEMA	2 to 3 years	Carry Forward	Generators currently needed for Central Receiving & Distribution point, Sheriff's maintenance shop, and EOC.
M12	Continue to monitor water resources in an effort to mitigate the impacts of drought conditions. These efforts will include maintaining a local water shortage ordinance. This ordinance will be activated in coordination with all utility providers as the need arises.	Martin Co., Bear Grass, Everetts, Hamilton, Hassell, Jamesville, Oak City, Parmele, Robersonville, Williamston	Extreme Heat, Drought	High	1.1	NRP	Martin County Administration Municipal Administrations	Staff Time	General Fund	2020-2025	Carry Forward	Water shortage ordinance is under consideration.
M13	Create or Update Community Wildfire Protection Plans in each fire district.	Martin Co., Bear Grass, Everetts, Hamilton, Hassell, Jamesville, Oak City, Parmele, Robersonville, Williamston	Wildfire	Med	1.4	P	Martin County Emergency Management, Fire Departments, NC Forest Service	To Be Determined	Grant Funds	5 years	New	

Table 7.4 – Mitigation Action Plan, Tyrrell County

Action #	Description	Applicable Jurisdictions	Hazards Addressed	Priority	Goal & Objective	Category	Lead/Participating Agencies	Estimated Cost	Potential Funding Sources	Implementation Schedule	2025 Status	Status Comments/Explanation
T1	Maintain a policy of keeping branches and limbs from encroaching upon the right-of-way and power lines. The Town will assist in this effort through ensuring that this issue is properly addressed by utility providers.	Columbia	Flooding, Hurricanes & Coastal Hazards, Severe Winter Storm, Earthquake, Wildfire, Severe Weather, Tornado	High	1.1	P	Columbia Administration Electric Service Providers	Staff Time	General Fund, Electric Service Providers	2025-2030	Carry Forward	The Town will coordinate with utility providers to minimize the impacts of natural hazard events on Town-wide infrastructure systems.
T2	Monitor the county's equipment and facility needs with respect to mitigation and emergency management. Following a natural disaster, the county will utilize potential Hazard Mitigation Grant Program funds to acquire any identified needs.	Tyrrell Co., Columbia	All Hazards	High	1.1	PP, ES	Tyrrell County Emergency Management Tyrrell County Board of Commissioners Municipal Administration	Staff Time	General Fund, NCDPS	1 year	Carry Forward	Current priority needs include swift water rescue equipment & training.
T3	Mail a floodplain protection informational flyer to all county and town property owners a minimum of two times over the next five years. This effort will ensure that this critical information is being disseminated to a broad base of the population.	Tyrrell Co., Columbia	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	High	4.2	PIO	Tyrrell County Administration Tyrrell County Building Inspections Municipal Administration	\$4,000	General Fund	1 year	Carry Forward	Outreach was previously mailed but this effort needs to be reestablished once the County Floodplain Administrator position is filled.
T4	Advertise the availability of federal flood insurance offered through the National Flood Insurance Program at least once annually through the county's website and/or social media. Additionally, the county will assist property owners in acquiring this insurance.	Tyrrell Co., Columbia	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	High	4.2	PIO	Tyrell County Administration Municipal Administration	\$4,000	General Fund	2 years	Carry Forward	Action revised as Tyrrell County does not have a local newspaper but will use social media and website outreach to promote flood insurance.
T5	Establish a long-range plan in conjunction with the US Army Corps of Engineers to clean out the arterial canals located throughout the county.	Tyrrell Co.	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	Medium	1.3	NRP	Tyrrell County Administration US Army Corps of Engineers	To be determined	General Fund, NCDPS, NCDEQ	2 to 3 years	Carry Forward	Soil & Water Conservation has been working to keep streams and canals clear. Currently working on several USACE permits.
T6	Work towards a long-term solution to the flooding and drainage issues impacting the Alligator and Goat Neck communities within the county.	Tyrrell Co.	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	Medium	1.3	SP	Tyrrell County Administration Tyrrell County Public Services	To be determined	General Fund, NCDPS, NCDEQ	2 to 3 years	Carry Forward	Tyrrell County has been dealing with this issue for many years. The County will continue to seek out a long-term sustainable solution to this issue. Currently working on USACE permitting for a drainage improvement project.

Action #	Description	Applicable Jurisdictions	Hazards Addressed	Priority	Goal & Objective	Category	Lead/Participating Agencies	Estimated Cost	Potential Funding Sources	Implementation Schedule	2025 Status	Status Comments/Explanation
T7	Work to relocate all County service facilities to sites outside the flood hazard area.	Tyrrell Co.	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	Low	1.1, 2.3	PP	Tyrrell County Administration Tyrrell County Board of Commissioners Municipal Administration	To be determined	General Fund, NCDPS, FEMA, USDA Loan Program	5 years	Carry Forward	No progress to report but this remains a priority goal.
T8	Continue to utilize annual, as well as post disaster Federal (FEMA) and State mitigation funds, to both acquire and elevate structures impacted by excessive flooding. The following provides a summary of mitigation target areas established following Hurricane Matthew in 2016: - Alligator Community - Albemarle Sound Area - Town of Columbia	Tyrrell Co., Columbia	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	Low	2.3	PP	Tyrrell County Administration Tyrrell County Emergency Management Municipal Administration	To be determined	General Fund, NCDPS, NCDEQ, NCDOT	5 years	Carry Forward	Completed one mitigation reconstruction project in Columbia. Post-Matthew target areas remain a priority.
T9	Actively working with Federal, State, local and private partners to identify mitigation measures and secure funding via grants to alleviate flooding. These efforts should focus on the following areas: - Drainage system – Grendle Hill Canal - Drainage system – Alligator Canal - Drainage system – South Fork Creek Canal - Drainage system – Rider Creek Canal	Tyrrell Co., Columbia	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	Low	1.1, 2.3	SP	Tyrrell County Administration Tyrrell County Emergency Management Municipal Administration	To be determined	General Fund, NCDPS, NCDEQ, NCDOT	5 years	Carry Forward	County obligates funding to Soil & Water Conservation department and that department conducts drainage maintenance. This is an ongoing need.
T10	Seek grant funding for eligible mitigation opportunities which may include but are not limited to: acquisition/elevation, mitigation/reconstruction, and wet/dry floodproofing to residential and non-residential structures. Funding may also be utilized for redundant power to critical facilities, wind retrofits to critical facilities, storm shelters and other activities that reduce the loss of life and property.	Tyrrell Co., Columbia	All Hazards	Medium	1.1, 2.3	SP, PP	Tyrrell County Administration Tyrrell County Emergency Management Municipal Administration	To be determined	General Fund, NCDPS, FEMA	2020-2025	Carry Forward	Completed one mitigation reconstruction project in Columbia.
T11	Maintain, and where necessary, establish backup generators at all identified critical facilities. Additionally, County Emergency Services will evaluate the equipment on a regular basis to assure it continues to meet operational demands at county facilities.	Tyrrell Co., Columbia	All Hazards	Medium	1.1, 4.1	PP	Tyrrell County Emergency Management Municipal Administration	To be determined	General Fund, NCDPS, FEMA	2 to 3 years	Carry Forward	A new school is planned that will need backup power

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Action #	Description	Applicable Jurisdictions	Hazards Addressed	Priority	Goal & Objective	Category	Lead/Participating Agencies	Estimated Cost	Potential Funding Sources	Implementation Schedule	2025 Status	Status Comments/Explanation
T12	Create or Update Community Wildfire Protection Plans in each fire district.	Tyrrell Co., Columbia	Wildfire	Med	1.4	P	Tyrrell County Emergency Management, Fire Departments, NC Forest Service	To Be Determined	Grant Funds	5 years	New	

Table 7.5 – Mitigation Action Plan, Washington County

Action #	Description	Applicable Jurisdictions	Hazards Addressed	Priority	Goal & Objective	Category	Lead/Participating Agencies	Estimated Cost	Potential Funding Sources	Implementation Schedule	2025 Status	Status Comments/Explanation
W1	Continue to seek funding for assistance in constructing a new dedicated EOC. The county's existing facility is adequate; however, there is a need for a new and dedicated facility.	Washington Co., Creswell, Plymouth, Roper	All Hazards	Low	3.1, 3.2	PP, ES	Washington County Planning & Safety Washington County Board of Commissioners Municipal Administrations	To be Determined	General Fund, NCDPS, FEMA	5 years	Carry Forward	New EOC is under construction. Additional work remains to establish operations once construction is complete.
W2	Continue to seek grant funding that will enable the removal of all critical infrastructure from the floodplain. This effort is currently underway; however, there is more to be accomplished. This effort will require assistance from the county Emergency Management Department.	Washington Co., Plymouth	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	Low	1.1, 2.3	PP	Washington County Planning & Safety Washington County Board of Commissioners Municipal Administration	To be determined	General Fund, NCDPS, FEMA	5 years	Carry Forward	No progress to report. The County will continue to look for opportunities to relocate or otherwise protect critical infrastructure.
W3	Monitor all land development codes, including the county and town Flood Damage Prevention Ordinances, on an annual basis to ensure that they are up-to-date and address current issues and concerns. This review will also be conducted following substantial natural hazard events.	Washington Co., Creswell, Plymouth, Roper	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	High	2.2	P	Washington County Planning & Safety Washington County Inspections Washington County Board of Commissioners Municipal Administrations	Staff Time	General Fund, NCDPS	2025-2030	Carry Forward	Hazard mitigation will be incorporated into decisions regarding amendments to the County's land development regulations as opportunities arise.
W4	Continue to work towards the development of a system to provide on-line offerings of permits, inspections, and taxes. This effort will streamline operations and provide for a more efficient flow of information.	Washington Co.	All Hazards	High	3.1	P	Washington County Inspections	\$20,000	General Fund	2 years	Carry Forward	Washington County is still working to establish an online permit portal. This effort will also impact all participating municipal jurisdictions.
W5	The Washington County Inspections office will aim to acquire a new permitting program that will be helpful in tracking floodplain development activity.	Washington Co., Creswell, Plymouth, Roper	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure, Severe Weather	High	3.1	P	Washington County Inspections Municipal Administrations	\$20,000	General Fund	2 years	Carry Forward	No progress to report, but this action remains a priority.

Action #	Description	Applicable Jurisdictions	Hazards Addressed	Priority	Goal & Objective	Category	Lead/Participating Agencies	Estimated Cost	Potential Funding Sources	Implementation Schedule	2025 Status	Status Comments/Explanation
W6	Mail a notice once annually to all property owners whose land is located within a special flood hazard area. The notice should clearly state that the recipient's property is susceptible to flooding and provide information pertinent to emergency evacuation and post-disaster recovery. Additionally, the county will notify all property owners once annually via mail, either through individual mailers or utility bill inserts, of the hazards associated with flooding and other hazards resulting from severe weather events.	Washington Co., Creswell, Plymouth, Roper	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	High	4.2	PIO	Washington County Inspections Municipal Administrations	\$4,500	General Fund, NCDPS	2025-2030	Carry Forward	This effort occurs annually and supports the County's ongoing CRS program. The County will continue to implement this action.
W7	Maintain a map information service involving the following: • Provide information relating to Flood Insurance Rate Maps (FIRM) to all inquirers, including providing information on whether a given property is located within a flood hazard area. • Provide information regarding the flood insurance purchase requirement. • Maintain historical and current FIRMs. • Locally advertise once annually in the local newspaper. • Provide information to inquirers about local floodplain management requirements.	Washington Co., Creswell, Plymouth, Roper	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	High	2.2, 4.2	PIO	Washington County Inspections Washington County Administration Municipal Administrations	Staff Time	General Fund	2025-2030	Carry Forward	Washington County provides this service on a daily basis to property owners, builders, and contractors. This effort supports the County's CRS program and will continue to be implemented.
W8	Work with local real estate agencies to ensure that agents are informing clients when property for sale is located within an SFHA. The county will provide these agencies with brochures documenting the concerns relating to development located within flood-prone areas and ways that homeowners may make their homes more disaster-resistant to strong winds, lightning, and heavy rains.	Washington Co., Creswell, Plymouth, Roper	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	High	2.2, 4.2	PIO	Washington County Inspections Municipal Administrations	Staff Time	General Fund, Municipal Administrations	2025-2030	Carry Forward	This effort occurs annually and supports the County's ongoing CRS program. The County will continue to implement this action.
W9	Make information regarding hazards and development regulations within floodplains available through the following: • Ensure that the local library maintains information relating to flooding and flood protection. • Provide a link on county/town websites to FEMA resources addressing flooding and flood protection. • Maintain information pertinent to local development conditions and make this information readily available to the public, including being posted at the local library.	Washington Co., Creswell, Plymouth, Roper	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	High	4.2	PIO	Washington County Inspections Washington County Administration Municipal Administrations	Staff Time	General Fund, NCDPS, FEMA	2025-2030	Carry Forward	This effort is reviewed annually and supports the County's ongoing CRS program. The County will continue to implement this action.

Action #	Description	Applicable Jurisdictions	Hazards Addressed	Priority	Goal & Objective	Category	Lead/Participating Agencies	Estimated Cost	Potential Funding Sources	Implementation Schedule	2025 Status	Status Comments/Explanation
W10	Provide comprehensive services regarding planning and development activities within the defined SFHA and issues relating to the construction of disaster-resistant structures. These services will include: • Provide site-specific flood and flood related information on an as-needed basis. • Maintain a list of contractors with experience in floodproofing and retrofit techniques. • Provide information on methods of windproofing construction methods for new and renovated structures. • Maintain materials providing an overview of how to select a qualified contractor. • Make site visits upon request to review occurrences of flooding, drainage problems, and sewer problems. If applicable, the inspector should provide one-on-one advice to the property owner. • Provide advice and assistance regarding CRS Activity 530 (Flood Protection). • Advertise the availability of this service in the local newspaper once annually. • Maintain a log of all individuals assisted through this service, including all site visits.	Washington Co, Creswell, Plymouth, Roper	All Hazards	High	2.3, 4.2	PP, PIO	Washington County Inspections Washington County Administration Municipal Administrations	Staff Time	General Fund	2025-2030	Carry Forward	This effort is reviewed annually and supports the County's ongoing CRS program. The County will continue to implement this action.
W11	Maintain a comprehensive Geographic Information System (GIS) with current FIRM panels in an effort to make this information readily available to county citizens. In addition to this digital data, bound copies of all historical and current FIRM panels will be maintained within Planning and Building Inspections Department.	Washington Co., Creswell, Plymouth, Roper	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	Medium	2.2, 3.1	P, PIO	Washington County Tax Office Washington County Inspections Municipal Administrations	Staff Time	General Fund, NCDPS	2 to 3 years	Carry Forward	Contract in place for ongoing updates as needed. Will continue to implement and need to establish an in-house GIS coordinator.
W12	Seek grant funding for eligible mitigation opportunities which may include but are not limited to: acquisition/elevation, mitigation/reconstruction, and wet/dry floodproofing to residential and non-residential structures. Funding may also be utilized for redundant power to critical facilities, wind retrofits to critical facilities, storm shelters and other activities that reduce the loss of life and property.	Washington Co., Creswell, Plymouth, Roper	All Hazards	High	1.1, 2.3	PP, SP	Washington County Administration Municipal Administrations	Staff Time	General Fund, NCPDS, FEMA	2020-2025	Carry Forward	No completed projects to report. Washington County and municipal jurisdictions will continue to seek funding to implement property protection and structural projects as specific needs arise.

Action #	Description	Applicable Jurisdictions	Hazards Addressed	Priority	Goal & Objective	Category	Lead/Participating Agencies	Estimated Cost	Potential Funding Sources	Implementation Schedule	2025 Status	Status Comments/Explanation
W13	Work to implement all strategies and recommendations outlined within the Washington County Hurricane Matthew Resilient Redevelopment Plan.	Washington Co., Creswell, Plymouth, Roper	Flood, Hurricanes & Coastal Hazards, Dam & Levee Failure	Low	1.1, 2.3	SP, PP	Washington County Administrations Municipal Administrations	To be Determined	General Fund, NCPDS, NCDEQ, FEMA	5 years	Carry Forward	No progress to report. Remaining priority projects include residential elevations, a countywide drainage improvement study, retrofitting the county court house, retrofitting the Plymouth East Main St lift station, and elevating the entry road to the sewer treatment plant.
W14	Promote and encourage the training of Community Emergency Response Teams (CERT) throughout the county.	Washington Co., Creswell, Plymouth, Roper	All Hazards	High	3.1, 4.2	ES	Washington County Planning & Safety Washington County Community Emergency Response Teams Municipal Administrations	To be determined	General Fund, NCDPS, FEMA	1 to 3 years	Carry Forward	No progress to report, but this action remains a priority.
W15	Work to develop continuity of operations plans (COOP) for county/town departments, assisted living facilities, long-term care facilities, day care centers, etc.	Washington Co., Creswell, Plymouth, Roper	All Hazards	High	3.2	ES	Washington County Planning & Safety Municipal Administrations	To be determined	General Fund, NCDPS, FEMA	1 to 3 years	Carry Forward	COOP plan in place but will be reassessed annually.
W16	Acquire generators or other forms of redundant power supply and equipment such as backup water pumps and pump parts to ensure that critical facilities and infrastructure remain operational.	Washington Co., Creswell, Plymouth, Roper	All Hazards	Medium	1.1, 2.3	PP	Washington County Planning & Safety Washington County Administration Municipal Administrations	\$10,000-\$25,000 each	General Fund, NCDPS, FEMA	2 to 3 years	Carry Forward	Action revised to incorporate other redundant infrastructure. Generator provided for county radio station. Additional needs remain.
W17	Maintain a contract with a qualified post-disaster recovery service provider. This contract will include the provision of essential services and equipment, including generators, and will include documentation required for reimbursement from FEMA/NCDEM.	Washington Co., Creswell, Plymouth, Roper	All Hazards	High	3.2	ES	Washington County Administration Municipal Administrations	Staff Time	General Fund, NCDPS, FEMA	2025-2030	Carry Forward	Washington County will continue to maintain an on-call contract with a qualified post-disaster provider.

Action #	Description	Applicable Jurisdictions	Hazards Addressed	Priority	Goal & Objective	Category	Lead/Participating Agencies	Estimated Cost	Potential Funding Sources	Implementation Schedule	2025 Status	Status Comments/Explanation
W18	Annually review and update the County's Emergency Operations Plan (EOP) to ensure compliance with all NCEM and NCOEMS procedures and policies. Through these updates, the County will work closely with all participating municipalities to ensure that all jurisdictions continue to be educated and prepared for activation of the EOP in the event of a disaster event.	Washington Co., Creswell, Plymouth, Roper	All Hazards	High	2.1	ES	Washington County Planning & Safety Municipal Administrations	Staff Time	General Fund, NCDPS, FEMA	2025-2030	Carry Forward	Washington County will continue to review the EOP annually.
W19	Create or Update Community Wildfire Protection Plans in each fire district.	Washington Co., Creswell, Plymouth, Roper	Wildfire	Med	1.4	P	Washington County Planning & Safety, Fire Departments, NC Forest Service	To Be Determined	Grant Funds	5 years	New	
W20	Improve drainage conditions through the identification and implementation of capital improvements projects.	Washington Co., Creswell, Plymouth, Roper	Dam & Levee Failure, Flooding, Hurricane & Coastal Hazards	Med	1.3	SP	Washington County Planning & Safety Municipal Administrations	To Be Determined	Grant Funds	2025-2030	New	
W21	Construct a new storage building at new EOC to house emergency supplies and response equipment.	Washington Co., Creswell, Plymouth, Roper	All Hazards	High	3.2	ES	Washington County Planning & Safety	To Be Determined	General Fund, NCDPS, FEMA	5 years	New	
W22	Create an Assistant Emergency Manager/Planning Coordinator position to support emergency management responsibilities including mitigation planning and grant identification and application.	Washington Co., Creswell, Plymouth, Roper	All Hazards	High	3.1, 3.2	P, ES	Washington County Planning & Safety, Washington County Administration	To Be Determined	General Fund, NCDPS, FEMA	5 years	New	
W23	Develop a security plan and conduct an initial emergency response exercise and ongoing exercises for the new school/hurricane shelter.	Washington Co., Creswell, Plymouth, Roper	All Hazards	High	3.2, 4.1	ES	Washington County Planning & Safety	To Be Determined	General Fund, NCDPS, FEMA	2-3 years	New	
W24	Upgrade current message board and acquire at least two additional boards to be able to meet countywide needs for Plymouth, Creswell, and Roper zones.	Washington Co., Creswell, Plymouth, Roper	All Hazards	High	3.2, 4.1	ES	Washington County Planning & Safety	To Be Determined	General Fund, NCDPS, FEMA	2-3 years	New	
W25	Establish a communications plan and a radio study to help implement new repeaters that may be needed for backup high-band communication.	Washington Co., Creswell, Plymouth, Roper	All Hazards	High	3.2, 4.1	P, ES	Washington County Planning & Safety	To Be Determined	General Fund, NCDPS, FEMA	2-3 years	New	
W26	Establish satellite communications to support continuity of operations during hazard events.	Washington Co.	All Hazards	High	3.3, 4.1	ES	Washington County Planning & Safety	To Be Determined	General Fund, NCDPS, FEMA	2-3 years	New	

8 PLAN MAINTENANCE

Requirement §201.6(c)(4): [The plan maintenance process shall include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.

Implementation and maintenance of the plan is critical to the overall success of hazard mitigation planning. This section discusses how the Mitigation Action Plans will be implemented by participating jurisdictions and outlines the method and schedule for monitoring, updating, and evaluating the plan. This section also discusses incorporating the plan into existing planning mechanisms and how the public will continue to be involved in the planning process. It consists of the following three subsections:

- 8.1 Implementation
- 8.2 Monitoring, Evaluation, and Enhancement
- 8.3 Continued Public Involvement

8.1 IMPLEMENTATION

8.1.1 MITIGATION PLAN IMPLEMENTATION

Each jurisdiction participating in this plan update is responsible for implementing specific mitigation actions as prescribed in their Mitigation Action Plan (found in Section 7). In each Mitigation Action Plan, every proposed action is assigned to a specific local department or agency to ensure responsibility and accountability and increase the likelihood of subsequent implementation. This approach enables individual jurisdictions to update their own unique mitigation action list as needed without altering the broader focus of the regional plan.

In addition to the assignment of a local lead department or agency, an implementation timeline or a specific implementation date or window has been assigned to each mitigation action to help assess whether reasonable progress is being made toward implementation. The participating jurisdictions will seek outside funding sources to implement mitigation projects in both the pre-disaster and post-disaster environments. When applicable, potential funding sources have been identified for proposed actions listed in the Mitigation Action Plan.

8.1.2 PLAN INTEGRATION

An important implementation mechanism that is highly effective and low-cost is incorporation of the Hazard Mitigation Plan recommendations and their underlying principles into other plans and mechanisms. Where possible, plan participants will use existing plans and/or programs to implement the Mitigation Action Plan. It will be the responsibility of the HMPC representatives from each participating jurisdiction to determine and pursue opportunities for integrating the requirements of this plan with other local planning documents and ensure that the goals and strategies of new and updated local planning documents for their jurisdictions or agencies are consistent with the goals and actions of the Hazard Mitigation Plan and will not contribute to increased hazard vulnerability in the region. Methods for integration may include:

- Monitoring other planning/program agendas;

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- Attending other planning/program meetings;
- Participating in other planning processes; and
- Monitoring community budget meetings for other community program opportunities.

Table 8.1 details each jurisdiction's integration of the 2021 Northeastern NC Regional Hazard Mitigation Plan into other local planning efforts as well as any identified opportunities for integration of this plan update.

Table 8.1 – Integration Efforts

Jurisdiction	Integration of 2021 plan	Intended integration of this plan update
Bertie County	Bertie County participated in NC DCM's Resilient Coastal Communities Program (RCCP) and utilized components of the 2021 plan to develop a resilience strategy.	The County will continue to integrate findings and projects from this plan to guide future resilience efforts.
Askewville	No integration occurred.	Integration will be pursued as opportunities arise.
Aulander	Aulander participated in NC DCM's RCCP and utilized components of the 2021 plan to develop a resilience strategy.	The Town will continue to integrate findings and projects from this plan to guide future resilience efforts.
Colerain	As of 2025, the Town of Colerain is participating in NC DCM's RCCP and utilizing components of the 2021 plan to develop a resilience strategy.	Colerain will continue to integrate findings and projects from this plan to guide future resilience efforts.
Kelford	No integration occurred.	Integration will be pursued as opportunities arise.
Lewiston-Woodville	No integration occurred.	Integration will be pursued as opportunities arise.
Powellsville	No integration occurred.	Integration will be pursued as opportunities arise.
Roxobel	No integration occurred.	Integration will be pursued as opportunities arise.
Windsor	The Town of Windsor participated in NC DCM's RCCP and utilized components of the 2021 plan to develop a resilience strategy.	Windsor will continue to integrate findings and projects from this plan to guide future resilience efforts.
Hyde County	Hyde County is a current participant in NC DCM's RCCP and used components of the 2021 plan to develop a resilience strategy for Ocracoke.	In fall of 2025, Hyde County began working on a resilience strategy for the mainland and an update to the CAMA plan to incorporate resiliency. The County will continue to integrate findings and projects from this plan to guide these and other resilience efforts. This plan will also be used to support the county's CRS participation.
Martin County	Martin County established GIS mapping for the county and its municipal jurisdictions. GIS mapping is essential to an effective hazard mitigation plan. This was a key recommendation of the 2021 plan.	Martin County will continue to utilize the updated plan in relation to future decisions associated with land development policy and regulation.

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Jurisdiction	Integration of 2021 plan	Intended integration of this plan update
Bear Grass	As noted above, Martin County efforts have included all municipal jurisdictions.	The Town of Bear Grass will continue to utilize the updated plan in relation to future decisions associated with land development policy and regulation
Everetts	As noted above, Martin County efforts have included all municipal jurisdictions.	The Town of Everetts will continue to utilize the updated plan in relation to future decisions associated with land development policy and regulation
Hamilton	As noted above, Martin County efforts have included all municipal jurisdictions.	The Town of Hamilton will continue to utilize the updated plan in relation to future decisions associated with land development policy and regulation
Hassell	As noted above, Martin County efforts have included all municipal jurisdictions.	The Town of Hassell will continue to utilize the updated plan in relation to future decisions associated with land development policy and regulation
Jamesville	As noted above, Martin County efforts have included all municipal jurisdictions.	The Town of Jamesville will continue to utilize the updated plan in relation to future decisions associated with land development policy and regulation
Oak City	As noted above, Martin County efforts have included all municipal jurisdictions.	The Town of Oak City will continue to utilize the updated plan in relation to future decisions associated with land development policy and regulation
Parmelee	As noted above, Martin County efforts have included all municipal jurisdictions.	The Town of Parmelee will continue to utilize the updated plan in relation to future decisions associated with land development policy and regulation
Robersonville	As noted above, Martin County efforts have included all municipal jurisdictions.	The Town of Robersonville will continue to utilize the updated plan in relation to future decisions associated with land development policy and regulation
Williamston	As noted above, Martin County efforts have included all municipal jurisdictions.	The Town of Williamston will continue to utilize the updated plan in relation to future decisions associated with land development policy and regulation
Tyrrell County	As of 2025, Tyrrell County is participating in NC DCM's RCCP and utilizing components of the 2021 plan to develop a resilience strategy.	Tyrrell County will continue to integrate findings and projects from this plan to guide future resilience efforts.
Columbia	No integration occurred.	Integration will be pursued as opportunities arise.
Washington County	Washington County participated in NC DCM's RCCP and utilized components of this plan to develop a resilience strategy.	The County will continue to integrate findings and projects from this plan to guide future resilience efforts. This plan will also be used to support the county's CRS participation.

Jurisdiction	Integration of 2021 plan	Intended integration of this plan update
Creswell	Creswell participated in NC DCM's RCCP and utilized components of this plan to develop a resilience strategy.	The Town will continue to integrate findings and projects from this plan to guide future resilience efforts. This plan will also be used to support the town's CRS participation.
Plymouth	Plymouth participated in NC DCM's RCCP and utilized components of this plan to develop a resilience strategy.	The Town will continue to integrate findings and projects from this plan to guide future resilience efforts. This plan will also be used to support the town's CRS participation.
Roper	No integration occurred.	Integration will be pursued as opportunities arise. This plan will also be used to support the town's CRS participation.

Opportunities to integrate the requirements of this Plan into other local planning mechanisms shall continue to be identified through future meetings of the HMPC and through the five-year review process described herein. Although it is recognized that there are many possible benefits to integrating components of this plan into other local planning mechanisms, the development and maintenance of this stand-alone Hazard Mitigation Plan is deemed by the HMPC to be the most effective and appropriate method to implement local hazard mitigation actions at this time.

8.2 MONITORING, EVALUATION, AND ENHANCEMENT

8.2.1 ROLE OF HMPC IN IMPLEMENTATION, MONITORING AND MAINTENANCE

With adoption of this plan, each jurisdiction will be responsible for the implementation and maintenance of their mitigation actions. The County Emergency Managers or County Managers will take the lead in all plan monitoring and update procedures. As such, the County Emergency Managers/County Managers agree to continue their relationship with the HMPC and:

- Act as a forum for hazard mitigation issues;
- Disseminate hazard mitigation ideas and activities to all participants;
- Pursue the implementation of high-priority, low/no-cost recommended actions;
- Ensure hazard mitigation remains a consideration for community decision makers;
- Maintain a vigilant monitoring of multi-objective cost-share opportunities to help the communities implement the plan's recommended actions for which no current funding exists;
- Monitor and assist in implementation and update of this plan;
- Report on plan progress and recommended revisions to their County Boards of Commissioners;
- Support local jurisdictions in reporting on plan progress and recommended revisions to their local governing bodies; and
- Inform and solicit input from the public.

The HMPC's primary duty moving forward is to see the plan successfully carried out and report to the individual County Boards of Commissioners, Town and City Councils, NCEM, FEMA, and the public on the status of plan implementation and mitigation opportunities. Other duties include reviewing and promoting mitigation proposals, considering stakeholder concerns about flood mitigation, passing concerns on to appropriate entities, and providing relevant information for posting on each County and local community websites (and others as appropriate).

Simultaneous to these efforts, it will be important to maintain a constant monitoring of funding opportunities that can be leveraged to implement some of the costlier recommended actions. This task will include creating and maintaining a bank of ideas on how to meet local match or participation requirements. When funding does become available, the Region, individual counties, and participating jurisdictions will be positioned to capitalize on the opportunity. Funding opportunities to be monitored include special pre- and post-disaster funds, state and federal earmarked funds, benefit assessments, and other grant programs, including those that can serve or support multi-objective applications.

8.2.2 MAINTENANCE SCHEDULE

Plan maintenance implies an ongoing effort to monitor and evaluate plan implementation and to update the plan as progress, roadblocks, or changing circumstances are recognized. The County Emergency Managers/County Managers will reconvene the HMPC quarterly for regular reviews and plan maintenance. These meetings may be held in-person or via conference call or webinar. The HMPC will also convene to review the plan after significant hazard events. If determined appropriate or as requested, an annual report on the plan will be developed and presented to local governing bodies of participating jurisdictions to report on implementation progress and recommended changes.

The five-year written update to this plan will be submitted to the NCEM and FEMA Region IV, unless disaster or other circumstances (e.g., changing regulations) require a change to this schedule. With this plan update anticipated to be adopted and fully approved by 2026, the next plan update for the Northeastern NC Region will be completed by 2031.

8.2.3 MAINTENANCE EVALUATION PROCESS

Evaluation of progress can be achieved by monitoring changes in vulnerabilities identified in the plan. Changes in vulnerability can be identified by noting:

- Decreased vulnerability as a result of implementing recommended actions;
- Increased vulnerability as a result of failed or ineffective mitigation actions; and/or
- Increased vulnerability as a result of new development (and/or annexation).

Updates to this plan will:

- Consider changes in vulnerability due to project implementation;
- Document success stories where mitigation efforts have proven effective;
- Document areas where mitigation actions were not effective;
- Document any new hazards that may arise or were previously overlooked;
- Incorporate new data or studies on hazards and risks;
- Incorporate new capabilities or changes in capabilities;
- Incorporate growth and development-related changes to Regional inventories; and
- Incorporate new project recommendations or changes in project prioritization.

In order to best evaluate any changes in vulnerability as a result of plan implementation, the HMPC will follow the following process:

- The HMPC representatives from each jurisdiction will be responsible for tracking and reporting on their mitigation actions. Jurisdictional representatives should provide input on whether the action as implemented met the defined objectives and/or is likely to be successful in reducing vulnerabilities.
- If the action does not meet identified objectives, the jurisdictional representatives will determine what additional measures may be implemented and will make any required modifications to the plan.
- All monitoring and implementation information will be reported to the full HMPC, led by the County Emergency Managers/County Managers, during quarterly meetings. An annual plan maintenance report may be drafted as deemed necessary.

Changes will be made to the plan as needed to accommodate for actions that have failed or are not considered feasible after a review of their consistency with established criteria, time frame, community priorities, and/or funding resources. Actions that were not ranked high but were identified as potential mitigation activities will be reviewed during the monitoring and update of this plan to determine feasibility of future implementation. Updating of the mitigation action plans will be by written changes and submissions, as is appropriate and necessary, and as approved by the appropriate jurisdiction's local governing body.

Following a disaster declaration, the plan will be revised as necessary to reflect lessons learned, or to address specific issues and circumstances arising from the event. It will be the responsibility of the County Emergency Managers/County Managers to reconvene the HMPC and ensure the appropriate stakeholders are invited to participate in the plan revision and update process following declared disaster events.

CRITERIA FOR QUARTERLY REVIEWS IN PREPARATION FOR 5-YEAR UPDATE

The criteria recommended in 44 CFR 201 and 206 will be utilized in reviewing and updating the plan. More specifically, quarterly reviews will monitor changes to the following information:

- Community growth or change in the past quarter.
- The number of substantially damaged or substantially improved structures by flood zone.
- The renovations to public infrastructure including water, sewer, drainage, roads, bridges, gas lines, and buildings.
- Natural hazard occurrences that required activation of the Emergency Operations Center (EOC) and whether the event resulted in a presidential disaster declaration.
- Natural hazard occurrences that were not of a magnitude to warrant activation of the EOC or a federal disaster declaration but were severe enough to cause damage in the community or closure of businesses, schools, or public services.
- The dates of hazard events descriptions.
- Documented damages due to the event.
- Closures of places of employment or schools and the number of days closed.
- Road or bridge closures due to the hazard and the length of time closed.
- Assessment of the number of private and public buildings damaged and whether the damage was minor, substantial, major, or if buildings were destroyed. The assessment will include residences, mobile homes, commercial structures, industrial structures, and public buildings, such as schools and public safety buildings.
- Review of any changes in federal, state, and local policies to determine the impact of these policies on the community and how and if the policy changes can or should be incorporated into the Hazard

Mitigation Plan. Review of the status of implementation of projects (mitigation strategies) including projects completed will be noted. Projects behind schedule will include a reason for delay of implementation.

8.3 CONTINUED PUBLIC INVOLVEMENT

Continued public involvement is imperative to the overall success of the plan's implementation. The quarterly review process will provide an opportunity to solicit participation from new and existing stakeholders and to publicize success stories from the plan implementation and seek additional public comment. Efforts to involve the public in the maintenance, evaluation, and revision process may include:

- Advertising HMPC meetings in the local newspaper, public bulletin boards and/or City and County office buildings;
- Designating willing citizens and private sector representatives as official members of the HMPC;
- Utilizing local media to update the public of any maintenance and/or review activities;
- Utilizing City and County websites to advertise any maintenance and/or review activities;
- Maintaining copies of the plan in public libraries or other appropriate venues;
- Posting annual progress reports on the Plan to County, City, and Town websites;
- Heavy publicity of the plan and potential ways for the public to be involved after significant hazard events, tailored to the event that has just happened;
- Keeping websites, social media outlets, etc. updated;
- Drafting articles for the local community newspapers/newsletters;
- Utilizing social media accounts (e.g. Twitter, Facebook).

PUBLIC INVOLVEMENT FOR FIVE-YEAR UPDATE

When the HMPC reconvenes for the five-year update, they will coordinate with all stakeholders participating in the planning process—including those that joined the committee since the planning process began—to update and revise the plan. In reconvening, the HMPC will be responsible for coordinating the activities necessary to involve the greater public, including disseminating information through a variety of media channels detailing the plan update process. As part of this effort, public meetings will be held, and public comments will be solicited on the plan update draft.

9 PLAN ADOPTION

Requirement §201.6(c)(5): [The plan shall include] documentation that the plan has been formally approved by the governing body of the jurisdiction requesting approval of the plan (e.g., City Council, County Commissioner, Tribal Council).

The purpose of formally adopting this plan is to secure buy-in, raise awareness of the plan, and formalize the plan's implementation. The adoption of this plan completes Planning Step 9 (Adopt the Plan) of the 10-step planning process, in accordance with the requirements of DMA 2000. FEMA Approval Letters and community adoption resolutions are provided below.

ANNEX A. BERTIE COUNTY

A.1 ASSET INVENTORY

Bertie County and the HMPC provided a local inventory of critical facilities and community lifelines, which are a priority for mitigation planning and emergency management. Lifelines are the most fundamental services in the community that, when stabilized, enable all other aspects of society to function. Table A.1 through Table A.9 provide a count of critical facilities by FEMA lifeline category by jurisdiction in Bertie County. Figure A.1 through Figure A.9 show the locations of all critical facilities by jurisdiction in Bertie County.

Table A.10 provides a detailed inventory of the critical facilities in Bertie County, indicating each facility's FEMA lifeline category, flood zone, 1% annual chance flood depth, minimum storm surge category, and wildfire risk. More information on hazard vulnerability is provided in Section A.2.

Table A.1 – Critical Facilities by Type, Unincorporated Bertie County

Facility Type	Count of Facility Type	Structure Value
Communications	0	\$-
Energy	0	\$-
Food, Hydration, Shelter	85	\$140,634,873
Hazardous Materials	4	\$575,803
Health and Medical	2	\$109,748
Safety and Security	4	\$784,344
Transportation	0	\$-
Water Systems	23	\$31,884,425
Total	118	\$173,989,193

Table A.2 – Critical Facilities by Type, Town of Askewville

Facility Type	Count of Facility Type	Structure Value
Communications	0	\$-
Energy	0	\$-
Food, Hydration, Shelter	1	\$1,824,150
Hazardous Materials	0	\$-
Health and Medical	1	\$93,315
Safety and Security	1	\$93,315
Transportation	0	\$-
Water Systems	0	\$-
Total	3	\$2,010,780

Table A.3 – Critical Facilities by Type, Town of Aulander

Facility Type	Count of Facility Type	Structure Value
Communications	0	\$-
Energy	0	\$-
Food, Hydration, Shelter	0	\$-
Hazardous Materials	0	\$-
Health and Medical	1	\$2,756
Safety and Security	2	\$491,665
Transportation	0	\$-
Water Systems	1	\$4,800
Total	4	\$499,221

Table A.4 – Critical Facilities by Type, Town of Colerain

Facility Type	Count of Facility Type	Structure Value
Communications	0	\$-
Energy	0	\$-
Food, Hydration, Shelter	2	\$5,110,094
Hazardous Materials	0	\$-
Health and Medical	1	\$234,081
Safety and Security	1	\$50,754
Transportation	0	\$-
Water Systems	0	\$-
Total	4	\$5,394,929

Table A.5 – Critical Facilities by Type, Town of Kelford

Facility Type	Count of Facility Type	Structure Value
Communications	0	\$-
Energy	0	\$-
Food, Hydration, Shelter	0	\$-
Hazardous Materials	0	\$-
Health and Medical	0	\$-
Safety and Security	1	\$54,090
Transportation	0	\$-
Water Systems	0	\$-
Total	1	\$54,090

Table A.6 – Critical Facilities by Type, Town of Lewiston-Woodville

Facility Type	Count of Facility Type	Structure Value
Communications	0	\$-
Energy	0	\$-
Food, Hydration, Shelter	0	\$-
Hazardous Materials	0	\$-
Health and Medical	1	\$154,202
Safety and Security	2	\$308,404
Transportation	0	\$-
Water Systems	0	\$-
Total	3	\$462,606

Table A.7 – Critical Facilities by Type, Town of Powellsville

Facility Type	Count of Facility Type	Structure Value
Communications	0	\$-
Energy	0	\$-
Food, Hydration, Shelter	0	\$-
Hazardous Materials	0	\$-
Health and Medical	1	\$178,149
Safety and Security	1	\$178,149
Transportation	0	\$-
Water Systems	1	\$8,323
Total	3	\$364,621

Table A.8 – Critical Facilities by Type, Town of Roxobel

Facility Type	Count of Facility Type	Structure Value
Communications	0	\$-
Energy	0	\$-
Food, Hydration, Shelter	0	\$-
Hazardous Materials	0	\$-
Health and Medical	0	\$-
Safety and Security	1	\$149,237
Transportation	0	\$-
Water Systems	0	\$-
Total	1	\$149,237

Table A.9 – Critical Facilities by Type, Town of Windsor

Facility Type	Count of Facility Type	Structure Value
Communications	0	\$-
Energy	0	\$-
Food, Hydration, Shelter	6	\$20,239,332
Hazardous Materials	0	\$-
Health and Medical	4	\$1,785,620
Safety and Security	6	\$7,636,482
Transportation	0	\$-
Water Systems	4	\$159,217
Total	20	\$29,820,651

Figure A.1 – Critical Facilities, Unincorporated Bertie County

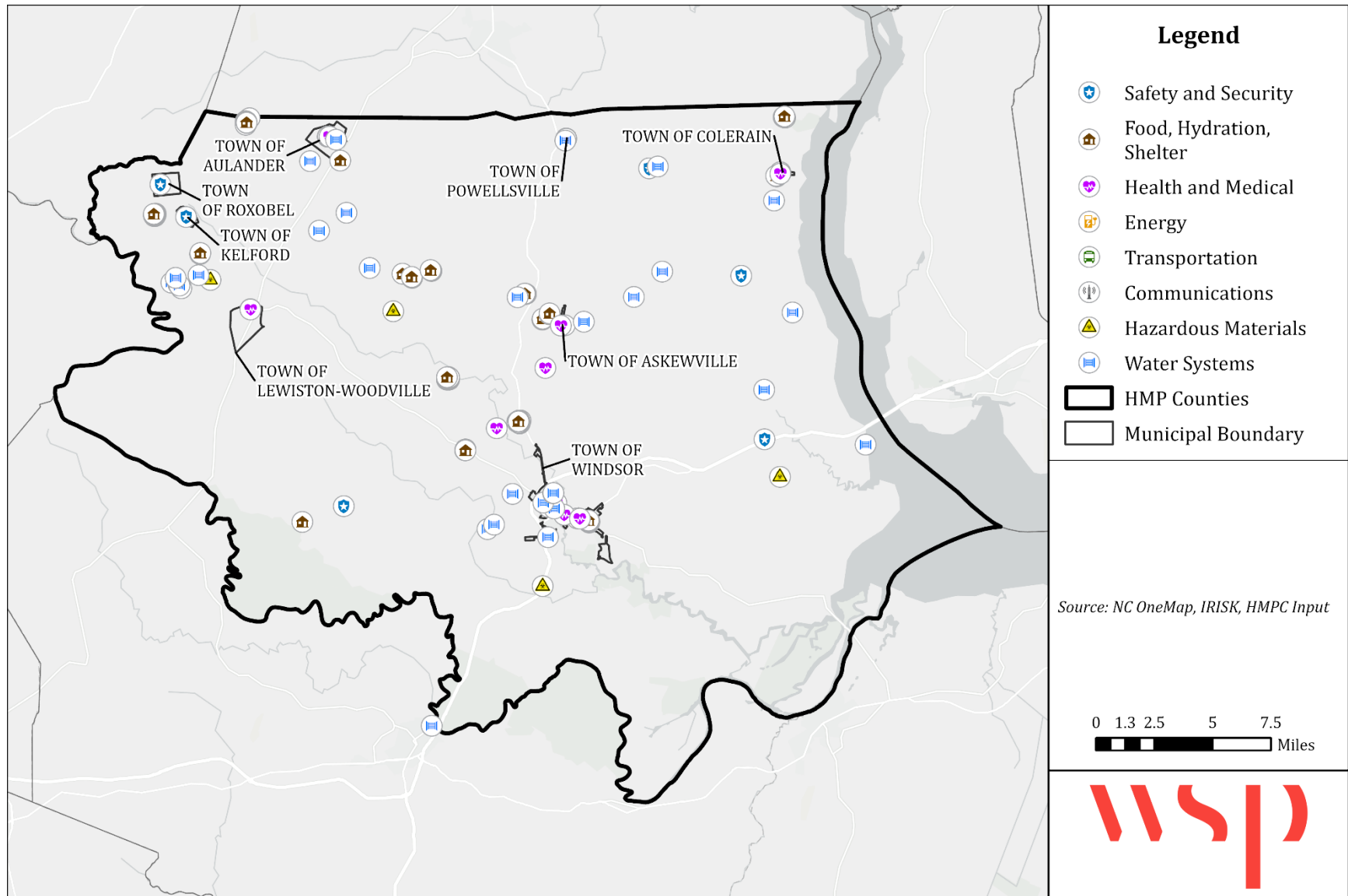


Figure A.2 – Critical Facilities, Town of Askewville

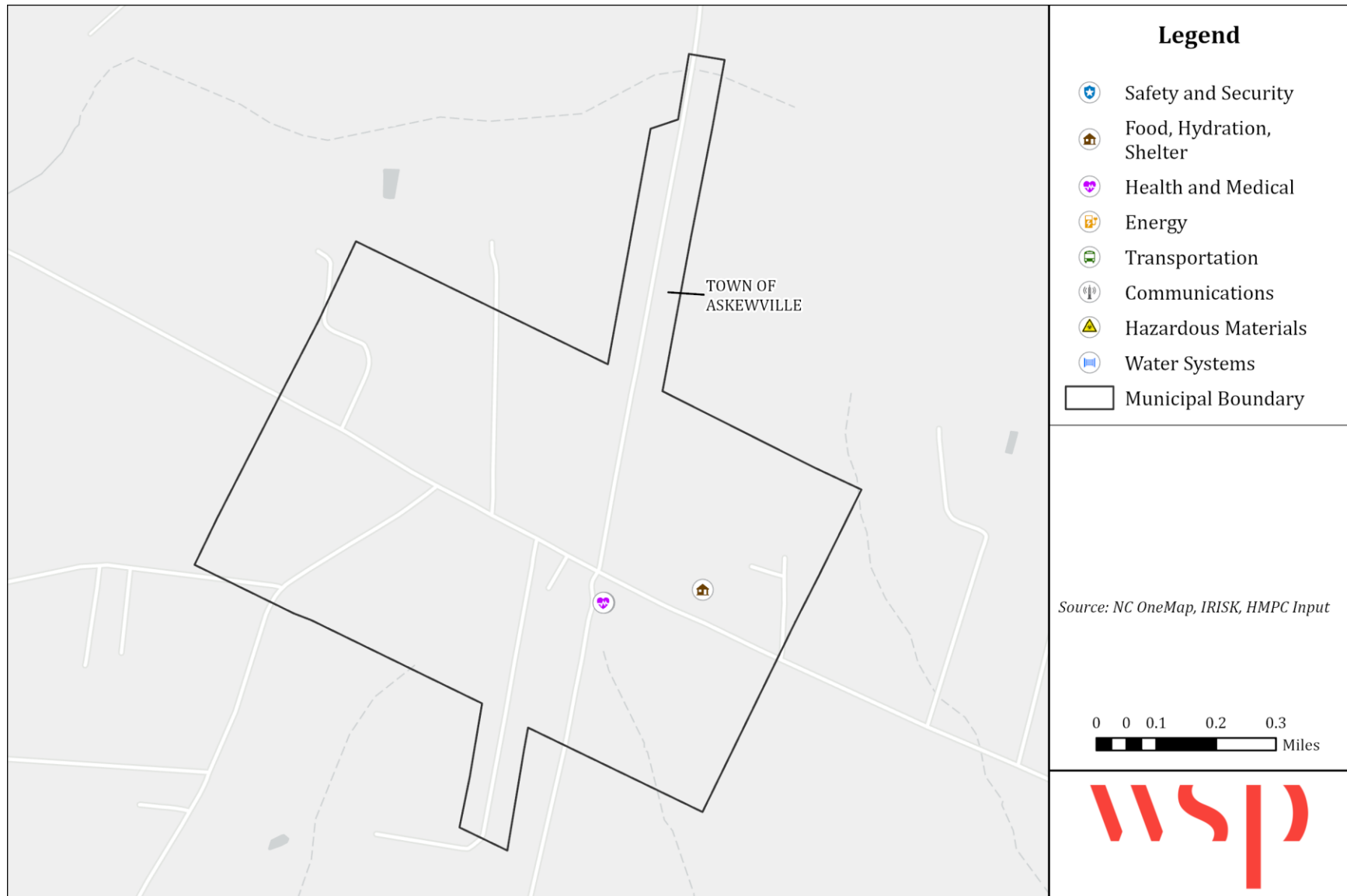


Figure A.3 – Critical Facilities, Town of Aulander

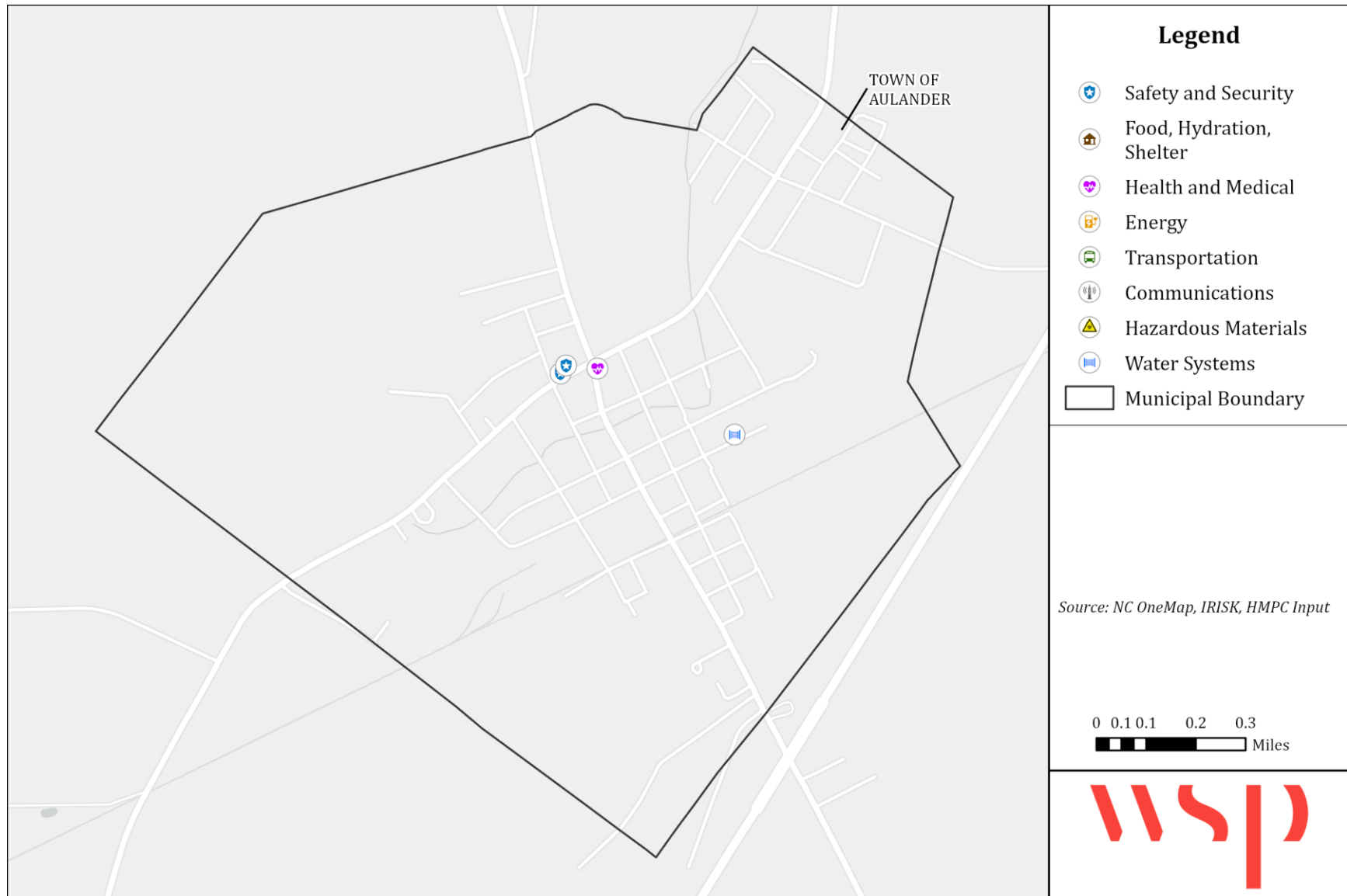


Figure A.4 – Critical Facilities, Town of Colerain

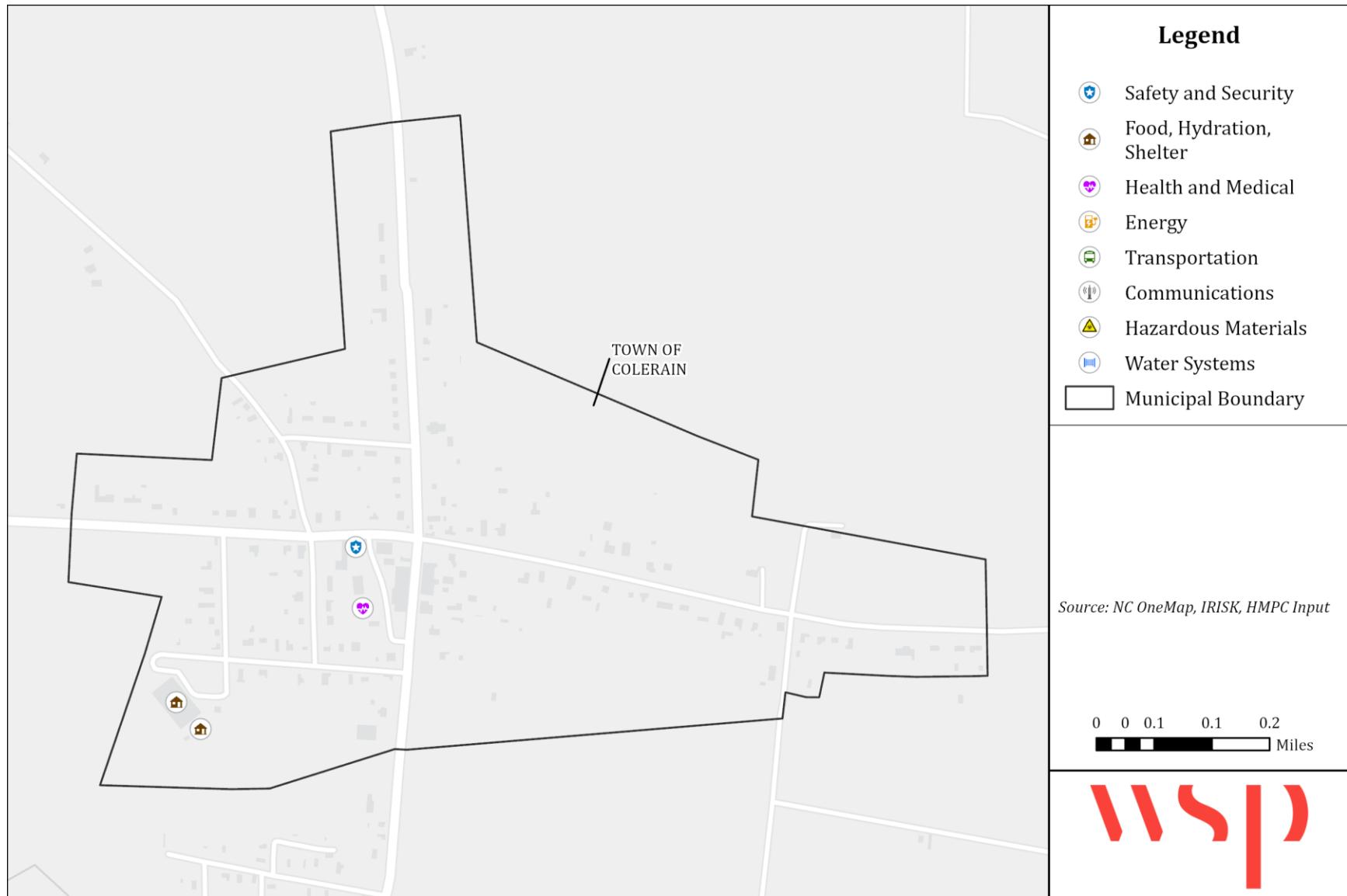


Figure A.5 – Critical Facilities, Town of Kelford

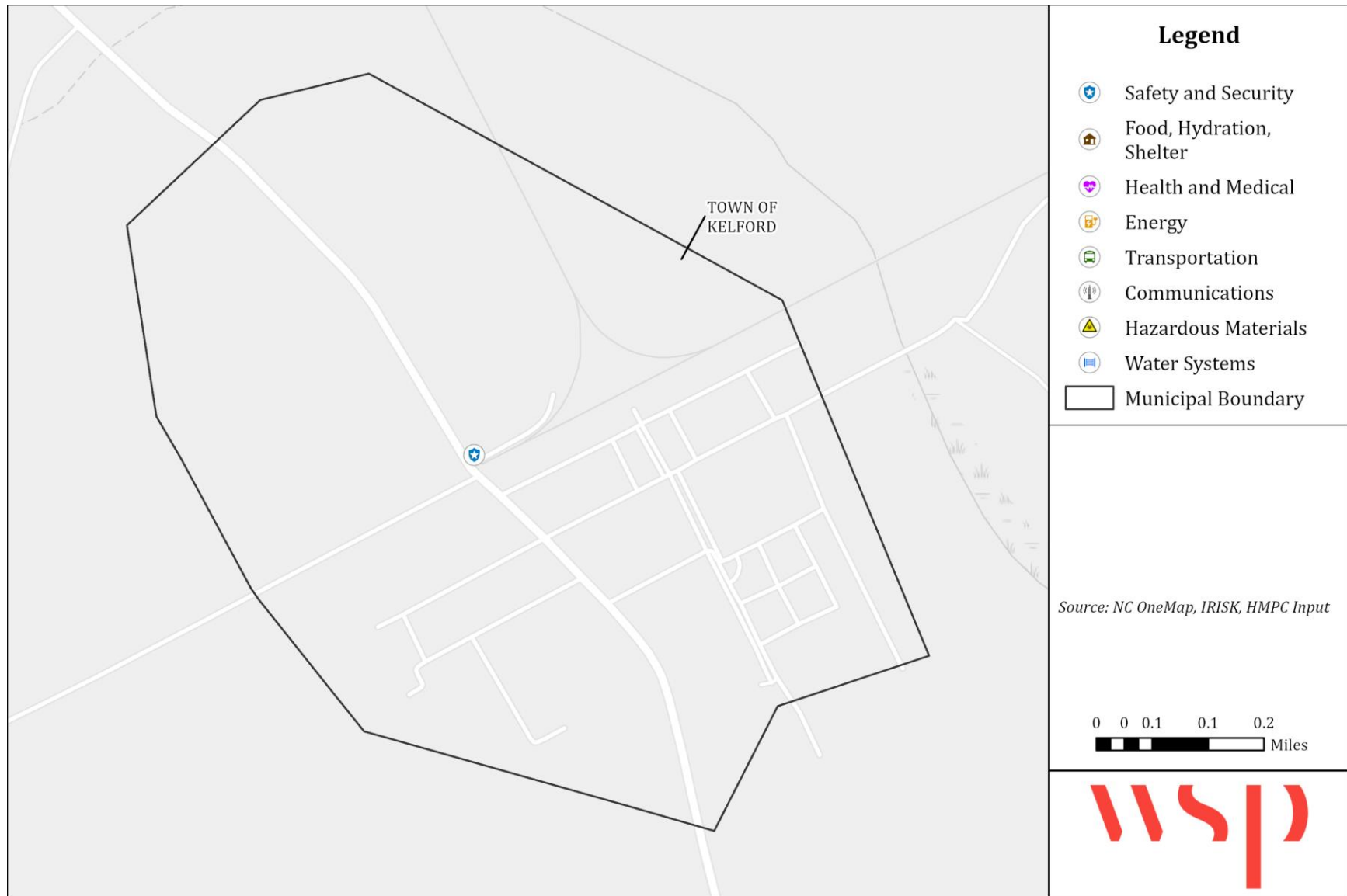


Figure A.6 – Critical Facilities, Town of Lewiston-Woodville

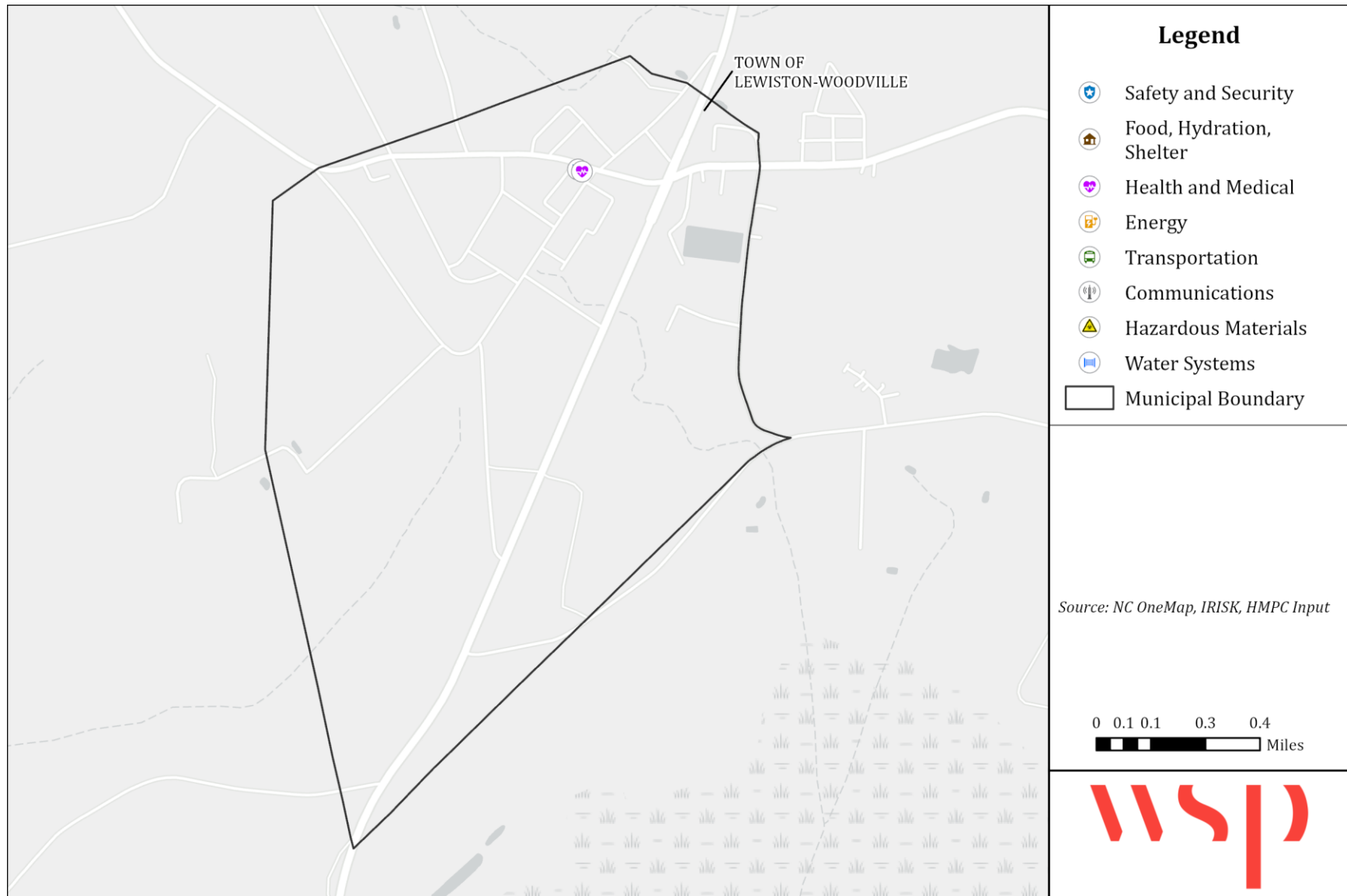


Figure A.7 – Critical Facilities, Town of Powellsville

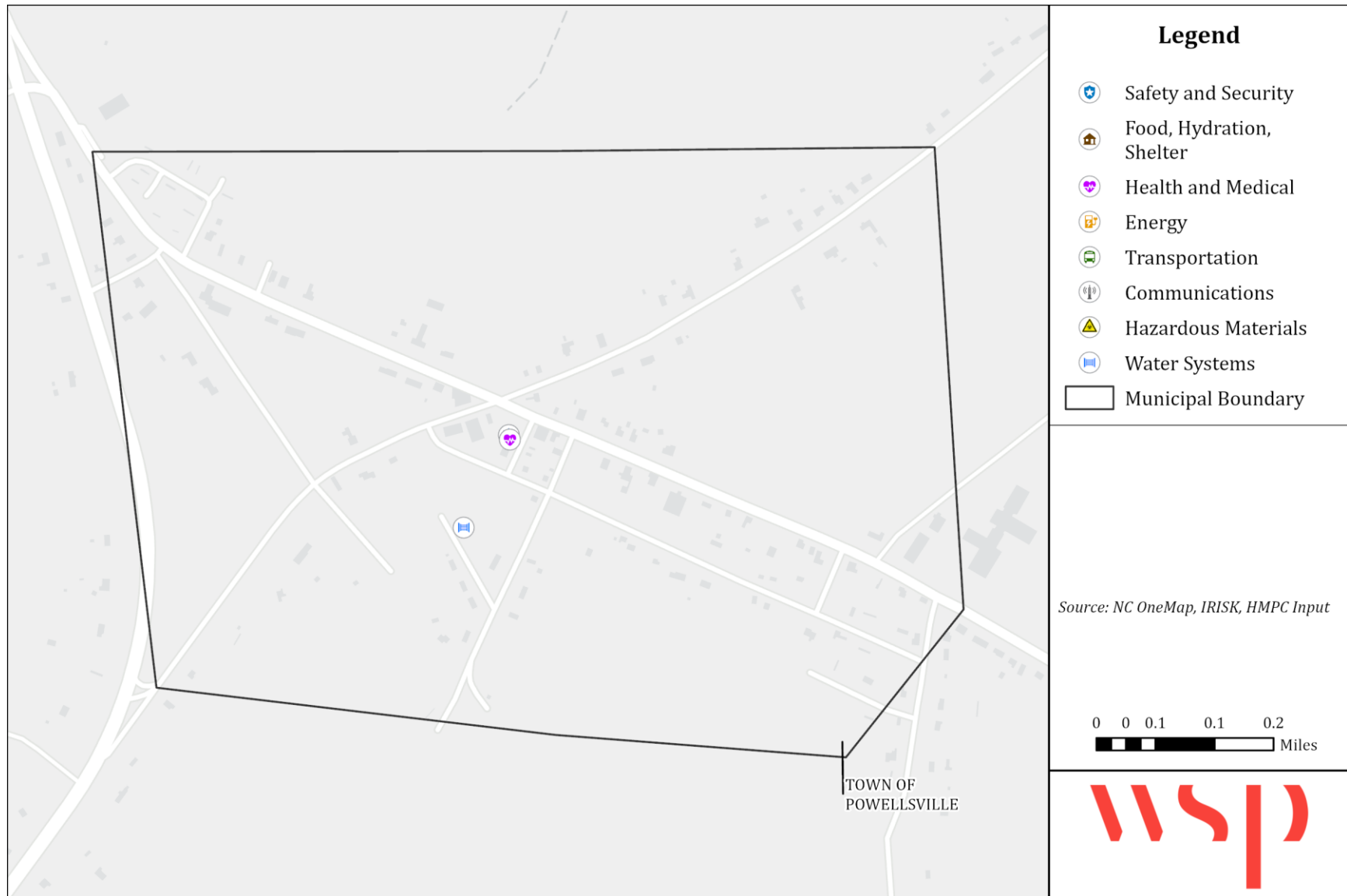


Figure A.8 – Critical Facilities, Town of Roxobel



Figure A.9 – Critical Facilities, Town of Windsor

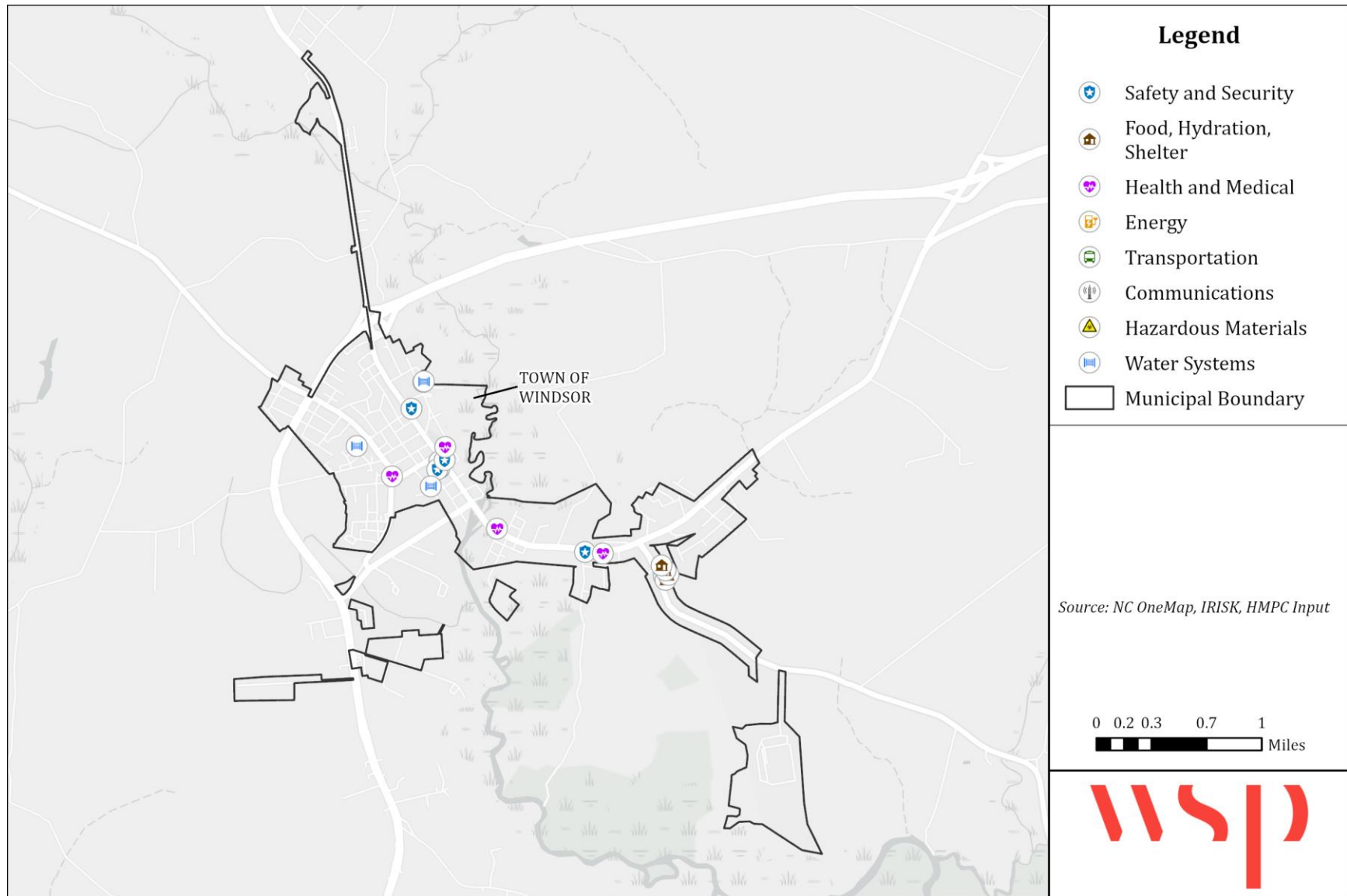


Table A.10 – Bertie County Critical Facilities Inventory

FEMA Lifeline	Facility Name	Address	Structure Value	Flood Depth	Flood Zone	Min. Storm Surge Cat.	High WUI Exposure	Fire Intensity
Unincorporated Bertie County								
Safety and Security	Blue Jay Volunteer Fire Company, Inc.	1653 Indianwoods Rd	\$96,899	0	X Unshaded	N/A	Indirect Exposure	0
Safety and Security	Merry Hill-Midway Volunteer Fire Department	109 NC 45 N	\$82,477	0	X Unshaded	N/A	Direct Exposure	2
Safety and Security	Perrytown Fire Department, Incorporated	848 Perrytown Rd	\$408,960	0	X Unshaded	N/A	Indirect Exposure	0
Safety and Security	Trap Volunteer Fire Department, Inc.	1404 Meadow Rd	\$196,008	0	X Unshaded	N/A	Direct Exposure	2
Food, Hydration, Shelter	Bertie HS	715 US 13 N	\$4,575,839	0	X Unshaded	N/A	Indirect Exposure	0
Health and Medical	White Oak Medical Transport	446 White Oak Road	\$109,748	0	X Unshaded	N/A	Direct Exposure	0
Health and Medical	Medi-Port Incorporated	344 School Road	-	0	X Unshaded	N/A	Direct Exposure	2.5
Hazardous Materials	Avoca, Incorporated	Avoca Farm Road	-	0	X Unshaded	N/A	Indirect Exposure	0
Hazardous Materials	Bill Clough Ford Inc	US 13 N	-	0	X Unshaded	N/A	Indirect Exposure	0
Hazardous Materials	Perdue Farms Inc	Governors Rd	-	0	X Unshaded	N/A	Indirect Exposure	0
Water Systems	Windsor, Town Of	128 South King Street	\$3,500	0	X Unshaded	N/A	Sources of Ember Load to Buildings	2
Water Systems	Aulander, Town Of	119 S Commerce St	\$58,500	0	X Unshaded	N/A	Direct Exposure	1
Water Systems	Clearwater Valley Water Assoc	516 Grabtown Rd	\$400	0	X Unshaded	N/A	Direct Exposure	2.5
Water Systems	Bertie County Regional Water	106 Dundee St	\$10,000	0	X Unshaded	N/A	Critical Fireshed	2
Water Systems	Bertie County Regional Water	106 Dundee St	\$10,000	0	X Unshaded	N/A	Sources of Ember Load to Buildings	2
Water Systems	Bertie County Regional Water	106 Dundee St	\$5,851	0	X Unshaded	N/A	Critical Fireshed	0
Water Systems	Bertie County Regional Water	106 Dundee St	\$12,500	0	X Unshaded	N/A	Indirect Exposure	0

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FEMA Lifeline	Facility Name	Address	Structure Value	Flood Depth	Flood Zone	Min. Storm Surge Cat.	High WUI Exposure	Fire Intensity
Water Systems	Bertie County Regional Water	106 Dundee St	\$10,726	0	X Unshaded	N/A	Critical Fireshed	0
Water Systems	Bertie County Regional Water	106 Dundee St	\$23,419	0	X Unshaded	N/A	Critical Fireshed	0
Water Systems	Bertie County Regional Water	106 Dundee St	\$10,675	0	X Unshaded	N/A	Critical Fireshed	0
Water Systems	Bertie County Regional Water	106 Dundee St	\$10,000	0	X Unshaded	N/A	Sources of Ember Load to Buildings	2.5
Water Systems	Bertie County Regional Water	106 Dundee St	\$160,765	0	X Unshaded	N/A	Indirect Exposure	0
Water Systems	Bertie County Regional Water	106 Dundee St	\$16,500	0	X Unshaded	N/A	Critical Fireshed	2
Water Systems	Bertie County Regional Water	106 Dundee St	\$260,500	0	X Unshaded	N/A	Indirect Exposure	0
Water Systems	Bertie County Regional Water	106 Dundee St	\$262,700	0	X Unshaded	N/A	Sources of Ember Load to Buildings	3
Water Systems	Bertie County Regional Water	106 Dundee St	\$10,408	0	X Unshaded	N/A	Critical Fireshed	2
Water Systems	Perdue Foods LLC	-	-	0	X Unshaded	N/A	Critical Fireshed	2
Water Systems	Perdue Foods LLC	-	\$7,746,228	0	X Unshaded	N/A	Critical Fireshed	0
Water Systems	Perdue Foods LLC	-	\$7,746,228	0	X Unshaded	N/A	Critical Fireshed	0
Water Systems	Perdue Foods LLC	-	\$7,746,228	0	X Unshaded	N/A	Critical Fireshed	2.5
Water Systems	Perdue Foods LLC	-	\$7,746,228	0	X Unshaded	N/A	Critical Fireshed	0
Water Systems	Perdue Foods LLC	-	-	0	X Unshaded	N/A	Critical Fireshed	2
Water Systems	Bertie Beach	243 Bal Gra Road	\$33,069	0	X Unshaded	N/A	Critical Fireshed	3
Food, Hydration, Shelter	Kelford Hog Farm	222 Kelford Farms Rd (1138)	-	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	Farm 35 & 33	721 Buck Branch Rd (1213)	\$1,249,140	0	X Unshaded	N/A	Sources of Ember Load to Buildings	2.5
Food, Hydration, Shelter	Tri G Farms	1335 NC 305	\$325	0	X Unshaded	N/A	Critical Fireshed	1
Food, Hydration, Shelter	Tri-G3 Farm	OFF 1236 NC 305	\$12,016	0	X Unshaded	N/A	Direct Exposure	0
Food, Hydration, Shelter	Indian Woods	603 Billip Club Rd (1123)	\$4,579	0	X Unshaded	N/A	Critical Fireshed	0
Food, Hydration, Shelter	Republican Sow Farm	352 Spruill Farm Rd	\$1,941,392	0	X Unshaded	N/A	Indirect Exposure	0

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FEMA Lifeline	Facility Name	Address	Structure Value	Flood Depth	Flood Zone	Min. Storm Surge Cat.	High WUI Exposure	Fire Intensity
Hazardous Materials	East Carolina Environmental Regional Landfill	1922 Republican Rd (1225)	\$575,803	0	X Unshaded	N/A	Critical Fireshed	0
Food, Hydration, Shelter	-	811 GOVERNORS RD (NC 308)	\$1,839,603	0	X Unshaded	N/A	Direct Exposure	1
Food, Hydration, Shelter	-	811 GOVERNORS RD (NC 308)	\$1,839,603	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	811 GOVERNORS RD (NC 308)	\$1,839,603	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	230 Kelford Farms Rd	\$32,173	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	721 Buck Branch Rd (1213)	\$1,249,140	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	721 Buck Branch Rd (1213)	\$1,249,140	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	721 Buck Branch Rd (1213)	\$1,249,140	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	721 Buck Branch Rd (1213)	\$1,249,140	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	721 Buck Branch Rd (1213)	\$1,249,140	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	721 Buck Branch Rd (1213)	\$1,249,140	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	713 US 13N	\$4,575,839	0	X Shaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	713 US 13N	\$4,575,839	0	X Shaded	N/A	Direct Exposure	0
Food, Hydration, Shelter	-	713 US 13N	\$4,575,839	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	713 US 13N	\$4,575,839	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	811 GOVERNORS RD (NC 308)	\$1,839,603	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	352 Spruill Farm Rd	\$1,941,392	0	X Unshaded	N/A	Direct Exposure	2
Food, Hydration, Shelter	-	352 Spruill Farm Rd	\$1,941,392	0	X Unshaded	N/A	Direct Exposure	1
Food, Hydration, Shelter	-	352 Spruill Farm Rd	\$1,941,392	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	352 Spruill Farm Rd	\$1,941,392	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	352 Spruill Farm Rd	\$1,941,392	0	X Unshaded	N/A	Indirect Exposure	0

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FEMA Lifeline	Facility Name	Address	Structure Value	Flood Depth	Flood Zone	Min. Storm Surge Cat.	High WUI Exposure	Fire Intensity
Food, Hydration, Shelter	-	352 Spruill Farm Rd	\$1,941,392	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	352 Spruill Farm Rd	\$1,941,392	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	352 Spruill Farm Rd	\$1,941,392	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	352 Spruill Farm Rd	\$1,941,392	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	352 Spruill Farm Rd	\$1,941,392	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	352 Spruill Farm Rd	\$1,941,392	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	721 BUCK BRANCH RD (1213)	\$1,249,140	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	721 BUCK BRANCH RD (1213)	\$1,249,140	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	721 BUCK BRANCH RD (1213)	\$1,249,140	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	721 BUCK BRANCH RD (1213)	\$1,249,140	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	721 BUCK BRANCH RD (1213)	\$1,249,140	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	721 BUCK BRANCH RD (1213)	\$1,249,140	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	721 BUCK BRANCH RD (1213)	\$1,249,140	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	721 BUCK BRANCH RD (1213)	\$1,249,140	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	721 BUCK BRANCH RD (1213)	\$1,249,140	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	721 BUCK BRANCH RD (1213)	\$1,249,140	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	713 US 13N	\$4,575,839	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	713 US 13N	\$4,575,839	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	713 US 13N	\$4,575,839	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	713 US 13N	\$4,575,839	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	713 US 13N	\$4,575,839	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	713 US 13N	\$4,575,839	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	713 US 13N	\$4,575,839	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	713 US 13N	\$4,575,839	0	X Unshaded	N/A	Indirect Exposure	0

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FEMA Lifeline	Facility Name	Address	Structure Value	Flood Depth	Flood Zone	Min. Storm Surge Cat.	High WUI Exposure	Fire Intensity
Food, Hydration, Shelter	-	713 US 13N	\$4,575,839	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	713 US 13N	\$4,575,839	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	713 US 13N	\$4,575,839	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	Unknown	-	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	246 Askewville Rd	\$435,005	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	246 Askewville Rd	\$435,005	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	246 Askewville Rd	\$435,005	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	117 Askewville Mizelle St	\$403,940	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	117 Askewville Mizelle St	\$403,940	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	117 Askewville Mizelle St	\$403,940	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	230 Kelford Farms Rd	\$32,173	0	X Unshaded	N/A	Direct Exposure	2
Food, Hydration, Shelter	-	230 Kelford Farms Rd	\$32,173	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	230 Kelford Farms Rd	\$32,173	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	230 Kelford Farms Rd	\$32,173	0	X Unshaded	N/A	Direct Exposure	2.5
Food, Hydration, Shelter	-	230 Kelford Farms Rd	\$32,173	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	230 Kelford Farms Rd	\$32,173	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	230 Kelford Farms Rd	\$32,173	0	X Unshaded	N/A	Direct Exposure	2
Food, Hydration, Shelter	-	230 Kelford Farms Rd	\$32,173	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	230 Kelford Farms Rd	\$32,173	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	230 Kelford Farms Rd	\$32,173	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	2513 NC 305	\$2,123,945	0	X Unshaded	N/A	Direct Exposure	2.5
Food, Hydration, Shelter	-	OFF 1845 US 13N	\$1,268,434	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	OFF 1845 US 13N	\$1,268,434	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	OFF 1845 US 13N	\$1,268,434	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	OFF 1845 US 13N	\$1,268,434	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	1239 NC 305	\$289,102	0	X Unshaded	N/A	Direct Exposure	2
Food, Hydration, Shelter	-	1239 NC 305	\$289,102	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	1239 NC 305	\$289,102	0	X Unshaded	N/A	Indirect Exposure	0

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FEMA Lifeline	Facility Name	Address	Structure Value	Flood Depth	Flood Zone	Min. Storm Surge Cat.	High WUI Exposure	Fire Intensity
Food, Hydration, Shelter	-	OFF 1236 NC 305	\$12,016	0	X Unshaded	N/A	Direct Exposure	2.5
Food, Hydration, Shelter	-	OFF 1236 NC 305	\$12,016	0	X Unshaded	N/A	Direct Exposure	0
Food, Hydration, Shelter	-	3736 GOVERNORS RD	\$2,901,708	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	3736 GOVERNORS RD	\$2,901,708	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	Unknown	-	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	Unknown	-	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	Unknown	-	0	X Unshaded	N/A	Direct Exposure	2
Town of Askewville								
Safety and Security	Askewville Volunteer Fire Department, Inc.	105 S Railroad St	\$93,315	0	X Unshaded	N/A	Indirect Exposure	0
Health and Medical	Askewville Volunteer Fire Department Incorporated	105 Askewville South Railroad Street	\$93,315	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	119 E Askewville St	\$1,824,150	0	X Unshaded	N/A	Indirect Exposure	0
Town of Aulander								
Safety and Security	Aulander Fire Department	124 W. Main St.	\$118,908	0	X Unshaded	N/A	Indirect Exposure	0
Safety and Security	Aulander Police Department	124 West Main Street	\$372,757	0	X Unshaded	N/A	Indirect Exposure	0
Health and Medical	Preferred Medical Transport	105 South Commerce Street	\$2,756	0	X Unshaded	N/A	Indirect Exposure	0
Water Systems	Aulander, Town Of	119 S Commerce St	\$4,800	1.1	AE	N/A	Indirect Exposure	0
Town of Colerain								
Safety and Security	Colerain Fire Department	110 Winton Street	\$50,754	0	X Unshaded	N/A	Indirect Exposure	0
Health and Medical	Colerain Rescue Squad	110 Winton Street	\$234,081	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	204 N Academy St	\$2,555,047	0	X Unshaded	N/A	Direct Exposure	2
Food, Hydration, Shelter	-	204 N Academy St	\$2,555,047	0	X Unshaded	N/A	Indirect Exposure	0
Town of Kelford								
Safety and Security	Kelford Volunteer Fire Dept. Inc.	106 N. Main St	\$54,090	0	X Unshaded	N/A	Indirect Exposure	0

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FEMA Lifeline	Facility Name	Address	Structure Value	Flood Depth	Flood Zone	Min. Storm Surge Cat.	High WUI Exposure	Fire Intensity
Town of Lewiston-Woodville								
Safety and Security	Lewiston Woodville Volunteer Fire Department, Inc.	103 W. Church Street	\$154,202	0	X Unshaded	N/A	Indirect Exposure	0
Safety and Security	Lewiston Woodville Police Department	103 West Church Street	\$154,202	0	X Unshaded	N/A	Indirect Exposure	0
Health and Medical	Lewiston Woodville Volunteer Fire and EMS	103 West Church Street	\$154,202	0	X Unshaded	N/A	Indirect Exposure	0
Town of Powellsville								
Safety and Security	Powellsville Volunteer Fire Department, Inc.	106 Curtis St.	\$178,149	0	X Unshaded	N/A	Indirect Exposure	0
Health and Medical	Powellsville Volunteer Fire Department Incorporated	105 Curtis St.	\$178,149	0	X Unshaded	N/A	Indirect Exposure	0
Water Systems	Powellsville, Town Of	106 E Main St	\$8,323	0	X Unshaded	N/A	Indirect Exposure	0
Town of Roxobel								
Safety and Security	Roxobel Volunteer Fire Department, Inc.	204 S Main St	\$149,237	0	X Unshaded	N/A	Direct Exposure	2
Town of Windsor								
Safety and Security	Windsor Fire Department	501 N King St.	\$435,341	0	X Unshaded	N/A	Indirect Exposure	0
Safety and Security	Windsor Police Department	128 South King Street	\$33,592	0	X Shaded	Category 4	Indirect Exposure	0
Safety and Security	Bertie County Sheriffs Office	104 Dundee Street	\$3,003,272	0	X Shaded	Category 4	Indirect Exposure	0
Safety and Security	North Carolina State Bureau Of Investigation	108 Dundee Street	\$3,003,272	0	X Shaded	Category 4	Indirect Exposure	0
Health and Medical	Coastal Medical Transport Incorporated	101 South Granville Street	\$1,302,973	0	X Unshaded	N/A	Indirect Exposure	0
Health and Medical	Bertie County Rescue Squad	208 East Granville Street	\$137,846	2.9	AE	Category 3	Direct Exposure	2.5
Health and Medical	Bertie Ambulance Service Incorporated	601 South King Street	\$344,801	2.7	AE	Category 4	Indirect Exposure	0
Health and Medical	Vidant-Bertie Hospital	1403 South King Street	-	0	X Unshaded	N/A	Indirect Exposure	0

ANNEX A: BERTIE COUNTY

FEMA Lifeline	Facility Name	Address	Structure Value	Flood Depth	Flood Zone	Min. Storm Surge Cat.	High WUI Exposure	Fire Intensity
Safety and Security	Bertie County Health Department Albemarle District	102 Rhodes Avenue	\$849,365	0	X Shaded	Category 4	Indirect Exposure	0
Water Systems	Windsor, Town Of	128 South King Street	\$88,417	0	X Shaded	Category 4	Indirect Exposure	0
Water Systems	Windsor, Town Of	128 South King Street	\$70,800	0	X Unshaded	N/A	Indirect Exposure	0
Water Systems	Windsor, Town Of	128 South King Street	-	0	X Unshaded	N/A	Indirect Exposure	0
Water Systems	Windsor, Town Of	128 South King Street	-	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	104 Cooper Hill Rd	\$3,373,222	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	104 Cooper Hill Rd	\$3,373,222	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	104 Cooper Hill Rd	\$3,373,222	0	X Unshaded	N/A	Direct Exposure	2
Food, Hydration, Shelter	-	104 Cooper Hill Rd	\$3,373,222	0	X Unshaded	N/A	Direct Exposure	0
Food, Hydration, Shelter	-	104 Cooper Hill Rd	\$3,373,222	0	X Unshaded	N/A	Indirect Exposure	0
Food, Hydration, Shelter	-	104 Cooper Hill Rd	\$3,373,222	0	X Unshaded	N/A	Indirect Exposure	0
Safety and Security	-	128 S King St	\$311,640	0	X Shaded	Category 4	Indirect Exposure	0

A.2 RISK ASSESSMENT

This section contains a summary of the County's asset inventory as well as hazard profile and vulnerability assessment for those hazards that are spatially defined and have variations in risk that could be evaluated quantitatively on a jurisdictional level. The hazards included in this section are: Flooding, Hurricanes & Coastal Hazards, and Wildfire.

A.2.1 FLOODING

Table A.11 details the acreage of Bertie County's total area by jurisdiction and flood zone on the Effective DFIRM. Per this assessment, at 27 percent, unincorporated Bertie County has the largest portion of land area within the mapped 1%-annual-chance floodplain. Conversely, the Towns of Colerain and Powellsville are entirely outside the SFHA.

Table A.11 – Flood Zone Acreage by Jurisdiction, Bertie County

Flood Zone	Acreage	Percent of Total
Unincorporated Bertie County		
Zone AE	120,324.0	25.7%
Zone AO	0.3	0.0%
Zone VE	6,031.3	1.3%
Zone X Shaded	4,513.9	1.0%
Zone X Unshaded	322,662.3	68.8%
Open Water	15,129.2	3.2%
Total	468,661.0	-
Askewville		
Zone AE	2.6	0.7%
Zone X Unshaded	363.0	99.3%
Total	365.6	-
Aulander		
Zone AE	142.7	13.7%
Zone X Shaded	55.5	5.3%
Zone X Unshaded	842.2	80.9%
Total	1,040.4	-
Colerain		
Zone X Unshaded	173.0	100.0%
Total	173.0	-
Kelford		
Zone AE	43.8	13.4%
Zone X Unshaded	284.1	86.6%
Total	327.9	-
Lewiston-Woodville		
Zone AE	58.1	4.6%
Zone X Shaded	12.0	1.0%
Zone X Unshaded	1,187.6	94.4%
Total	1,257.7	-

Flood Zone	Acreage	Percent of Total
Powellsville		
Zone X Unshaded	215.6	100.0%
Total	215.6	-
Roxobel		
Zone AE	11.5	1.7%
Zone X Shaded	1.1	0.2%
Zone X Unshaded	654.1	98.1%
Total	666.7	-
Windsor		
Zone AE	387.1	22.6%
Zone X Shaded	166.7	9.8%
Zone X Unshaded	1,155.2	67.6%
Total	1,709.0	-
Bertie County Total		
Zone AE	120,582.8	25.5%
Zone AO	0.3	0.0%
Zone VE	6,031.3	1.3%
Zone X Shaded	4,582.5	1.0%
Zone X Unshaded	326,381.8	69.0%
Open Water	15,129.2	3.2%
Total	472,707.8	-

Source: FEMA Effective DFIRM

Figure A.10 through Figure A.16 reflect the effective mapped flood hazard zones for all jurisdictions in Bertie County with land in or near the SFHA, and Figure A.17 through Figure A.23 display the depth of flooding estimated to occur in these areas during the 1%-annual-chance flood.

Table A.12 provides building counts and values for critical facilities by flood zone in Bertie County and participating jurisdictions.

Table A.12 – Critical Facilities Exposed to Flooding by Event and Jurisdiction

Flood Zone	Critical Facility Count	Structure Value
Unincorporated Bertie County		
Zone X (500-year)	2	\$9,151,678
Zone X (unshaded)	116	\$164,837,515
Total	118	\$173,989,193
Askewville		
Zone X (unshaded)	3	\$2,010,780
Total	3	\$2,010,780
Aulander		
Zone AE	1	\$4,800
Zone X (unshaded)	3	\$494,421
Total	4	\$499,221
Colerain		
Zone X (unshaded)	4	\$5,394,929
Total	4	\$5,394,929

ANNEX A: BERTIE COUNTY

Flood Zone	Critical Facility Count	Structure Value
Kelford		
Zone X (unshaded)	1	\$54,090
Total	1	\$54,090
Lewiston-Woodville		
Zone X (unshaded)	3	\$462,606
Total	3	\$462,606
Powellsville		
Zone X (unshaded)	3	\$364,621
Total	3	\$364,621
Roxobel		
Zone X (unshaded)	1	\$149,237
Total	1	\$149,237
Windsor		
Zone AE	2	\$482,647
Zone X (500-year)	6	\$7,289,558
Zone X (unshaded)	12	\$22,048,446
Total	20	\$29,820,651
Bertie County Total		
Zone AE	3	\$487,447
Zone X (500-year)	8	\$16,441,236
Zone X (unshaded)	146	\$195,816,645
Total	157	\$212,745,328

Source: FEMA Effective DFIRM, HMPC

Figure A.10 – FEMA Flood Hazard Areas, Unincorporated Bertie County

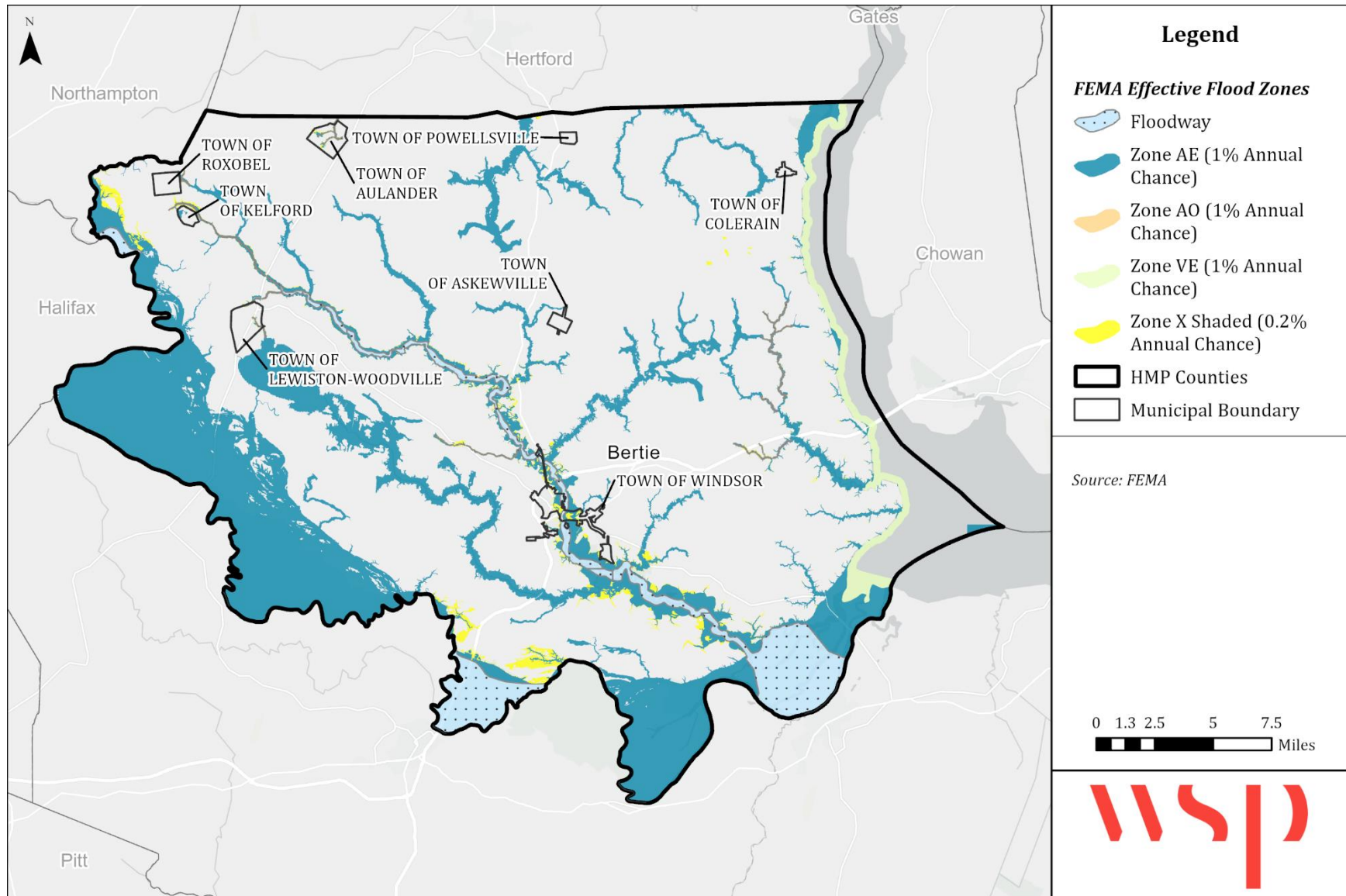


Figure A.11 – FEMA Flood Hazard Areas, Town of Askewville



Figure A.12 – FEMA Flood Hazard Areas, Town of Aulander

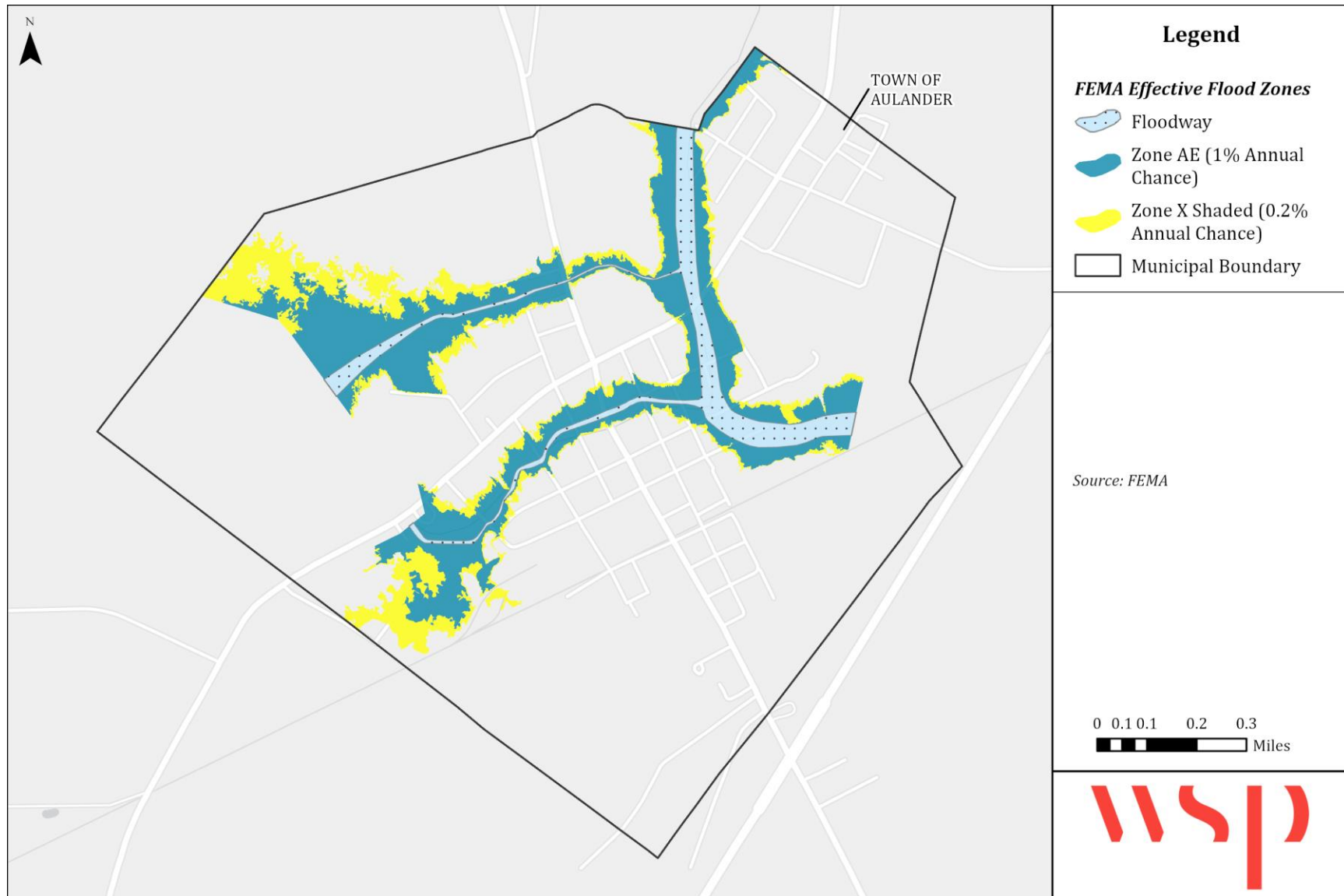


Figure A.13 – FEMA Flood Hazard Areas, Town of Kelford

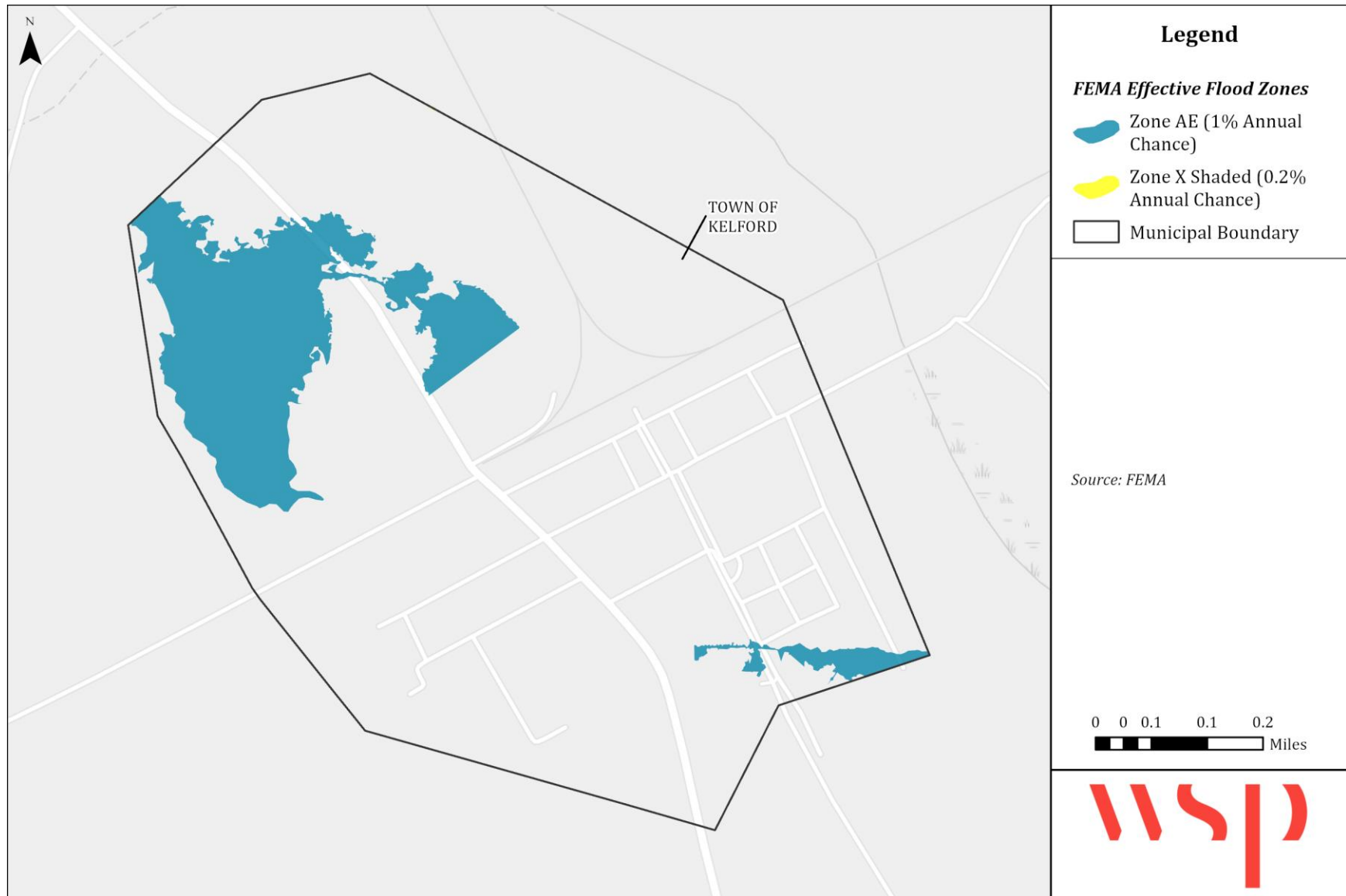


Figure A.14 – FEMA Flood Hazard Areas, Town of Lewiston-Woodville

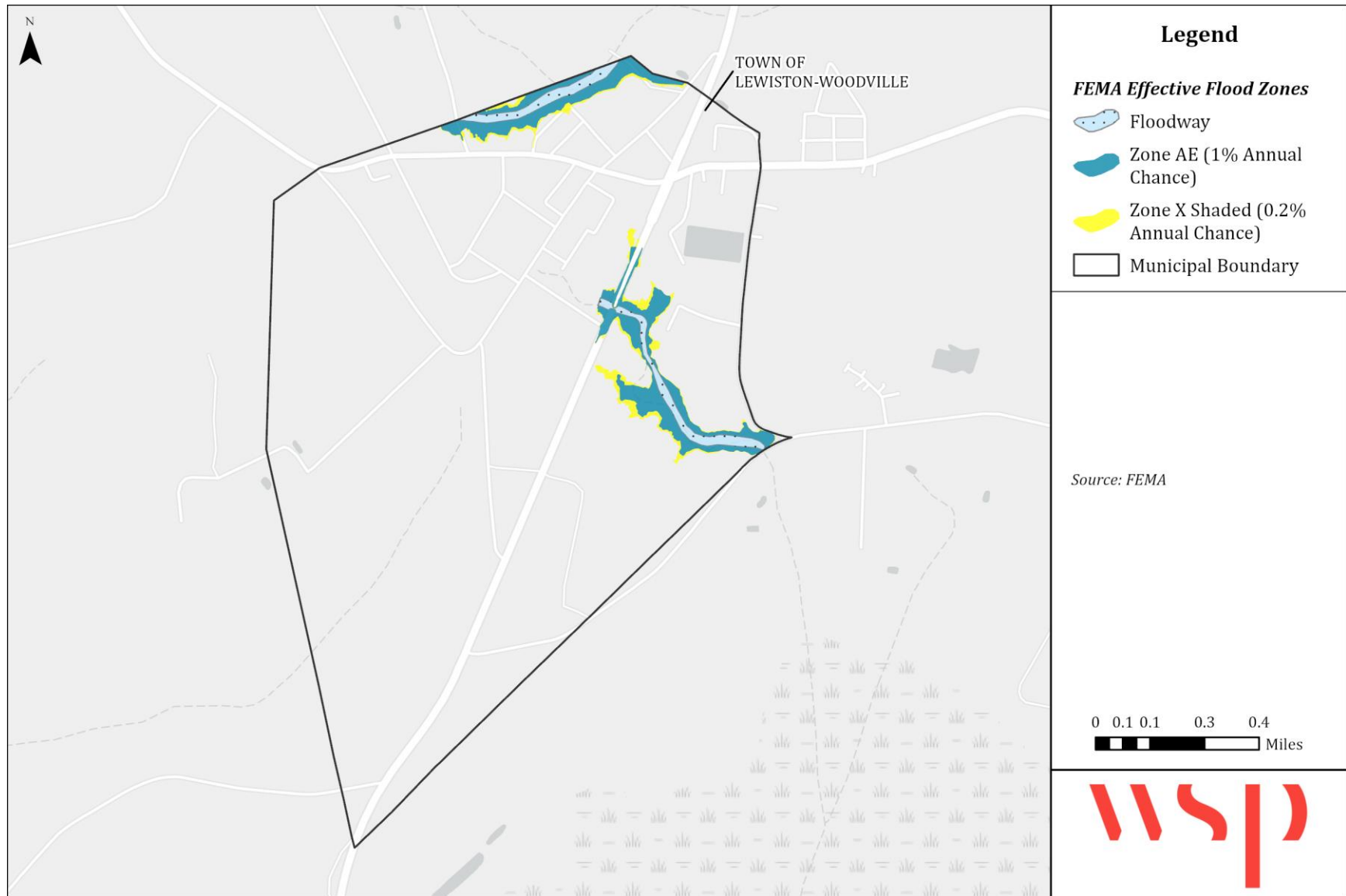


Figure A.15 – FEMA Flood Hazard Areas, Town of Roxobel



Figure A.16 – FEMA Flood Hazard Areas, Town of Windsor

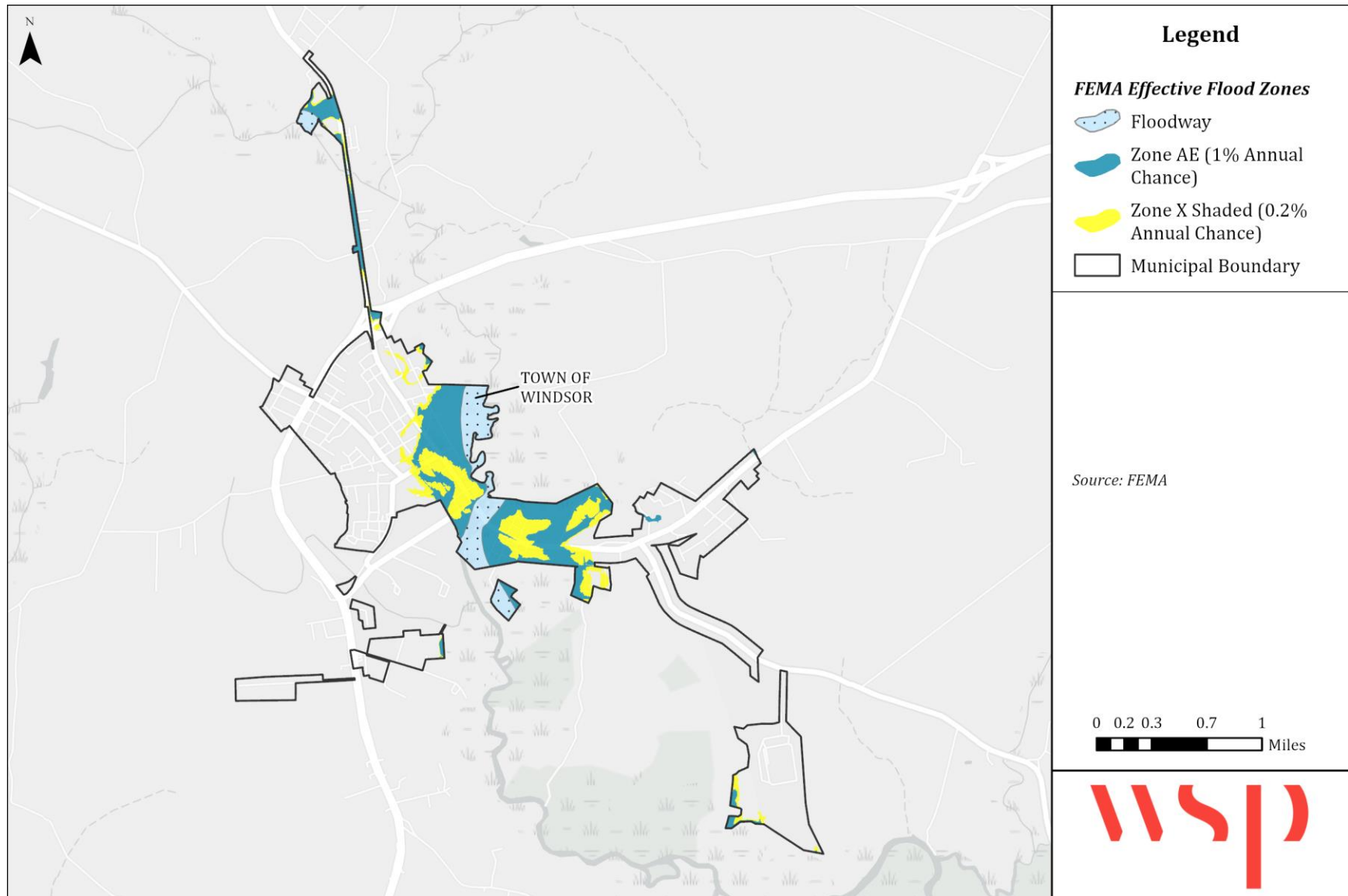


Figure A.17 – Flood Depth, 1%-Annual-Chance Floodplain, Unincorporated Bertie County

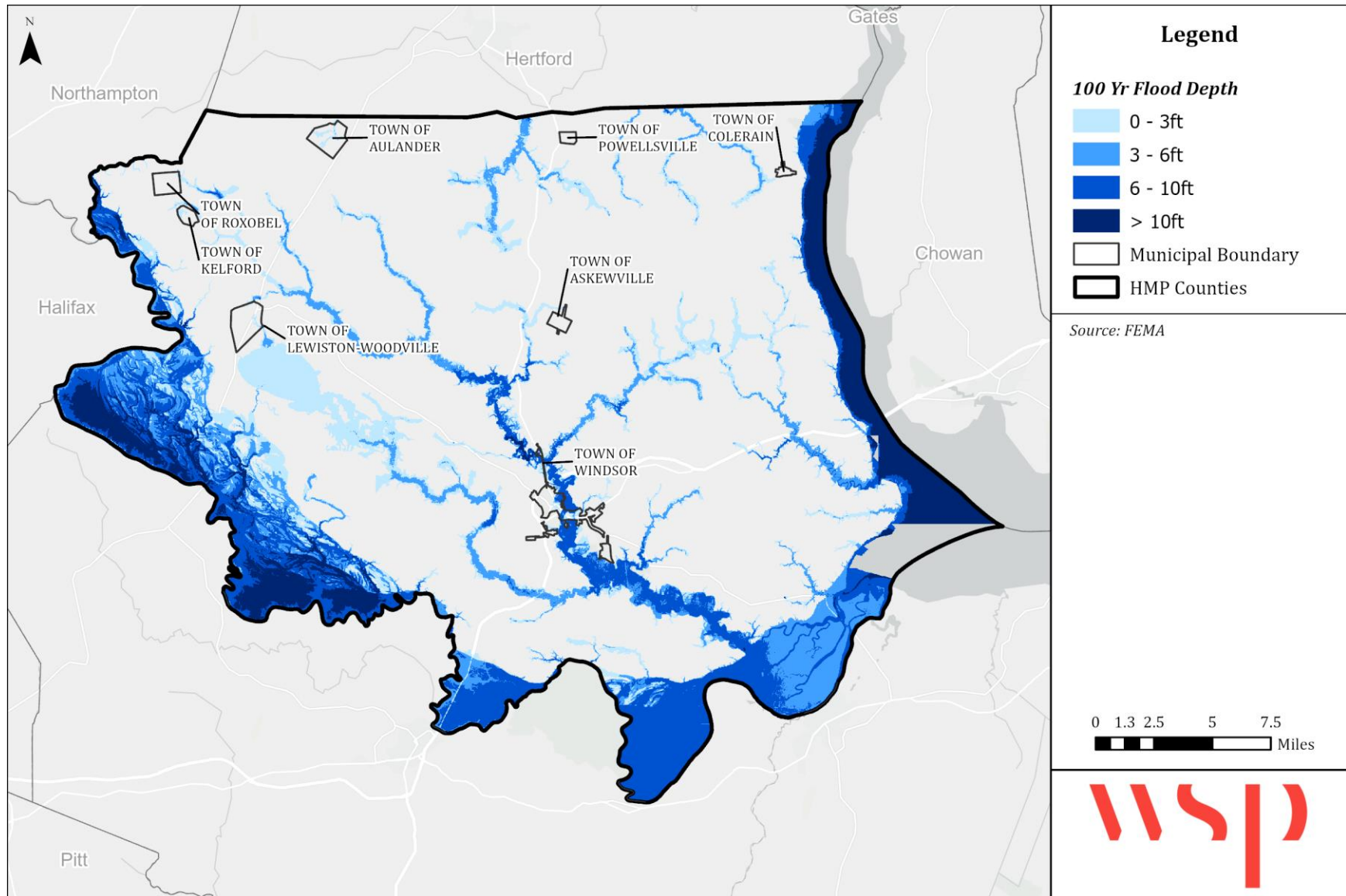


Figure A.18 – Flood Depth, 1%-Annual-Chance Floodplain, Town of Askewville

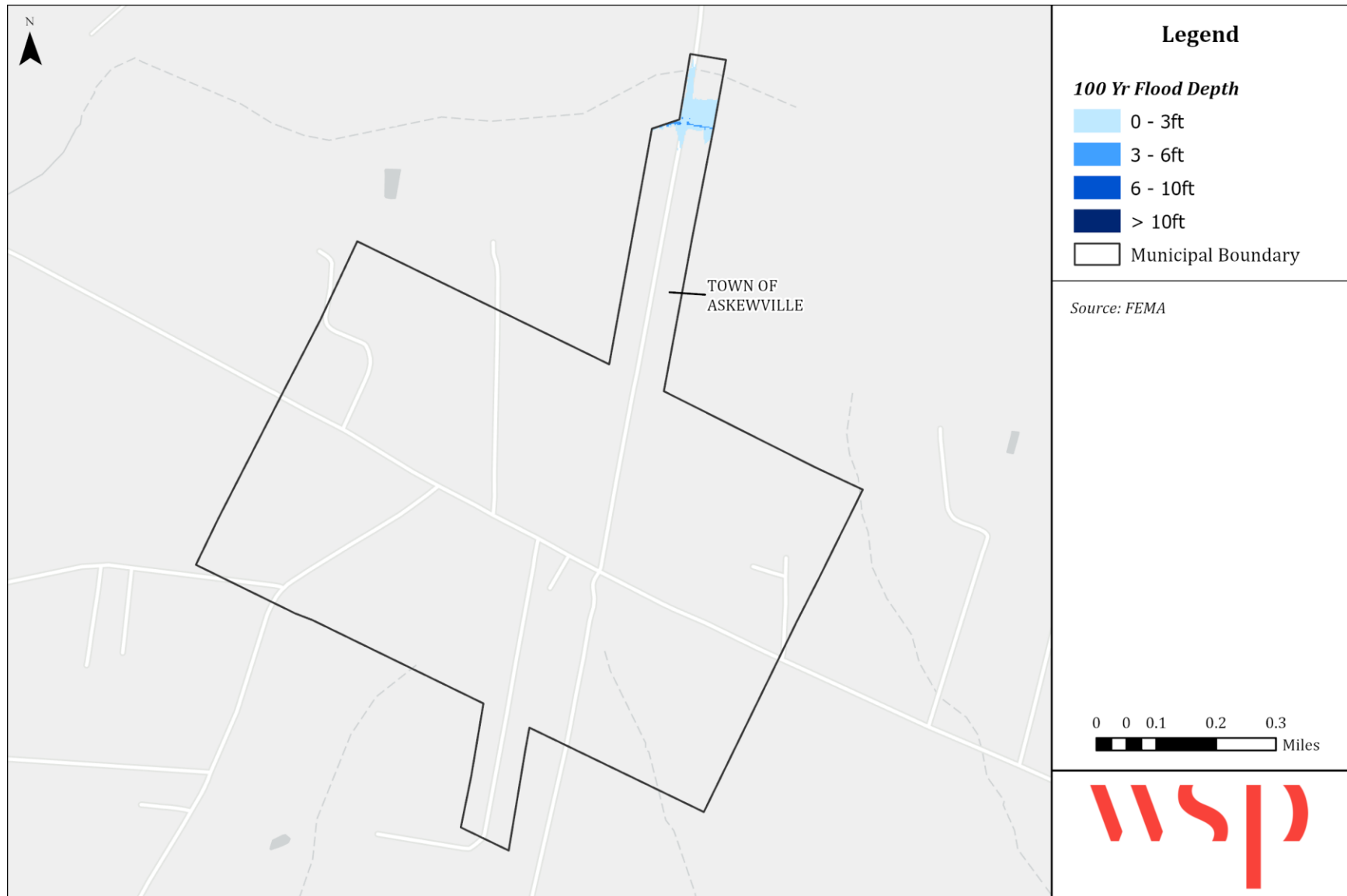


Figure A.19 – Flood Depth, 1%-Annual-Chance Floodplain, Town of Aulander

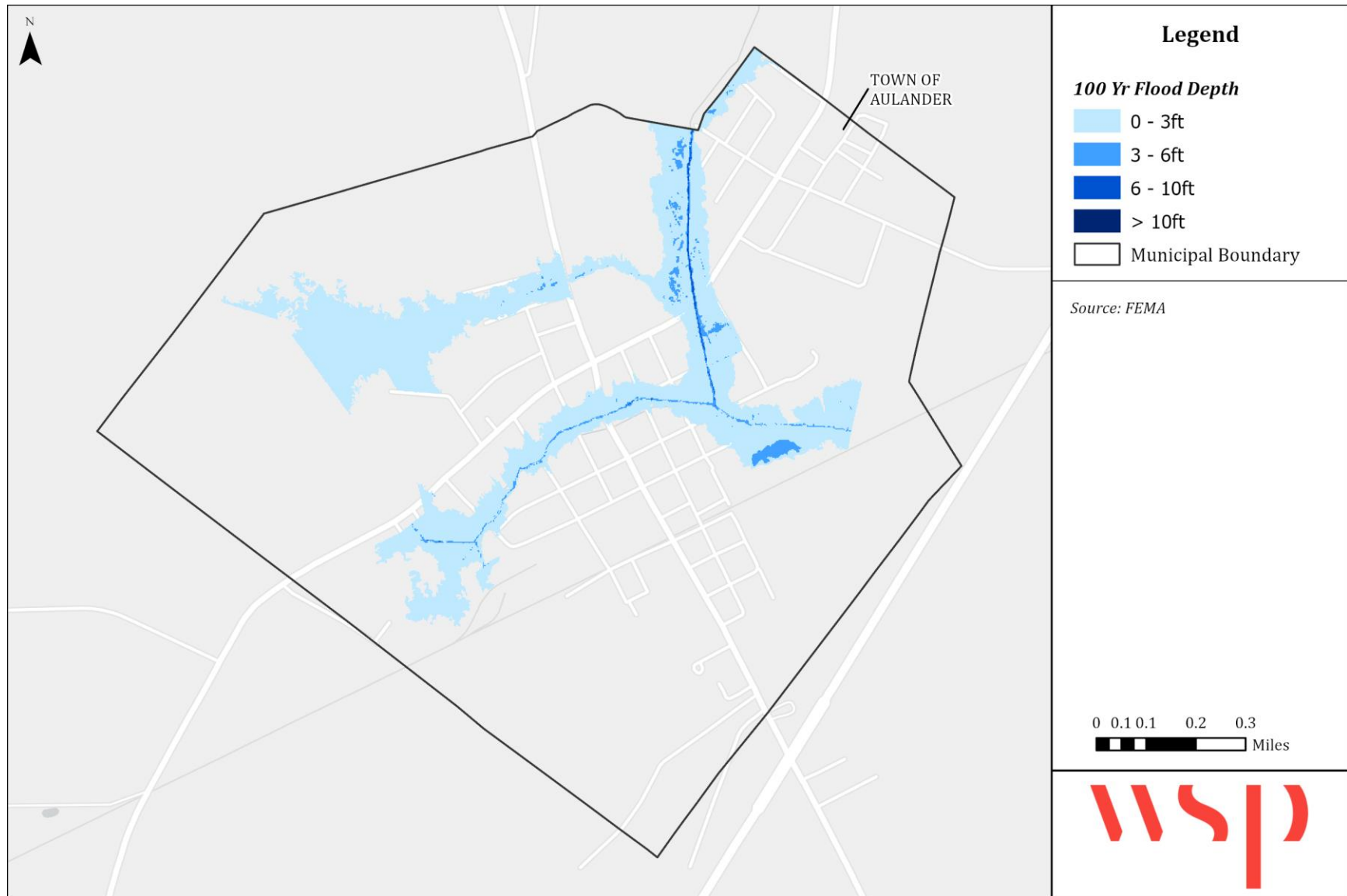


Figure A.20 – Flood Depth, 1%-Annual-Chance Floodplain, Town of Kelford

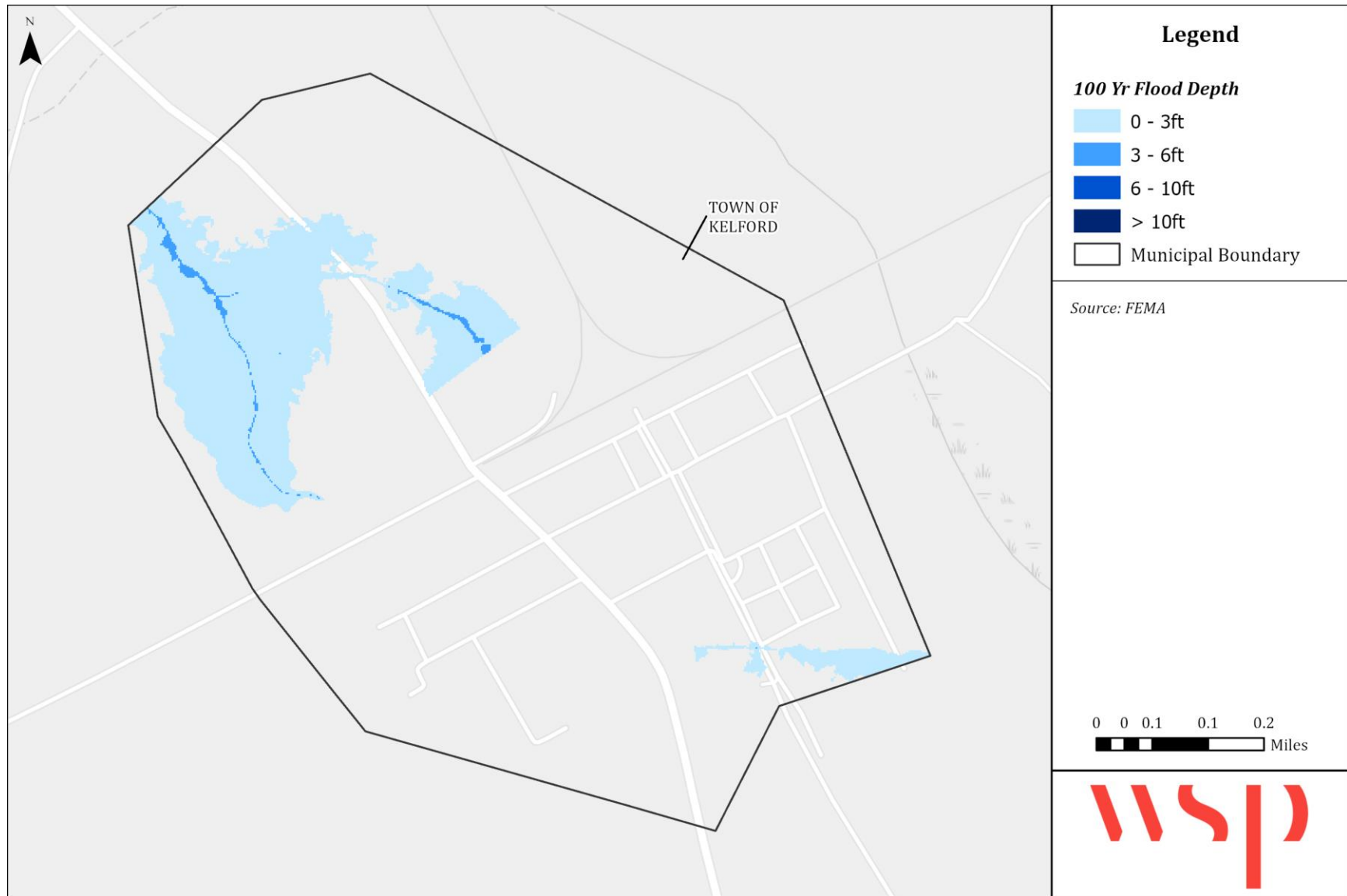


Figure A.21 – Flood Depth, 1%-Annual-Chance Floodplain, Town of Lewiston-Woodville

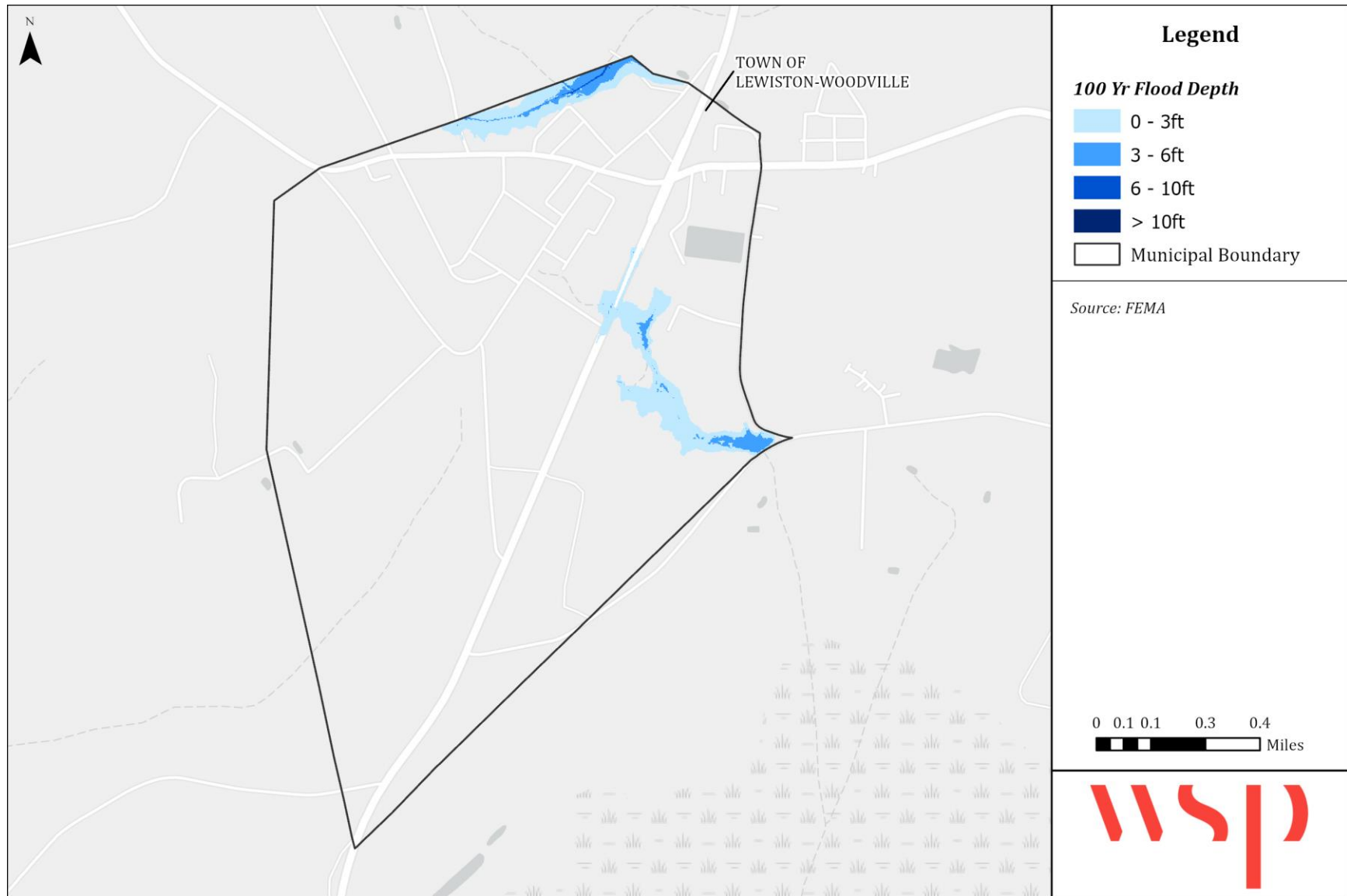


Figure A.22 - Flood Depth, 1%-Annual-Chance Floodplain, Town of Roxobel

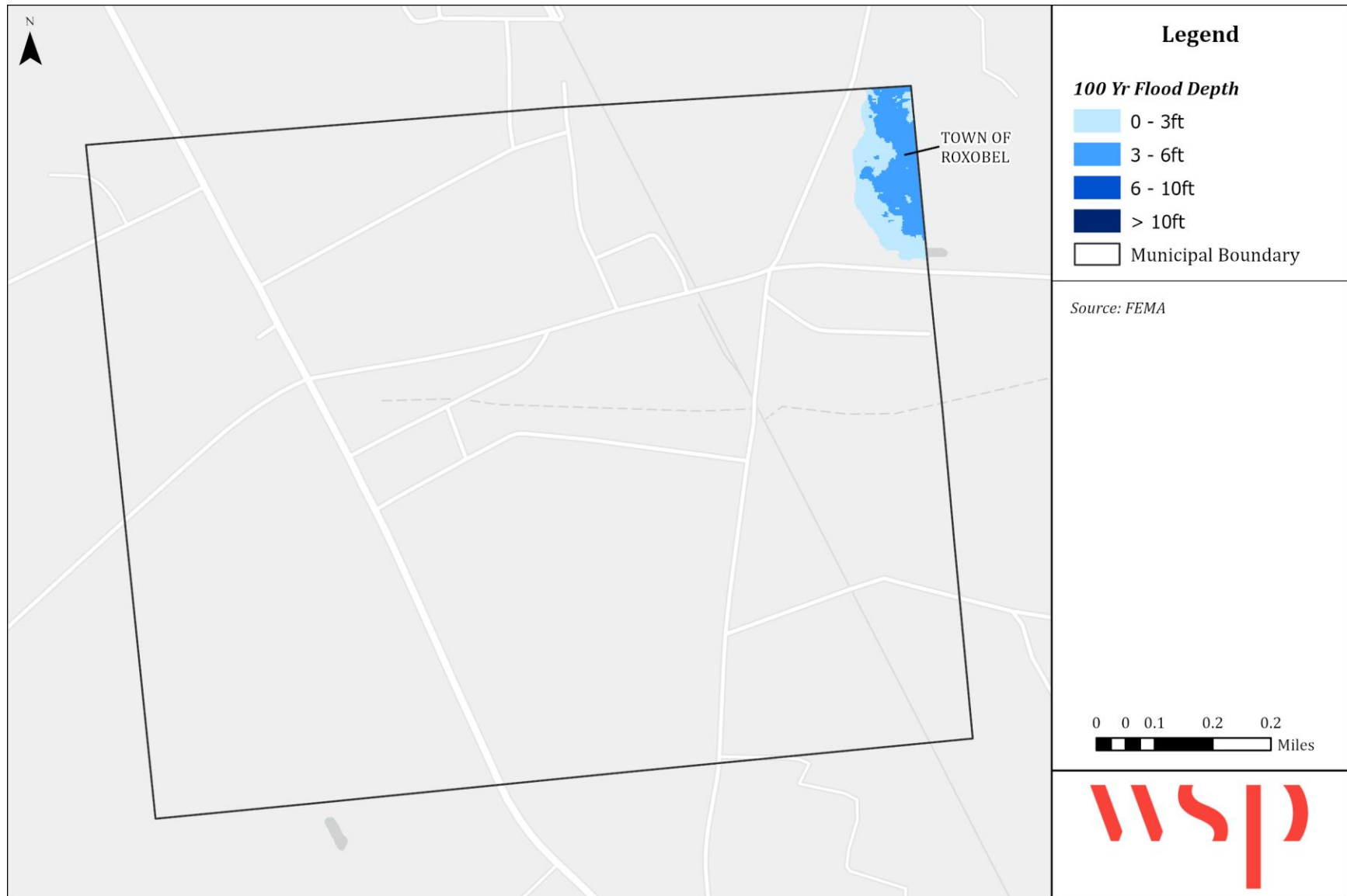
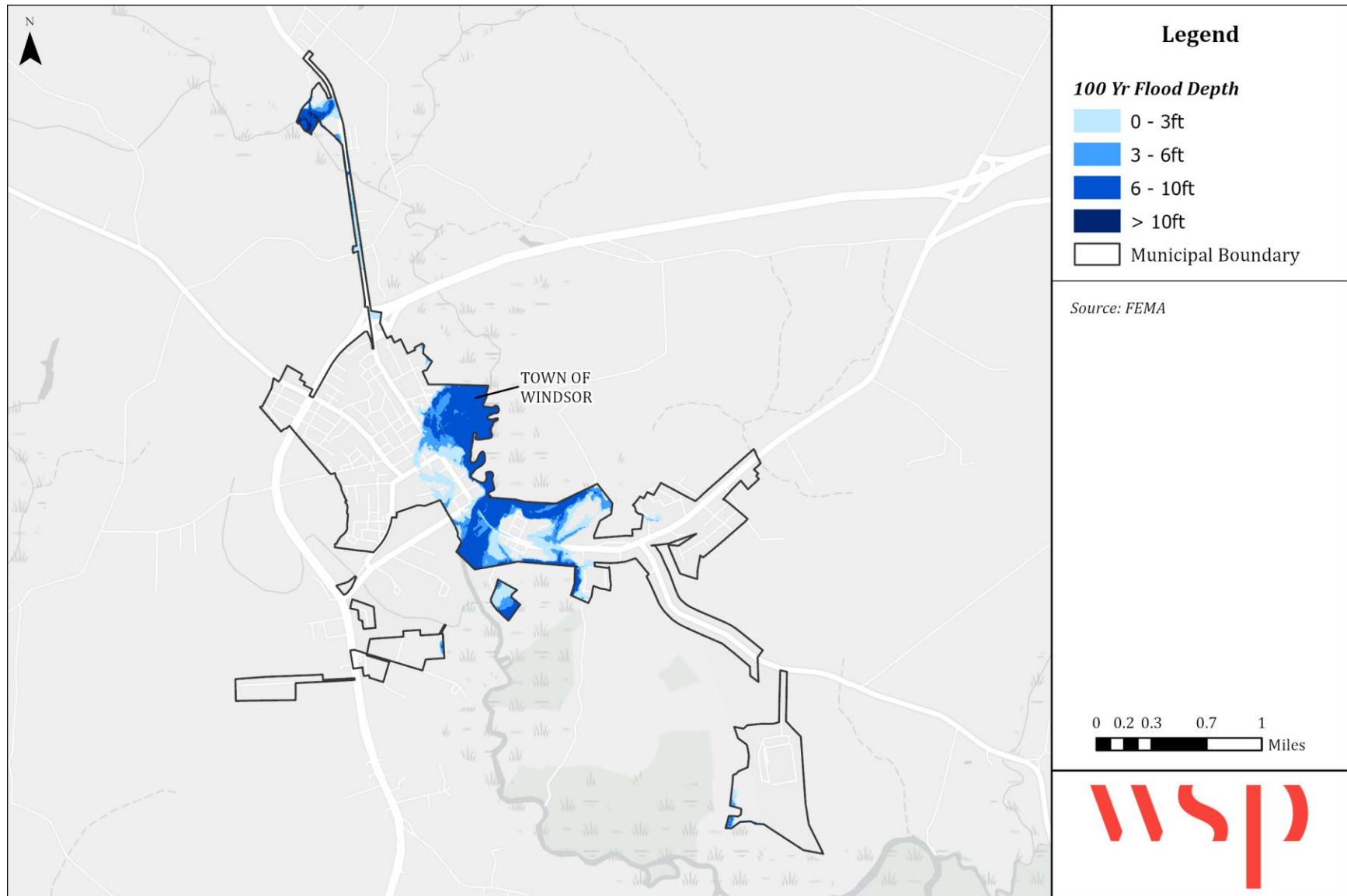


Figure A.23 - Flood Depth, 1%-Annual-Chance Floodplain, Town of Windsor



FLOODPLAIN MANAGEMENT

The following tables reflect NFIP policy and claims data for Bertie County and incorporated areas categorized by structure type, flood zone, Pre-FIRM and Post-FIRM. Note that the Towns of Askewville, Lewiston-Woodville, and Powellsville do not participate in the NFIP. The Town of Roxobel participates in the NFIP but has no active policies or past paid claims.

Table A.13 – NFIP Policy and Claims Data by Structure Type

Structure Type	Policies in Force	Total Premium	Insurance in Force	Number of Closed Paid Losses	Total of Closed Paid Losses
Bertie County Unincorporated Area					
Single Family	38	\$29,122	\$9,317,000	89	\$1,942,478.83
Non Residential	6	\$5,789	\$923,000	12	\$577,342.39
Total	44	\$34,911	\$10,240,000	101	\$2,519,821.22
Town of Aulander					
Single Family	5	\$3,122	\$512,000	9	\$70,371.52
Total	5	\$3,122	\$512,000	9	\$70,371.52
Town of Colerain					
Single Family	1	\$767	\$350,000	0	\$0.00
Total	1	\$767	\$350,000	0	\$0.00
Town of Kelford					
Single Family	1	\$492	\$70,000	0	\$0.00
Total	1	\$492	\$70,000	0	\$0.00
Town of Windsor					
Single Family	29	\$17,690	\$5,801,000	177	\$5,304,002.96
2-4 Family	0	\$0	\$0	2	\$17,578.36
All Other Residential	0	\$0	\$0	1	\$4,440.81
Non Residential	34	\$28,120	\$5,011,000	125	\$5,370,450.90
Total	63	\$45,810	\$10,812,000	305	\$10,696,473.03

Source: FEMA Community Information System, accessed December 2025

Table A.14 – NFIP Policy and Claims Data by Flood Zone

Flood Zone	Policies in Force	Total Premium	Insurance in Force	Number of Closed Paid Losses	Total of Closed Paid Losses
Bertie County Unincorporated Area					
A01-30 & AE Zones	27	\$23,799	\$6,005,000	56	\$1,726,865.77
A Zones	0	\$0	\$0	5	\$50,455.18
B, C & X Zone					
Standard	17	\$11,112	\$4,235,000	13	\$365,921.48
Preferred	0	\$0	\$0	25	\$348,675.18
Total	44	\$34,911	\$10,240,000	99	\$2,491,917.61
Town of Aulander					
A01-30 & AE Zones	4	\$2,674	\$442,000	3	\$22,459.49
B, C & X Zone					
Standard	1	\$448	\$70,000	3	\$33,271.18
Preferred	0	\$0	\$0	1	\$3,290.55
Total	5	\$3,122	\$512,000	7	\$59,021.22

ANNEX A: BERTIE COUNTY

Flood Zone	Policies in Force	Total Premium	Insurance in Force	Number of Closed Paid Losses	Total of Closed Paid Losses
Town of Colerain					
A01-30 & AE Zones	1	\$767	\$350,000	0	\$0.00
Total	1	\$767	\$350,000	0	\$0.00
Town of Kelford					
A01-30 & AE Zones	1	\$492	\$70,000	0	\$0.00
Total	1	\$492	\$70,000	0	\$0.00
Town of Windsor					
A01-30 & AE Zones	44	\$30,366	\$6,857,000	231	\$8,004,879.28
A Zones	0	\$0	\$0	8	\$300,910.66
B, C & X Zone					
Standard	19	\$15,444	\$3,955,000	40	\$1,233,850.49
Preferred	0	\$0	\$0	26	\$1,156,832.60
Total	63	\$45,810	\$10,812,000	305	\$10,696,473.03

Source: FEMA Community Information System, accessed December 2025

Table A.15 – NFIP Policy and Claims Data Pre-FIRM

Flood Zone	Policies in Force	Total Premium	Insurance in Force	Number of Closed Paid Losses	Total of Closed Paid Losses
Bertie County Unincorporated Area					
A01-30 & AE Zones	7	\$6,854	\$1,591,000	41	\$1,002,107.42
A Zones	0	\$0	\$0	5	\$50,455.18
B, C & X Zone	10	\$5,803	\$2,120,000	25	\$663,396.97
Standard	10	\$5,803	\$2,120,000	9	\$346,588.52
Preferred	0	\$0	\$0	16	\$316,808.45
Total	17	\$12,657	\$3,711,000	71	\$1,715,959.57
Town of Aulander					
A01-30 & AE Zones	4	\$2,674	\$442,000	3	\$22,459.49
B, C & X Zone	1	\$448	\$70,000	4	\$36,561.73
Standard	1	\$448	\$70,000	3	\$33,271.18
Preferred	0	\$0	\$0	1	\$3,290.55
Total	5	\$3,122	\$512,000	7	\$59,021.22
Town of Kelford					
A01-30 & AE Zones	1	\$492	\$70,000	0	\$0.00
Total	1	\$492	\$70,000	0	\$0.00
Town of Windsor					
A01-30 & AE Zones	36	\$23,767	\$4,886,000	184	\$6,033,835.62
A Zones	0	\$0	\$0	6	\$297,783.65
B, C & X Zone	12	\$8,994	\$2,421,000	48	\$1,611,083.87
Standard	12	\$8,994	\$2,421,000	29	\$773,048.97
Preferred	0	\$0	\$0	19	\$838,034.90
Total	48	\$32,761	\$7,307,000	238	\$7,942,703.14

Source: FEMA Community Information System, accessed December 2025

Table A.16 – NFIP Policy and Claims Data Post-FIRM

Flood Zone	Policies in Force	Total Premium	Insurance in Force	Number of Closed Paid Losses	Total of Closed Paid Losses
Bertie County Unincorporated Area					
A01-30 & AE Zones	20	\$16,945	\$4,414,000	15	\$724,758.35
B, C & X Zone	7	\$5,309	\$2,115,000	13	\$51,199.69
Standard	7	\$5,309	\$2,115,000	4	\$19,332.96
Preferred	0	\$0	\$0	9	\$31,866.73
Total	27	\$22,254	\$6,529,000	28	\$775,958.04
Town of Colerain					
A01-30 & AE Zones	1	\$767	\$350,000	0	\$0.00
Total	1	\$767	\$350,000	0	\$0.00
Town of Windsor					
A01-30 & AE Zones	8	\$6,599	\$1,971,000	47	\$1,971,043.66
A Zones	0	\$0	\$0	2	\$3,127.01
B, C & X Zone	7	\$6,450	\$1,534,000	18	\$779,599.22
Standard	7	\$6,450	\$1,534,000	11	\$460,801.52
Preferred	0	\$0	\$0	7	\$318,797.70
Total	15	\$13,049	\$3,505,000	67	\$2,753,769.89

Source: FEMA Community Information System, accessed December 2025

A.2.2 HURRICANES AND COASTAL HAZARDS

Figure A.24 on the following page shows the estimated extent of storm surge by storm category according to NOAA SLOSH data that would occur in unincorporated Bertie County and all participating jurisdictions. Much of southeastern Bertie County near the Albemarle Sound, Roanoke River, and along the Cashie River is at the highest risk to storm surge. Unincorporated Bertie County and the Town of Windsor could experience direct impacts from storm surge.

Figure A.25 shows the estimated inundation extents of 1 foot, 2 feet, and 3 feet of sea level rise that may occur in Bertie County and participating jurisdictions. Sea level rise is likely to impact land adjacent to the Albemarle Sound, Roanoke River, and Cashie River. Unincorporated Bertie County and the Town of Windsor could experience direct impacts from sea level rise.

Figure A.24 - Storm Surge Extent by Storm Category

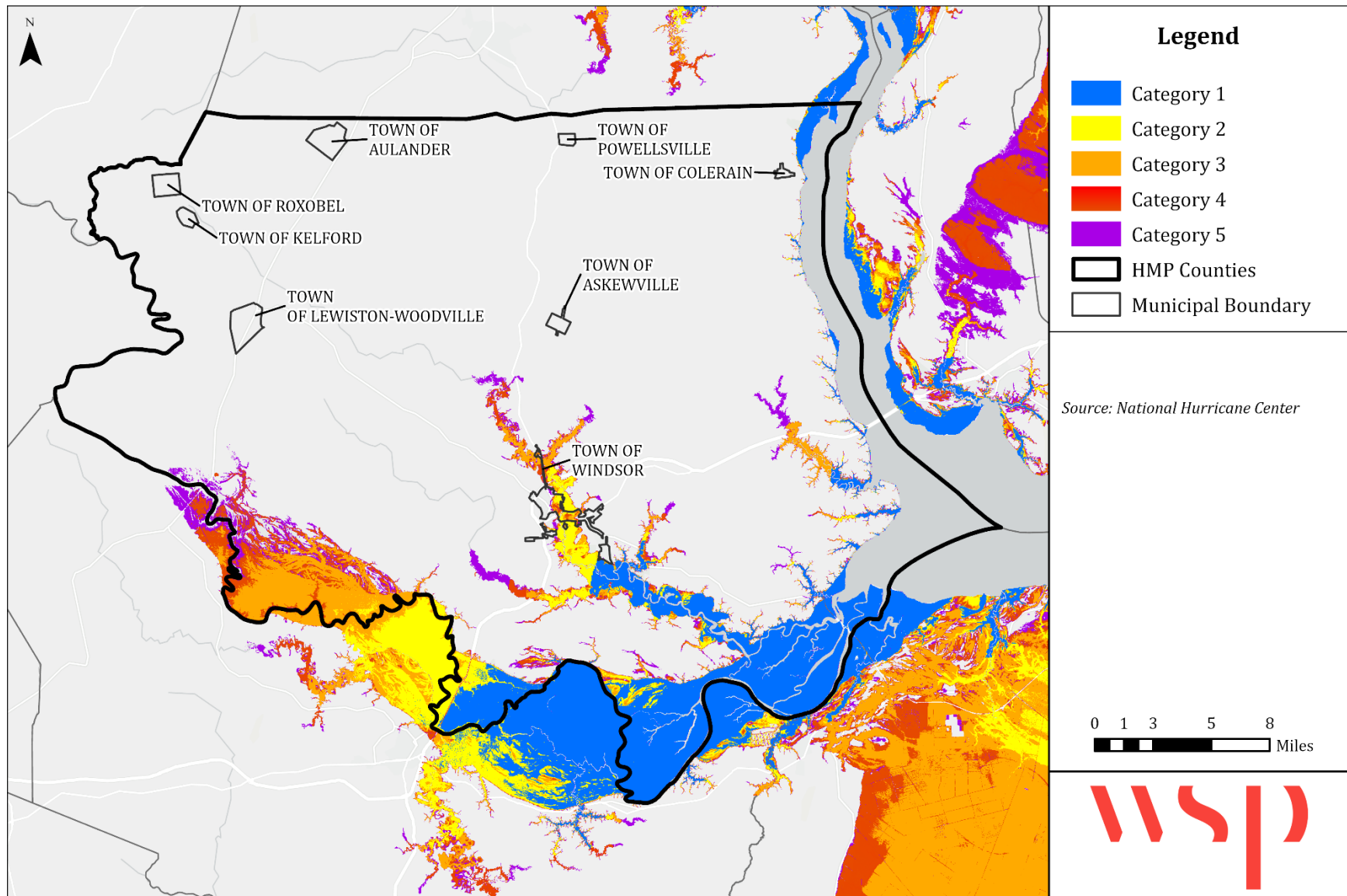
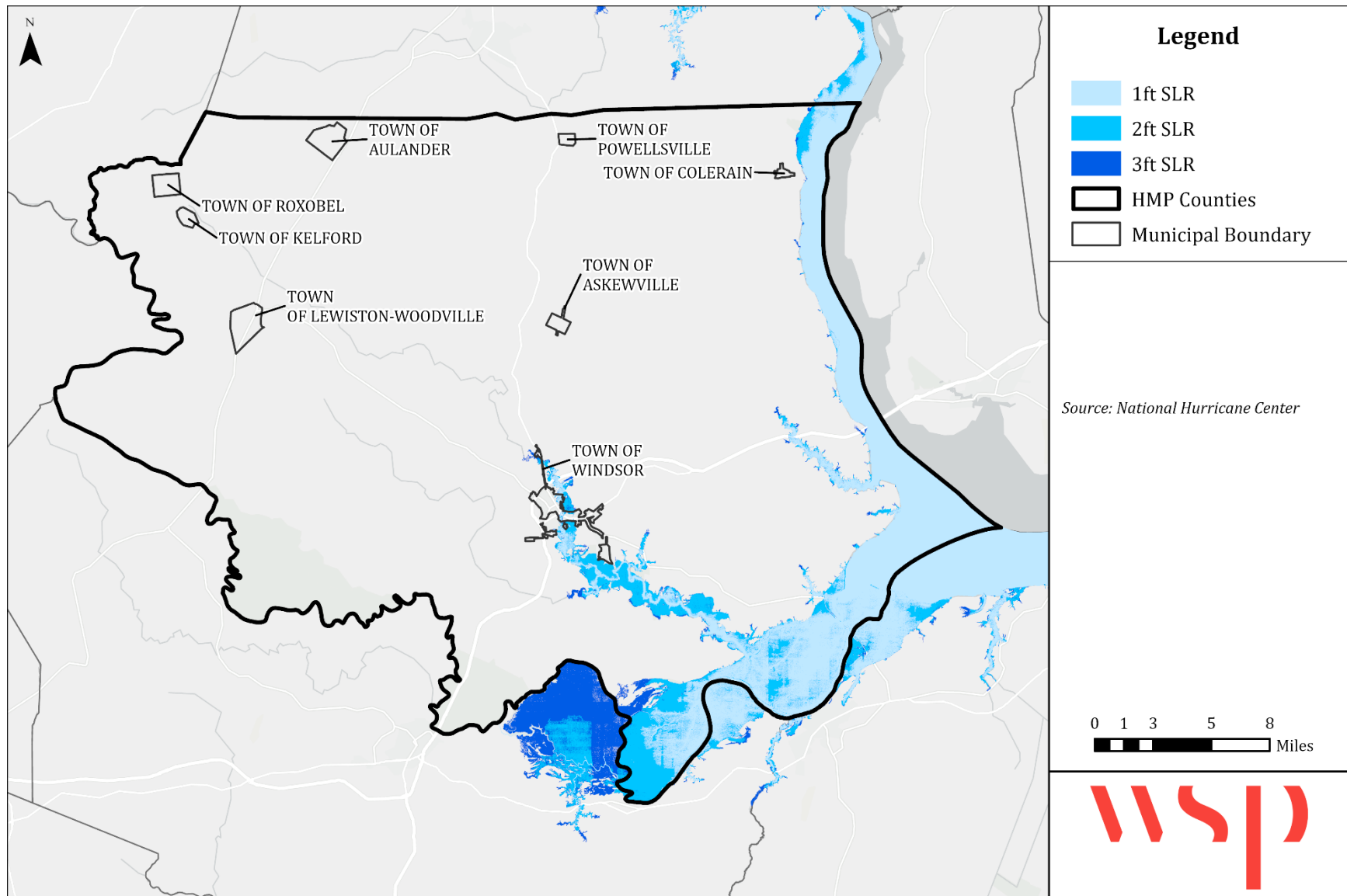


Figure A.25 - Sea Level Rise Extent



A.2.3 WILDFIRE

summarizes the acreage in unincorporated Bertie County that falls within the Functional Wildland Urban Interface (WUI), categorized into zones that describe the wildfire risk mitigation activities appropriate for each zone. Areas in the Functional WUI are those areas where development and building structures may intermix with burnable land cover. Approximately, 3 percent of unincorporated Bertie County is categorized as having direct exposure to wildfire risk and 82 percent is located within the critical fireshed of the Functional WUI. summarizes the acreage in unincorporated Bertie County that falls within the Functional Wildland Urban Interface (WUI), categorized into zones that describe the wildfire risk mitigation activities appropriate for each zone. Areas in the Functional WUI are those areas where development and building structures may intermix with burnable land cover. Approximately, 3 percent of unincorporated Bertie County is categorized as having direct exposure to wildfire risk and 82 percent is located within the critical fireshed of the Functional WUI.

Table A.17 – Functional Wildland Urban Interface Acreage, Unincorporated Bertie County

	Functional Wildland Urban Interface (WUI) Category	Acres	Percent
	Direct Exposure	13,031	3%
	Indirect Exposure	11,264	3%
	Critical Fireshed	369,241	82%
	Sources of Ember Load to Buildings	41,391	9%
	Little to No Exposure	0	0%
	Water	13,442	3%
	Total	448,369	100%

Source: Southern Wildfire Risk Assessment

Figure A.26 through Figure A.34 depicts the Functional WUI for unincorporated Bertie County and all participating jurisdictions. Figure A.35 through Figure A.43 depict the Fire Intensity Scale, which indicates the potential severity of fire based on fuel loads, topography, and other factors. Figure A.44 through Figure A.52 depicts Burn Probability based on landscape conditions, percentile weather, historical ignition patterns, and historical prevention and suppression efforts.

Functional WUI areas with direct exposure to wildfire are distributed throughout the county, with gaps on the southern and western edges of the county along the Roanoke River and its floodplain. Areas of moderate to high potential fire intensity also occur throughout the county, with the lowest potential intensity along the Roanoke River. However, burn probability is very low throughout the county with the exception of a small cluster of moderate burn probability northeast of Windsor and throughout the center region of the county.

Table A.18 provides building counts and values for critical facilities by FEMA lifeline that are located in areas categorized with direct exposure to wildfire risk on the Functional WUI scale. Note that not all jurisdictions within Bertie County contain critical facilities that have exposure to direct exposure.

Table A.18 – Critical Facilities Exposed to Wildfire by Jurisdiction, Bertie County

Type	Critical Facility Count	Structure Value
Bertie County Unincorporated Area		
Food, Hydration, Shelter	13	\$12,843,840
Health and Medical	2	\$109,748
Safety and Security	2	\$278,485
Water Systems	2	\$58,900
All Categories	19	\$13,290,973
Town of Colerain		
Food, Hydration, Shelter	1	\$2,555,047
All Categories	1	\$2,555,047
Town of Roxobel		
Safety and Security	1	\$149,237
All Categories	1	\$149,237
Town of Windsor		
Food, Hydration, Shelter	2	\$6,746,444
Health and Medical	1	\$137,846
All Categories	3	\$6,884,290
County Total	24	\$22,879,547

Figure A.26 – Functional Wildland Urban Interface, Unincorporated Bertie County

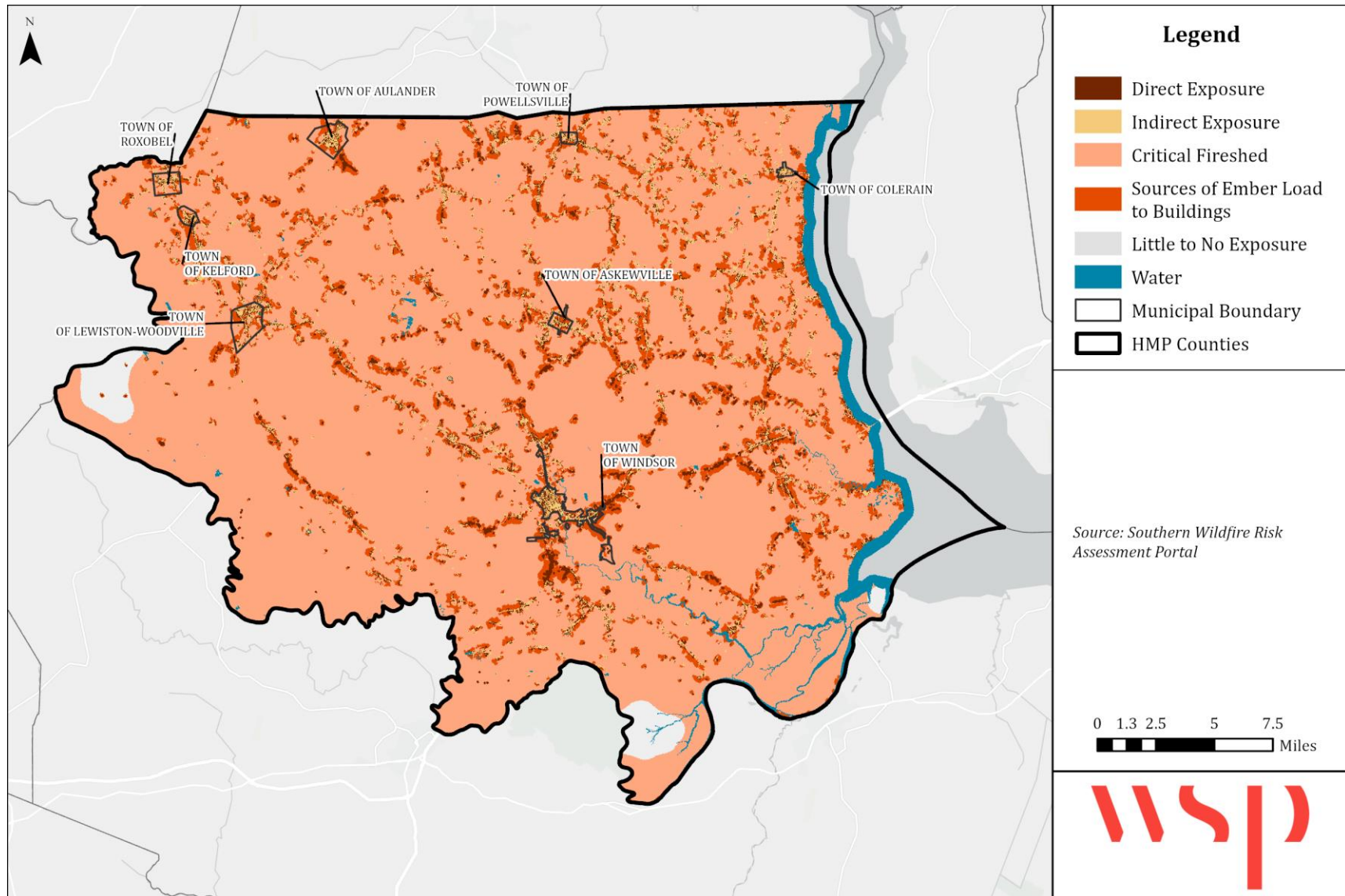


Figure A.27 - Functional Wildland Urban Interface, Town of Askeville

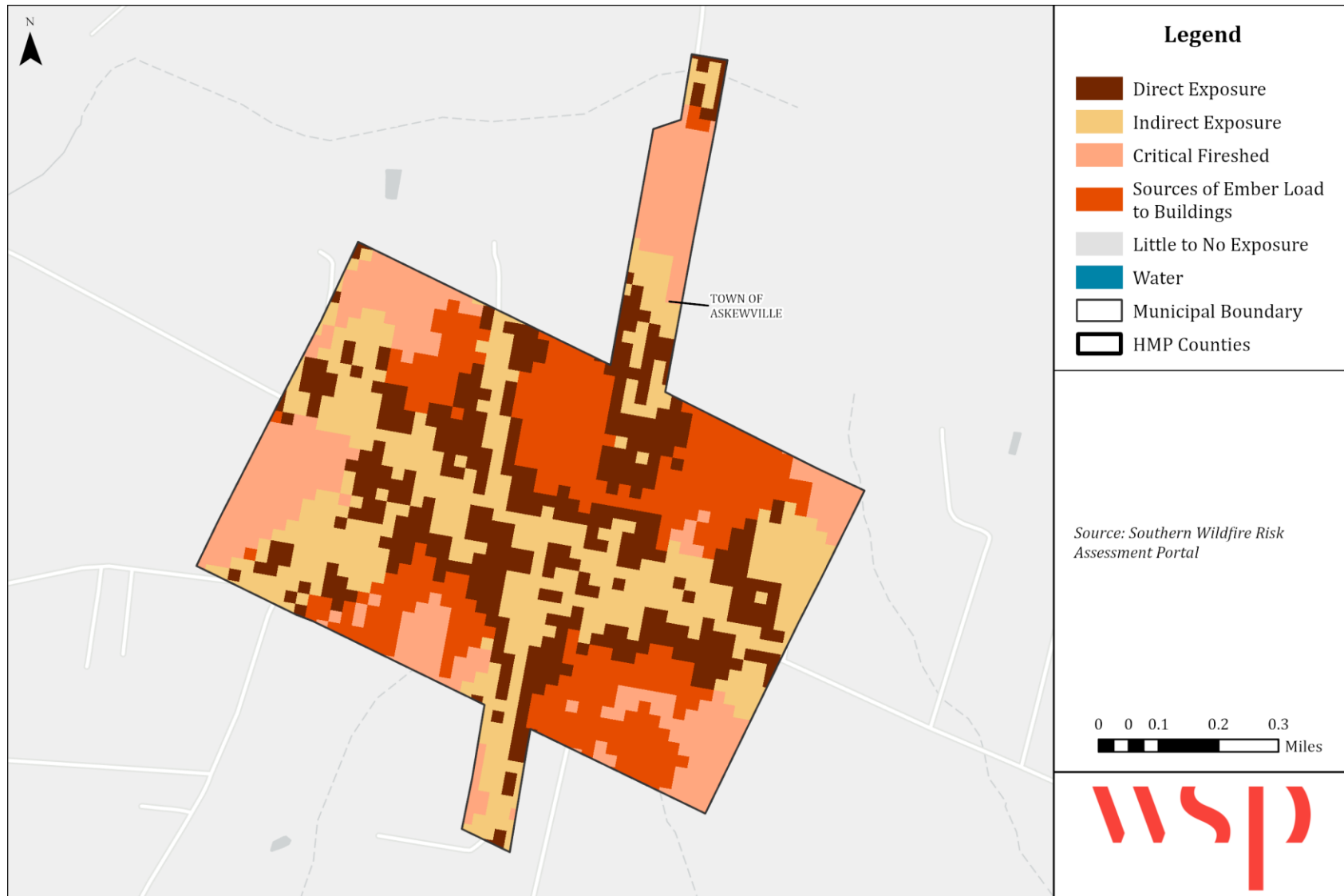


Figure A.28 – Functional Wildland Urban Interface, Town of Aulander

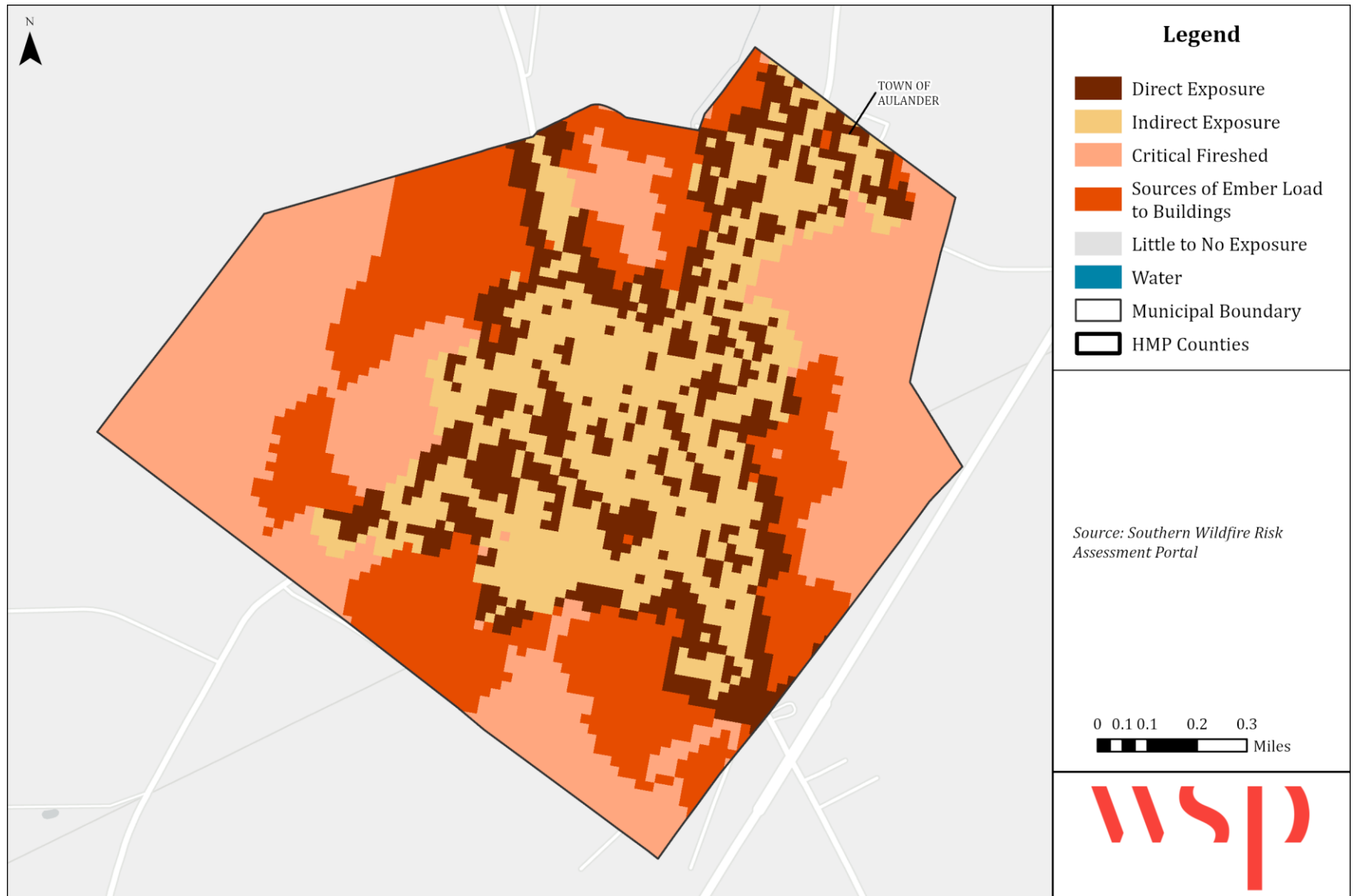


Figure A.29 – Functional Wildland Urban Interface, Town of Colerain

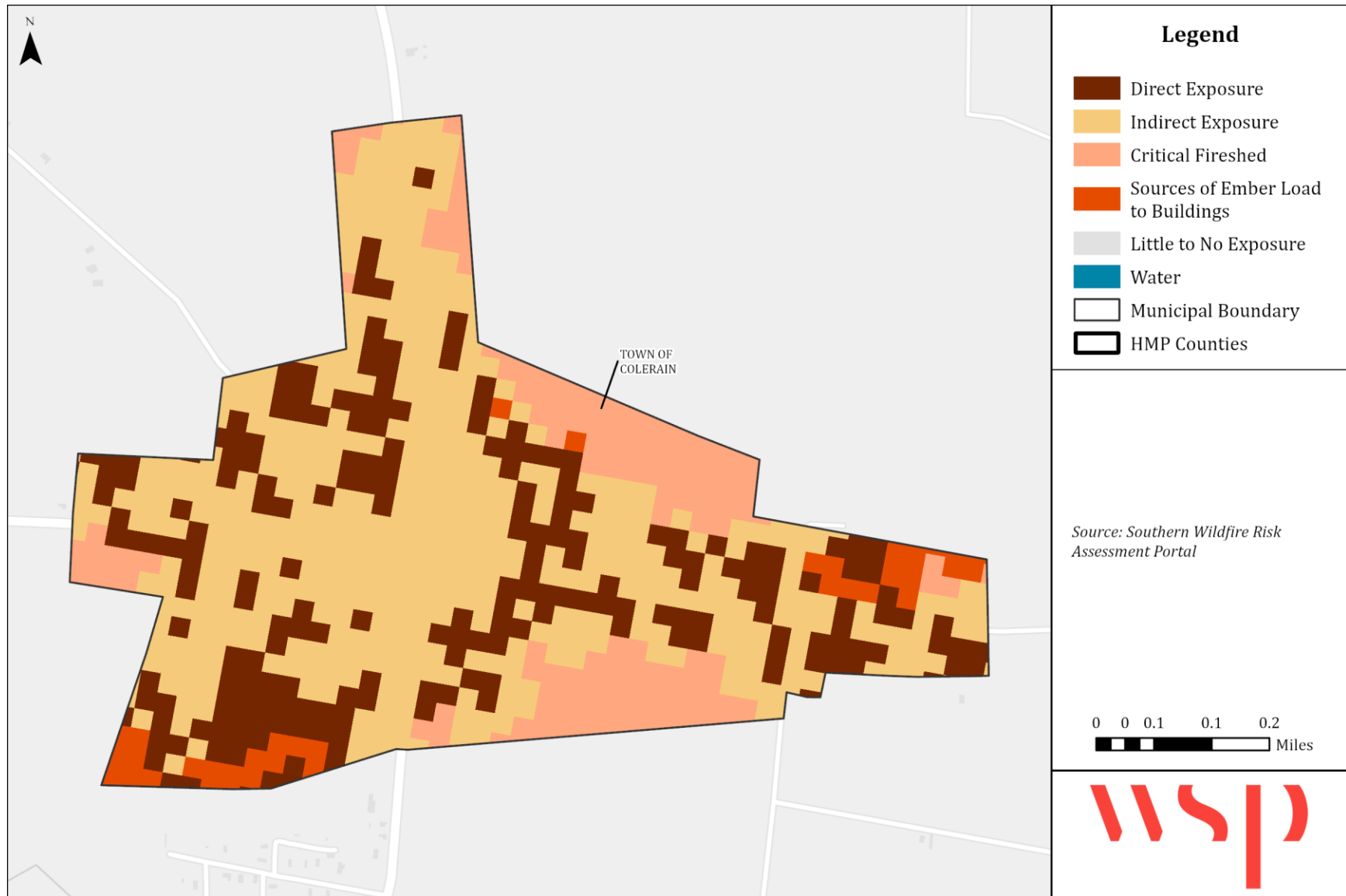


Figure A.30 – Functional Wildland Urban Interface, Town of Kelford

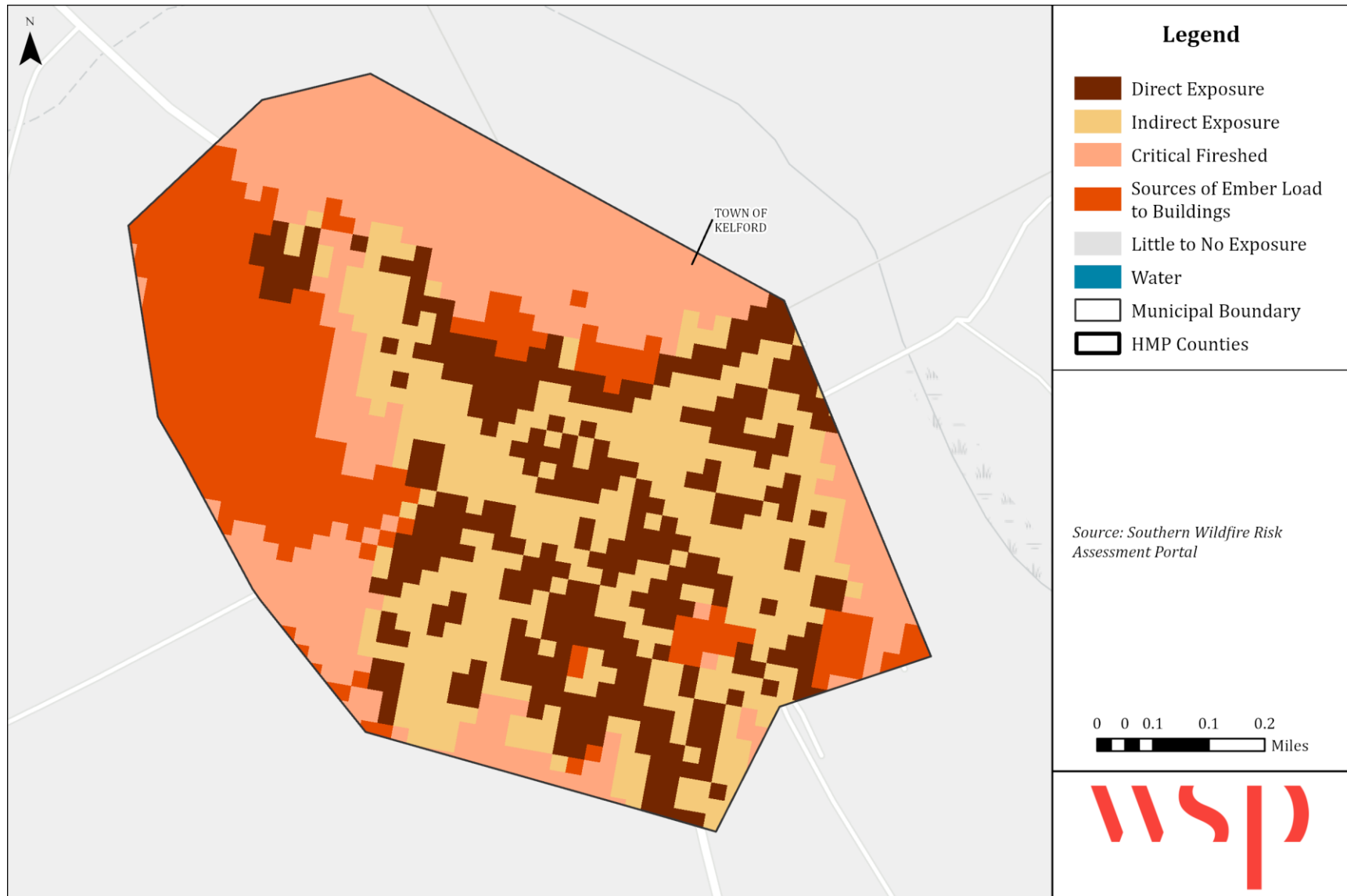


Figure A.31 – Functional Wildland Urban Interface, Town of Lewiston-Woodville

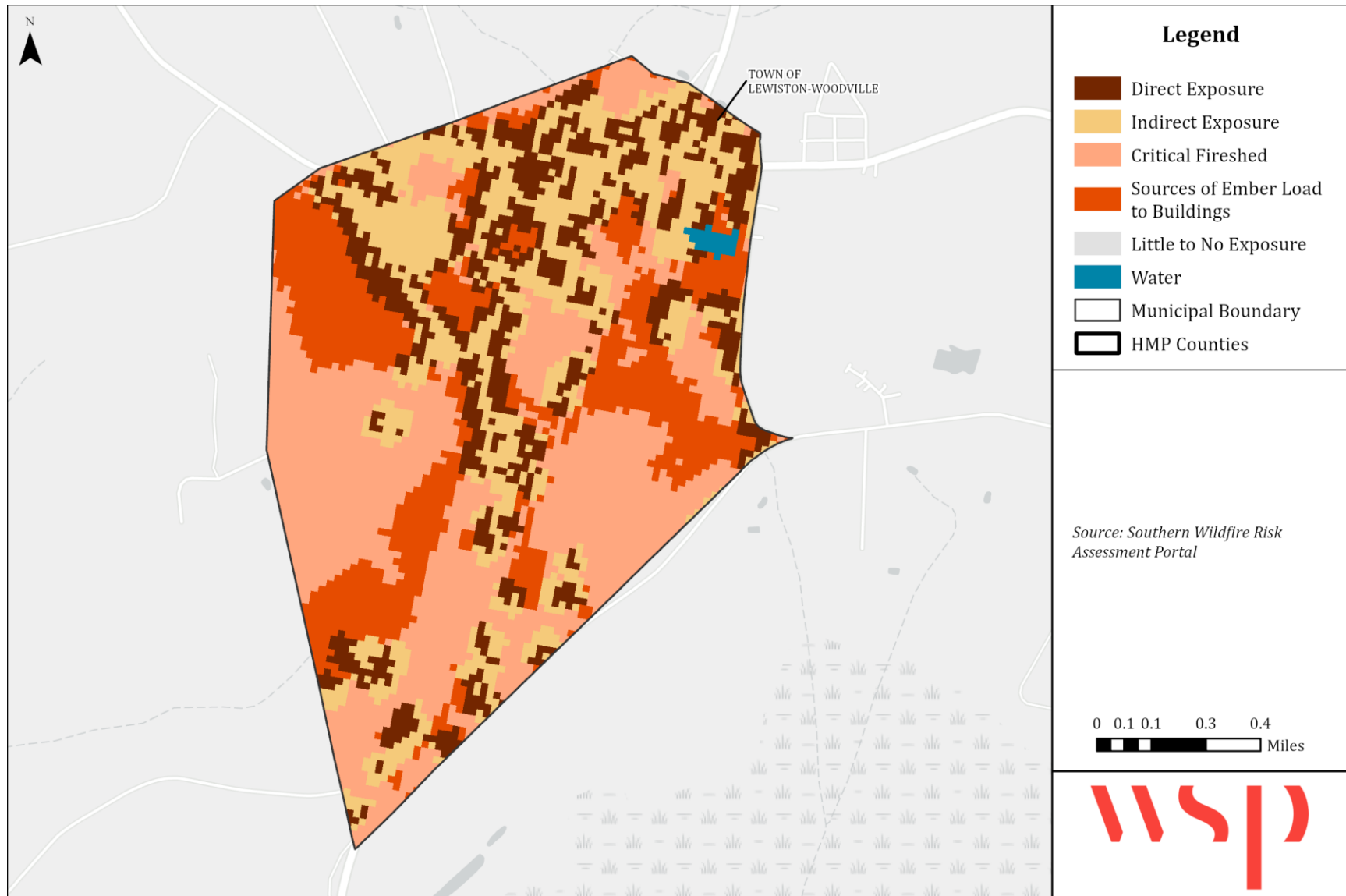


Figure A.32 - Functional Wildland Urban Interface, Town of Powellsville

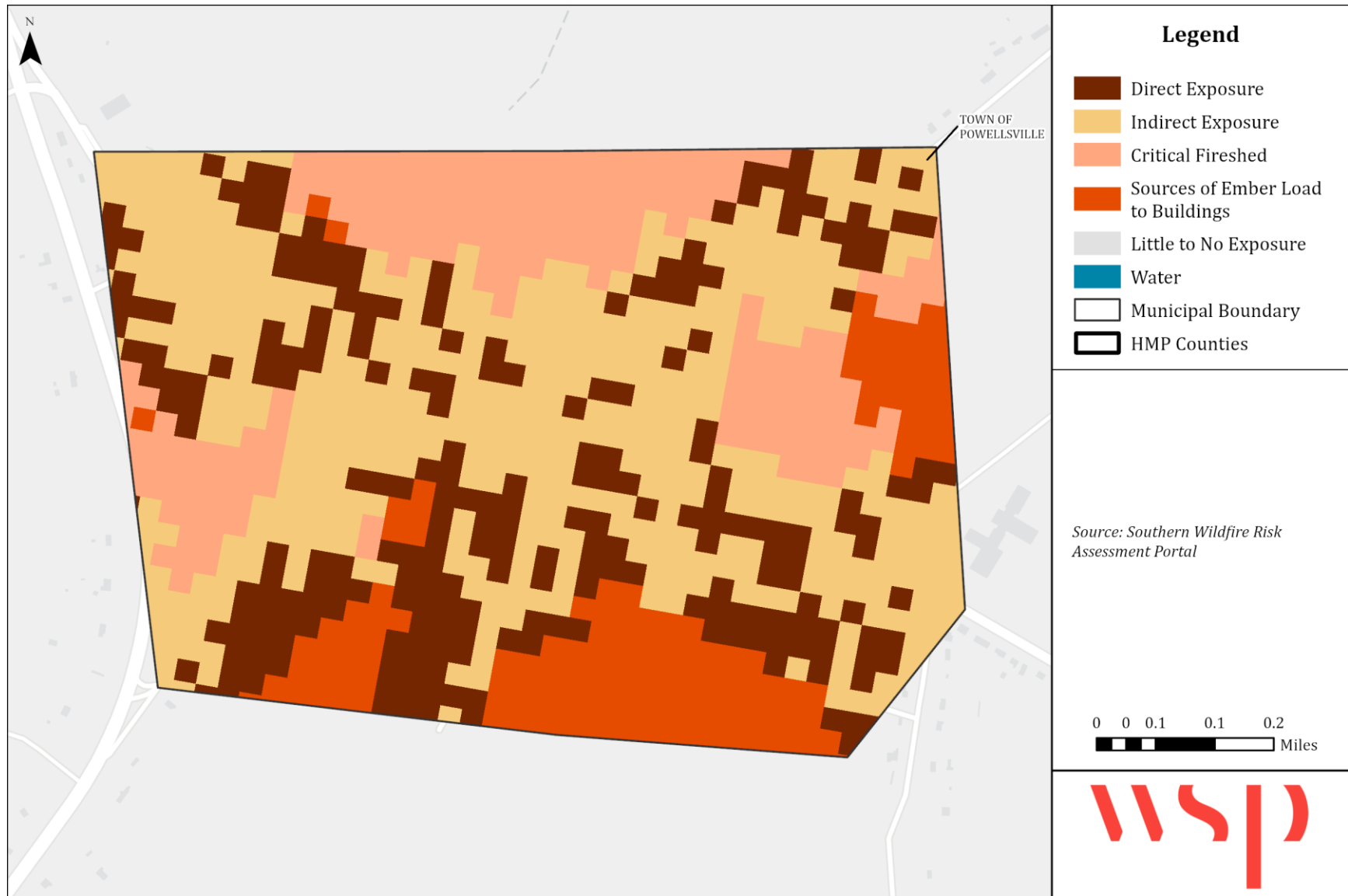


Figure A.33 - Functional Wildland Urban Interface, Town of Roxobel

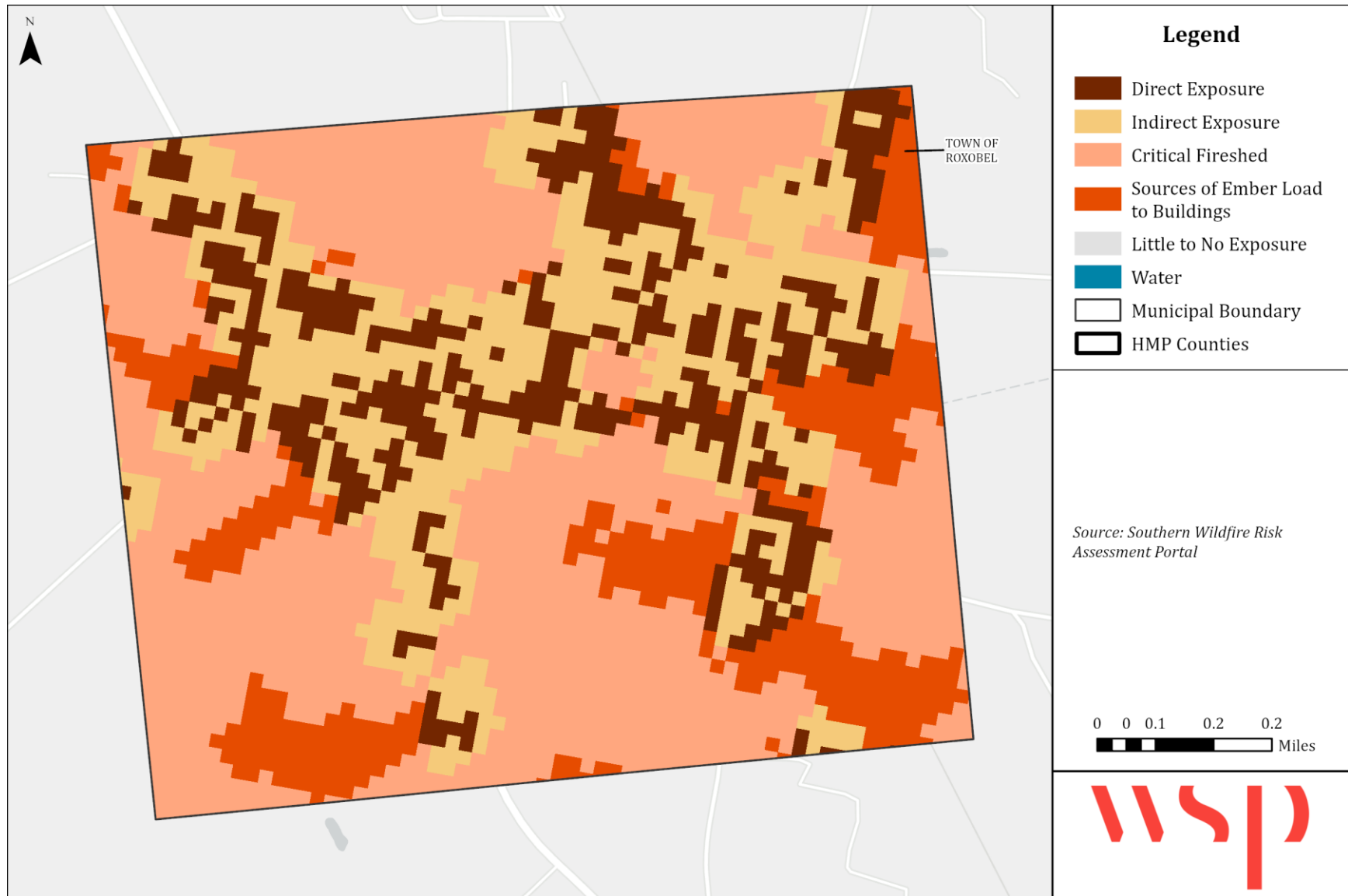


Figure A.34 - Functional Wildland Urban Interface, Town of Windsor

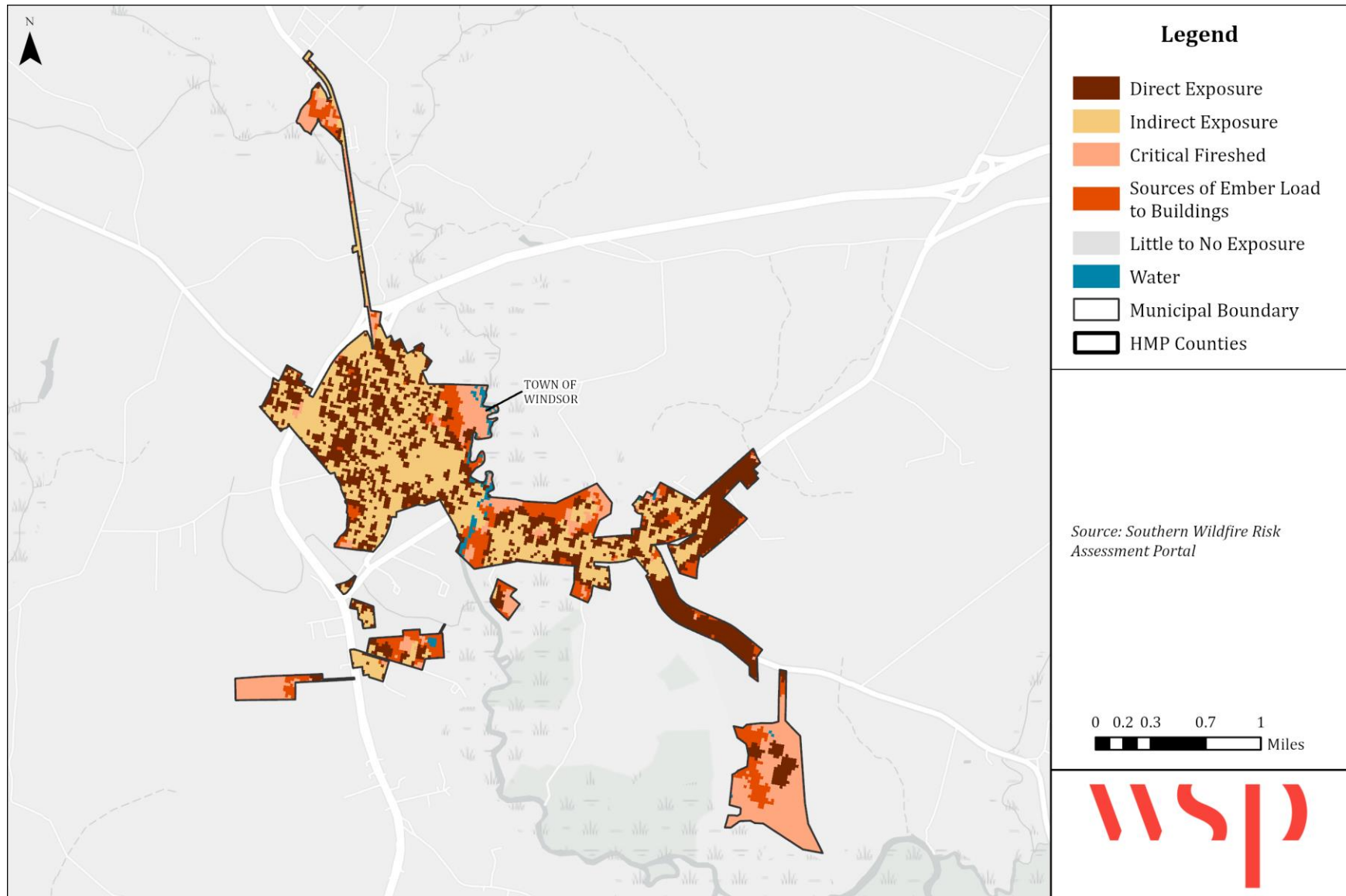


Figure A.35 - Fire Intensity Scale, Unincorporated Bertie County

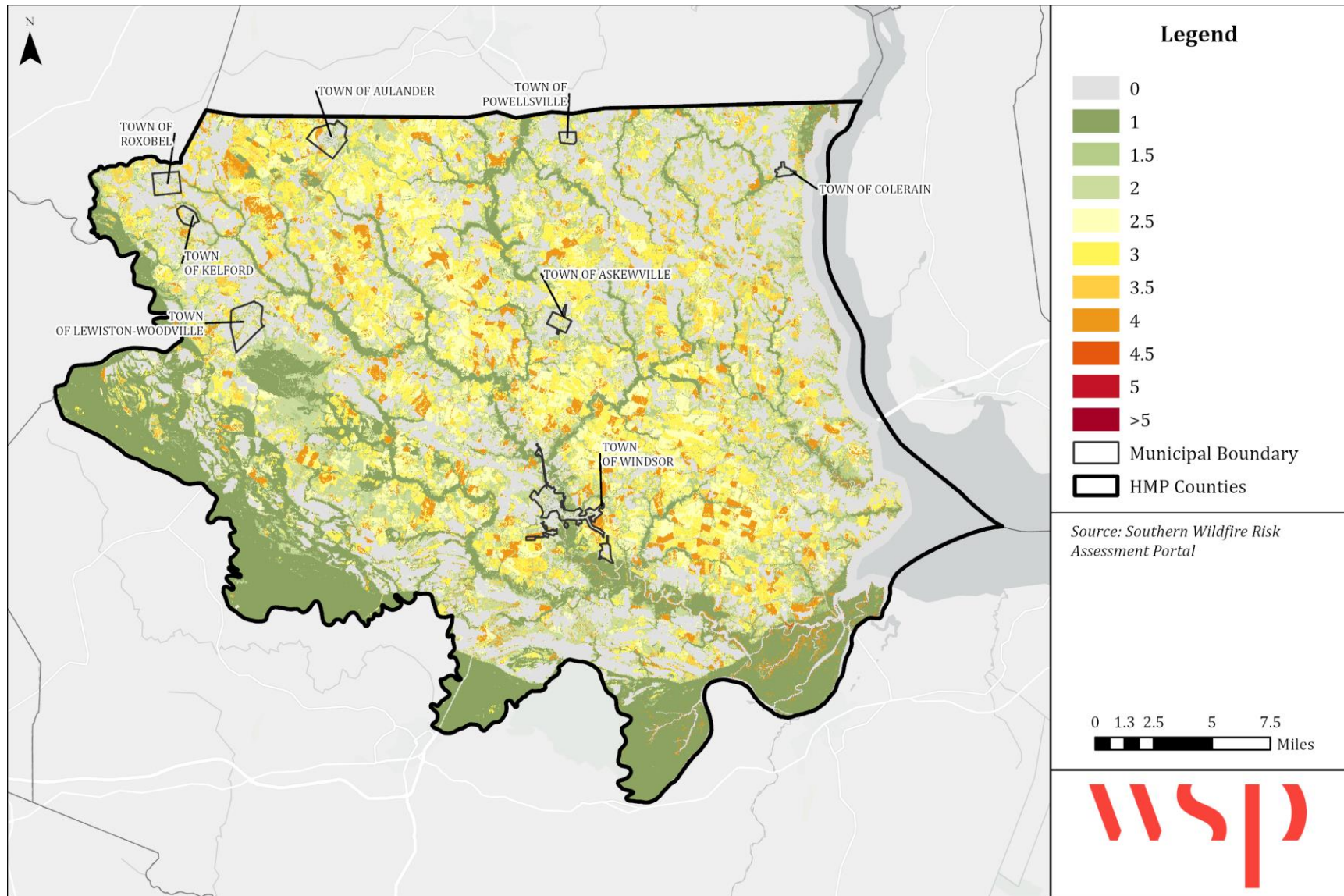


Figure A.36 - Fire Intensity, Town of Askewville

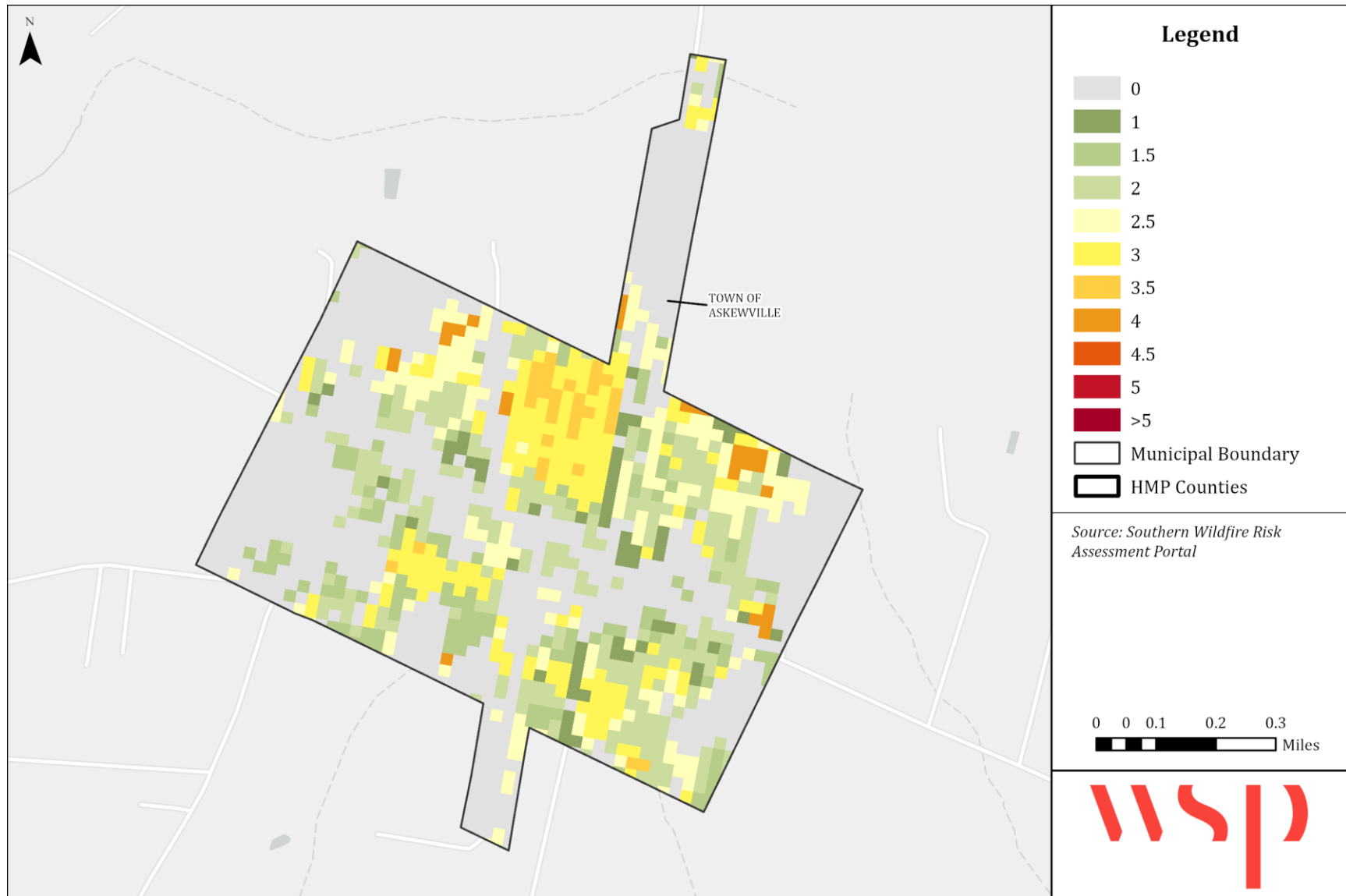


Figure A.37 - Fire Intensity, Town of Aulander

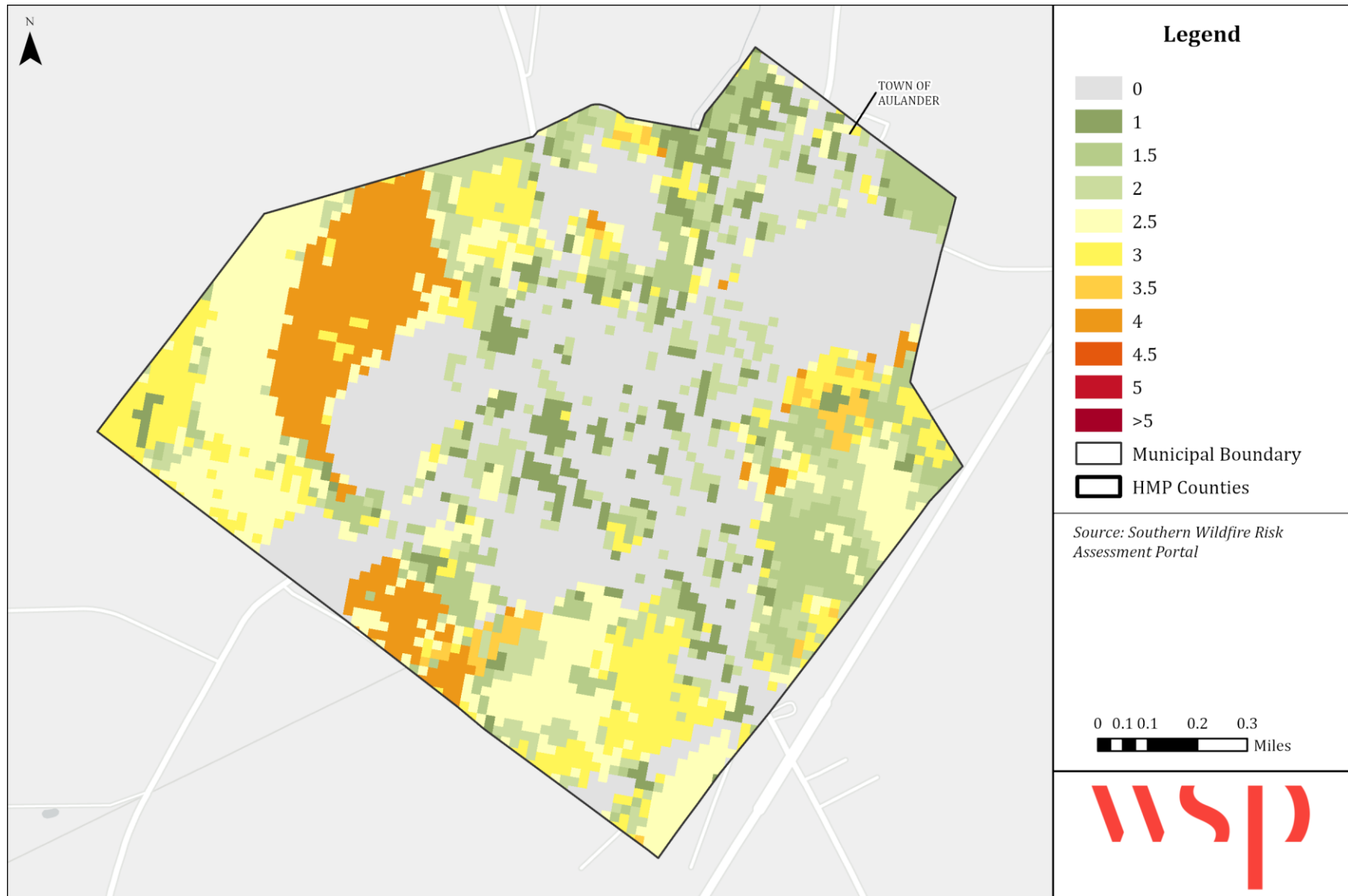


Figure A.38 – Fire Intensity, Town of Colerain

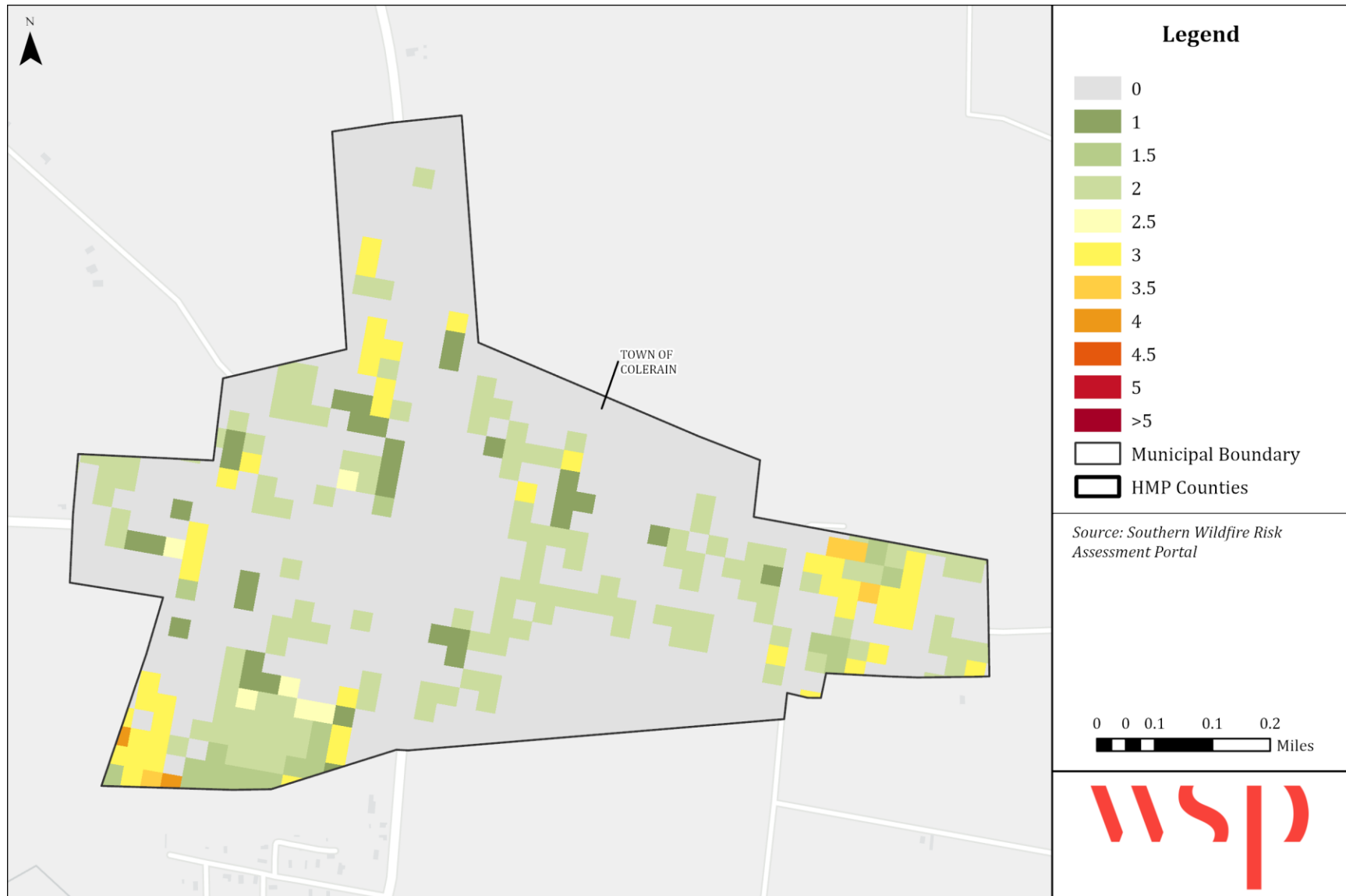


Figure A.39 - Fire Intensity, Town of Kelford

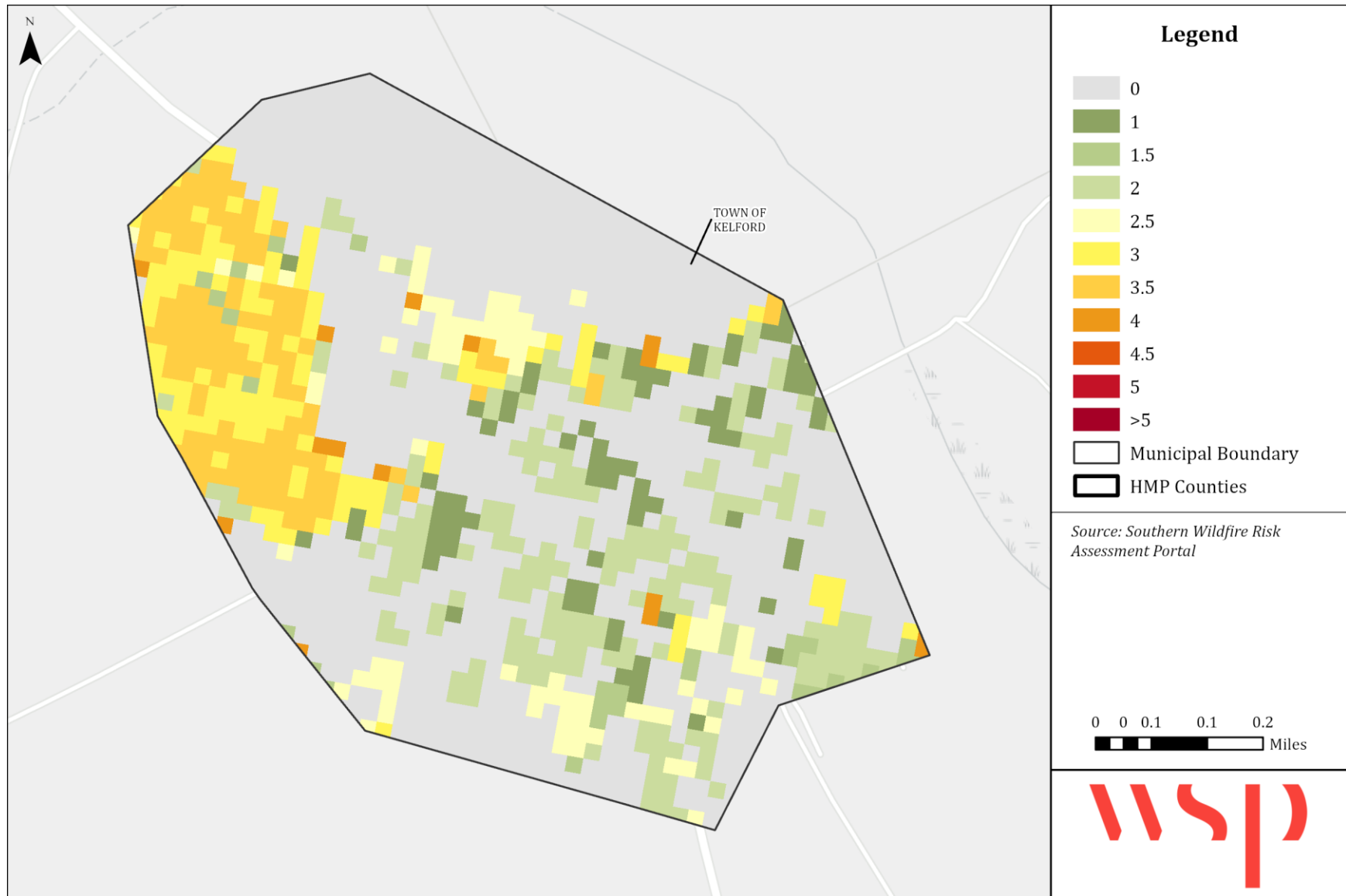


Figure A.40 – Fire Intensity, Town of Lewiston-Woodville

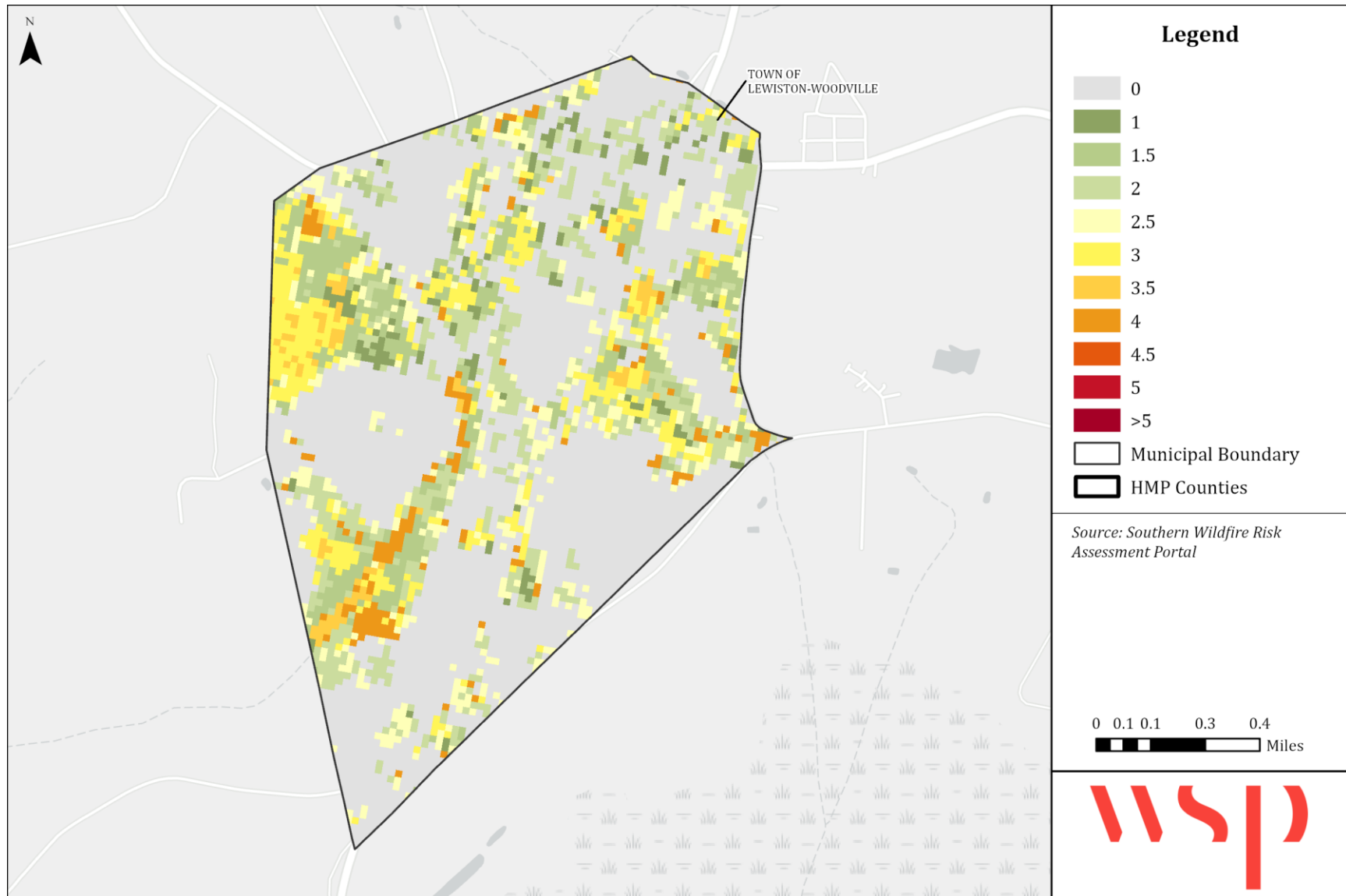


Figure A.41 – Fire Intensity, Town of Powellsville

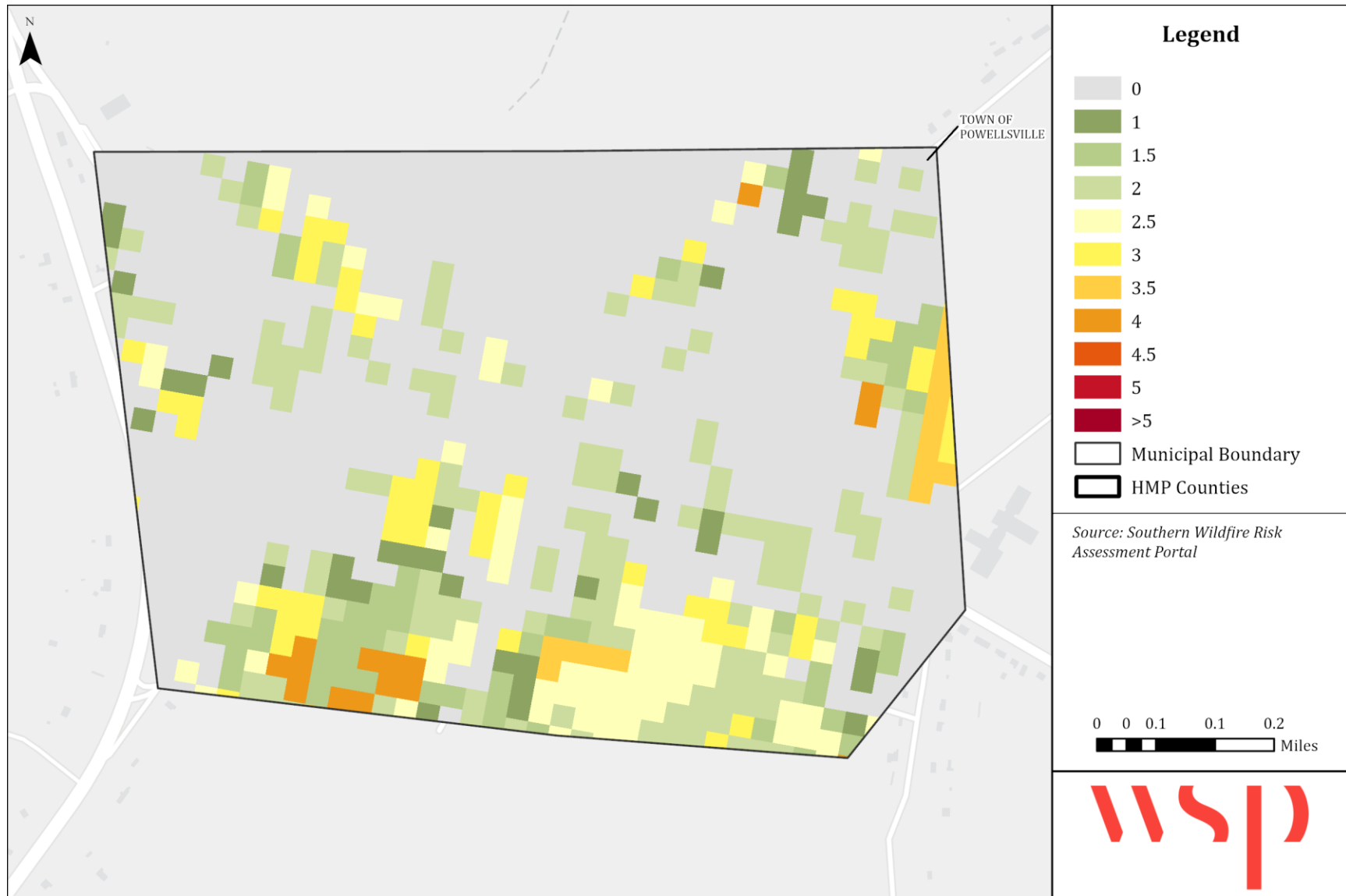


Figure A.42 - Fire Intensity, Town of Roxobel

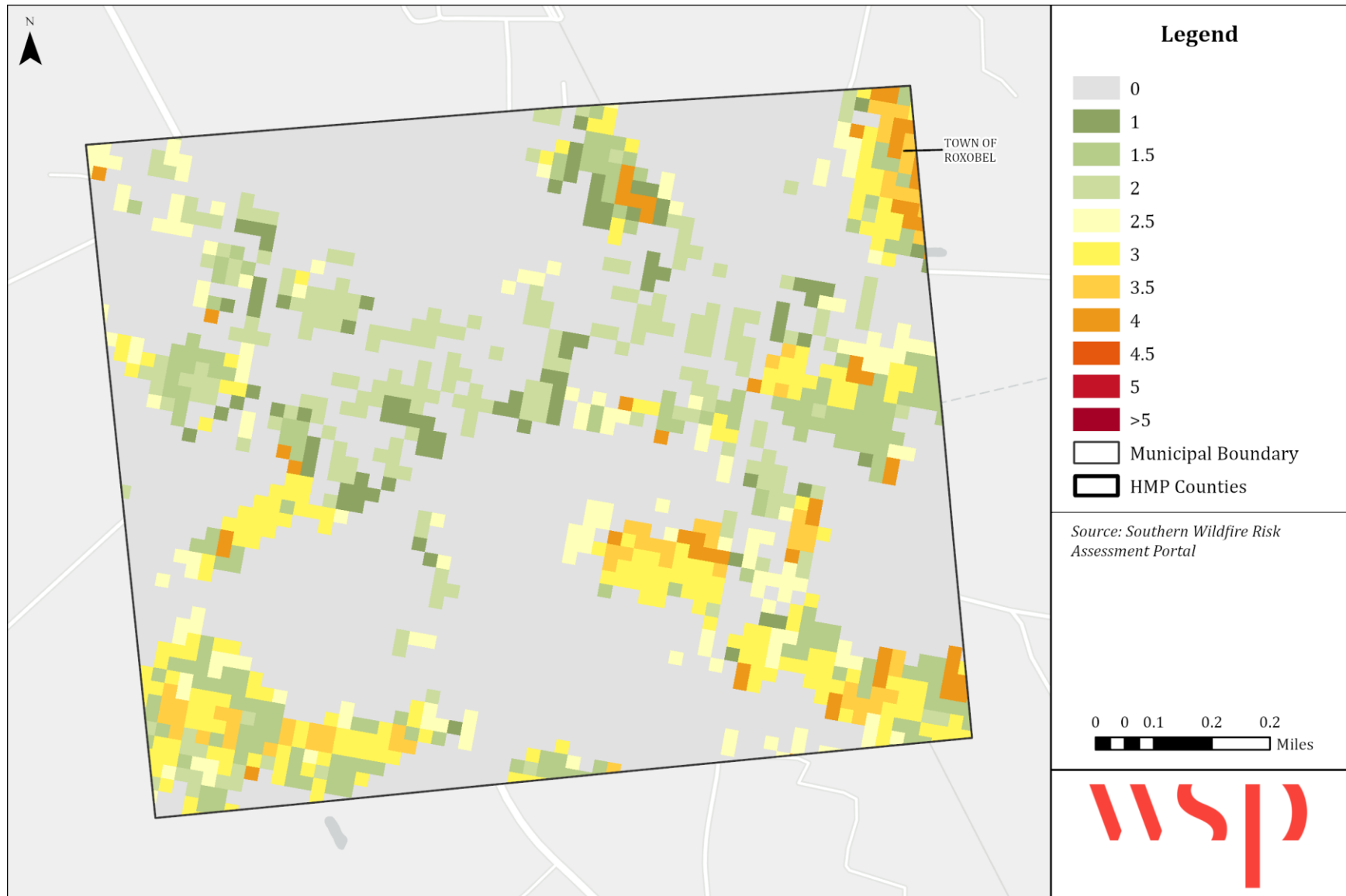


Figure A.43 - Fire Intensity, Town of Windsor

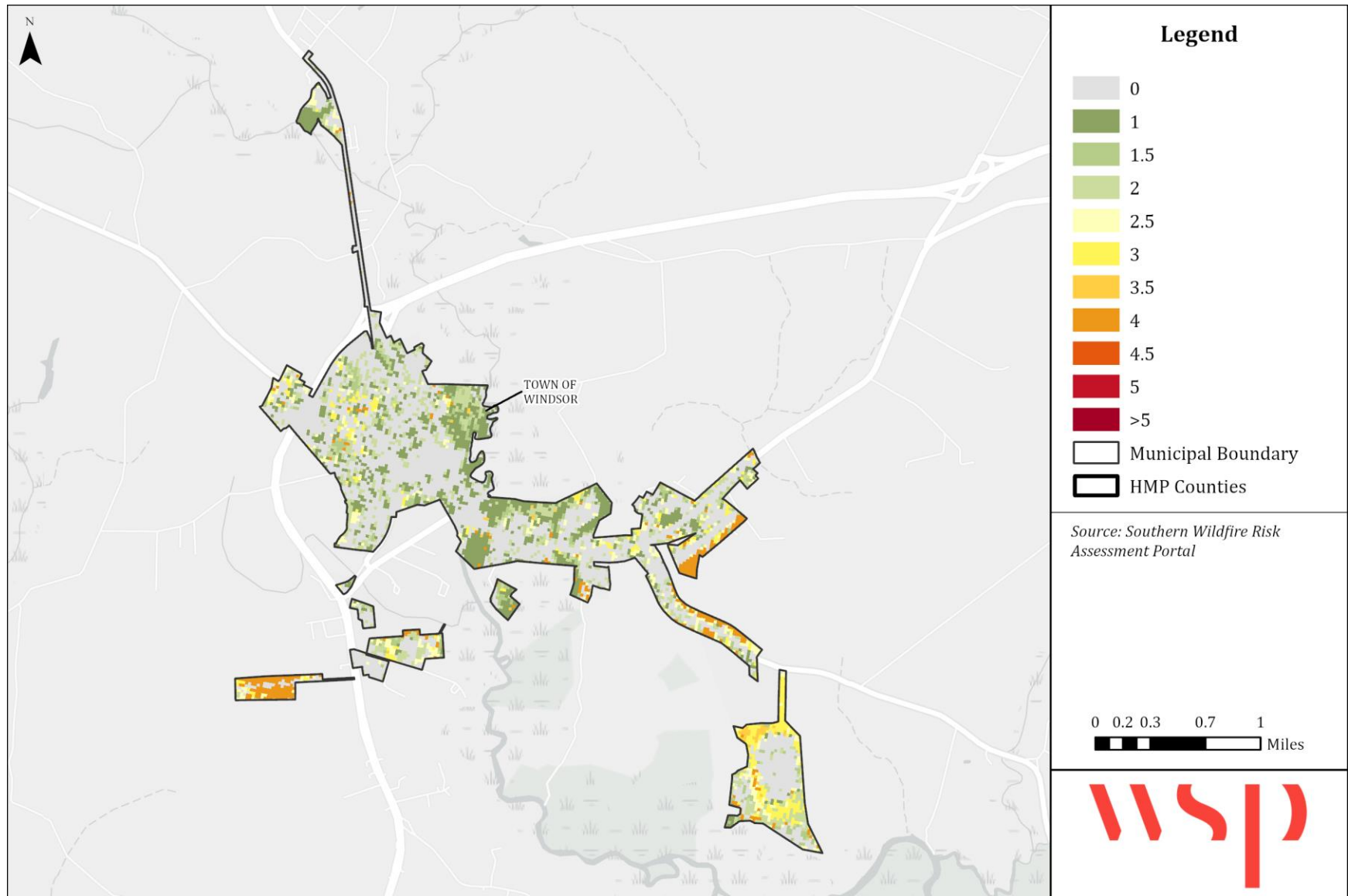


Figure A.44 - Burn Probability, Unincorporated Bertie County

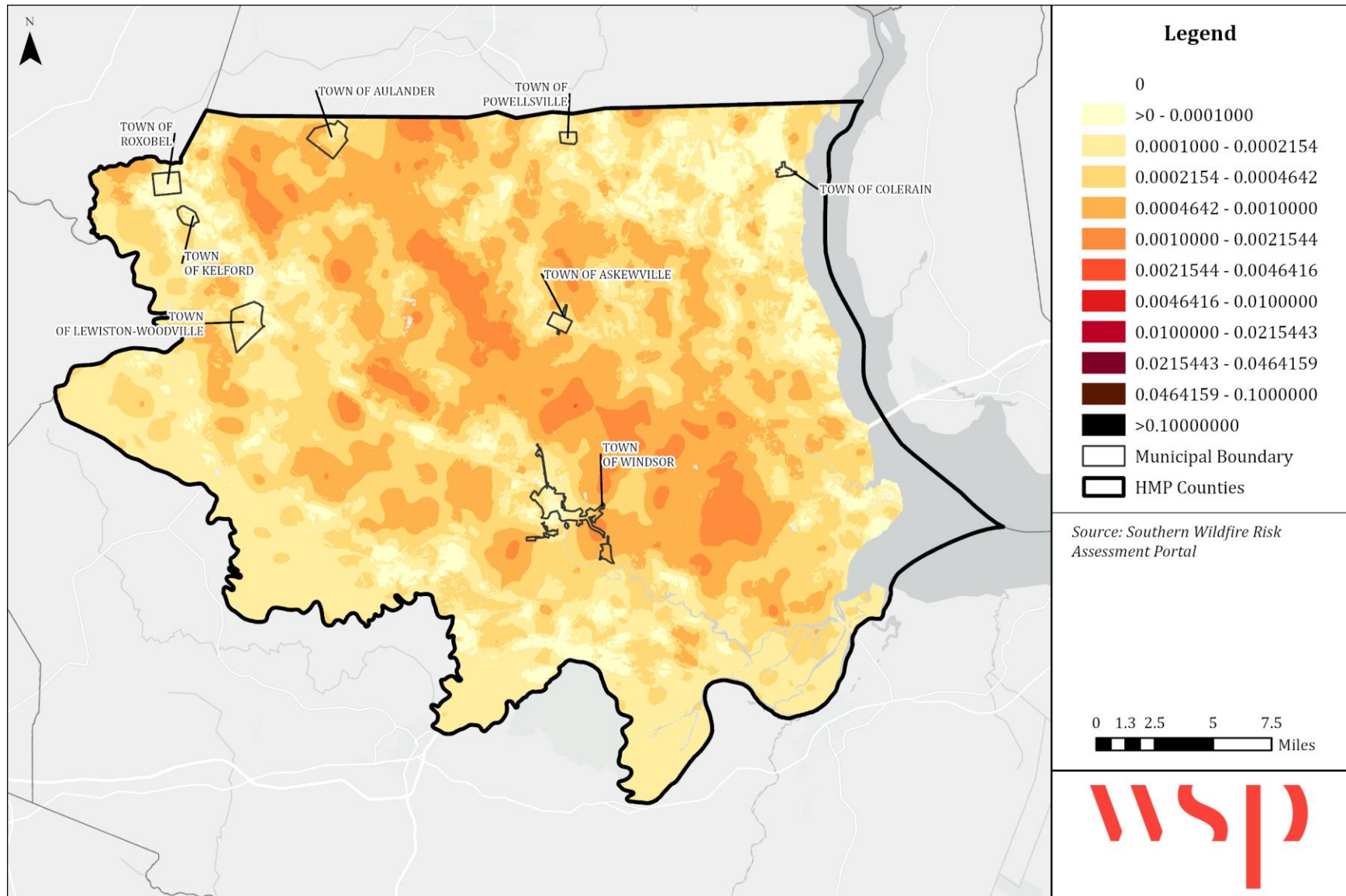


Figure A.45 - Burn Probability, Town of Askewville

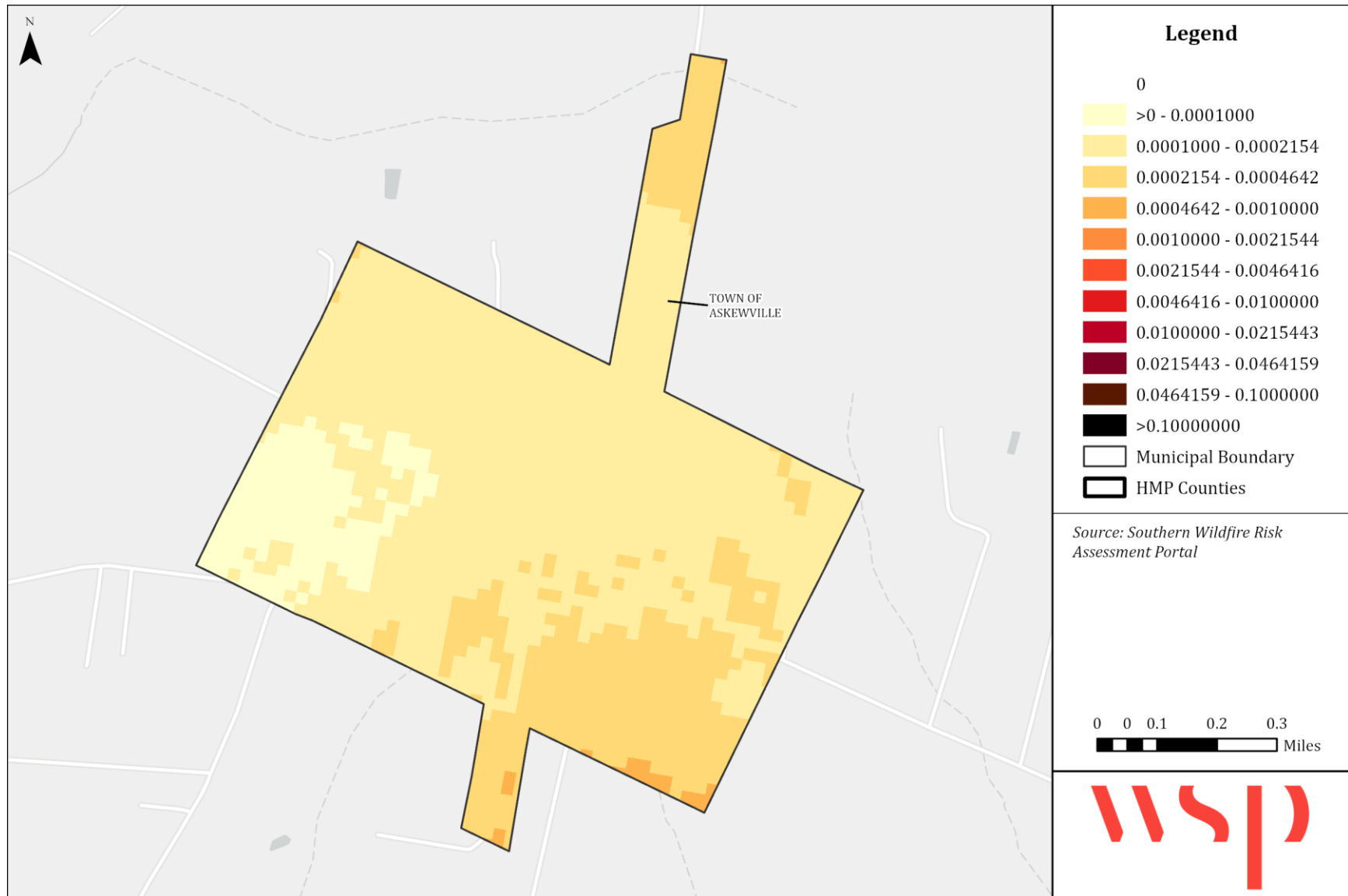


Figure A.46 – Burn Probability, Town of Aulander

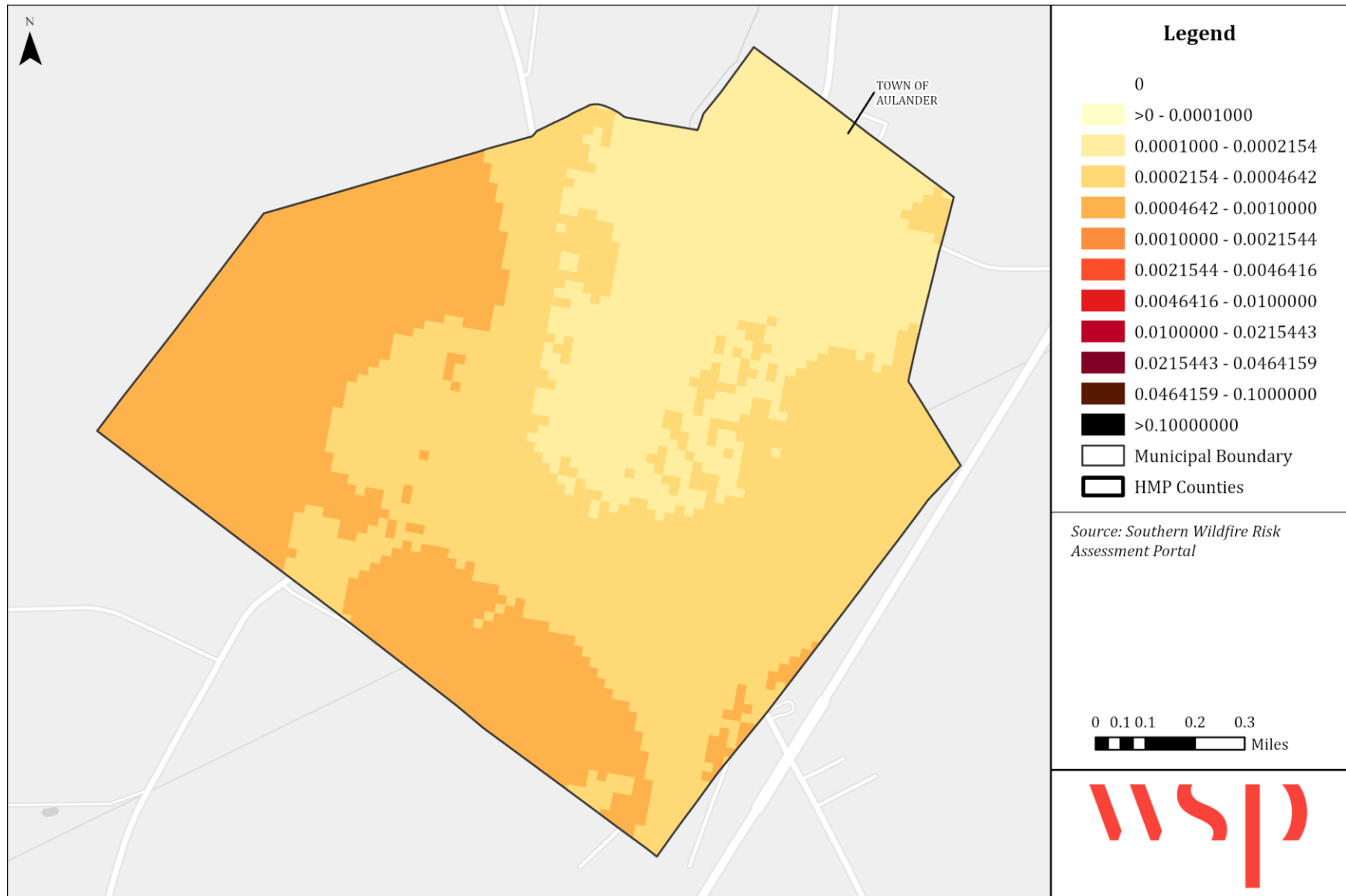


Figure A.47 - Burn Probability, Town of Colerain

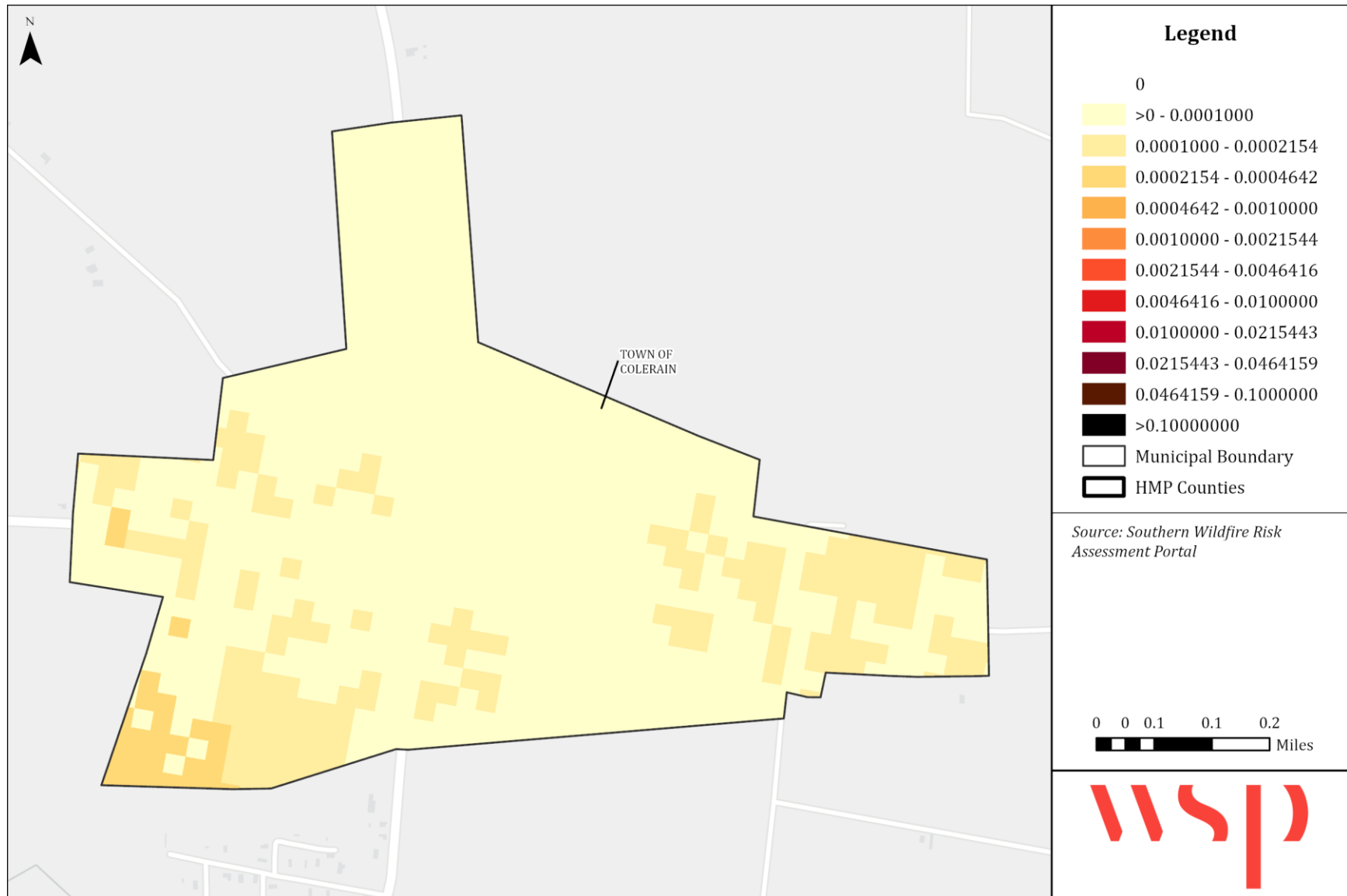


Figure A.48 - Burn Probability, Town of Kelford

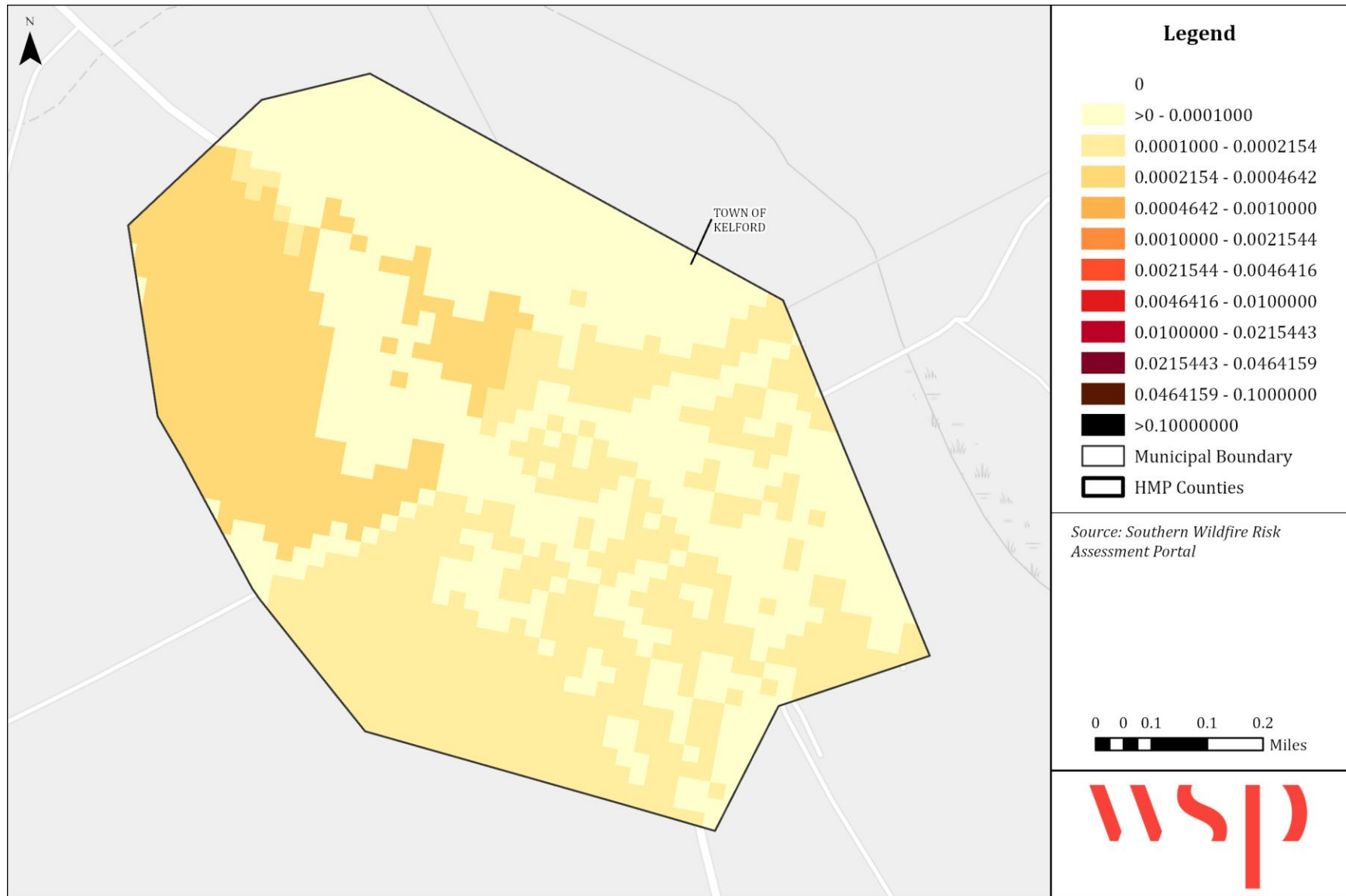


Figure A.49 - Burn Probability, Town of Lewiston-Woodville

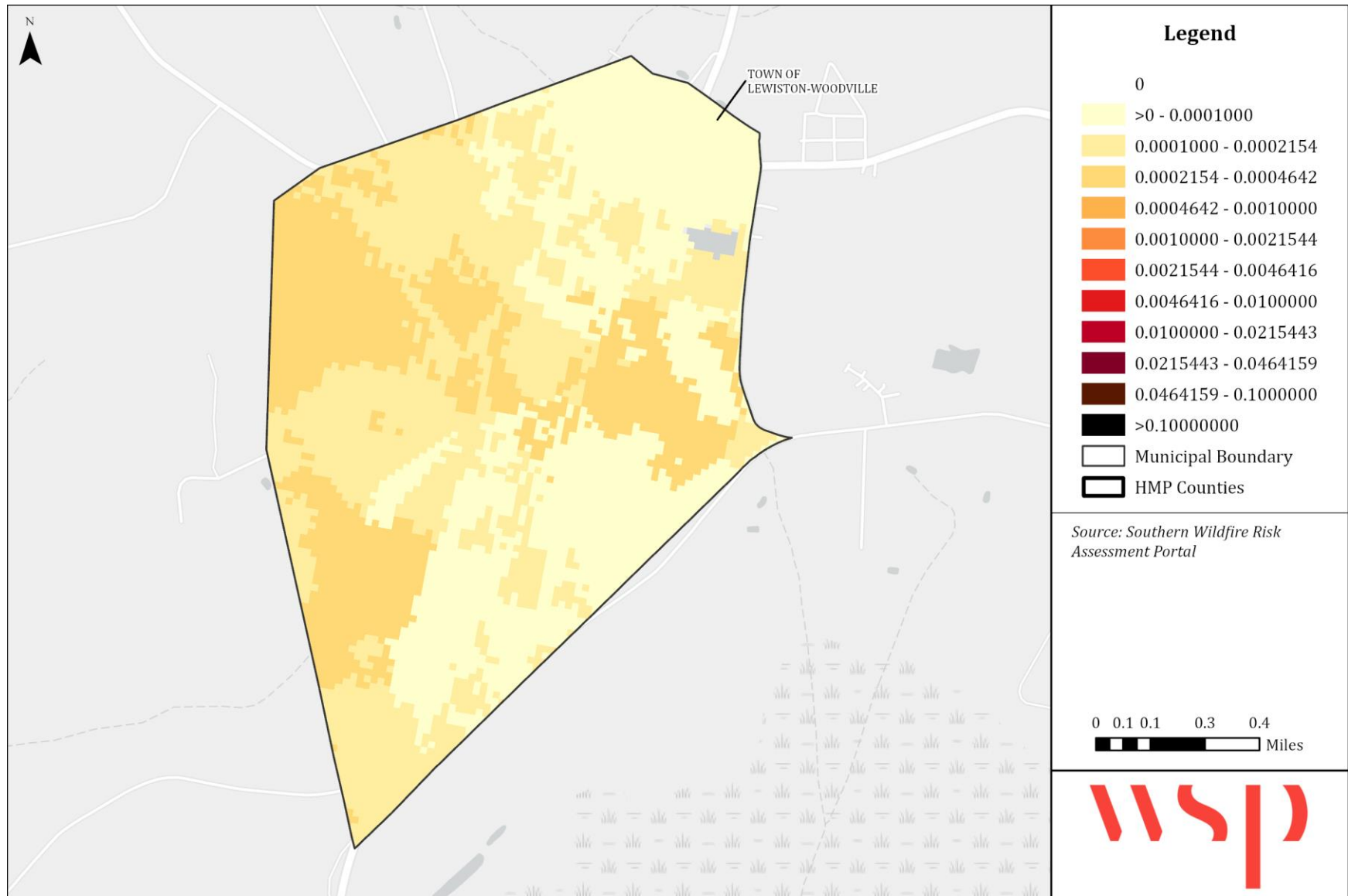


Figure A.50 – Burn Probability, Town of Powellsville

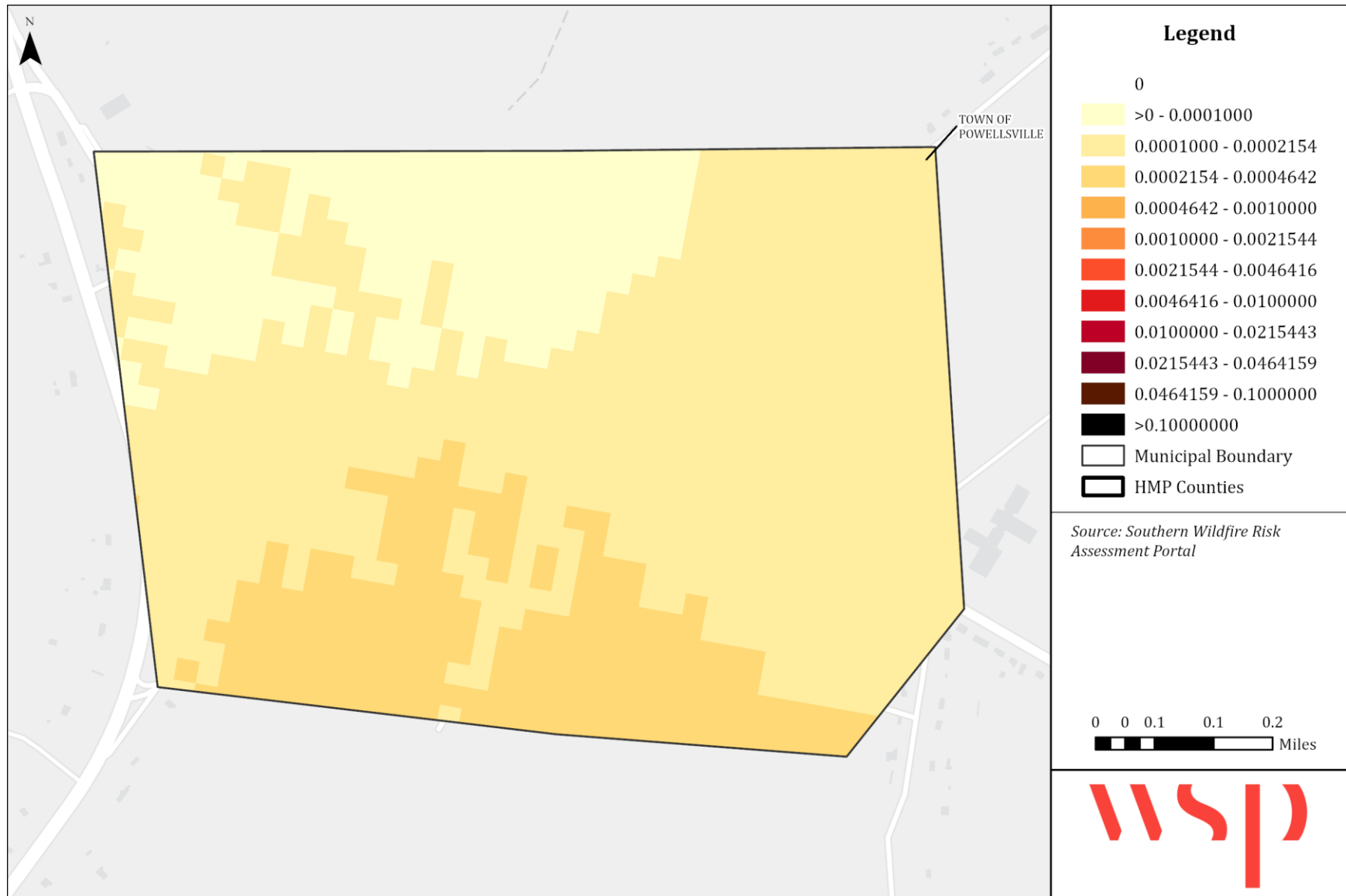


Figure A.51 – Burn Probability, Town of Roxobel

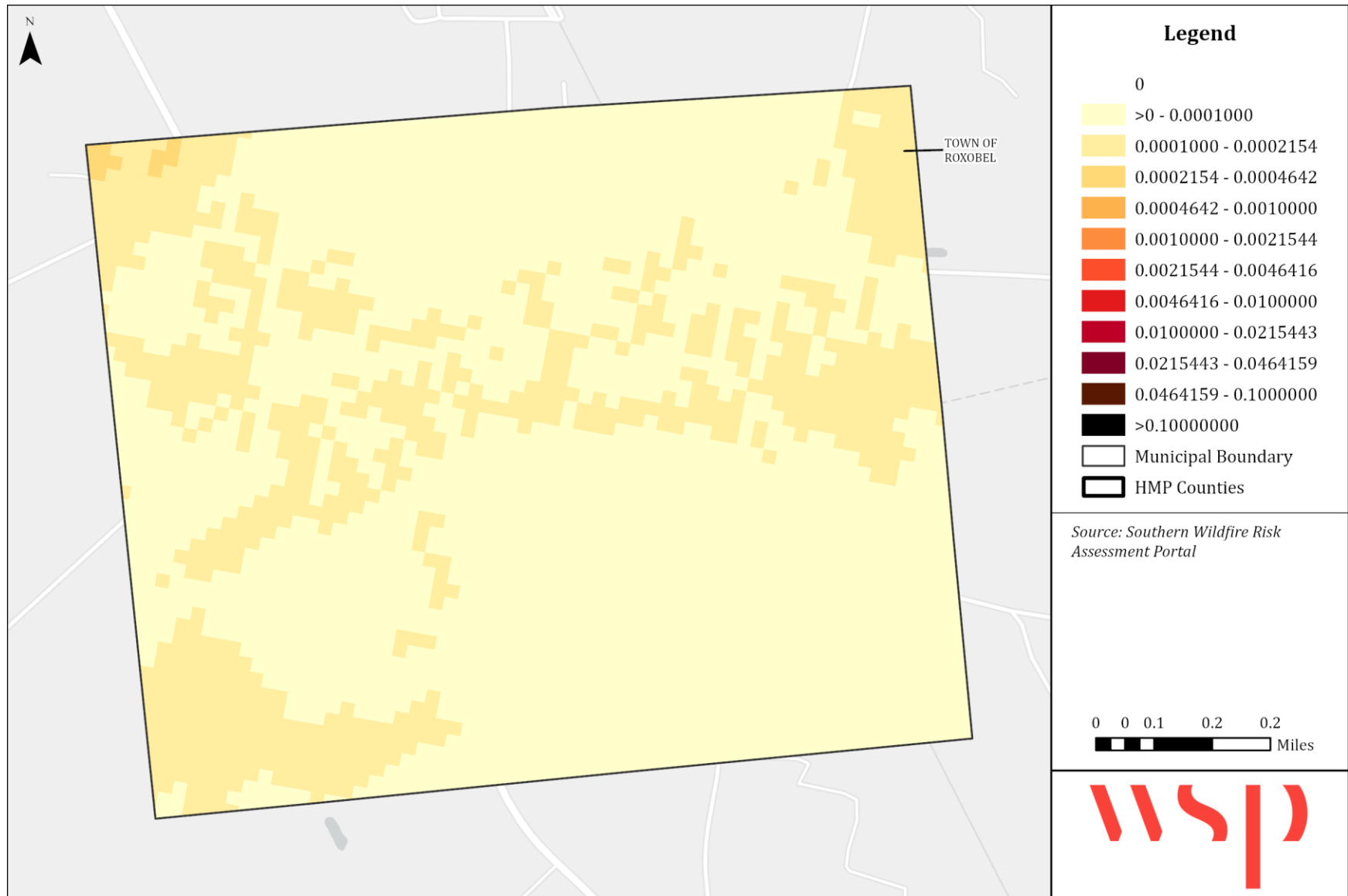
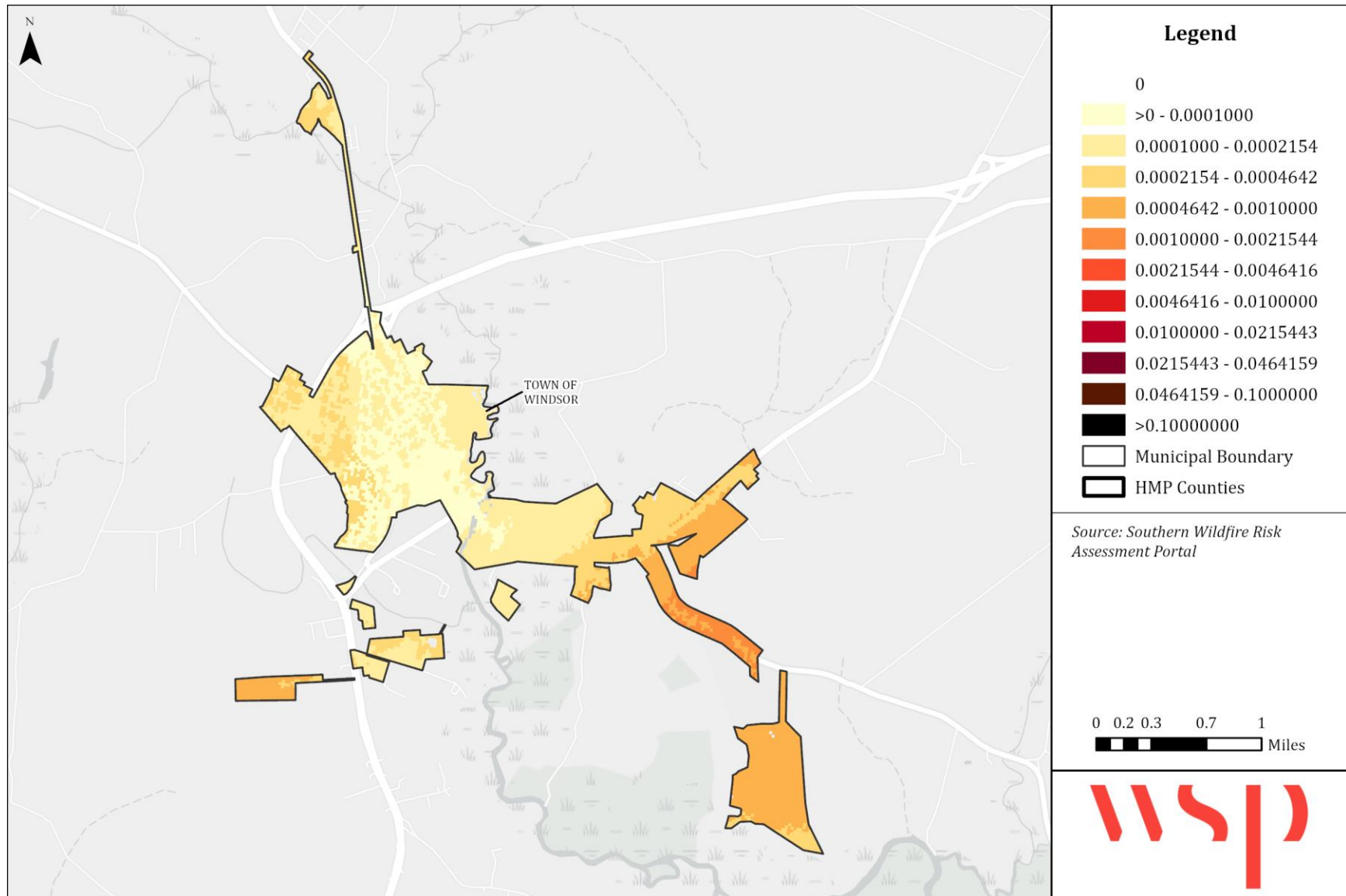


Figure A.52 - Burn Probability, Town of Windsor



A.3 MITIGATION STRATEGY

Action #	Description	Applicable Jurisdictions	Hazards Addressed	Priority	Goal & Objective	Category	Lead/Participating Agencies	Estimated Cost	Potential Funding Sources	Implementation Schedule	2025 Status	Status Comments/Explanation
B2	Continue to develop a Geographic Information System (GIS) to map current land uses and to map proposed future land uses (CAMA Land Use Plan Update) as an aid in assessing community vulnerability.	Bertie County, Askewville, Aulander, Colerain, Kelford, Lewiston-Woodville, Powellsville, Roxobel, Windsor	All Hazards	Med	2.2, 3.1	P	Bertie County Planning Department Bertie County Emergency Management Municipal Administrations	Staff Time	General Fund, NCDPS	2 to 3 years	Carry Forward	Updated flood data has been included in County GIS system, as have utility lines, fire districts, and fire stations. Remains a priority to develop a GIS layer for land use.
B4	Accomplish the following during the next CAMA Land Use Plan update: - Establish more specific growth guidelines and policies and specifically delineate sensitive environmental areas for protection; - Adopt a more limited policy on the types of uses allowed within flood hazard areas; - Adopt a policy to not extend public services and utilities into flood hazard or other environmentally sensitive areas to discourage growth.	Bertie County, Askewville, Aulander, Colerain, Kelford, Lewiston-Woodville, Powellsville, Roxobel, Windsor	All Hazards	Med	2.2, 1.1, 1.2	PP	Bertie County Planning Department Bertie County Administration Municipal Administrations	\$45,000	General Fund, NCDPS, NCDEQ	3 to 5 years	Carry Forward	No progress to report. This remains a priority and Bertie County is still seeking funding to update the CAMA Land Use Plan.
B5	Consider adopting a zoning ordinance that: - Establishes zoning districts and sets standards for future development. - Includes standards for clustering of residential lot development to help preserve flood hazard areas from development. - Includes a flood hazard overlay zone to ensure that inappropriate development is adequately controlled.	Bertie County	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	Med	1.2	PP	Bertie County Planning Department Bertie County Board of Commissioners	\$75,000	General Fund	3 to 5 years	Carry Forward	Bertie County is still considering developing and adopting Countywide zoning regulations but would like to update the CAMA Land Use Plan first to inform this. ECU students prepared a study and draft ordinance for the Highway 17 area.
B8	Identify repetitive flood loss properties and other high risk properties for acquisition and relocation. Seek Federal and State funding (voluntary program).	Bertie County, Askewville, Aulander, Colerain, Kelford, Lewiston-Woodville, Powellsville, Roxobel, Windsor	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	Med	2.3, 1.2	SP	Bertie County Administration Bertie County Board of Commissioners Municipal Administrations	Staff Time	General Fund, NCDPS	2025-2030	Carry Forward	Bertie County and Town of Windsor have completed HMGP grants for acquisitions and elevations. Will continue to look for opportunities to protect additional properties.

Action #	Description	Applicable Jurisdictions	Hazards Addressed	Priority	Goal & Objective	Category	Lead/Participating Agencies	Estimated Cost	Potential Funding Sources	Implementation Schedule	2025 Status	Status Comments/Explanation
B9	Establish a countywide Stormwater Management Program to improve and maintain stormwater drainage systems countywide.	Bertie County, Askewville, Aulander, Colerain, Kelford, Lewiston-Woodville, Powellsville, Roxobel, Windsor	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	High	1.3	SP	Bertie County Administration Municipal Administrations	To Be Determined	General Fund, NCDPS	1 year	Carry Forward	Coordinating committee not established and drainage needs to be addressed on a countywide level. Specific drainage issues have been identified. Bertie County and Town of Windsor have received a grant to address drainage improvements in Hoggard Mill Pond.
B10	Maintain a coordinated debris inspection and removal program.	Bertie County, Askewville, Aulander, Colerain, Kelford, Lewiston-Woodville, Powellsville, Roxobel, Windsor	Flooding, Hurricanes & Tropical Storm, Severe Winter Storm, Extreme Heat, Earthquake, Wildfire, Dam & Levee Failure, Severe Weather, Tornado	High	3.2	ES	Bertie County Board of Commissioners Bertie County Emergency Management Municipal Administrations	Staff Time	General Fund, NCDPS, FEMA	2025-2030	Carry Forward	Bertie County will continue to maintain a post disaster debris management contractor. The County will review this contract and update it annually prior to hurricane season.
B12	Advise/assist property owners in retrofitting homes and businesses.	Bertie County, Askewville, Aulander, Colerain, Kelford, Lewiston-Woodville, Powellsville, Roxobel, Windsor	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	High	4.2	PIO	Bertie County Planning Department Municipal Administrations	Staff Time	General Fund	2025-2030	Carry Forward	The Bertie County Planning and Inspection Department works closely with property owners and builders to retrofit homes to minimize future flood damages. County coordinates with NRCS to offer advice on drainage issues.
B13	Acquire generators or other forms of redundant power supply to ensure that critical facilities and infrastructure remain operational where normal power supply is not available.	Bertie County, Askewville, Aulander, Colerain, Kelford, Lewiston-Woodville, Powellsville, Roxobel, Windsor	All Hazards	High	1.1	PP	Bertie County Emergency Management American Red Cross Bertie County School System Municipal Administrations	To Be Determined	General Fund, NCDPS	1 to 3 years	Carry Forward	Priority facilities in need of backup generators include: County Admin Building, two EMS substations, all schools, all fire departments, and new 911 Center

Action #	Description	Applicable Jurisdictions	Hazards Addressed	Priority	Goal & Objective	Category	Lead/Participating Agencies	Estimated Cost	Potential Funding Sources	Implementation Schedule	2025 Status	Status Comments/Explanation
B14	Work to improve the emergency notification system in an effort to increase awareness regarding the locations of shelters and evacuation routes during natural hazard events.	Bertie County, Askewville, Aulander, Colerain, Kelford, Lewiston-Woodville, Powellsville, Roxobel, Windsor	All Hazards	High	4.1	PIO	Bertie County Emergency Management Municipal Administrations	Staff Time	General Fund	2025-2030	Carry Forward	Bertie County, along with other counties in the region, uses HyperReach emergency notification system. Additional improvements to support emergency notifications will be pursued as funding becomes available.
B15	Seek grant funding for eligible mitigation opportunities which may include but are not limited to: acquisition/elevation (addressed above), mitigation/reconstruction, and wet/dry floodproofing to residential and non-residential structures. Funding may also be utilized for redundant power to critical facilities, wind retrofits to critical facilities, storm shelters and other activities that reduce the loss of life and property.	Bertie County, Askewville, Aulander, Colerain, Kelford, Lewiston-Woodville, Powellsville, Roxobel, Windsor	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	Med	1.1, 2.3	PP, SP	Bertie County Administration Municipal Administrations	To Be Determined	NCDPS, FEMA	2025-2030	Carry Forward	County has received grants for drainage improvements and property protection. County has contracted with a consultant to identify and apply for grant funding.
B16	Work to implement all strategies and recommendations outlined within the Bertie County Hurricane Matthew Resilient Redevelopment Plan.	Bertie County	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	Low	2.3, 1.1	SP	Bertie County Administration Municipal Administrations	To Be Determined	General Fund, NCDPS, FEMA	5 years	Carry Forward	Drainage study completed. County will work to identify and implement other projects that are still a priority.
B17	Create or Update Community Wildfire Protection Plans in each fire district.	Bertie County, Askewville, Aulander, Colerain, Kelford, Lewiston-Woodville, Powellsville, Roxobel, Windsor	Wildfire	Med	1.4	P	Bertie County Emergency Management, Fire Departments, NC Forest Service	To Be Determined	Grant Funds	5 years	New	
B18	Acquire additional emergency response equipment to support emergency management operations, including lights, command trailer, and portable generators.	Bertie County	All Hazards	High	3.4, 4.1	ES	Bertie County Emergency Management	To Be Determined	General Fund, NCDPS, FEMA	5 years	New	

ANNEX B. HYDE COUNTY

B.1 ASSET INVENTORY

Hyde County and the HMPC provided a local inventory of critical facilities and community lifelines, which are a priority for mitigation planning and emergency management. Lifelines are the most fundamental services in the community that, when stabilized, enable all other aspects of society to function. Table B.1 provides a count of critical facilities by FEMA lifeline category in Hyde County. Figure B.1 shows the locations of all critical facilities in Hyde County.

Table B.2 provides a detailed inventory of the critical facilities in Hyde County, indicating each facility's FEMA lifeline category, flood zone, 1% annual chance flood depth, minimum storm surge category, and wildfire risk. More information on hazard vulnerability is provided in Section B.2.

Table B.1 – Critical Facilities by Type, Hyde County

Facility Type	Count of Facility Type	Structure Value
Communications	0	\$-
Energy	3	\$-
Food, Hydration, Shelter	40	\$22,333,359
Hazardous Materials	1	\$-
Health and Medical	4	\$2,125,741
Safety and Security	12	\$8,557,677
Transportation	0	\$-
Water Systems	12	\$479,754
Total	72	\$33,496,531

Figure B.1 – Critical Facilities, Hyde County

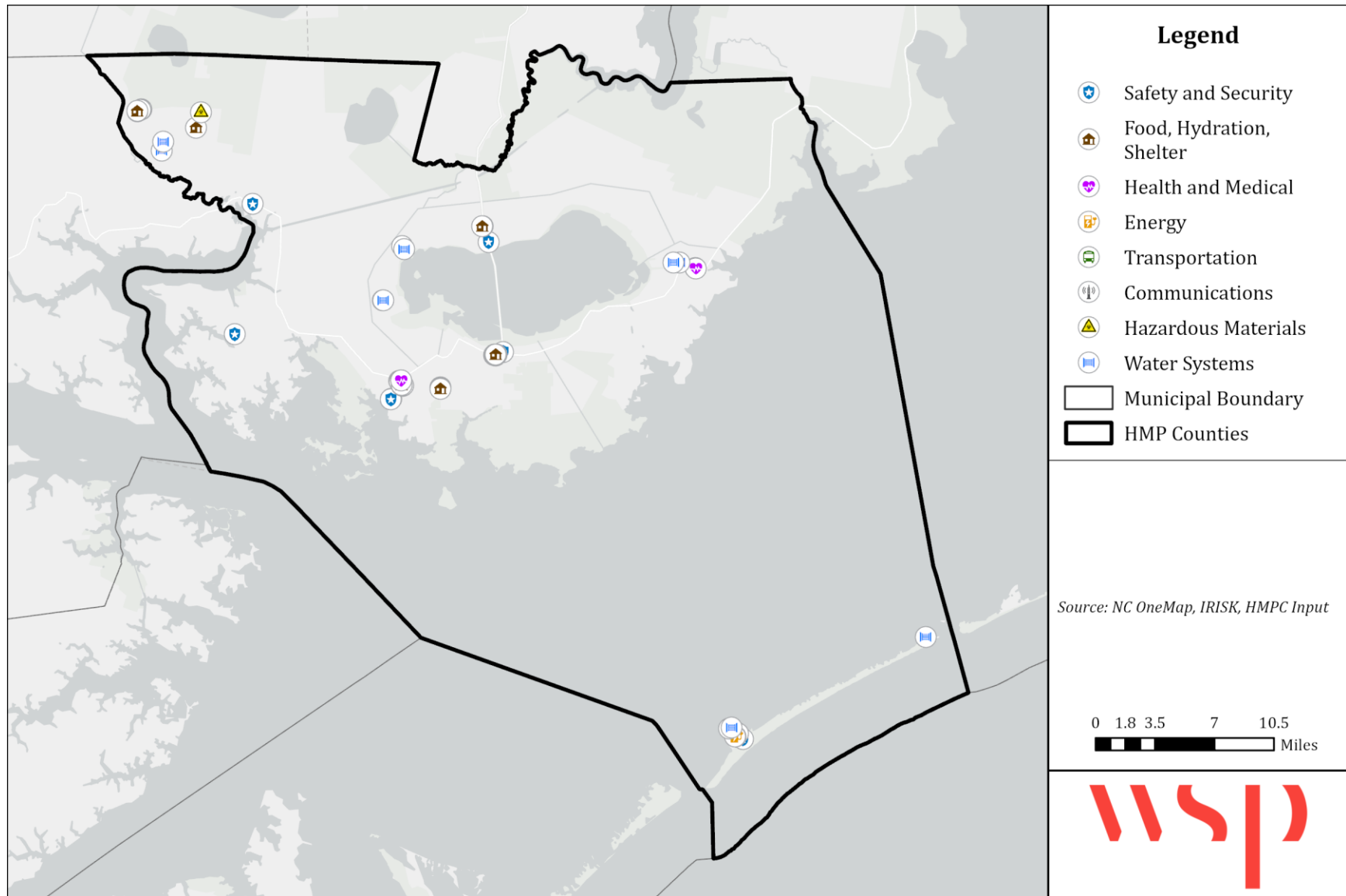


Table B.2 – Hyde County Critical Facilities Inventory

FEMA Lifeline	Facility Name	Address	Structure Value	Flood Depth	Flood Zone	Min. Sea Level Rise	Min. Storm Surge Cat.	High WUI Exposure	Fire Intensity
Safety and Security	Engelhard Volunteer Fire Department, Inc.	34545 US 264	\$99,170	2.2	AE	2ft SLR	Category 1	Indirect Exposure	0
Safety and Security	Fairfield Volunteer Fire Department	6680 NC 94	\$39,704	1.2	AE	3ft SLR	Category 1	Indirect Exposure	0
Safety and Security	Ocracoke Fire Protection Association, Inc.	822 Irvin Garrish Highway	\$204,365	2.0	AE	3ft SLR	Category 1	Indirect Exposure	0
Safety and Security	Ponzer Volunteer Fire & Rescue, Inc.	40186 US 264 E	\$104,134	0.0	X Unshaded	N/A	Category 3	Direct Exposure	0
Safety and Security	Scranton Volunteer Fire Department, Inc.	5224 Sladesville-Credle Rd	-	1.1	AE	3ft SLR	Category 1	Indirect Exposure	0
Safety and Security	Swan Quarter Volunteer Fire Department, Inc.	25 Oyster Creek Rd	\$356,080	0.2	AE	N/A	Category 1	Indirect Exposure	0
Safety and Security	Swan Quarter Volunteer Fire Department, Inc.	149 NC 94	-	0.5	AE	3ft SLR	Category 1	Indirect Exposure	0
Safety and Security	Hyde County Sheriffs Office - Ocracoke Island Station	1140 Irvin S Garrish Highway	\$115,262	1.4	AE	3ft SLR	Category 1	Indirect Exposure	0
Safety and Security	National Park Service - Cape Hatteras National Seashore - Ocracoke Island Ranger Station	49 Pilot Town Circle	-	1.5	AE	3ft SLR	Category 1	Indirect Exposure	0
Safety and Security	Hyde County Sheriffs Office/Hyde County Jail	1223 Main Street	\$2,256,956	1.0	AE	N/A	Category 2	Indirect Exposure	0
Health and Medical	Ocracoke Volunteer Fire Department	215 Back Road	\$70,271	2.7	AE	2ft SLR	Category 1	Indirect Exposure	0
Health and Medical	Engelhard Volunteer Fire Department Incorporated	34545 United States Highway 264	\$99,170	3.1	AE	1ft SLR	Category 1	Indirect Exposure	0
Health and Medical	Hyde County Emergency Medical Services	1223 Main Street	\$54,830	0.0	X Shaded	N/A	Category 2	Indirect Exposure	0

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FEMA Lifeline	Facility Name	Address	Structure Value	Flood Depth	Flood Zone	Min. Sea Level Rise	Min. Storm Surge Cat.	High WUI Exposure	Fire Intensity
Health and Medical	Ocracoke Island Emergency Medical Services District 2	305 Back Road	\$1,901,470	2.1	AE	2ft SLR	Category 1	Indirect Exposure	0
Hazardous Materials	Rose Acre Farms	1560 Hyde Park Canal Road	-	0.0	X Unshaded	N/A	Category 3	Critical Fireshed	1
Safety and Security	Hyde County Health Department	1151 Main Street	\$2,256,956	0.0	X Unshaded	N/A	Category 1	Indirect Exposure	0
Water Systems	Hyde County Water System	-	-	1.4	AE	N/A	Category 1	Direct Exposure	2
Water Systems	Hyde County Water System	-	-	2.1	AE	N/A	Category 1	Sources of Ember Load to Buildings	3
Water Systems	Hyde County Water System	-	\$142,264	0.1	AE	N/A	Category 2	Direct Exposure	2
Water Systems	Hyde County Water System	-	\$142,264	0.0	X Shaded	N/A	Category 2	Critical Fireshed	0
Water Systems	Hyde County Water System	-	\$82,097	0.0	X Unshaded	N/A	Category 2	Indirect Exposure	0
Water Systems	Hyde County Water System	-	\$82,097	0.0	X Unshaded	N/A	Category 2	Critical Fireshed	0
Water Systems	Ocracoke Sanitary District	159 Water Plant Rd	-	1.5	AE	N/A	Category 1	Indirect Exposure	0
Water Systems	Ocracoke Sanitary District	159 Water Plant Rd	-	0.0	X Unshaded	N/A	Category 3	Indirect Exposure	0
Water Systems	Ocracoke Sanitary District	159 Water Plant Rd	-	0.0	X Unshaded	N/A	Category 3	Indirect Exposure	0
Water Systems	Dot-Hatteras Ferry South Dock	-	\$31,032	0.0	X Shaded	3ft SLR	Category 1	Direct Exposure	4
Food, Hydration, Shelter	Hyde County Egg Farm	1560 Hyde Park Canal	\$2,455,918	0.0	X Unshaded	N/A	Category 3	Indirect Exposure	0
Food, Hydration, Shelter	Hyde County Egg Farm	1560 Hyde Park Canal	\$2,455,918	0.0	X Unshaded	N/A	Category 3	Indirect Exposure	0
Food, Hydration, Shelter	Rodlee Pork Inc.	600 Refuge Rd	\$12,500	0.0	X Unshaded	N/A	Category 3	Direct Exposure	3
Food, Hydration, Shelter		1054 Main St	-	0.0	X Shaded	N/A	Category 2	Indirect Exposure	0

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FEMA Lifeline	Facility Name	Address	Structure Value	Flood Depth	Flood Zone	Min. Sea Level Rise	Min. Storm Surge Cat.	High WUI Exposure	Fire Intensity
Food, Hydration, Shelter		1054 Main St	-	0.6	AE	N/A	Category 1	Direct Exposure	2
Food, Hydration, Shelter		1054 Main St	-	0.0	X Shaded	N/A	Category 2	Indirect Exposure	0
Food, Hydration, Shelter		1054 Main St	-	0.0	X Shaded	N/A	Category 2	Indirect Exposure	0
Food, Hydration, Shelter		1054 Main St	-	2.1	AE	N/A	Category 2	Indirect Exposure	0
Food, Hydration, Shelter		1054 Main St	-	0.7	AE	N/A	Category 1	Direct Exposure	2
Food, Hydration, Shelter		Unknown	-	0.0	X Shaded	N/A	Category 2	Indirect Exposure	0
Food, Hydration, Shelter		Unknown	-	0.0	X Shaded	N/A	Category 2	Indirect Exposure	0
Food, Hydration, Shelter		Unknown	-	0.0	X Shaded	N/A	Category 2	Indirect Exposure	0
Food, Hydration, Shelter		Unknown	-	0.0	X Shaded	N/A	Category 2	Direct Exposure	2
Food, Hydration, Shelter		Unknown	-	0.0	X Shaded	N/A	Category 2	Indirect Exposure	0
Food, Hydration, Shelter		7681 NC 94 HWY	-	3.9	AE	3ft SLR	Category 1	Indirect Exposure	0
Food, Hydration, Shelter		7681 NC 94 HWY	-	3.7	AE	3ft SLR	Category 1	Indirect Exposure	0
Food, Hydration, Shelter		1054 MAIN ST	-	0.0	X Shaded	N/A	Category 1	Indirect Exposure	0
Food, Hydration, Shelter		20418 US 2 / US 264 HWY	\$2,079,863	0.0	X Shaded	N/A	Category 1	Indirect Exposure	0
Food, Hydration, Shelter		20392 US 2 / US 264 HWY	-	0.0	X Shaded	N/A	Category 2	Indirect Exposure	0
Food, Hydration, Shelter		20392 US 2 / US 264 HWY	-	0.4	AE	3ft SLR	Category 1	Indirect Exposure	0
Food, Hydration, Shelter		20392 US 2 / US 264 HWY	-	0.6	AE	3ft SLR	Category 1	Indirect Exposure	0
Food, Hydration, Shelter		20392 US 2 / US 264 HWY	-	0.5	AE	3ft SLR	Category 1	Indirect Exposure	0

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FEMA Lifeline	Facility Name	Address	Structure Value	Flood Depth	Flood Zone	Min. Sea Level Rise	Min. Storm Surge Cat.	High WUI Exposure	Fire Intensity
Food, Hydration, Shelter		20392 US 2 / US 264 HWY	-	0.2	AE	3ft SLR	Category 1	Indirect Exposure	0
Food, Hydration, Shelter		20392 US 2 / US 264 HWY	-	0.2	AE	3ft SLR	Category 1	Indirect Exposure	0
Food, Hydration, Shelter		20392 US 2 / US 264 HWY	-	0.0	X Shaded	N/A	Category 2	Indirect Exposure	0
Food, Hydration, Shelter		20418 US 2 20418 US 264 HWY	\$2,079,863	0.5	AE	3ft SLR	Category 1	Indirect Exposure	0
Safety and Security		10 Oyster Creek Rd	\$3,125,050	1.4	AE	3ft SLR	Category 1	Indirect Exposure	0
Food, Hydration, Shelter		215 Back Rd	\$1,901,470	2.1	AE	3ft SLR	Category 1	Indirect Exposure	0
Food, Hydration, Shelter		215 Back Rd	\$1,901,470	1.8	AE	3ft SLR	Category 1	Indirect Exposure	0
Food, Hydration, Shelter		215 Back Rd	\$1,901,470	1.5	AE	3ft SLR	Category 1	Indirect Exposure	0
Energy		Unknown	-	1.5	AE	3ft SLR	Category 1	Indirect Exposure	0
Energy		Unknown	-	2.1	AE	3ft SLR	Category 1	Indirect Exposure	0
Energy		Unknown	-	1.3	AE	3ft SLR	Category 1	Indirect Exposure	0
Food, Hydration, Shelter		20392 US 2 / US 264 HWY	-	0.0	X Shaded	N/A	Category 2	Indirect Exposure	0
Food, Hydration, Shelter		20392 US 2 / US 264 HWY	-	0.0	X Shaded	N/A	Category 2	Indirect Exposure	0
Food, Hydration, Shelter		Unknown	\$652,649	0.0	X Unshaded	N/A	Category 2	Indirect Exposure	0
Food, Hydration, Shelter		20418 US 2 / US 264 HWY	\$2,079,863	0.0	X Shaded	N/A	Category 1	Indirect Exposure	0
Food, Hydration, Shelter		20418 US 2 / US 264 HWY	\$2,079,863	0.0	X Shaded	N/A	Category 1	Indirect Exposure	0
Food, Hydration, Shelter		Unknown	\$652,649	0.0	X Unshaded	N/A	Category 2	Indirect Exposure	0
Food, Hydration, Shelter		20418 US 2 / US 264 HWY	\$2,079,863	0.0	X Shaded	N/A	Category 2	Indirect Exposure	0

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FEMA Lifeline	Facility Name	Address	Structure Value	Flood Depth	Flood Zone	Min. Sea Level Rise	Min. Storm Surge Cat.	High WUI Exposure	Fire Intensity
Food, Hydration, Shelter		560 Refuge Rd	-	0.0	X Unshaded	N/A	Category 2	Indirect Exposure	0
Food, Hydration, Shelter		560 Refuge Rd	-	0.0	X Unshaded	N/A	Category 2	Indirect Exposure	0
Food, Hydration, Shelter		Unknown	-	0.0	X Unshaded	N/A	Category 2	Indirect Exposure	0
Food, Hydration, Shelter		Unknown	-	0.0	X Unshaded	N/A	Category 3	Direct Exposure	2
Water Systems		567 Prison Rd	-	0.0	X Shaded	N/A	Category 1	Direct Exposure	0
Water Systems		567 Prison Rd	-	0.0	X Shaded	N/A	Category 1	Indirect Exposure	0

B.2 RISK ASSESSMENT

This section contains a summary of the County's asset inventory as well as hazard profile and vulnerability assessment for those hazards that are spatially defined and have variations in risk that could be evaluated quantitatively on a jurisdictional level. The hazards included in this section are: Flooding, Hurricanes & Coastal Hazards, and Wildfire.

B.2.1 FLOODING

Table B.3 details the acreage of Hyde County's total area by flood zone on the Effective DFIRM. Per this assessment, nearly 43 percent of Hyde County is within the SFHA.

Table B.3 – Flood Zone Acreage, Hyde County

Flood Zone	Acreage	Percent of Total (%)
Zone A	5,362.0	0.6%
Zone AE	372,295.2	42.2%
Zone AO	73.5	0.0%
Zone VE	2,837.5	0.3%
Zone X Shaded	15,848.5	1.8%
Zone X Unshaded	90,762.2	10.3%
Open Water	396,083.0	44.8%
Total	883,262.0	--

Source: FEMA Effective DFIRM

Flood Zone	Critical Facility Count	Structure Value
Zone AE	34	\$16,194,035
Zone X (500-year)	22	\$8,547,578
Zone X (unshaded)	16	\$8,754,918
Total	72	\$33,496,531

Source: FEMA Effective DFIRM, HMPC

Figure B.2 reflects the effective mapped flood hazard zones for all jurisdictions in Hyde County, and Figure B.3 displays the depth of flooding estimated to occur in these areas during the 1%-annual-chance flood.

Table B.4 provides building counts and values for critical facilities by flood zone in Hyde County and participating jurisdictions.

Table B.4 – Critical Facilities Exposed to Flooding by Event, Hyde County

Flood Zone	Critical Facility Count	Structure Value
Zone AE	34	\$16,194,035
Zone X (500-year)	22	\$8,547,578
Zone X (unshaded)	16	\$8,754,918
Total	72	\$33,496,531

Source: FEMA Effective DFIRM, HMPC

Figure B.2 – FEMA Flood Hazard Areas, Hyde County

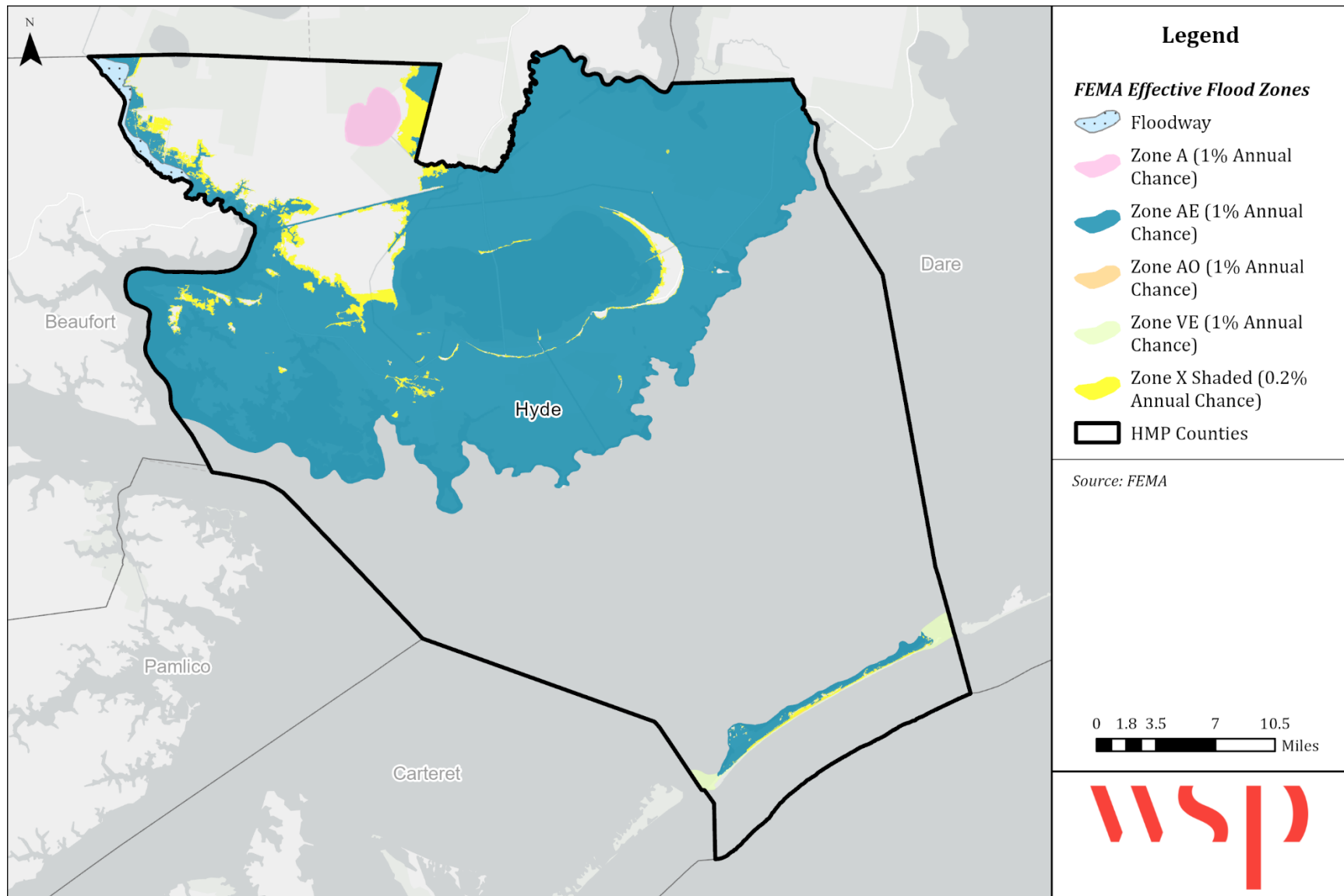
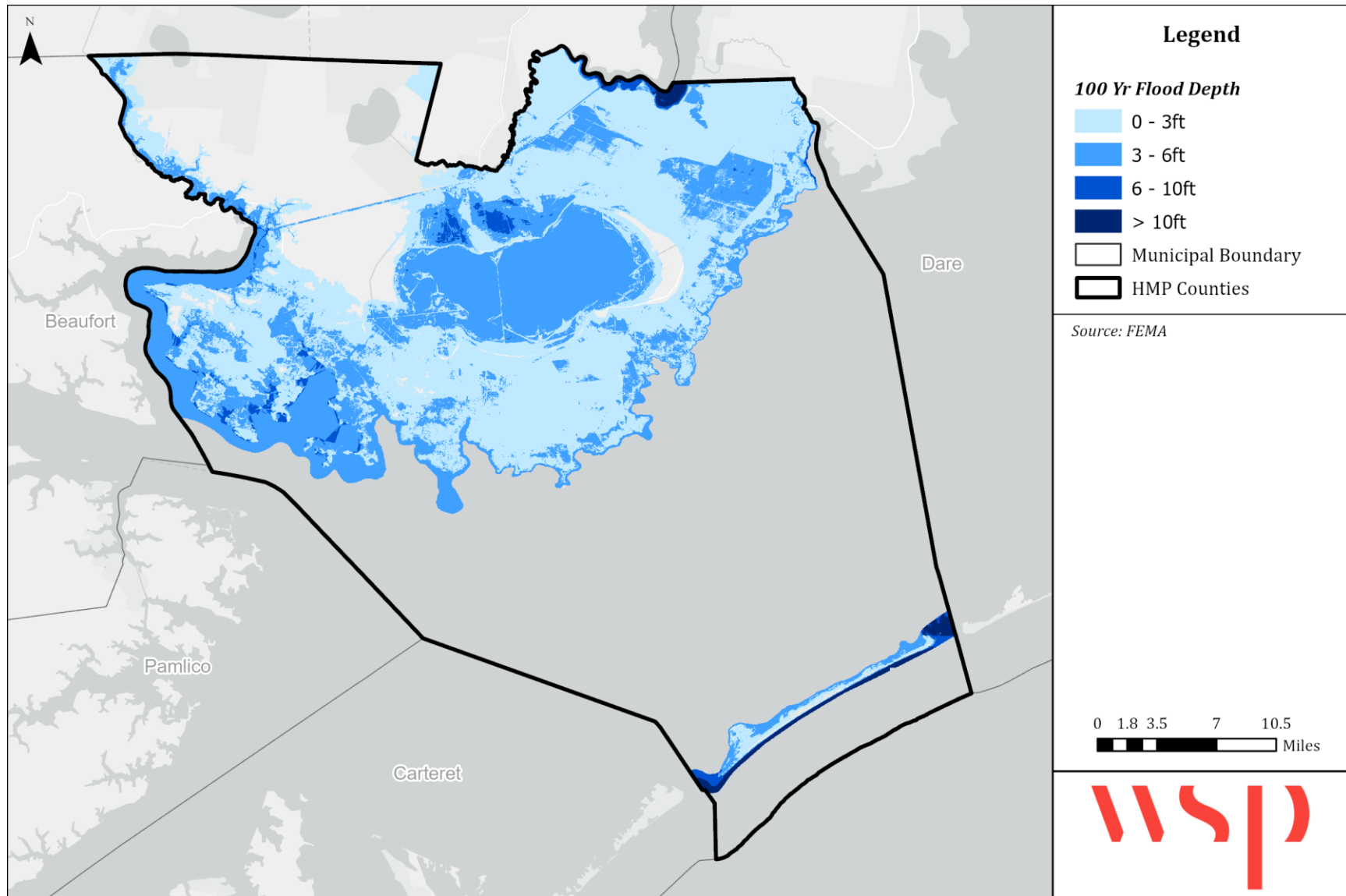


Figure B.3 - Flood Depth, 1%-Annual-Chance Floodplain, Hyde County



FLOODPLAIN MANAGEMENT

Hyde County entered the NFIP on February 4, 1987. The following tables reflect NFIP policy and claims data for Hyde County categorized by structure type, flood zone, Pre-FIRM and Post-FIRM.

Table B.5 – NFIP Policy and Claims Data by Structure Type, Hyde County

Structure Type	Policies in Force	Total Premium	Insurance in Force	Number of Closed Paid Losses	Total of Closed Paid Losses
Single Family	656	\$390,410	\$140,833,000	1,466	\$30,906,360.86
2-4 Family	27	\$15,332	\$6,686,000	14	\$301,399.01
All Other Residential	44	\$16,734	\$11,173,000	11	\$707,561.02
Non Residential	85	\$130,867	\$30,767,000	274	\$12,954,374.84
Total	812	\$553,343	\$189,459,000	1,765	\$44,869,695.73

Source: FEMA Community Information System, accessed December 2025

Table B.6 – NFIP Policy and Claims Data by Flood Zone, Hyde County

Flood Zone	Policies in Force	Total Premium	Insurance in Force	Number of Closed Paid Losses	Total of Closed Paid Losses
A01-30 & AE Zones	769	\$522,633	\$178,531,000	1,673	\$43,800,816.83
A Zones	0	\$0	\$0	27	\$309,602.50
V01-30 & VE Zones	0	\$0	\$0	6	\$57,377.11
B, C & X Zone					
Standard	43	\$30,710	\$10,928,000	11	\$428,721.88
Preferred	0	\$0	\$0	3	\$1,942.17
Total	812	\$553,343	\$189,459,000	1,720	\$44,598,460.49

Source: FEMA Community Information System, accessed December 2025

Table B.7 – NFIP Policy and Claims Data Pre-FIRM, Hyde County

Flood Zone	Policies in Force	Total Premium	Insurance in Force	Number of Closed Paid Losses	Total of Closed Paid Losses
A01-30 & AE Zones	330	\$241,707	\$67,728,000	1,136	\$32,224,550.96
A Zones	0	\$0	\$0	27	\$309,602.50
V01-30 & VE Zones	0	\$0	\$0	6	\$57,377.11
B, C & X Zone	28	\$19,893	\$6,657,000	7	\$182,788.05
Standard	28	\$19,893	\$6,657,000	4	\$180,845.88
Preferred	0	\$0	\$0	3	\$1,942.17
Total	358	\$261,600	\$74,385,000	1,176	\$32,774,318.62

Source: FEMA Community Information System, accessed December 2025

Table B.8 – NFIP Policy and Claims Data Post-FIRM, Hyde County

Flood Zone	Policies in Force	Total Premium	Insurance in Force	Number of Closed Paid Losses	Total of Closed Paid Losses
A01-30 & AE Zones	439	\$280,926	\$110,803,000	537	\$11,576,265.87
B, C & X Zone	15	\$10,817	\$4,271,000	7	\$247,876.00

Flood Zone	Policies in Force	Total Premium	Insurance in Force	Number of Closed Paid Losses	Total of Closed Paid Losses
Standard	15	\$10,817	\$4,271,000	7	\$247,876.00
Preferred	0	\$0	\$0	0	\$0.00
Total	454	\$291,743	\$115,074,000	544	\$11,824,141.87

Source: FEMA Community Information System, accessed December 2025

B.2.2 HURRICANES AND COASTAL HAZARDS

Figure B.4 on the following page shows the estimated extent of surge by storm category according to NOAA SLOSH data that would occur in Hyde County. Due to its coastal location and low elevation, the majority of Hyde County is at risk to storm surge.

Figure B.5 shows the estimated inundation extents of 1 foot, 2 feet, and 3 feet of sea level rise that may occur in Hyde County. Sea level rise is likely to impact Hyde County from the Pamlico Sound and up the Pungo River and Alligator River.

Figure B.4 - Storm Surge Extent by Storm Category

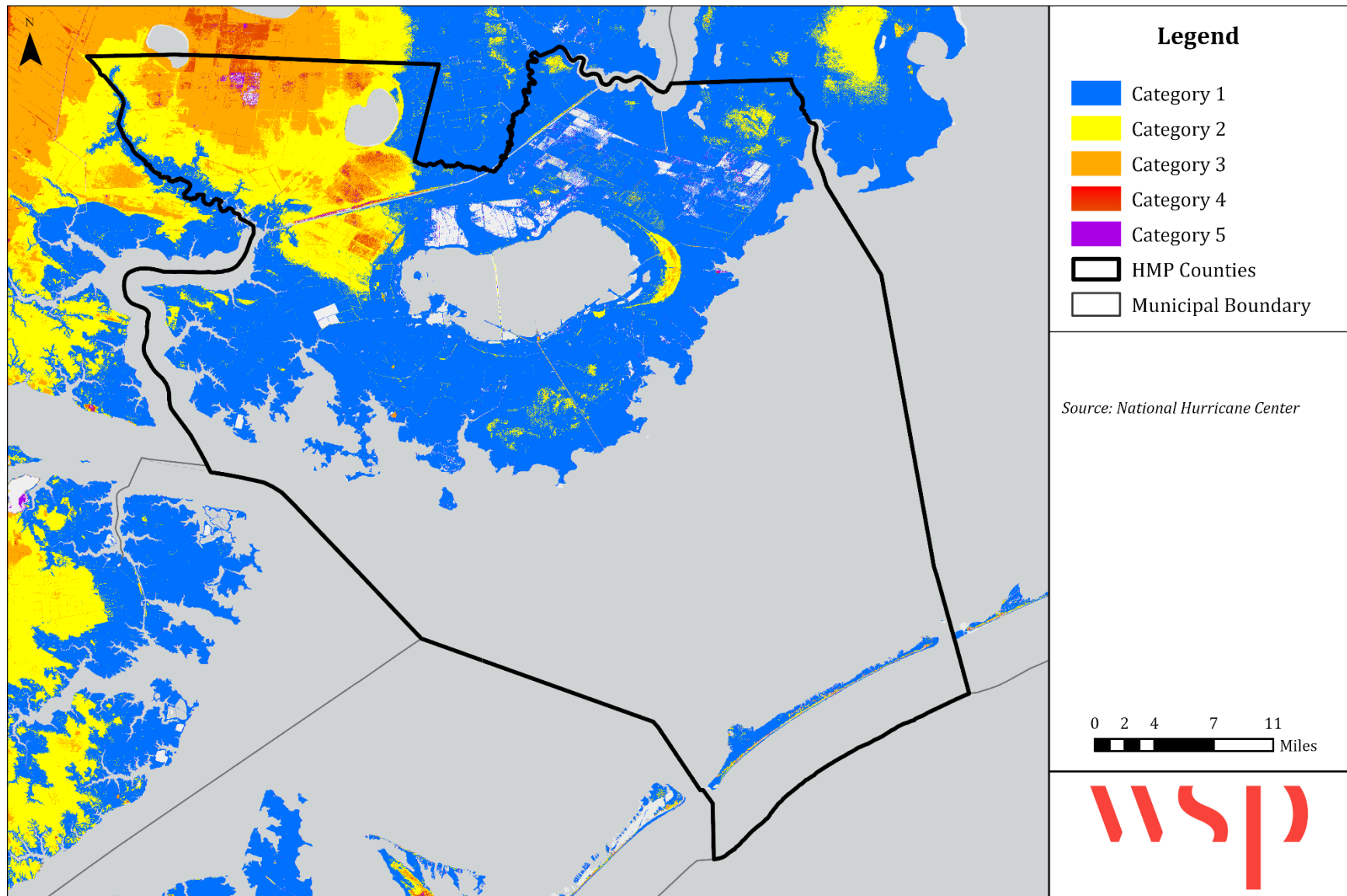
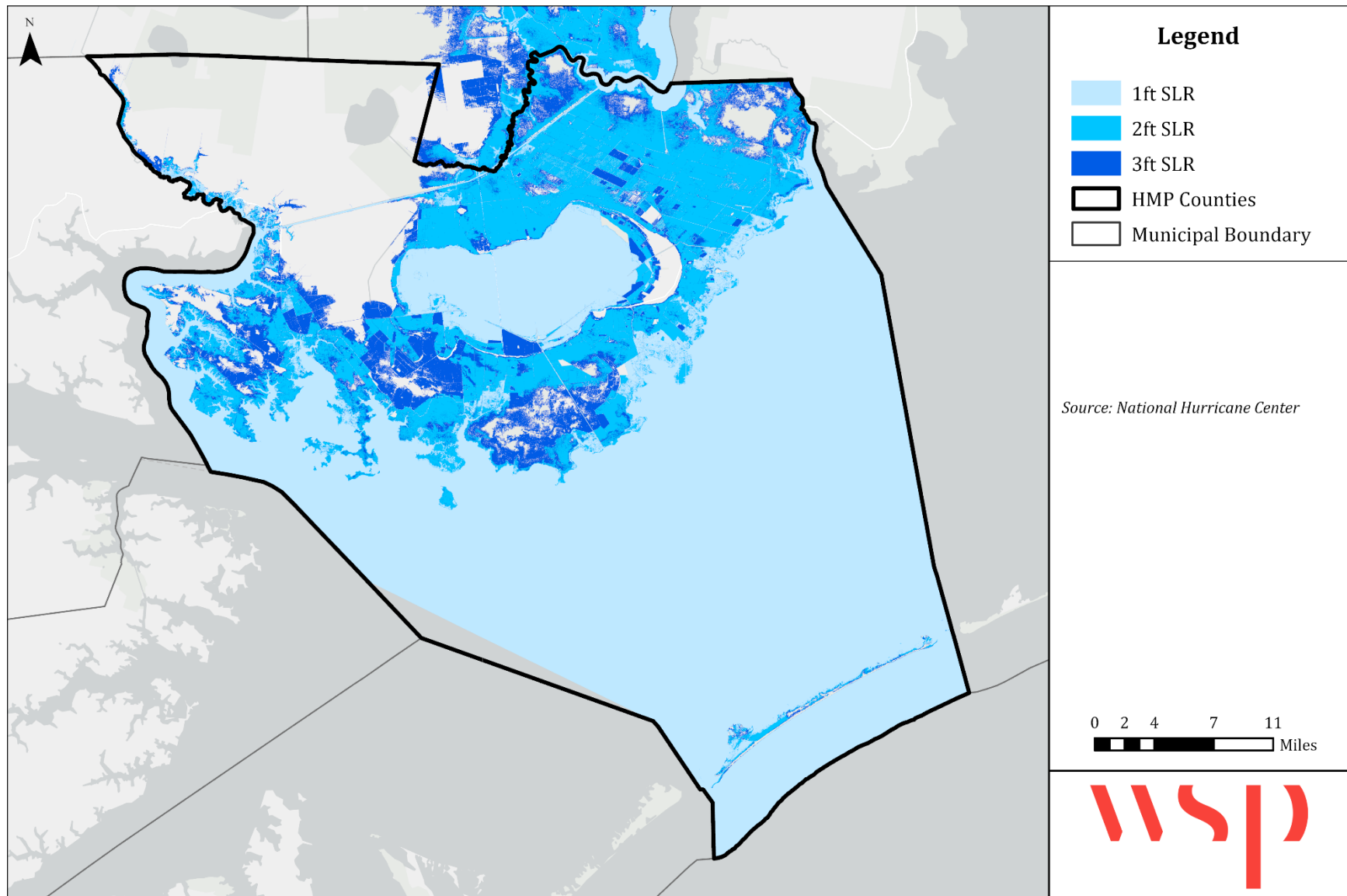


Figure B.5 – Sea Level Rise Extent



B.2.3 WILDFIRE

Table B.9 summarizes the acreage in Hyde County that falls within the Functional Wildland Urban Interface (WUI), categorized into zones that describe the wildfire risk mitigation activities appropriate for each zone. Areas in the Functional WUI are those areas where development and building structures may intermix with burnable land cover. Approximately, 1 percent of Hyde County is categorized as having direct exposure to wildfire risk and 61 percent is located within the critical fireshed of the Functional WUI.

Table B.9 – Functional Wildland Urban Interface Acreage, Hyde County

	Functional Wildland Urban Interface (WUI) Category	Acres	Percent
	Direct Exposure	3,789	1%
	Indirect Exposure	5,301	1%
	Critical Fireshed	220,779	61%
	Sources of Ember Load to Buildings	22,302	6%
	Little to No Exposure	0	0%
	Water	111,404	31%
	Total	363,575	100%

Source: Southern Wildfire Risk Assessment

Figure B.6 depicts the Functional WUI for Hyde County. Figure B.7 depicts the Fire Intensity Scale, which indicates the potential severity of fire based on fuel loads, topography, and other factors. Figure B.8 depicts Burn Probability based on landscape conditions, percentile weather, historical ignition patterns, and historical prevention and suppression efforts.

Potential fire intensity is moderate to high across much of Hyde County, especially along the Pamlico Sound and the county boundaries. Burn probability is also moderate to high in these areas. However, function WUI areas with direct exposure to wildfire are very limited in Hyde County, and in general they correspond with lower fire intensity and burn probability. Therefore, exposure of buildings and people to severe wildfire impacts is minimal.

Table B.10 provides building counts and values for critical facilities by FEMA lifeline that are located in areas with direct exposure to wildfire risk on the Functional WUI scale.

Table B.10 – Critical Facilities Exposed to Wildfire by Jurisdiction, Hyde County

Type	Critical Facility Count	Structure Value
Food, Hydration, Shelter	5	\$12,500
Safety and Security	1	\$104,134
Water Systems	4	\$173,296
All Categories	10	\$289,930

Source: Southern Wildfire Risk Assessment

Figure B.6 – Functional Wildland Urban Interface, Hyde County

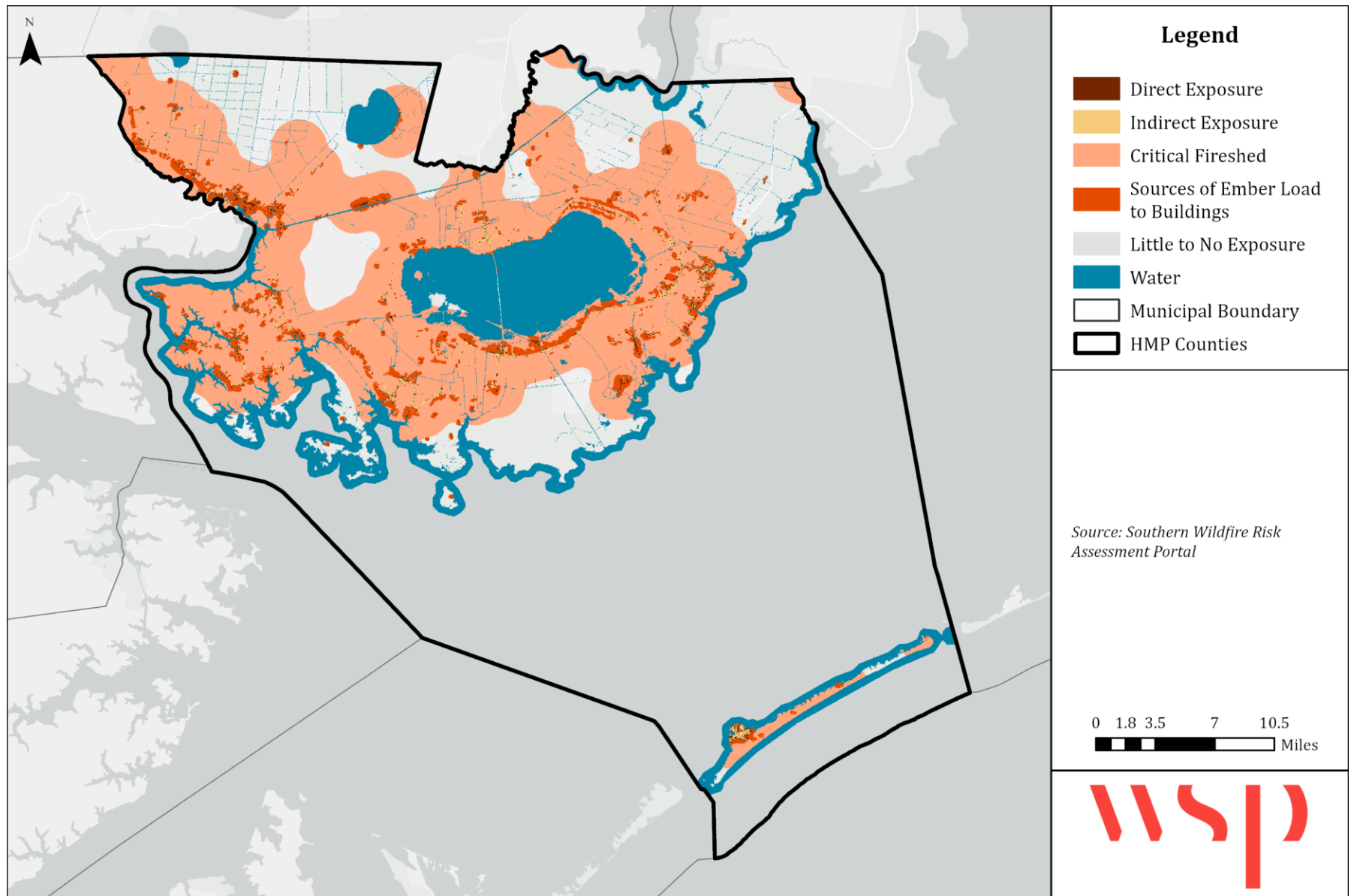


Figure B.7 – Fire Intensity Scale, Hyde County

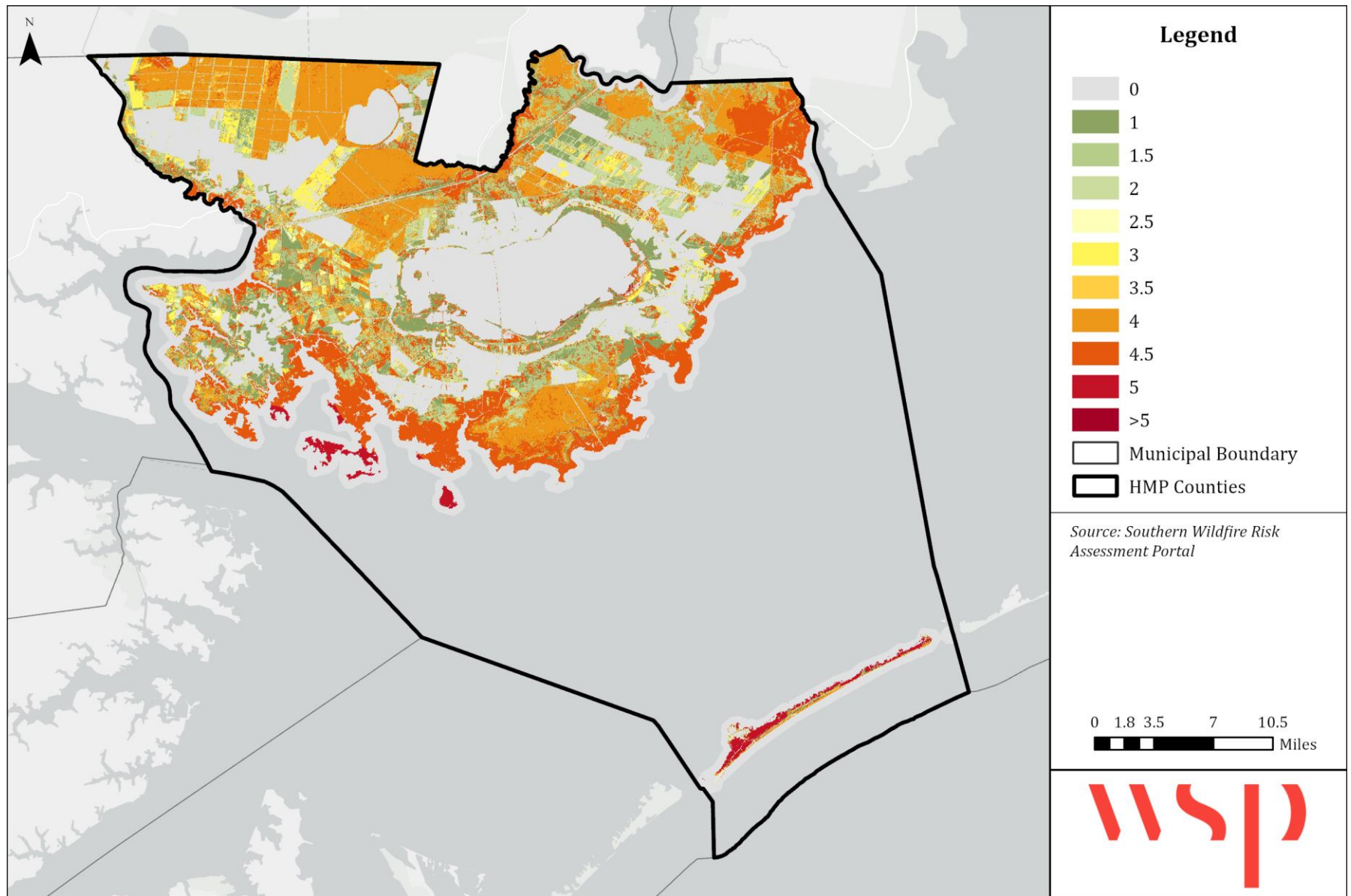
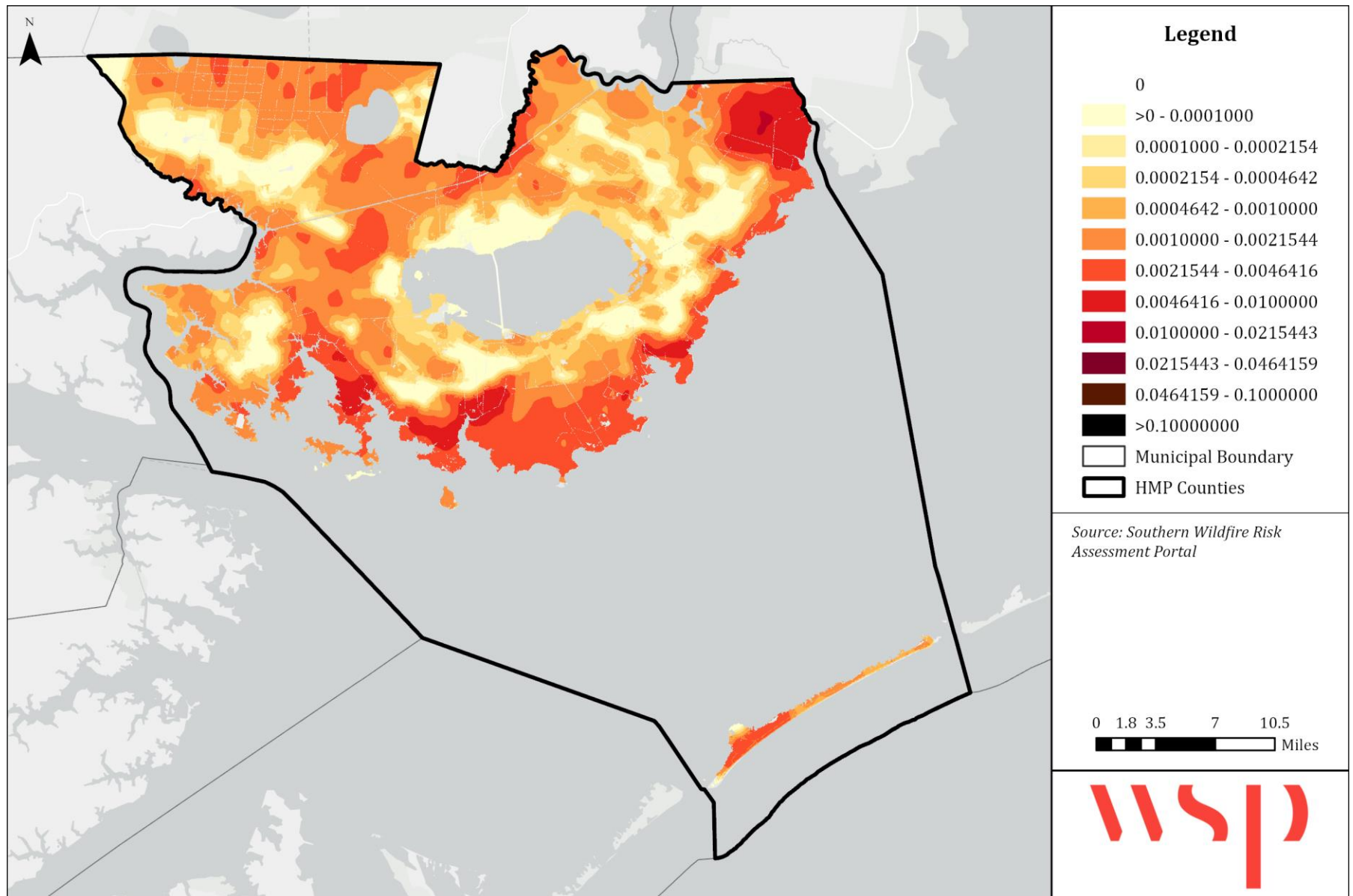


Figure B.8 – Burn Probability, Hyde County



B.3 MITIGATION STRATEGY

Action #	Description	Hazards Addressed	Priority	Goal & Objective	Category	Lead/Participating Agencies	Estimated Cost	Potential Funding Sources	Implementation Schedule	2025 Status	Status Comments/Explanation
H1	Promote the availability of flood insurance available through the National Flood Insurance Program (NFIP) using the following means: - Post on county website - Provide information on building permit applications - Make available at the library on the mainland in Engelhard and on Ocracoke Island.	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	Med	4.2	PIO	Hyde County Administration, Hyde County Building Inspections	Staff Time	General Fund, NCDPS	2025-2030	Carry Forward	Hyde County continues to promote the availability of federally subsidized flood insurance available to all County residents. Particular attention is given to those citizens that are not located within the defined special flood hazard area but are still potentially subject to flood damage.
H2	Continue to maintain, operate, and carry out all activities outlined within the Swan Quarter Watershed Project Operation and Maintenance Checklist. This effort includes ensuring functionality of the Swan Quarter Dike.	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	High	1.3	PP, SP	Hyde County Administration, Hyde County Soil & Water, Hyde County Water & Flood Control Manager, SQ Watershed Steering Committee	Staff Time	General Fund, NCDPS, HMGP	2025-2030	Carry Forward	Hyde County continues to monitor the status of the Swan Quarter flood control system and associated maintenance protocols. In addition, Hyde County continues to apply for grant and private funding to improve the functionality of the flood control system through the installation of additional pumps and culvert resizing and replacement for feeder canals. Pre-storm and post-storm assessments of the flood-control system will continue to be standard protocol as outlined in our SQ Watershed Operations and Maintenance Plan.
H3	Continue to maintain and map GIS-based data related to floodplain management and mitigation. These efforts will involve maintaining the most recent Flood Insurance Rate Maps (FIRMS), as well as GIS locations for each property either acquired or mitigated under through current and past Mitigation Grant Projects.	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	Med	4.2, 2.2	PIO	Hyde County Administration	Staff Time	General Fund	2 to 3 years	Carry Forward	Hyde County has the most current FIRMS mapped within its GIS system and will continue to update the GIS database, to work in concert with the information provided in this plan, to be utilized for guidance regarding development policy and regulation.
H4	Make a variety of materials related to flood insurance, flood protection, floodplain management, increased cost of compliance coverage, information on floodplains, and listings of qualified contractors familiar with floodproofing and elevation techniques, available through various methods including: - Placing materials in the county library - Disseminating information to local contractors	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	Med	4.2	PIO	Hyde County Administration	Staff Time	General Fund, NCDPS	2025-2030	Carry Forward	The Hyde County Building Inspections Department continues to maintain materials associated with floodplain protection that are available to County residents.

Action #	Description	Hazards Addressed	Priority	Goal & Objective	Category	Lead/Participating Agencies	Estimated Cost	Potential Funding Sources	Implementation Schedule	2025 Status	Status Comments/Explanation
H5	Continue to proactively seek out grant funding through NCEM and FEMA for mitigation of repetitive loss properties (RLPs) and high risk properties from future flooding events. The county will continue maintaining a list of RLPs, and on an annual basis, will apply for funding for all structures that meet cost-benefit thresholds as defined by FEMA. The priority will be for the elevation of structures. Hyde County will also work with homeowners in marginalized communities to address living conditions and provide housing repairs as needed to fortify existing structures until elevation funding is made available.	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	High	1.1, 2.3	PP	Hyde County Administration and Grants Management, Planning & Economic Development	Staff Time	General Fund, NCDPS, FEMA, CDBG, NC Housing Finance, HMGP	2025-2030	Carry Forward	Hyde County continues to utilize funding to address the treatment of repetitive loss properties through both annual funding cycles, as well as through post disaster funding. Hyde will also continue to apply for CDBG funding, NCFA Urgent Repair Program funds and any other available funding sources.
H6	Review the vulnerability of all critical facilities identified in this plan as a component of annual county Emergency Operations Plan updates. This effort will involve an assessment of whether facilities are readily accessible before, during, or after a natural hazard event has transpired. The county will also consider all information and data outlined in this plan when making determinations on the location of all future critical facilities.	All Hazards	High	4.1, 3.2	ES	Hyde County Emergency Services Hyde County Administration	Staff Time	General Fund	1 to 3 years	Carry Forward	Hyde County continues to work to fortify all critical facilities with elevations and generators. Hyde County will update their Emergency Operations Plan, as well as hold annual tabletop exercises and other trainings.
H7	Continue to participate in and support the Disaster Assistance Working Group (DAWG). This effort includes maintaining a mutual aid agreement with DAWG, which makes all available Hyde County resources available to participating counties in the event of a disaster. Coordination of all county resources in concert with DAWG will be handled through the group's E-Plan web based portal. All resources are updated as a component of the NC State Resource Management System.	All Hazards	High	3.2	ES	Hyde County Emergency Services Disaster Assistance Working Group	Staff Time	General Fund, NCDPS	2025-2030	Carry Forward	Hyde County continues to support the efforts of the Disaster Assistance Working Group and the group's efforts to further emergency service effectiveness throughout the region.

Action #	Description	Hazards Addressed	Priority	Goal & Objective	Category	Lead/Participating Agencies	Estimated Cost	Potential Funding Sources	Implementation Schedule	2025 Status	Status Comments/Explanation
H8	Continue to support the efforts of Tideland Electric and NCDOT in maintaining the county's right-of-ways and utility easements. This effort involves the trimming and pruning of trees that pose an imminent threat to the county's limited infrastructure system as well as supporting Tideland and NCDOT across Hatteras Inlet and NC DOT Hwy 12 which is the supply of Ocracoke Island's electricity, telecommunications and transportation to the mainland. Maintaining clear access into and out of the county, as well as protection of the county's electrical and communications networks, is critical to effective response during natural hazard events.	Flooding, Hurricanes & Coastal Hazards, Severe Winter Storm, Earthquake, Wildfire, Dam & Levee Failure, Severe Weather, Tornado	High	1.1	P	Hyde County Emergency Services Electric Service Providers	Staff Time	General Fund, Electric Service Providers	2025-2030	Carry Forward	Hyde County continues to work closely with all utility providers to ensure that right of ways and utility easements are properly maintained in an effort to minimize damage associated with natural hazard events. Additionally, utility providers attend the Control Group meetings before and after natural disasters and are involved with long term resilience planning related to access to Ocracoke Island via the North End from Hatteras for transportation, utilities and telecommunications.
H9	In an effort to inform and educate citizens about county efforts to increase public safety and mitigate private property losses and other government functions, Hyde County will hold an annual Citizen Hyde class for interested individuals. Presenters include but are not limited to Sheriff, EMS, Building Inspections, Emergency Management and Grants Management. Additionally, Emergency Mgmt, EMS, Sheriff and Administration staff will present information related to students in the local schools.	All Hazards	High	4.2	PIO	Hyde County Emergency Services Hyde County Administration	Staff Time	General Fund	2025-2030	Carry Forward	Action revised. Hyde County will continue to disseminate information associated with emergency services through their Citizen Hyde academy.
H10	Continue to work closely with NCDPS, NCDOT, the American Red Cross, and DAWG in addressing emergency evacuation and sheltering needs throughout the county. Due to limited resources and high vulnerability, Hyde County must often rely on resources available throughout the region. This effort is bolstered by the regional coordination efforts available through DAWG.	All Hazards	High	4.1	ES	Hyde County Emergency Services	Staff Time	General Fund, American Red Cross	2025-2030	Carry Forward	Hyde County continues to work closely with the American Red Cross to address the issue of shelter openings and evacuation. These two processes must be closely coordinated.
H11	Continue to participate in the Community Rating System (CRS) made available through the NFIP Program. This effort will involve continuing to provide detailed information regarding properties located within flood hazard areas as outlined under CRS Manual Section 322.a through 322.g.	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	High	2.2	PP	Hyde County Administration	Staff Time	General Fund, NCDPS	2025-2030	Carry Forward	Hyde County will continue to maintain its current Community Rating System program. The County's current rating will be reviewed and improved when feasible through the County's required five-year audit.

Action #	Description	Hazards Addressed	Priority	Goal & Objective	Category	Lead/Participating Agencies	Estimated Cost	Potential Funding Sources	Implementation Schedule	2025 Status	Status Comments/Explanation
H12	Acquire generators or other forms of redundant power supply to ensure that critical facilities and infrastructure remain operational where normal power supply is not available.	All Hazards	Med	1.1, 3.2	PP	Hyde County Emergency Services	To Be Determined	General Fund, NCDPS, FEMA	2 to 5 years	Carry Forward	Hyde County will continue to look for opportunities to establish permanent pad mount generators in an effort to ensure a redundant power supply at critical and community facilities including but not limited to the Government Center, Emergency Operations Center, EMS Stations on the mainland and Ocracoke, the Ocracoke Community Center and Davis School.
H13	Develop a Comprehensive Water Management Plan to monitor the County’s water supply and impose water restriction measures as deemed necessary during extreme drought conditions.	Drought, Extreme Heat	High	1.1	NRP	Hyde County Soil & Water Hyde County Administration, Hyde County Health, Hyde County Water Department, Cooperative Extension	Staff Time	General Fund	2020-2025	Carry Forward	No progress to report. Hyde County will begin to look closer at our public water supply and ways to protect that water supply for the future.

Action #	Description	Hazards Addressed	Priority	Goal & Objective	Category	Lead/Participating Agencies	Estimated Cost	Potential Funding Sources	Implementation Schedule	2025 Status	Status Comments/Explanation
H14	Actively working with Federal, State, local and private partners to identify mitigation measures and secure funding via grants to alleviate flooding. These efforts should focus on the following areas: • Upgrade Fairfield Drainage District #17 • Improve Mattamuskeet Association Flood Protection System • Continue to partner with local land owners to install drainage infrastructure through private funding and low interest loans • Enlarge/replace culverts in Swan Quarter along town ditch • Install stationary water pump on Landing Road as part of the Swan Quarter Watershed • Contract for large scale stream snagging/clearing • Continue to complete projects as adopted through the Resilient Coastal Communities Program through the NC Division of Coastal Management including but not limited to those outlined in the Ocracoke Stormwater Management Plan. • Continue to work with a Community Action Team for the Lake Landing Community through the Resilient Coastal Communities Program through the NC Division of Coastal Management to develop a resiliency plan for those communities with a list of projects and goals for those areas. Hyde County will work with the CAT team to develop those goals and will then seek funding to carry those projects to fruition. • Continue to address transportation needs to Ocracoke Island including issues related to the North End Ferry Terminal, Highway 12 and dredging of navigational channels. • Continue to support all drainage districts and private landowners with technical assistance to complete drainage infrastructure projects. • Continue to aggressively apply for housing elevations funds, critical facility funds, and telecommunication funding.	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	High	1.3	SP	Hyde County Administration, Hyde Soil and Water, Hyde Emergency Mgmt., Hyde County Grants Management	To Be Determined	General Fund, NCDPS, FEMA, NC Soil & Water	5 years	Carry Forward	Hyde County will work with all available grant funding agencies along with our Congressional and State Delegations to apply for funding to carry out the projects indicated plus new projects that will increase resiliency across our communities.

Action #	Description	Hazards Addressed	Priority	Goal & Objective	Category	Lead/Participating Agencies	Estimated Cost	Potential Funding Sources	Implementation Schedule	2025 Status	Status Comments/Explanation
H15	Hyde County will work cooperatively with the Davis Ventures Nonprofit group, who currently holds a long-term lease for the Davis Building, owned by Hyde County and on the National Historic Preservation Registry, to create a Resiliency Hub. This Resiliency Hub will be a place where community information is disseminated through workshops and community events and will serve as a post disaster facility to supply the community with needs including but not limited to water, commodities, electrical charging stations, cool down stations, basic first aid, and volunteer organization outreach to aid in storm response and recovery.	Flooding, Hurricane & Tropical Storm, Dam & Levee Failure	High	3.2, 4.2	PIO	Hyde County Admin, Grants Mgmt, Emergency Mgmt,	To Be Determined	NCDPS, NC DEQ, CDBG	2025-2030	New	Hyde County has been working with the Davis Ventures group to restore the Davis Building for ten years and has most recently repaired the roof system, windows and building envelope through NCORR funding. As this project concludes, a new focus will be given to restore the gymnasium and associated bathrooms to provide a space for a resiliency hub.
H16	Hyde County will continue to address septic system and sanitary district capacity, operations and efficiency through partnerships and supplying technical resources and grant management support. Hyde County will work with NCDEQ to develop a Revolving Loan for Hyde County Property owners to receive no to low interest loans to replace and/or repair existing marginal systems. Marginal systems create dangerous and unsanitary conditions during storm events. Additionally, Hyde County will support its 3 Sanitary Districts with technical support and will partner with them on grant funded projects to increase their capacity and efficiency as well.	Flood, Hurricane & Tropical Storm	High	1.1, 2.3	PP, SP	Hyde County Admin, Grants Mgmt, Emergency Mgmt, Hyde County Health Dept., DEQ	To Be Determined	NC DEQ CDBG HMGP	2025-2030	New	Hyde County has been working with our Community Disaster Resiliency Zone staff through FEMA to develop this project in conjunction with NC DEQ. An application for funding has been submitted and Hyde is currently working with its partners to develop the program. Additionally, Hyde has partnered with DEQ to provide training to the Sanitary Districts and has added capacity to the Engelhard Sanitary District through CDBG Grant projects.

Action #	Description	Hazards Addressed	Priority	Goal & Objective	Category	Lead/Participating Agencies	Estimated Cost	Potential Funding Sources	Implementation Schedule	2025 Status	Status Comments/Explanation
H17	Hyde County will work with Motorola Solutions to provide pricing and a project plan to replace Hyde County’s existing Hatteras-to-Ocracoke Point-to-Point (PTP) microwave backhaul network with a new Aviat Networks microwave backhaul system. This upgrade will significantly enhance the reliability, capacity, and resilience of the county’s communications infrastructure, which supports critical services including public safety, emergency response, and VIPER system connectivity. Motorola has selected Aviat Networks due to their proven compliance with VIPER statewide P25 network specifications, strong product performance, and cost effectiveness.	Flooding, Hurricane & Coastal Hazards, Tornadoes & Thunderstorms	High	3.2	ES	Hyde County Admin, Sheriff’s Office, Emergency Mgmt, NCDPS, NCEM	\$1,088,108	Hyde County General Fund, NCGA appropriations	2025-2027	New	The new system design features all-indoor Aviat microwave transceivers engineered to provide 99.999% end-to-end two-way annual reliability, meeting the data capacity requirements for both Hyde County and VIPER sites. The project includes engineering, installation, optimization, FCC coordination, licensing, and a first-year warranty, as well as new antenna and line installations on the Ocracoke Water Tank to support Hyde County’s VHF Paging, Fire, and EMS repeaters. Field path studies and site walks will be conducted to confirm initial design profiles. The overall project will align Hyde County’s network infrastructure with the state’s broader VIPER and Dare County network topology, providing multiple redundant paths for future communication resilience.

Action #	Description	Hazards Addressed	Priority	Goal & Objective	Category	Lead/Participating Agencies	Estimated Cost	Potential Funding Sources	Implementation Schedule	2025 Status	Status Comments/Explanation
H18	Hyde County will continue to focus efforts on the Ocracoke Resilient Infrastructure Initiative which is outlined through a formal resolution by the BOC to address transportation and access to Ocracoke Island. Project components include but are not limited to dredging of channels, beach nourishment/sandbags/hard stabilization structures to fortify and protect the South Dock NCDOT Ferry Basin, NC Hwy 12 on the northern end of the island and long term strategic planning for roadway alternatives.	Flooding, Hurricane & Coastal Hazards, Tornadoes & Thunderstorms	High	1.1, 2.3	SP	Hyde County Administration/ Water and Flood Control	To Be Determined	NC General Assembly, US Congress, NC Div. of Coastal Management, NCDOT Hwy and Ferry Divisions, Federal Hwy Administration	2025-2030	New	The Resolution Requesting Immediate Action at Federal and State Levels to Provide Reliable and Sustainable Transportation to and from Ocracoke Island through Investment in Resilient Transportation Infrastructure urges coordinated action to secure long-term, dependable access for Ocracoke Island residents, businesses, and visitors. The resolution outlines the urgent need for resilient transportation solutions following repeated closures of NC Highway 12 and ferry route disruptions, including a seven-day access breach in March 2024. The Hyde County Board of Commissioners calls for federal and state investment in dredging and channel maintenance, completion of NCDOT's sandbag replacement project, initiation of a beach nourishment study and project for the Highway 12 "hot spot" area, and evaluation of roadway alternatives to improve long-term resilience. The resolution further requests investment in ferry vessels, ramps, and stabilization of the NCDOT South Dock Terminal, along with a coordinated feasibility analysis combining the South Dock and Highway 12 corridor to ensure a sustainable and comprehensive transportation network for Ocracoke Island.
H19	Create or Update Community Wildfire Protection Plans in each fire district.	Wildfire	Med	1.4	P	Hyde County Emergency Services, Fire Departments, NC Forest Service	To Be Determined	Grant Funds	5 years	New	N/A

ANNEX C. MARTIN COUNTY

C.1 ASSET INVENTORY

Martin County and the HMPC provided a local inventory of critical facilities and community lifelines, which are a priority for mitigation planning and emergency management. Lifelines are the most fundamental services in the community that, when stabilized, enable all other aspects of society to function. Table C.1 through Table C.6 provide a count of critical facilities by FEMA lifeline category by jurisdiction in Martin County. Figure C.1 through Figure C.6 show the locations of all critical facilities by jurisdiction in Martin County. It is important to note that structure value data for the critical facilities was not available for Martin County and the Towns of Bear Grass, Everetts, Hassell, and Parmele do not have any critical facilities within their jurisdictional boundaries.

Table C.7 provides a detailed inventory of the critical facilities in Martin County, indicating each facility's FEMA lifeline category, flood zone, 1% annual chance flood depth, minimum storm surge category, and wildfire risk. More information on hazard vulnerability is provided in Section C.2.

Table C.1 – Critical Facilities by Type, Unincorporated Martin County

Facility Type	Count of Facility Type
Communications	0
Energy	0
Food, Hydration, Shelter	8
Hazardous Materials	2
Health and Medical	2
Safety and Security	3
Transportation	0
Water Systems	18
Total	33

Table C.2 – Critical Facilities by Type, Town of Hamilton

Facility Type	Count of Facility Type
Communications	0
Energy	0
Food, Hydration, Shelter	0
Hazardous Materials	0
Health and Medical	2
Safety and Security	1
Transportation	0
Water Systems	1
Total	4

Table C.3 – Critical Facilities by Type, Town of Jamesville

Facility Type	Count of Facility Type
Communications	0
Energy	0
Food, Hydration, Shelter	0
Hazardous Materials	0
Health and Medical	1
Safety and Security	1
Transportation	0
Water Systems	2
Total	4

Table C.4 – Critical Facilities by Type, Town of Oak City

Facility Type	Count of Facility Type
Communications	0
Energy	0
Food, Hydration, Shelter	0
Hazardous Materials	0
Health and Medical	1
Safety and Security	1
Transportation	0
Water Systems	0
Total	2

Table C.5 – Critical Facilities by Type, Town of Robersonville

Facility Type	Count of Facility Type
Communications	0
Energy	0
Food, Hydration, Shelter	0
Hazardous Materials	1
Health and Medical	1
Safety and Security	2
Transportation	0
Water Systems	2
Total	6

Table C.6 – Critical Facilities by Type, Town of Williamston

Facility Type	Count of Facility Type
Communications	0
Energy	0
Food, Hydration, Shelter	1
Hazardous Materials	1
Health and Medical	4
Safety and Security	4
Transportation	0
Water Systems	4
Total	14

Figure C.1 – Critical Facilities, Unincorporated Martin County

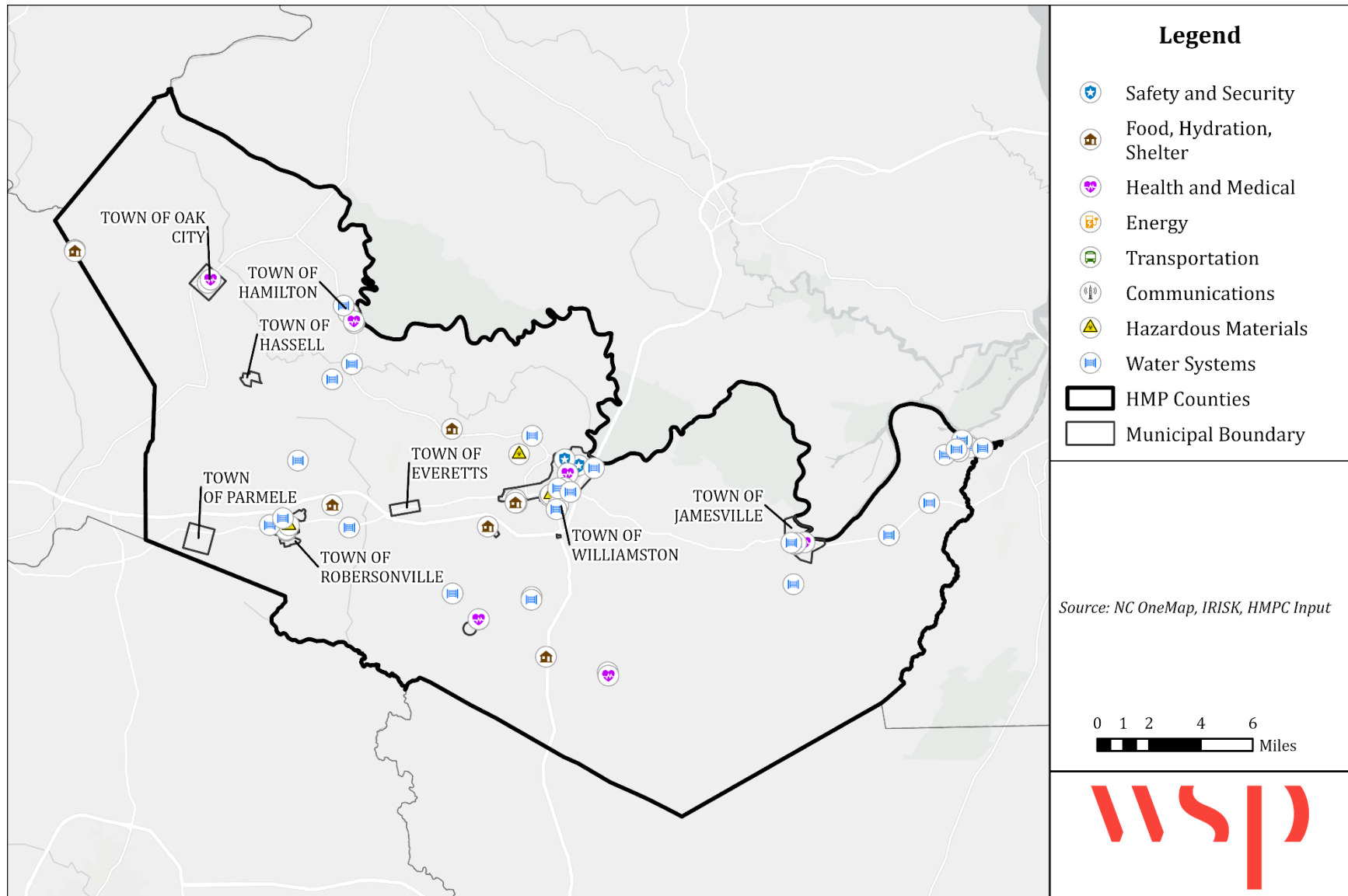


Figure C.2 – Critical Facilities, Town of Hamilton

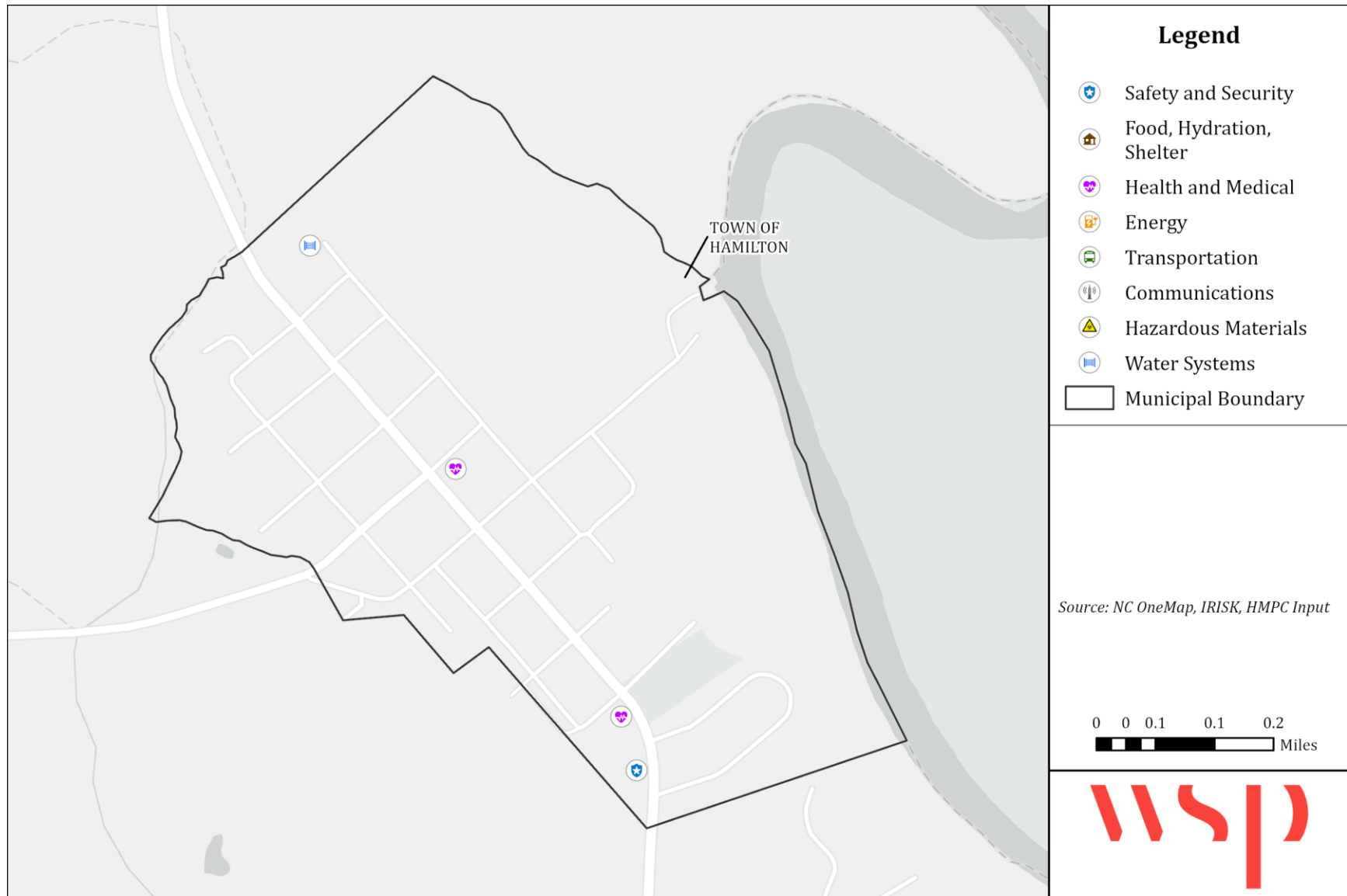


Figure C.3 - Critical Facilities, Town of Jamesville

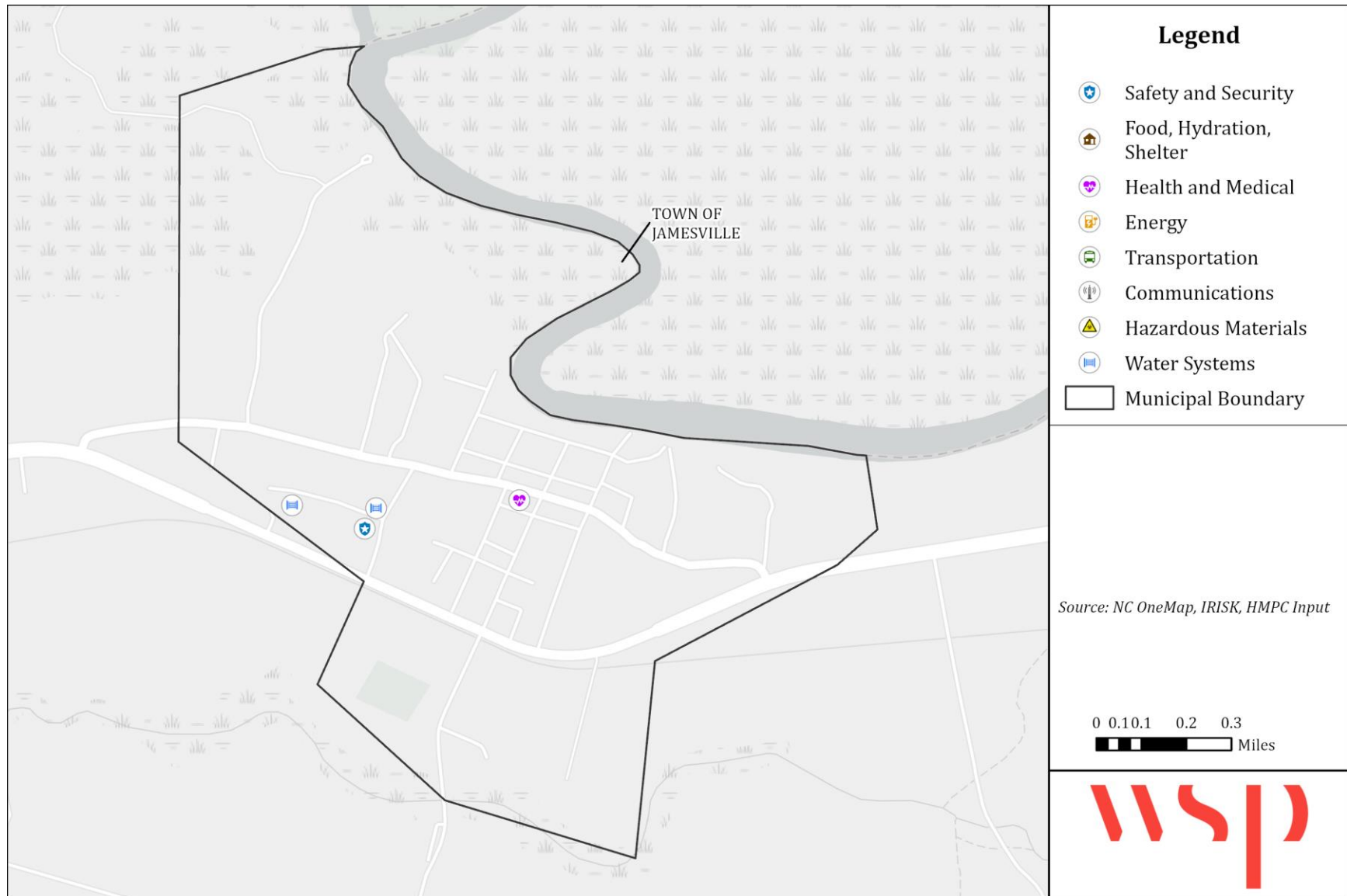


Figure C.4 - Critical Facilities, Town of Oak City

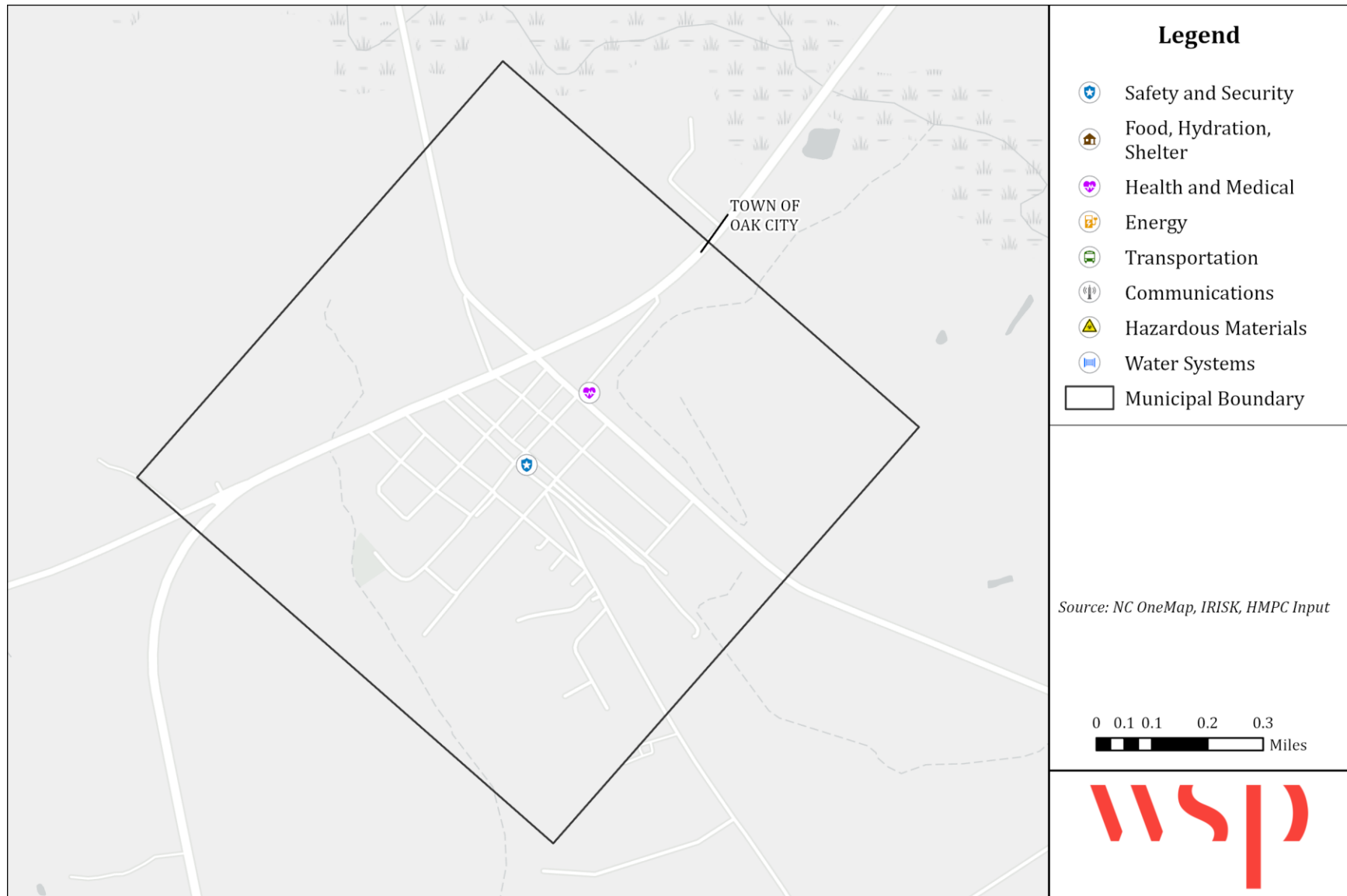


Figure C.5 – Critical Facilities, Town of Robersonville

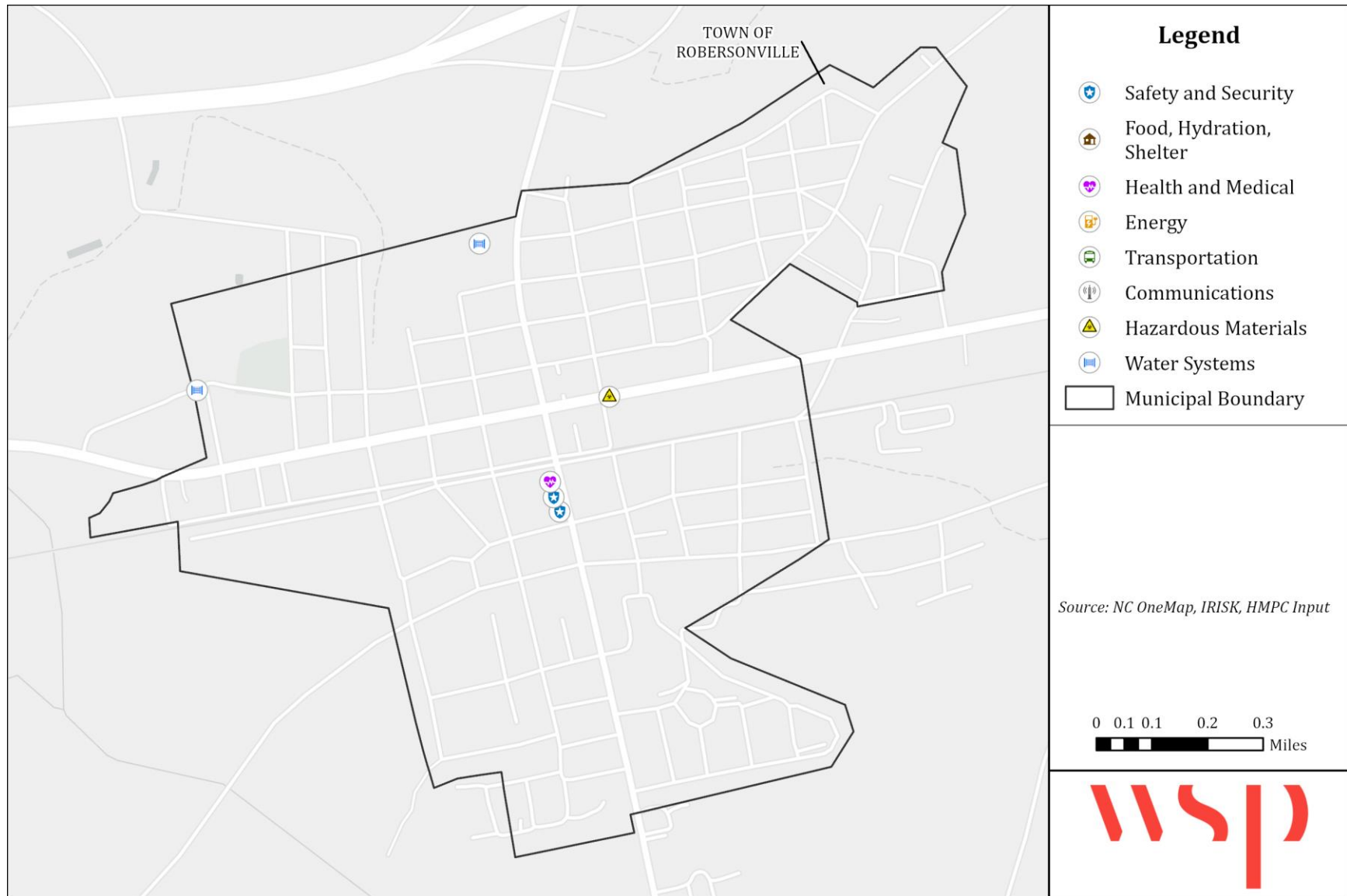


Figure C.6 – Critical Facilities, Town of Williamston

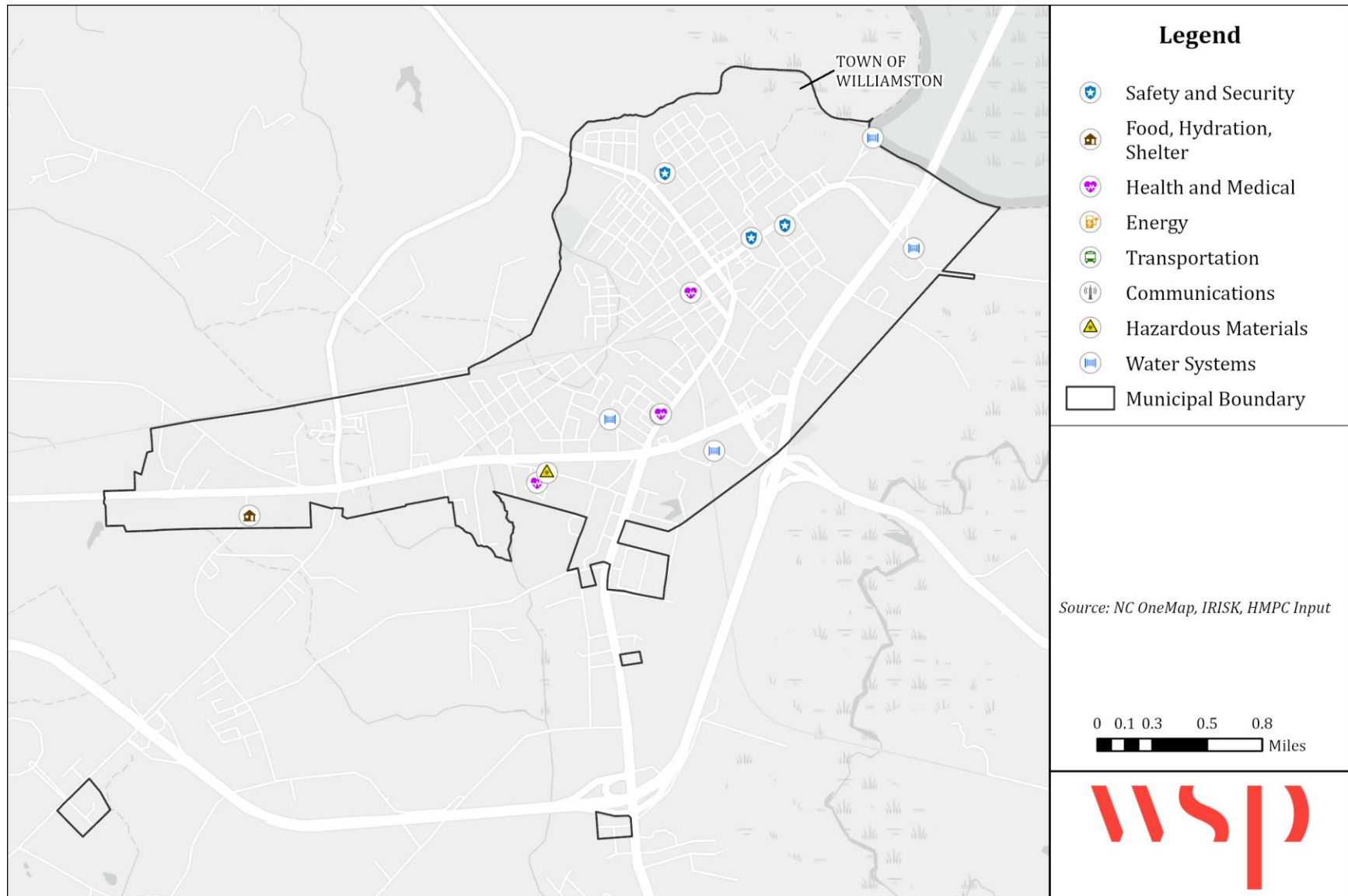


Table C.7 – Martin County Critical Facilities Inventory

FEMA Lifeline	Facility Name	Address	Flood Depth	Flood Zone	Min. Sea Level Rise	Min. Storm Surge Cat.	High WUI Exposure	Fire Intensity
Unincorporated Martin County								
Safety & Security	Bear Grass Fire Rescue, Inc.	6005 Bear Grass Road	0.0	X Unshaded	N/A	N/A	Indirect Exposure	0
Safety & Security	Griffins Township Fire Department, Inc.	5120 Fire Department Rd	0.0	X Unshaded	N/A	N/A	Indirect Exposure	0
Safety & Security	Martin Community College Campus Police	1161 Kehukee Park Rd	0.0	X Unshaded	N/A	N/A	Indirect Exposure	0
Health & Medical	Griffins Township Fire Department Incorporated	5217 Fire Department Rd	0.0	X Unshaded	N/A	N/A	Indirect Exposure	0
Health & Medical	Bear Grass Fire Rescue Incorporated	6005 Bear Grass Road	0.0	X Unshaded	N/A	N/A	Indirect Exposure	0
Hazardous Materials	Walmart Supercenter #1641	Washington St	0.0	X Unshaded	N/A	N/A	Indirect Exposure	0
Water Systems	Williamston, Town Of	602 Tank Street	0.0	X Unshaded	N/A	N/A	Direct Exposure	2
Water Systems	Robersonville, Town Of	109 South Main St	0.0	X Unshaded	N/A	N/A	Direct Exposure	3
Water Systems	Ross Motel	1700 US HWY 17	0.0	X Unshaded	N/A	N/A	Indirect Exposure	0
Water Systems	Cedar Branch Baptist Church	2407 NC HWY 171	0.0	X Unshaded	N/A	N/A	Indirect Exposure	0
Water Systems	Domtar Paper Company - Pulp & Paper	-	0.0	X Shaded	N/A	Category 2	Indirect Exposure	0
Water Systems	Domtar Paper Company - Pulp & Paper	-	0.0	X Shaded	N/A	Category 2	Indirect Exposure	0
Water Systems	Green Acres Campground	-	0.0	X Unshaded	N/A	N/A	Direct Exposure	2
Water Systems	Green Acres Campground	-	0.0	X Unshaded	N/A	N/A	Direct Exposure	2
Water Systems	Robersonville County Club	20720 NC 903	0.0	X Unshaded	N/A	N/A	Indirect Exposure	0
Water Systems	Gospel Light Ch Of Christ	3337 OLD US 64	0.0	X Unshaded	N/A	N/A	Indirect Exposure	0
Water Systems	Weyerhaeuser-Southern Lumber	-	0.1	AE	N/A	Category 2	Critical Fireshed	0
Water Systems	Domtar Paper Company - Wood Yard	NC HWY 149 NORTH	0.1	AE	N/A	Category 3	Critical Fireshed	2

ANNEX C: MARTIN COUNTY

FEMA Lifeline	Facility Name	Address	Flood Depth	Flood Zone	Min. Sea Level Rise	Min. Storm Surge Cat.	High WUI Exposure	Fire Intensity
Water Systems	Domtar Paper Company - Rec/Picnic Hut	NC HWY 149 NORTH	1.4	AE	N/A	Category 2	Indirect Exposure	0
Water Systems	Martin Co Water & Sewer Dist 1	305 East Main Street	0.0	X Unshaded	N/A	N/A	Indirect Exposure	0
Water Systems	Martin Co Water & Sewer Dist 2	305 East Main St	0.0	X Unshaded	N/A	N/A	Indirect Exposure	0
Water Systems	Mackey's Ferry Peanuts & Gifts	30871 US 64 EAST	0.0	X Unshaded	N/A	N/A	Direct Exposure	2.5
Water Systems	Domtar Paper Co - Mobile Equipment	NC HWY 149 N	0.1	AE	N/A	Category 3	Indirect Exposure	0
Water Systems	Martin Co. Regional Wasa Authority Well	1001 Park Street	0.0	X Unshaded	N/A	N/A	Critical Fireshed	4
Food, Hydration, Shelter	Robersonville Boar Stud Farm	3257 C L Keel Rd	0.0	X Unshaded	N/A	N/A	Critical Fireshed	3
Food, Hydration, Shelter	Williamston Boar Stud Farm	20145 NC 125	0.0	X Unshaded	N/A	N/A	Direct Exposure	3
Food, Hydration, Shelter	Senator Bob Martin Eastern Agricultural Center	2900 Prison Camp Rd	0.0	X Unshaded	N/A	N/A	Indirect Exposure	0
Hazardous Materials	Martin County C&D Landfill	1445 Landfill Rd	0.0	X Unshaded	N/A	N/A	Critical Fireshed	0
Food, Hydration, Shelter		1083 Red Oak Fork Rd	0.0	X Unshaded	N/A	N/A	Indirect Exposure	0
Food, Hydration, Shelter		1083 Red Oak Fork Rd	0.0	X Unshaded	N/A	N/A	Indirect Exposure	0
Food, Hydration, Shelter		1083 Red Oak Fork Rd	0.0	X Unshaded	N/A	N/A	Indirect Exposure	0
Food, Hydration, Shelter		1161 Kehukee Park Rd	0.0	X Unshaded	N/A	N/A	Indirect Exposure	0
Food, Hydration, Shelter	Macedonia Church	7640 US 17	0.0	X Unshaded	N/A	N/A	Direct Exposure	2
Town of Hamilton								
Safety & Security	Hamilton District Volunteer Fire-Ems Dept., Inc.	408 S. Front St.	0.0	X Unshaded	N/A	N/A	Indirect Exposure	0
Health & Medical	Midway Medical Transport Incorporated	107 East Liberty Street	0.0	X Unshaded	N/A	N/A	Indirect Exposure	0

ANNEX C: MARTIN COUNTY

FEMA Lifeline	Facility Name	Address	Flood Depth	Flood Zone	Min. Sea Level Rise	Min. Storm Surge Cat.	High WUI Exposure	Fire Intensity
Health & Medical	Hamilton District Volunteer Fire and EMS Department	408 South Front Street	0.0	X Unshaded	N/A	N/A	Indirect Exposure	0
Water Systems	Hamilton, Town Of	101 N. Front St.	0.0	X Unshaded	N/A	N/A	Indirect Exposure	0
Town of Jamesville								
Safety & Security	Jamesville Community Volunteer Fire Department, Inc.	1035 Hayes St	0.0	X Unshaded	N/A	N/A	Indirect Exposure	0
Health & Medical	Jamesville Community EMS and Rescue	1116 WASHINGTON STREET	0.0	X Unshaded	N/A	N/A	Indirect Exposure	0
Water Systems	Jamesville, Town Of	1211 Wtr St	0.0	X Unshaded	N/A	N/A	Indirect Exposure	0
Water Systems	Jamesville, Town Of	1211 Wtr St	0.0	X Unshaded	N/A	N/A	Critical Fireshed	0
Town of Oak City								
Safety & Security	The Oak City Volunteer Fire Department, Inc.	100 Commerce Street	0.0	X Unshaded	N/A	N/A	Indirect Exposure	0
Health & Medical	Oak City Rescue Squad	100 Commerce Street	0.0	X Unshaded	N/A	N/A	Indirect Exposure	0
Town of Robersonville								
Safety & Security	Robersonville Fire Department	119 S. Main Street	0.0	X Unshaded	N/A	N/A	Indirect Exposure	0
Safety & Security	Robersonville Police Department	119 South Main Street	0.0	X Unshaded	N/A	N/A	Indirect Exposure	0
Health & Medical	Robersonville Rescue Squad and EMS	119 South Main Street	0.0	X Unshaded	N/A	N/A	Indirect Exposure	0
Hazardous Materials	NCDSCA 059-0001 (WILLIFORD CLEANERS)	E ACADEMY ST, STE 100	0.0	X Unshaded	N/A	N/A	Indirect Exposure	0
Water Systems	ROBERSONVILLE, TOWN OF	109 South Main St	0.0	X Unshaded	N/A	N/A	Indirect Exposure	0
Water Systems	ROBERSONVILLE, TOWN OF	109 South Main St	0.0	X Unshaded	N/A	N/A	Indirect Exposure	0
Town of Williamston								
Safety & Security	Williamston Fire/Rescue/EMS	901 Washington St.	0.0	X Unshaded	N/A	N/A	Indirect Exposure	0

ANNEX C: MARTIN COUNTY

FEMA Lifeline	Facility Name	Address	Flood Depth	Flood Zone	Min. Sea Level Rise	Min. Storm Surge Cat.	High WUI Exposure	Fire Intensity
Safety & Security	Williamston Police Department	106 East Main Street	0.0	X Unshaded	N/A	N/A	Indirect Exposure	0
Water Systems	Martin Co Regional WASA	1001 Park Street	5.1	AE	1ft SLR	N/A	Water	0
Safety & Security	Martin County Sheriffs Department/Detention Center	305 East Main Street	0.0	X Unshaded	N/A	N/A	Indirect Exposure	0
Health & Medical	Williamston Rescue Squad	901 Washington Street	0.0	X Unshaded	N/A	N/A	Indirect Exposure	0
Health & Medical	Coastal Medical Transport Incorporated	108 South Pearl Street	0.0	X Unshaded	N/A	N/A	Indirect Exposure	0
Health & Medical	Williamston Fire and Rescue EMS	901 Washington Street	0.0	X Unshaded	N/A	N/A	Indirect Exposure	0
Health & Medical	Martin General Hospital	310 South McCaskey Rd	0.0	X Unshaded	N/A	N/A	Indirect Exposure	0
Food, Hydration, Shelter	Martin Community College	1161 Kehukee Pk Rd	0.0	X Unshaded	N/A	N/A	Indirect Exposure	0
Safety & Security	Martin Tyrrell Washington District Health Department	210 West Liberty Street	0.0	X Unshaded	N/A	N/A	Indirect Exposure	0
Hazardous Materials	Martin General Hospital	S Mccaskey Rd	0.0	X Unshaded	N/A	N/A	Indirect Exposure	0
Water Systems	Williamston, Town Of	602 Tank Street	0.0	X Unshaded	N/A	N/A	Direct Exposure	2
Water Systems	Williamston, Town Of	602 Tank Street	0.0	X Unshaded	N/A	N/A	Direct Exposure	2
Water Systems	Williamston, Town Of	602 Tank Street	0.0	X Shaded	N/A	Category 3	Direct Exposure	2

Note: Structure value was not available for critical facilities in Martin County

C.2 RISK ASSESSMENT

This section contains a summary of the County's asset inventory as well as hazard profile and vulnerability assessment for those hazards that are spatially defined and have variations in risk that could be evaluated quantitatively on a jurisdictional level. The hazards included in this section are: Flooding, Hurricanes & Coastal Hazards, and Wildfire.

C.2.1 FLOODING

Table C.8 details the acreage of Martin County's total area by jurisdiction and flood zone on the Effective DFIRM. Per this assessment, at nearly 27 percent, the Town of Jamesville has the largest portion of land area within the mapped 1%-annual-chance floodplain. Conversely, the Towns of Bear Grass, Everetts, Hassell, Parmele, and Robersonville are entirely outside the SFHA.

Table C.8 – Flood Zone Acreage by Jurisdiction, Martin County

Flood Zone	Acreage	Percent of Total (%)
Bear Grass		
Zone X Unshaded	125.2	100.0%
Total	125.2	--
Everetts		
Zone X Unshaded	304.4	100.0%
Total	304.4	--
Hamilton		
Zone AE	18.5	5.7%
Zone X Unshaded	304.4	94.3%
Total	322.9	--
Hassell		
Zone X Unshaded	173.7	100.0%
Total	173.7	--
Jamesville		
Zone AE	236.6	26.9%
Zone X Shaded	27.9	3.2%
Zone X Unshaded	614.9	69.9%
Total	879.4	--
Oak City		
Zone AE	0.1	0.0%
Zone X Unshaded	635.7	100.0%
Total	635.8	--
Parmele		
Zone X Unshaded	637.9	100.0%
Total	637.9	--
Robersonville		
Zone X Unshaded	727.3	100.0%
Total	727.3	--

Flood Zone	Acreage	Percent of Total (%)
Williamston		
Zone AE	242.3	9.5%
Zone X Shaded	169.0	6.6%
Zone X Unshaded	2,144.9	83.9%
Total	2,556.2	--
Unincorporated Martin County		
Zone AE	62,927.1	22.0%
Zone X Shaded	1,704.9	0.6%
Zone X Unshaded	221,300.0	77.4%
Total	285,932.0	--
Martin County Total		
Zone AE	63,424.6	21.7%
Zone X Shaded	1,901.8	0.7%
Zone X Unshaded	226,968.4	77.7%
Total	292,294.8	--

Source: FEMA Effective DFIRM

Figure C.7 through Figure C.10 reflect the effective mapped flood hazard zones for all jurisdictions that have land in the Special Flood Hazard Area in Martin County, and Figure C.11 through Figure C.14 displays the depth of flooding estimated to occur in these areas during the 1%-annual-chance flood.

Table C.9 provides building counts for critical facilities by flood zone in Martin County and participating jurisdictions. It is important to note that structure value for critical facilities in Martin County was not available.

Table C.9 – Critical Facilities Exposed to Flooding by Event and Jurisdiction

Flood Zone	Critical Facility Count
Unincorporated Martin County	
Zone AE	4
Zone X (500-year)	2
Zone X (unshaded)	27
Total	33
Hamilton	
Zone X (unshaded)	4
Total	4
Jamesville	
Zone X (unshaded)	4
Total	4
Oak City	
Zone X (unshaded)	2
Total	2
Robersonville	
Zone X (unshaded)	6
Total	6
Williamston	
Zone AE	1
Zone X (500-year)	1

Flood Zone	Critical Facility Count
Zone X (unshaded)	12
Total	14
Martin County Total	
Zone AE	5
Zone X (500-year)	3
Zone X (unshaded)	55
Total	63

Source: FEMA Effective DFIRM, HMPC

Figure C.7 - FEMA Flood Hazard Areas, Unincorporated Martin County

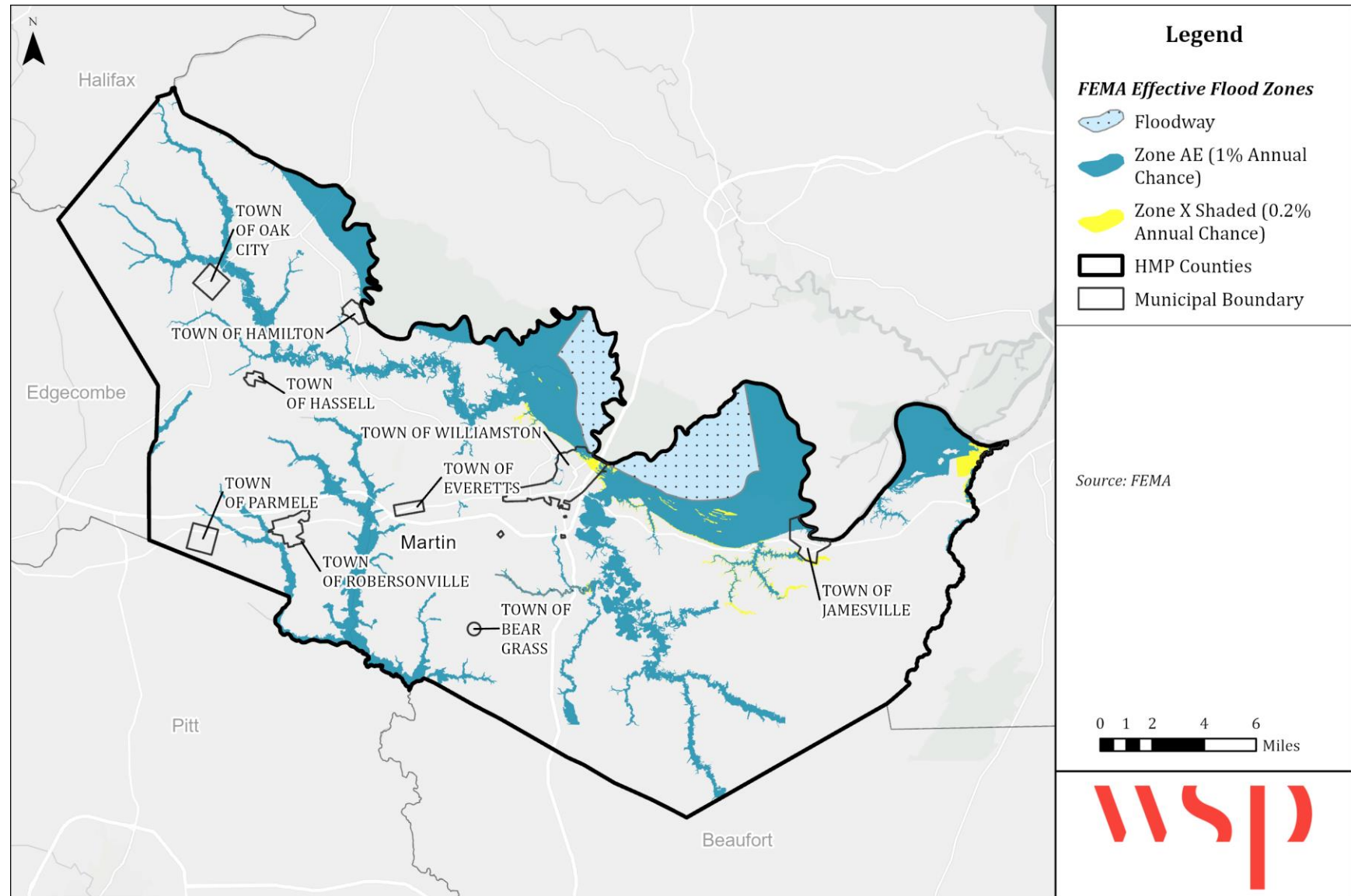


Figure C.8 - FEMA Flood Hazard Areas, Town of Hamilton



Figure C.9 - FEMA Flood Hazard Areas, Town of Jamesville

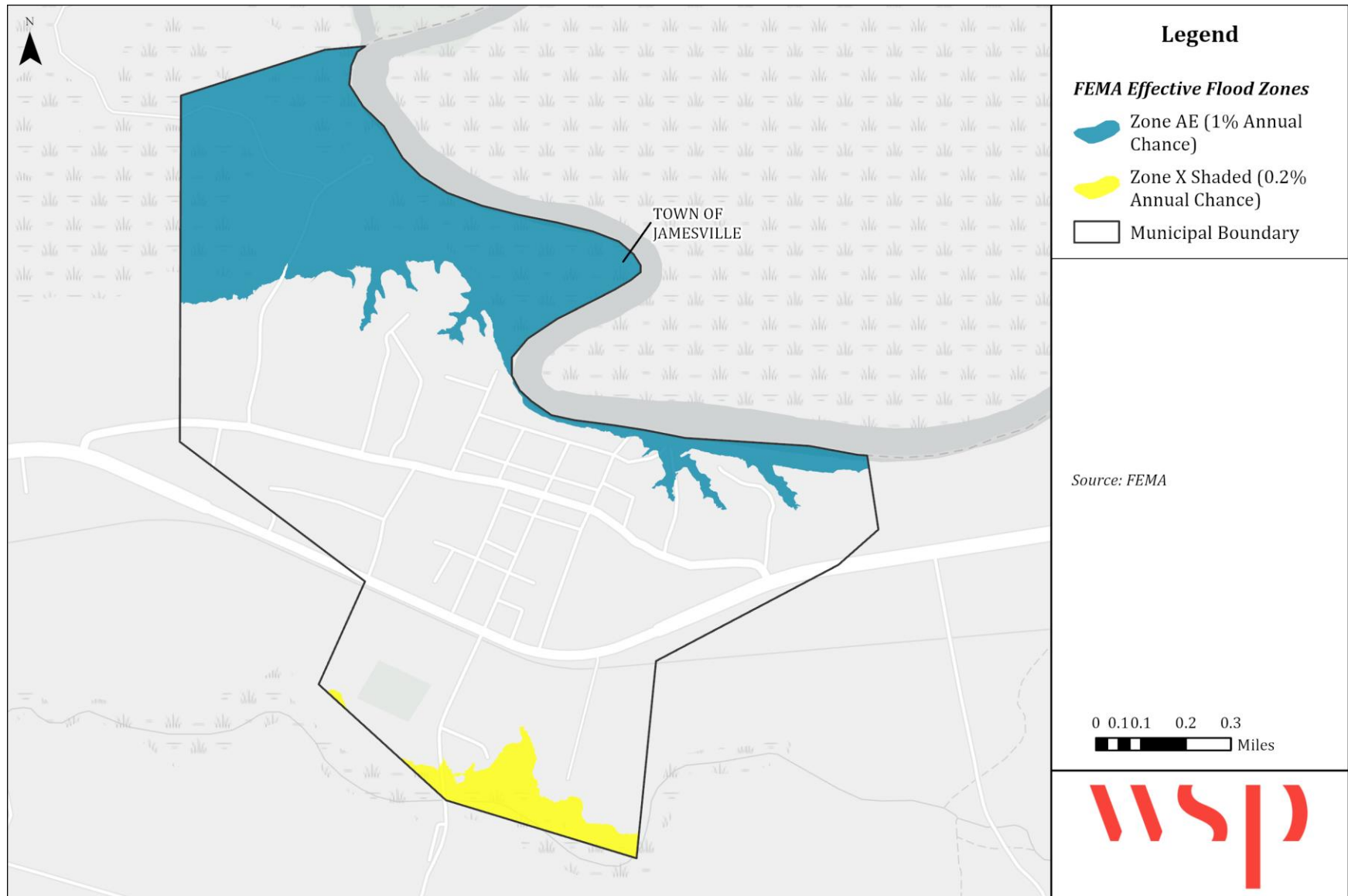


Figure C.10 – FEMA Flood Hazard Areas, Town of Williamston

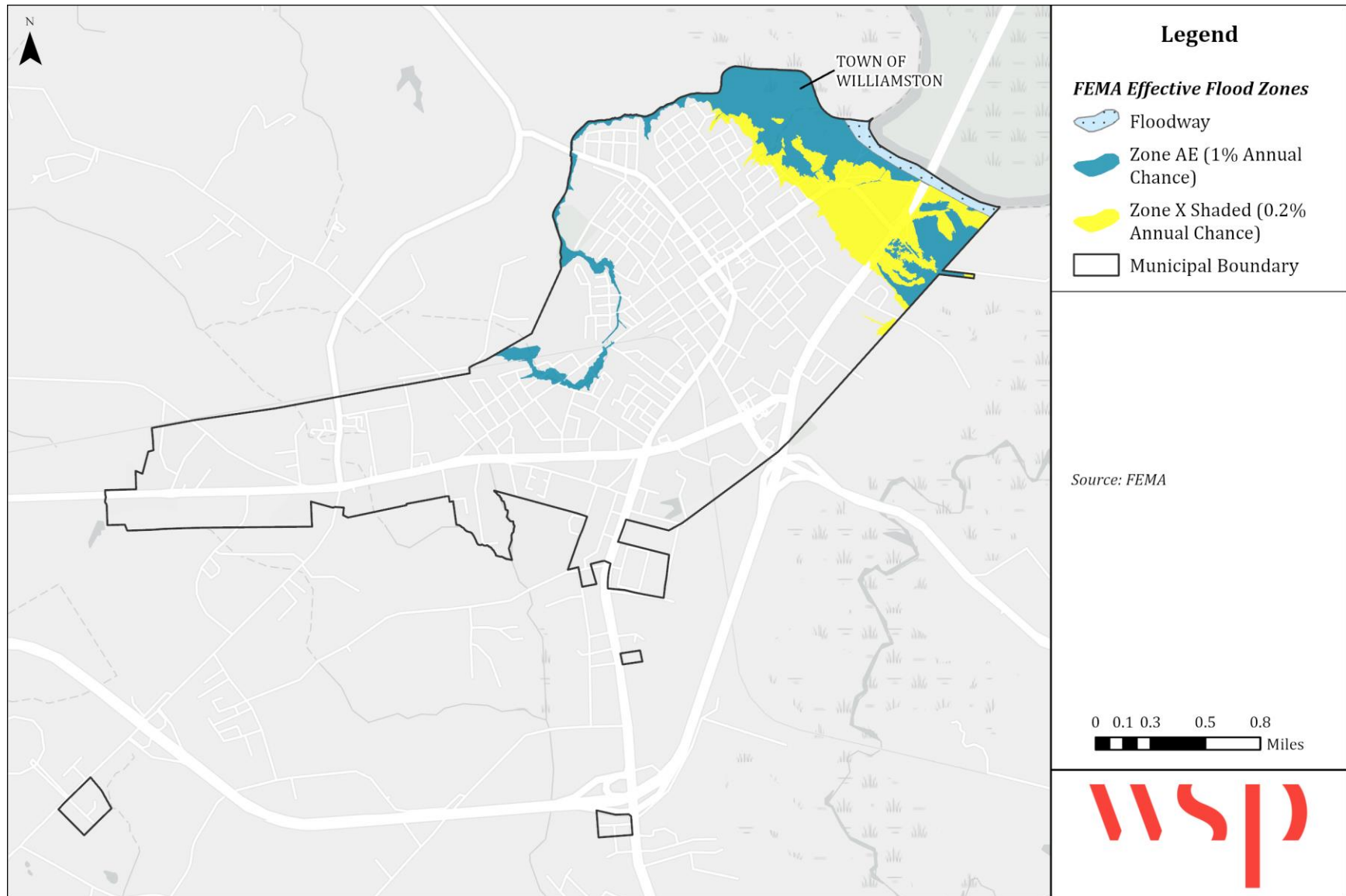


Figure C.11 – Flood Depth, 1%-Annual-Chance Floodplain, Unincorporated Martin County

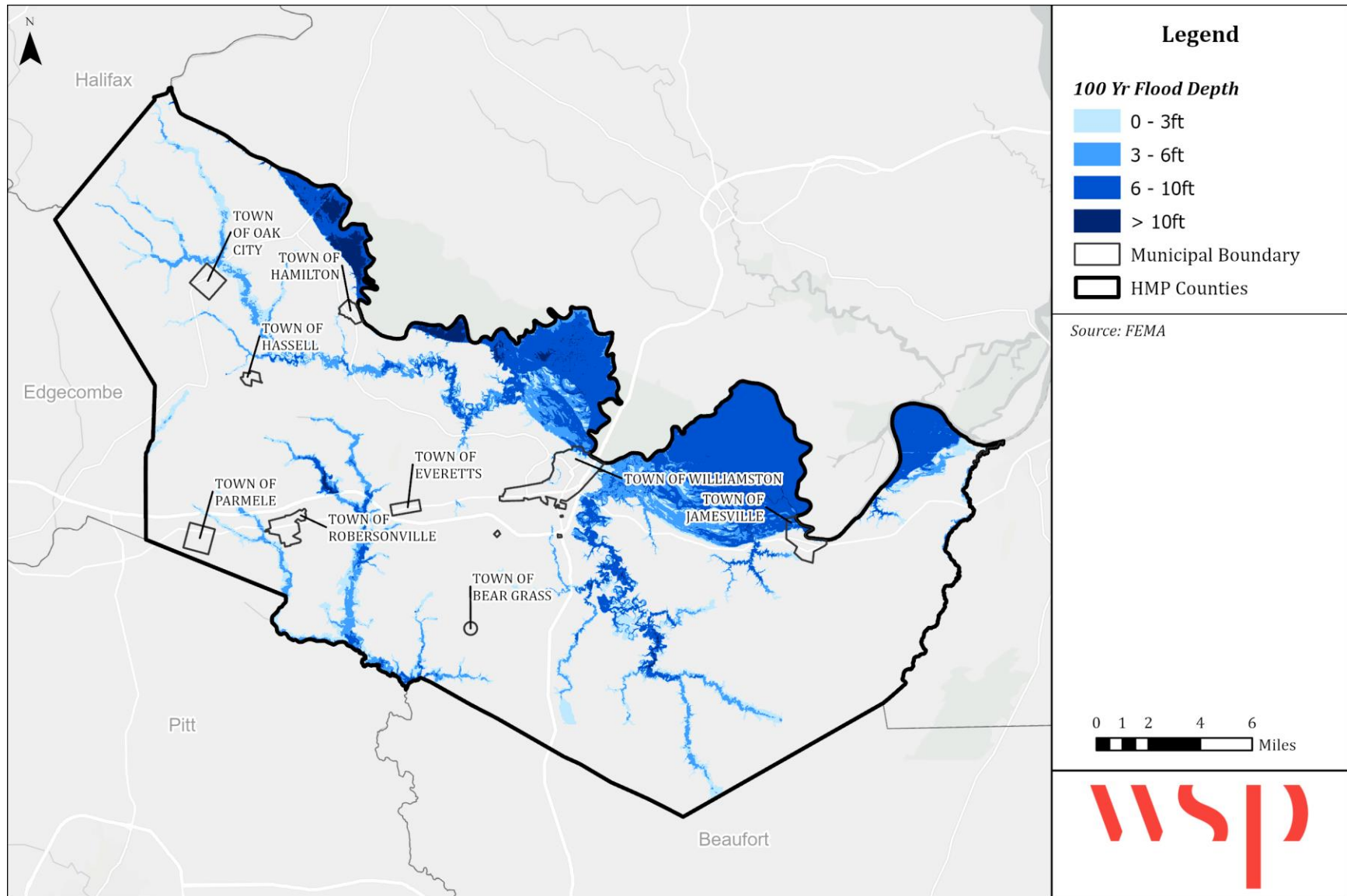


Figure C.12 – Flood Depth, 1%-Annual-Chance Floodplain, Town of Hamilton

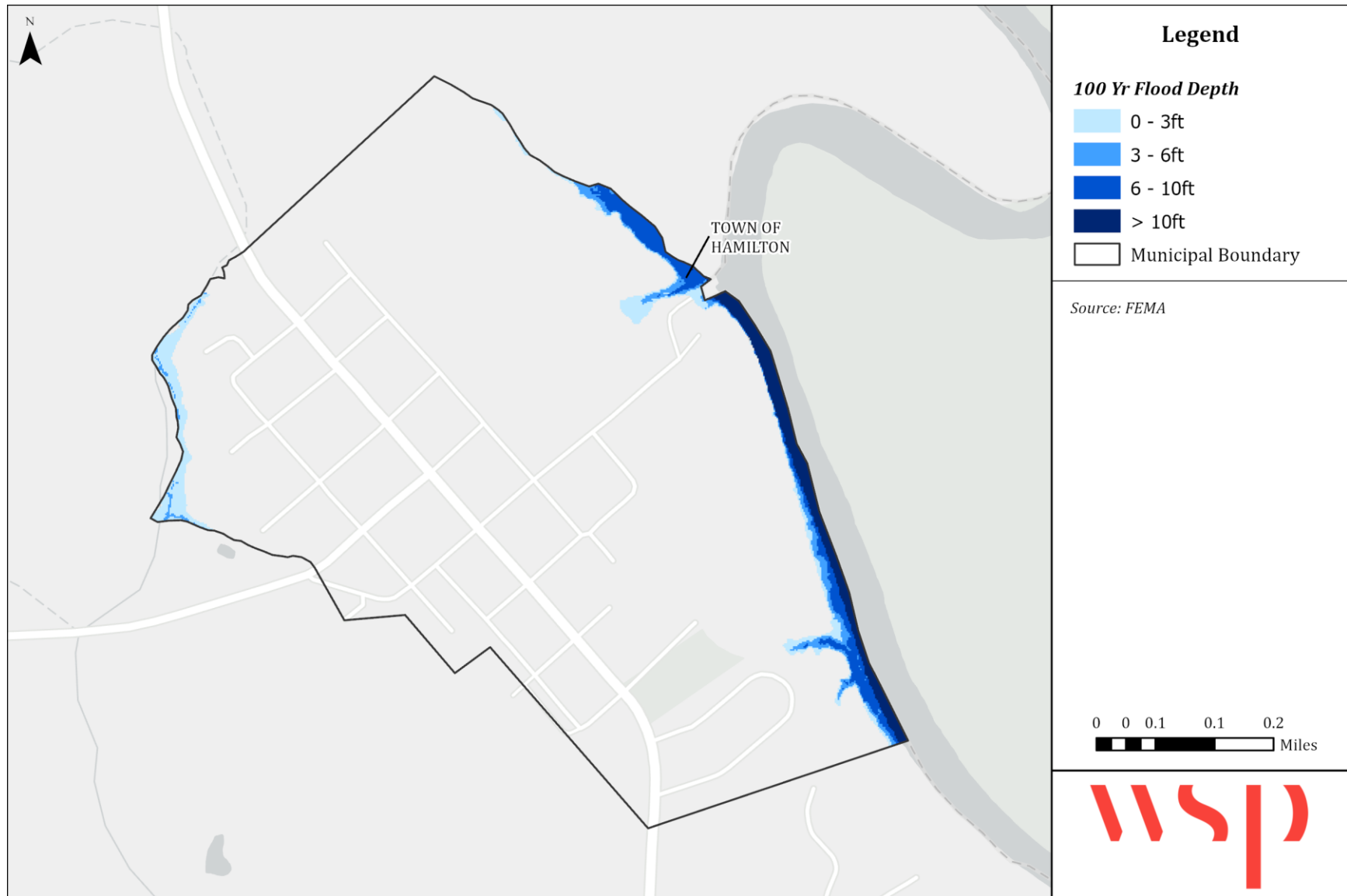


Figure C.13 – Flood Depth, 1%-Annual-Chance Floodplain, Town of Jamesville

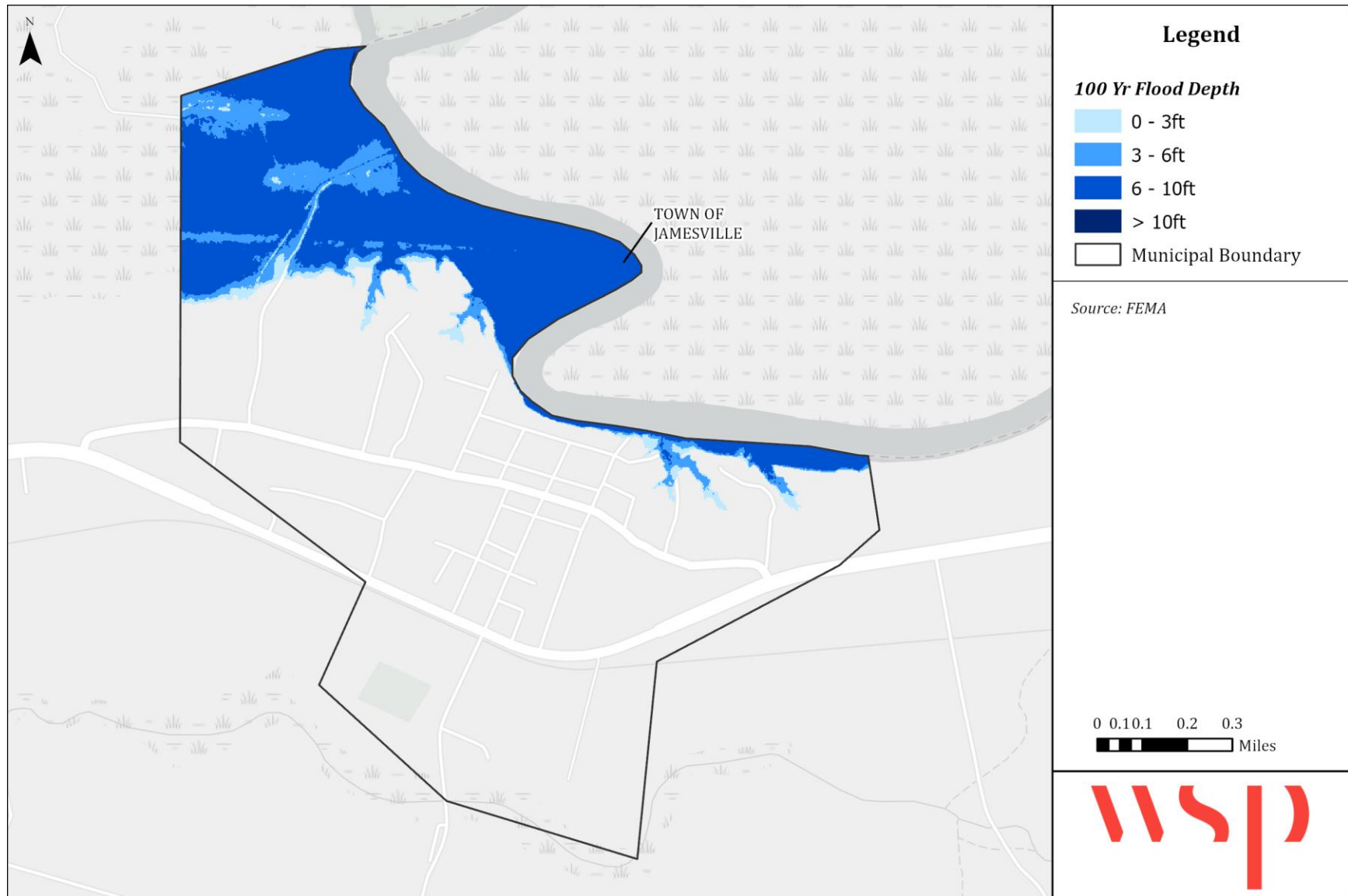
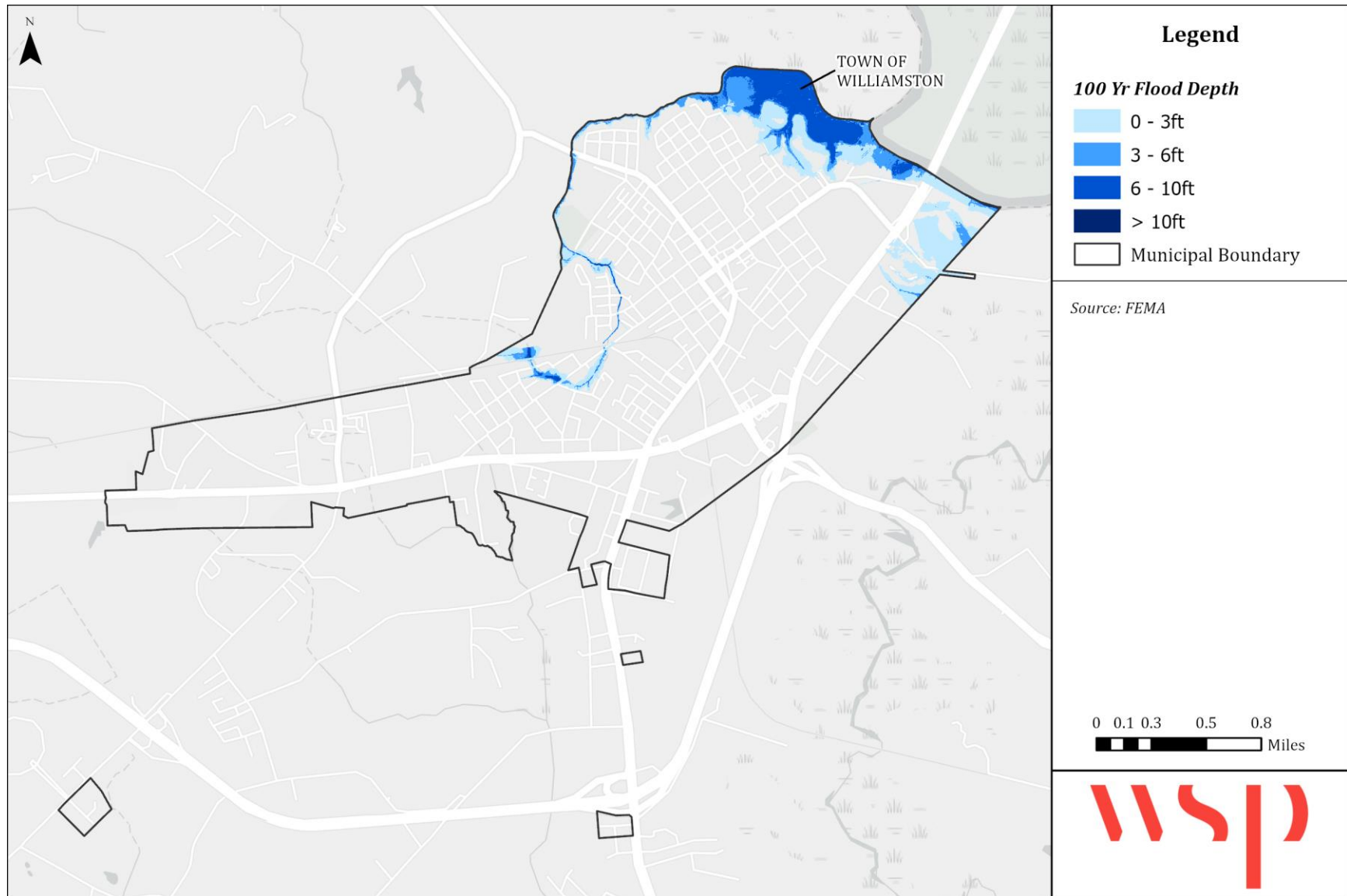


Figure C.14 – Flood Depth, 1%-Annual-Chance Floodplain, Town of Williamston



FLOODPLAIN MANAGEMENT

The following tables reflect NFIP policy and claims data for Martin County and incorporated communities categorized by structure type, flood zone, Pre-FIRM and Post-FIRM. Note that the Town of Everetts and the Town of Parmele are not participating in the NFIP. The Towns of Bear Grass, Hassell, Jamesville, and Oak City do not have any active policies or past paid claims.

Table C.10 – NFIP Policy and Claims Data by Structure Type

Structure Type	Policies in Force	Total Premium	Insurance in Force	Number of Closed Paid Losses	Total of Closed Paid Losses
Martin County Unincorporated Area					
Single Family	27	\$19,864	\$6,687,000	18	\$261,581.48
Non-Residential	1	\$1,229	\$137,000	4	\$8,498.10
Total	28	\$21,093	\$6,824,000	22	\$270,079.58
Town of Hamilton					
Single Family	0	\$0	\$0	1	\$26,019.60
Total	0	\$0	\$0	1	\$26,019.60
Town of Robersonville					
Single Family	4	\$1,987	\$1,187,000	4	\$32,886.38
Total	4	\$1,987	\$1,187,000	5	\$39,838.28
Town of Williamston					
Single Family	16	\$11,733	\$3,018,000	8	\$27,699.39
2-4 Family	9	\$6,955	\$2,385,000	0	\$0.00
Non Residential	7	\$10,245	\$1,794,000	6	\$201,649.64
Total	32	\$28,933	\$7,197,000	14	\$229,349.03

Source: FEMA Community Information System, accessed December 2025

Table C.11 – NFIP Policy and Claims Data by Flood Zone

Flood Zone	Policies in Force	Total Premium	Insurance in Force	Number of Closed Paid Losses	Total of Closed Paid Losses
Martin County Unincorporated Area					
A01-30 & AE Zones	16	\$12,822	\$3,232,000	6	\$152,659.56
A Zones	0	\$0	\$0	6	\$64,924.20
B, C & X Zone					
Standard	12	\$8,271	\$3,592,000	0	\$0.00
Preferred	0	\$0	\$0	7	\$48,550.43
Total	28	\$21,093	\$6,824,000	19	\$266,134.19
Town of Hamilton					
A Zones	0	\$0	\$0	1	\$26,019.60
Total	0	\$0	\$0	1	\$26,019.60
Town of Robersonville					
B, C & X Zone					
Standard	4	\$1,987	\$1,187,000	3	\$33,986.13
Preferred	0	\$0	\$0	2	\$5,852.15
Total	4	\$1,987	\$1,187,000	5	\$39,838.28

Flood Zone	Policies in Force	Total Premium	Insurance in Force	Number of Closed Paid Losses	Total of Closed Paid Losses
Town of Williamston					
A01-30 & AE Zones	11	\$13,287	\$2,222,000	3	\$33,616.67
A Zones	0	\$0	\$0	1	\$359.00
B, C & X Zone					
Standard	21	\$15,646	\$4,975,000	5	\$62,743.44
Preferred	0	\$0	\$0	4	\$131,457.87
Total	32	\$28,933	\$7,197,000	13	\$228,176.98

Source: FEMA Community Information System, accessed December 2025

Table C.12 – NFIP Policy and Claims Data Pre-FIRM

Flood Zone	Policies in Force	Total Premium	Insurance in Force	Number of Closed Paid Losses	Total of Closed Paid Losses
Martin County Unincorporated Area					
A01-30 & AE Zones	8	\$6,672	\$1,274,000	5	\$152,489.97
A Zones	0	\$0	\$0	4	\$43,396.01
B, C & X Zone	9	\$6,526	\$2,957,000	6	\$44,603.90
Standard	9	\$6,526	\$2,957,000	0	\$0.00
Preferred	0	\$0	\$0	6	\$44,603.90
Total	17	\$13,198	\$4,231,000	15	\$240,489.88
Town of Hamilton					
A Zones	0	\$0	\$0	1	\$26,019.60
Total	0	\$0	\$0	1	\$26,019.60
Town of Robersonville					
B, C & X Zone	4	\$1,987	\$1,187,000	3	\$33,986.13
Standard	4	\$1,987	\$1,187,000	3	\$33,986.13
Preferred	0	\$0	\$0	0	\$0.00
Total	4	\$1,987	\$1,187,000	3	\$33,986.13
Town of Williamston					
A01-30 & AE Zones	8	\$11,263	\$1,776,000	3	\$33,616.67
A Zones	0	\$0	\$0	1	\$359.00
B, C & X Zone	17	\$13,239	\$4,522,000	9	\$194,201.31
Standard	17	\$13,239	\$4,522,000	5	\$62,743.44
Preferred	0	\$0	\$0	4	\$131,457.87
Total	25	\$24,502	\$6,298,000	13	\$228,176.98

Source: FEMA Community Information System, accessed December 2025

Table C.13 – NFIP Policy and Claims Data Post-FIRM

Flood Zone	Policies in Force	Total Premium	Insurance in Force	Number of Closed Paid Losses	Total of Closed Paid Losses
Martin County Unincorporated Area					
A01-30 & AE Zones	8	\$6,150	\$1,958,000	1	\$169.59

Flood Zone	Policies in Force	Total Premium	Insurance in Force	Number of Closed Paid Losses	Total of Closed Paid Losses
A Zones	0	\$0	\$0	2	\$21,528.19
B, C & X Zone	3	\$1,745	\$635,000	1	\$3,946.53
Standard	3	\$1,745	\$635,000	0	\$0.00
Preferred	0	\$0	\$0	1	\$3,946.53
Total	11	\$7,895	\$2,593,000	4	\$25,644.31
Town of Robersonville					
B, C & X Zone	0	\$0	\$0	2	\$5,852.15
Preferred	0	\$0	\$0	2	\$5,852.15
Total	0	\$0	\$0	2	\$5,852.15
Town of Williamston					
A01-30 & AE Zones	3	\$2,024	\$446,000	0	\$0.00
B, C & X Zone	4	\$2,407	\$453,000	0	\$0.00
Standard	4	\$2,407	\$453,000	0	\$0.00
Preferred	0	\$0	\$0	0	\$0.00
Total	7	\$4,431	\$899,000	0	\$0.00

Source: FEMA Community Information System, accessed December 2025

C.2.2 HURRICANES AND COASTAL HAZARDS

Figure C.15 on the following page show the estimated extent of surge by storm category according to NOAA SLOSH data that would occur in unincorporated Martin County and all participating jurisdictions. Much of the northeastern edge of Martin County along the Roanoke River and near the Albemarle Sound is at the highest risk to storm surge.

Figure C.16 show the estimated inundation extents of 1 foot, 2 feet, and 3 feet of sea level rise that may occur in Martin County and participating jurisdictions. Sea level rise is likely to impact land adjacent to the Roanoke River.

Figure C.15 – Storm Surge Extent by Storm Category

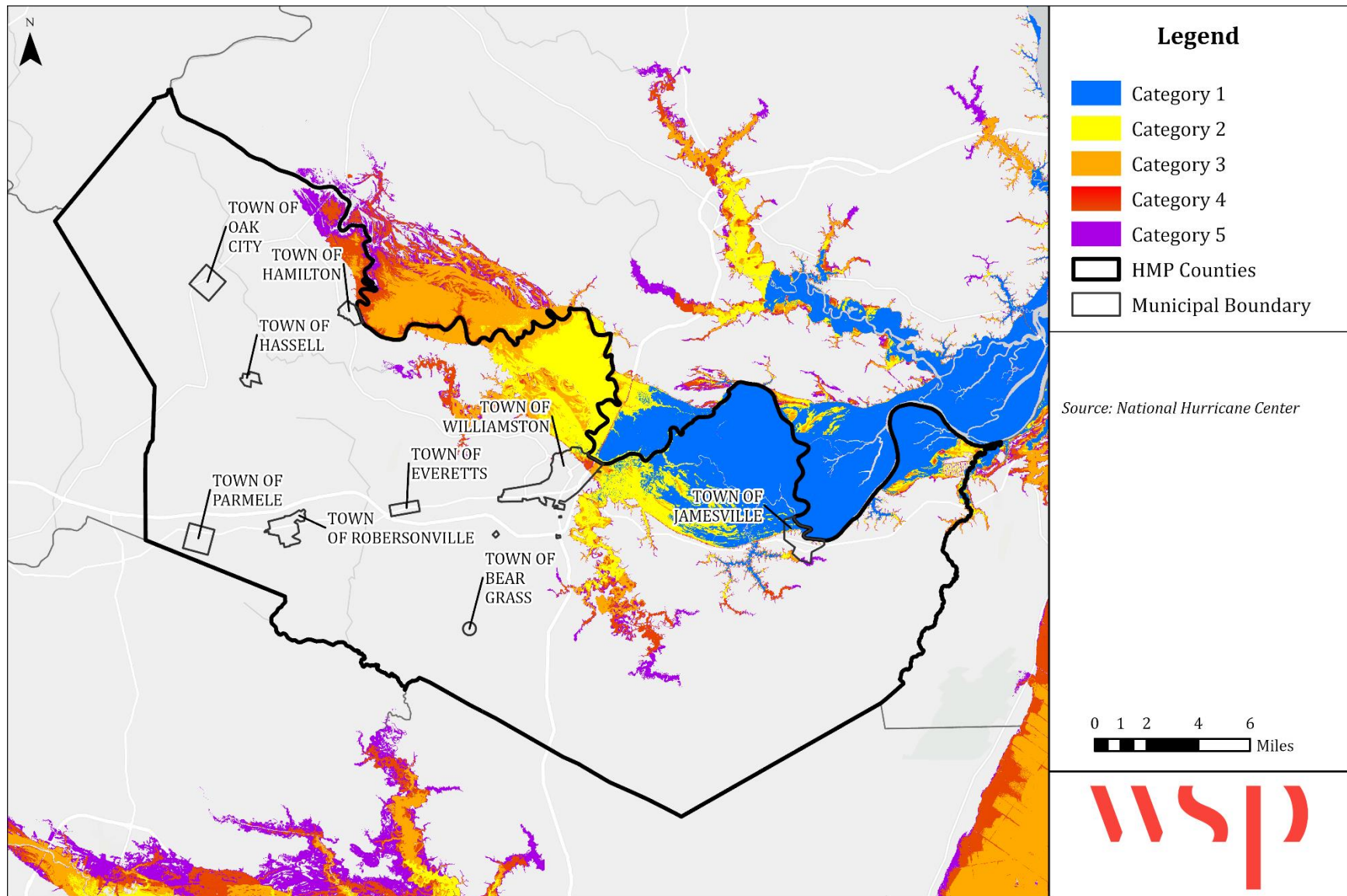
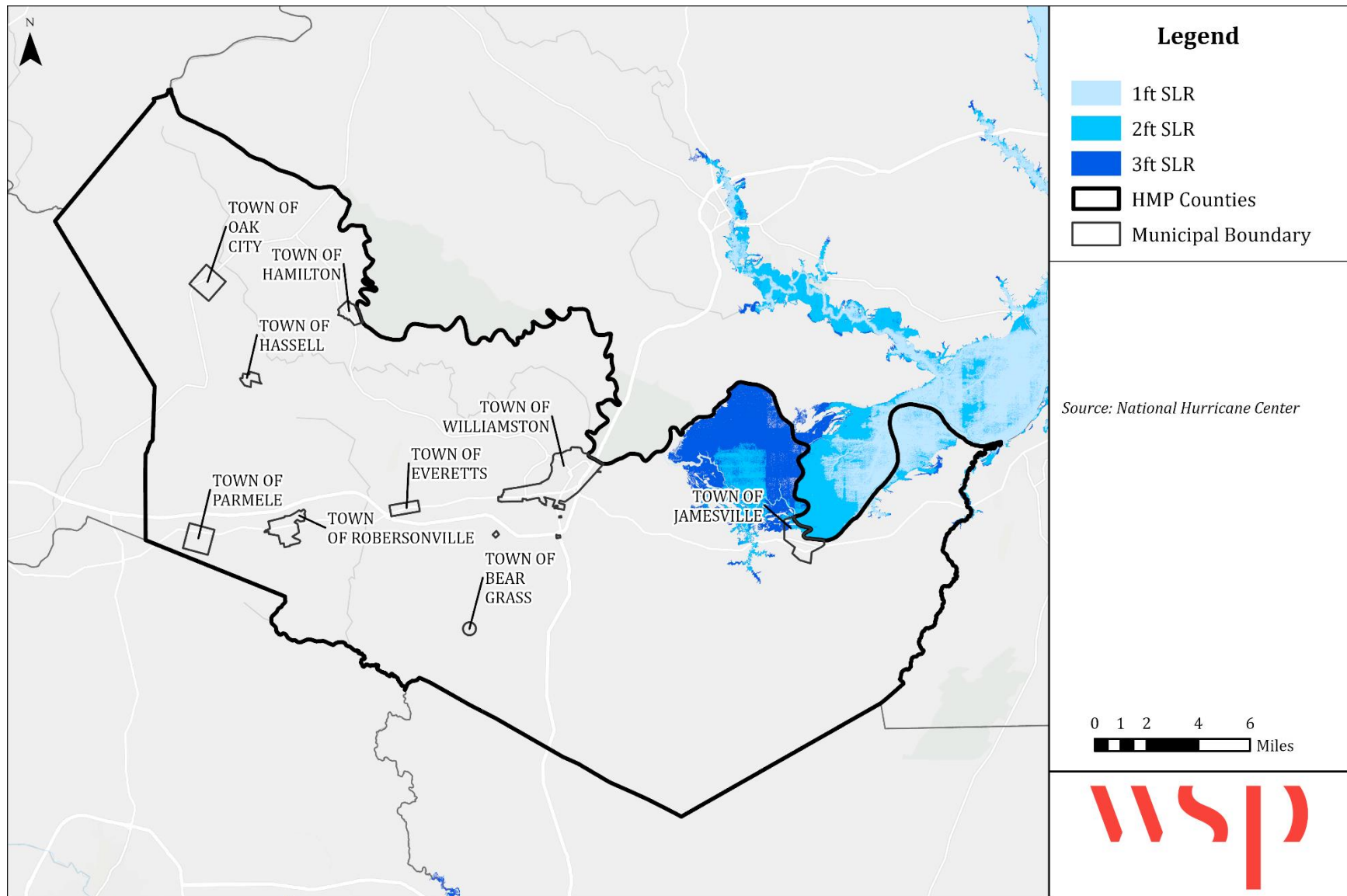


Figure C.16 – Sea Level Rise Extent



C.2.3 WILDFIRE

Table C.14 summarizes the acreage in unincorporated Martin County that falls within the Functional Wildland Urban Interface (WUI), categorized into zones that describe the wildfire risk mitigation activities appropriate for each zone. Areas in the Functional WUI are those areas where development and building structures may intermix with burnable land cover. Approximately, 4 percent of unincorporated Martin County is categorized as having direct exposure to wildfire risk and 76 percent is located within the critical fireshed of the Functional WUI.

Table C.14 – Functional Wildland Urban Interface Acreage, Unincorporated Martin County

	Functional Wildland Urban Interface (WUI) Category	Acres	Percent
	Direct Exposure	11,360	4%
	Indirect Exposure	13,943	5%
	Critical Fireshed	211,173	76%
	Sources of Ember Load to Buildings	41,147	15%
	Little to No Exposure	0	0%
	Water	1,492	1%
	Total	279,116	100%

Source: Southern Wildfire Risk Assessment

Figure C.17 through Figure C.26 depicts the Functional WUI for unincorporated Martin County and all participating jurisdictions. Figure C.27 through Figure C.36 depicts the Fire Intensity Scale, which indicates the potential severity of fire based on fuel loads, topography, and other factors. Figure C.37 through Figure C.46 depicts Burn Probability based on landscape conditions, percentile weather, historical ignition patterns, and historical prevention and suppression efforts.

Potential fire intensity is highest in the unincorporated areas of Martin County, particularly near the western border with Edgecombe County and the southeastern border with Beaufort and Washington Counties. Functional WUI areas with direct exposure to wildfire are spread throughout the county appearing in areas with more housing density around Williamston and the major roadways. Burn probability is low across most of the county, but there is a large area of moderate probability in the southeastern portion of the county as well as a clusters of moderate burn probability near Oak City and Hassell in the northwestern corner of the county. Areas of the Functional WUI that intersect with high fire intensity and moderate burn probability may be exposed to greater potential wildfire risk.

Table C.15 provides building counts and values for critical facilities by FEMA lifeline that are located in areas categorized with direct exposure to wildfire risk on the Functional WUI scale. Note that not all jurisdictions within Martin County contain critical facilities that have exposure to direct exposure.

Table C.15 – Critical Facilities Exposed to Wildfire by Jurisdiction, Martin County

Type	Critical Facility Count	Structure Value
Martin County Unincorporated Area		
Food, Hydration, Shelter	2	\$0
Water Systems	5	\$0
All Categories	7	\$0
Town of Williamston		
Water Systems	3	\$0
All Categories	3	\$0
County Total	10	\$0

Source: Southern Wildfire Risk Assessment

Figure C.17 – Functional Wildland Urban Interface, Unincorporated Martin County

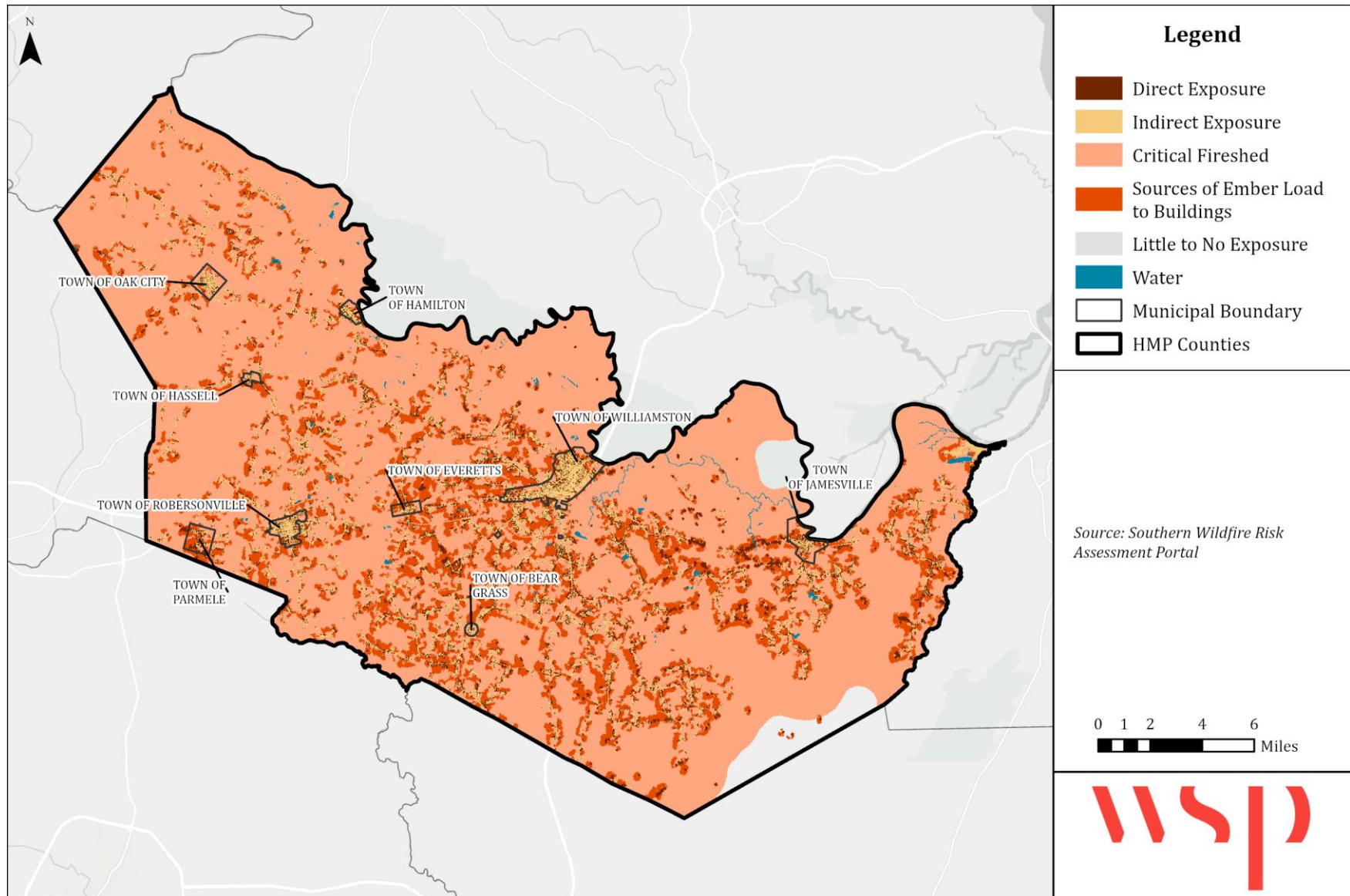


Figure C.18 – Functional Wildland Urban Interface, Town of Bear Grass

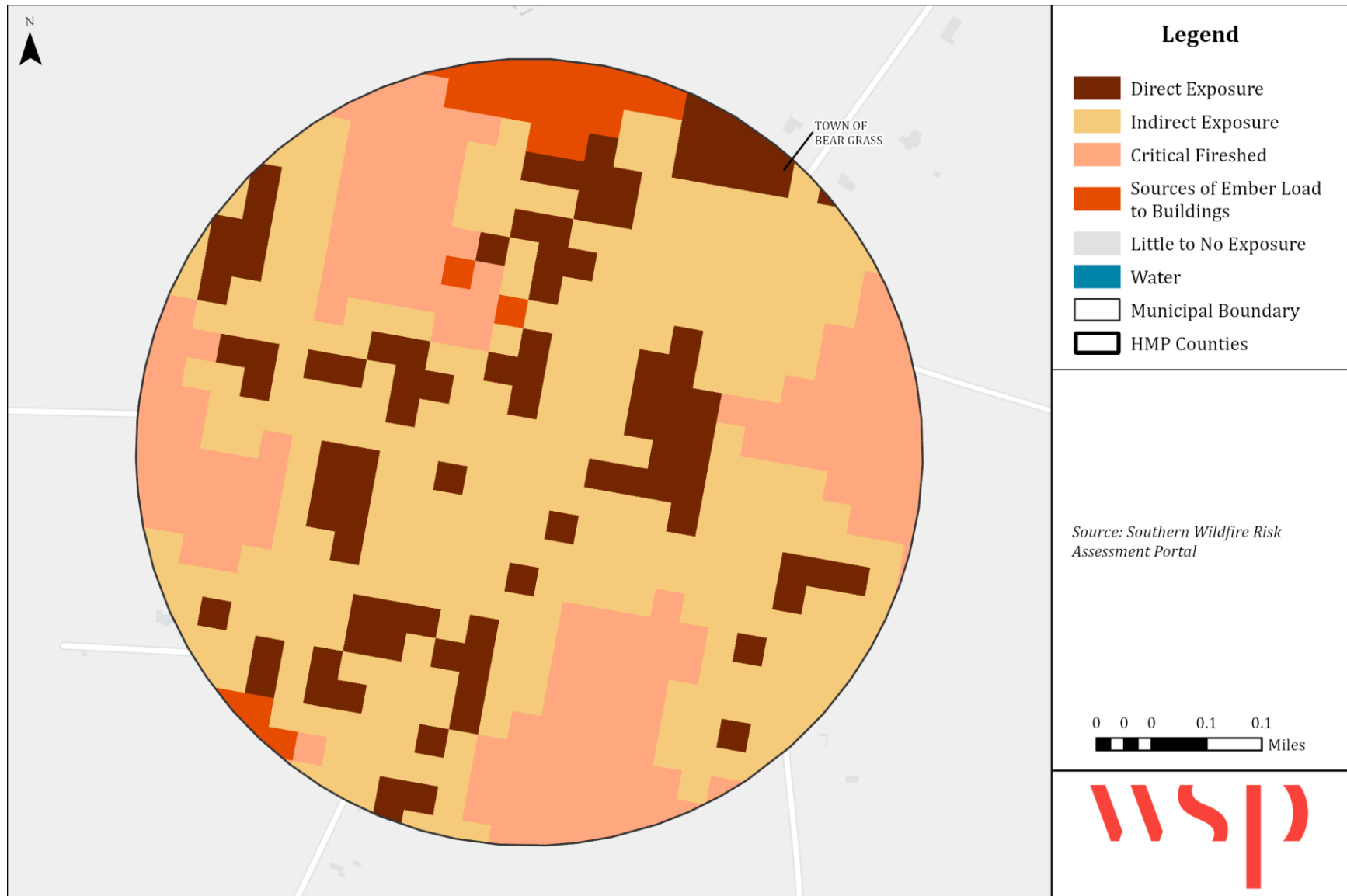


Figure C.19 – Functional Wildland Urban Interface, Town of Everetts

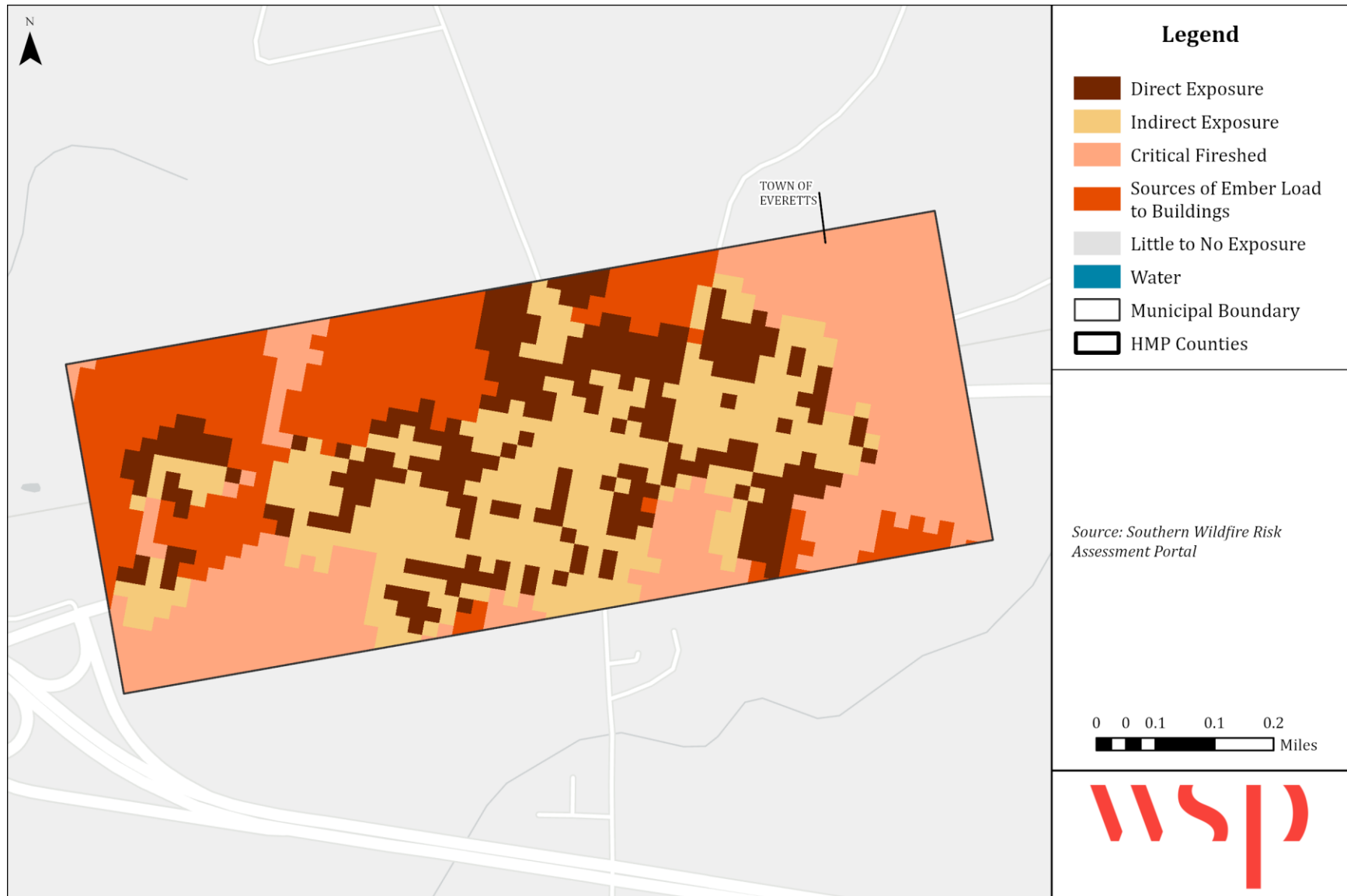


Figure C.20 - Functional Wildland Urban Interface, Town of Hamilton

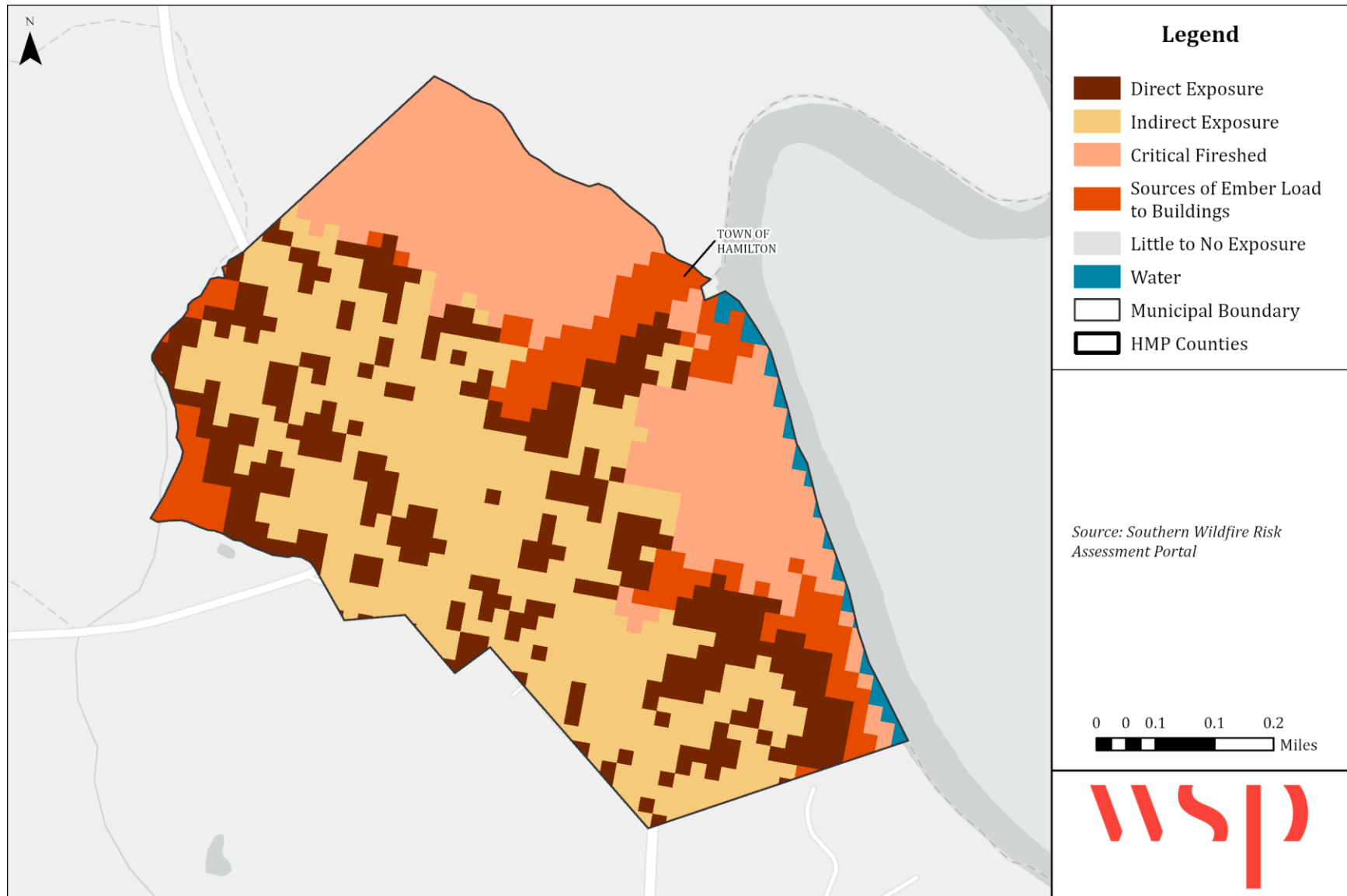


Figure C.21 – Functional Wildland Urban Interface, Town of Hassell

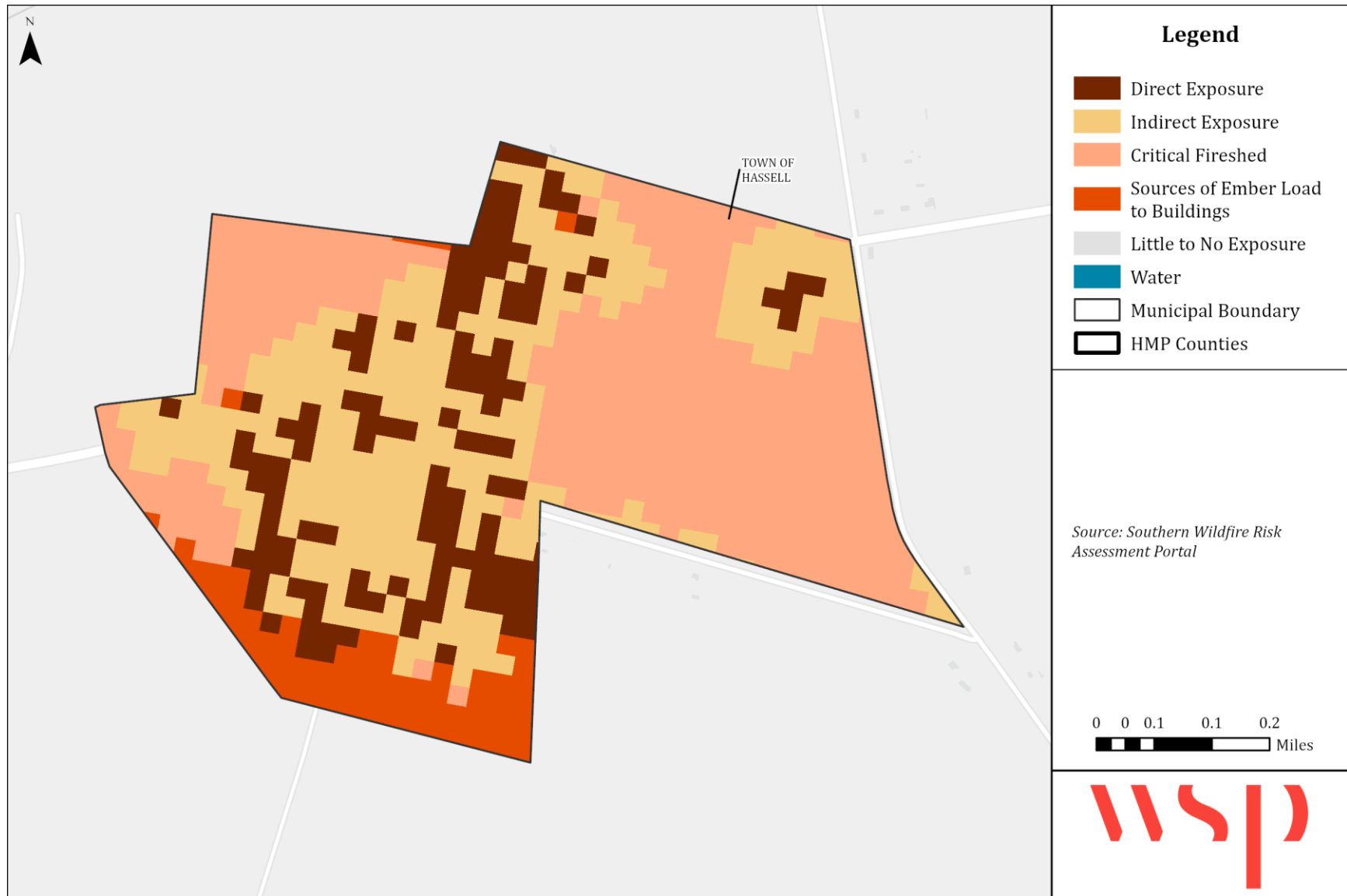


Figure C.22 – Functional Wildland Urban Interface, Town of Jamesville

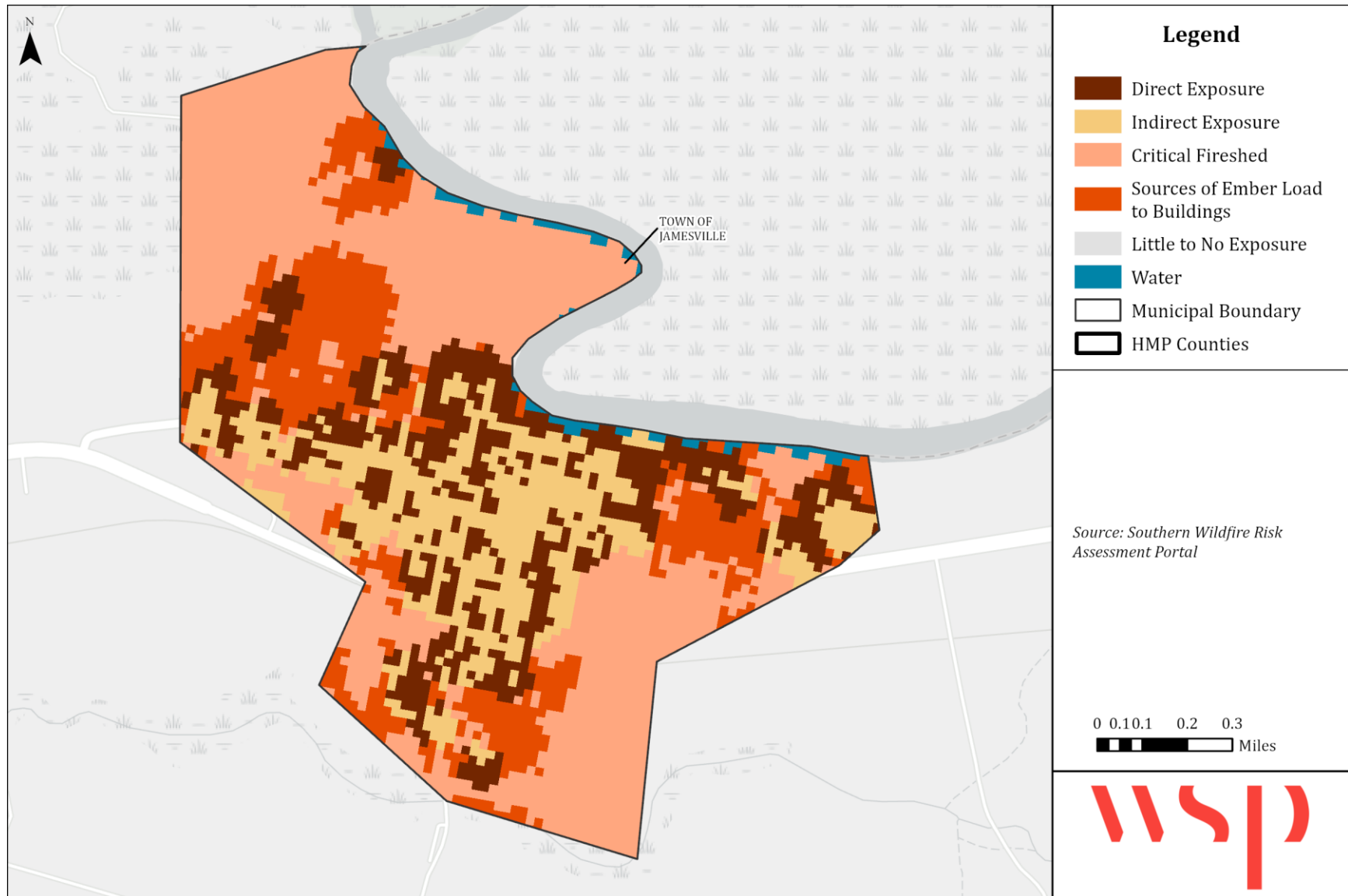


Figure C.23 – Functional Wildland Urban Interface, Town of Oak City

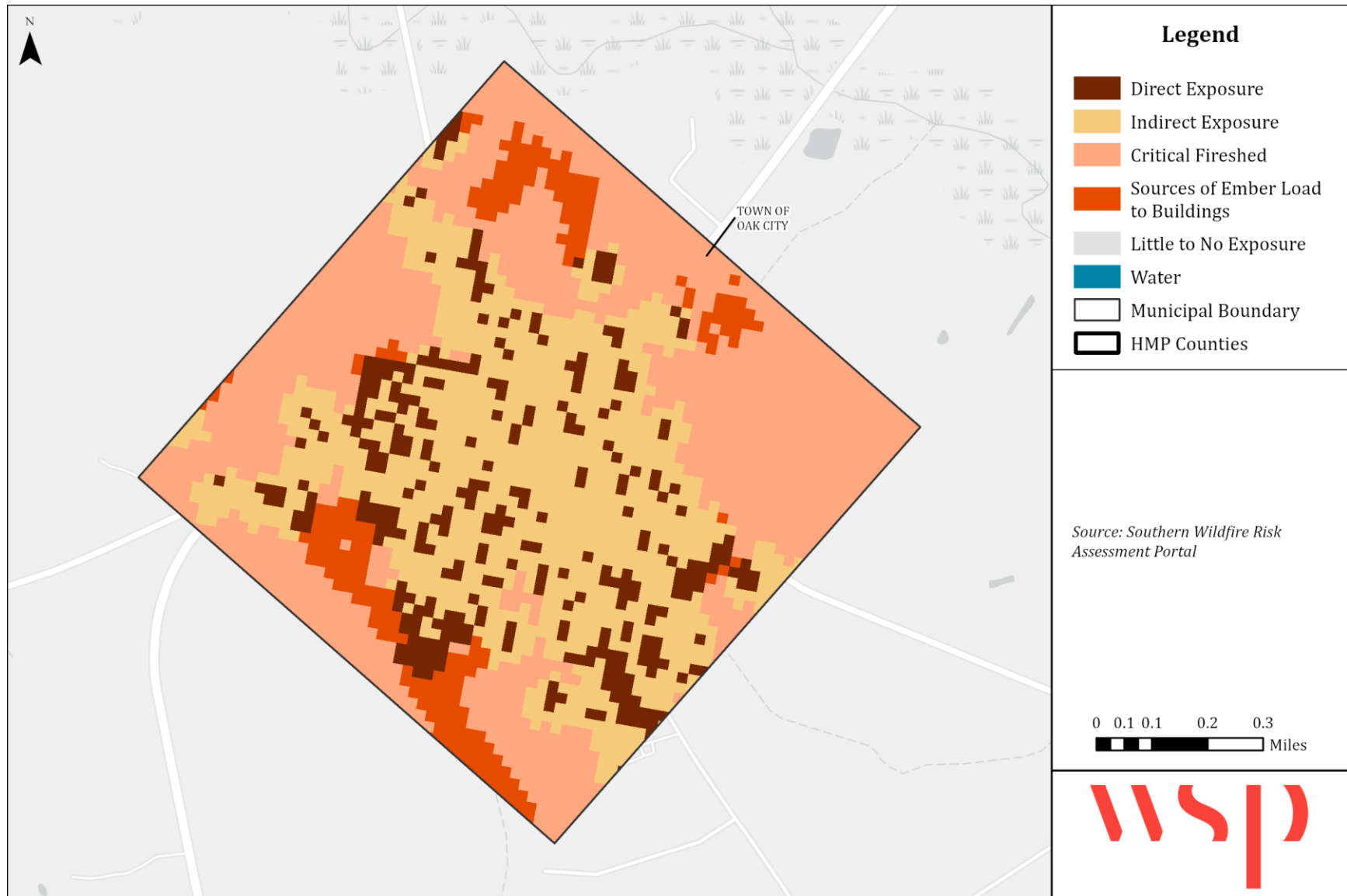


Figure C.24 – Functional Wildland Urban Interface, Town of Parmele

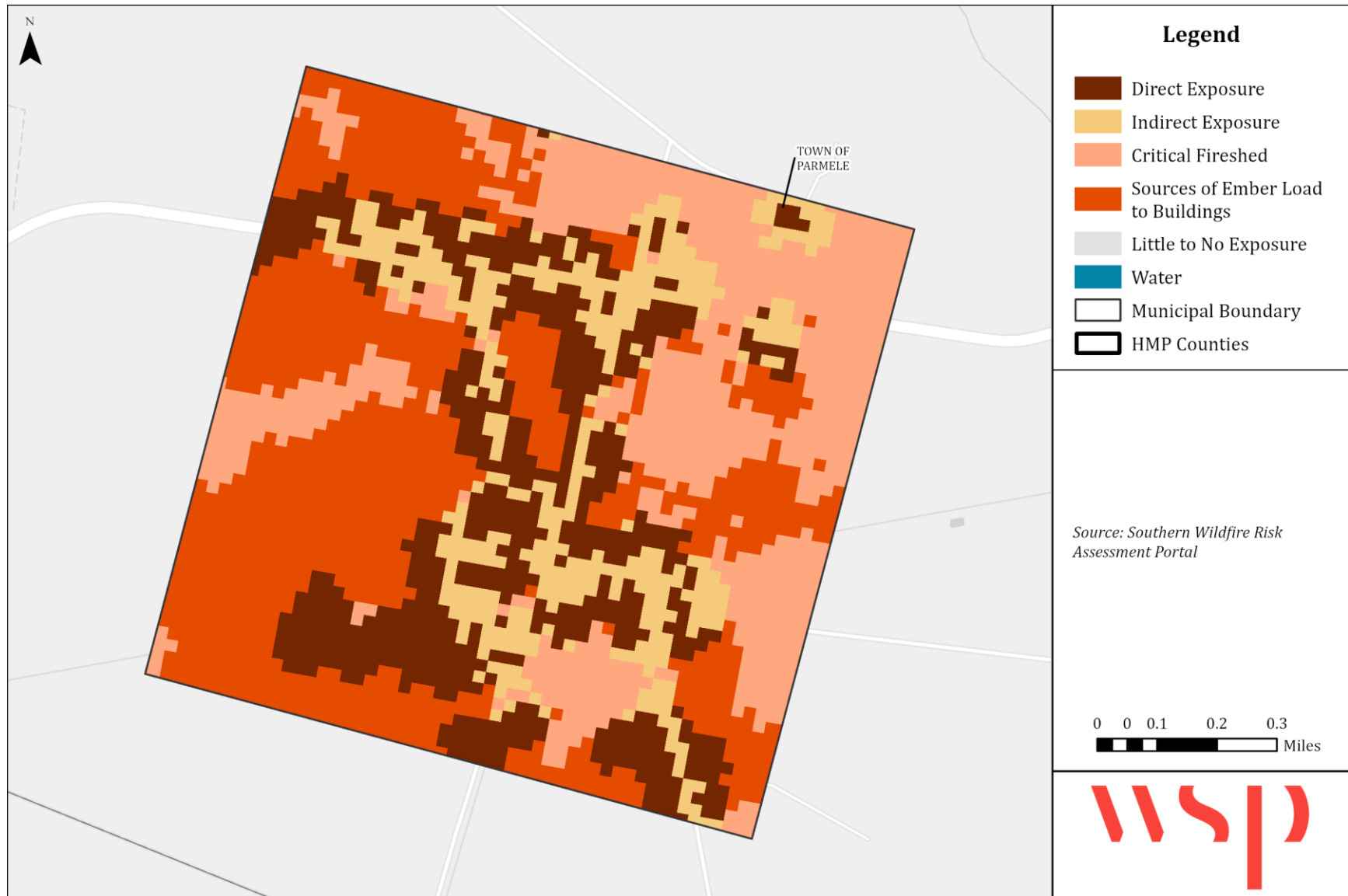


Figure C.25 - Functional Wildland Urban Interface, Town of Robersonville

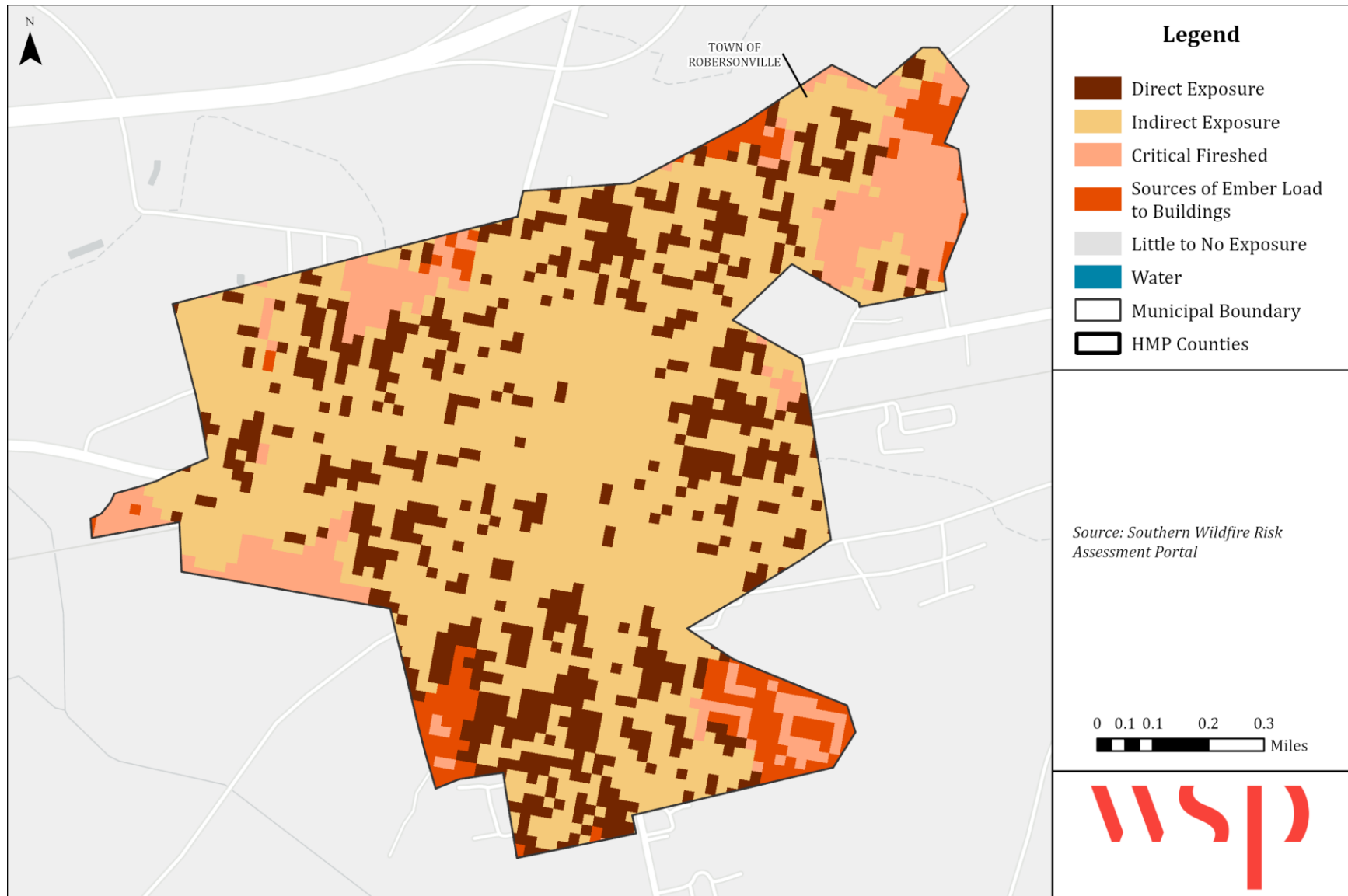


Figure C.26 - Functional Wildland Urban Interface, Town of Williamston

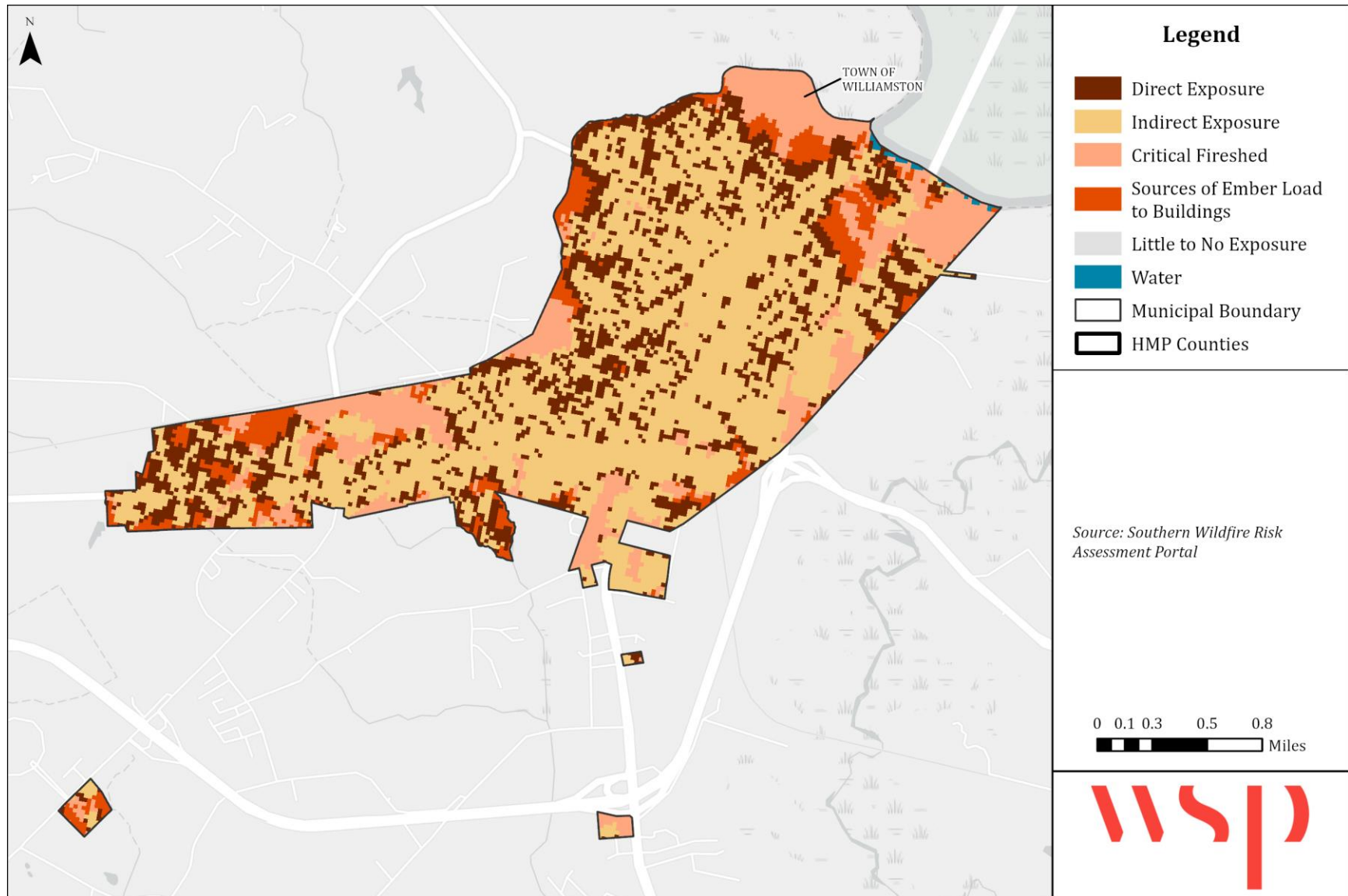


Figure C.27 – Fire Intensity Scale, Unincorporated Martin County

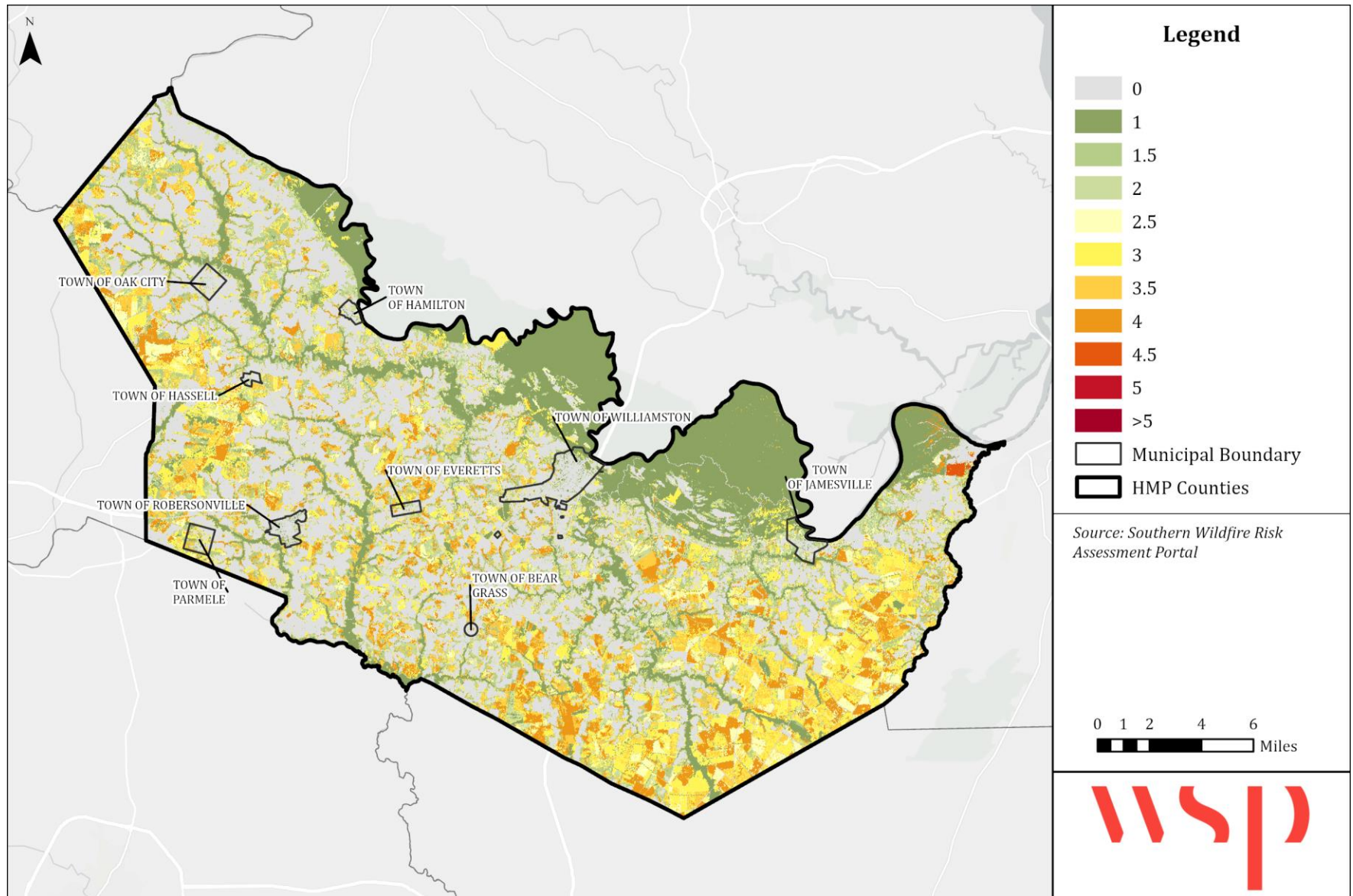


Figure C.28 - Fire Intensity Scale, Town of Bear Grass



Figure C.29 - Fire Intensity Scale, Town of Everetts

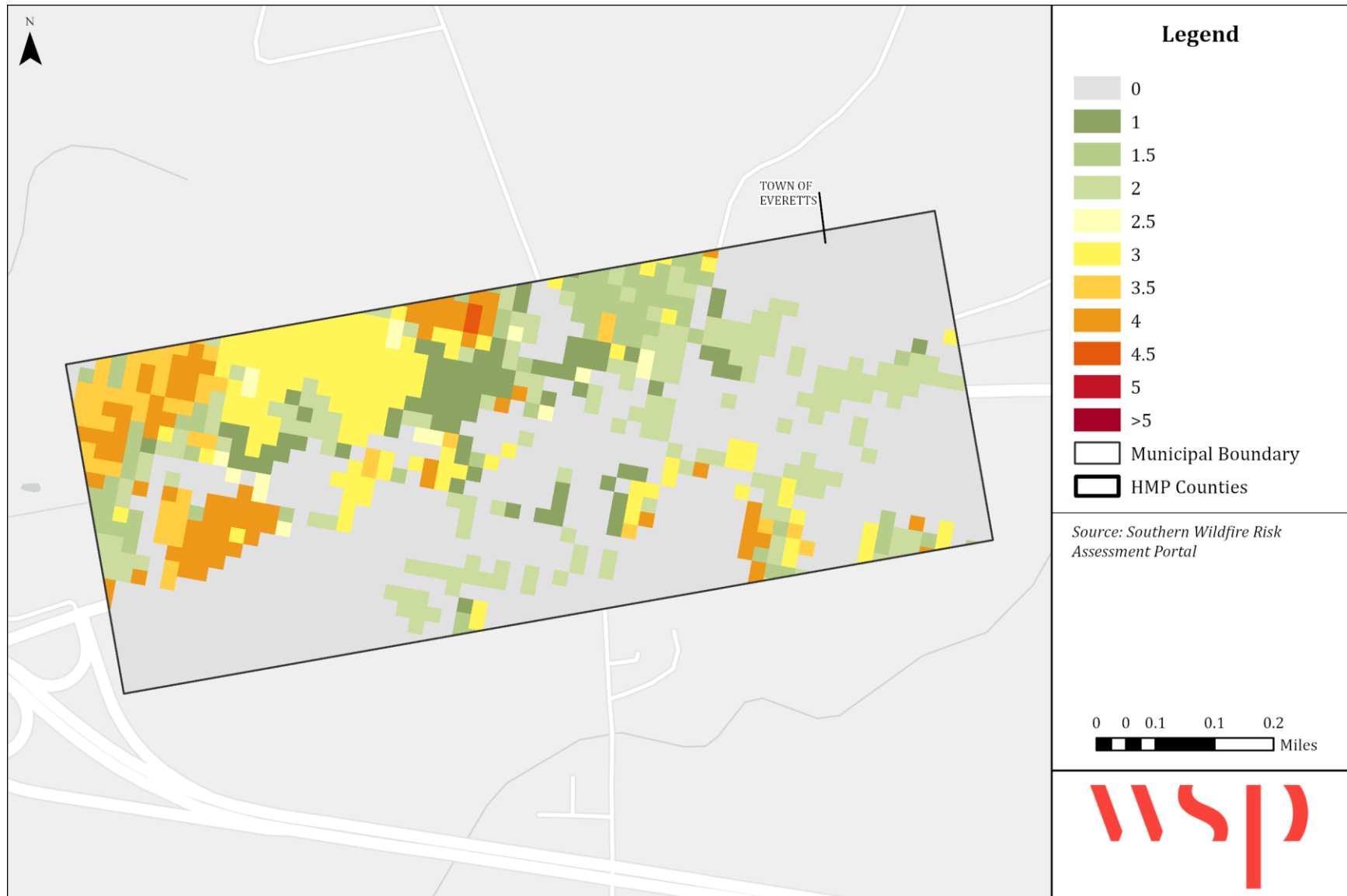


Figure C.30 - Fire Intensity Scale, Town of Hamilton

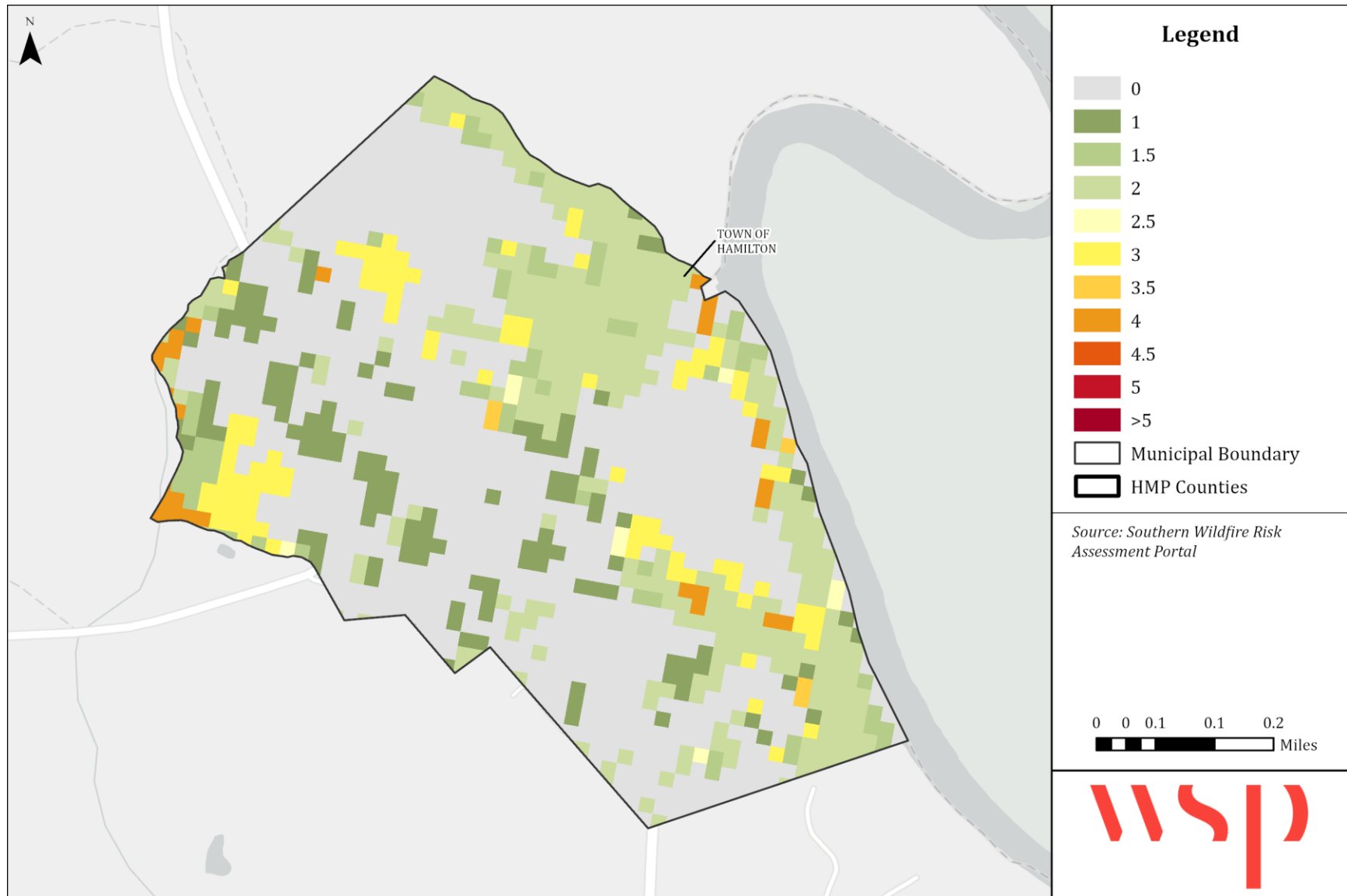


Figure C.31 – Fire Intensity Scale, Town of Hassell

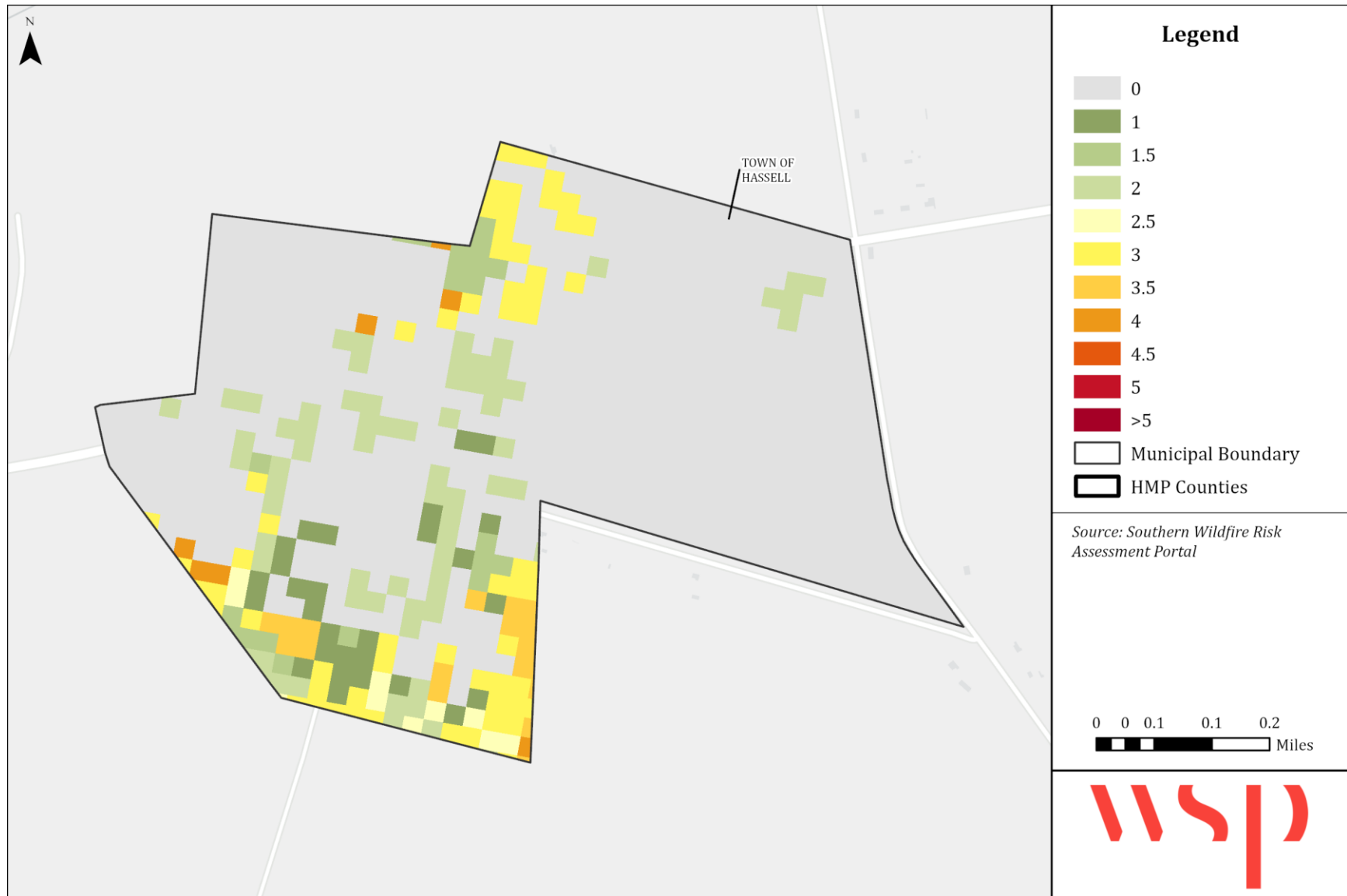


Figure C.32 – Fire Intensity Scale, Town of Jamesville

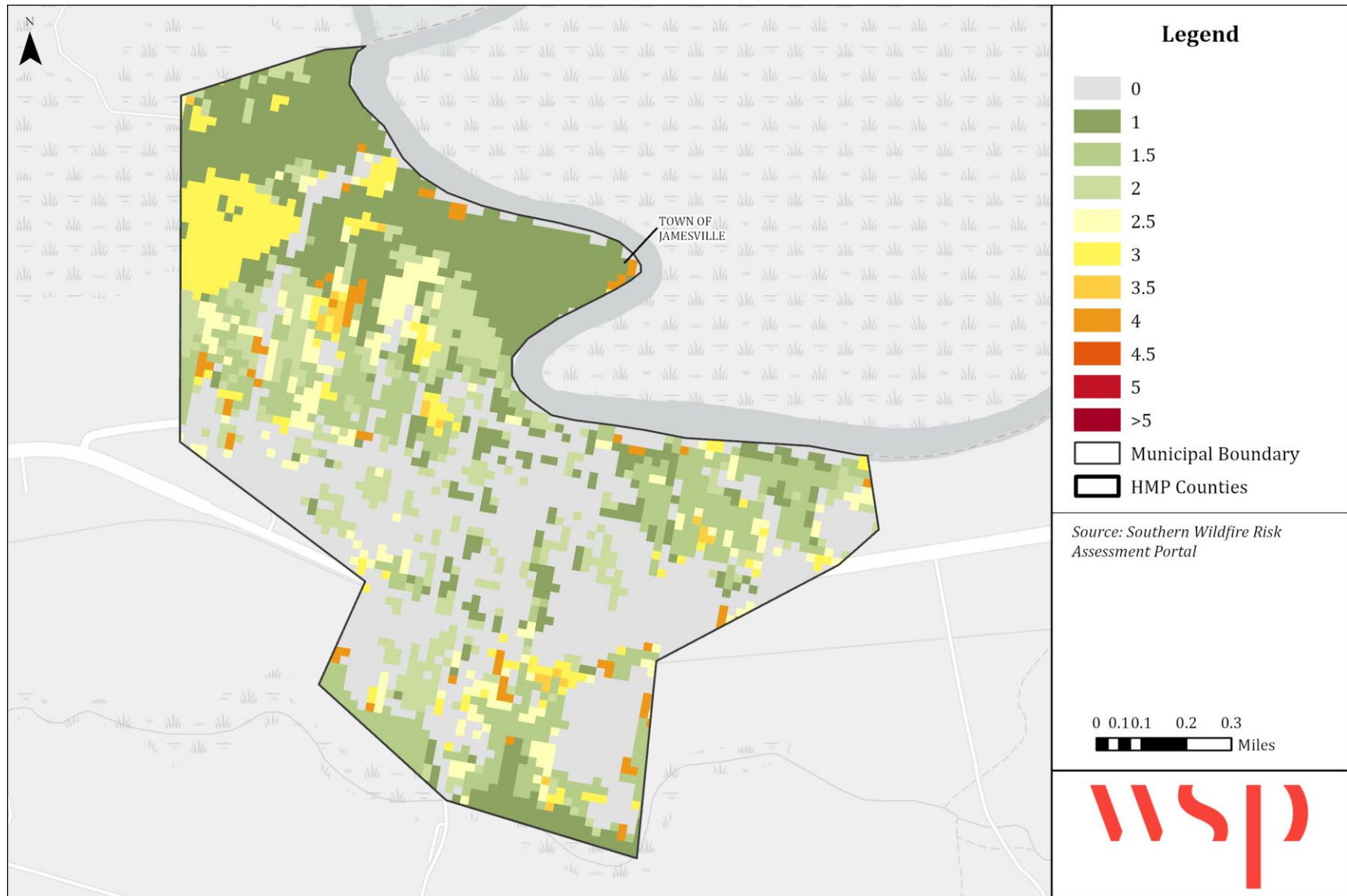


Figure C.33 – Fire Intensity Scale, Town of Oak City

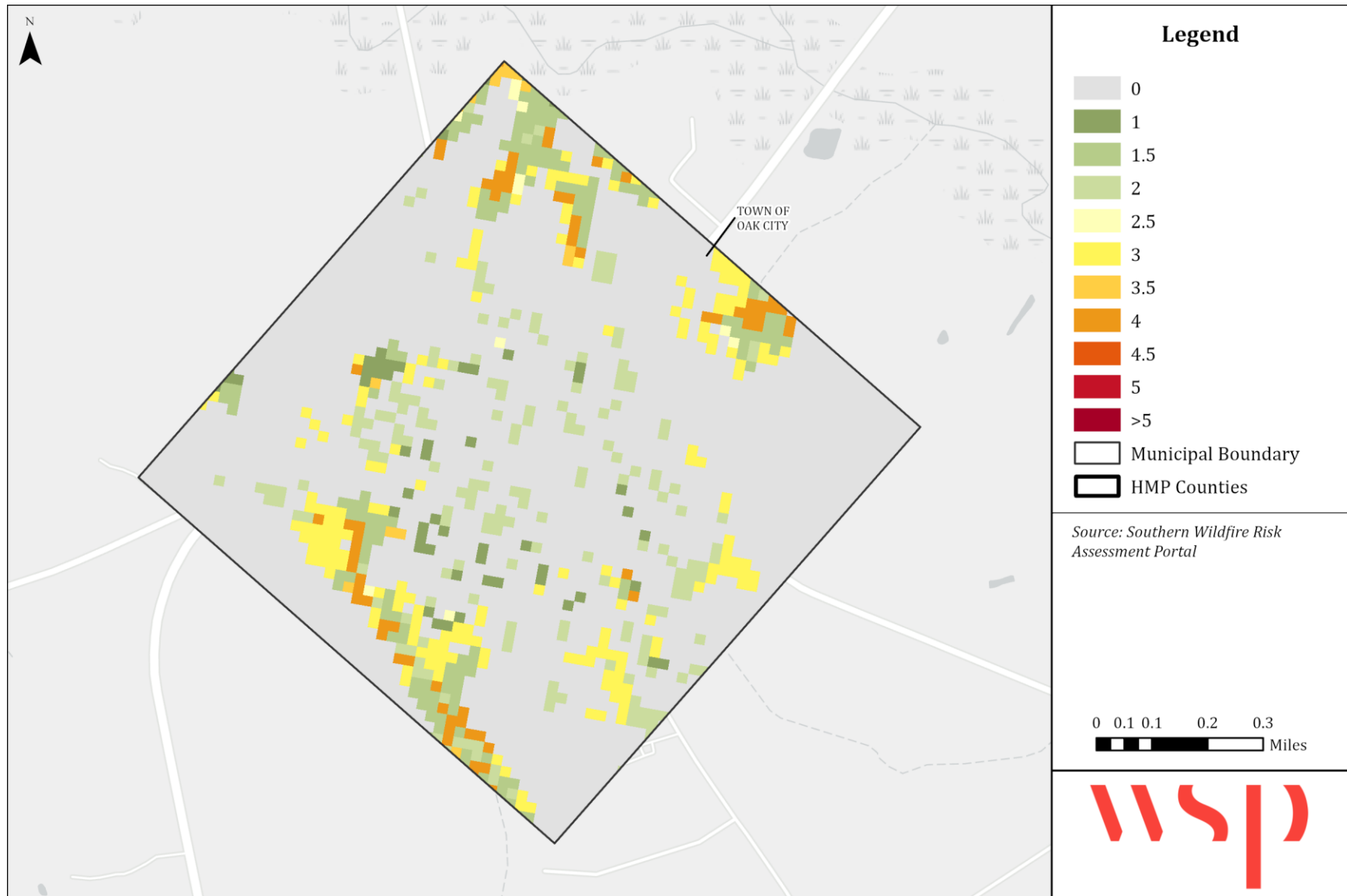


Figure C.34 – Fire Intensity Scale, Town of Parmele

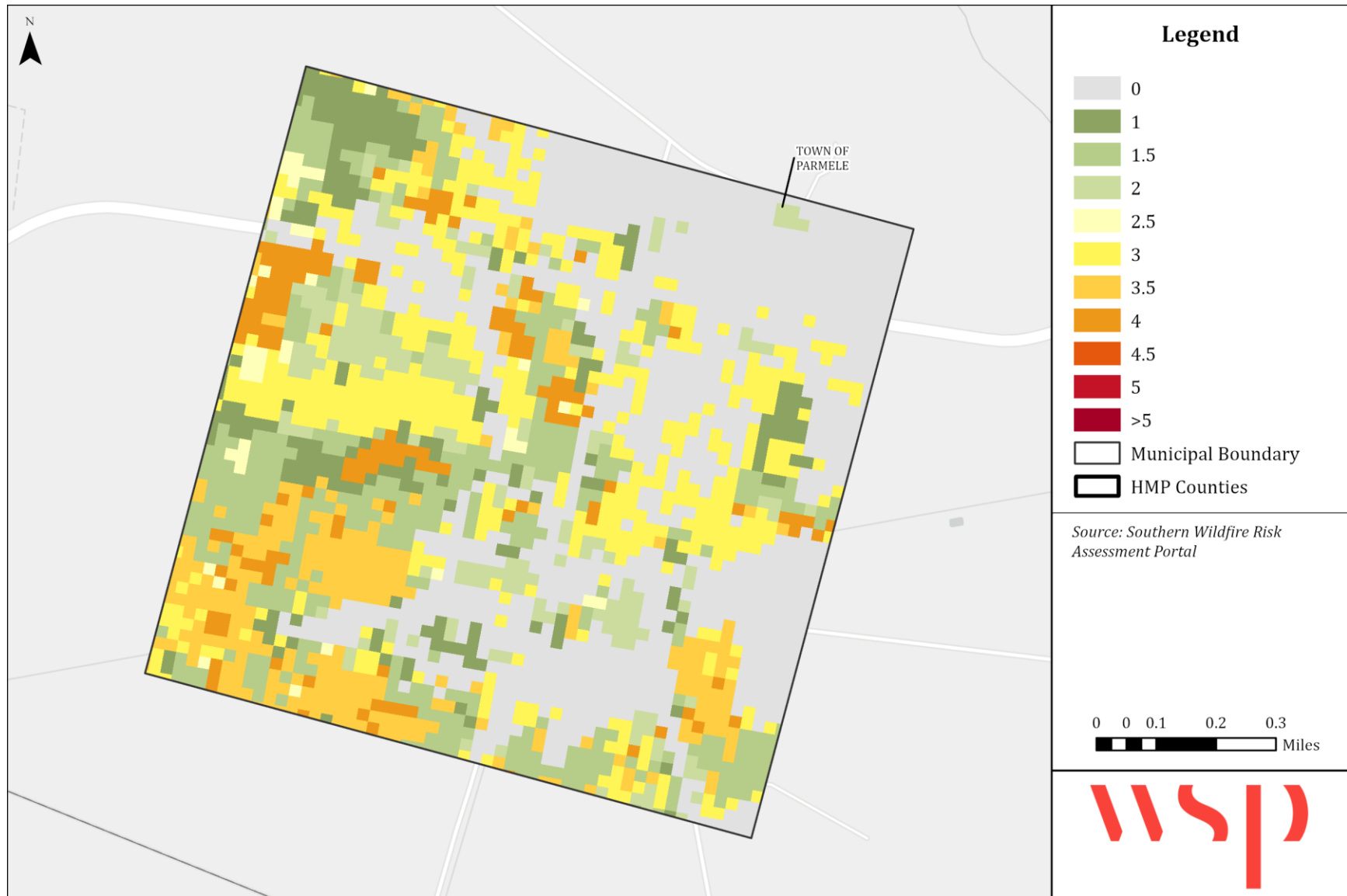


Figure C.35 - Fire Intensity Scale, Town of Robersonville

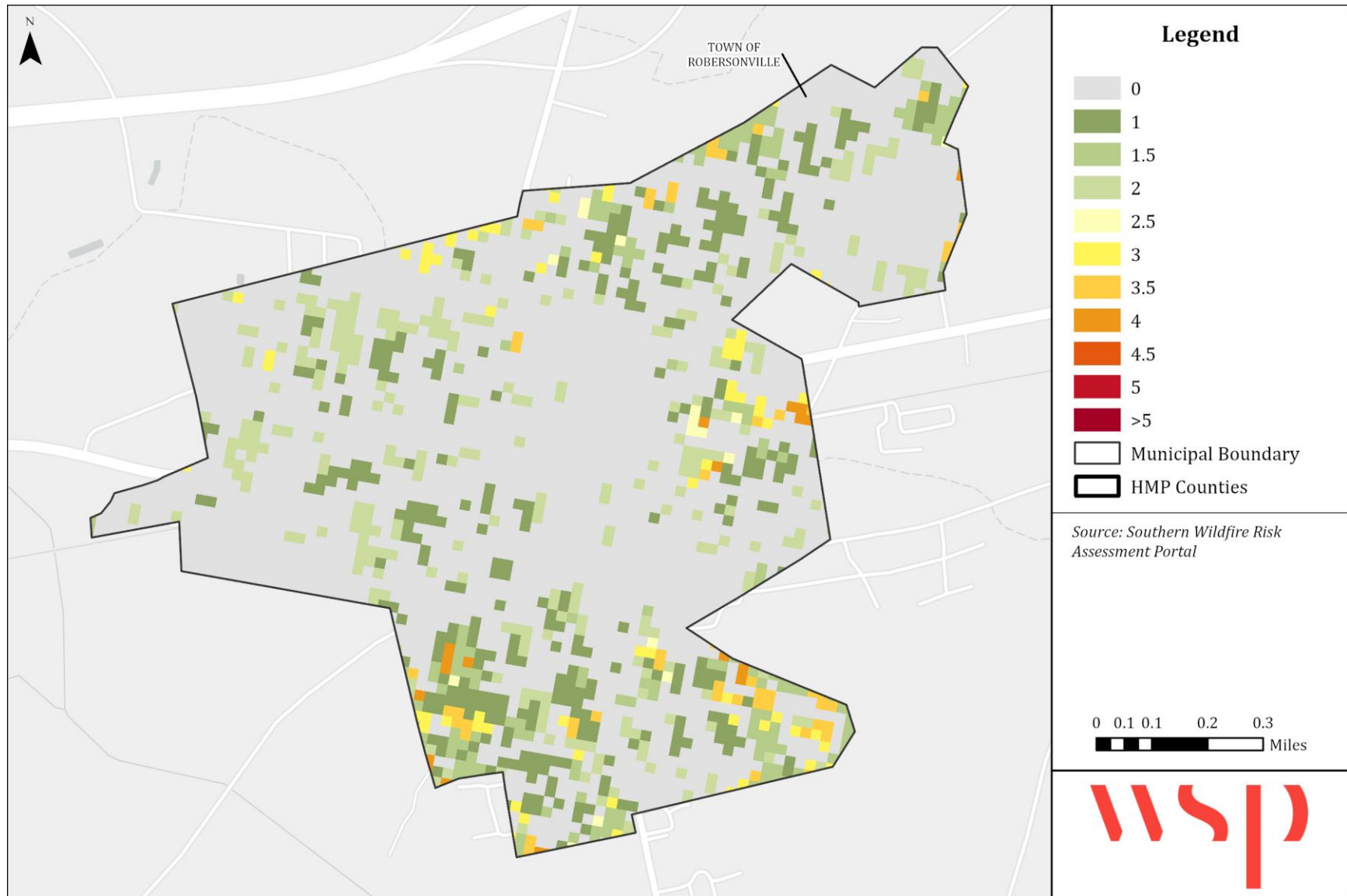


Figure C.36 - Fire Intensity Scale, Town of Williamston

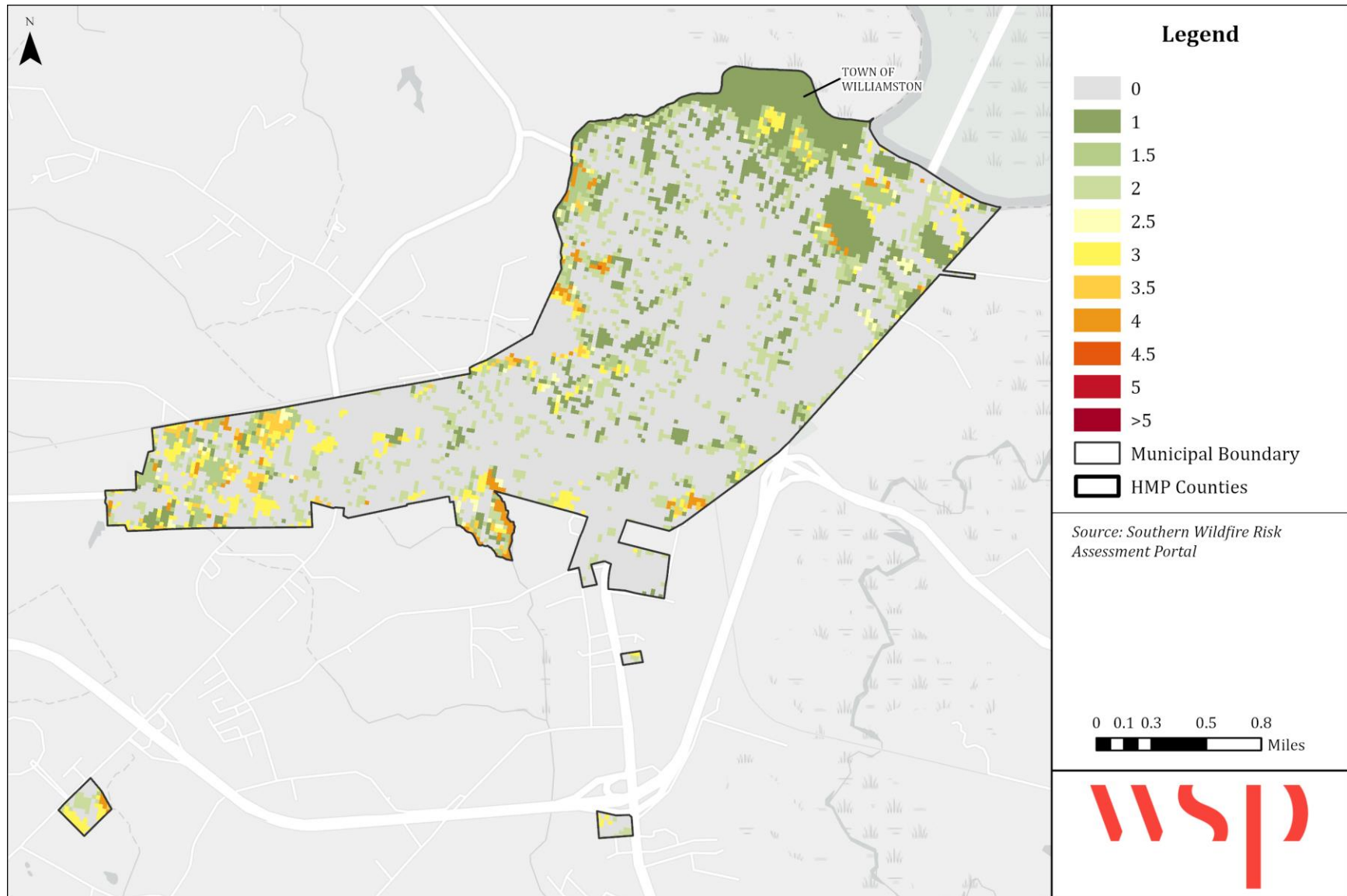


Figure C.37 – Burn Probability, Unincorporated Martin County

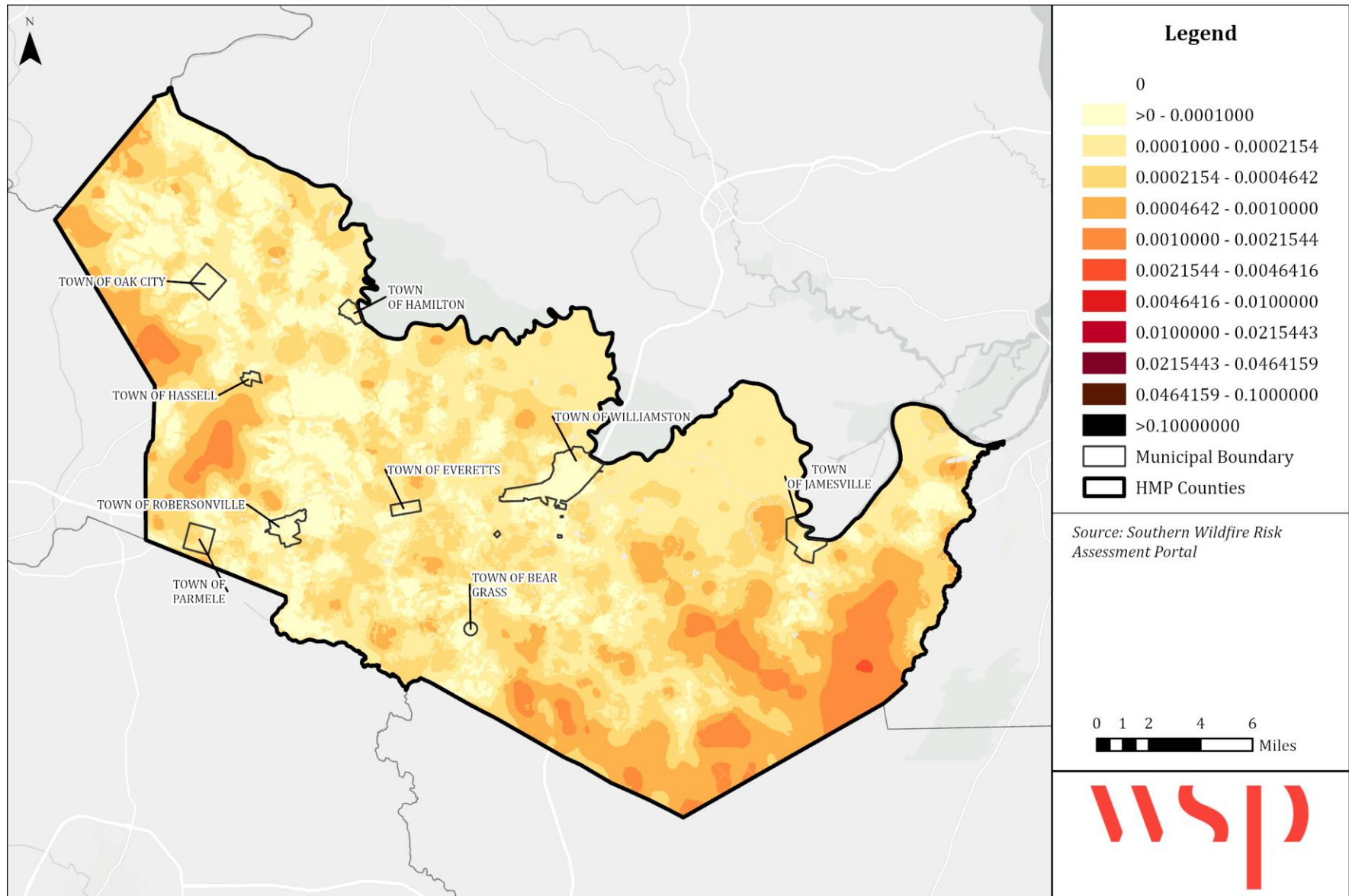


Figure C.38 – Burn Probability, Town of Bear Grass

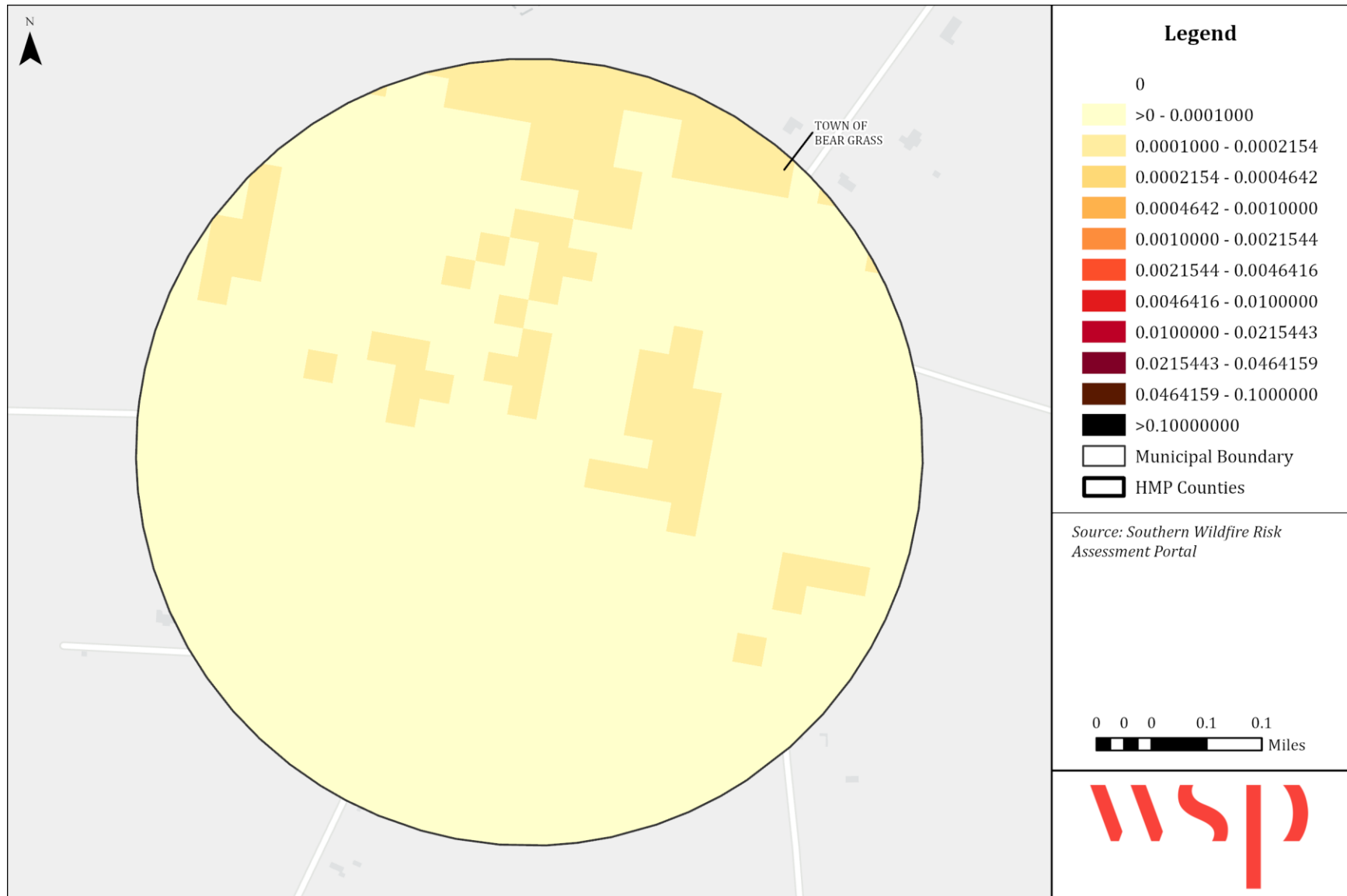


Figure C.39 – Burn Probability, Town of Everetts

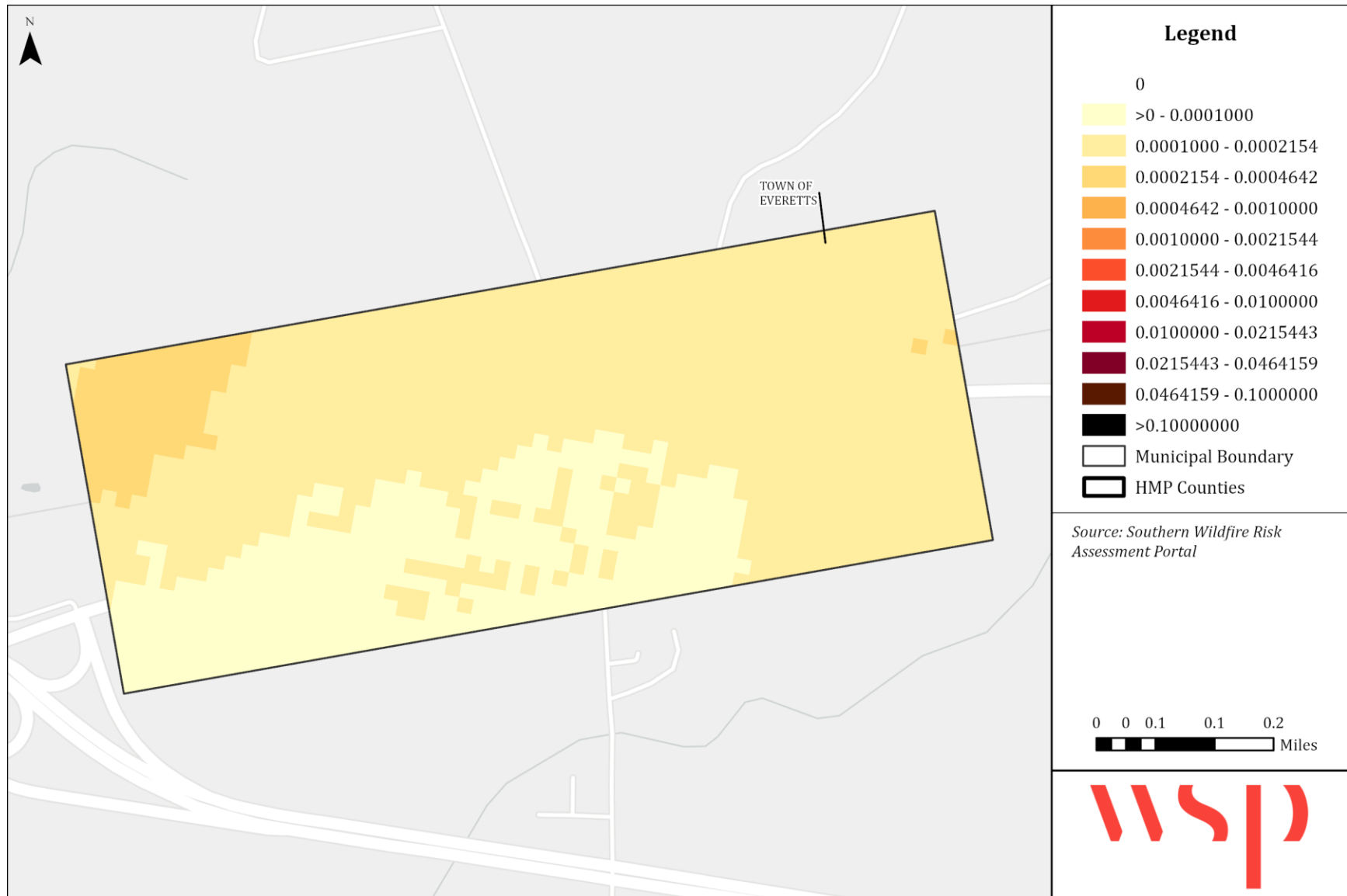


Figure C.40 – Burn Probability, Town of Hamilton

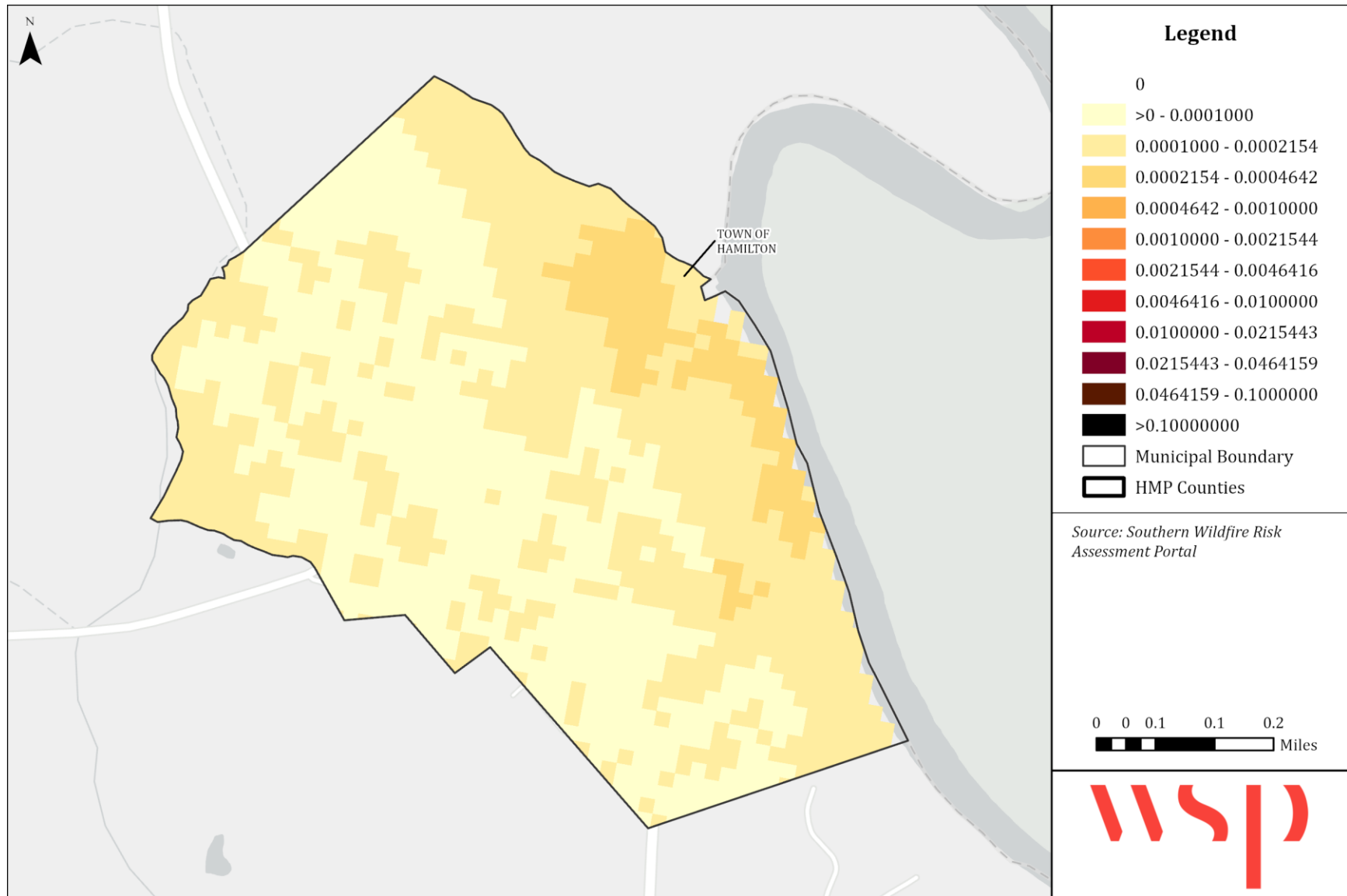


Figure C.41 – Burn Probability, Town of Hassell

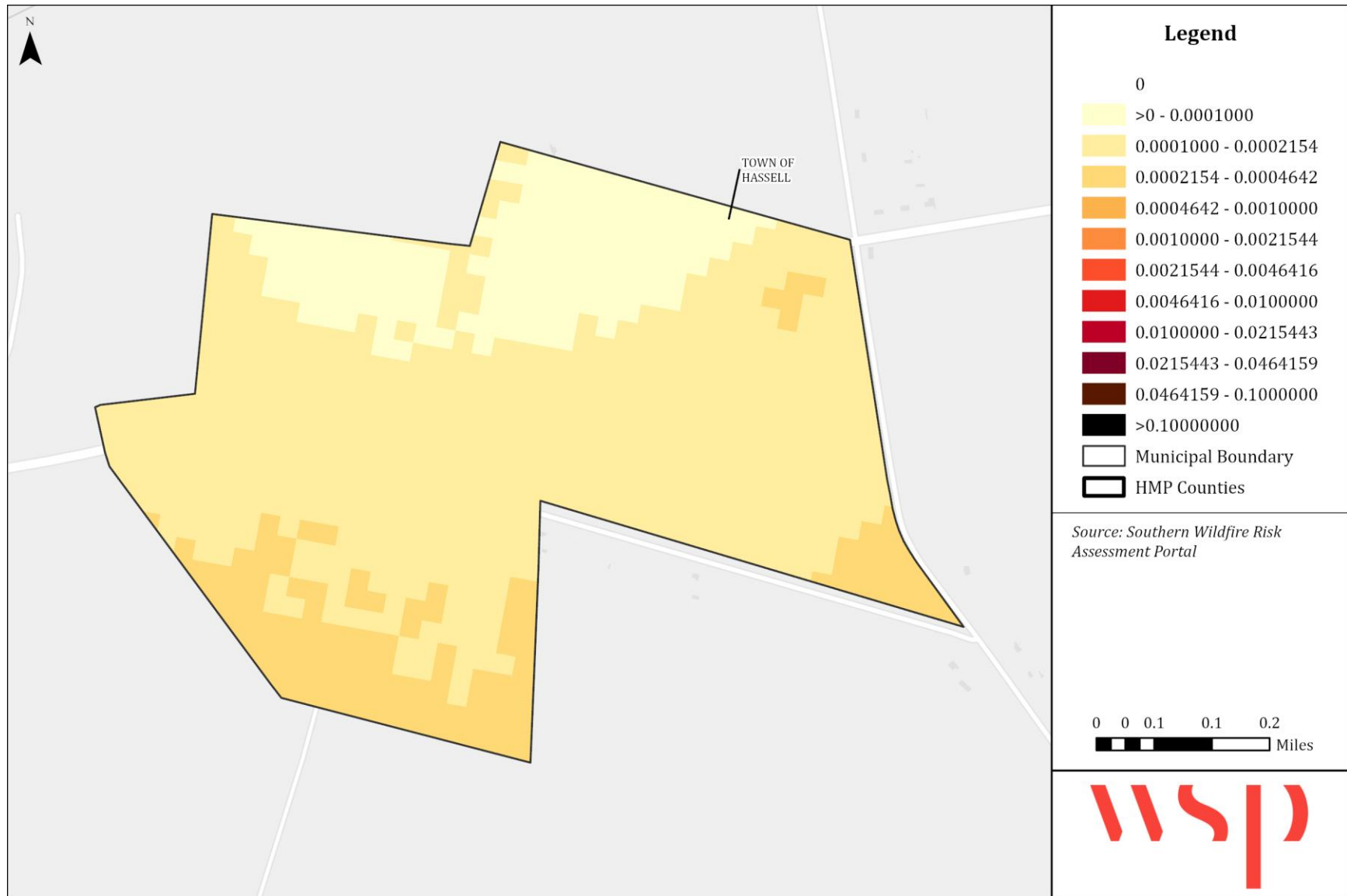


Figure C.42 – Burn Probability, Town of Jamesville

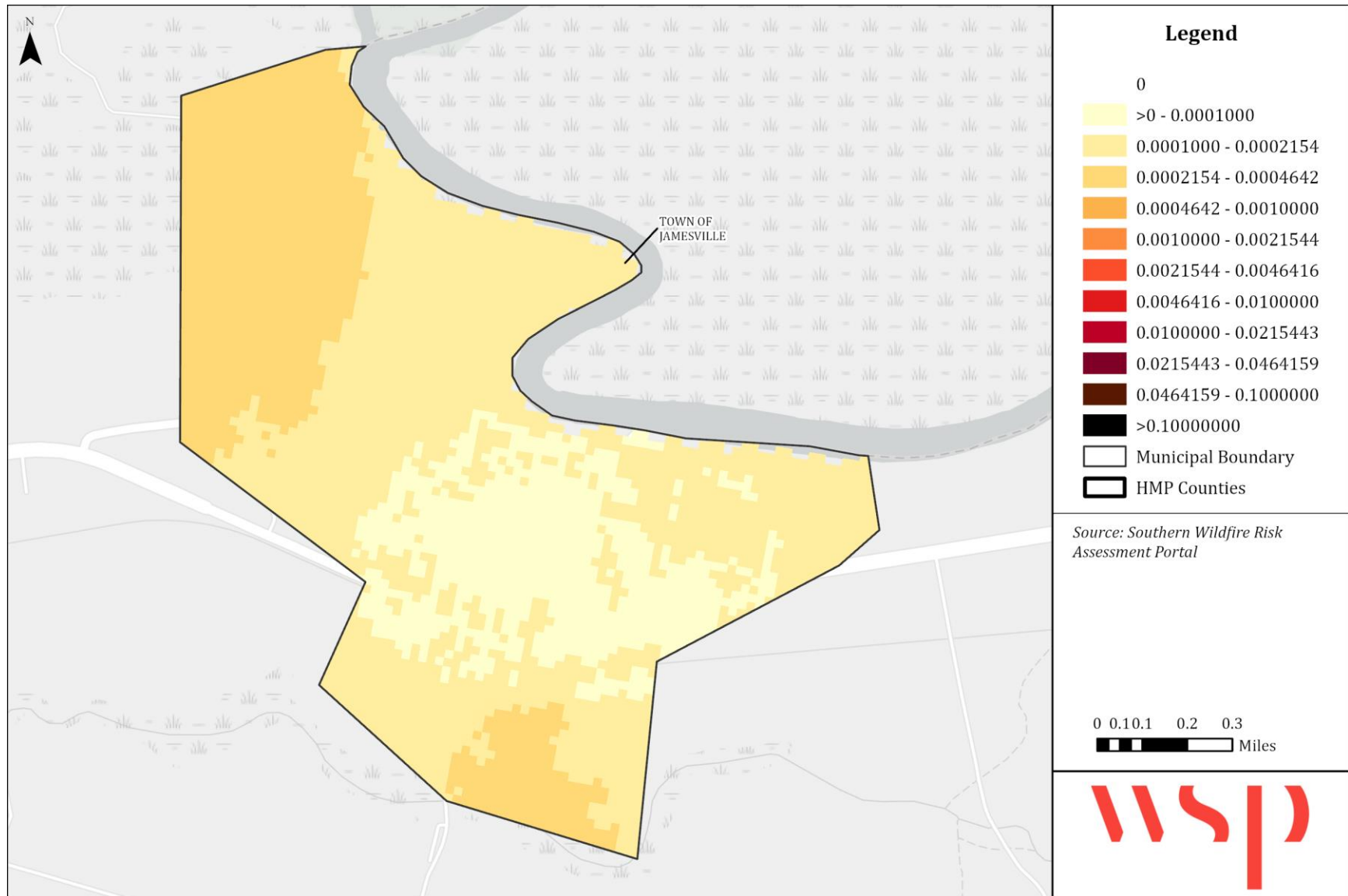


Figure C.43 – Burn Probability, Town of Oak City

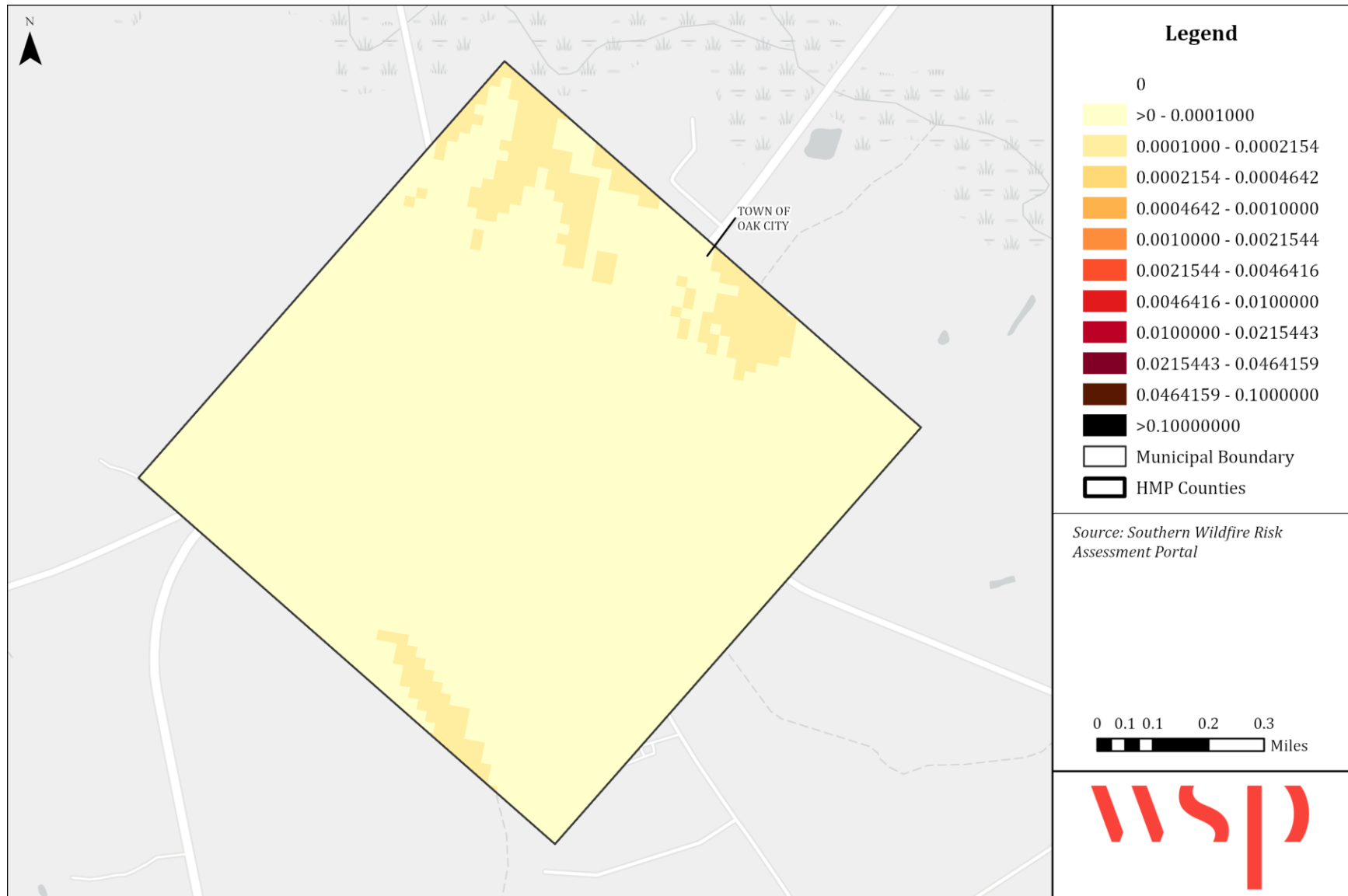


Figure C.44 – Burn Probability, Town of Parmele

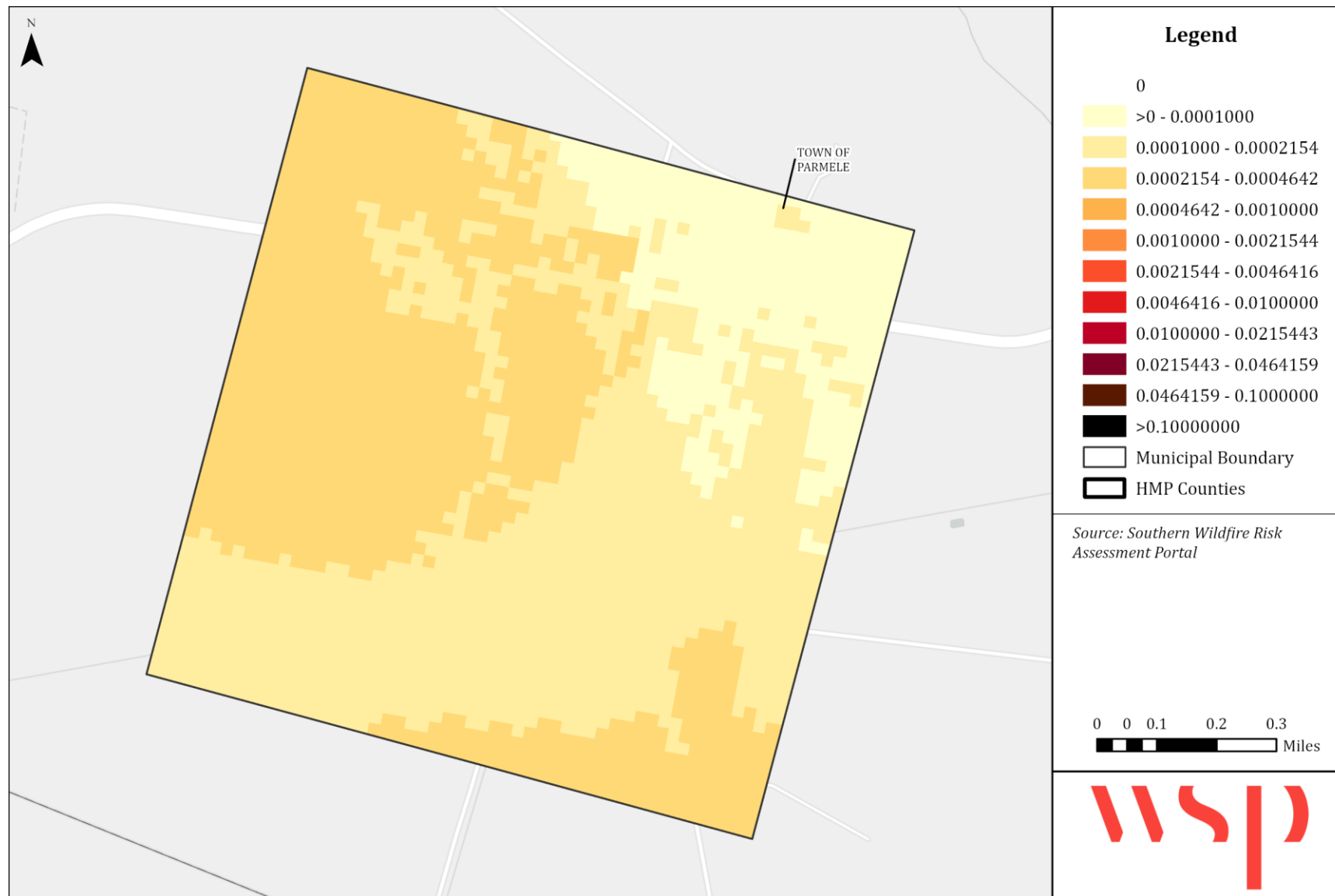


Figure C.45 - Burn Probability, Town of Robersonville

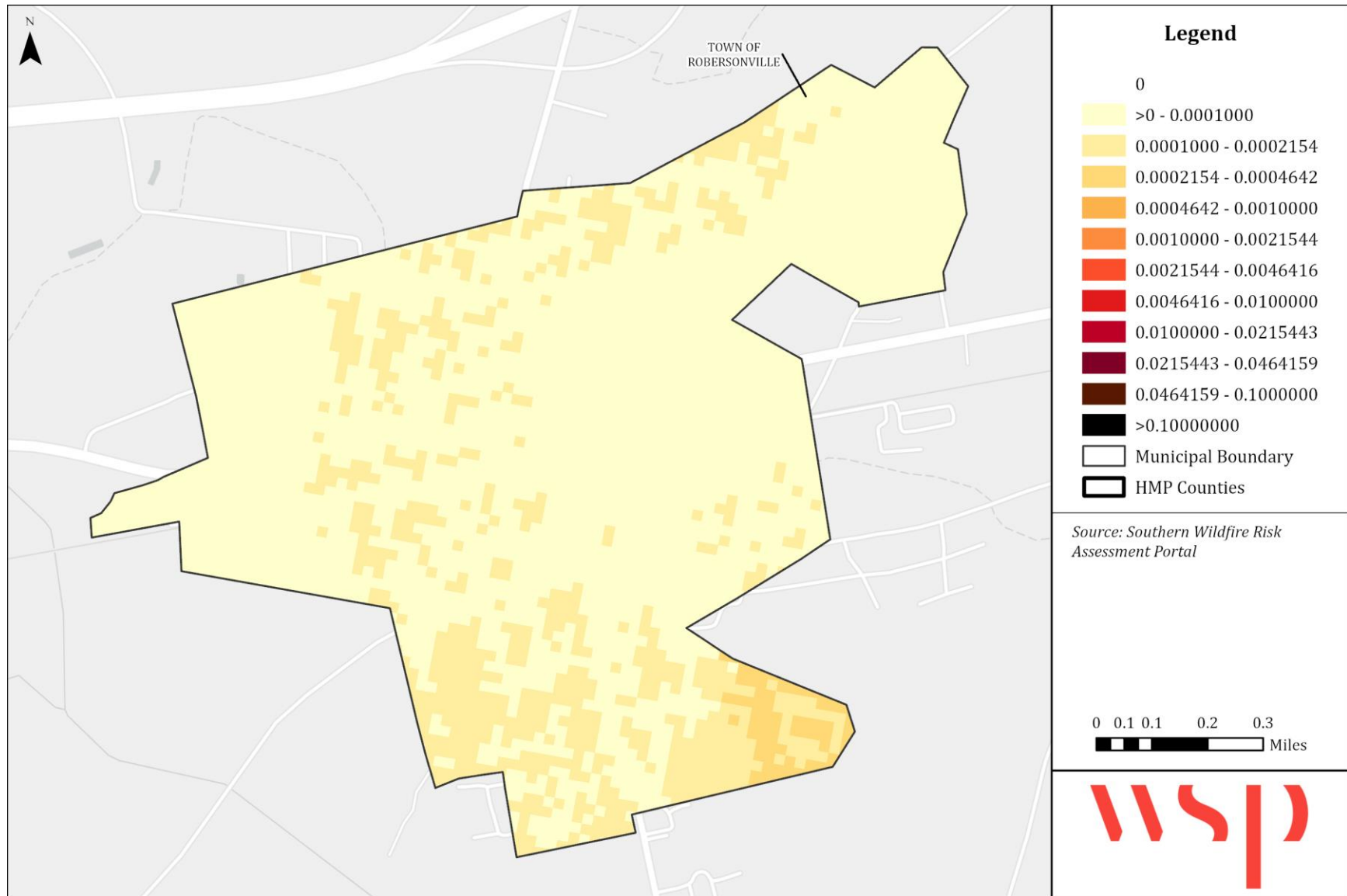
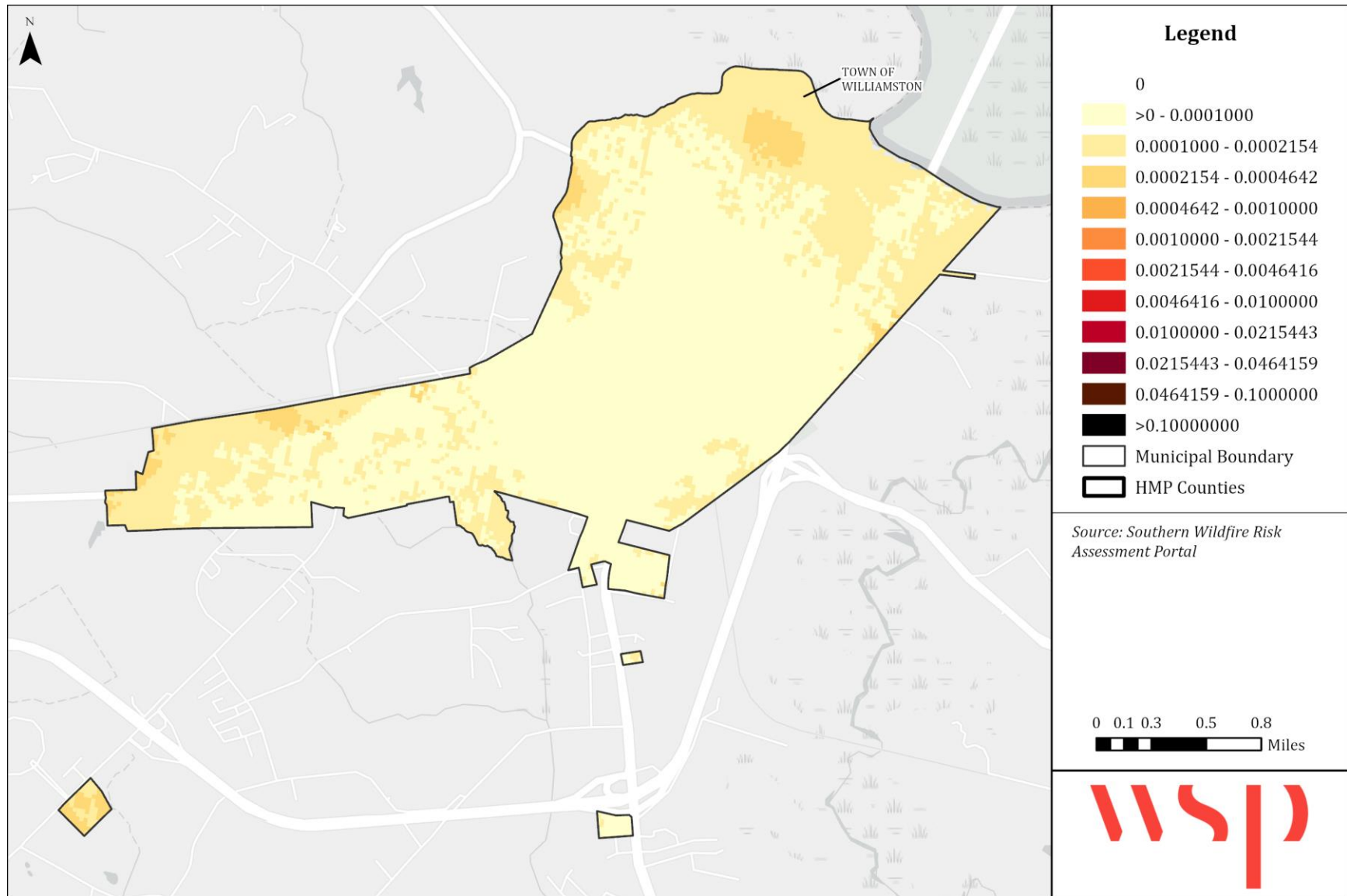


Figure C.46 - Burn Probability, Town of Williamston



C.3 MITIGATION STRATEGY

Action #	Description	Applicable Jurisdictions	Hazards Addressed	Priority	Goal & Objective	Category	Lead/Participating Agencies	Estimated Cost	Potential Funding Sources	Implementation Schedule	2025 Status	Status Comments/Explanation
M1	Continue to develop a county-wide Geographic Information System (GIS). This system will include a comprehensive land use inventory that will be used for improving upon future hazard mitigation vulnerability analysis.	Martin Co., Bear Grass, Everetts, Hamilton, Hassell, Jamesville, Oak City, Parmele, Robersonville, Williamston	All Hazards	Medium	4.2, 3.1	PP	Martin County Administration Martin County Emergency Management Municipal Administrations	Staff Time	General Fund	2 to 3 years	Carry Forward	County GIS mapping is established and new data continues to be integrated to improve performance and information.
M2	Monitor development rates and issues over the next five years. If the county feels that it is the appropriate time to establish either limited or county-wide zoning regulations, then this effort will be initiated.	Martin Co.	All Hazards	Low	1.3, 2.2	P	Martin County Board of Commissioners Martin County Administration	\$70,000	General Fund, NCDPS, NCDEQ	3 to 5 years	Carry Forward	The County has and will continue to adopt ordinances influencing development in specific disciplines as the need becomes apparent. (ie: UDO adopted; Solar development ordinance currently in the works.)
M3	Continue to monitor Flood Damage Prevention Ordinances and update as deemed necessary due to local conditions or as directed by FEMA and/or NCEM. Additionally, the county will consider increasing the freeboard requirement.	Martin Co., Bear Grass, Hamilton, Hassell, Jamesville, Oak City, Robersonville, Williamston	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	High	2.1	P	Martin County Administration Municipal Administrations	Staff Time	General Fund, NCDPS	2020-2025	Carry Forward	Martin County will continue to review the County's Flood Damage Prevention Ordinance annually to address any necessary changes.
M4	Work in conjunction with the Regional HMPC on dealing with county drainage issues. This effort will involve an inventory of stormwater "hot spots." Following identification of drainage concerns, the county will work to address each issue on a case-by-case basis.	Martin Co., Bear Grass, Everetts, Hamilton, Hassell, Jamesville, Oak City, Parmele, Robersonville, Williamston	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	High	1.3	SP	Martin County Administration Northeastern NC Regional HMPC	Staff Time	General Fund, NCDPS	2020-2025	Carry Forward	County has established drainage improvements of blue line streams through our local Soil & Water office, which uses grants to contract out clearing of these streams.

Action #	Description	Applicable Jurisdictions	Hazards Addressed	Priority	Goal & Objective	Category	Lead/Participating Agencies	Estimated Cost	Potential Funding Sources	Implementat ion Schedule	2025 Status	Status Comments/Explanation
M5	Continue to maintain a post-disaster debris management contract with a qualified service provider. The county will review this contract on an annual basis.	Martin Co., Bear Grass, Everetts, Hamilton, Hassell, Jamesville, Oak City, Parmele, Robersonville, Williamston	Flooding, Hurricanes & Coastal Hazards, Severe Winter Storm, Earthquake, Wildfire, Dam & Levee Failure, Severe Weather, Tornado	High	3.2	ES	Martin County Board of Commissioners Martin County Emergency Management Municipal Administrations	Staff Time	NCDPS, FEMA	2020-2025	Carry Forward	Martin County will continue to review annually the County's Post Disaster Debris Management Contract. The terms and provider will be reviewed and changes made when deemed necessary.
M6	Work closely with county Emergency Management and the Regional HMPC to ensure that adequate evacuation procedures are in place. This effort will involve the establishment of a public outreach campaign to ensure that the public is aware of the proper procedures.	Martin Co., Bear Grass, Everetts, Hamilton, Hassell, Jamesville, Oak City, Parmele, Robersonville, Williamston	Flooding, Hurricanes & Coastal Hazards, Earthquake, Wildfire, Dam & Levee Failure, Tornado	High	3.2, 4.2	PIO	Martin County Emergency Management Municipal Administrations	Staff Time	General Fund	1 year	Carry Forward	Martin County will establish a dialogue with the regional partners to improve upon evacuation and emergency notification protocols.
M7	Maintain information on flood damage protection techniques for dissemination to citizens and property owners. Additionally, provide guidance to individuals looking for options relating to the elevation or retrofitting of homes. Make these materials available at the local library.	Martin Co., Bear Grass, Everetts, Hamilton, Hassell, Jamesville, Oak City, Parmele, Robersonville, Williamston	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	High	4.2	PIO	Martin County Building Inspections Municipal Administrations	Staff Time	General Fund, NCDPS	2020-2025	Carry Forward	The Martin County Planning and Inspections Department works closely with property owners and builders to retrofit homes in an effort to minimize future flood damages.
M8	Work closely on addressing mitigation needs, including the identification of structural mitigation projects and the establishment of new mitigation policies and initiatives.	Martin Co., Bear Grass, Everetts, Hamilton, Hassell, Jamesville, Oak City, Parmele, Robersonville, Williamston	All Hazards	High	1.1, 2.3	SP	Martin County Administration Municipal Administrations	Staff Time	General Fund, NCDPS	2020-2025	Carry Forward	Martin County will continue to identify projects that may be eligible for funding through either annual or post disaster mitigation funding. Projects for improvement have been identified through a local mitigation contractor with funding through CDBG

Action #	Description	Applicable Jurisdictions	Hazards Addressed	Priority	Goal & Objective	Category	Lead/Participating Agencies	Estimated Cost	Potential Funding Sources	Implementat ion Schedule	2025 Status	Status Comments/Explanation
M9	Seek grant funding for eligible mitigation opportunities which may include but are not limited to: acquisition/elevation (addressed above), mitigation/reconstruction, and wet/dry floodproofing to residential and non-residential structures. Funding may also be utilized for redundant power to critical facilities, wind retrofits to critical facilities, storm shelters and other activities that reduce the loss of life and property.	Martin Co., Bear Grass, Everetts, Hamilton, Hassell, Jamesville, Oak City, Parmele, Robersonville, Williamston	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	High	1.1, 2.3	PP, SP	Martin County Administration Municipal Administrations	To be determined	General Fund, NCDPS, FEMA	2020-2025	Carry Forward	Martin County, as well as participating municipal jurisdictions, will continue to maintain a listing of vulnerable and/or repetitive loss properties and work to identify treatment options as funding becomes available.
M10	Work to implement all strategies and recommendations outlined within the Martin County Hurricane Matthew Resilient Redevelopment Plan.	Martin Co., Bear Grass, Everetts, Hamilton, Hassell, Jamesville, Oak City, Parmele, Robersonville, Williamston	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	Low	1.1, 2.3	PP, SP, P	Martin County Administration Municipal Administrations	To be determined	General Fund, NCDPS, NCDEQ, FEMA	5 years	Carry Forward	Will continue to pursue implementation of relevant projects from this plan.
M11	Acquire generators or other forms of redundant power supply to ensure that critical facilities and infrastructure remain operational where normal power supply is not available.	Martin Co., Bear Grass, Everetts, Hamilton, Hassell, Jamesville, Oak City, Parmele, Robersonville, Williamston	All Hazards	Medium	1.1	PP	Martin County Emergency Management Municipal Administrations	To be determined	General Fund, NCDPS, FEMA	2 to 3 years	Carry Forward	Generators currently needed for Central Receiving & Distribution point, Sheriff's maintenance shop, and EOC.
M12	Continue to monitor water resources in an effort to mitigate the impacts of drought conditions. These efforts will include maintaining a local water shortage ordinance. This ordinance will be activated in coordination with all utility providers as the need arises.	Martin Co., Bear Grass, Everetts, Hamilton, Hassell, Jamesville, Oak City, Parmele, Robersonville, Williamston	Extreme Heat, Drought	High	1.1	NRP	Martin County Administration Municipal Administrations	Staff Time	General Fund	2020-2025	Carry Forward	Water shortage ordinance is under consideration.
M13	Create or Update Community Wildfire Protection Plans in each fire district.	Martin Co., Bear Grass, Everetts, Hamilton, Hassell, Jamesville, Oak City, Parmele, Robersonville, Williamston	Wildfire	Med	1.4	P	Martin County Emergency Management, Fire Departments, NC Forest Service	To Be Determined	Grant Funds	5 years	New	

ANNEX D. TYRRELL COUNTY

D.1 ASSET INVENTORY

Tyrrell County and the HMPC provided a local inventory of critical facilities and community lifelines, which are a priority for mitigation planning and emergency management. Lifelines are the most fundamental services in the community that, when stabilized, enable all other aspects of society to function. Table D.1 and Table D.2 provide a count of critical facilities by FEMA lifeline category by jurisdiction in Tyrrell County. Figure D.1 through Figure D.2 show the locations of all critical facilities by jurisdiction in Tyrrell County.

Table D.3 provides a detailed inventory of the critical facilities in Tyrrell County, indicating each facility's FEMA lifeline category, flood zone, 1% annual chance flood depth, minimum storm surge category, and wildfire risk. More information on hazard vulnerability is provided in Section D.2.

Table D.1 – Critical Facilities by Type, Unincorporated Tyrrell County

Facility Type	Count of Facility Type	Structure Value
Communications	0	\$-
Energy	0	\$-
Food, Hydration, Shelter	23	\$39,788,374.29
Hazardous Materials	0	\$-
Health and Medical	0	\$-
Safety and Security	5	\$394,748
Transportation	0	\$-
Water Systems	6	\$1,525,064
Total	34	\$41,708,186.29

Table D.2 – Critical Facilities by Type, Town of Columbia

Facility Type	Count of Facility Type	Structure Value
Communications	0	\$-
Energy	0	\$-
Food, Hydration, Shelter	12	\$5,526,099.72
Hazardous Materials	0	\$-
Health and Medical	2	\$377,143
Safety and Security	5	\$1,979,332
Transportation	0	\$-
Water Systems	2	\$111,000
Total	21	\$7,993,574.72

Figure D.1 – Critical Facilities, Unincorporated Tyrrell County

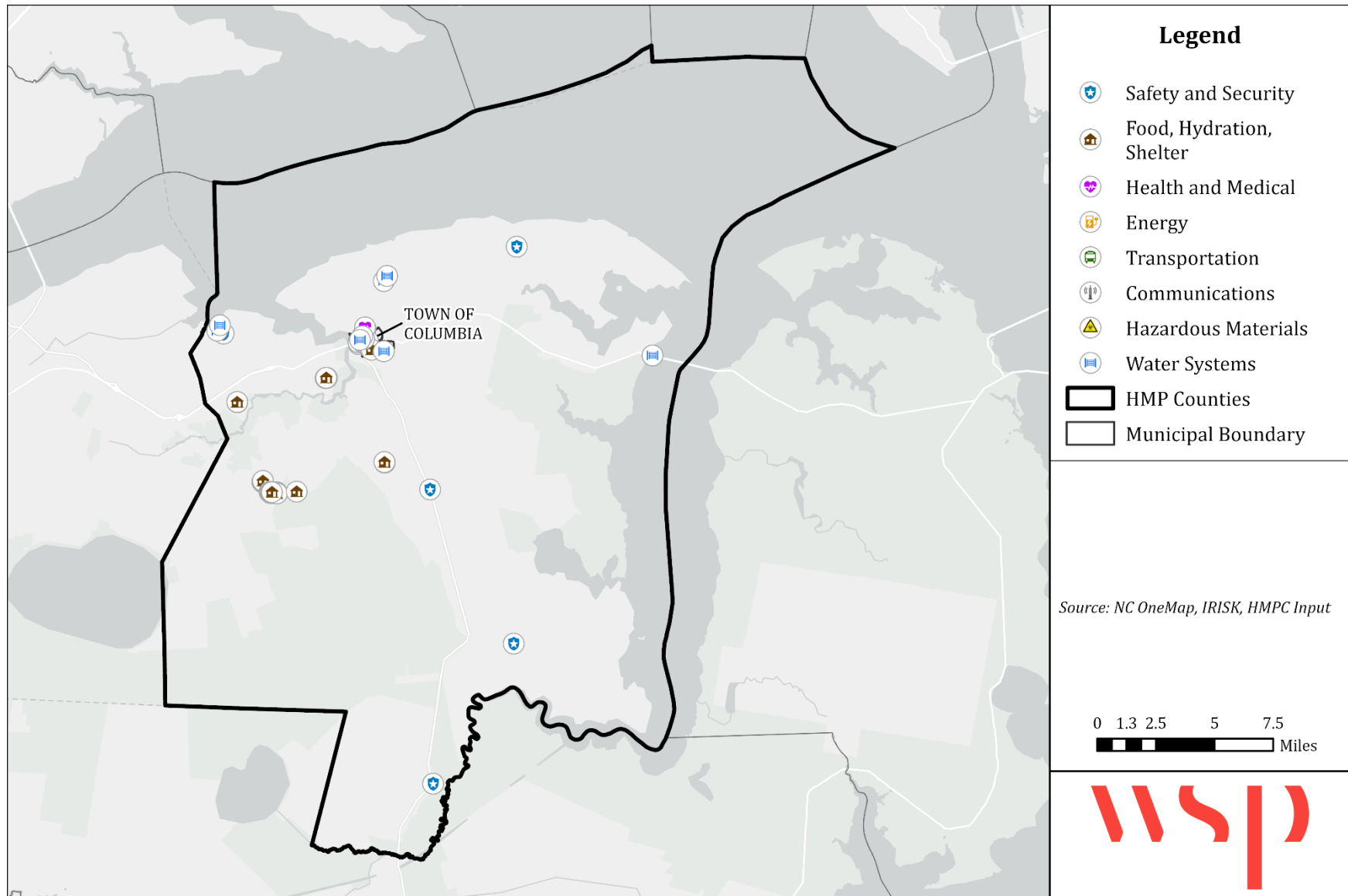


Figure D.2 – Critical Facilities, Town of Columbia

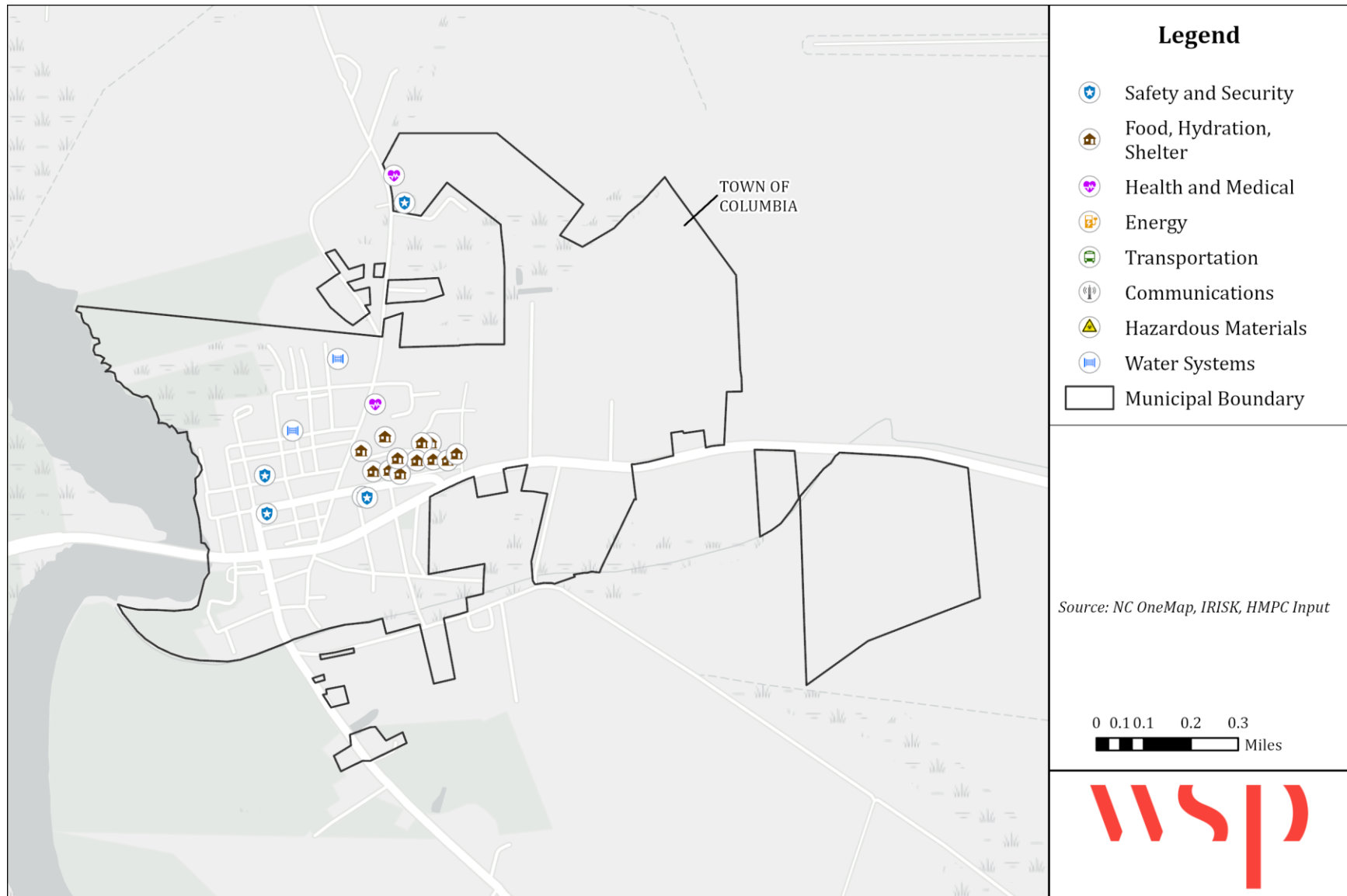


Table D.3 – Tyrrell County Critical Facilities Inventory

FEMA Lifeline	Facility Name	Address	Structure Value	Flood Depth	Flood Zone	Min. Sea Level Rise	Min. Storm Surge Cat.	High WUI Exposure	Fire Intensity
Unincorporated Tyrrell County									
Safety & Security	Tyrrell Volunteer Fire Department, Inc.	2950 N. Gum Neck Rd.	\$46,248	2.5	AE	3ft SLR	Category 1	Direct Exposure	2
Safety & Security	Tyrrell Volunteer Fire Department, Inc.	9 Kilkenny Rd.	\$41,028	1.5	AE	3ft SLR	Category 1	Indirect Exposure	0
Safety & Security	Tyrrell Volunteer Fire Department, Inc.	33 Frying Pan Rd.	\$76,617	0.0	X Shaded	N/A	Category 2	Direct Exposure	2
Safety & Security	Tyrrell Volunteer Fire Department, Inc.	3575 Albemarle Church Rd.	\$82,865	0.0	X Shaded	N/A	Category 3	Indirect Exposure	0
Safety & Security	Tyrrell Volunteer Fire Department, Inc.	9720 Sound Side Rd.	\$147,990	2.6	AE	N/A	Category 2	Direct Exposure	0
Water Systems	Columbia Water System	110 Light St	-	0.1	AE	N/A	Category 3	Critical Fireshed	0
Water Systems	Tyrrell County Water	SR 1301-LEVELS RD	\$746,315	0.0	X Unshaded	N/A	Category 3	Sources of Ember Load to Buildings	2
Water Systems	Tyrrell County Water	SR 1301-LEVELS RD	\$4,000	0.0	X Shaded	N/A	Category 2	Critical Fireshed	0
Water Systems	Tyrrell County Water	SR 1301-LEVELS RD	\$377,897	0.1	AE	3ft SLR	Category 1	Indirect Exposure	0
Water Systems	Tyrrell County Water	SR 1301-LEVELS RD	-	0.1	AE	N/A	Category 2	Indirect Exposure	0
Water Systems	Alligator River Marina	13435 HWY 64 EAST	\$396,852	0.0	X Shaded	N/A	Category 3	Water	0
Food, Hydration, Shelter	New Colony Sow Farm	-	\$7,765,374	0.0	X Unshaded	N/A	Category 5	Direct Exposure	3
Food, Hydration, Shelter		-	\$104,723	0.0	X Unshaded	N/A	N/A	Indirect Exposure	0
Food, Hydration, Shelter		-	\$7,765,374	0.0	X Unshaded	N/A	N/A	Direct Exposure	2
Food, Hydration, Shelter		-	\$1,565,989	1.7	AE	3ft SLR	Category 1	Direct Exposure	2
Food, Hydration, Shelter		-	\$7,765,374	0.0	X Unshaded	N/A	N/A	Indirect Exposure	0
Food, Hydration, Shelter		-	\$1,953,837	0.0	X Unshaded	N/A	N/A	Indirect Exposure	0
Food, Hydration, Shelter		-	-	1.9	AE	N/A	Category 1	Direct Exposure	3
Food, Hydration, Shelter		-	-	1.7	AE	N/A	Category 1	Direct Exposure	3
Food, Hydration, Shelter		-	\$330,331	1.4	AE	N/A	Category 1	Indirect Exposure	0

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FEMA Lifeline	Facility Name	Address	Structure Value	Flood Depth	Flood Zone	Min. Sea Level Rise	Min. Storm Surge Cat.	High WUI Exposure	Fire Intensity
Food, Hydration, Shelter		-	\$333,750	1.9	AE	N/A	Category 1	Direct Exposure	2
Food, Hydration, Shelter		-	\$249,860	0.0	X Unshaded	N/A	Category 2	Indirect Exposure	0
Food, Hydration, Shelter		-	\$165,836	0.0	X Unshaded	N/A	Category 2	Direct Exposure	2
Food, Hydration, Shelter		-	\$339,340	0.0	X Unshaded	N/A	Category 2	Indirect Exposure	0
Food, Hydration, Shelter		-	\$25,208	0.0	X Unshaded	N/A	Category 2	Indirect Exposure	0
Food, Hydration, Shelter		-	\$7,765,374	0.0	X Unshaded	N/A	N/A	Indirect Exposure	0
Food, Hydration, Shelter		-	\$30,749	0.0	X Unshaded	N/A	N/A	Indirect Exposure	0
Food, Hydration, Shelter		-	\$31,084	0.0	X Unshaded	N/A	N/A	Indirect Exposure	0
Food, Hydration, Shelter		-	\$2,324,900	0.0	X Unshaded	N/A	N/A	Indirect Exposure	0
Food, Hydration, Shelter		-	\$71,605	0.0	X Unshaded	N/A	N/A	Indirect Exposure	0
Food, Hydration, Shelter		-	\$276,743	0.0	X Unshaded	N/A	N/A	Indirect Exposure	0
Food, Hydration, Shelter		-	\$76,356	0.0	X Shaded	N/A	Category 2	Indirect Exposure	0
Food, Hydration, Shelter		-	\$115,785	0.0	X Shaded	N/A	Category 2	Indirect Exposure	0
Food, Hydration, Shelter		-	\$730,782	0.1	AE	3ft SLR	Category 1	Indirect Exposure	0
Town of Columbia									
Safety & Security	Tyrrell Volunteer Fire Department, Inc.	618 N. Road St.	\$734,054	2.9	AE	N/A	Category 3	Indirect Exposure	0
Safety & Security	Tyrrell County Sheriffs Department	405 Main Street	\$924,762	0.1	AE	N/A	Category 2	Indirect Exposure	0
Health & Medical	Tyrrell EMS Incorporated	618 North Road Street	\$377,143	1.9	AE	3ft SLR	Category 1	Indirect Exposure	0
Health & Medical	Tyrrell Volunteer Fire Department and EMS Incorporated	State Highway 1209	-	2.6	AE	2ft SLR	Category 1	Critical Fireshed	0
Safety & Security	Tyrrell County Health Department	408 Bridge Street	\$254,981	1.1	AE	N/A	Category 2	Indirect Exposure	0
Water Systems	Columbia Water System	110 Light St	-	0.1	AE	N/A	Category 2	Indirect Exposure	0
Water Systems	Columbia Water System	110 Light St	\$111,000	1.8	AE	3ft SLR	Category 1	Indirect Exposure	0

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FEMA Lifeline	Facility Name	Address	Structure Value	Flood Depth	Flood Zone	Min. Sea Level Rise	Min. Storm Surge Cat.	High WUI Exposure	Fire Intensity
Food, Hydration, Shelter		-	\$326,689	2.8	AE	3ft SLR	Category 1	Direct Exposure	2
Food, Hydration, Shelter		-	\$305,639	1.3	AE	3ft SLR	Category 1	Indirect Exposure	0
Safety and Security		801 Main St	\$14,403	2.0	AE	2ft SLR	Category 1	Indirect Exposure	0
Food, Hydration, Shelter		-	\$141,430	1.2	AE	3ft SLR	Category 1	Indirect Exposure	0
Food, Hydration, Shelter		-	\$92,279	0.1	AE	N/A	Category 2	Indirect Exposure	0
Food, Hydration, Shelter		-	\$66,621	0.1	AE	3ft SLR	Category 1	Indirect Exposure	0
Food, Hydration, Shelter		-	\$2,663,470	1.8	AE	3ft SLR	Category 1	Indirect Exposure	0
Food, Hydration, Shelter		-	\$352,286	0.1	AE	N/A	Category 1	Indirect Exposure	0
Food, Hydration, Shelter		-	\$352,286	0.1	AE	N/A	Category 2	Indirect Exposure	0
Food, Hydration, Shelter		-	\$168,541	1.7	AE	N/A	Category 2	Indirect Exposure	0
Food, Hydration, Shelter		-	\$352,286	1.4	AE	3ft SLR	Category 1	Indirect Exposure	0
Food, Hydration, Shelter		-	\$352,286	0.0	X Shaded	N/A	Category 2	Indirect Exposure	0
Safety and Security		-	\$51,132	2.2	AE	2ft SLR	Category 1	Indirect Exposure	0
Food, Hydration, Shelter		-	\$352,286	3.0	AE	3ft SLR	Category 1	Indirect Exposure	0

D.2 RISK ASSESSMENT

This section contains a summary of the County's asset inventory as well as hazard profile and vulnerability assessment for those hazards that are spatially defined and have variations in risk that could be evaluated quantitatively on a jurisdictional level. The hazards included in this section are: Flooding, Hurricanes & Coastal Hazards, and Wildfire.

D.2.1 FLOODING

Table D.4 details the acreage of Tyrrell County's total area by jurisdiction and flood zone on the Effective DFIRM. Per this assessment the Town of Columbia has 86% of land area within the mapped 1%-annual-chance floodplain and over half of Tyrrell County overall is within the SFHA.

Table D.4 – Flood Zone Acreage by Jurisdiction, Tyrrell County

Flood Zone	Acreage	Percent of Total (%)
Columbia		
Zone AE	523.1	86.0%
Zone X (500-year)	81.8	13.4%
Zone X (unshaded)	3.9	0.6%
Total	608.8	--
Unincorporated Tyrrell County		
Zone AE	208,778.4	54.8%
Zone VE	3,517.3	0.9%
Zone X (500-year)	20,754.2	5.4%
Zone X (unshaded)	37,296.1	9.8%
Open Water	110,827.1	29.1%
Total	381,173.0	--
Tyrrell County Total		
Zone AE	209,301.6	54.8%
Zone VE	3,517.3	0.9%
Zone X (500-year)	20,836.0	5.5%
Zone X Unshaded	37,299.9	9.8%
Open Water	110,827.1	29.0%
Total	381,781.8	--

Source: FEMA Effective DFIRM

Figure D.3 and Figure D.4 reflect the effective mapped flood hazard zones for Tyrrell County and the Town of Columbia, and Figure D.5 and Figure D.6 displays the depth of flooding estimated to occur in these areas during the 1%-annual-chance flood.

Table D.5 provides building counts and values for critical facilities by flood zone in Tyrrell County and participating jurisdictions.

Table D.5 – Critical Facilities Exposed to Flooding by Event and Jurisdiction

Flood Zone	Critical Facility Count	Structure Value
Unincorporated Tyrrell County		
Zone AE	12	\$3,574,015.29
Zone X (500-year)	6	\$752,475
Zone X (unshaded)	16	\$37,381,696
Total	34	\$41,708,186.29
Columbia		
Zone AE	20	\$7,641,288.72
Zone X (500-year)	1	\$352,286
Total	21	\$7,993,574.72
Tyrrell County Total		
Zone AE	32	\$11,215,304.02
Zone X (500-year)	7	\$1,104,761
Zone X (unshaded)	16	\$37,381,696
Total	55	\$49,701,761.02

Source: FEMA Effective DFIRM, HMPC

Figure D.3 – FEMA Flood Hazard Areas, Unincorporated Tyrrell County

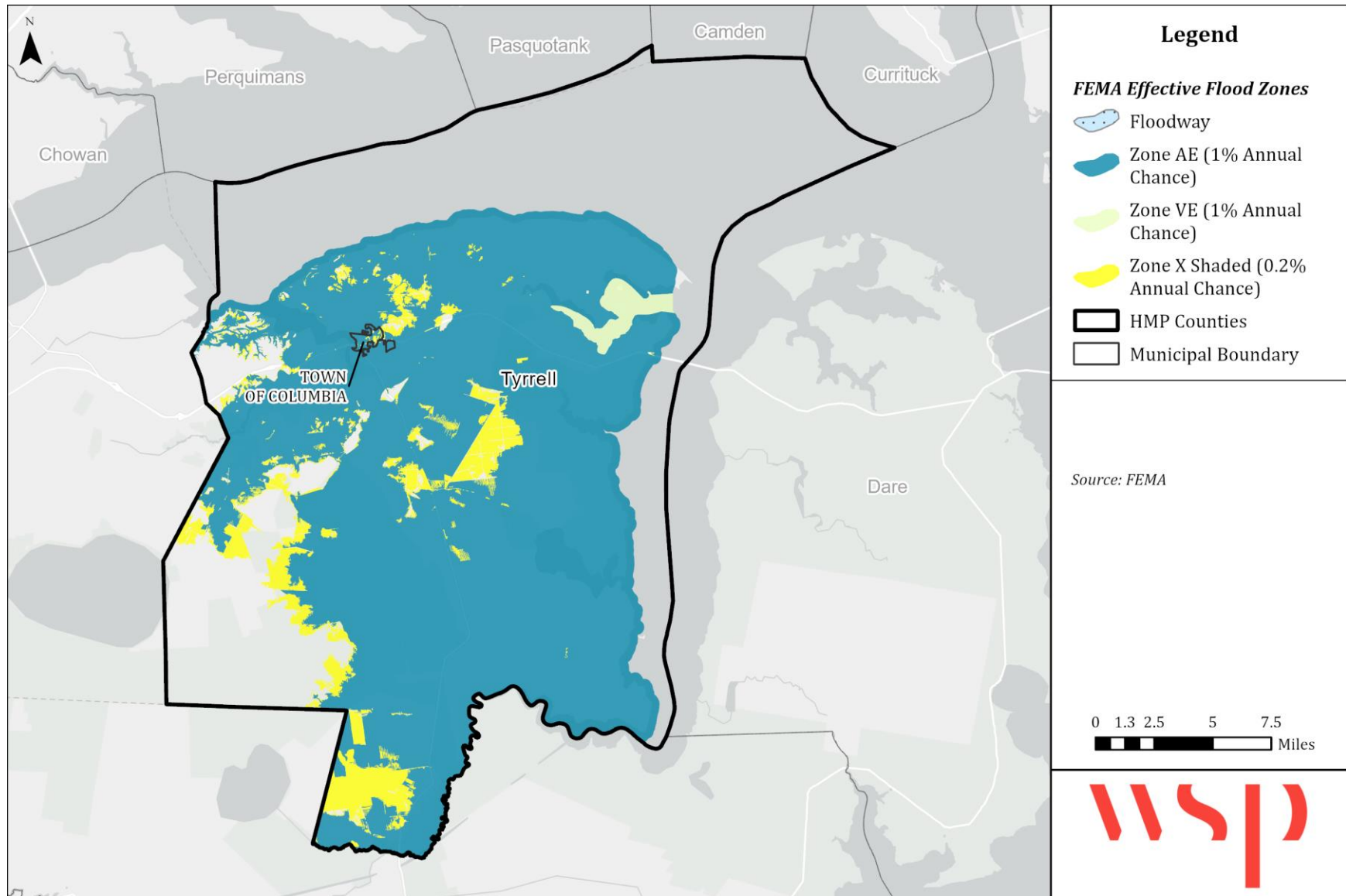


Figure D.4 – FEMA Flood Hazard Areas, Town of Columbia

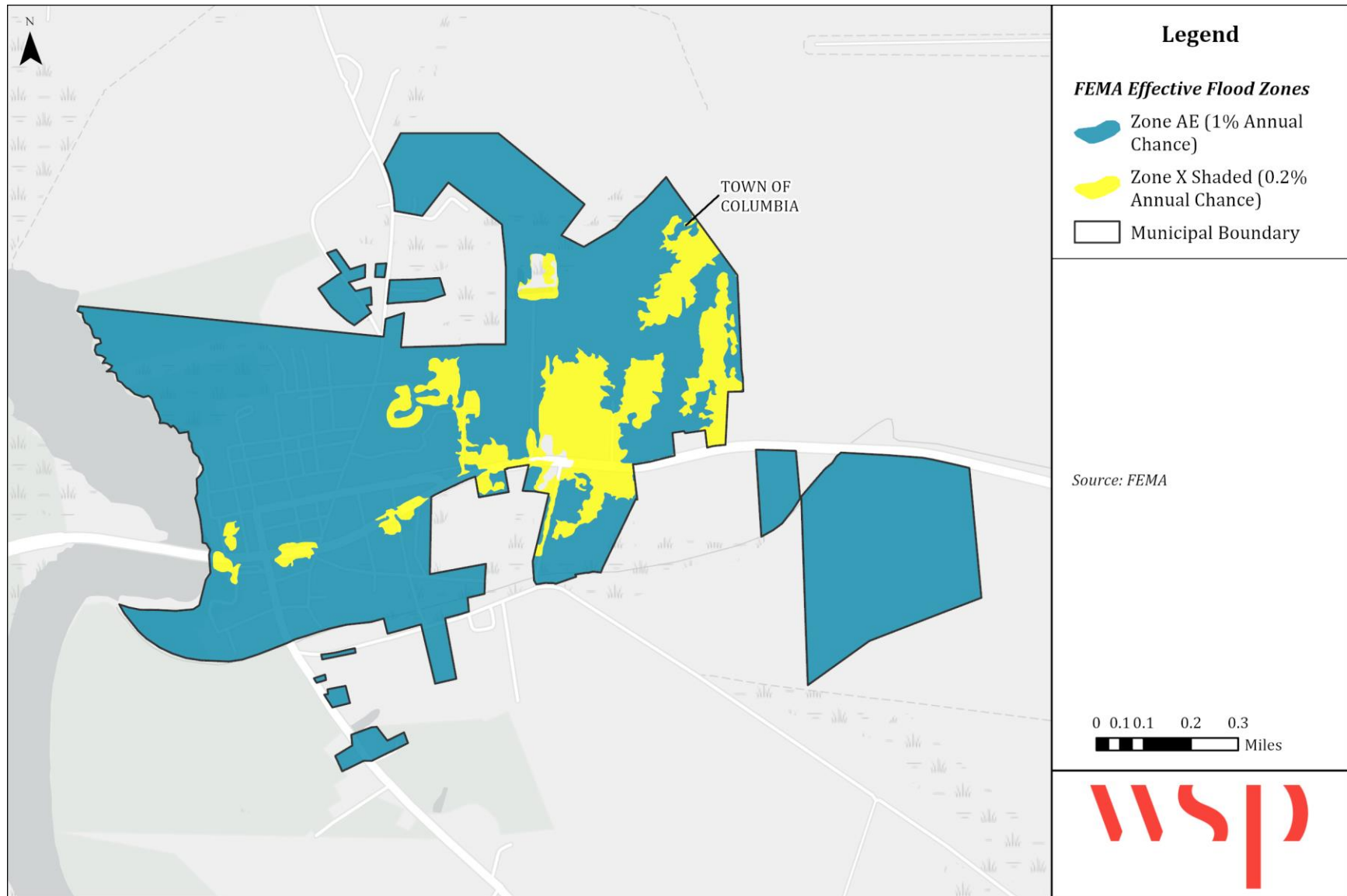


Figure D.5 – Flood Depth, 1%-Annual-Chance Floodplain, Unincorporated Tyrrell County

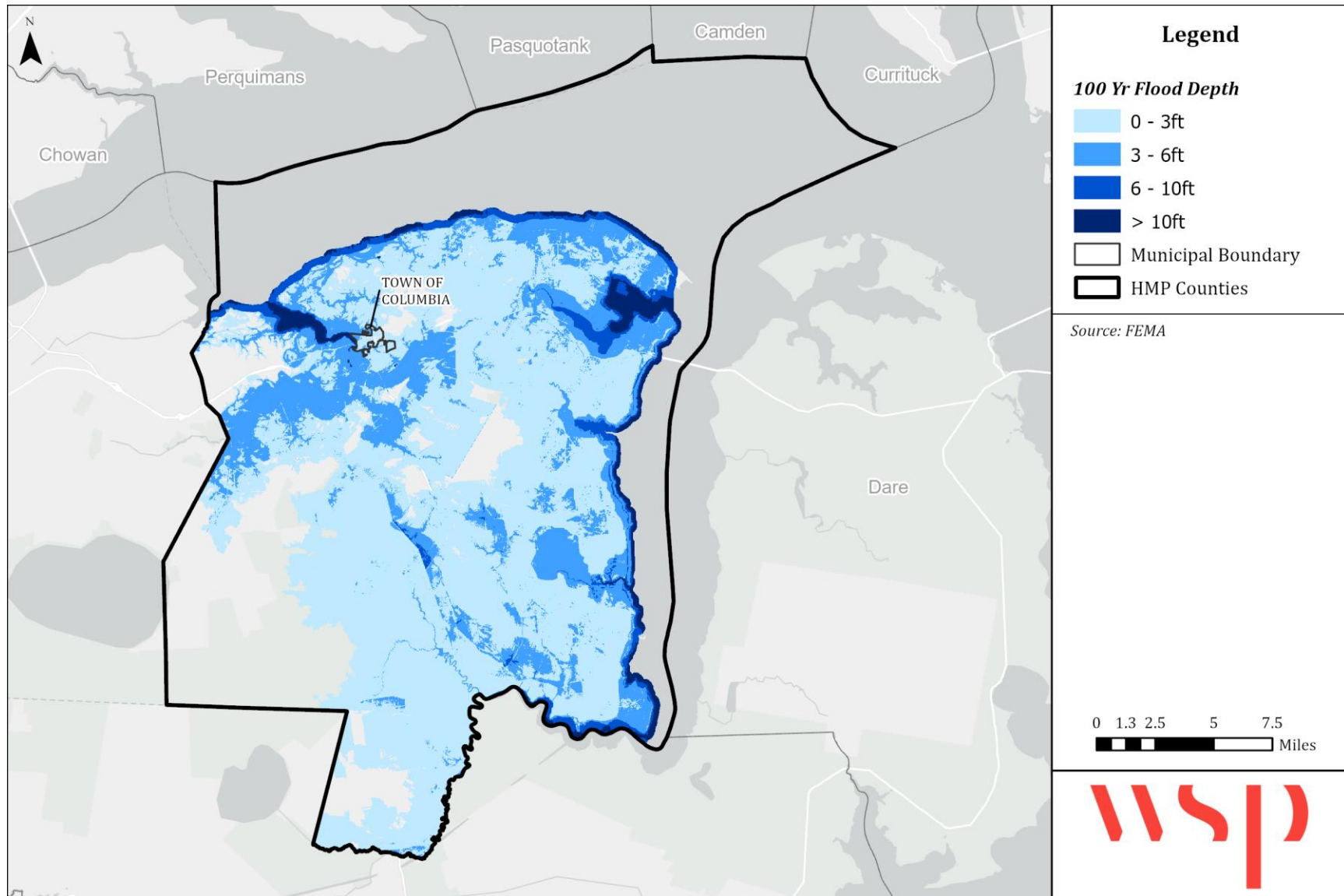
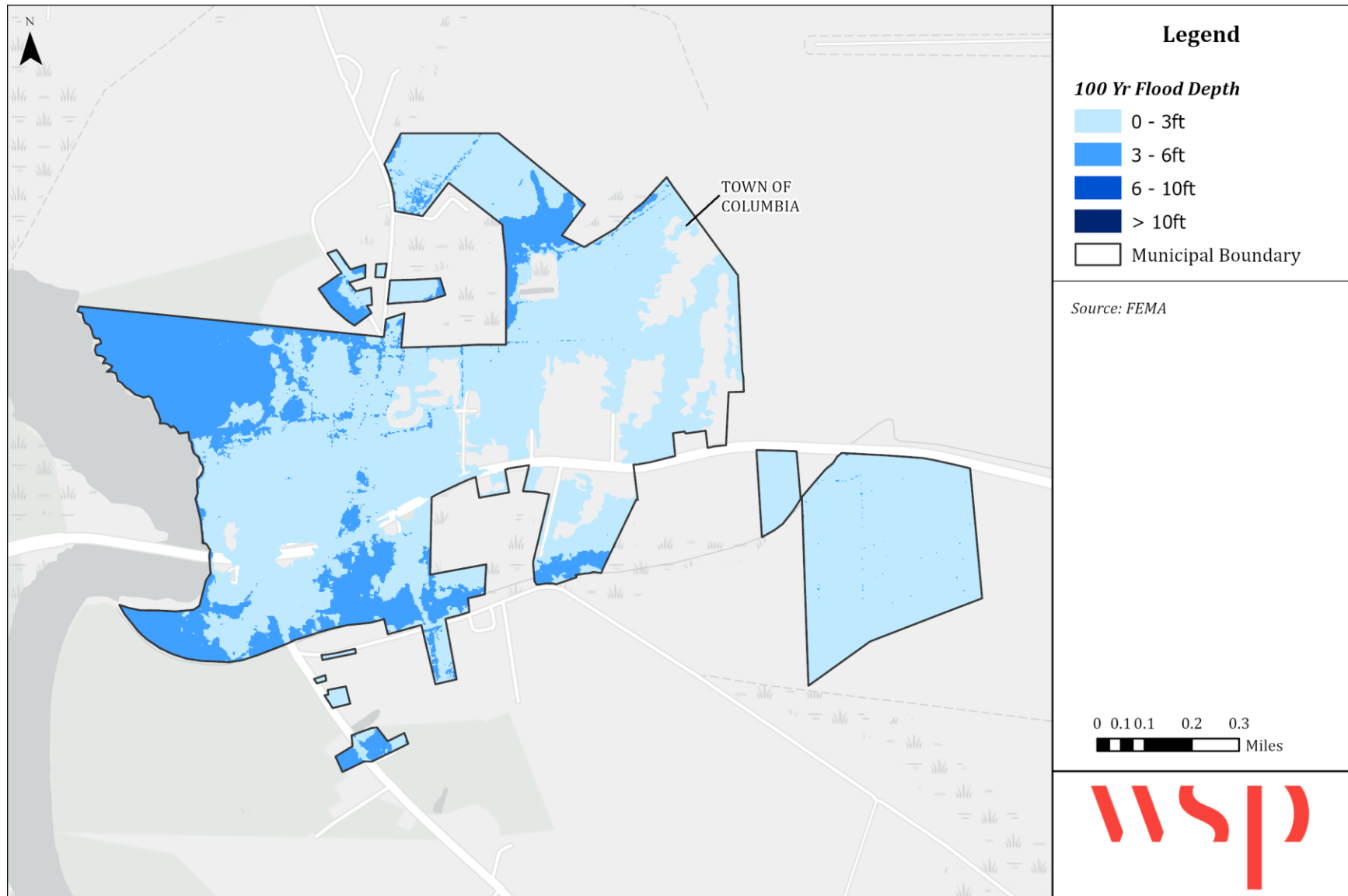


Figure D.6 – Flood Depth, 1%-Annual-Chance Floodplain, Town of Columbia



FLOODPLAIN MANAGEMENT

The following tables reflect NFIP policy and claims data for Tyrrell County and the Town of Columbia categorized by structure type, flood zone, Pre-FIRM and Post-FIRM.

Table D.6 – NFIP Policy and Claims Data by Structure Type

Structure Type	Policies in Force	Total Premium	Insurance in Force	Number of Closed Paid Losses	Total of Closed Paid Losses
Tyrrell County Unincorporated Area					
Single Family	208	\$140,920	\$35,433,000	369	\$4,310,725.84
2-4 Family	3	\$1,920	\$750,000	0	\$0.00
All Other Residential	3	\$5,650	\$1,500,000	1	\$20,724.85
Non Residential	5	\$5,933	\$1,346,000	22	\$552,320.39
Total	219	\$154,423	\$39,029,000	392	\$4,883,771.08
Town of Columbia					
Single Family	36	\$29,382	\$5,116,000	157	\$2,191,835.74
2-4 Family	17	\$8,576	\$2,108,000	2	\$85,968.41
All Other Residential	1	\$1,145	\$189,000	5	\$120,829.13
Non Residential	13	\$34,016	\$4,432,000	31	\$1,734,863.25
Total	67	\$73,119	\$11,845,000	195	\$4,133,496.53

Source: FEMA Community Information System, accessed December 2025

Table D.7 – NFIP Policy and Claims Data by Flood Zone

Flood Zone	Policies in Force	Total Premium	Insurance in Force	Number of Closed Paid Losses	Total of Closed Paid Losses
Tyrrell County Unincorporated Area					
A01-30 & AE Zones	213	\$149,517	\$37,837,000	361	\$4,643,280.37
B, C & X Zone					
Standard	6	\$4,906	\$1,192,000	11	\$81,945.15
Preferred	0	\$0	\$0	15	\$129,467.51
Total	219	\$154,423	\$39,029,000	387	\$4,854,693.03
Town of Columbia					
A01-30 & AE Zones	67	\$73,119	\$11,845,000	194	\$4,132,556.53
Total	67	\$73,119	\$11,845,000	194	\$4,132,556.53

Source: FEMA Community Information System, accessed December 2025

Table D.8 – NFIP Policy and Claims Data Pre-FIRM

Flood Zone	Policies in Force	Total Premium	Insurance in Force	Number of Closed Paid Losses	Total of Closed Paid Losses
Tyrrell County Unincorporated Area					
A01-30 & AE Zones	83	\$54,856	\$11,261,000	250	\$3,561,810.94
B, C & X Zone					
Standard	5	\$4,251	\$1,017,000	19	\$173,435.50
Preferred	0	\$0	\$0	9	\$95,080.36
Total	88	\$59,107	\$12,278,000	269	\$3,735,246.44

Flood Zone	Policies in Force	Total Premium	Insurance in Force	Number of Closed Paid Losses	Total of Closed Paid Losses
Town of Columbia					
A01-30 & AE Zones	57	\$63,336	\$9,563,000	184	\$3,968,687.22
Total	57	\$63,336	\$9,563,000	184	\$3,968,687.22

Source: FEMA Community Information System, accessed December 2025

Table D.9 – NFIP Policy and Claims Data Post-FIRM

Flood Zone	Policies in Force	Total Premium	Insurance in Force	Number of Closed Paid Losses	Total of Closed Paid Losses
Tyrrell County Unincorporated Area					
A01-30 & AE Zones	130	\$94,661	\$26,576,000	111	\$1,081,469.43
B, C & X Zone	1	\$655	\$175,000	7	\$37,977.16
Standard	1	\$655	\$175,000	1	\$3,590.01
Preferred	0	\$0	\$0	6	\$34,387.15
Total	131	\$95,316	\$26,751,000	118	\$1,119,446.59
Town of Columbia					
A01-30 & AE Zones	10	\$9,783	\$2,282,000	10	\$163,869.31
Total	10	\$9,783	\$2,282,000	10	\$163,869.31

Source: FEMA Community Information System, accessed December 2025

D.2.2 HURRICANES AND COASTAL HAZARDS

Figure D.7 on the following page show the estimated extent of surge by storm category according to NOAA SLOSH data that would occur in unincorporated Tyrrell County and the Town of Columbia. Due to its coastal location, the majority of Tyrrell County and the Town of Columbia are at risk to storm surge.

Figure D.8 show the estimated inundation extents of 1 foot, 2 feet, and 3 feet of sea level rise that may occur in Tyrrell County and the Town of Columbia. Sea level rise is likely to impact much of the county along the Albemarle Sound and Alligator River.

Figure D.7 – Storm Surge Extent by Storm Category

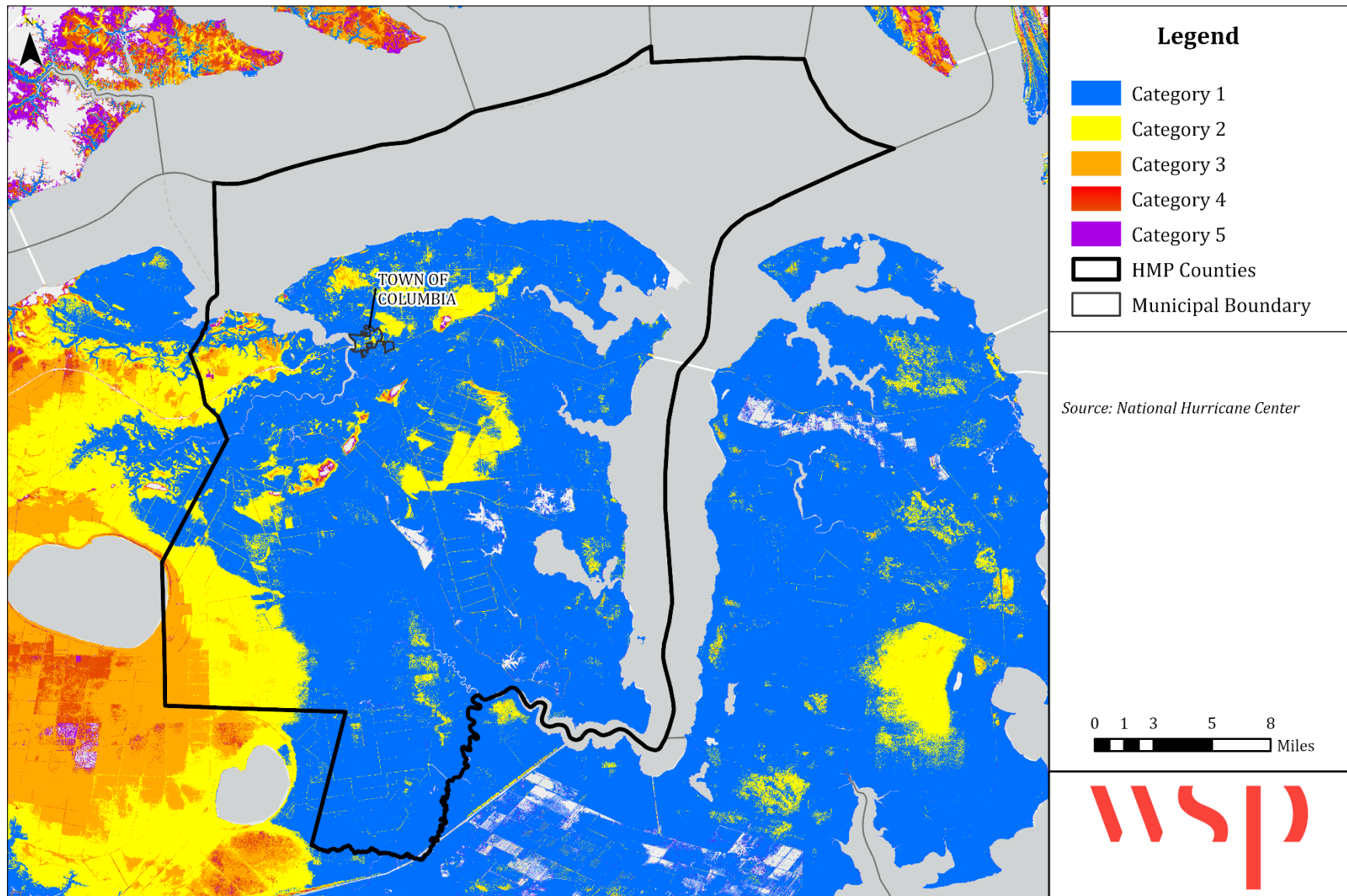
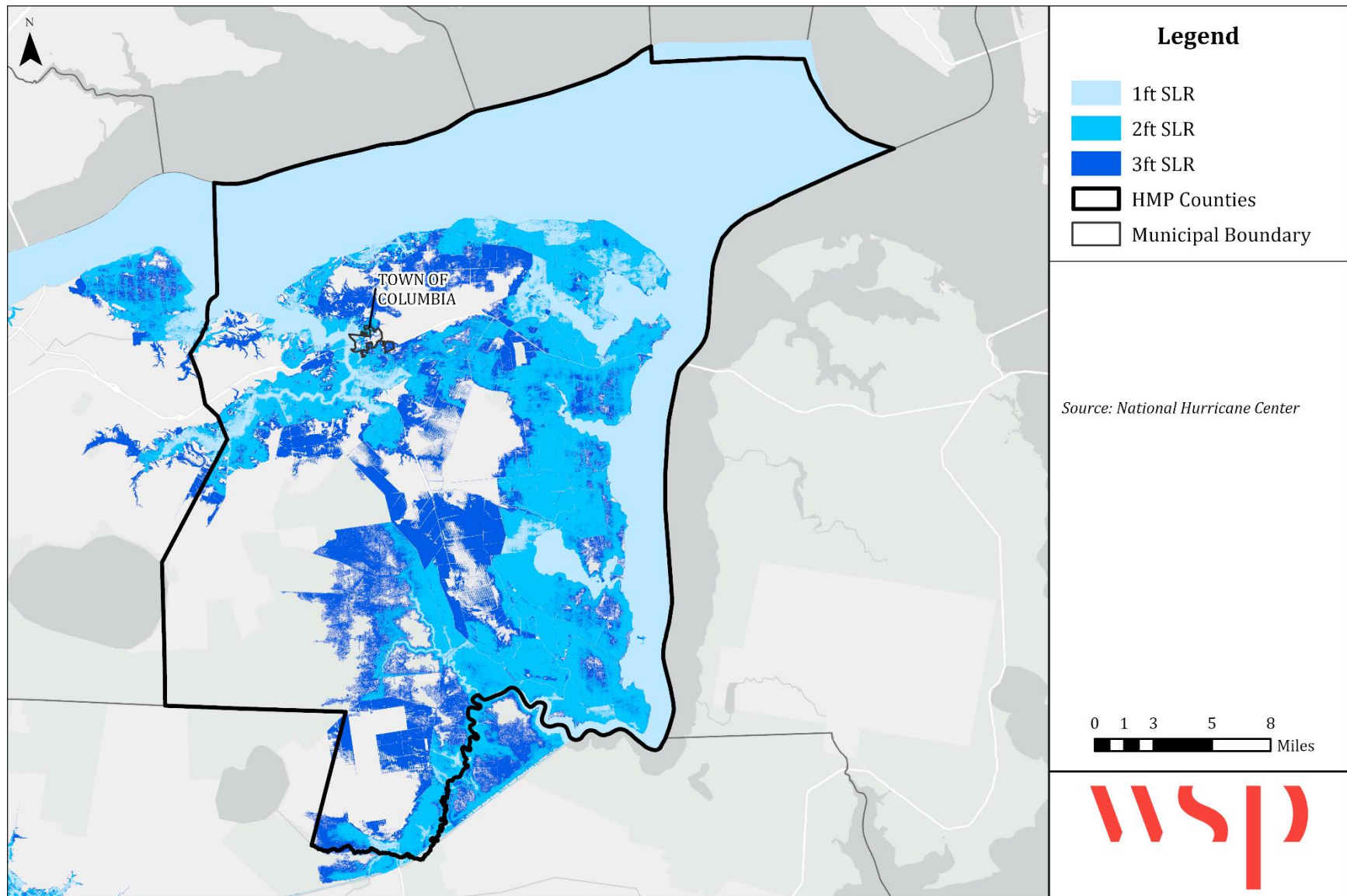


Figure D.8 – Sea Level Rise Extent



D.2.3 WILDFIRE

Table D.10 summarizes the acreage in unincorporated Tyrrell County that falls within the Functional Wildland Urban Interface (WUI), categorized into zones that describe the wildfire risk mitigation activities appropriate for each zone. Areas in the Functional WUI are those areas where development and building structures may intermix with burnable land cover. Approximately, 2 percent of unincorporated Tyrrell County is categorized as having direct exposure to wildfire risk and 74 percent is located within the critical fireshed of the Functional WUI.

Table D.10 – Wildland Urban Interface Acreage, Unincorporated Tyrrell County

	Functional Wildland Urban Interface (WUI) Category	Acres	Percent
	Direct Exposure	2,810	2%
	Indirect Exposure	2,855	2%
	Critical Fireshed	137,758	74%
	Sources of Ember Load to Buildings	13,566	7%
	Little to No Exposure	4	0%
	Water	28,430	15%
	Total	185,424	100%

Source: Southern Wildfire Risk Assessment

Figure D.9 and Figure D.10 depict the Functional WUI for unincorporated Tyrrell County and the Town of Columbia. Figure D.11 and Figure D.12 depict the Fire Intensity Scale, which indicates the potential severity of fire based on fuel loads, topography, and other factors. Figure D.13 and Figure D.14 depict Burn Probability based on landscape conditions, percentile weather, historical ignition patterns, and historical prevention and suppression efforts.

Functional WUI areas with direct exposure to wildfire are very limited in Tyrrell County and occur primarily in the northwestern quadrant of the county near the Albemarle Sound. There are large areas of high potential fire intensity in unincorporated Tyrrell County, particularly along the Albemarle Sound and Alligator River as well as in inland areas in the south. Burn probability is highest in the southern portion of the county with a cluster of high burn probability occurring northeast of the Town of Columbia, but moderate burn probability covers much of the county. Areas of high potential fire intensity and moderate burn probability overlap with portions of the functional WUI in unincorporated Tyrrell County. A potential fire here could pose a high risk to human settlement and the built environment.

Table D.11 provides building counts and values for critical facilities by FEMA lifeline that are located in areas categorized with direct exposure to wildfire risk on the Functional WUI scale.

Table D.11 – Critical Facilities Exposed to Wildfire by Jurisdiction, Tyrrell County

Type	Critical Facility Count	Structure Value
Tyrrell County Unincorporated Area		
Food, Hydration, Shelter	7	\$17,596,323.24
Safety and Security	3	\$270,855
All Categories	10	\$17,867,178.24

ANNEX D: TYRRELL COUNTY

Type	Critical Facility Count	Structure Value
Town of Columbia		
Food, Hydration, Shelter	1	\$326,689.43
All Categories	1	\$326,689.43
County Total	11	\$18,193,867.68

Source: Southern Wildfire Risk Assessment

Figure D.9 – Functional Wildland Urban Interface, Unincorporated Tyrrell County

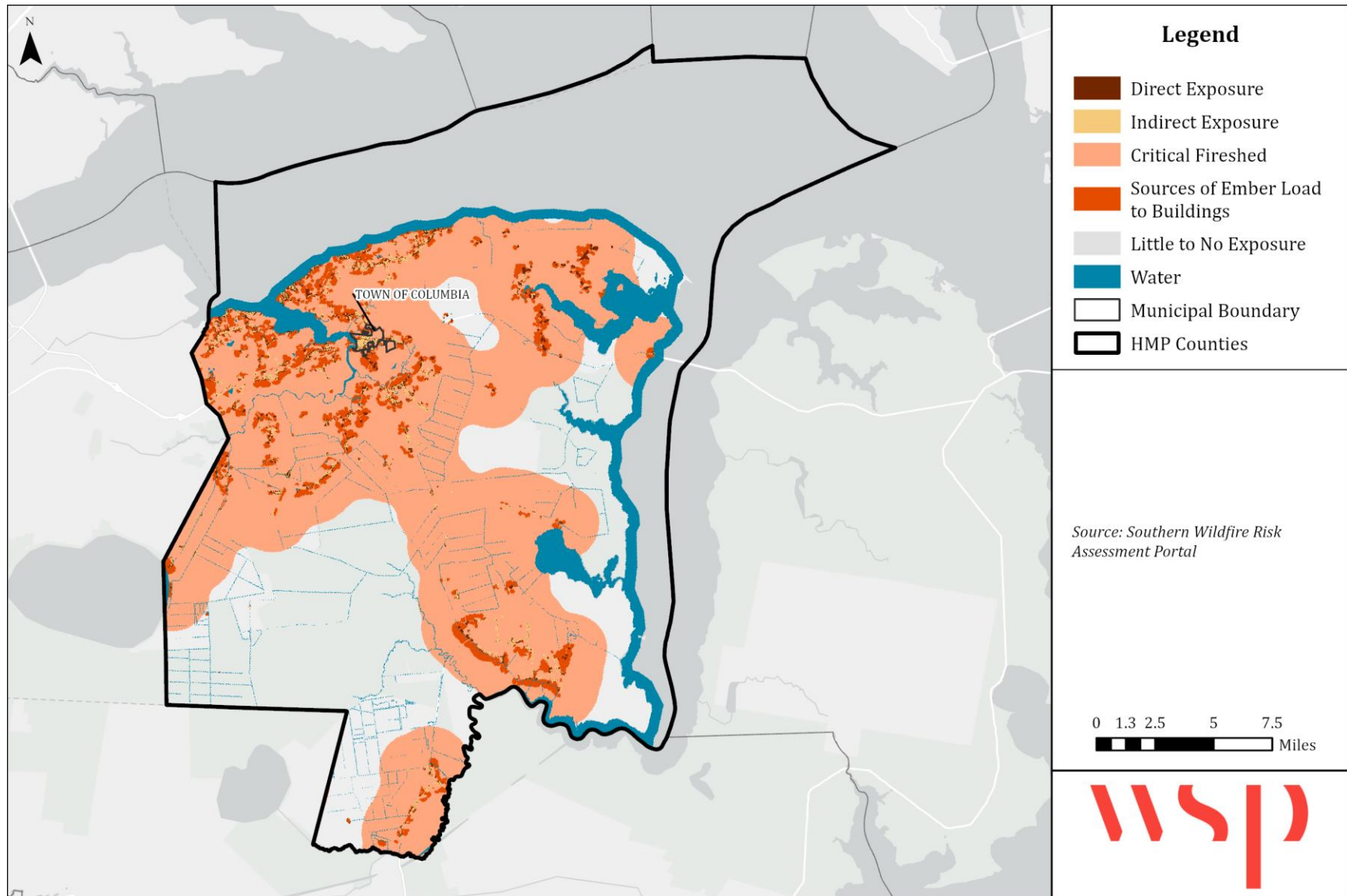


Figure D.10 – Functional Wildland Urban Interface, Town of Columbia

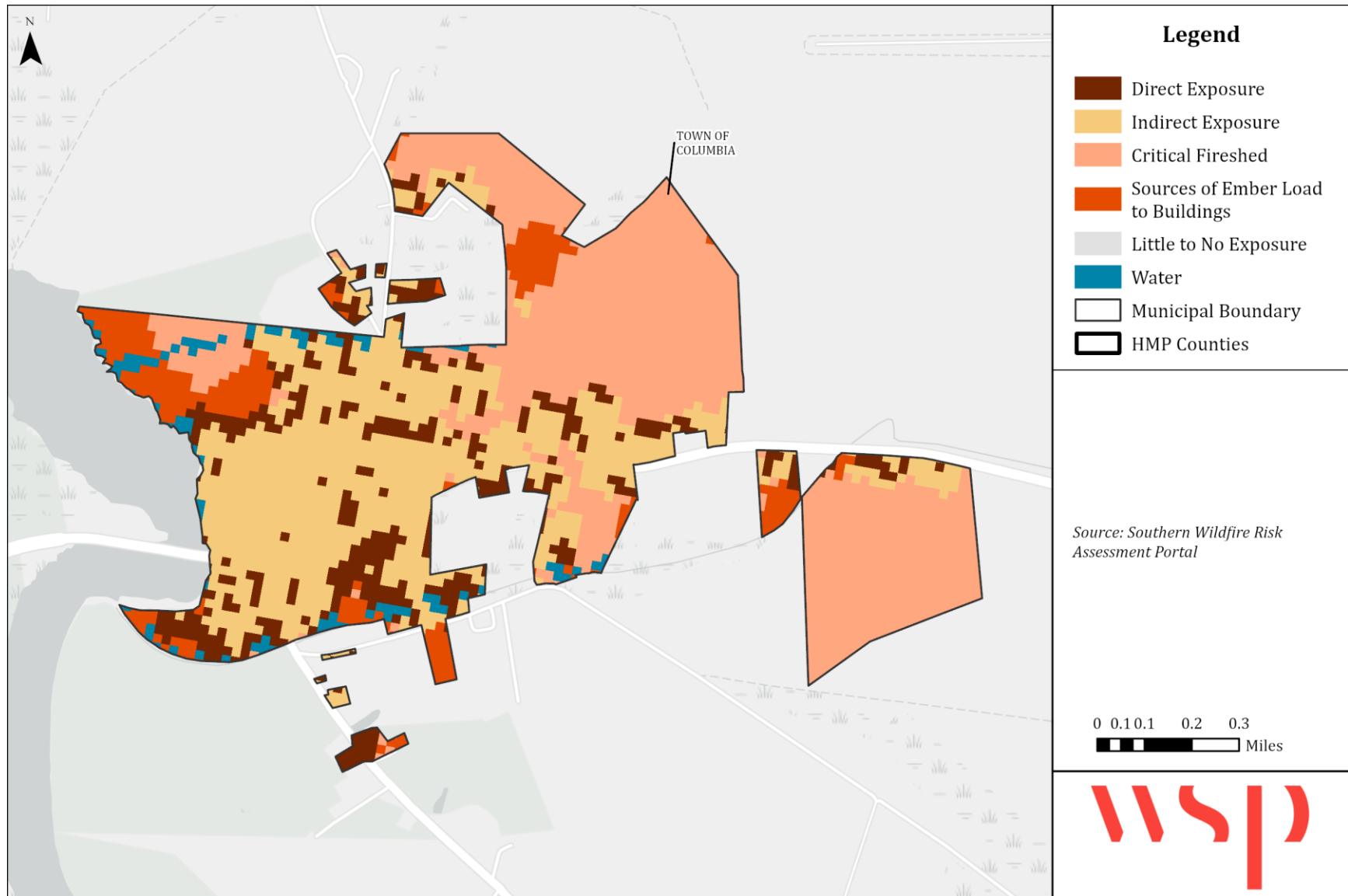


Figure D.11 – Fire Intensity Scale, Unincorporated Tyrrell County

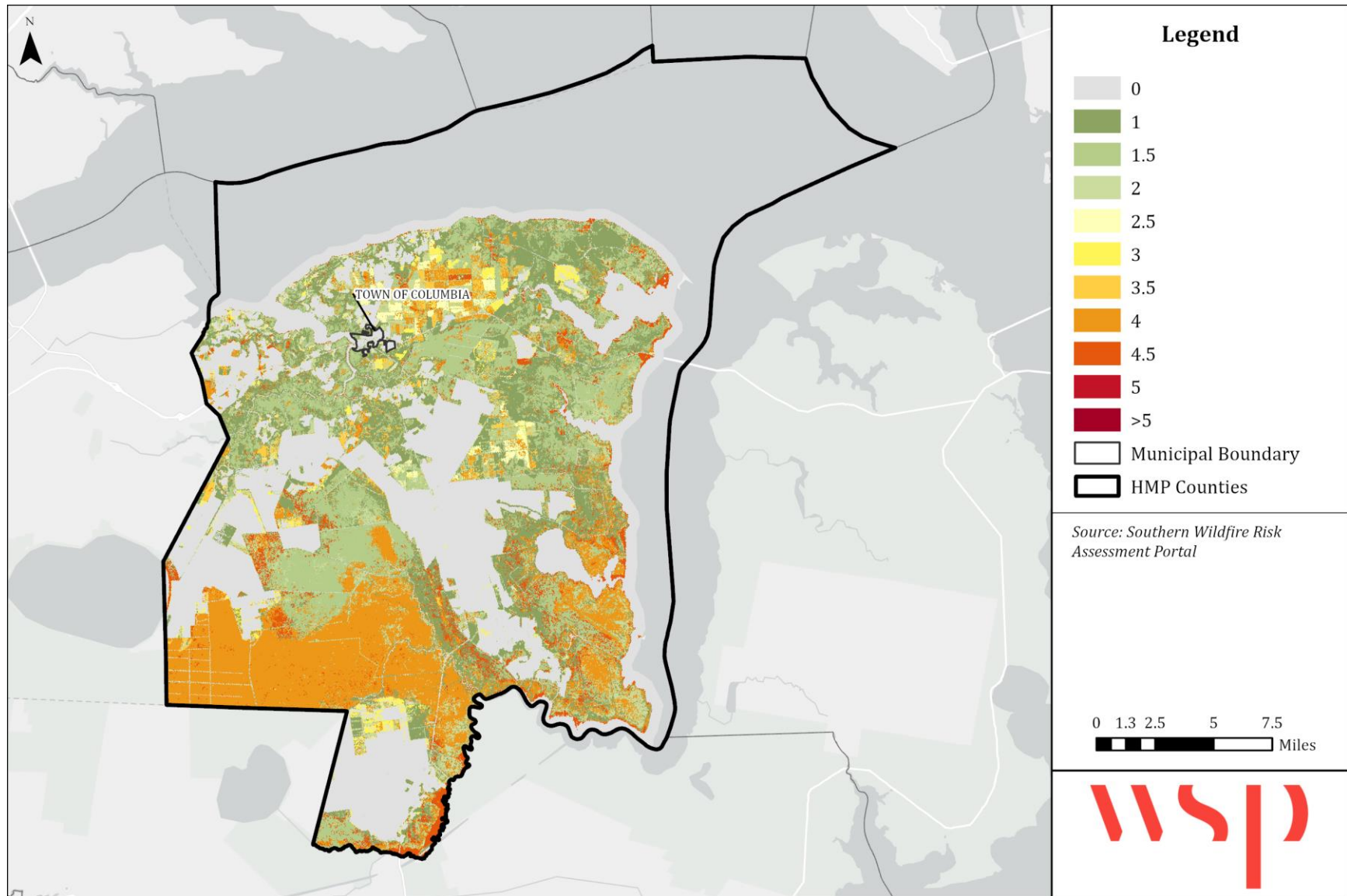


Figure D.12 – Fire Intensity Scale, Town of Columbia

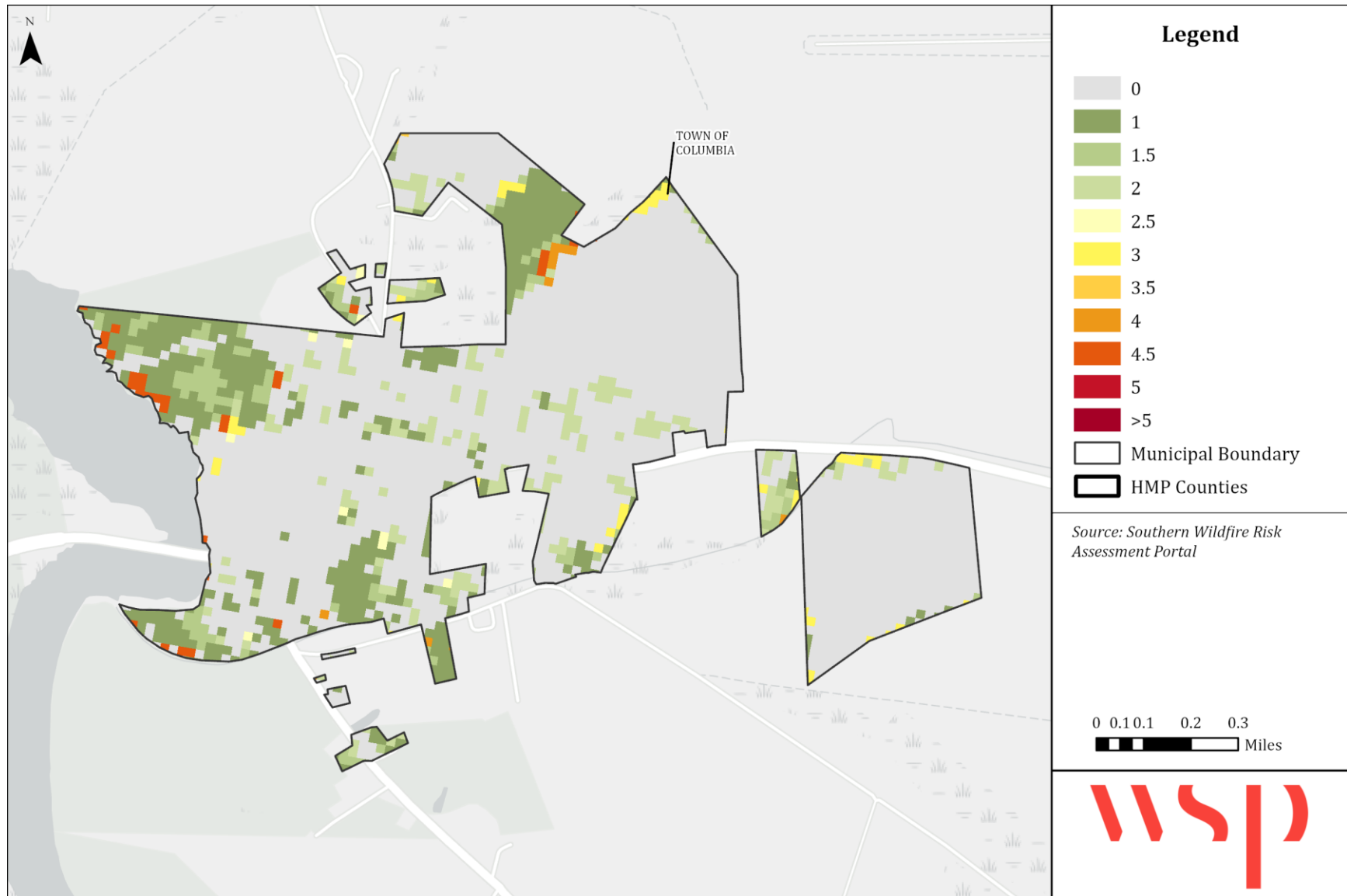


Figure D.13 – Burn Probability, Unincorporated Tyrrell County

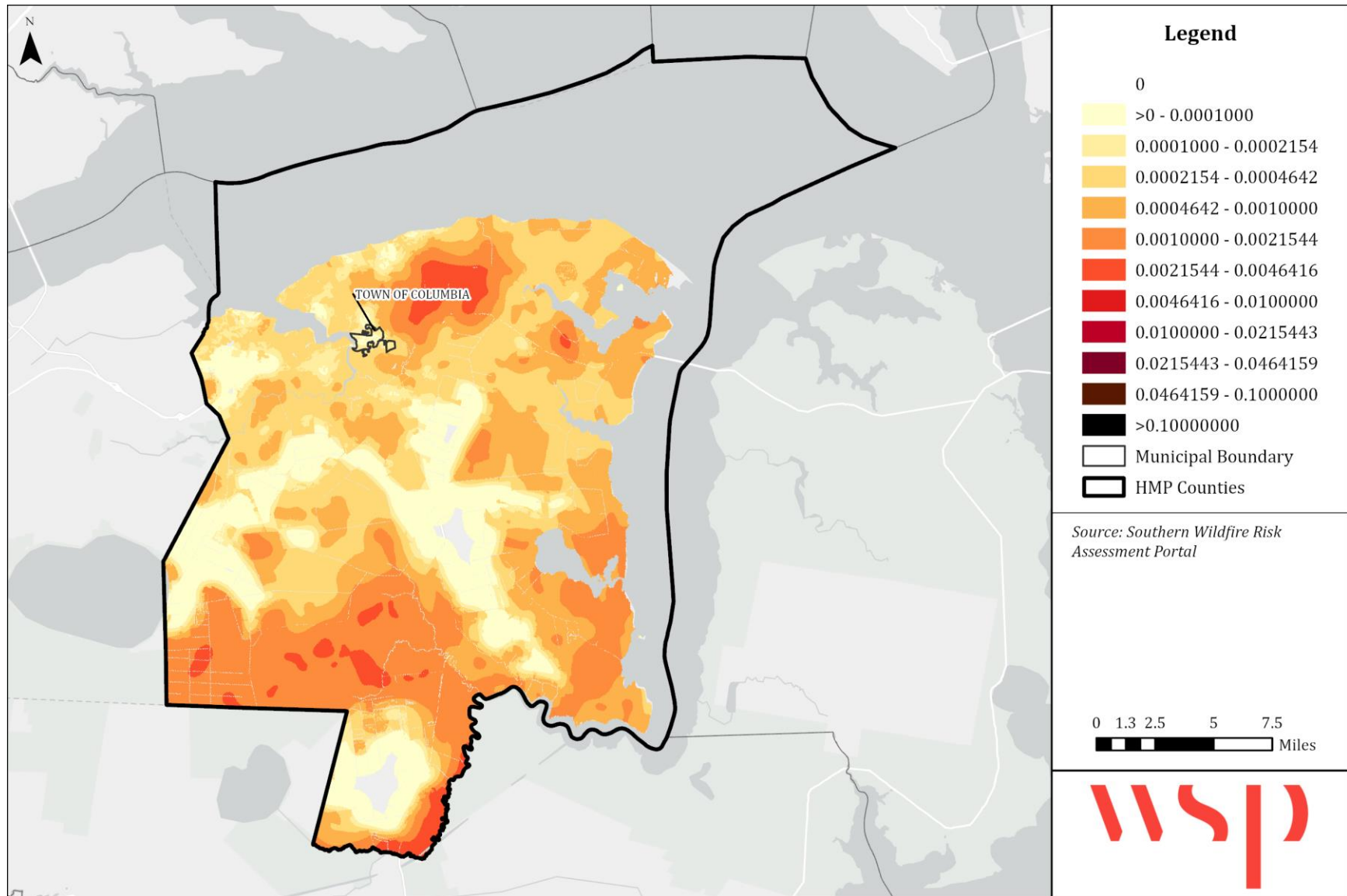
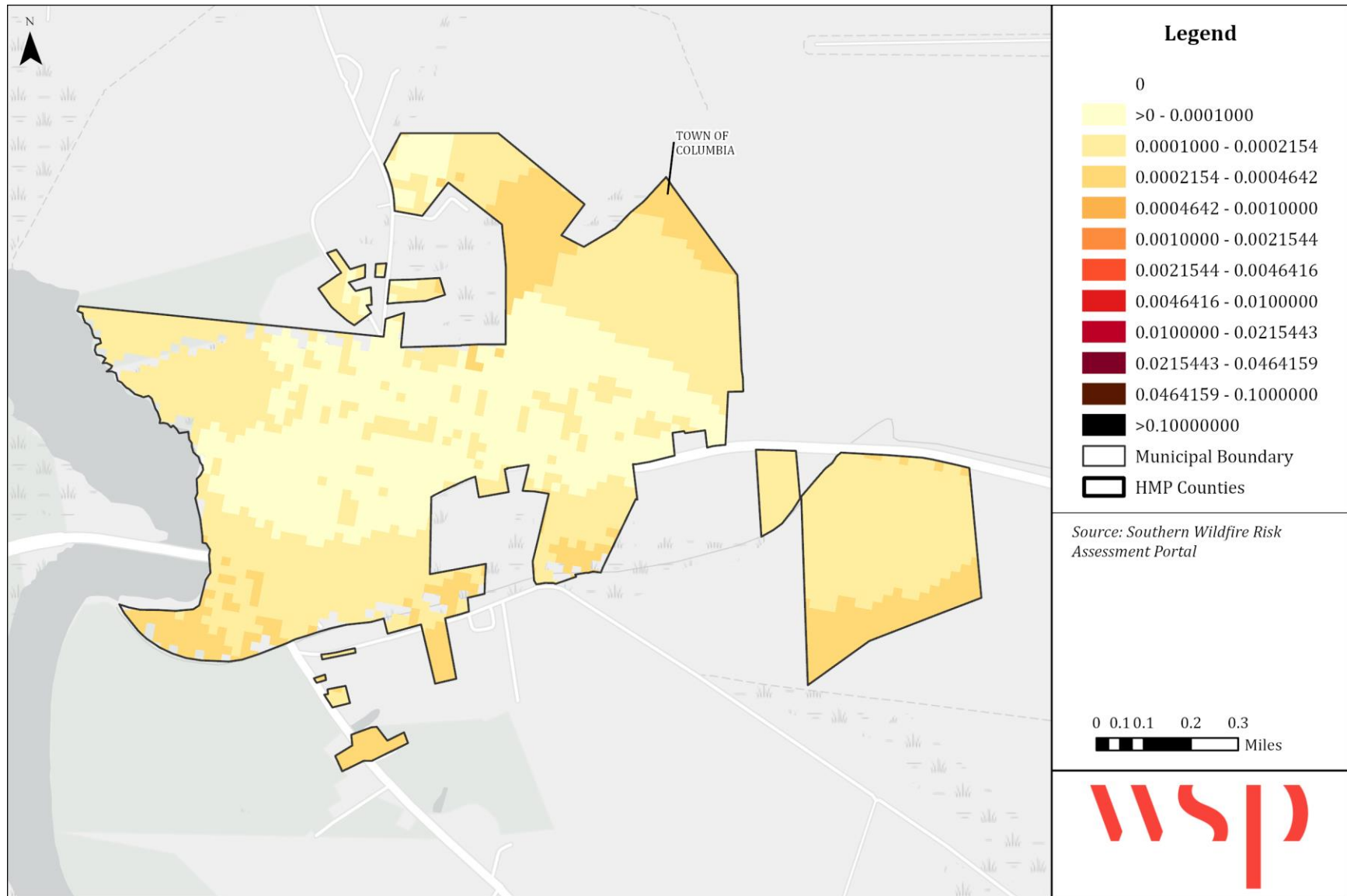


Figure D.14 – Burn Probability, Town of Columbia



D.3 MITIGATION STRATEGY

Action #	Description	Applicable Jurisdictions	Hazards Addressed	Priority	Goal & Objective	Category	Lead/Participating Agencies	Estimated Cost	Potential Funding Sources	Implementation Schedule	2025 Status	Status Comments/Explanation
T1	Maintain a policy of keeping branches and limbs from encroaching upon the right-of-way and power lines. The Town will assist in this effort through ensuring that this issue is properly addressed by utility providers.	Columbia	Flooding, Hurricanes & Coastal Hazards, Severe Winter Storm, Earthquake, Wildfire, Severe Weather, Tornado	High	1.1	P	Columbia Administration Electric Service Providers	Staff Time	General Fund, Electric Service Providers	2025-2030	Carry Forward	The Town will coordinate with utility providers to minimize the impacts of natural hazard events on Town-wide infrastructure systems.
T2	Monitor the county's equipment and facility needs with respect to mitigation and emergency management. Following a natural disaster, the county will utilize potential Hazard Mitigation Grant Program funds to acquire any identified needs.	Tyrrell Co., Columbia	All Hazards	High	1.1	PP, ES	Tyrrell County Emergency Management Tyrrell County Board of Commissioners Municipal Administration	Staff Time	General Fund, NCDPS	1 year	Carry Forward	Current priority needs include swift water rescue equipment & training.
T3	Mail a floodplain protection informational flyer to all county and town property owners a minimum of two times over the next five years. This effort will ensure that this critical information is being disseminated to a broad base of the population.	Tyrrell Co., Columbia	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	High	4.2	PIO	Tyrrell County Administration Tyrrell County Building Inspections Municipal Administration	\$4,000	General Fund	1 year	Carry Forward	Outreach was previously mailed but this effort needs to be reestablished once the County Floodplain Administrator position is filled.
T4	Advertise the availability of federal flood insurance offered through the National Flood Insurance Program at least once annually through the county's website and/or social media. Additionally, the county will assist property owners in acquiring this insurance.	Tyrrell Co., Columbia	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	High	4.2	PIO	Tyrell County Administration Municipal Administration	\$4,000	General Fund	2 years	Carry Forward	Action revised as Tyrrell County does not have a local newspaper but will use social media and website outreach to promote flood insurance.
T5	Establish a long-range plan in conjunction with the US Army Corps of Engineers to clean out the arterial canals located throughout the county.	Tyrrell Co.	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	Medium	1.3	NRP	Tyrrell County Administration US Army Corps of Engineers	To be determined	General Fund, NCDPS, NCDEQ	2 to 3 years	Carry Forward	Soil & Water Conservation has been working to keep streams and canals clear. Currently working on several USACE permits.

Action #	Description	Applicable Jurisdictions	Hazards Addressed	Priority	Goal & Objective	Category	Lead/Participating Agencies	Estimated Cost	Potential Funding Sources	Implementation Schedule	2025 Status	Status Comments/Explanation
T6	Work towards a long-term solution to the flooding and drainage issues impacting the Alligator and Goat Neck communities within the county.	Tyrrell Co.	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	Medium	1.3	SP	Tyrrell County Administration Tyrrell County Public Services	To be determined	General Fund, NCDPS, NCDEQ	2 to 3 years	Carry Forward	Tyrrell County has been dealing with this issue for many years. The County will continue to seek out a long-term sustainable solution to this issue. Currently working on USACE permitting for a drainage improvement project.
T7	Work to relocate all County service facilities to sites outside the flood hazard area.	Tyrrell Co.	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	Low	1.1, 2.3	PP	Tyrrell County Administration Tyrrell County Board of Commissioners Municipal Administration	To be determined	General Fund, NCDPS, FEMA, USDA Loan Program	5 years	Carry Forward	No progress to report but this remains a priority goal.
T8	Continue to utilize annual, as well as post disaster Federal (FEMA) and State mitigation funds, to both acquire and elevate structures impacted by excessive flooding. The following provides a summary of mitigation target areas established following Hurricane Matthew in 2016: - Alligator Community - Albemarle Sound Area - Town of Columbia	Tyrrell Co., Columbia	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	Low	2.3	PP	Tyrrell County Administration Tyrrell County Emergency Management Municipal Administration	To be determined	General Fund, NCDPS, NCDEQ, NCDOT	5 years	Carry Forward	Completed one mitigation reconstruction project in Columbia. Post-Matthew target areas remain a priority.
T9	Actively working with Federal, State, local and private partners to identify mitigation measures and secure funding via grants to alleviate flooding. These efforts should focus on the following areas: - Drainage system – Grendle Hill Canal - Drainage system – Alligator Canal - Drainage system – South Fork Creek Canal - Drainage system – Rider Creek Canal	Tyrrell Co., Columbia	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	Low	1.1, 2.3	SP	Tyrrell County Administration Tyrrell County Emergency Management Municipal Administration	To be determined	General Fund, NCDPS, NCDEQ, NCDOT	5 years	Carry Forward	County obligates funding to Soil & Water Conservation department and that department conducts drainage maintenance. This is an ongoing need.

Action #	Description	Applicable Jurisdictions	Hazards Addressed	Priority	Goal & Objective	Category	Lead/Participating Agencies	Estimated Cost	Potential Funding Sources	Implementation Schedule	2025 Status	Status Comments/Explanation
T10	Seek grant funding for eligible mitigation opportunities which may include but are not limited to: acquisition/elevation, mitigation/reconstruction, and wet/dry floodproofing to residential and non-residential structures. Funding may also be utilized for redundant power to critical facilities, wind retrofits to critical facilities, storm shelters and other activities that reduce the loss of life and property.	Tyrrell Co., Columbia	All Hazards	Medium	1.1, 2.3	SP, PP	Tyrrell County Administration Tyrrell County Emergency Management Municipal Administration	To be determined	General Fund, NCDPS, FEMA	2020-2025	Carry Forward	Completed one mitigation reconstruction project in Columbia.
T11	Maintain, and where necessary, establish backup generators at all identified critical facilities. Additionally, County Emergency Services will evaluate the equipment on a regular basis to assure it continues to meet operational demands at county facilities.	Tyrrell Co., Columbia	All Hazards	Medium	1.1, 4.1	PP	Tyrrell County Emergency Management Municipal Administration	To be determined	General Fund, NCDPS, FEMA	2 to 3 years	Carry Forward	A new school is planned that will need backup power
T12	Create or Update Community Wildfire Protection Plans in each fire district.	Tyrrell Co., Columbia	Wildfire	Med	1.4	P	Tyrrell County Emergency Management, Fire Departments, NC Forest Service	To Be Determined	Grant Funds	5 years	New	

ANNEX E. WASHINGTON COUNTY

E.1 ASSET INVENTORY

Washington County and the HMPC provided a local inventory of critical facilities and community lifelines, which are a priority for mitigation planning and emergency management. Lifelines are the most fundamental services in the community that, when stabilized, enable all other aspects of society to function. Table E.1 through Table E.4 provide a count of critical facilities by FEMA lifeline category by jurisdiction in Washington County. Figure E.1 through Figure E.4 show the locations of all critical facilities by jurisdiction in Washington County.

Table E.5 provides a detailed inventory of the critical facilities in Washington County, indicating each facility's FEMA lifeline category, flood zone, 1% annual chance flood depth, minimum storm surge category, and wildfire risk. More information on hazard vulnerability is provided in Section E.2.

Table E.1 – Critical Facilities by Type, Unincorporated Washington County

Facility Type	Count of Facility Type	Structure Value
Communications	0	\$-
Energy	0	\$-
Food, Hydration, Shelter	74	\$18,677,115.19
Hazardous Materials	3	\$1,000
Health and Medical	2	\$372,500
Safety and Security	5	\$1,675,500
Transportation	0	\$-
Water Systems	18	\$1,539,539
Total	102	\$22,265,654.19

Table E.2 – Critical Facilities by Type, Town of Creswell

Facility Type	Count of Facility Type	Structure Value
Communications	0	\$-
Energy	0	\$-
Food, Hydration, Shelter	7	\$2,510,983.73
Hazardous Materials	0	\$-
Health and Medical	1	\$69,900
Safety and Security	1	\$69,900
Transportation	0	\$-
Water Systems	2	\$82,400
Total	11	\$2,733,183.73

Table E.3 – Critical Facilities by Type, Town of Plymouth

Facility Type	Count of Facility Type	Structure Value
Communications	0	\$-
Energy	0	\$-
Food, Hydration, Shelter	2	\$4,344,200
Hazardous Materials	0	\$-
Health and Medical	3	\$6,047,200
Safety and Security	3	\$545,600
Transportation	0	\$-
Water Systems	2	\$1,063,400
Total	10	\$12,000,400

Table E.4 – Critical Facilities by Type, Town of Roper

Facility Type	Count of Facility Type	Structure Value
Communications	0	\$-
Energy	0	\$-
Food, Hydration, Shelter	0	\$-
Hazardous Materials	0	\$-
Health and Medical	1	\$89,900
Safety and Security	2	\$136,400
Transportation	0	\$-
Water Systems	3	\$123,166
Total	6	\$349,466

Figure E.1 – Critical Facilities, Unincorporated Washington County

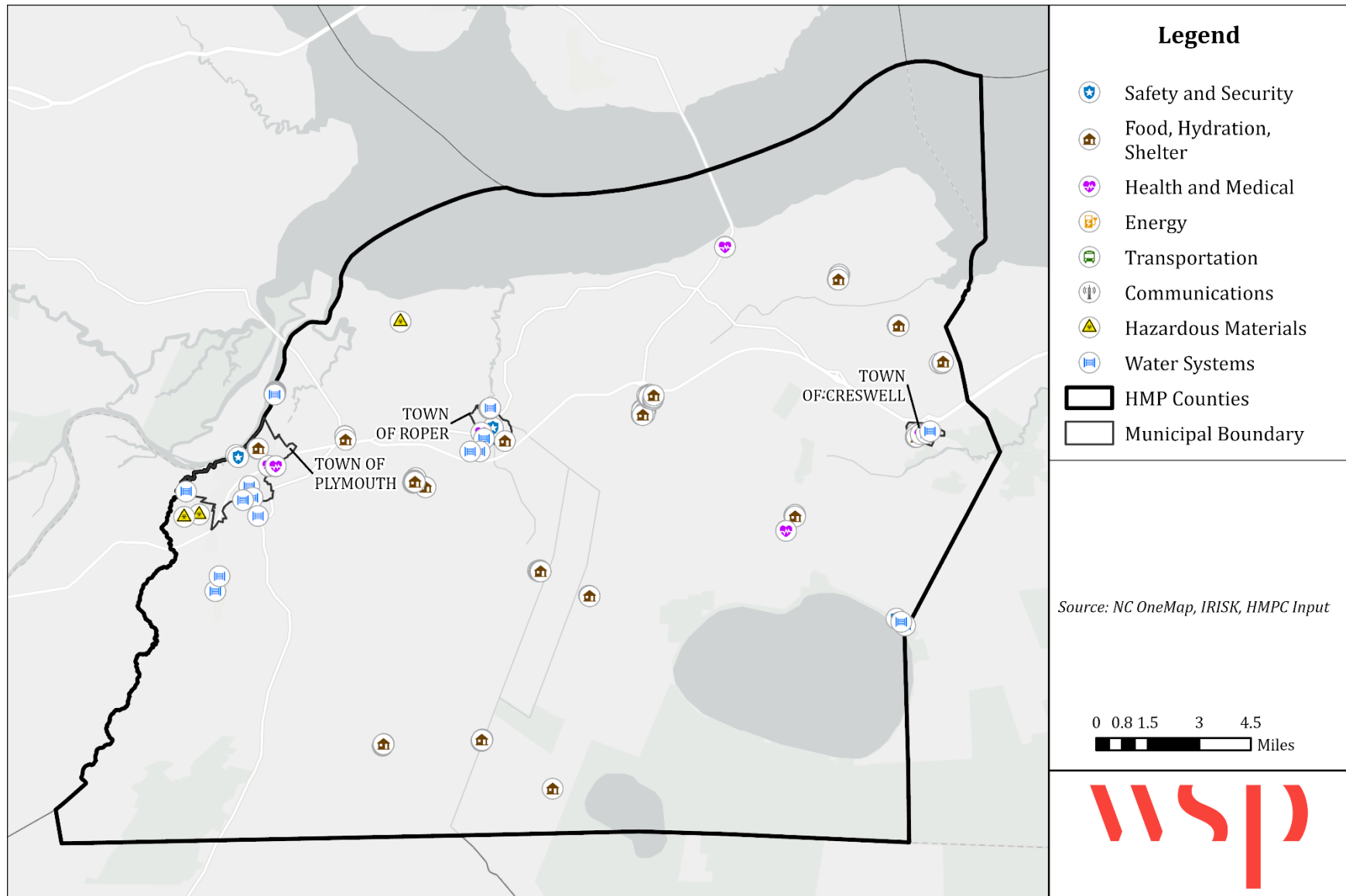


Figure E.2 – Critical Facilities, Town of Creswell

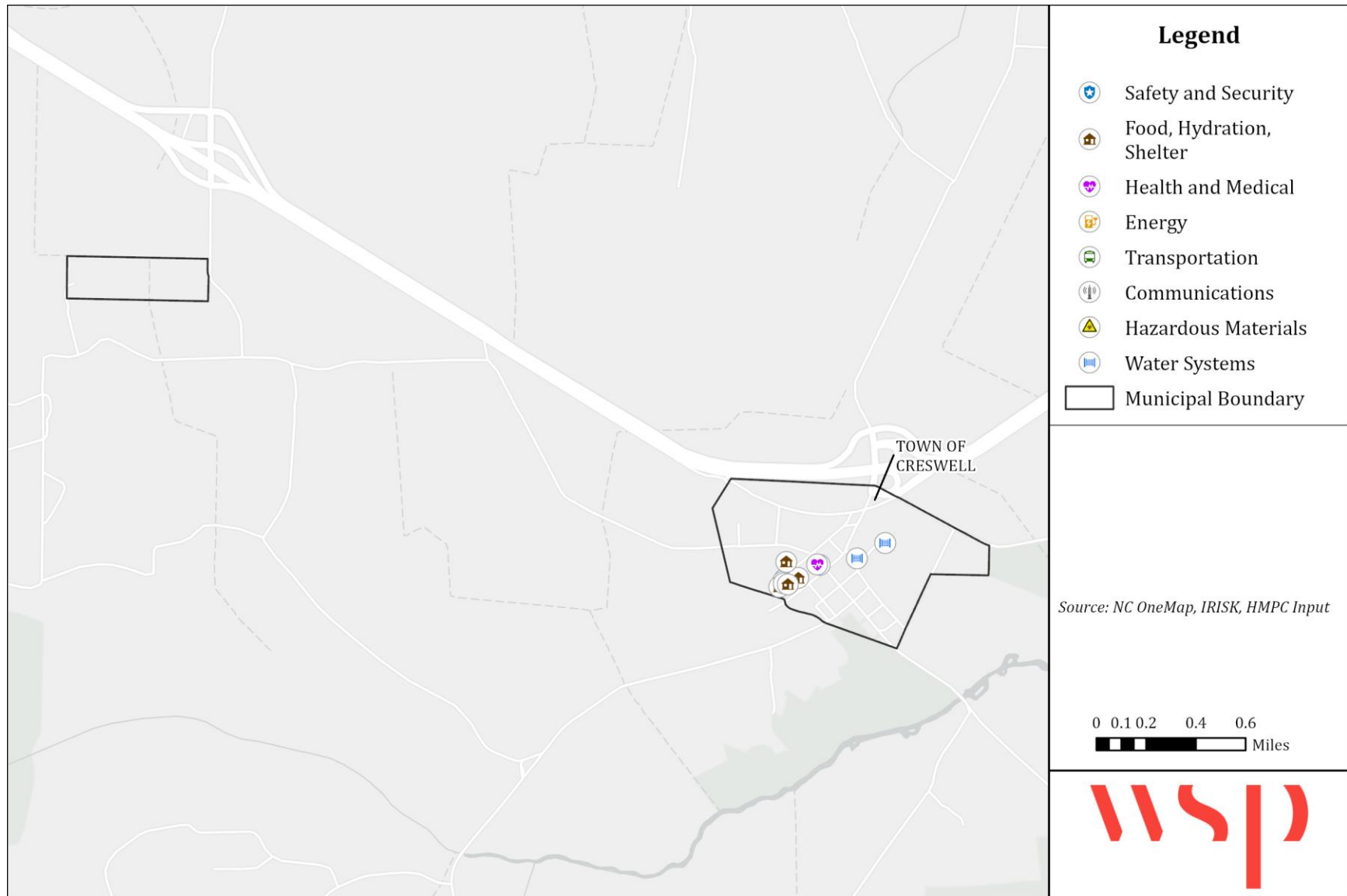


Figure E.3 - Critical Facilities, Town of Plymouth

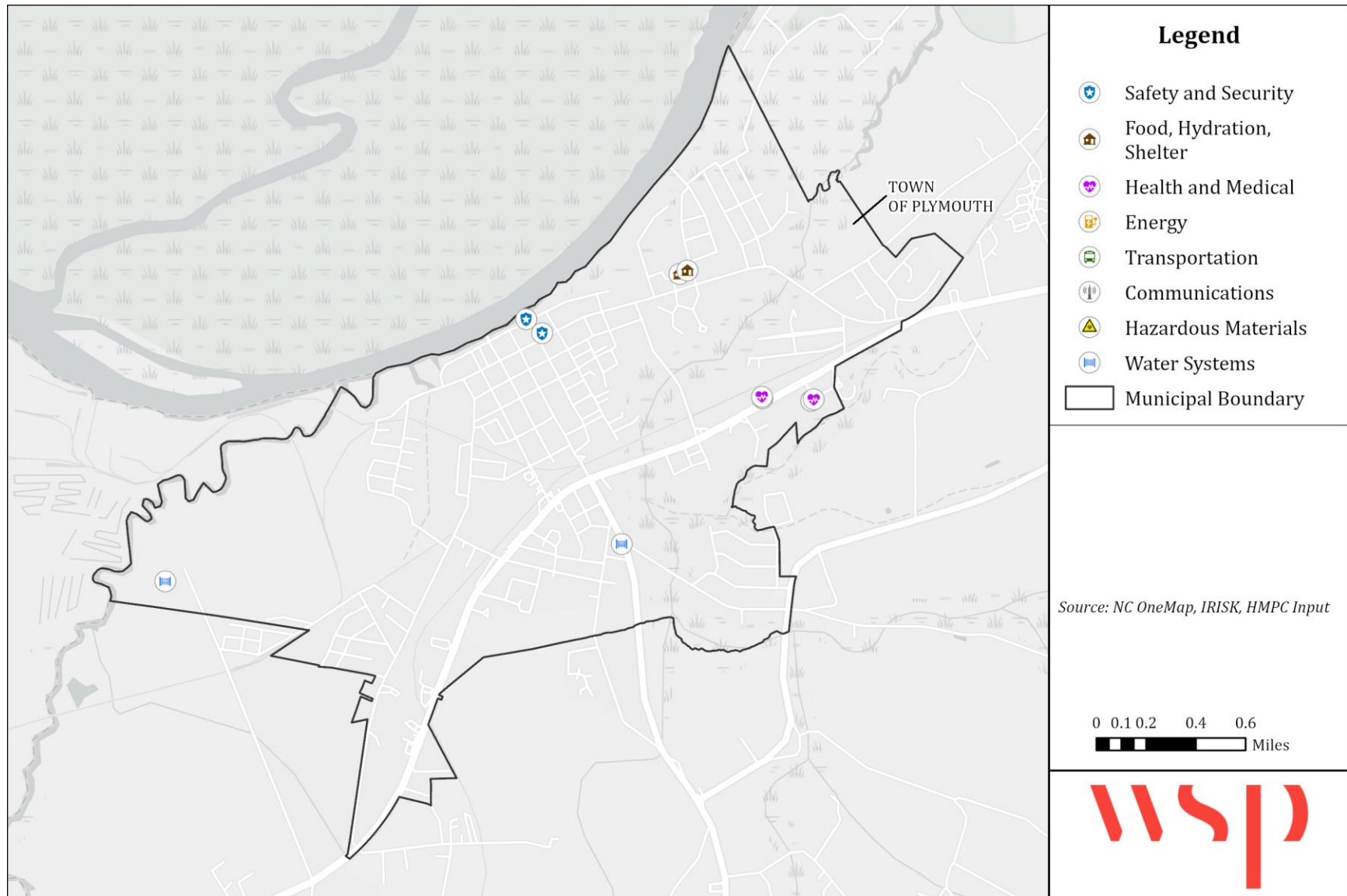


Figure E.4 - Critical Facilities, Town of Roper

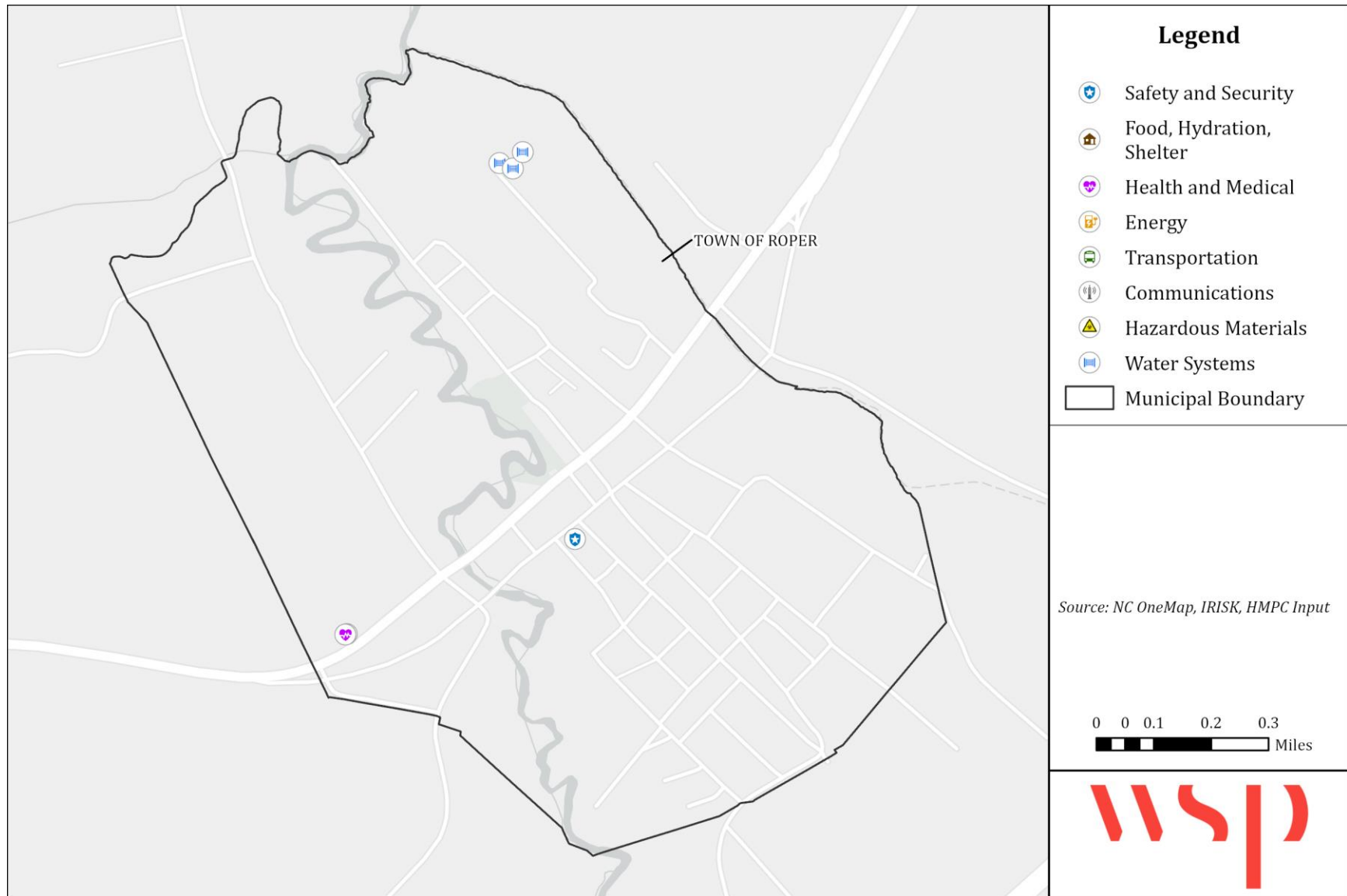


Table E.5 – Washington County Critical Facilities Inventory

FEMA Lifeline	Facility Name	Address	Structure Value	Flood Depth	Flood Zone	Min. Sea Level Rise	Min. Storm Surge Cat.	High WUI Exposure	Fire Intensity
Unincorporated Washington County									
Safety & Security	Lake Phelps Volunteer Fire Department	9688 Newland Road	\$143,600	0	X Unshaded	N/A	Category 3	Indirect Exposure	0
Safety & Security	Mid-County Volunteer Fire Department, Inc.	18135 NC Highway 32 North	\$228,900	0	X Unshaded	N/A	Category 3	Indirect Exposure	0
Safety & Security	NC Division of Parks – Pettigrew State Park	2252 Lake Shore Rd	-	0	X Unshaded	N/A	Category 4	Direct Exposure	2
Health & Medical	Lake Phelps Volunteer Fire Department	9606 Newland Rd	\$143,600	0	X Unshaded	N/A	Category 3	Direct Exposure	2
Health & Medical	Mid-County Volunteer Fire Department Incorporated	1485 State HWY 32 North	\$228,900	0	X Unshaded	N/A	Category 3	Indirect Exposure	0
Safety & Security	Washington County Health Department	198 NC HWY 45 NORTH	\$651,500	0	X Unshaded	N/A	Category 3	Direct Exposure	2
Safety & Security	Martin-Tyrrell-Washington District Health Department	198 NC HWY 45 NORTH	\$651,500	0	X Unshaded	N/A	Category 3	Indirect Exposure	0
Hazardous Materials	Domtar Paper Company LLC	NC HWY 149 N	-	0	X Unshaded	N/A	N/A	Critical Fireshed	0
Water Systems	Plymouth Water System	809 Washington St	\$25,000	0	X Shaded	N/A	Category 3	Sources of Ember Load to Buildings	0
Water Systems	Plymouth Water System	809 Washington St	\$1,200	0	X Unshaded	N/A	Category 3	Direct Exposure	1
Water Systems	Plymouth Water System	809 Washington St	-	0	X Unshaded	N/A	Category 3	Critical Fireshed	0
Water Systems	Plymouth Water System	809 Washington St	-	0	X Unshaded	N/A	N/A	Sources of Ember Load to Buildings	3
Water Systems	Plymouth Water System	809 Washington St	-	0	X Unshaded	N/A	N/A	Critical Fireshed	0
Water Systems	Washington County Water System	396 West Mill Pond Rd	\$1,083,000	0	X Shaded	N/A	Category 2	Direct Exposure	3
Water Systems	Washington County Water System	396 West Mill Pond Rd	\$3,700	0	X Shaded	N/A	Category 3	Indirect Exposure	0
Water Systems	Washington County Water System	396 West Mill Pond Rd	\$4,200	0	X Unshaded	N/A	Category 3	Critical Fireshed	0

ANNEX E: WASHINGTON COUNTY

FEMA Lifeline	Facility Name	Address	Structure Value	Flood Depth	Flood Zone	Min. Sea Level Rise	Min. Storm Surge Cat.	High WUI Exposure	Fire Intensity
Water Systems	Somerset Place Historic Site	2572 Lake Shore Rd	\$99,400	0	X Unshaded	N/A	Category 3	Indirect Exposure	0
Water Systems	Pettigrew State Park	2572 Lake Shore Rd	-	0	X Unshaded	N/A	Category 4	Sources of Ember Load to Buildings	1
Food, Hydration, Shelter	Coles Farms Inc.- North Pork	1563 Railroad Bed Rd	\$22,800	0	X Unshaded	N/A	Category 3	Direct Exposure	2
Food, Hydration, Shelter	Tidewater Research Station 2	US HWY 64	\$141,700	0	X Unshaded	N/A	N/A	Direct Exposure	2
Food, Hydration, Shelter	Tidewater Research Station	US HWY 64	\$141,700	0	X Unshaded	N/A	Category 3	Indirect Exposure	0
Food, Hydration, Shelter	Joshua Spear Farm	Ambrose Rd	\$85,400	0	X Unshaded	N/A	Category 2	Indirect Exposure	0
Food, Hydration, Shelter	Somerset Farm	Northline Rd	\$58,400	0	X Unshaded	N/A	Category 4	Direct Exposure	2
Hazardous Materials	Domtar Paper Company Landfill, Lined #3	Ken Trowbridge Rd-Tract 26	\$1,000	0	X Unshaded	N/A	N/A	Critical Fireshed	3
Hazardous Materials	Washington County C&D Landfill	Landfill Rd	-	0	X Unshaded	N/A	N/A	Critical Fireshed	0
Food, Hydration, Shelter		Unknown	\$5,269	0	X Unshaded	N/A	N/A	Indirect Exposure	0
Food, Hydration, Shelter		Unknown	\$16,714	0	X Unshaded	N/A	N/A	Direct Exposure	2
Food, Hydration, Shelter		Unknown	\$8,359	0	X Unshaded	N/A	N/A	Indirect Exposure	0
Food, Hydration, Shelter		Unknown	\$13,599	0	X Unshaded	N/A	Category 4	Indirect Exposure	0
Food, Hydration, Shelter		Northline Rd	\$5,000	0	X Unshaded	N/A	Category 4	Direct Exposure	2
Food, Hydration, Shelter		Unknown	\$37,895	0	X Unshaded	N/A	Category 5	Critical Fireshed	0
Food, Hydration, Shelter		Unknown	\$66,008	0	X Unshaded	N/A	Category 3	Critical Fireshed	0
Food, Hydration, Shelter		Northline Rd	\$5,000	0	X Unshaded	N/A	Category 3	Critical Fireshed	0
Food, Hydration, Shelter		Off Northline Rd	\$17,800	0	X Unshaded	N/A	Category 3	Direct Exposure	2
Food, Hydration, Shelter		Unknown	\$57,691	0	X Unshaded	N/A	Category 5	Indirect Exposure	0
Water Systems		Conaby Dr	\$37,500	0.1	AE	N/A	Category 2	Indirect Exposure	0
Water Systems		Unknown	\$5,284	0.1	AE	N/A	Category 2	Indirect Exposure	0
Water Systems		Unknown	\$63,034	0.1	AE	N/A	Category 3	Indirect Exposure	0
Water Systems		Unknown	\$40,829	0.1	AE	N/A	Category 3	Indirect Exposure	0
Water Systems		Unknown	\$43,751	0.1	AE	N/A	Category 3	Direct Exposure	2

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FEMA Lifeline	Facility Name	Address	Structure Value	Flood Depth	Flood Zone	Min. Sea Level Rise	Min. Storm Surge Cat.	High WUI Exposure	Fire Intensity
Water Systems		Unknown	\$43,240	0.1	AE	N/A	N/A	Indirect Exposure	0
Water Systems		Unknown	\$45,066	0.1	AE	N/A	Category 2	Indirect Exposure	0
Water Systems		Unknown	\$44,335	0.1	AE	N/A	Category 2	Indirect Exposure	0
Food, Hydration, Shelter		Unknown	\$393,488	0	X Shaded	N/A	Category 2	Indirect Exposure	0
Food, Hydration, Shelter		Unknown	\$142,030	0	X Shaded	N/A	Category 2	Indirect Exposure	0
Food, Hydration, Shelter		Unknown	\$171,098	0	X Unshaded	N/A	Category 2	Indirect Exposure	0
Food, Hydration, Shelter		Unknown	\$650,004	0	X Unshaded	N/A	Category 2	Indirect Exposure	0
Food, Hydration, Shelter		Unknown	\$440,951	0	X Shaded	N/A	Category 2	Indirect Exposure	0
Food, Hydration, Shelter		Unknown	\$175,687	0	X Unshaded	N/A	Category 2	Direct Exposure	2
Food, Hydration, Shelter		Unknown	\$177,195	0	X Unshaded	N/A	Category 2	Indirect Exposure	0
Food, Hydration, Shelter		Unknown	\$349,058	0	X Unshaded	N/A	Category 4	Direct Exposure	2.5
Food, Hydration, Shelter		Unknown	\$45,084	0	X Unshaded	N/A	Category 4	Indirect Exposure	0
Food, Hydration, Shelter		Unknown	\$6,883	0	X Unshaded	N/A	Category 5	Indirect Exposure	0
Food, Hydration, Shelter		Unknown	\$5,302	0	X Unshaded	N/A	Category 5	Indirect Exposure	0
Food, Hydration, Shelter		Unknown	\$36,167	0	X Unshaded	N/A	Category 5	Indirect Exposure	0
Food, Hydration, Shelter		Unknown	\$5,171	0	X Unshaded	N/A	Category 4	Indirect Exposure	0
Food, Hydration, Shelter		Off Northline Rd	\$65,200	0	X Unshaded	N/A	Category 4	Direct Exposure	2
Food, Hydration, Shelter		Northline Rd	\$5,000	0	X Unshaded	N/A	Category 4	Critical Fireshed	0
Food, Hydration, Shelter		Unknown	\$61,323	0	X Unshaded	N/A	Category 4	Indirect Exposure	0
Food, Hydration, Shelter		Unknown	\$55,759	0	X Unshaded	N/A	N/A	Indirect Exposure	0
Food, Hydration, Shelter		Unknown	\$24,153	0	X Unshaded	N/A	Category 5	Indirect Exposure	0
Food, Hydration, Shelter		Unknown	\$29,088	0	X Unshaded	N/A	Category 5	Direct Exposure	2
Food, Hydration, Shelter		Unknown	\$2,291,529	0	X Unshaded	N/A	Category 4	Indirect Exposure	0
Food, Hydration, Shelter		Unknown	\$3,814,173	0	X Unshaded	N/A	Category 4	Indirect Exposure	0
Food, Hydration, Shelter		Unknown	\$1,192,192	0	X Unshaded	N/A	Category 5	Indirect Exposure	0
Food, Hydration, Shelter		Unknown	\$1,207,069	0	X Unshaded	N/A	Category 5	Indirect Exposure	0
Food, Hydration, Shelter		Unknown	\$1,166,012	0	X Unshaded	N/A	Category 5	Indirect Exposure	0
Food, Hydration, Shelter		Unknown	\$1,810,565	0	X Unshaded	N/A	Category 4	Indirect Exposure	0

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FEMA Lifeline	Facility Name	Address	Structure Value	Flood Depth	Flood Zone	Min. Sea Level Rise	Min. Storm Surge Cat.	High WUI Exposure	Fire Intensity
Food, Hydration, Shelter		1514 C Canal Rd	\$47,400	0	X Unshaded	N/A	Category 3	Indirect Exposure	0
Food, Hydration, Shelter		NC HWY 99	\$15,100	0	X Unshaded	N/A	Category 3	Little to No Exposure	0
Food, Hydration, Shelter		1563 Railroad Bed Rd	\$22,800	0	X Unshaded	N/A	Category 3	Indirect Exposure	0
Food, Hydration, Shelter		1563 Railroad Bed Rd	\$22,800	0	X Unshaded	N/A	Category 3	Indirect Exposure	0
Food, Hydration, Shelter		Pea Ridge Rd/Sr 1302	\$37,100	0	X Shaded	N/A	Category 2	Direct Exposure	0
Food, Hydration, Shelter		Pea Ridge Rd/Sr 1302	\$37,100	0	X Unshaded	N/A	Category 3	Direct Exposure	0
Food, Hydration, Shelter		4007 Pea Ridge Rd	\$76,500	0	X Unshaded	N/A	Category 2	Direct Exposure	0
Food, Hydration, Shelter		4007 Pea Ridge Rd	\$76,500	0	X Unshaded	N/A	Category 3	Direct Exposure	0
Food, Hydration, Shelter		1563 Railroad Bed Rd	\$22,800	0	X Unshaded	N/A	Category 3	Direct Exposure	2
Food, Hydration, Shelter		1563 Railroad Bed Rd	\$22,800	0	X Unshaded	N/A	Category 3	Indirect Exposure	0
Food, Hydration, Shelter		1563 Railroad Bed Rd	\$22,800	0	X Unshaded	N/A	Category 3	Direct Exposure	2
Food, Hydration, Shelter		1847 Alligood Rd	\$72,500	0	X Unshaded	N/A	Category 2	Direct Exposure	3
Food, Hydration, Shelter		1847 Alligood Rd	\$72,500	0	X Unshaded	N/A	Category 2	Direct Exposure	2
Food, Hydration, Shelter		1847 Alligood Rd	\$72,500	0	X Unshaded	N/A	Category 5	Indirect Exposure	0
Food, Hydration, Shelter		NC HWY 99	\$15,100	0	X Unshaded	N/A	Category 3	Little to No Exposure	0
Food, Hydration, Shelter		NC HWY 99	\$15,100	0	X Unshaded	N/A	Category 3	Little to No Exposure	0
Food, Hydration, Shelter		NC HWY 99	\$15,100	0	X Unshaded	N/A	Category 3	Little to No Exposure	0
Food, Hydration, Shelter		NC HWY 99	\$15,100	0	X Unshaded	N/A	Category 3	Little to No Exposure	0
Food, Hydration, Shelter		NC HWY 99	\$15,100	0	X Unshaded	N/A	Category 3	Little to No Exposure	0
Food, Hydration, Shelter		3121 & 3123 B Canal Rd	\$43,200	0	X Unshaded	N/A	Category 3	Direct Exposure	2

ANNEX E: WASHINGTON COUNTY

FEMA Lifeline	Facility Name	Address	Structure Value	Flood Depth	Flood Zone	Min. Sea Level Rise	Min. Storm Surge Cat.	High WUI Exposure	Fire Intensity
Food, Hydration, Shelter		3121 & 3123 B Canal Rd	\$43,200	0	X Unshaded	N/A	Category 3	Indirect Exposure	0
Food, Hydration, Shelter		US HWY 64	\$141,700	0	X Unshaded	N/A	Category 4	Indirect Exposure	0
Food, Hydration, Shelter		US HWY 64	\$141,700	0	X Unshaded	N/A	Category 4	Indirect Exposure	0
Food, Hydration, Shelter		US HWY 64	\$141,700	0	X Unshaded	N/A	Category 4	Indirect Exposure	0
Food, Hydration, Shelter		US HWY 64	\$141,700	0	X Unshaded	N/A	Category 4	Indirect Exposure	0
Food, Hydration, Shelter		US HWY 64	\$141,700	0	X Unshaded	N/A	Category 4	Indirect Exposure	0
Food, Hydration, Shelter		US HWY 64	\$141,700	0	X Unshaded	N/A	Category 4	Indirect Exposure	0
Food, Hydration, Shelter		US HWY 64	\$141,700	0	X Unshaded	N/A	Category 3	Direct Exposure	2
Food, Hydration, Shelter		US HWY 64	\$141,700	0	X Unshaded	N/A	Category 4	Indirect Exposure	0
Food, Hydration, Shelter		US HWY 64	\$141,700	0	X Unshaded	N/A	Category 3	Direct Exposure	2
Food, Hydration, Shelter		Railroad Bed Rd	\$18,400	0	X Unshaded	N/A	Category 3	Critical Fireshed	2
Food, Hydration, Shelter		Railroad Bed Rd	\$18,400	0	X Unshaded	N/A	Category 4	Direct Exposure	2
Food, Hydration, Shelter		Railroad Bed Rd	\$18,400	0	X Unshaded	N/A	Category 3	Indirect Exposure	0
Food, Hydration, Shelter		401 E Mill Pond Rd	\$1,560,000	0	X Unshaded	N/A	Category 3	Indirect Exposure	0
Town of Creswell									
Safety & Security	The Creswell Volunteer Fire Department, Inc.	109 West Main Street	\$69,900	0.0	X Shaded	N/A	Category 2	Indirect Exposure	0
Health & Medical	Creswell Volunteer Fire Department Incorporated	109 WEST MAIN STREET	\$69,900	0.0	X Shaded	N/A	Category 2	Indirect Exposure	0
Water Systems	Creswell Town Of	110 Palmentto	\$82,000	0.0	X Unshaded	N/A	Category 2	Indirect Exposure	0
Water Systems	Creswell Town Of	110 Palmentto	\$400	0.0	X Unshaded	N/A	Category 2	Sources of Ember Load to Buildings	2
Food, Hydration, Shelter		Unknown	\$88,441	0.1	AE	N/A	Category 1	Indirect Exposure	0
Food, Hydration, Shelter		Unknown	\$23,311	1.1	AE	N/A	Category 2	Indirect Exposure	0
Food, Hydration, Shelter		Unknown	\$57,984	0.0	X Shaded	N/A	Category 1	Direct Exposure	2
Food, Hydration, Shelter	Creswell High School	-	\$2,151,900	1.3	AE	N/A	Category 1	Indirect Exposure	0
Food, Hydration, Shelter		Unknown	\$92,013	0.0	X Unshaded	N/A	Category 2	Indirect Exposure	0
Food, Hydration, Shelter		Unknown	\$85,629	0.0	X Shaded	N/A	Category 2	Indirect Exposure	0

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FEMA Lifeline	Facility Name	Address	Structure Value	Flood Depth	Flood Zone	Min. Sea Level Rise	Min. Storm Surge Cat.	High WUI Exposure	Fire Intensity
Food, Hydration, Shelter		Unknown	\$11,706	2.2	AE	3ft SLR	Category 1	Indirect Exposure	0
Town of Plymouth									
Safety & Security	Plymouth Fire Department	775 US Highway 64 East	\$411,400	0	X Unshaded	N/A	Category 5	Indirect Exposure	0
Safety & Security	Plymouth Police Department	132 East Water Street	\$116,200	0	X Shaded	N/A	Category 3	Indirect Exposure	0
Safety & Security	Washington County Sheriffs Department/Washington County Jail	120 Adams Street	\$18,000	0	X Unshaded	N/A	Category 5	Indirect Exposure	0
Health & Medical	Plymouth Fire Department Station 2	US HWY 64 EAST	\$411,400	0	X Unshaded	N/A	Category 5	Indirect Exposure	0
Health & Medical	Washington County Emergency Medical Services	958 US HWY 64 EAST	\$2,817,900	0	X Unshaded	N/A	Category 5	Indirect Exposure	0
Health & Medical	Washington County Hospital	958 US Hwy 64 East	\$2,817,900	0	X Unshaded	N/A	Category 5	Indirect Exposure	0
Water Systems	Plymouth Water System	809 Washington Street	\$19,400	0	X Unshaded	N/A	Category 4	Indirect Exposure	0
Water Systems	Domtar Resource Bldg	-	\$1,044,000	3.0	AE	N/A	Category 2	Direct Exposure	3
Food, Hydration, Shelter		800 E Main St	\$2,172,100	0	X Unshaded	N/A	Category 5	Indirect Exposure	0
Food, Hydration, Shelter		800 E Main St	\$2,172,100	0	X Unshaded	N/A	Category 4	Indirect Exposure	0
Town of Roper									
Safety & Security	Roper Fire Department, Inc.	7121 NC Highway 32 North	\$89,900	0	X Unshaded	N/A	Category 3	Direct Exposure	2
Safety & Security	Roper Police Department	301 West Buncombe Street	\$46,500	0	X Unshaded	N/A	Category 3	Indirect Exposure	0
Health & Medical	Roper Volunteer Fire Department Incorporated	410 State HWY 32 North	\$89,900	0	X Unshaded	N/A	Category 3	Direct Exposure	2
Water Systems		Unknown	\$37,250	0	X Unshaded	N/A	N/A	Indirect Exposure	0
Water Systems		Unknown	\$2,798	0	X Unshaded	N/A	Category 4	Indirect Exposure	0
Water Systems		Unknown	\$83,118	0	X Unshaded	N/A	Category 4	Indirect Exposure	0

E.2 RISK ASSESSMENT

This section contains a summary of the County's asset inventory as well as hazard profile and vulnerability assessment for those hazards that are spatially defined and have variations in risk that could be evaluated quantitatively on a jurisdictional level. The hazards included in this section are: Flooding, Hurricanes & Coastal Hazards, and Wildfire.

E.2.1 FLOODING

Table E.6 details the acreage of Washington County's total area by jurisdiction and flood zone on the Effective DFIRM. Per this assessment, at 33 percent, the Town of Plymouth has the largest proportion of its land area within the mapped 1%-annual-chance floodplain. Overall, approximately 15.5 percent of the county's total area falls within the SFHA.

Table E.6 – Flood Zone Acreage by Jurisdiction, Washington County

Flood Zone	Acreage	Percent of Total (%)
Unincorporated Washington County		
Zone AE	37,912.1	14.2%
Zone AO	13.4	0.0%
Zone VE	2,917.1	1.1%
Zone X Shaded	6,615.0	2.5%
Zone X Unshaded	193,389.4	72.5%
Open Water	25,745.3	9.7%
Total	266,592.2	--
Creswell		
Zone AE	79.4	21.9%
Zone X Shaded	93.7	25.8%
Zone X Unshaded	189.7	52.3%
Total	362.9	--
Plymouth		
Zone AE	838.3	33.2%
Zone X Shaded	227.7	9.0%
Zone X Unshaded	1,457.3	57.8%
Total	2,523.3	--
Roper		
Zone AE	107.8	19.9%
Zone X Shaded	68.8	12.7%
Zone X Unshaded	365.3	67.4%
Total	541.9	--
Washington County Total		
Zone AE	38,937.7	14.4%
Zone AO	13.4	0.0%
Zone VE	2,917.1	1.1%
Zone X Shaded	7,005.2	2.6%
Zone X Unshaded	195,401.7	72.4%
Open Water	25,745.3	9.5%

Flood Zone	Acreage	Percent of Total (%)
Total	270,020.3	--

Source: FEMA Effective DFIRM

Figure E.5 through Figure E.8 reflect the effective mapped flood hazard zones for all jurisdictions with land in the Special Flood Hazard Area in Washington County, and Figure E.9 through Figure E.12 displays the depth of flooding estimated to occur in these areas during the 1%-annual-chance flood.

Table E.7 provides building counts and values for critical facilities by flood zone in Washington County and participating jurisdictions.

Table E.7 – Critical Facilities Exposed to Flooding by Event and Jurisdiction

Flood Zone	Critical Facility Count	Structure Value
Unincorporated Washington County		
Zone AE	8	\$323,039
Zone X (500-year)	7	\$2,125,268.98
Zone X (unshaded)	87	\$19,817,346.21
Total	102	\$22,265,654.19
Creswell		
Zone AE	4	\$2,275,357.73
Zone X (500-year)	4	\$283,413
Zone X (unshaded)	3	\$174,413
Total	11	\$2,733,183.73
Plymouth		
Zone AE	1	\$1,044,000
Zone X (500-year)	1	\$116,200
Zone X (unshaded)	8	\$10,840,200
Total	10	\$12,000,400
Roper		
Zone X (unshaded)	6	\$349,466
Total	6	\$349,466
Washington County Total		
Zone AE	13	\$3,642,396.73
Zone X (500-year)	12	\$2,524,881.98
Zone X (unshaded)	104	\$31,181,425.21
Total	129	\$37,348,703.93

Source: FEMA Effective DFIRM; HMPC

Figure E.5 - FEMA Flood Hazard Areas, Unincorporated Washington County

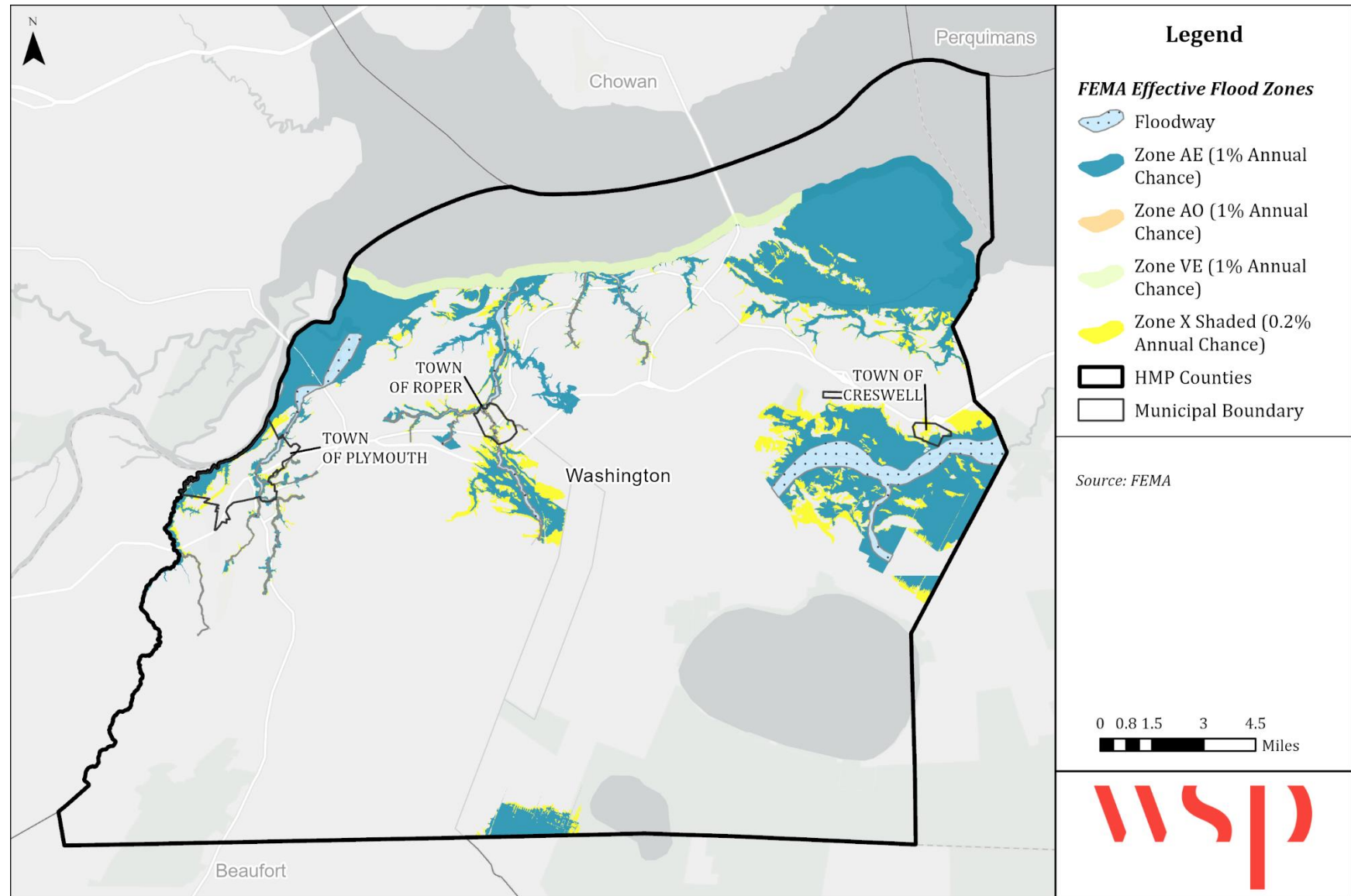


Figure E.6 - FEMA Flood Hazard Areas, Town of Creswell

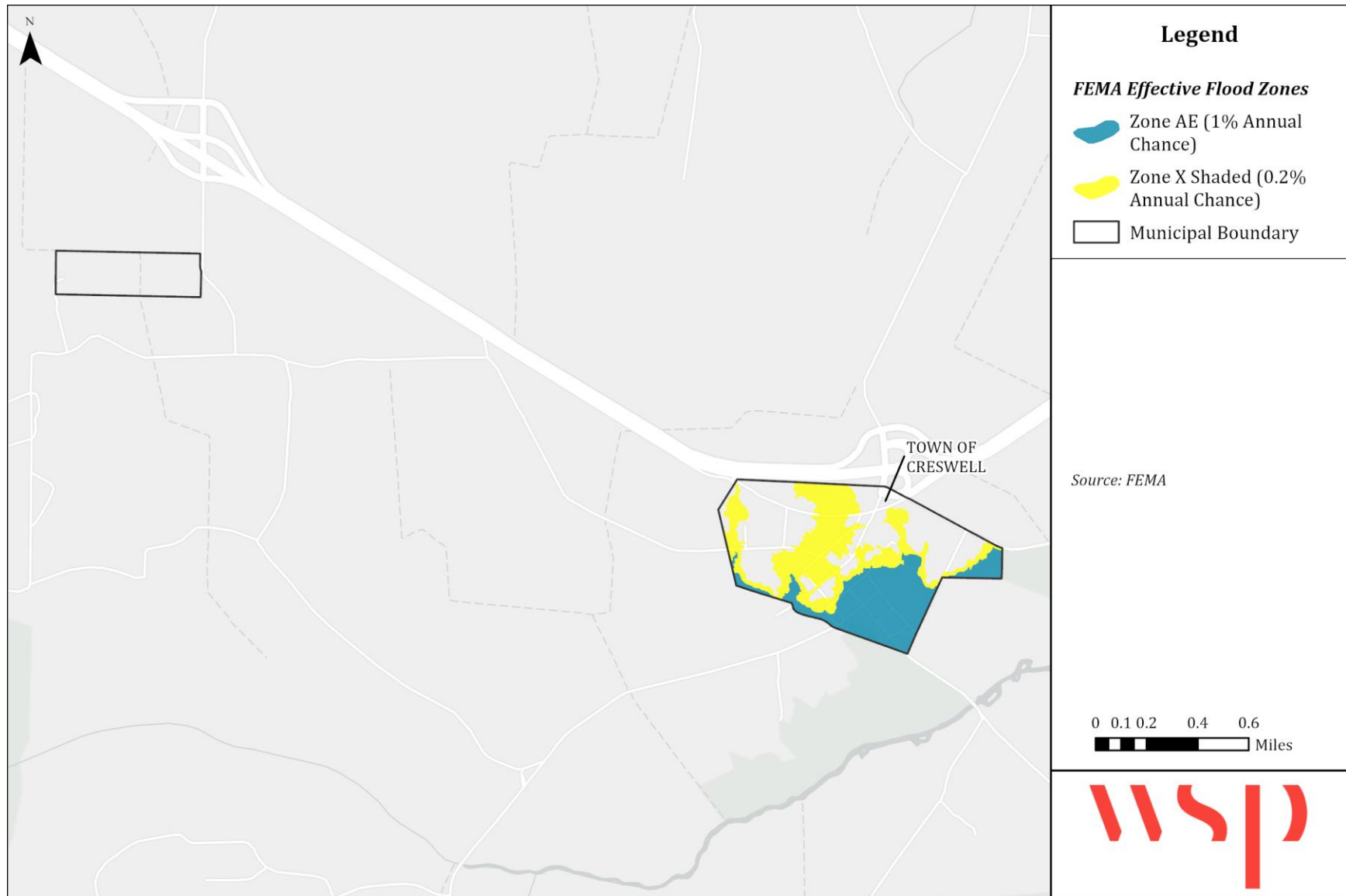


Figure E.7 - FEMA Flood Hazard Areas, Town of Plymouth

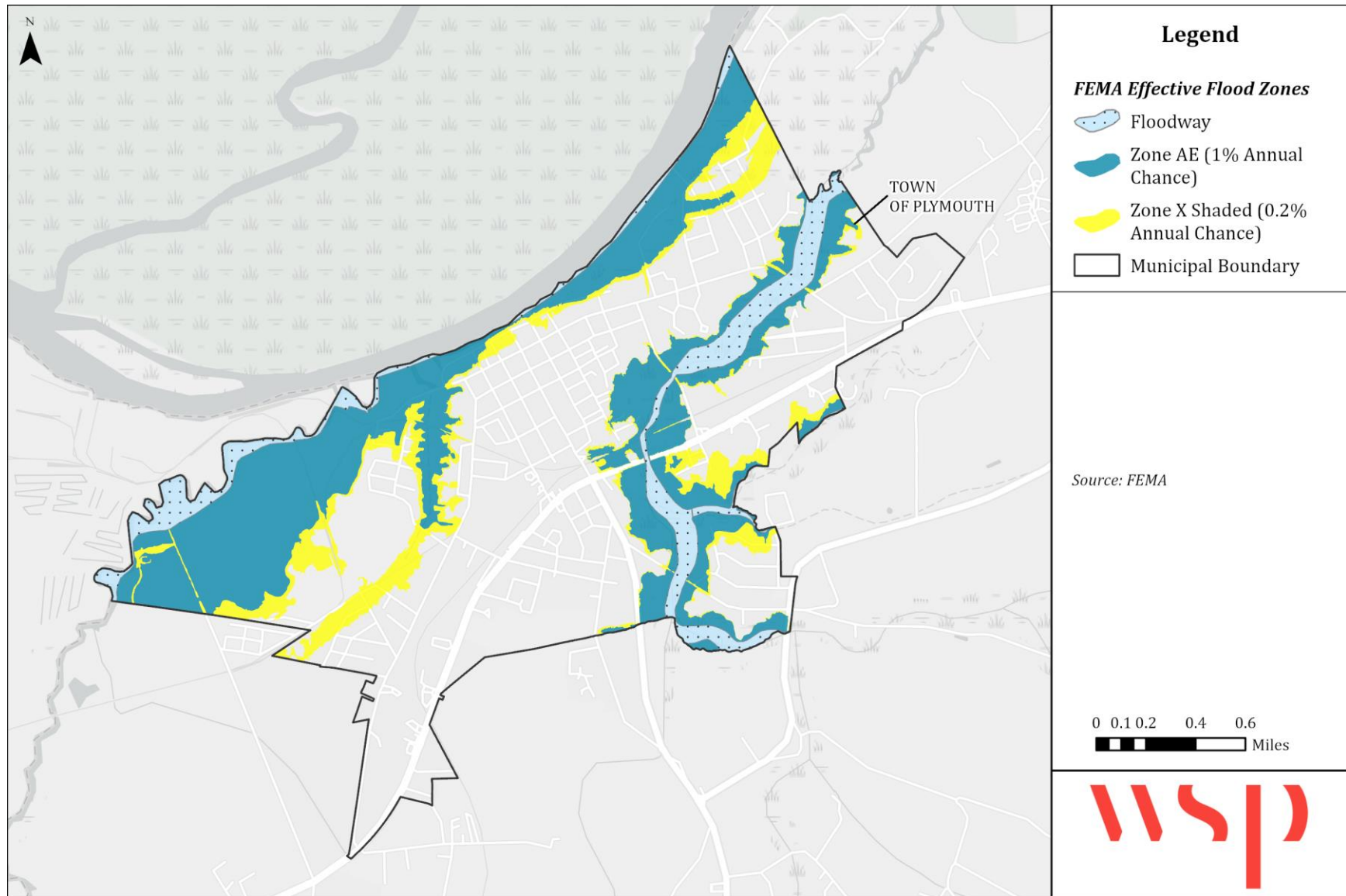


Figure E.8 - FEMA Flood Hazard Areas, Village of Roper

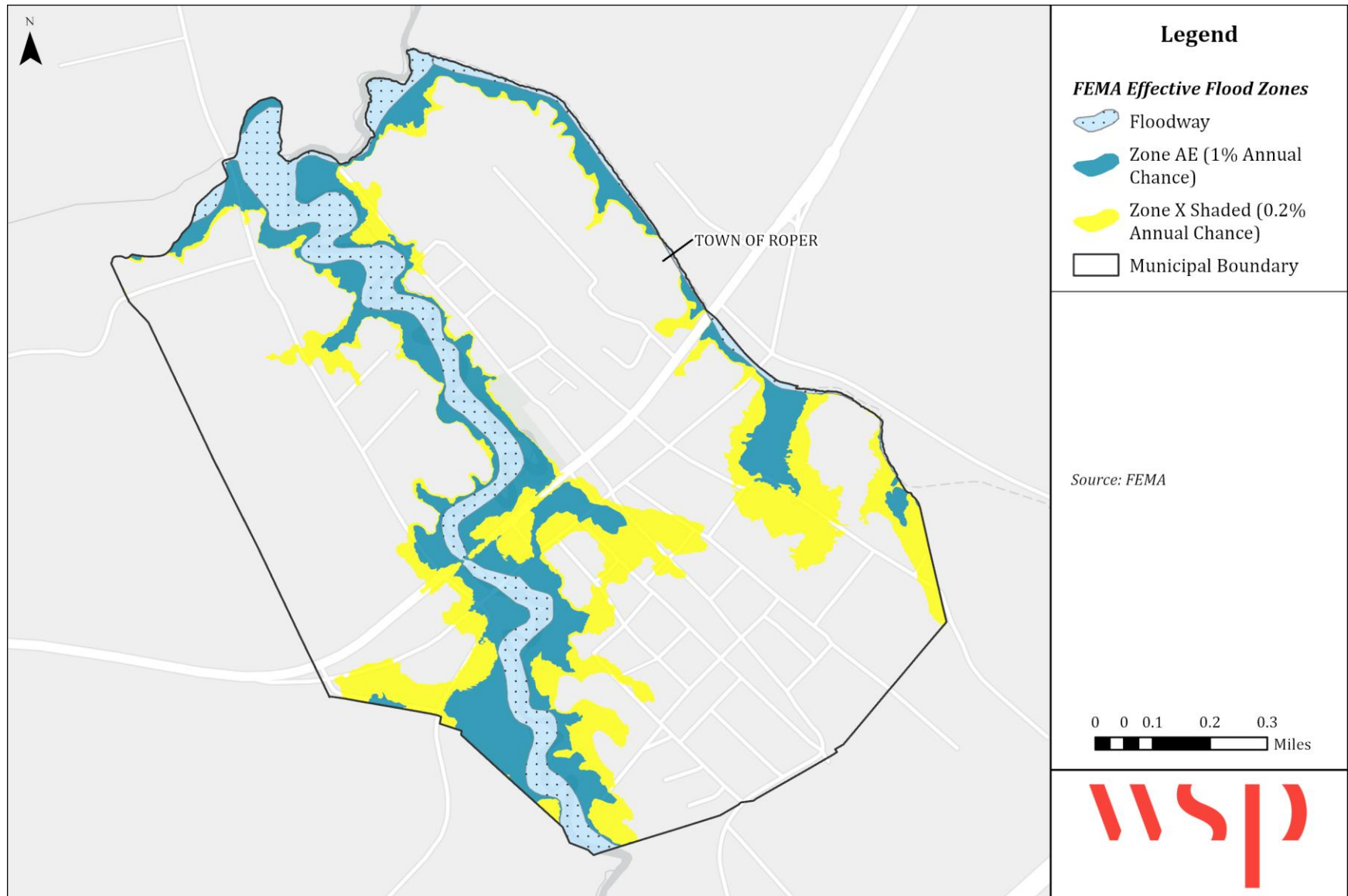


Figure E.9 - Flood Depth, 1%-Annual-Chance Floodplain, Unincorporated Washington County

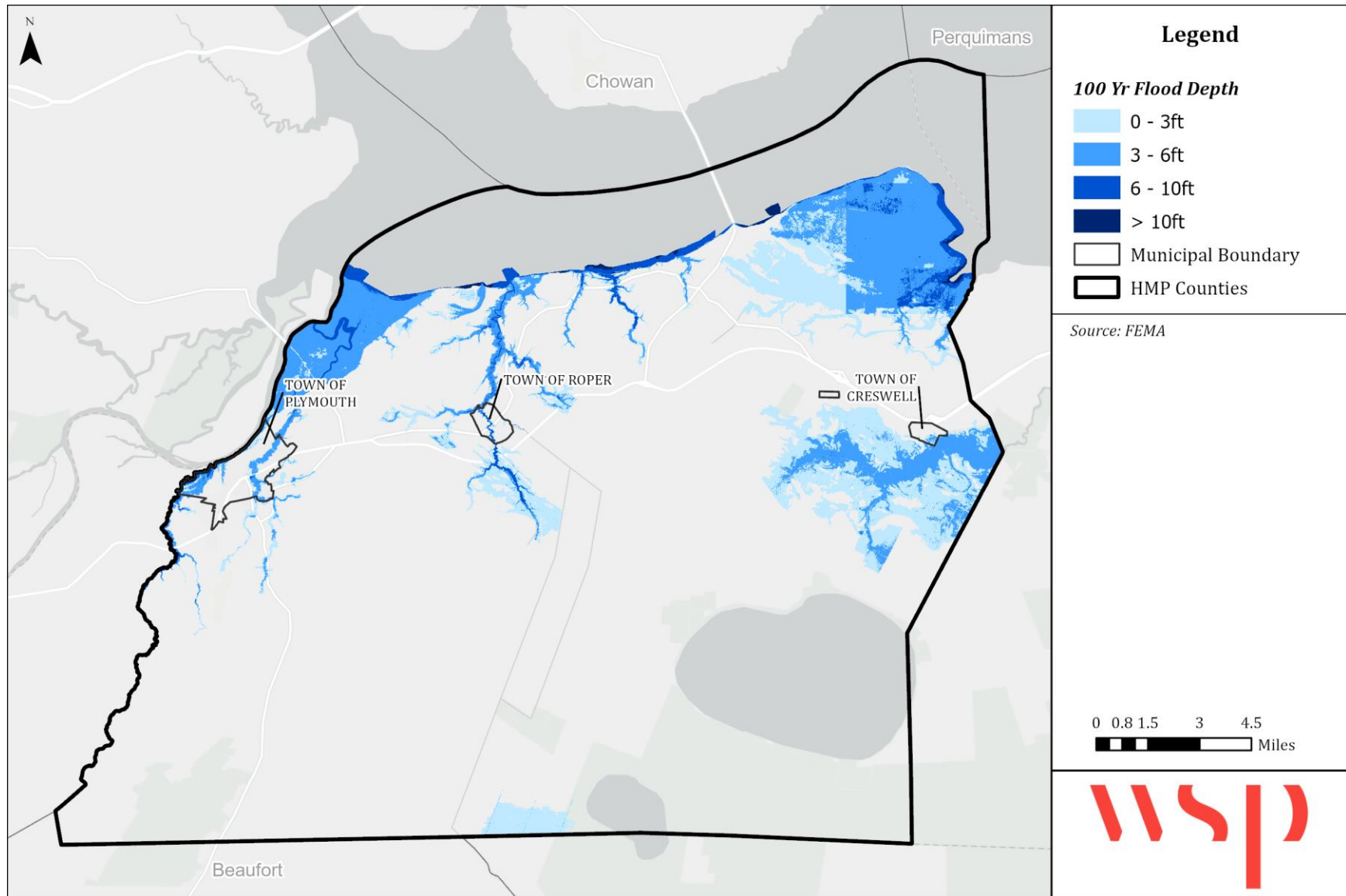


Figure E.10 – Flood Depth, 1%-Annual-Chance Floodplain, Town of Creswell

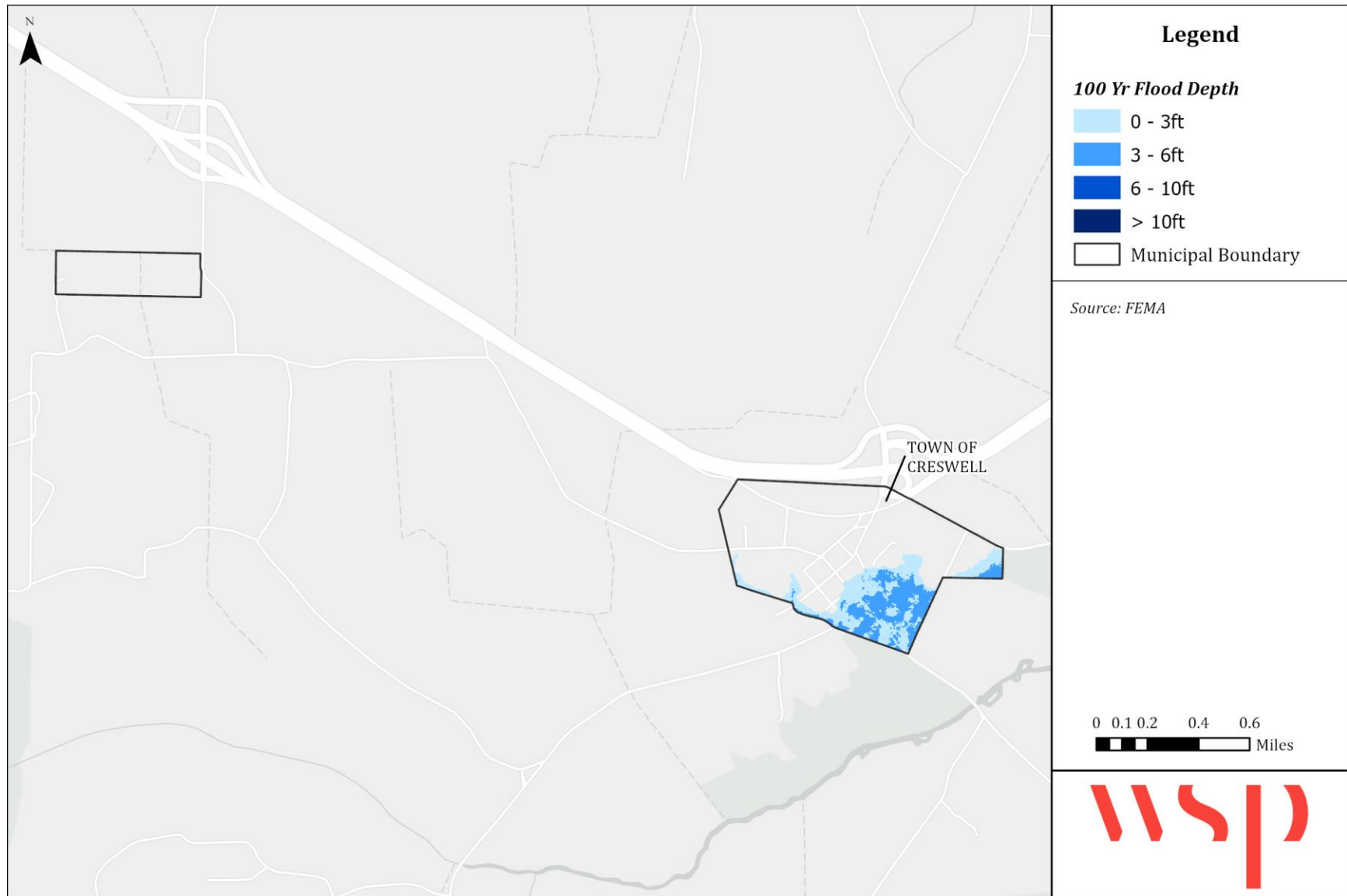


Figure E.11 – Flood Depth, 1%-Annual-Chance Floodplain, Town of Plymouth

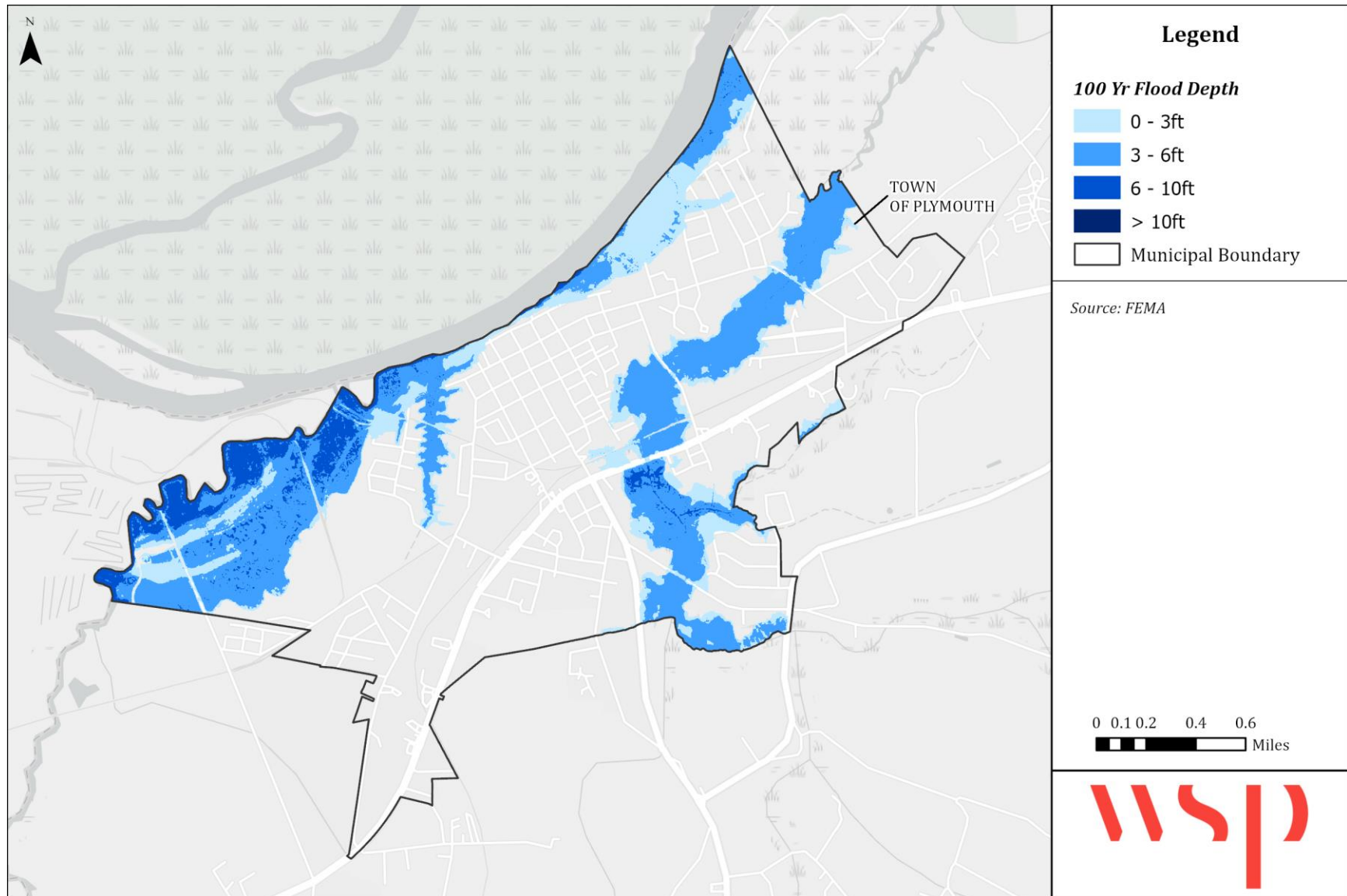
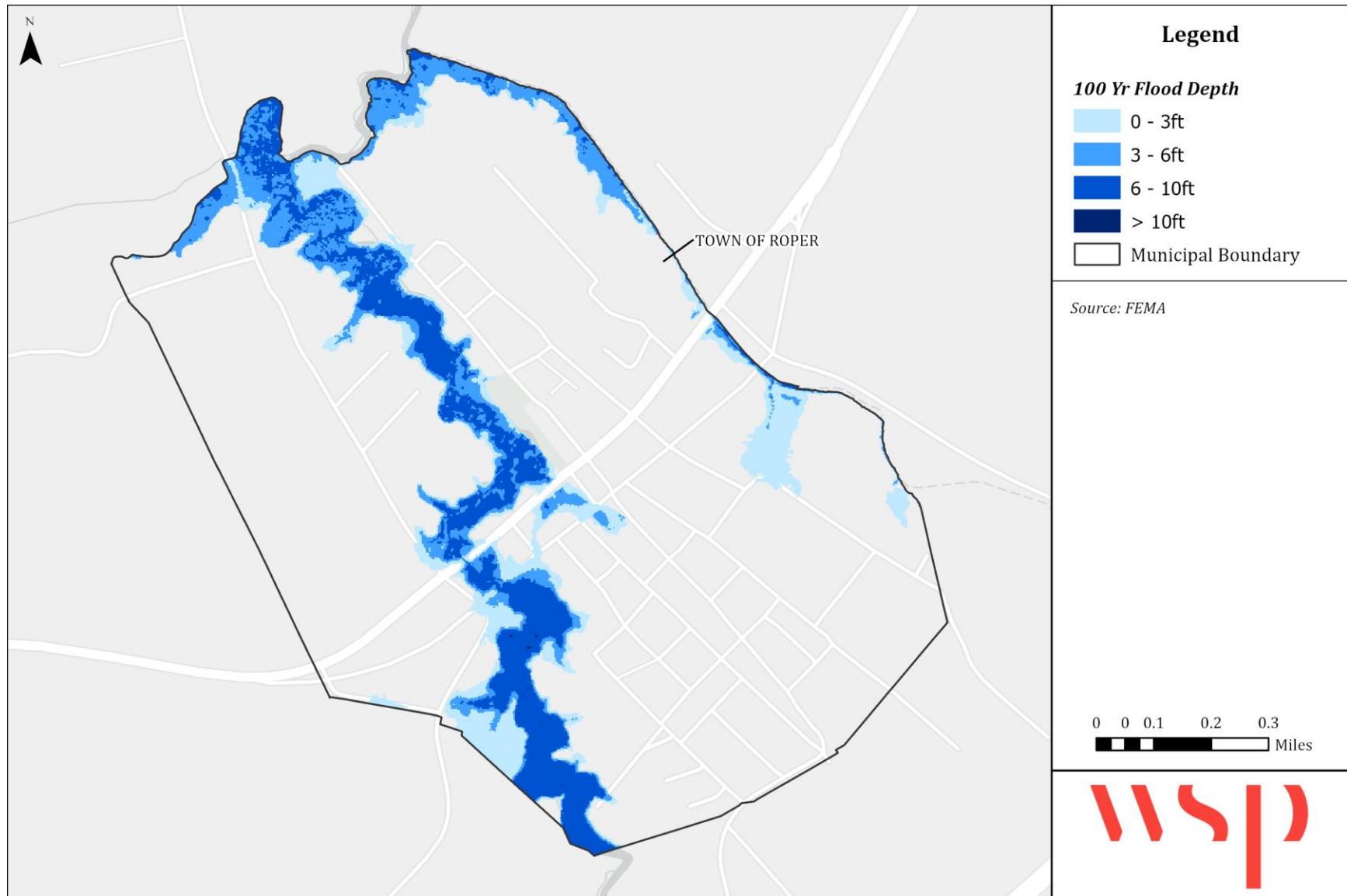


Figure E.12 – Flood Depth, 1%-Annual-Chance Floodplain, Town of Roper



FLOODPLAIN MANAGEMENT

The following tables reflect NFIP policy and claims data for Washington County and incorporated categorized by structure type, flood zone, Pre-FIRM and Post-FIRM.

Table E.8 – NFIP Policy and Claims Data by Structure Type

Structure Type	Policies in Force	Total Premium	Insurance in Force	Number of Closed Paid Losses	Total of Closed Paid Losses
Washington County Unincorporated Area					
Single Family	84	\$58,585	\$20,368,000	95	\$1,238,526.64
Non Residential	0	\$0	\$0	3	\$119,518.79
Total	84	\$58,585	\$20,368,000	98	\$1,358,045.43
Town of Creswell					
Single Family	8	\$5,056	\$1,518,000	6	\$25,575.37
Total	8	\$5,056	\$1,518,000	6	\$25,575.37
Town of Plymouth					
Single Family	35	\$24,131	\$9,064,000	40	\$435,851.07
Non Residential	5	\$5,577	\$2,391,000	8	\$866,196.81
Total	40	\$29,708	\$11,455,000	48	\$1,302,047.88
Town of Roper					
Single Family	6	\$3,812	\$1,379,000	5	\$83,200.26
Total	6	\$3,812	\$1,379,000	5	\$83,200.26

Source: FEMA Community Information System, accessed December 2025

Table E.9 – NFIP Policy and Claims Data by Flood Zone

Flood Zone	Policies in Force	Total Premium	Insurance in Force	Number of Closed Paid Losses	Total of Closed Paid Losses
Washington County Unincorporated Area					
A01-30 & AE Zones	54	\$36,501	\$11,017,000	84	\$945,802.37
A Zones	1	\$621	\$250,000	2	\$12,274.32
B, C & X Zone					
Standard	29	\$21,463	\$9,101,000	2	\$157,406.42
Preferred	0	\$0	\$0	10	\$242,562.32
Total	84	\$58,585	\$20,368,000	98	\$1,358,045.43
Town of Creswell					
A01-30 & AE Zones	5	\$3,380	\$672,000	5	\$21,833.16
B, C & X Zone					
Standard	3	\$1,676	\$846,000	0	\$0.00
Preferred	0	\$0	\$0	1	\$3,742.21
Total	8	\$5,056	\$1,518,000	6	\$25,575.37
Town of Plymouth					
A01-30 & AE Zones	26	\$18,278	\$5,911,000	33	\$813,527.59
A Zones	1	\$669	\$250,000	4	\$20,097.38
B, C & X Zone					
Standard	13	\$10,761	\$5,294,000	5	\$440,084.03
Preferred	0	\$0	\$0	6	\$28,338.88
Total	40	\$29,708	\$11,455,000	48	\$1,302,047.88

Flood Zone	Policies in Force	Total Premium	Insurance in Force	Number of Closed Paid Losses	Total of Closed Paid Losses
Town of Roper					
A01-30 & AE Zones	3	\$1,849	\$539,000	1	\$0.00
B, C & X Zone					
Standard	3	\$1,963	\$840,000	2	\$72,533.67
Preferred	0	\$0	\$0	2	\$10,666.59
Total	6	\$3,812	\$1,379,000	5	\$83,200.26

Source: FEMA Community Information System, accessed December 2025

Table E.10 – NFIP Policy and Claims Data Pre-FIRM

Flood Zone	Policies in Force	Total Premium	Insurance in Force	Number of Closed Paid Losses	Total of Closed Paid Losses
Washington County Unincorporated Area					
A01-30 & AE Zones	22	\$16,427	\$4,371,000	43	\$649,555.62
A Zones	1	\$621	\$250,000	2	\$12,274.32
B, C & X Zone	19	\$13,397	\$5,766,000	12	\$399,968.74
Standard	19	\$13,397	\$5,766,000	2	\$157,406.42
Preferred	0	\$0	\$0	10	\$242,562.32
Total	42	\$30,445	\$10,387,000	57	\$1,061,798.68
Town of Creswell					
A01-30 & AE Zones	2	\$1,604	\$367,000	5	\$21,833.16
B, C & X Zone	3	\$1,676	\$846,000	1	\$3,742.21
Standard	3	\$1,676	\$846,000	0	\$0.00
Preferred	0	\$0	\$0	1	\$3,742.21
Total	5	\$3,280	\$1,213,000	6	\$25,575.37
Town of Plymouth					
A01-30 & AE Zones	16	\$11,468	\$3,291,000	17	\$725,095.50
A Zones	1	\$669	\$250,000	0	\$0.00
B, C & X Zone	10	\$8,378	\$3,729,000	10	\$456,632.04
Standard	10	\$8,378	\$3,729,000	4	\$428,293.16
Preferred	0	\$0	\$0	6	\$28,338.88
Total	27	\$20,515	\$7,270,000	27	\$1,181,727.54
Town of Roper					
A01-30 & AE Zones	2	\$1,412	\$418,000	0	\$0.00
B, C & X Zone	3	\$1,963	\$840,000	4	\$83,200.26
Standard	3	\$1,963	\$840,000	2	\$72,533.67
Preferred	0	\$0	\$0	2	\$10,666.59
Total	5	\$3,375	\$1,258,000	4	\$83,200.26

Source: FEMA Community Information System, accessed December 2025

Table E.11 – NFIP Policy and Claims Data Post-FIRM

Flood Zone	Policies in Force	Total Premium	Insurance in Force	Number of Closed Paid Losses	Total of Closed Paid Losses
Washington County Unincorporated Area					
A01-30 & AE Zones	32	\$20,074	\$6,646,000	41	\$296,246.75

Flood Zone	Policies in Force	Total Premium	Insurance in Force	Number of Closed Paid Losses	Total of Closed Paid Losses
B, C & X Zone	10	\$8,066	\$3,335,000	0	\$0.00
Standard	10	\$8,066	\$3,335,000	0	\$0.00
Preferred	0	\$0	\$0	0	\$0.00
Total	42	\$28,140	\$9,981,000	41	\$296,246.75
Town of Creswell					
A01-30 & AE Zones	3	\$1,776	\$305,000	0	\$0.00
Total	3	\$1,776	\$305,000	0	\$0.00
Town of Plymouth					
A01-30 & AE Zones	10	\$6,810	\$2,620,000	16	\$88,432.09
A Zones	0	\$0	\$0	4	\$20,097.38
B, C & X Zone	3	\$2,383	\$1,565,000	1	\$11,790.87
Standard	3	\$2,383	\$1,565,000	1	\$11,790.87
Preferred	0	\$0	\$0	0	\$0.00
Total	13	\$9,193	\$4,185,000	21	\$120,320.34
Town of Roper					
A01-30 & AE Zones	1	\$437	\$121,000	1	\$0.00
Total	1	\$437	\$121,000	1	\$0.00

Source: FEMA Community Information System, accessed December 2025

E.2.2 HURRICANES AND COASTAL HAZARDS

Figure E.13 on the following page shows the estimated extent of surge by storm category according to NOAA SLOSH data that would occur in unincorporated Washington County and all participating jurisdictions. Much of the coastline along the northeastern edge of Washington County near the Albemarle Sound is at the highest risk to storm surge. However, during severe categories of storm surge inundation, the majority of Washington County is at risk to storm surge.

Figure E.14 shows the estimated inundation extents of 1 foot, 2 feet, and 3 feet of sea level rise that may occur in Washington County and participating jurisdictions. Sea level rise is likely to impact the land along the Albemarle Sound and Roanoke River.

Figure E.13 – Storm Surge Extent by Storm Category

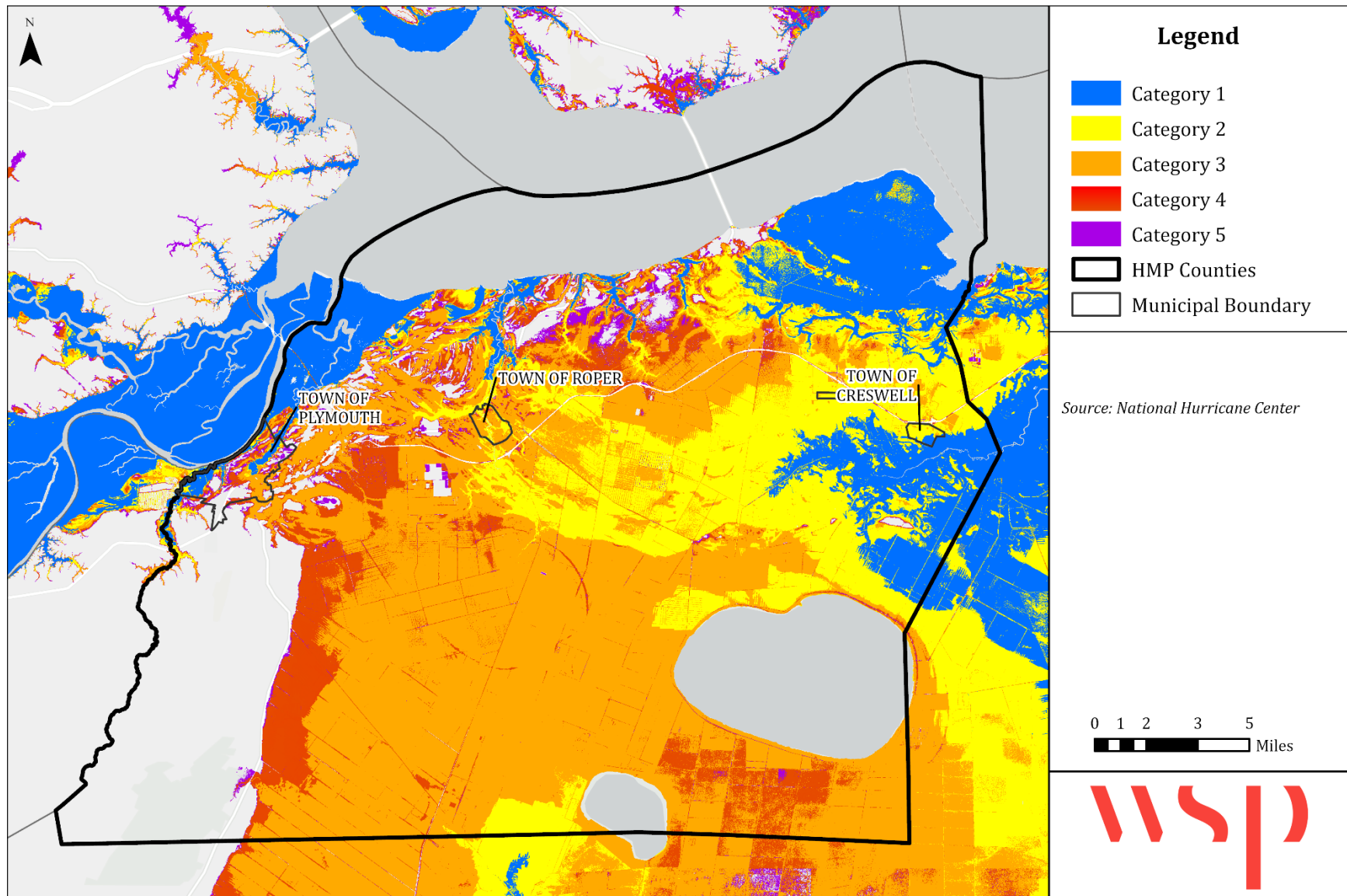
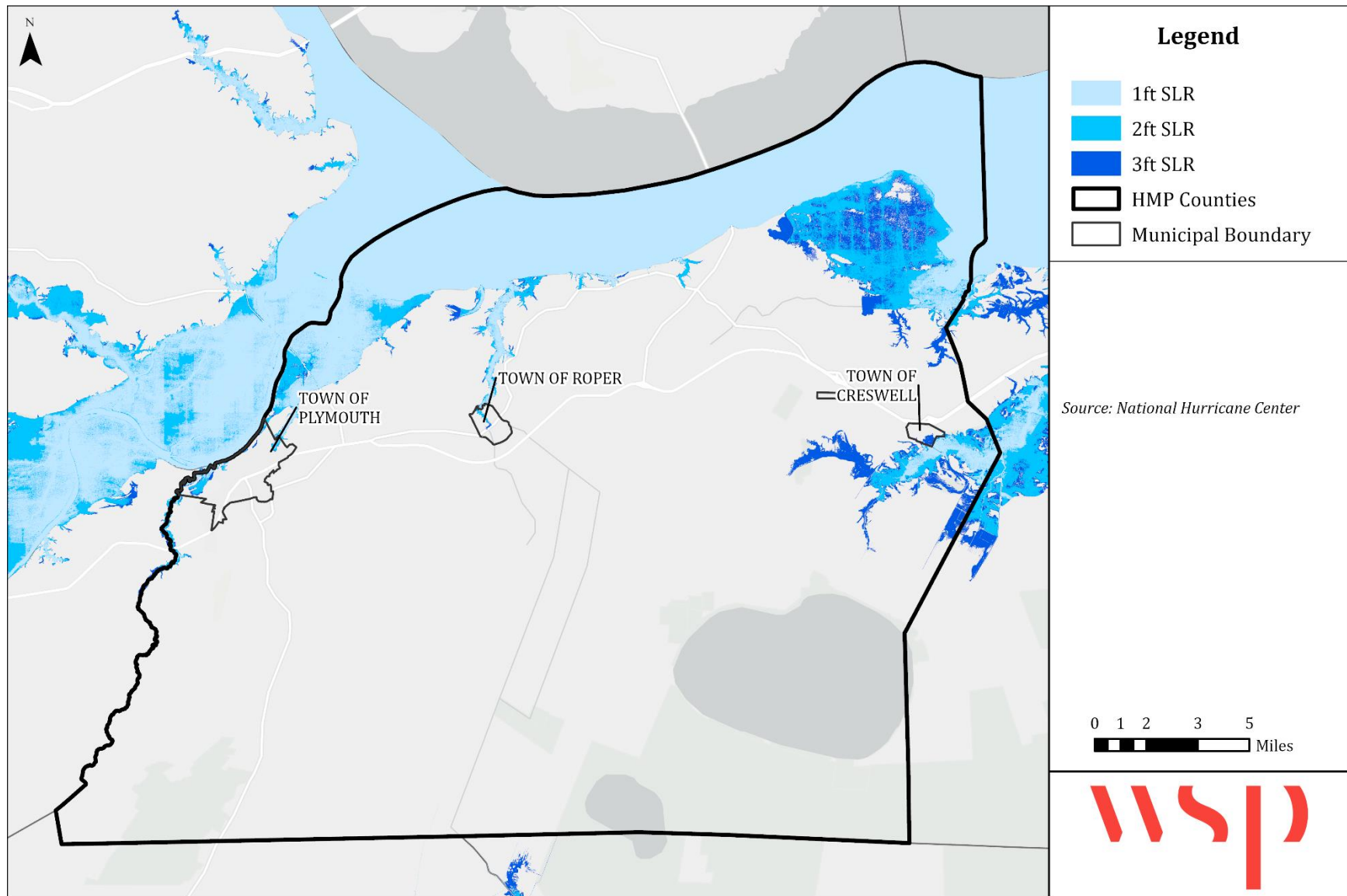


Figure E.14 – Sea Level Rise Extent



E.2.3 WILDFIRE

Table E.12 summarizes the acreage in unincorporated Washington County that falls within the Functional Wildland Urban Interface (WUI), categorized into zones that describe the wildfire risk mitigation activities appropriate for each zone. Areas in the Functional WUI are those areas where development and building structures may intermix with burnable land cover. Approximately, 3 percent of unincorporated Washington County is categorized as having direct exposure to wildfire risk and 73 percent is located within the critical fireshed of the Functional WUI.

Table E.12 – Functional Wildland Urban Interface Acreage, Unincorporated Washington County

	Functional Wildland Urban Interface (WUI) Category	Acres	Percent
	Direct Exposure	5,960	3%
	Indirect Exposure	6,481	3%
	Critical Fireshed	160,073	73%
	Sources of Ember Load to Buildings	21,024	10%
	Little to No Exposure	47	0%
	Water	26,493	12%
	Total	220,078	100%

Source: Southern Wildfire Risk Assessment

Figure E.15 through Figure E.18 depict the Functional WUI for unincorporated Washington County and all participating jurisdictions. Figure E.19 through Figure E.22 depict the Fire Intensity Scale, which indicates the potential severity of fire based on fuel loads, topography, and other factors. Figure E.23 through Figure E.26 depict Burn Probability based on landscape conditions, percentile weather, historical ignition patterns, and historical prevention and suppression efforts.

Areas of high potential fire intensity occur in the southeastern corner of the county and along the northern and eastern edges of the county. Moderate burn probability also exists in these areas with high potential fire intensity. Functional WUI areas with direct exposure to wildfire occur primarily along the northern and western edges of the county. There are many areas of overlap between high potential fire intensity, moderate burn probability, and WUI which occur primarily in the unincorporated areas of the county. Based on these correlations, there is significant exposure to wildfire in Washington County.

Table E.13 provides building counts and values for critical facilities by FEMA lifeline that are located in areas categorized with direct exposure to wildfire risk on the Functional WUI scale.

Table E.13 – Critical Facilities Exposed to Wildfire by Jurisdiction, Washington County

Type	Critical Facility Count	Structure Value
Washington County Unincorporated Area		
Food, Hydration, Shelter	22	\$1,644,246.80
Health and Medical	1	\$143,600
Safety and Security	2	\$651,500
Water Systems	3	\$1,127,951
All Categories	28	\$3,567,297.80

ANNEX E: WASHINGTON COUNTY

Type	Critical Facility Count	Structure Value
Town of Creswell		
Food, Hydration, Shelter	1	\$57,984
All Categories	1	\$57,984
Town of Plymouth		
Water Systems	1	\$1,044,000
All Categories	1	\$1,044,000
Town of Roper		
Health and Medical	1	\$89,900
Safety and Security	1	\$89,900
All Categories	2	\$179,800
County Total	32	\$4,849,081.80

Source: Southern Wildfire Risk Assessment

Figure E.15 – Functional Wildland Urban Interface, Unincorporated Washington County

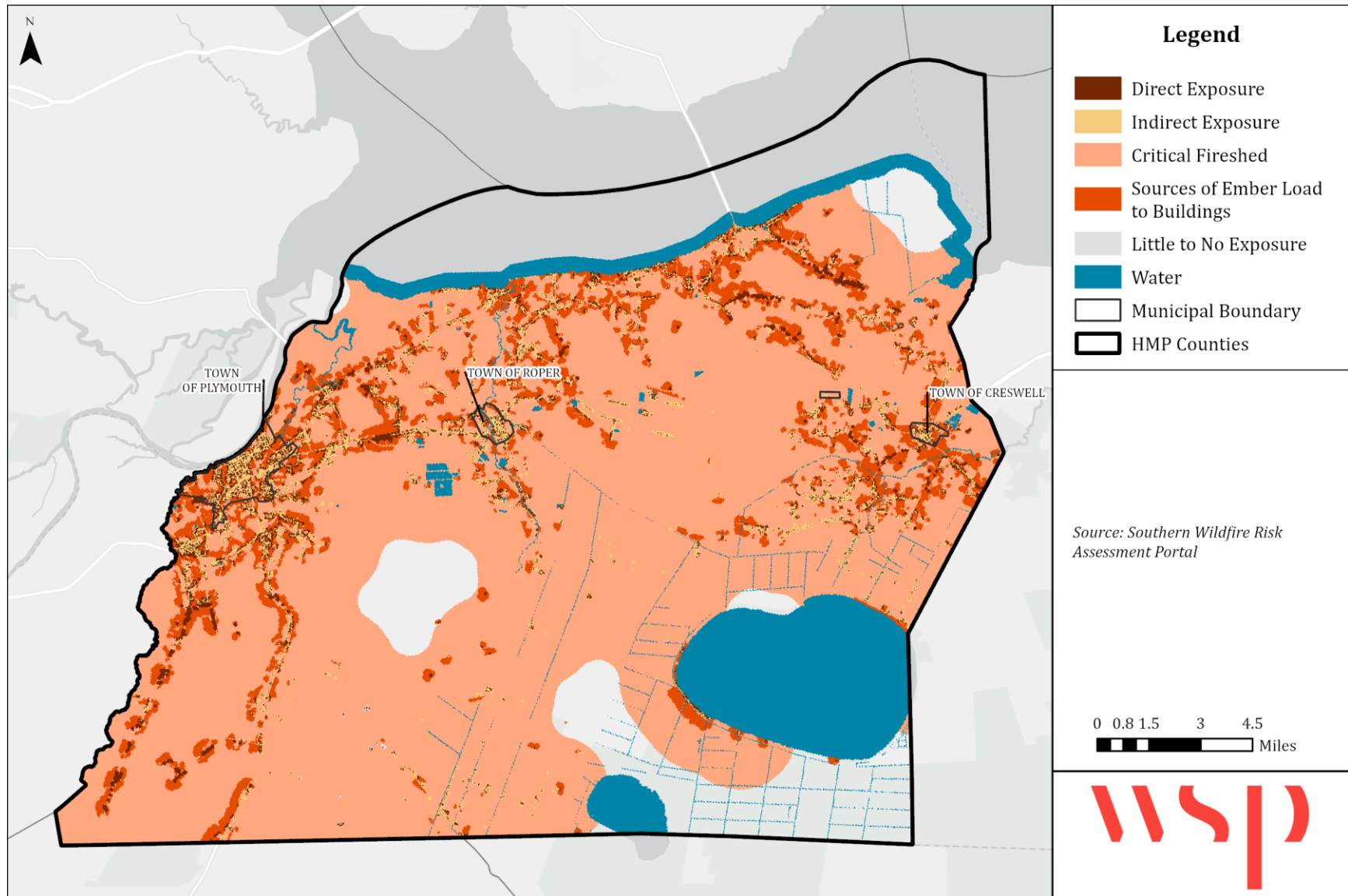


Figure E.16 – Functional Wildland Urban Interface, Town of Creswell

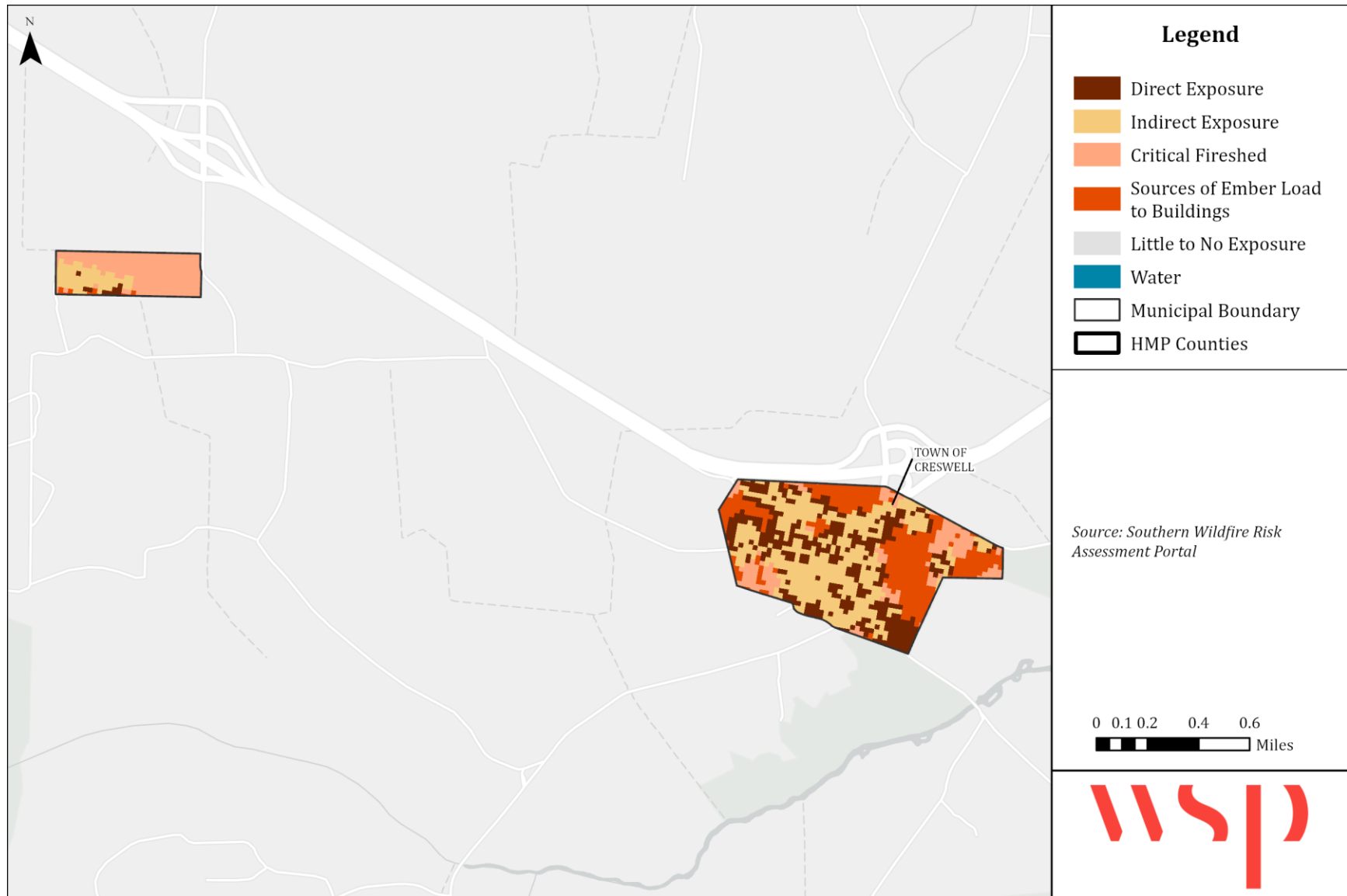


Figure E.17 – Functional Wildland Urban Interface, Town of Plymouth

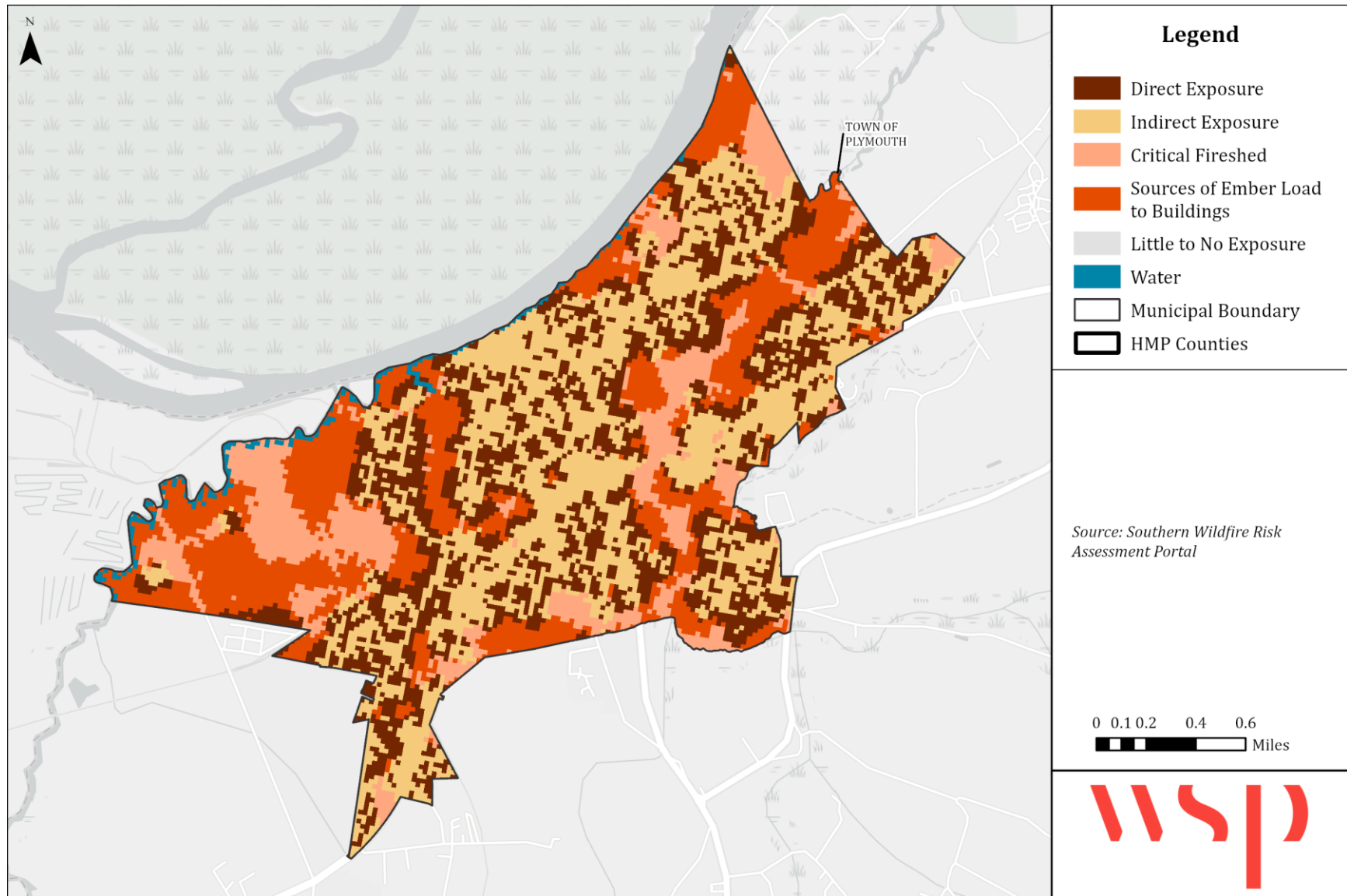


Figure E.18 – Functional Wildland Urban Interface, Town of Roper

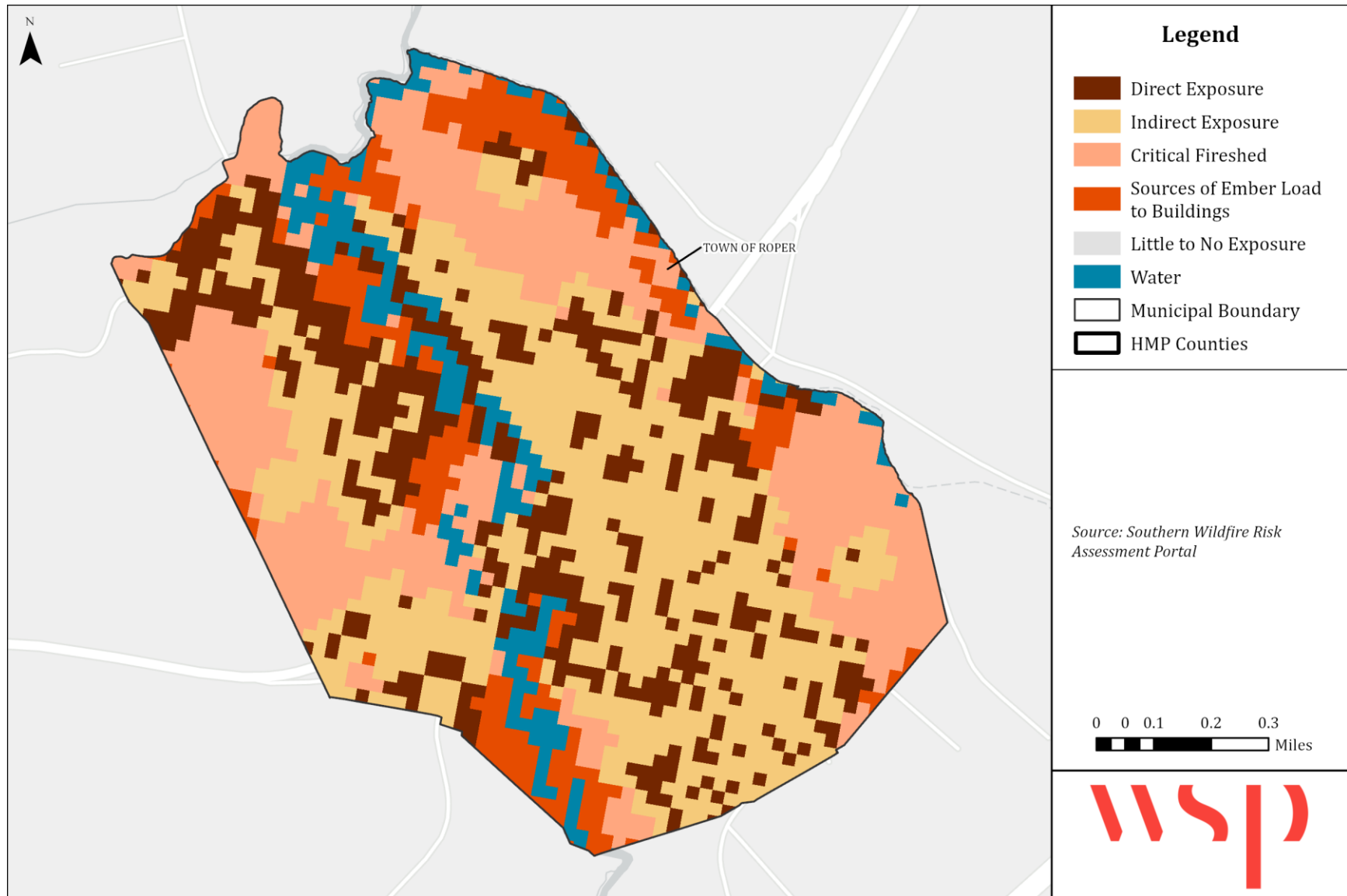


Figure E.19 – Fire Intensity Scale, Unincorporated Washington County

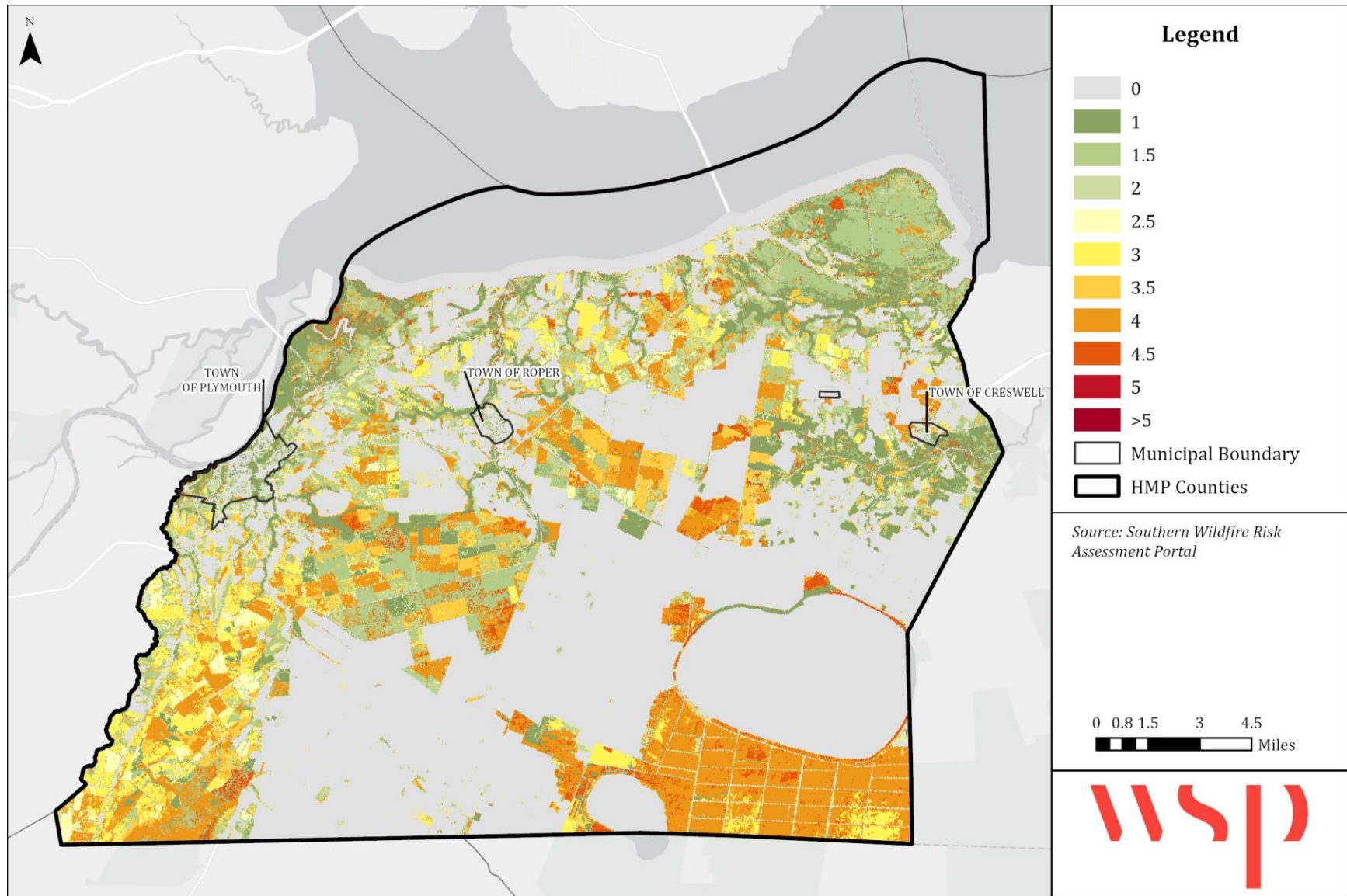


Figure E.20 - Fire Intensity Scale, Town of Creswell

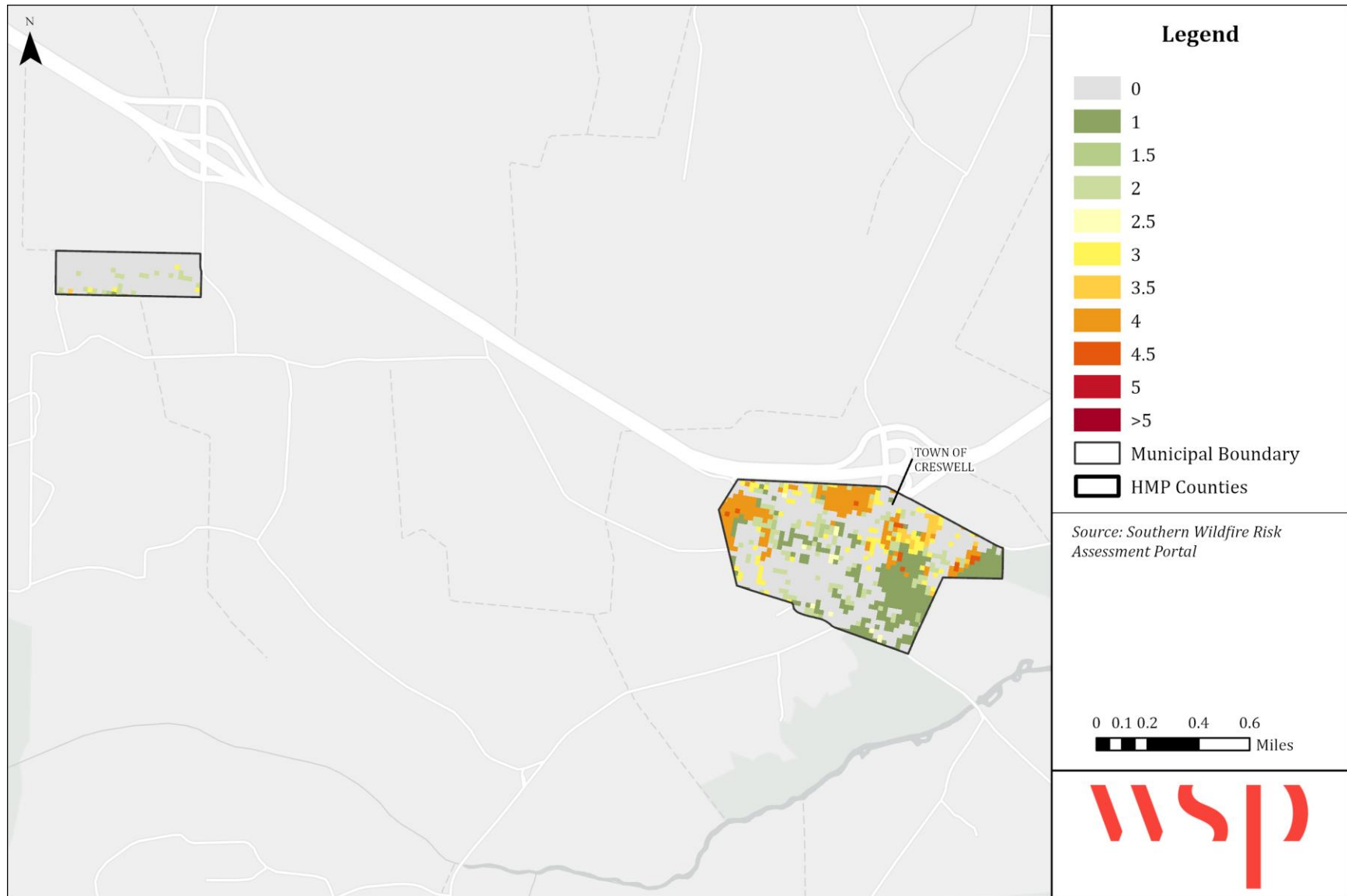


Figure E.21 – Fire Intensity Scale, Town of Plymouth

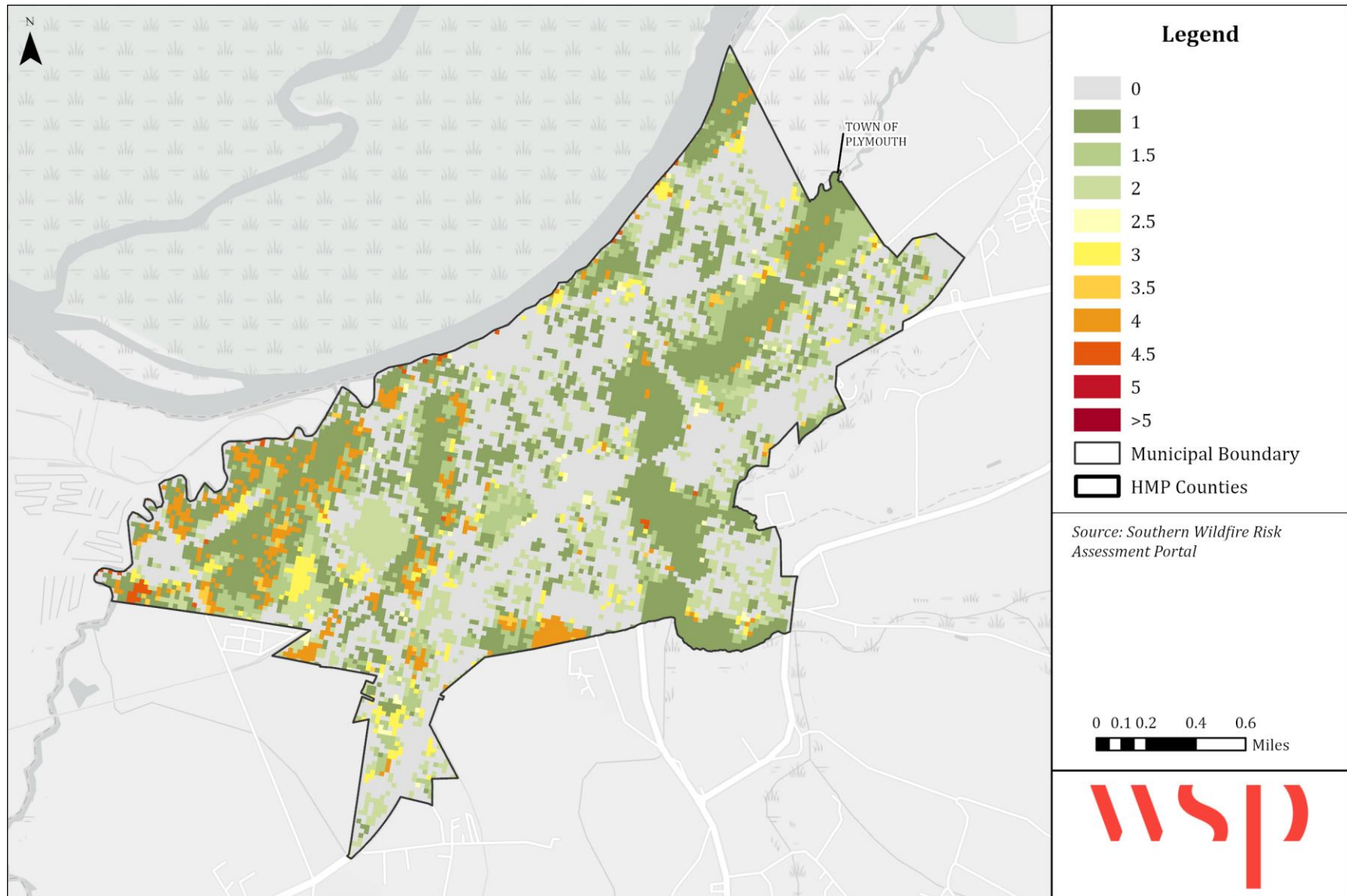


Figure E.22 – Fire Intensity Scale, Town of Roper

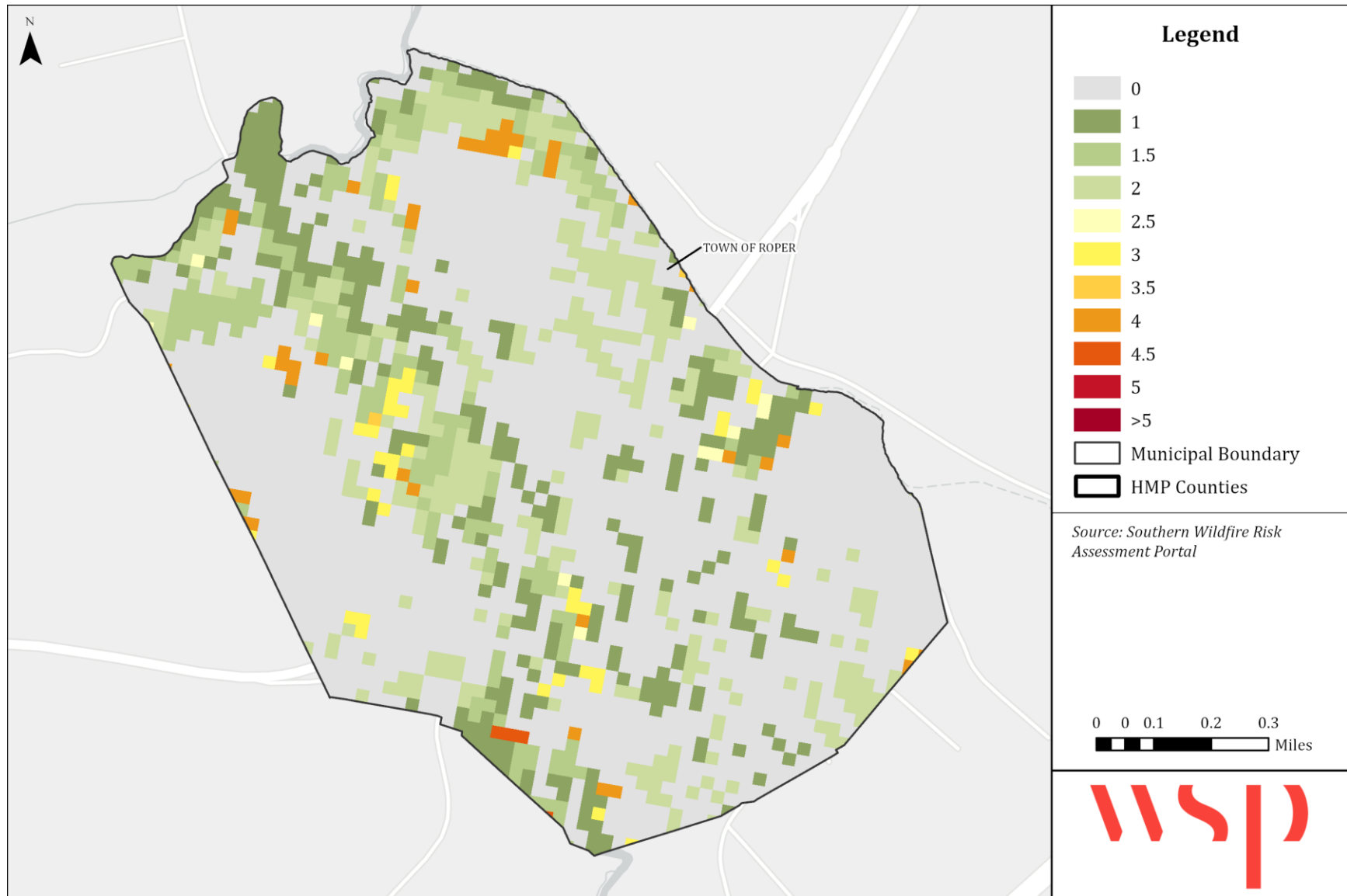


Figure E.23 – Burn Probability, Unincorporated Washington County

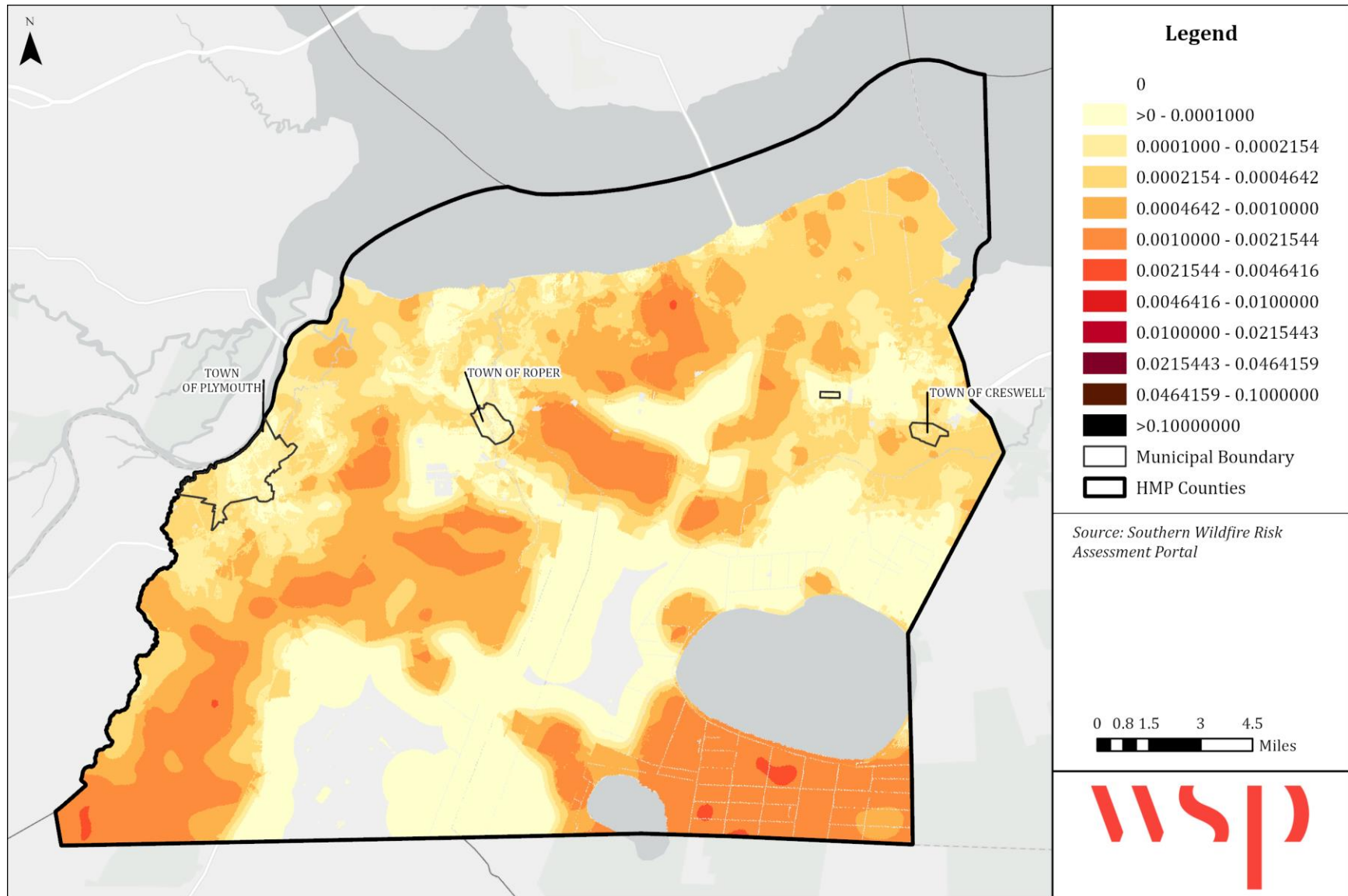


Figure E.24 – Burn Probability, Town of Creswell

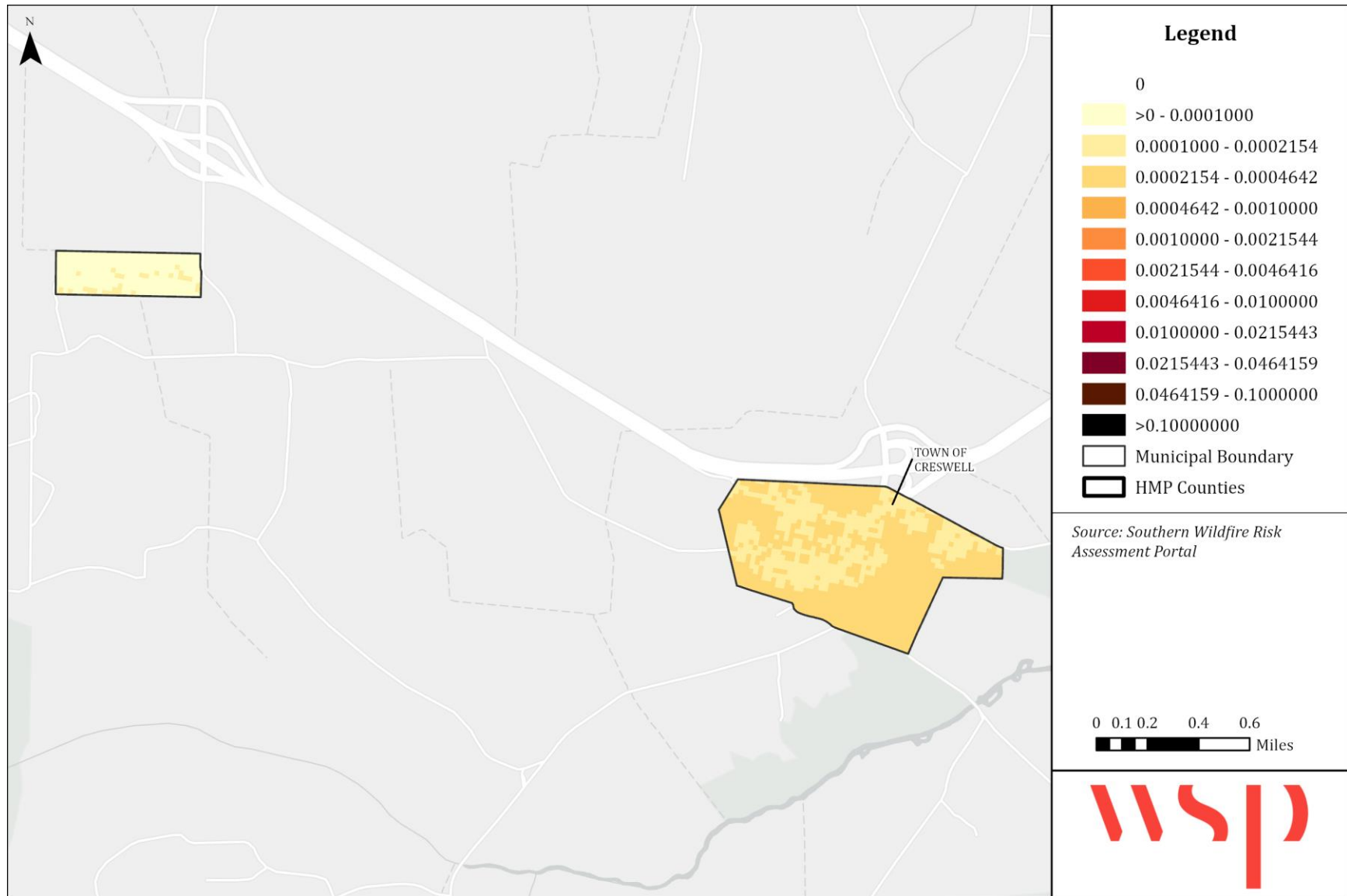


Figure E.25 – Burn Probability, Town of Plymouth

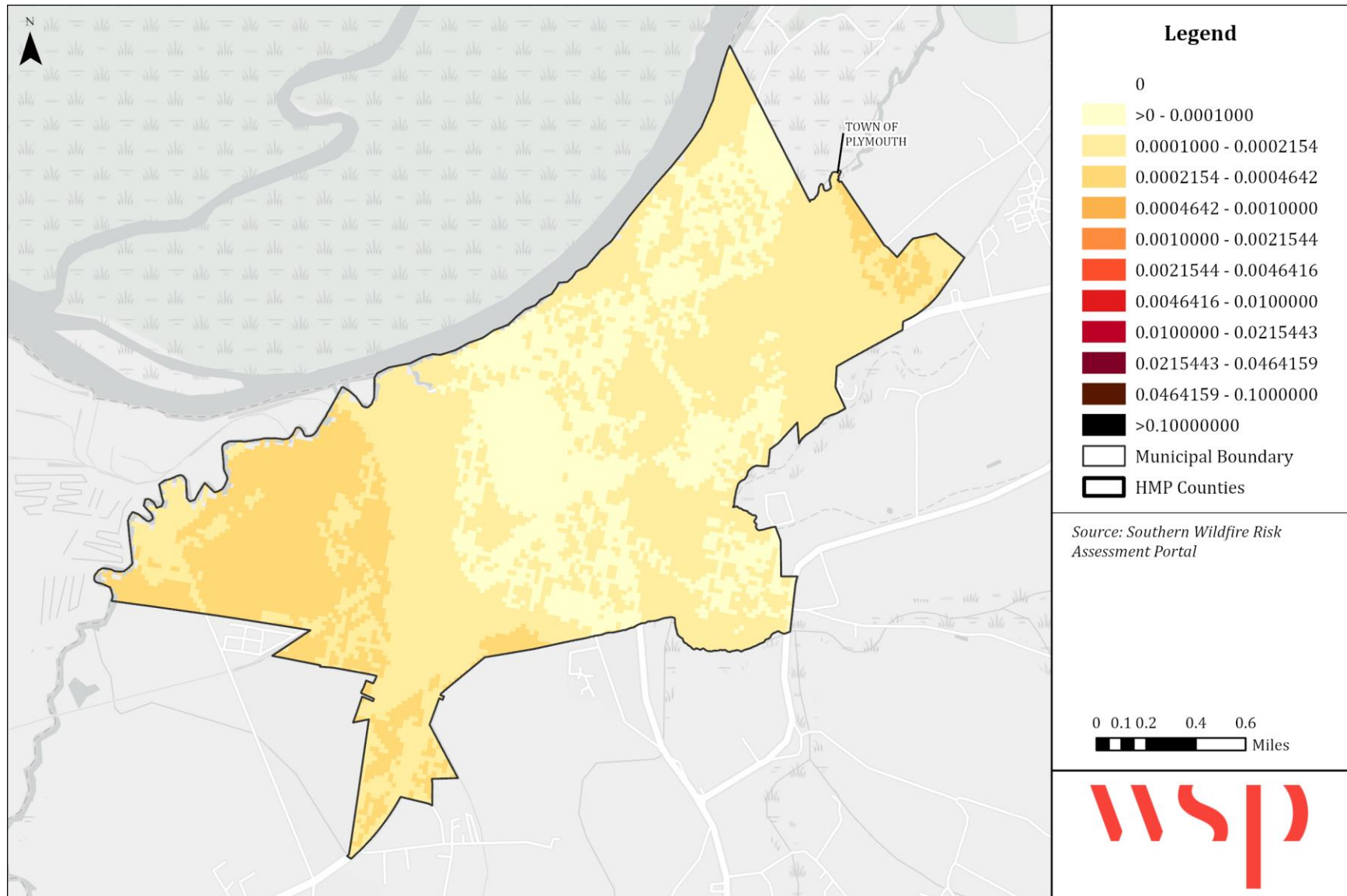
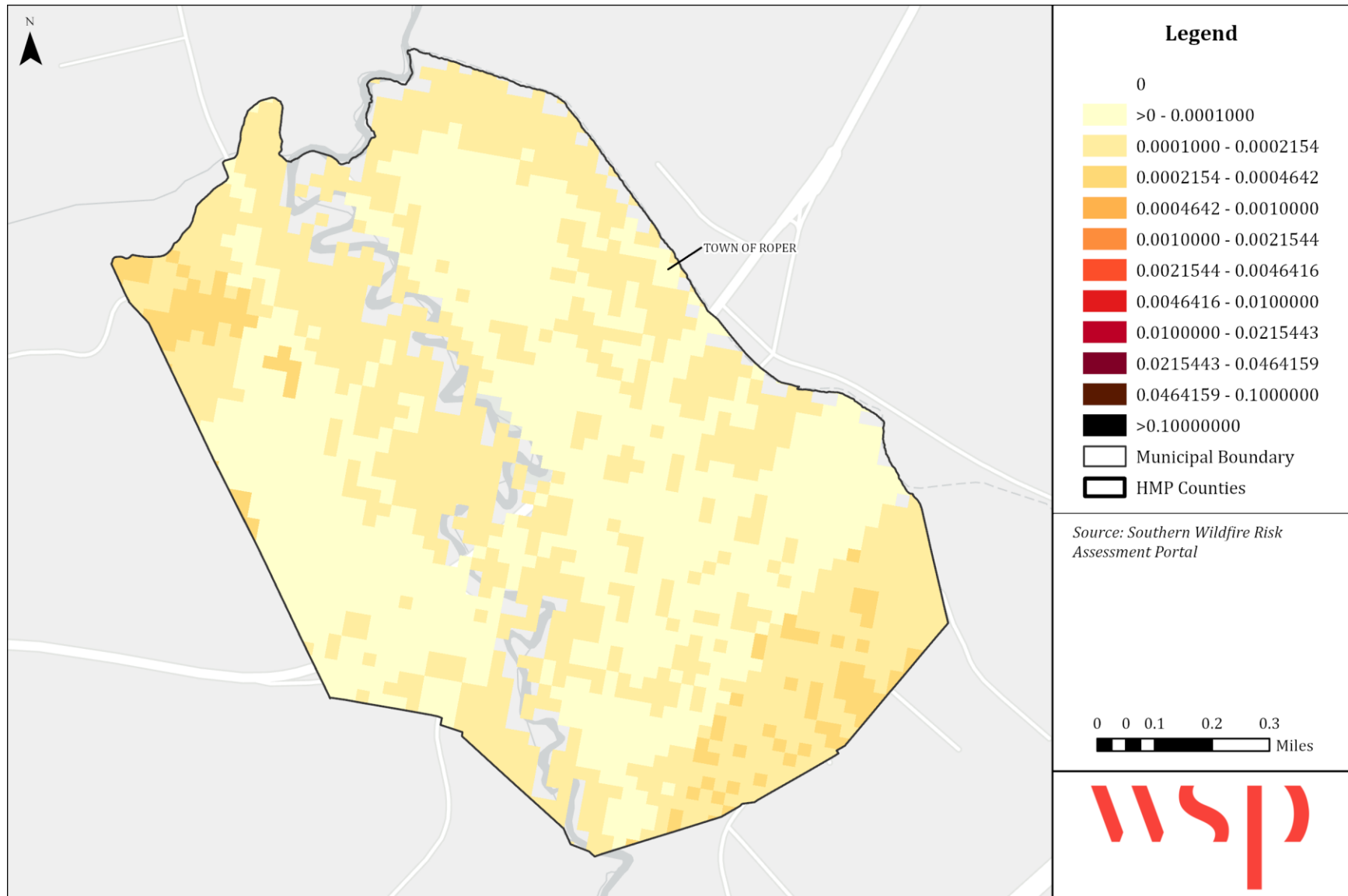


Figure E.26 – Burn Probability, Town of Roper



E.3 MITIGATION STRATEGY

Action #	Description	Applicable Jurisdictions	Hazards Addressed	Priority	Goal & Objective	Category	Lead/Participating Agencies	Estimated Cost	Potential Funding Sources	Implementation Schedule	2025 Status	Status Comments/Explanation
W1	Continue to seek funding for assistance in constructing a new dedicated EOC. The county's existing facility is adequate; however, there is a need for a new and dedicated facility.	Washington Co., Creswell, Plymouth, Roper	All Hazards	Low	3.1, 3.2	PP, ES	Washington County Planning & Safety Washington County Board of Commissioners Municipal Administrations	To be Determined	General Fund, NCDPS, FEMA	5 years	Carry Forward	New EOC is under construction. Additional work remains to establish operations once construction is complete.
W2	Continue to seek grant funding that will enable the removal of all critical infrastructure from the floodplain. This effort is currently underway; however, there is more to be accomplished. This effort will require assistance from the county Emergency Management Department.	Washington Co., Plymouth	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	Low	1.1, 2.3	PP	Washington County Planning & Safety Washington County Board of Commissioners Municipal Administration	To be determined	General Fund, NCDPS, FEMA	5 years	Carry Forward	No progress to report. The County will continue to look for opportunities to relocate or otherwise protect critical infrastructure.
W3	Monitor all land development codes, including the county and town Flood Damage Prevention Ordinances, on an annual basis to ensure that they are up-to-date and address current issues and concerns. This review will also be conducted following substantial natural hazard events.	Washington Co., Creswell, Plymouth, Roper	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	High	2.2	P	Washington County Planning & Safety Washington County Inspections Washington County Board of Commissioners Municipal Administrations	Staff Time	General Fund, NCDPS	2025-2030	Carry Forward	Hazard mitigation will be incorporated into decisions regarding amendments to the County's land development regulations as opportunities arise.
W4	Continue to work towards the development of a system to provide on-line offerings of permits, inspections, and taxes. This effort will streamline operations and provide for a more efficient flow of information.	Washington Co.	All Hazards	High	3.1	P	Washington County Inspections	\$20,000	General Fund	2 years	Carry Forward	Washington County is still working to establish an online permit portal. This effort will also impact all participating municipal jurisdictions.
W5	The Washington County Inspections office will aim to acquire a new permitting program that will be helpful in tracking floodplain development activity.	Washington Co., Creswell, Plymouth, Roper	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure, Severe Weather	High	3.1	P	Washington County Inspections Municipal Administrations	\$20,000	General Fund	2 years	Carry Forward	No progress to report, but this action remains a priority.

Action #	Description	Applicable Jurisdictions	Hazards Addressed	Priority	Goal & Objective	Category	Lead/Participating Agencies	Estimated Cost	Potential Funding Sources	Implementation Schedule	2025 Status	Status Comments/Explanation
W6	Mail a notice once annually to all property owners whose land is located within a special flood hazard area. The notice should clearly state that the recipient's property is susceptible to flooding and provide information pertinent to emergency evacuation and post-disaster recovery. Additionally, the county will notify all property owners once annually via mail, either through individual mailers or utility bill inserts, of the hazards associated with flooding and other hazards resulting from severe weather events.	Washington Co., Creswell, Plymouth, Roper	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	High	4.2	PIO	Washington County Inspections Municipal Administrations	\$4,500	General Fund, NCDPS	2025-2030	Carry Forward	This effort occurs annually and supports the County's ongoing CRS program. The County will continue to implement this action.
W7	Maintain a map information service involving the following: • Provide information relating to Flood Insurance Rate Maps (FIRM) to all inquirers, including providing information on whether a given property is located within a flood hazard area. • Provide information regarding the flood insurance purchase requirement. • Maintain historical and current FIRMs. • Locally advertise once annually in the local newspaper. • Provide information to inquirers about local floodplain management requirements.	Washington Co., Creswell, Plymouth, Roper	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	High	2.2, 4.2	PIO	Washington County Inspections Washington County Administration Municipal Administrations	Staff Time	General Fund	2025-2030	Carry Forward	Washington County provides this service on a daily basis to property owners, builders, and contractors. This effort supports the County's CRS program and will continue to be implemented.
W8	Work with local real estate agencies to ensure that agents are informing clients when property for sale is located within an SFHA. The county will provide these agencies with brochures documenting the concerns relating to development located within flood-prone areas and ways that homeowners may make their homes more disaster-resistant to strong winds, lightning, and heavy rains.	Washington Co., Creswell, Plymouth, Roper	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	High	2.2, 4.2	PIO	Washington County Inspections Municipal Administrations	Staff Time	General Fund, Municipal Administrations	2025-2030	Carry Forward	This effort occurs annually and supports the County's ongoing CRS program. The County will continue to implement this action.
W9	Make information regarding hazards and development regulations within floodplains available through the following: • Ensure that the local library maintains information relating to flooding and flood protection. • Provide a link on county/town websites to FEMA resources addressing flooding and flood protection. • Maintain information pertinent to local development conditions and make this information readily available to the public, including being posted at the local library.	Washington Co., Creswell, Plymouth, Roper	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	High	4.2	PIO	Washington County Inspections Washington County Administration Municipal Administrations	Staff Time	General Fund, NCDPS, FEMA	2025-2030	Carry Forward	This effort is reviewed annually and supports the County's ongoing CRS program. The County will continue to implement this action.

Action #	Description	Applicable Jurisdictions	Hazards Addressed	Priority	Goal & Objective	Category	Lead/Participating Agencies	Estimated Cost	Potential Funding Sources	Implementation Schedule	2025 Status	Status Comments/Explanation
W10	Provide comprehensive services regarding planning and development activities within the defined SFHA and issues relating to the construction of disaster-resistant structures. These services will include: • Provide site-specific flood and flood related information on an as-needed basis. • Maintain a list of contractors with experience in floodproofing and retrofit techniques. • Provide information on methods of windproofing construction methods for new and renovated structures. • Maintain materials providing an overview of how to select a qualified contractor. • Make site visits upon request to review occurrences of flooding, drainage problems, and sewer problems. If applicable, the inspector should provide one-on-one advice to the property owner. • Provide advice and assistance regarding CRS Activity 530 (Flood Protection). • Advertise the availability of this service in the local newspaper once annually. • Maintain a log of all individuals assisted through this service, including all site visits.	Washington Co, Creswell, Plymouth, Roper	All Hazards	High	2.3, 4.2	PP, PIO	Washington County Inspections Washington County Administration Municipal Administrations	Staff Time	General Fund	2025-2030	Carry Forward	This effort is reviewed annually and supports the County's ongoing CRS program. The County will continue to implement this action.
W11	Maintain a comprehensive Geographic Information System (GIS) with current FIRM panels in an effort to make this information readily available to county citizens. In addition to this digital data, bound copies of all historical and current FIRM panels will be maintained within Planning and Building Inspections Department.	Washington Co., Creswell, Plymouth, Roper	Flooding, Hurricanes & Coastal Hazards, Dam & Levee Failure	Medium	2.2, 3.1	P, PIO	Washington County Tax Office Washington County Inspections Municipal Administrations	Staff Time	General Fund, NCDPS	2 to 3 years	Carry Forward	Contract in place for ongoing updates as needed. Will continue to implement and need to establish an in-house GIS coordinator.
W12	Seek grant funding for eligible mitigation opportunities which may include but are not limited to: acquisition/elevation, mitigation/reconstruction, and wet/dry floodproofing to residential and non-residential structures. Funding may also be utilized for redundant power to critical facilities, wind retrofits to critical facilities, storm shelters and other activities that reduce the loss of life and property.	Washington Co., Creswell, Plymouth, Roper	All Hazards	High	1.1, 2.3	PP, SP	Washington County Administration Municipal Administrations	Staff Time	General Fund, NCPDS, FEMA	2020-2025	Carry Forward	No completed projects to report. Washington County and municipal jurisdictions will continue to seek funding to implement property protection and structural projects as specific needs arise.

Action #	Description	Applicable Jurisdictions	Hazards Addressed	Priority	Goal & Objective	Category	Lead/Participating Agencies	Estimated Cost	Potential Funding Sources	Implementation Schedule	2025 Status	Status Comments/Explanation
W13	Work to implement all strategies and recommendations outlined within the Washington County Hurricane Matthew Resilient Redevelopment Plan.	Washington Co., Creswell, Plymouth, Roper	Flood, Hurricanes & Coastal Hazards, Dam & Levee Failure	Low	1.1, 2.3	SP, PP	Washington County Administrations Municipal Administrations	To be Determined	General Fund, NCPDS, NCDEQ, FEMA	5 years	Carry Forward	No progress to report. Remaining priority projects include residential elevations, a countywide drainage improvement study, retrofitting the county court house, retrofitting the Plymouth East Main St lift station, and elevating the entry road to the sewer treatment plant.
W14	Promote and encourage the training of Community Emergency Response Teams (CERT) throughout the county.	Washington Co., Creswell, Plymouth, Roper	All Hazards	High	3.1, 4.2	ES	Washington County Planning & Safety Washington County Community Emergency Response Teams Municipal Administrations	To be determined	General Fund, NCDPS, FEMA	1 to 3 years	Carry Forward	No progress to report, but this action remains a priority.
W15	Work to develop continuity of operations plans (COOP) for county/town departments, assisted living facilities, long-term care facilities, day care centers, etc.	Washington Co., Creswell, Plymouth, Roper	All Hazards	High	3.2	ES	Washington County Planning & Safety Municipal Administrations	To be determined	General Fund, NCDPS, FEMA	1 to 3 years	Carry Forward	COOP plan in place but will be reassessed annually.
W16	Acquire generators or other forms of redundant power supply and equipment such as backup water pumps and pump parts to ensure that critical facilities and infrastructure remain operational.	Washington Co., Creswell, Plymouth, Roper	All Hazards	Medium	1.1, 2.3	PP	Washington County Planning & Safety Washington County Administration Municipal Administrations	\$10,000-\$25,000 each	General Fund, NCDPS, FEMA	2 to 3 years	Carry Forward	Action revised to incorporate other redundant infrastructure. Generator provided for county radio station. Additional needs remain.
W17	Maintain a contract with a qualified post-disaster recovery service provider. This contract will include the provision of essential services and equipment, including generators, and will include documentation required for reimbursement from FEMA/NCDEM.	Washington Co., Creswell, Plymouth, Roper	All Hazards	High	3.2	ES	Washington County Administration Municipal Administrations	Staff Time	General Fund, NCDPS, FEMA	2025-2030	Carry Forward	Washington County will continue to maintain an on-call contract with a qualified post-disaster provider.

Action #	Description	Applicable Jurisdictions	Hazards Addressed	Priority	Goal & Objective	Category	Lead/Participating Agencies	Estimated Cost	Potential Funding Sources	Implementation Schedule	2025 Status	Status Comments/Explanation
W18	Annually review and update the County's Emergency Operations Plan (EOP) to ensure compliance with all NCEM and NCOEMS procedures and policies. Through these updates, the County will work closely with all participating municipalities to ensure that all jurisdictions continue to be educated and prepared for activation of the EOP in the event of a disaster event.	Washington Co., Creswell, Plymouth, Roper	All Hazards	High	2.1	ES	Washington County Planning & Safety Municipal Administrations	Staff Time	General Fund, NCDPS, FEMA	2025-2030	Carry Forward	Washington County will continue to review the EOP annually.
W19	Create or Update Community Wildfire Protection Plans in each fire district.	Washington Co., Creswell, Plymouth, Roper	Wildfire	Med	1.4	P	Washington County Planning & Safety, Fire Departments, NC Forest Service	To Be Determined	Grant Funds	5 years	New	
W20	Improve drainage conditions through the identification and implementation of capital improvements projects.	Washington Co., Creswell, Plymouth, Roper	Dam & Levee Failure, Flooding, Hurricane & Coastal Hazards	Med	1.3	SP	Washington County Planning & Safety Municipal Administrations	To Be Determined	Grant Funds	2025-2030	New	
W21	Construct a new storage building at new EOC to house emergency supplies and response equipment.	Washington Co., Creswell, Plymouth, Roper	All Hazards	High	3.2	ES	Washington County Planning & Safety	To Be Determined	General Fund, NCDPS, FEMA	5 years	New	
W22	Create an Assistant Emergency Manager/Planning Coordinator position to support emergency management responsibilities including mitigation planning and grant identification and application.	Washington Co., Creswell, Plymouth, Roper	All Hazards	High	3.1, 3.2	P, ES	Washington County Planning & Safety, Washington County Administration	To Be Determined	General Fund, NCDPS, FEMA	5 years	New	
W23	Develop a security plan and conduct an initial emergency response exercise and ongoing exercises for the new school/hurricane shelter.	Washington Co., Creswell, Plymouth, Roper	All Hazards	High	3.2, 4.1	ES	Washington County Planning & Safety	To Be Determined	General Fund, NCDPS, FEMA	2-3 years	New	
W24	Upgrade current message board and acquire at least two additional boards to be able to meet countywide needs for Plymouth, Creswell, and Roper zones.	Washington Co., Creswell, Plymouth, Roper	All Hazards	High	3.2, 4.1	ES	Washington County Planning & Safety	To Be Determined	General Fund, NCDPS, FEMA	2-3 years	New	
W25	Establish a communications plan and a radio study to help implement new repeaters that may be needed for backup high-band communication.	Washington Co., Creswell, Plymouth, Roper	All Hazards	High	3.2, 4.1	P, ES	Washington County Planning & Safety	To Be Determined	General Fund, NCDPS, FEMA	2-3 years	New	
W26	Establish satellite communications to support continuity of operations during hazard events.	Washington Co.	All Hazards	High	3.3, 4.1	ES	Washington County Planning & Safety	To Be Determined	General Fund, NCDPS, FEMA	2-3 years	New	

APPENDIX A PLAN REVIEW TOOL

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Local Mitigation Plan Review Tool

Cover Page

The Local Mitigation Plan Review Tool (PRT) demonstrates how the local mitigation plan meets the regulation in 44 CFR § 201.6 and offers states and FEMA Mitigation Planners an opportunity to provide feedback to the local governments, including special districts.

1. The Multi-Jurisdictional Summary Sheet is a worksheet that is used to document how each jurisdiction met the requirements of the plan elements (Planning Process; Risk Assessment; Mitigation Strategy; Plan Maintenance; Plan Update; and Plan Adoption).
2. The Plan Review Checklist summarizes FEMA's evaluation of whether the plan has addressed all requirements.

For greater clarification of the elements in the Plan Review Checklist, please see Section 4 of this guide. Definitions of the terms and phrases used in the PRT can be found in Appendix E of this guide.

Plan Information	
Jurisdiction(s)	Bertie County, Hyde County, Martin County, Tyrrell County, Washington County and incorporated jurisdictions
Title of Plan	Northeastern NC Regional Hazard Mitigation Plan
New Plan or Update	Update
Single- or Multi-Jurisdiction	Multi-jurisdiction
Date of Plan	12/19/2025
Local Point of Contact	
Title	Joseph Griffin, Director
Agency	Martin County Office of Code Enforcement & Safety
Address	205 E. Main Street
Phone Number	252-789-4310
Email	jgriffin@martincountync.gov

Additional Point of Contact	
Title	David Stroud
Agency	WSP
Address	4021 Stirrup Creek Drive, Suite 100, Durham, NC 27703
Phone Number	919-325-6497
Email	david.stroud@wsp.com

Review Information	
State Review	
State Reviewer(s) and Title	Click or tap here to enter text.
State Review Date	Click or tap to enter a date.
FEMA Review	
FEMA Reviewer(s) and Title	Click or tap here to enter text.
Date Received in FEMA Region	Click or tap to enter a date.
Plan Not Approved	Click or tap to enter a date.
Plan Approvable Pending Adoption	Click or tap to enter a date.
Plan Approved	Click or tap to enter a date.

Multi-Jurisdictional Summary Sheet

In the boxes for each element, mark if the element is met (Y) or not met (N).

#	Jurisdiction Name	A. Planning Process	B. Risk Assessment	C. Mitigation Strategy	D. Plan Maintenance	E. Plan Update	F. Plan Adoption	G. HHPD Requirements	H. State Requirements
1	Bertie County								
2	Askewville								
3	Aulander								
4	Colerain								
5	Kelford								
6	Lewiston-Woodville								
7	Powellsville								
8	Roxobel								
9	Windsor								
10	Hyde County								
11	Martin County								
12	Bear Grass								
13	Everetts								
14	Hamilton								
15	Hassell								
16	Jamesville								
17	Oak City								
18	Parmelee								
19	Robersonville								
20	Williamston								
21	Tyrrell County								
22	Columbia								
23	Washington County								

#	Jurisdiction Name	A. Planning Process	B. Risk Assessment	C. Mitigation Strategy	D. Plan Maintenance	E. Plan Update	F. Plan Adoption	G. HHPD Requirements	H. State Requirements
24	Creswell								
25	Plymouth								
26	Roper								

Plan Review Checklist

The Plan Review Checklist is completed by FEMA. States and local governments are encouraged, but not required, to use the PRT as a checklist to ensure all requirements have been met prior to submitting the plan for review and approval. The purpose of the checklist is to identify the location of relevant or applicable content in the plan by element/sub-element and to determine if each requirement has been “met” or “not met.” FEMA completes the “required revisions” summary at the bottom of each element to clearly explain the revisions that are required for plan approval. Required revisions must be explained for each plan sub-element that is “not met.” Sub-elements in each summary should be referenced using the appropriate numbers (A1, B3, etc.), where applicable. Requirements for each element and sub-element are described in detail in Section 4: Local Plan Requirements of this guide.

Plan updates must include information from the current planning process.

If some elements of the plan do not require an update, due to minimal or no changes between updates, the plan must document the reasons for that.

Multi-jurisdictional elements must cover information unique to all participating jurisdictions.

Element A: Planning Process

Element A Requirements	Location in Plan (section and/or page number)	Met / Not Met
A1. Does the plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement 44 CFR § 201.6(c)(1))		
A1-a. Does the plan document how the plan was prepared, including the schedule or time frame and activities that made up the plan’s development, as well as who was involved?	Section 2, p.7-17; Appendix B	Choose an item.
A1-b. Does the plan list the jurisdiction(s) participating in the plan that seek approval, and describe how they participated in the planning process?	Section 1.3, p.2; Section 2.3-2.9, p.7-22; Appendix B	Choose an item.

Element A Requirements	Location in Plan (section and/or page number)	Met / Not Met
A2. Does the plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development as well as businesses, academia, and other private and non-profit interests to be involved in the planning process? (Requirement 44 CFR § 201.6(b)(2))		
A2-a. Does the plan identify all stakeholders involved or given an opportunity to be involved in the planning process, and how each stakeholder was presented with this opportunity?	Section 2.4, p.10-14; Section 2.5, p.14-15; Section 2.7-2.8, p.16-17, Appendix B	Choose an item.
A3. Does the plan document how the public was involved in the planning process during the drafting stage and prior to plan approval? (Requirement 44 CFR § 201.6(b)(1))		
A3-a. Does the plan document how the public was given the opportunity to be involved in the planning process and how their feedback was included in the plan?	Section 2.4-2.7, p.10-16;	Choose an item.
A4. Does the plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement 44 CFR § 201.6(b)(3))		
A4-a. Does the plan document what existing plans, studies, reports and technical information were reviewed for the development of the plan, as well as how they were incorporated into the document?	Section 2.3.1, p.8-9	Choose an item.
ELEMENT A REQUIRED REVISIONS		
Required Revision: Click or tap here to enter text.		

Element B: Risk Assessment

Element B Requirements	Location in Plan (section and/or page number)	Met / Not Met
B1. Does the plan include a description of the type, location, and extent of all natural hazards that can affect the jurisdiction? Does the plan also include information on previous occurrences of hazard events and on the probability of future hazard events? (Requirement 44 CFR § 201.6(c)(2)(i))		
B1-a. Does the plan describe all natural hazards that can affect the jurisdiction(s) in the planning area, and does it provide the rationale if omitting any natural hazards that are commonly recognized to affect the jurisdiction(s) in the planning area?	Section 4.2, p.55-59, Section 4.5, p.77-296 (Hazard Description, Location, Extent, Hazard Summary by Jurisdiction)	Choose an item.
B1-b. Does the plan include information on the location of each identified hazard?	Section 4.5, p. 77-296 ("Location" subheadings)	Choose an item.
B1-c. Does the plan describe the extent for each identified hazard?	Section 4.5, p. 77-296 ("Extent" subheadings)	Choose an item.
B1-d. Does the plan include the history of previous hazard events for each identified hazard?	Section 4.5, p. 77-296 ("Historical Occurrences" subheadings)	Choose an item.
B1-e. Does the plan include the probability of future events for each identified hazard, including the type, location and range of anticipated intensities?	Section 4.5, p. 77-296 ("Probability of Future Occurrence" subheadings)	Choose an item.
B1-f. For participating jurisdictions in a multi-jurisdictional plan, does the plan describe any hazards that are unique to and/or vary from those affecting the overall planning area?	Section 4.5, p. 77-296 ("Hazard Summary by Jurisdiction" subheadings); Annexes, p.376-617	Choose an item.

Element B Requirements	Location in Plan (section and/or page number)	Met / Not Met
B2. Does the plan include a summary of the jurisdiction's vulnerability and the impacts on the community from the identified hazards? Does this summary also address NFIP-insured structures that have been repetitively damaged by floods? (Requirement 44 CFR § 201.6(c)(2)(ii))		
B2-a. Does the plan provide an overall summary of each jurisdiction's vulnerability to the identified hazards?	Section 4.3, p.59-63; Section 4.4, p.64-76; Section 4.5, p.77-296 ("Vulnerability Assessment" subheadings); Annexes, p.376-617	Choose an item.
B2-b. For each participating jurisdiction, does the plan describe the potential impacts of each of the identified hazards on each participating jurisdiction?	Section 4.5, p.77-296; Annexes, p.376-617	Choose an item.
B2-c. Does the plan address NFIP-insured structures within each jurisdiction that have been repetitively damaged by floods?	Section 4.5.5, p.167	Choose an item.
ELEMENT B REQUIRED REVISIONS		
Required Revision: Click or tap here to enter text.		

Element C: Mitigation Strategy

Element C Requirements	Location in Plan (section and/or page number)	Met / Not Met
C1. Does the plan document each participant's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs? (Requirement 44 CFR § 201.6(c)(3))		
C1-a. Does the plan describe how the existing capabilities of each participant are available to support the mitigation strategy? Does this include a discussion of the existing building codes and land use and development ordinances or regulations?	Section 5, p.297-317	Choose an item.

Element C Requirements	Location in Plan (section and/or page number)	Met / Not Met
C1-b. Does the plan describe each participant's ability to expand and improve the identified capabilities to achieve mitigation?	Section 5, p.297-317	Choose an item.
C2. Does the plan address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate? (Requirement 44 CFR § 201.6(c)(3)(ii))		
C2-a. Does the plan contain a narrative description or a table/list of their participation activities?	Section 5.3.1.3, p.304-307	Choose an item.
C3. Does the plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement 44 CFR § 201.6(c)(3)(i))		
C3-a. Does the plan include goals to reduce the risk from the hazards identified in the plan?	Section 6.1, p.318-320	Choose an item.
C4. Does the plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure? (Requirement 44 CFR § 201.6(c)(3)(ii))		
C4-a. Does the plan include an analysis of a comprehensive range of actions/projects that each jurisdiction considered to reduce the impacts of hazards identified in the risk assessment?	Section 7, p.322-344; Appendix C	Choose an item.
C4-b. Does the plan include one or more action(s) per jurisdiction for each of the hazards as identified within the plan's risk assessment?	Section 7, p.322-344	Choose an item.
C5. Does the plan contain an action plan that describes how the actions identified will be prioritized (including a cost-benefit review), implemented, and administered by each jurisdiction? (Requirement 44 CFR § 201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))		
C5-a. Does the plan describe the criteria used for prioritizing actions?	Section 6.2, p. 320-321	Choose an item.
C5-b. Does the plan provide the position, office, department or agency responsible for implementing/administrating the identified mitigation actions, as well as potential funding sources and expected time frame?	Section 7, p.322-344	Choose an item.

ELEMENT C REQUIRED REVISIONS

Required Revision:

Click or tap here to enter text.

Element D: Plan Maintenance

Element D Requirements	Location in Plan (section and/or page number)	Met / Not Met
D1. Is there discussion of how each community will continue public participation in the plan maintenance process? (Requirement 44 CFR § 201.6(c)(4)(iii))		
D1-a. Does the plan describe how communities will continue to seek future public participation after the plan has been approved?	Section 8.3, p.351	Choose an item.
D2. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a five-year cycle)? (Requirement 44 CFR § 201.6(c)(4)(i))		
D2-a. Does the plan describe the process that will be followed to track the progress/status of the mitigation actions identified within the Mitigation Strategy, along with when this process will occur and who will be responsible for the process?	Section 8.2, p.348-351	Choose an item.
D2-b. Does the plan describe the process that will be followed to evaluate the plan for effectiveness? This process must identify the criteria that will be used to evaluate the information in the plan, along with when this process will occur and who will be responsible.	Section 8.2, p.348-351	Choose an item.
D2-c. Does the plan describe the process that will be followed to update the plan, along with when this process will occur and who will be responsible for the process?	Section 8.2, p.348-351	Choose an item.
D3. Does the plan describe a process by which each community will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate? (Requirement 44 CFR § 201.6(c)(4)(ii))		
D3-a. Does the plan describe the process the community will follow to integrate the ideas, information and strategy of the mitigation plan into other planning mechanisms?	Section 8.1, p. 345-348; Section 8.2, p.348-351	Choose an item.

Element D Requirements	Location in Plan (section and/or page number)	Met / Not Met
D3-b. Does the plan identify the planning mechanisms for each plan participant into which the ideas, information and strategy from the mitigation plan may be integrated?	Section 8.1, p. 345-348; Section 8.2, p.348-351	Choose an item.
D3-c. For multi-jurisdictional plans, does the plan describe each participant's individual process for integrating information from the mitigation strategy into their identified planning mechanisms?	Section 8.1, p. 345-348; Section 8.2, p.348-351	Choose an item.
ELEMENT D REQUIRED REVISIONS		
Required Revision: Click or tap here to enter text.		

Element E: Plan Update

Element E Requirements	Location in Plan (section and/or page number)	Met / Not Met
E1. Was the plan revised to reflect changes in development? (Requirement 44 CFR § 201.6(d)(3))		
E1-a. Does the plan describe the changes in development that have occurred in hazard-prone areas that have increased or decreased each community's vulnerability since the previous plan was approved?	Section 3, p.23-53	Choose an item.
E2. Was the plan revised to reflect changes in priorities and progress in local mitigation efforts? (Requirement 44 CFR § 201.6(d)(3))		
E2-a. Does the plan describe how it was revised due to changes in community priorities?	Section 2.1-2.2, p.5-7; Section 6, p.318-321, Section 7, p.322-344	Choose an item.
E2-b. Does the plan include a status update for all mitigation actions identified in the previous mitigation plan?	Section 7, p.322-344; Section 2.9, p.17-22	Choose an item.
E2-c. Does the plan describe how jurisdictions integrated the mitigation plan, when appropriate, into other planning mechanisms?	Section 8.1, p.345-348	Choose an item.

ELEMENT E REQUIRED REVISIONS

Required Revision:

Click or tap here to enter text.

Element F: Plan Adoption

Element F Requirements	Location in Plan (section and/or page number)	Met / Not Met
F1. For single-jurisdictional plans, has the governing body of the jurisdiction formally adopted the plan to be eligible for certain FEMA assistance? (Requirement 44 CFR § 201.6(c)(5))		
F1-a. Does the participant include documentation of adoption?	Section 9, p.352-375	Choose an item.
F2. For multi-jurisdictional plans, has the governing body of each jurisdiction officially adopted the plan to be eligible for certain FEMA assistance? (Requirement 44 CFR § 201.6(c)(5))		
F2-a. Did each participant adopt the plan and provide documentation of that adoption?	Section 9, p.352-375	Choose an item.
ELEMENT F REQUIRED REVISIONS		
Required Revision:		
Click or tap here to enter text.		

Element G: High Hazard Potential Dams (Optional)

HHPD Requirements	Location in Plan (section and/or page number)	Met / Not Met
HHPD1. Did the plan describe the incorporation of existing plans, studies, reports and technical information for HHPDs?		
HHPD1-a. Does the plan describe how the local government worked with local dam owners and/or the state dam safety agency?	N/A	Choose an item.
HHPD1-b. Does the plan incorporate information shared by the state and/or local dam owners?	N/A	Choose an item.

HHPD Requirements	Location in Plan (section and/or page number)	Met / Not Met
HHPD2. Did the plan address HHPDs in the risk assessment?		
HHPD2-a. Does the plan describe the risks and vulnerabilities to and from HHPDs?	N/A	Choose an item.
HHPD2-b. Does the plan document the limitations and describe how to address deficiencies?	N/A	Choose an item.
HHPD3. Did the plan include mitigation goals to reduce long-term vulnerabilities from HHPDs?		
HHPD3-a. Does the plan address how to reduce vulnerabilities to and from HHPDs as part of its own goals or with other long-term strategies?	N/A	Choose an item.
HHPD3-b. Does the plan link proposed actions to reducing long-term vulnerabilities that are consistent with its goals?	N/A	Choose an item.
HHPD4-a. Did the plan include actions that address HHPDs and prioritize mitigation actions to reduce vulnerabilities from HHPDs?		
HHPD4-a. Does the plan describe specific actions to address HHPDs?	N/A	Choose an item.
HHPD4-b. Does the plan describe the criteria used to prioritize actions related to HHPDs?	N/A	Choose an item.
HHPD4-c. Does the plan identify the position, office, department or agency responsible for implementing and administering the action to mitigate hazards to or from HHPDs?	N/A	Choose an item.
HHPD Required Revisions		
Required Revision: Click or tap here to enter text.		

Element H: Additional State Requirements (Optional)

Element H Requirements	Location in Plan (section and/or page number)	Met / Not Met
This space is for the State to include additional requirements.		
Click or tap here to enter text.	Click or tap here to enter text.	Choose an item.

Plan Assessment

These comments can be used to help guide your annual/regularly scheduled updates and the next plan update.

Element A. Planning Process

Strengths

- [insert comments]

Opportunities for Improvement

- [insert comments]

Element B. Risk Assessment

Strengths

- [insert comments]

Opportunities for Improvement

- [insert comments]

Element C. Mitigation Strategy

Strengths

- [insert comments]

Opportunities for Improvement

- [insert comments]

Element D. Plan Maintenance

Strengths

- [insert comments]

Opportunities for Improvement

- [insert comments]

Element E. Plan Update

Strengths

- [insert comments]

Opportunities for Improvement

- [insert comments]

Element G. HHPD Requirements (Optional)

Strengths

- [insert comments]

Opportunities for Improvement

- [insert comments]

Element H. Additional State Requirements (Optional)

Strengths

- [insert comments]

Opportunities for Improvement

- [insert comments]
-

APPENDIX B PLANNING PROCESS DOCUMENTATION

PLANNING STEP 1: ORGANIZE TO PREPARE THE PLAN

Table B.1 – HMPC Meeting Topics, Dates, and Locations

Meeting Title	Meeting Topic	Meeting Date	Meeting Location
HMPC Mtg. #1 – Project Kick-Off	1. Introduction to DMA, CRS, and FMA requirements and the planning process 2. Review of HMPC responsibilities and the project schedule.	July 15, 2025 3:00 p.m.	Bertie County Library Community Meeting Center & Microsoft Teams
HMPC Mtg. #2	1. Project overview 2. Asset inventory 3. Review draft Hazard Identification & Risk Assessment (HIRA) 4. Excessive heat presentation from North Carolina State Resilience Office	September 15, 2025 1:00 p.m.	Martin County TeleCenter & Microsoft Teams
HMPC Mtg. #3	1. Review capability assessment 2. Review & update mitigation strategy 3. Discuss public engagement & survey efforts	November 6, 2025 11:00 am	Washington County Commissioner's Room & Microsoft Teams
HMPC Mtg. #4	1. Review the Draft Hazard Mitigation Plan 2. Solicit comments and feedback	December 10, 2025 3:00 p.m.	Bertie County Library Community Meeting Center & Microsoft Teams

Note: All HMPC Meetings were open to the public.

Meeting agendas, minutes, and sign in sheets are provided on the following pages. Presentations referenced in the minutes can be provided upon request.

HMPC MEETING AGENDAS, MINUTES, AND SIGN-IN SHEETS

HMPC MEETING 1: JULY 15, 2025



NORTHEASTERN NC REGIONAL HAZARD MITIGATION PLAN UPDATE

HAZARD MITIGATION PLANNING COMMITTEE (HMPC) MEETING #1

July 15, 2025, 3 pm, Bertie County Library Community Meeting Center & Microsoft Teams

ATTENDANCE

There were 10 attendees in person and seven online. The following individuals were in attendance:

Traci White, Planning & Inspections Director, Bertie County
John Rawls, Director of Emergency Services, Bertie County
Charlotte Griffin, Mayor, Town of Bear Grass
Tina Brown, Mayor, Town of Robersonville
Jerry McCrary, Mayor, Town of Parmele
Joseph Griffin, Director of Emergency Management, Martin County
Michael Bryant, Deputy Director of Emergency Management, Martin County
Allen Castelloe, Town Administrator, Town of Windsor
Ben Jones, Mayor, Town of Everetts
Allen Pittman, Director of Planning and Inspections, Washington County
Andrew Brownfield, Planner & Zoning Administrator, Town of Williamston
Connie Barnes
Lance Swindell, Emergency Management Coordinator, Washington County
John Mello, NCEM Mitigation Specialist
Abby Moore, WSP
Ranger Ruffins, WSP

AGENDA

- NCEM Introduction
- Why Plan?
- Project Overview
- Planning Process
- Project Schedule
- Next Steps
- Q & A

NCEM INTRODUCTION

NCEM Mitigation Specialist John Mello, provided a brief overview of the Hazard Mitigation Plan (HMP) update process and the role of each participant. John explained that North Carolina plan updates are funded through the HMGP and State funds. He noted that while NCEM has appointed consultants to facilitate the plan updates, NCEM is available to provide support throughout the planning process. Once the draft plan is completed, NCEM will review the plan for accuracy and compliance with federal guidance. They will also submit the plan to FEMA for approval.

WHY PLAN?

Abby began the presentation with why we plan in the first place. She discussed the Disaster Mitigation Act (DMA) of 2000, which is codified in 44 CFR 201.6 and requires local government to update their

hazard mitigation plans every five years to be eligible for pre- and post-disaster grant funding through FEMA's Hazard Mitigation Assistance programs. Mitigation funding available through FEMA includes the Hazard Mitigation Grant Program (HMGP) and Flood Mitigation Assistance (FMA) program. Abby noted that every community in the state is eligible for HMGP funding whenever a disaster is declared in the state of North Carolina, even if it does not directly impact your community, as there is often funding left over after projects have been completed in affected areas.

Abby reviewed trends in disasters that support the need for mitigation planning. In FY2024 there were 27 billion-dollar disasters. There's an increasing trend in recent years in the number of billion-dollar disasters. This may be in part because we now have more frequent and intense hazard events and greater exposure to risk (people, property and critical infrastructure). Abby explained that hazard mitigation is a priority for multiple reasons, including that the cost of doing nothing is too high, many events are predictable and repetitive, loss reduction can be effective, cost-beneficial, and environmentally-sound, there are legal and moral responsibilities to prevent disasters, and there are federal funds available to support mitigation. The average benefit-cost ratio (BCR) for federally funded projects is 6:1 and is even higher for flood mitigation.

PROJECT OVERVIEW

Abby explained that we must follow the DMA planning process and integrate Community Rating System (CRS) Activity 510 planning steps into the DMA four-phase planning process to meet the requirements of both programs. The DMA process provides continued eligibility for mitigation funding and guides mitigation activities in a coordinated and economical manner. The CRS program is flood specific and provides flood insurance policy holders in participating communities with discounts based on the number of CRS points they communities earn. Hyde County, Town of Creswell, Town of Plymouth, Town of Roper, and Washington County participate in the CRS program. Overall, the WSP planning team will ensure that the updated hazard mitigation plan meets all FEMA planning requirements.

PLANNING PROCESS

PHASE 1

Abby described the planning process in more detail. Phase 1, organize resources, is already underway. The HMPC has been reconvened, and new staff members and stakeholders were identified for involvement. Each jurisdiction should have staff representatives and citizen/stakeholder representatives who are not affiliated with local government to have a 50/50 split of staff and stakeholders. Please contact Abby if you need additional updates to your communities' HMPC representatives.

The HMPC will be asked to attend four meetings (including this one), provide input on risk and capability, update mitigation actions, and review plan drafts. HMPC members, especially staff, will also be asked to support public involvement efforts throughout the planning process.

Abby noted that more stakeholders can still join the HMPC. We can also invite additional stakeholders to provide data and input without having to commit to participating on the HMPC. In particular, we should look to involve stakeholders that may be able to represent underserved communities and/or vulnerable populations.

PHASE 2: ASSESS RISKS

Phase 2 covers the risk assessment, which includes the hazard identification and the vulnerability assessment. All of the hazards that were addressed in the previous plan will be carried over into this plan update. The identified hazards are as follows: Coastal Erosion, Dam & Levee Failure, Drought, Earthquake, Extreme Heat, Flood, Hurricane & Tropical Storm, Severe Weather, Severe Winter Storm, Tornado, Wildfire. It was discussed and determined that hazardous substances be added as a hazard. Abby also explained that the hazards groupings and nomenclature will be updated to align with the State Hazard Mitigation Plan.

To conduct the vulnerability assessment, NCEM iRisk data will be used to provide loss estimates for several hazards. Additional qualitative, quantitative, and spatial analysis will be used as appropriate. WSP will send communities a web map with the iRisk facilities to review and add any missing critical facilities. If communities already have a list of updated facilities, they can also send those to the WSP team. Abby noted that critical facilities will be categorized by FEMA lifeline in the plan update, which may be helpful to communities when preparing FEMA grant applications.

PHASE 3: DEVELOP A MITIGATION STRATEGY

Phase 3 involves developing a mitigation strategy by reviewing and updating the plan goals and objectives, evaluating mitigation alternatives including existing and new projects, and drafting an action plan with prioritized projects. The action plan will identify criteria to support monitoring and implementation, including the responsible department or agency, timeline for completion, and potential funding sources. Abby explained that each community will need to provide a status update for each of the projects included in the previous plan. It should be indicated if each project has been completed, deleted, or carried forward. If the project is carried forward a progress update will need to be provided.

Abby also reviewed different approaches to mitigation based on the six FEMA/CRS mitigation categories: prevention, property, structural projects, emergency services, natural resources protection, and public education. CRS communities should look to identify a project for each of the categories. FEMA requires the community to have at least one action for each of the identified hazards. Abby reminded the HMPC that projects must be in the hazard mitigation plan to be eligible for FEMA HMA funding.

PHASE 4: ADOPTION AND IMPLEMENTATION

Phase 4 is where the communities must adopt and implement the plan. Each of the participating jurisdictions must adopt the plan by resolution. Abby noted that the HMPC will need to meet at least annually to review the action plan and look for funding and opportunities to implement projects. However, she recommends that community meet quarterly to maximize CRS credit. The plan will continue to be updated every five years.

PROJECT SCHEDULE

Abby presented the schedule for the planning process. The HMPC will meet again in September. Martin County may be able to host the next HMPC meeting. WSP will work with the County to select a date/time that works. The first public meeting will be held in the evening of July 15th following the HMPC meeting. The final public meetings will be held in December. The plan must be approved by NCEM and FEMA and adopted by all communities before the current plan expires in April 2026.

NEXT STEPS

Abby discussed public outreach efforts which include public meetings facilitated by WSP, a public survey, and a plan website (<https://www.NortheasternHMP.com>). Community staff will be asked to post outreach on local websites and social media. It was noted that a flyer would be useful for outreach; WSP will provide an electronic version of a flyer that staff can use to promote public engagement in the plan update. Community staff were also asked to think about additional stakeholders to involve in the planning process – please send any relevant contact to the WSP team.

The HMPC was asked to review the existing mitigation strategy to provide action status updates. WSP will send existing projects to communities for review.

WSP is working on the risk and vulnerability assessment update and will reach out to community representatives on the HMPC for updates on local capability. WSP will provide language for advertising the plan website and survey and provide an informational flyer that can be posted.

**Northeastern NC Regional Hazard Mitigation Plan
Hazard Mitigation Planning Committee - Meeting #1
Tuesday, July 15, 2025, 3pm**

	Name	Jurisdiction	Department/Agency/Organization	Email
1.	Abby Moore	_____	WSP	abigail.moore@wsp.corn
2.	Traci White	BERTIE COUNTY	PLANNING & INSPECTIONS	traci.white@berrie.nc.gov
3.	Charlotte Griffin	Bear Grass Martin County	Town of Bear Grass	ladybear44@outlook.com
4.	Lina Brown	Martin County	Town of Robersonville	lbrown@townofrobersonville.com
5.	Terry M. McKinney	Martin County	Town of Fremont	terrymckinney@gmail.com
6.	Joseph Griffin	Martin Co	Martin Co	josephgriffin@martincountync.gov
7.	Michael Bryant	Martin Co	Martin Co EM	michael.bryant@martincountync.gov
8.	Allen Castelle	Windsor	Administrator	acastelle@windsonc.com
9.	John Rauls	Bertie Co.	BCEES Director	john.rauls@bertie.nc.gov
10.	Ben Jones	Martin County	Town of Everett	bjonesjr@siddalaf.net
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				

Participants

Invite someone or dial a number

Share invite

✓ In this meeting (8)

Mute all

Ruffins, Ranger



AP

Allen Pittman (Unverified)



AB

Andrew Brownfield (Unverified)



CB

Connie Barnes (Unverified)



LS

Lance Swindell (Unverified)



JM

Mello, John (NCEM) (External)



AM

Moore, Abigail
Organizer



RN

read.ai meeting notes (Unverified)



HMPC MEETING 2: SEPTEMBER 15, 2025



NORTHEASTERN NC REGIONAL HAZARD MITIGATION PLAN UPDATE

HAZARD MITIGATION PLANNING COMMITTEE (HMPC) MEETING #2

September 15, 2025, 1 pm, Martin County Telecenter & Microsoft Teams

ATTENDANCE

There were 7 attendees in person and 11 online. The following individuals were in attendance:

Andrew Brownfield, Planner & Zoning Administrator, Town of Williamston
Charlotte Griffin, Mayor, Town of Bear Grass
Joseph Griffin, Director of Emergency Management, Martin County
Allen Castelloe, Town Administrator, Town of Windsor
Traci White, Planning & Inspections Director, Bertie County
Jerry McCrary, Mayor, Town of Parmele
Drew Batts, County Manager, Martin County
Connie Barnes, CERT Team Coordinator, Washington County
Marie Garriss, Clerk & Finance Officer, Town of Kelford
Lance Swindell, Emergency Management Coordinator, Washington County
Hannah Thompson, Wildfire Mitigation Specialist, N.C. Forest Service
Nicole Goddard, NCORR, Resilience Outreach and Engagement Manager
John Mello, NCEM Mitigation Specialist
Carl Baker, NCEM Mitigation Plans Manager
David Stroud, WSP
Abby Moore, WSP
Ranger Ruffins, WSP
Kimmy Hansen, WSP

AGENDA

- Project Overview & Where we are in the planning process
- Hazard Identification
- Asset Inventory
 - People, Property, and Critical Facilities
- Hazard Profiles: Risk & Vulnerability
 - Summary of key findings for each hazard
 - Excessive Heat presentation by Nicole Goddard, State Resilience Office
- Discussion
- Next Steps

PROJECT OVERVIEW & PLANNING PROCESS

Abby began the presentation by explaining where we are in the planning process. Currently, the plan update is in Phase 2 of the four-phase planning process which includes identifying hazards and assessing the problems. Abby proceeded to describe the steps taken during the Hazard Identification & Risk Assessment (HIRA) process which are shown to the right.

1. Identify Hazards

2. Profile Hazard Events

3. Inventory Assets

4. Estimate Losses

HAZARD IDENTIFICATION

Abby noted that there has been a total of 20 Disaster and Emergency Declarations within the Northeastern Region. Around 65% of those declarations have been caused due to Hurricanes. As shown in slide 7 of the presentation, a comprehensive list of all existing hazards that are being carried forward and reevaluated in the plan update were provided and reviewed. Abby explained that a few of these hazard profiles have been consolidated to mirror the State HMP. She presented the hazards that have been included and not included in the plan update. She also noted that Hazardous Substances has been added to the list of evaluated hazards.

ASSET INVENTORY

Abby briefly reviewed the data that has been collected and included in the asset inventory for Bertie, Hyde, Martin, Tyrell, and Washington counties. The data was sourced from the NCEM iRisk platform to collect information about population demographics, building counts and values, and critical facilities. Critical facilities are buildings and infrastructure that support continuity of operations and are essential to health and safety.

It was noted by several members of the HMPC that the presented population estimates are very low compared to actual 2020 census data. WSP will work with the State to address the issue in iRisk or determine another method for estimating vulnerability.

HAZARD PROFILES

Abby reviewed the Priority Risk Index (PRI) methodology and results. She reminded the Committee that the purpose of the PRI is to categorize and prioritize all hazards for the region as high, moderate, or low risk. She asked HMPC members to review the PRI ratings (found on slide 12) for each hazard and provide feedback if any changes are recommended. Abby then reviewed current draft findings for the hazard profiles listed below.

Dam and Levee Failure

There are 15 dams in the Northeastern Region – all are low hazard dams. Abby noted the importance of monitoring dam conditions. The HMPC also asked to include an evaluation of Kerr Dam, located upstream of the region. WSP will include Kerr Dam and see if inundation data is available to further explore vulnerability.

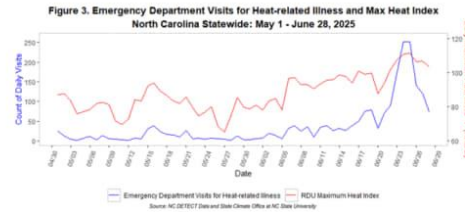
There are four levees in the Northeastern region – two in Tyrell County, one in Washington County, and one in Hyde County. Within the leveed areas there is an estimated 1,347 people, and \$274M in property value.

Drought

According to the U.S. Drought Monitor, from 2000-2024, all five counties were in some level of drought 36% of the time. Based on NCEI data, from 2007 – 2024 there were over \$62M in crop insurance claims paid in the region due to drought. The most severe droughts to recently occur were in 2007/2008 and 2011. Abby mentioned that drought can increase wildfire risk and may become more frequent and severe due to climate change.

Excessive Heat

Nicole Goddard from the Department of Environmental Quality (DEQ) State Resilience Office presented on heat vulnerability in the Northeastern Region. She noted that it is likely that temperatures will continue to increase which will impact the rate of heat-related illness. The [NC Resilience Exchange Climate Projects](#) site has more information on how excessive heat may change over time.



Higher temperatures will specifically impact infants and children, pregnant persons, persons taking certain medications, older adults (65+), outdoor workers, low income, people with underlying health conditions, and athletes. Additionally, it was noted that high temperatures will not only impact human health but utility costs, infrastructure, and agriculture. ReBuildNC has a [Heat Action Plan Toolkit](#) with helpful resources about how communities can build resilience to extreme heat.

Nicole also discussed the [Planning for Extreme Heat Cohort Program](#), which supports NC local governments in developing heat action plans.

Flooding

This plan evaluates both riverine and coastal flooding, which are evaluated using the current effective FIRMs for each county. Abby noted that localized and street stormwater flooding are also common sources of flooding. If any communities maintain known flooding hot spots, please share this data with WSP so they can be incorporated into the plan.

Abby explained that that 36% of the region is in the Special Flood Hazard Area (SFHA). The SFHA exceeds 50% of the total area in Tyrell County and Columbia. While the majority of the land area in the region is in the unshaded, low risk areas, flooding can occur outside of the SFHA and floodplains.

Data from iRisk estimates that around 7,690 buildings are at risk to the 1% annual chance flood event with an estimated damage of over \$60M.

Percent of total buildings at risk is highest in:

- Unincorporated Tyrell County (81%)
- Town of Columbia (59%)
- Unincorporated Hyde County (57%)
- Town of Creswell (34%)

Hurricane and Coastal Hazards

NCEI reports \$72.5M in property damages. Abby noted that an additional \$61M in damages associated with storm surge from Hurricane Irene. She also explained that survey responses note impacts from hurricanes Floyd and Matthew.

The plan uses NOAA SLOSH model to approximate maximum surge potential by storm category. Based on the model, every county is impacted by CAT 3 storm surge.

Abby explained that the region is seeing high levels of coastal and soundfront erosion. Abby asked communities to provide any known locations of erosion to be included in the plan.

Tornadoes and Thunderstorms

Based on NCEI data, the Northeastern Region has experienced 53 tornado incidents between 1999 and 2024, causing 14 deaths, 81 injuries, and \$6.5M in property damage and \$1.4M in crop damage. The

database reported 163 days with thunderstorm winds, and 76 days with reported hail incidents. There were not reports of lightning, however, Abby explained that NCEI only reports lightning events with recorded damage.

Severe Winter Weather

Two winter related disaster declarations have occurred in the region, however there are 144 events are reported in NCEI during the 25-year period from 1999 through 2024. Abby noted that there are 74 separate days with winter weather related events equating to an average of three days with winter weather per year. The HMPC discussed vulnerabilities associated with overhead powerlines and reliance on electric heat sources.

Wildfire

The WUI is the area where structures and other human improvements meet undeveloped wildland or vegetative fuels. These are high risk areas. An estimated 6% of the region has direct or indirect exposure, and 73% is located in the critical fireshed. Over 12% of the region is vulnerable to high or higher fire intensity, primarily in Hyde County. Hannah noted that some of the largest and longest fires have occurred in this region, so mitigation should focus on the impacts of long-lasting fires.

Abby reviewed the PRI results again noting that HMPC can further review the risk ratings when they read through the draft HIRA. She also noted that PRI tables are presented for each jurisdiction so variations by community can be reviewed.

PROJECT SCHEDULE

Abby presented a tentative schedule for the planning process, which includes two more HMPC meetings and one public meeting. The next HMPC meeting will be in early November and we will review the mitigation strategy. The final HMPC will be in February or March.

The draft plan is due to NCEM in March 2026. The plan must be approved by NCEM and FEMA and adopted by all communities before the current plan expires in April 2026.

PUBLIC SURVEY UPDATE

There have only been six survey responses so far. Abby encouraged communities to publicize the survey to increase responses.

NEXT STEPS

HMPC Action Items

- Review the draft risk assessment when made available
- Start reviewing existing mitigation action plans and prepare status updates for each action
- Publicize the plan website and public survey
- Abby suggested posting the survey on community websites and publicizing on social media. It can also be found on the plan website: www.NortheasternHMP.com/.

WSP Action Items

- WSP will post updated draft HIRA on the plan website for review once population discrepancy is addressed
- Will send existing mitigation action plans
- Will schedule the next HMPC meeting for early November

Survey Link: <https://forms.office.com/e/Kj1MPsEJBU>

Plan Website: www.NortheasternHMP.com/



Northeastern NC Regional Hazard Mitigation Plan
Hazard Mitigation Planning Committee - Meeting #2
Monday, September 15, 2025, 1pm

	Name	Jurisdiction	Department/Agency/Organization	Email
1.	Abby Meier	—	WSP	abigail.meier@wsp.com
2.	Angie Brownfield		Town of Williamson	abrownfield@townofwilliamson.com
3.	Charlotte Griffin		Bear Grass	ladybear45@outlook.com
4.	Joseph Griffin	Marquette Co	Marquette Co	jgriffin@marquettecountypa.gov
5.	Allen Castellor	Windsor	Town of Windsor	acastellor@windsornc.com
6.	Traci White	Bertie County	Bertie County	traci.white@bertie.nc.gov
7.	Tracy M. McHenry	Madison County	Madison	mpm@tracy.m@cmadison.com
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▼ In this meeting (13)

-  Hansen, Kimberly
-  Baker, Carl (NCEM) (Unverified)
-  Connie Barnes (Unverified)
-  Drew Batts (Unverified)
-  Goddard, Nicole (Unverified)
-  Lance Swindell (Unverified)
-  Marie Garris (Unverified)
-  Mello, John (NCEM) (Unverified)
-  **Moore, Abigail**
Organizer
-  read.ai meeting notes (Unverified)
-  Ruffins, Ranger
-  Stroud, David
-  Thompson, Hannah (Unverified)

HMPC MEETING 3: NOVEMBER 6, 2025



NORTHEASTERN NC REGIONAL HAZARD MITIGATION PLAN UPDATE

HAZARD MITIGATION PLANNING COMMITTEE (HMPC) MEETING #3

November 6, 2025, 11 am, Washington County Commissioner's Room & Microsoft Teams

ATTENDANCE

There were four attendees in person and four online. The following individuals were in attendance:

Andrew Brownfield, Planner & Zoning Administrator, Town of Williamston
Charlotte Griffin, Mayor, Town of Bear Grass
Jody Griffin, Director of Emergency Management, Martin County
Lance Swindell, Emergency Management Coordinator, Washington County
John Mello, NCEM Mitigation Specialist
Carl Baker, NCEM Mitigation Plans Manager
Abby Moore, WSP
Kimmy Hansen, WSP

AGENDA

- Project Overview & Where we are in the Planning Process
- Updates Since Last Meeting
- Capability Assessment
 - New Capabilities
 - Substantial Damage Management Procedures
- Mitigation Strategy
 - Goals & Objectives
 - Mitigation Action Plan Updates
- Next Steps

CAPABILITY ASSESSMENT

Abby facilitated the meeting and began by reviewing the region's capability assessment, highlighting strengths such as planning documents and emergency management resources, while identifying significant gaps in staffing, local funding, and capital improvement planning across the five-county region.

- Abby outlined the capability indicators used for assessment, including plans and regulatory capability, administrative and technical resources, fiscal resources, education and outreach, mitigation resources, and political will, emphasizing the need to catalog strengths and gaps to be able to identify feasible mitigation actions.
- The HMPC discussed the challenge of limited administrative personnel, noting that most small towns rely on county-level resources and that almost no new staff positions have been created, which restricts the scope of mitigation projects that can be pursued.
- The HMPC agreed that previous self-assessment ratings for community capabilities were overly optimistic, and the group decided to revise these ratings to more accurately reflect moderate or low capabilities, especially in smaller communities.

- It was noted by the committee that most towns now have basic zoning ordinances due to statutory requirements (Chapter 160D), but counties remain reliant on general ordinances without zoning, and much of the zoning work was supported by regional councils of government.
- The group clarified that most mitigation grant applications and projects have been managed at the county or state level, with little direct experience at the town level, and agreed to update the capability assessment to reflect this reality.

FEMA SUBSTANTIAL DAMAGE MANAGEMENT PROCEDURES

Abby discussed the new FEMA requirement to document substantial damage management procedures in the hazard mitigation plan, clarifying local responsibilities for floodplain management pre- and post-disaster.

- Jody explained that as the county ordinance administrator and building inspector, he reviews and enforces permit requirements for all incorporated communities. Williamston previously handled permitting independently but may have recently shifted to county oversight; Andrew confirmed that Williamston defers most building-related matters to the county.
- The group described the process for post-disaster damage assessment, noting that the tax assessor's offices conduct canvassing, data is collected in Survey123, and properties with substantial damage are flagged for compliance with current standards.
- Abby will document these procedures in the plan and follow up with relevant staff to ensure accuracy, including clarifying roles in communities where responsibilities may be changing due to retirements or staffing transitions.

MITIGATION STRATEGY AND ACTION PLAN UPDATES

Abby reviewed the existing goals and objectives for the Northeastern NC Regional Hazard Mitigation Plan, soliciting input from the HMPC to revise objectives, prioritize hazards, and ensure that new and ongoing mitigation actions are included for future grant eligibility.

- Abby presented the current goals and objectives, suggesting updates such as clarifying objectives related to property protection, compliance with regulatory requirements, and wildfire risk, with participants agreeing to move and rephrase certain objectives for better alignment as shown in slides 11 and 12.
- The group discussed the prioritization of hazards, agreeing to elevate wildfire risk due to the unique long-duration fires in the region, and decided to adjust the risk assessment scoring to reflect this.
- Abby emphasized the importance of including all desired mitigation actions in the plan to ensure eligibility for future grant funding, noting that actions can be broadly defined at this stage and that amendments are possible but more cumbersome.
- Participants were reminded that FEMA requires a status update for every mitigation action from the previous plan, and county leads will be responsible for providing updates, indicating whether actions are completed, carried forward, or deleted.
- Abby shared examples of potential mitigation projects, including flood mitigation, stormwater improvements, shoreline restoration, public education campaigns, and equipment needs such as generators and message boards, encouraging participants to submit ideas for inclusion.

PUBLIC ENGAGEMENT AND SURVEY EFFORTS

Abby updated the group on public survey responses and outreach efforts, encouraging further distribution and documentation of posts, and discussed how public input informs mitigation planning and education initiatives.

- Abby reported that the public survey has received only ten responses. She requested screenshots of any new outreach posts for documentation in the plan.
- Survey responses indicated that residents have taken preparedness actions such as acquiring generators and maintaining properties and expressed interest in learning more about local government efforts, highlighting opportunities for public education and outreach.

NEXT STEPS

HMPC Action Items

- Send mitigation action status updates and new mitigation action ideas to Abby at abigail.moore@wsp.com
- Review draft plan when made available (December)

WSP Action Items

- Provide draft plan for committee and the public to review by December. (The plan will be posted on the HMP website)
- Schedule the final HMPC and public meetings for early December.
 - The HMPC confirmed that it would be best to hold the final meetings in Bertie County during the first two weeks of December.

Survey Link: <https://forms.office.com/e/Kj1MPsEJBU>

Plan Website: www.NortheasternHMP.com/



WSP
December 2025
Page B.16

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HMPC MEETING 4: DECEMBER 10, 2025



NORTHEASTERN NC REGIONAL HAZARD MITIGATION PLAN UPDATE

HAZARD MITIGATION PLANNING COMMITTEE (HMPC) MEETING #4

December 10, 2025, 3 pm, Bertie County Library Community Meeting Center & Microsoft Teams

ATTENDANCE

There were four attendees in person and eleven online. The following individuals were in attendance:

Wesley Hopkins, EM, Tyrrell County
Charlotte Griffin, Mayor, Town of Bear Grass
Traci White, Planning Director, Bertie County
Andrew Brownfield, Planner & Zoning Administrator, Town of Williamston
Jody Griffin, Director of Emergency Management, Martin County
Ann Keyes, Board of County Commissioners Office, Washington County
Jerry McCrary, Mayor, Town of Parmele
Johnny Gibbs, Deputy Emergency Manager/Fire Marshall, Hyde County
Tracey Johnson, Board of County Commissioners Office, Washington County
John Mello, NCEM Mitigation Specialist
Carl Baker, NCEM Mitigation Plans Manager
David Stroud, WSP
Abby Moore, WSP
Ranger Ruffins, WSP
Kimmy Hansen, WSP

AGENDA

- Planning Process Update
- Structure of the Plan
- Review of Key Plan Components
 - Planning Process
 - Risk Assessment
 - Mitigation Strategy
- Plan Adoption & Implementation
- Next Steps
- Discussion/Feedback on Draft Plan

PLANNING PROCESS UPDATE

Ranger Ruffins with WSP began the presentation by explaining where we are in the planning process. We are nearing the end of the planning process as we have drafted the plan and now need to finalize it with any new mitigation actions that the communities wish to add. The plan will then need to be adopted and the HMPC and communities will work on implementation for the next five years.

STRUCTURE OF THE PLAN

Ranger provided an overview of the structure of the draft plan including a summary of each section of the plan, as follows.

- **Section 1: Introduction** provides background information on the plan, including context and justification for planning and the scope of the plan.
- **Section 2: Planning Process** summarizes how the planning process was conducted and how all planning requirements were met, including how the communities, public, and stakeholders were involved in the plan. This section also documents implementation progress of the last plan in terms of completed and deleted mitigation actions.
- **Section 3: Planning Area Profile** for summary information on the region and participating communities, including geographic, climate, demographic, and economic characteristics of the region.
- **Section 4: Risk Assessment** contains the bulk of the plan. This section presents the hazard identification and profiles each hazard with information on the location at risk, past occurrences, probability of future occurrence, and vulnerability of people, property, and critical facilities.
- **Section 5: Capability Assessment** summarizes each community's existing tools, staff, and other resources that can support the implementation of mitigation projects.
- **Section 6: Mitigation Strategy** reviews the goals and objectives of the plan and details how mitigation actions were identified and prioritized. David explained that existing mitigation actions from the previous plan were reviewed, and project status updates are reported in the plan. Some projects were carried forward. The HMPC also reviewed new mitigation projects to include in this plan update.
- **Section 7: Mitigation Action Plans** presents the action plan tables for each community.
- **Section 8: Plan Maintenance** describes past plan integration, opportunities for future plan integration, and the process for regular monitoring, maintenance, and implementation of the plan, including ongoing responsibilities of the HMPC.
- **Section 9: Plan Adoption** will document each community's adoption of the plan update.
- **Annexes** are provided for each participating community. The annexes provide an asset inventory with a full critical facility list, risk assessment data with vulnerability assessment results specific to the community for spatially defined hazards, and the mitigation action plan.
- **Appendix A** provides the Local Mitigation Plan Review Tool, which documents for the plan reviewers where the planning requirements were met.
- **Appendix B** provides planning process documentation demonstrating how the HMPC, public, and stakeholders were involved and engaged in the planning process.
- **Appendix C** provides mitigation alternatives analysis, documenting the review of mitigation action options, which is important for the CRS program planning requirements.
- **Appendix D** lists data and resources that were referenced in the plan.

KEY PLAN COMPONENTS

Ranger reviewed key parts of the planning process, including the HMPC meetings, the public meetings, and all the participating communities' public outreach efforts.

- Extensive public outreach was conducted, including a public survey with 13 responses highlighting experiences with hurricanes, flooding, and other hazards. Feedback on mitigation efforts and preferred categories, such as emergency services and natural resource protection, was incorporated into the plan.

- Ranger reviewed the Priority Risk Index results shown on slide 22, which notes Excessive Heat, Flooding, Hurricanes & Tropical Storms, and Thunderstorm Winds as “high risk” hazards for the Northeastern Region.
- On slides 23 and 24, Ranger reviewed the goals and objectives of the Northeastern Regional HMP update which were largely carried forward from the previous plan with some small revisions.
- Ranger reviewed a sample of the mitigation action plan to explain the organization of the table and the information included for each project, such as the lead agency, timeline for implementation, and potential funding sources.
- Based on prior discussions, the mitigation action plans for each jurisdiction will automatically include the creation or update of community wildfire protection plans, a generic property elevation/acquisition project, and a generic drainage improvement project for all communities, unless there are objections.

PLAN ADOPTION AND IMPLEMENTATION

- Ranger explained that every community will need to adopt the plan. A template adoption resolution from NCEM will be provided to all communities. Once NCEM approves the plan, communities can adopt the plan.
- Moving forward, the HMPC should meet quarterly to report on progress toward implementation and monitor funding opportunities and implementation of mitigation actions. At minimum, annual HMPC meetings should be held. The plan will continue to be updated every five years.
- David Stroud emphasized to all communities the importance of considering and submitting all potential mitigation projects for the next five years to avoid the need for future plan amendments, which require additional review by NCEM.

NEXT STEPS

- The HMPC was asked to send any final mitigation actions updates or new actions to Abby by Friday, December 12th. If any community needs extra assistance, they can schedule a call with Abby to review and update their mitigation actions.
- WSP will submit the draft plan to NCEM for review and approval on December 18th.
- A final public meeting is scheduled for December 10th at 5pm following the HMPC meeting. Community staff were asked to advertise the meeting to the public. It will be an in-person meeting held at the Bertie County Library Community Meeting Center.
- Any other draft plan comments should be sent by Thursday, December 18th. Comments will be incorporated into the final approved version of the plan.
- Plan Website: www.NortheasternHMP.com/

DISCUSSION

Tracey Johnson inquired about the inclusion of environmental issues such as PFAS and hydrilla as mitigation actions in the plan update. David Stroud and Carl Baker clarified that such issues are not typically covered under FEMA hazard mitigation plans and may be better addressed through the Department of Environmental Quality.

	Hansen, Kimberly	
	Andrew Brownfield - Town of Williamst... (Unverified)	
	Ann Keyes (Unverified)	
	Baker, Carl (NCEM) (Unverified)	
	Fireflies.ai Notetaker Jane (Unverified)	
	Jerry McCrary (Unverified)	
	Johnny Gibbs (Unverified)	
	Joseph Griffin (Unverified)	
	Mello, John (NCEM) (Unverified)	
	Moore, Abigail Organizer	
	read.ai meeting notes (Unverified)	
	Ruffins, Ranger	
	Stroud, David	
	Tracey Johnson (Unverified)	

Northeastern NC Regional Hazard Mitigation Plan
Hazard Mitigation Planning Committee - Meeting #4
Wednesday, December 10, 2025, 3pm

	Name	Jurisdiction	Department/Agency/Organization	Email
1.	Abby Moore		WSP	abigail.moore@wsp.com
2.	Wesley Hopkins	EM	Tyrrell County	wshopkins@tyrellcounty.net
3.	Charlotte Griffin	MAYOR	Bear Grass	charlotte.griffin@beargrass.com
4.	TRACI WHITE	BERTIE COUNTY	BERTIE COUNTY	traci.white@bertie.nc.gov
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PLANNING STEP 2: INVOLVE THE PUBLIC

Table B.2 – Public Meeting Topics, Dates, Locations

Meeting Title	Meeting Topic	Meeting Date	Meeting Location
Public Meeting #1	1. Introduction to DMA, CRS, and FMA requirements and the planning process 2. Review of HMPC responsibilities and the project schedule.	July 15, 2025 5:00 PM	Bertie County Library Community Meeting Center
Public Meeting #2	1. Review “Draft” Hazard Mitigation Plan 2. Solicit comments and feedback	December 10, 2025 5:00 PM	Bertie County Library Community Meeting Center

PUBLIC MEETING AGENDAS, MINUTES, SIGN-IN SHEETS, AND ANNOUNCEMENTS

PUBLIC MEETING 1: JULY 15, 2025



NORTHEASTERN NC REGIONAL HAZARD MITIGATION PLAN UPDATE

PUBLIC MEETING #1

July 15, 2025, 5 pm, Bertie County Library Community Meeting Center

ATTENDANCE

There were seven individuals in attendance:
Traci White, Planning & Inspections Director, Bertie County
James Peele, Mayor, Town of Powellsville
Mary Davis, Resident
Janet Capehart, Resident
Robert Capehart, Resident
Billy Barrow, Bertie Cooperative Extension
Abby Moore, WSP

AGENDA

- Why Plan?
- Project Overview
- Planning Process
- Project Schedule
- Next Steps
- Q & A

WHY PLAN?

Abby began the presentation with why we plan in the first place. She discussed the Disaster Mitigation Act (DMA) of 2000, which is codified in 44 CFR 201.6 and requires local government to update their hazard mitigation plans every five years to be eligible for pre- and post-disaster grant funding through FEMA's Hazard Mitigation Assistance programs. Mitigation funding available through FEMA includes the Hazard Mitigation Grant Program (HMGP) and Flood Mitigation Assistance (FMA) program. Abby noted that every community in the state is eligible for HMGP funding whenever a disaster is declared in the state of North Carolina, even if it does not directly impact your community, as there is often funding left over after projects have been completed in affected areas.

Other reasons to plan are to understand changing risks and to increase community resilience. Abby reviewed trends in disasters that support the need for mitigation planning. In FY2024 there were 27 billion-dollar disasters. There's an increasing trend in recent years in the number of billion-dollar disasters. This may be in part because we now have more frequent and intense hazard events and greater exposure to risk (people, property and critical infrastructure). Abby explained that hazard mitigation is a priority for multiple reasons, including that the cost of doing nothing is too high, many events are predictable and repetitive, loss reduction can be effective, cost-beneficial, and environmentally-sound, there are legal and moral responsibilities to prevent disasters, and there are federal funds available to support mitigation. The average benefit-cost ratio (BCR) for federally funded projects is 6:1 and is even higher for flood mitigation.

Abby explained that mitigation is a sustained or permanent action taken to reduce or eliminate long-term risk to people and/or property. Mitigation helps to break the damage/rebuild cycle. Basic approaches to mitigation include altering the hazard, averting the hazard, adapting to the hazard, or avoiding the hazard.

PROJECT OVERVIEW

Abby explained that we must follow the DMA planning process and will integrate Community Rating System (CRS) Activity 510 planning steps into the DMA four-phase planning process to meet the requirements of both programs. The DMA process provides continued eligibility for mitigation funding and guides mitigation activities in a coordinated and economical manner. The CRS program is flood specific and provides flood insurance policy holders in participating communities with discounts based on the number of CRS points their communities earn. Hyde County, Town of Creswell, Town of Plymouth, Town of Roper, and Washington County participate in the CRS program. Overall, the WSP planning team will ensure that the updated hazard mitigation plan meets all FEMA planning requirements.

PLANNING PROCESS

PHASE 1

Abby described the planning process in more detail. Phase 1, organize resources, is already underway. The HMPC has been reconvened, and new staff members and stakeholders were identified for involvement. Someone asked if the committee was already established; Abby clarified that the committee is established and already held their first meeting, but additional resident or stakeholder members can still join the committee and participate in the remaining meetings. Abby answered another question to clarify that the participants in the plan are the county and municipal jurisdictions in the region, which includes Bertie, Hyde, Martin, Tyrrell, and Washington Counties and their incorporated municipalities.

The HMPC will meet four times to provide input on risk and capability, update mitigation actions, and review plan drafts. HMPC meetings are open to the public, but there will also be two public meetings, this meeting and a meeting at the end of the planning process to review the draft plan.

It will also be important to involve stakeholders in the planning process in other ways. WSP will reach out to stakeholders to solicit input on the plan and is seeking suggestions on stakeholder to contact.

PHASE 2: ASSESS RISKS

Phase 2 covers the risk assessment, which includes the hazard identification and the vulnerability assessment. All of the hazards that were addressed in the previous plan will be carried over into this plan update. The identified hazards are as follows: Coastal Erosion, Dam & Levee Failure, Drought, Earthquake, Extreme Heat, Flood, Hurricane & Tropical Storm, Severe Weather, Severe Winter Storm, Tornado, Wildfire. The HMPC also decided to add hazardous substances to the plan update. Abby also explained that the hazards groupings and nomenclature will be updated to align with the State Hazard Mitigation Plan.

To conduct the vulnerability assessment, NCEM iRisk data will be used to provide loss estimates for several hazards. Additional qualitative, quantitative, and spatial analysis will be used as appropriate.

PHASE 3: DEVELOP A MITIGATION STRATEGY

Phase 3 involves developing a mitigation strategy by reviewing and updating the plan goals and objectives, evaluating mitigation alternatives including existing and new projects, and drafting an action plan with prioritized projects. The action plan will identify criteria to support monitoring and implementation, including the responsible department or agency, timeline for completion, and potential funding sources.

PHASE 4: ADOPTION AND IMPLEMENTATION

Phase 4 is where the communities must adopt and implement the plan. Each of the participating jurisdictions must adopt the plan by resolution and the committee will meet at least annually to review the action plan and look for funding and opportunities to implement projects. The plan will continue to be updated every five years.

PROJECT SCHEDULE

Abby presented the schedule for the planning process. The HMPC will meet again in September and November. The final public meeting will be held in December. The plan must be approved by NCEM and FEMA and adopted by all communities before the current plan expires in April 2026.

NEXT STEPS

Abby discussed opportunities for the public to stay involved in the plan update, including attending the public meetings, responding to the public survey, and reviewing meetings materials and draft documents on the plan website (<https://www.NortheasternHMP.com>).

WSP is working on the risk and vulnerability assessment update and responses to the public survey will be extremely helpful in identifying local risks and vulnerabilities as well as local priorities for mitigation.

Northeastern NC Regional Hazard Mitigation Plan
Public Meeting #1
Tuesday, July 15th, 5:00 PM

	Name	Agency/Organization/Affiliation	Email
1.	Mary Davis	Board of	Mary Davis@gmail.com
2.	Shirley Dale	Town of Pikesville	shirley.dale@pikesville.nc.gov
3.	James Carpenter	Resident	janet200@gmail.com
4.	Roland Carpenter		
5.	TRAC WHITE	BERTIE COUNTY PLANNING DEPT	traciwhite@bertie.nc.gov
6.	Billy Barrow	Berke Corp & Assoc	barrow@ncsu.edu
7.	Abby Woot	WSP	abigail.woot@wsp.com
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PUBLIC MEETING 2: DECEMBER 10, 2025



NORTHEASTERN NC REGIONAL HAZARD MITIGATION PLAN UPDATE

PUBLIC MEETING #2

December 10, 2025, 5pm, Bertie County Library Community Meeting Center

ATTENDANCE

There were two attendees:

Mary Davis
Abby Moore, WSP

AGENDA

- Planning Process Update
- Structure of the Plan
- Review of Key Plan Components
 - Planning Process
 - Risk Assessment
 - Mitigation Strategy
- Plan Adoption & Implementation
- Next Steps
- Discussion/Feedback on Draft Plan

PLANNING PROCESS UPDATE

Abby reviewed the planning process that was followed for the plan update, which is four phases as outlined by FEMA's local mitigation planning guidance.

STRUCTURE OF THE PLAN

Abby provided an overview of the structure of the draft plan including a summary of each section of the plan, as follows.

- **Section 1: Introduction** provides background information on the plan, including context and justification for planning and the scope of the plan.
- **Section 2: Planning Process** summarizes how the planning process was conducted and how all planning requirements were met, including how the communities, public, and stakeholders were involved in the plan. This section also documents implementation progress of the last plan in terms of completed and deleted mitigation actions.
- **Section 3: Planning Area Profile** for summary information on the region and participating communities, including geographic, climate, demographic, and economic characteristics of the region.
- **Section 4: Risk Assessment** contains the bulk of the plan. This section presents the hazard identification and profiles each hazard with information on the location at risk, past occurrences, probability of future occurrence, and vulnerability of people, property, and critical facilities.
- **Section 5: Capability Assessment** summarizes each community's existing tools, staff, and other resources that can support the implementation of mitigation projects.

- **Section 6: Mitigation Strategy** reviews the goals and objectives of the plan and details how mitigation actions were identified and prioritized. David explained that existing mitigation actions from the previous plan were reviewed, and project status updates are reported in the plan. Some projects were carried forward. The HMPC also reviewed new mitigation projects to include in this plan update.
- **Section 7: Mitigation Action Plans** presents the action plan tables for each community.
- **Section 8: Plan Maintenance** describes past plan integration, opportunities for future plan integration, and the process for regular monitoring, maintenance, and implementation of the plan, including ongoing responsibilities of the HMPC.
- **Section 9: Plan Adoption** will document each community's adoption of the plan update.
- **Annexes** are provided for each participating community. The annexes provide an asset inventory with a full critical facility list, risk assessment data with vulnerability assessment results specific to the community for spatially defined hazards, and the mitigation action plan.
- **Appendix A** provides the Local Mitigation Plan Review Tool, which documents for the plan reviewers where the planning requirements were met.
- **Appendix B** provides planning process documentation demonstrating how the HMPC, public, and stakeholders were involved and engaged in the planning process.
- **Appendix C** provides mitigation alternatives analysis, documenting the review of mitigation action options, which is important for the CRS program planning requirements.
- **Appendix D** lists data and resources that were referenced in the plan.

KEY PLAN COMPONENTS

Abby reviewed key parts of the planning process, including committee and public meetings, public outreach efforts, and the public survey results. Abby also highlighted the findings from the risk assessment, the updated goals and objectives, and the format of the mitigation action plans.

PLAN ADOPTION AND IMPLEMENTATION

Abby explained that every community will need to adopt the plan. The HMPC meet at least annually to report on progress toward implementation and monitor funding opportunities and implementation of mitigation actions. The plan will continue to be updated every five years.

NEXT STEPS

Abby asked that any comments on the draft plan be submitted to her via email or via the plan website by December 18th. WSP will submit the draft plan to NCEM for review and approval on December 18th.

The plan website is: www.NortheasternHMP.com/

Northeastern NC Regional Hazard Mitigation Plan
Public Meeting #2
Wednesday, December 10th, 5:00 PM

	Name	Agency/Organization/Affiliation	Email
1.	Abby Moore	WSP	abigail.moore@wsp.com
2.	Mary Davis	Community Member	MARY LEARY DAVIS@gmail.com
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PUBLIC MEETING 1 OUTREACH





Public Notice

Northeastern NC Regional Hazard Mitigation Plan

Public Kickoff Meeting

Bertie, Hyde, Martin, Tyrrell, and Washington Counties and their incorporated communities are updating the Northeastern NC Regional Hazard Mitigation Plan and are seeking public input on changes in risks, vulnerabilities, and opportunities for mitigation. To learn about the plan update process, review the identified hazards, and provide your input to the planning team, join us for a public meeting on:

**Tuesday, July 15th, 2025 at 5:00 p.m. at the
Bertie County Library Community Meeting Center
(102 Lancaster Ave, Windsor, NC)**

This plan update is required for all communities to maintain eligibility for pre- and post-disaster mitigation funding from FEMA. This effort will also help our communities understand vulnerability and develop ways to proactively reduce risk.

If you are unable to attend the public meeting but still want to be involved in the planning process, please take a few minutes to complete a brief public survey to provide your input on hazard risks and mitigation options. Click [here](#) or scan the QR code for the survey. Public input is critical to the planning process.



PUBLIC MEETING 2 OUTREACH

 **Martin County Government - NC** 
November 25 at 8:28 AM ·  ...

Bertie, Hyde, Martin, Tyrrell, and Washington Counties and their incorporated communities have updated the Northeastern NC Regional Hazard Mitigation Plan! Join us for ... [See more](#)



 4  Like  Comment  Share 4 shares

 **Bertie County Government** 
November 24 at 1:49 PM ·  ...



 2  Like  Comment  Share 2 shares

 Comment as Olivia Ranseen 



PUBLIC SURVEY & OUTREACH

The Northeastern NC region distributed a public survey, shown below, that requested public input into the Hazard Mitigation Plan planning process and the identification of mitigation activities that could lessen the risk and impact of future flood hazard events. The survey was announced at the first public meeting, provided via a link on participating jurisdictions web and social media accounts, and made available online on the plan website.



PUBLIC NOTICES

RELATED PAGES

UPCOMING EVENTS

- 12-10 - Martin County Board of Commissioners Regular Meeting
- 12-24 - Christmas Holiday-Offices Closed
- 12-25 - Christmas Holiday-Offices Closed

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- Bertie - Martin Regional Jail Commission Emergency Meeting Notice - December 3, 2025
- Proposed Martin County Citizens Academy
- Proposed Martin County Solar Energy Facilities Ordinance
- Public Hearing - Martin County Citizens Academy
- Public Hearing - Martin County Solar Energy Facilities Ordinance
- Public Notice - Martin County Landfill Closures
- Public Input Survey for the Northeastern NC Regional Hazard Mitigation Plan Update**
- Martin County Town Parades and Tree Lighting Ceremony Schedule 2025
- Water District 1 System Pressure Advisory Rescinded - October 24, 2025

Public Input Survey for the Northeastern NC Regional Hazard Mitigation Plan Update

Bertie, Hyde, Martin, Tyrrell, and Washington Counties and their incorporated communities are updating the Northeastern NC Regional Hazard Mitigation Plan and are seeking public input on changes in risks, vulnerabilities, and opportunities for mitigation. This plan update is required for all communities to maintain eligibility for pre- and post-disaster mitigation funding from FEMA. This effort will also help our communities to understand vulnerability and develop ways to proactively reduce risk.

Public input is critical to the planning process. Please take a few minutes to complete a brief public survey to provide your input on hazard risks and mitigation options. Click [here](#) or scan the QR code for the survey.

For more information about the plan update, visit the project website at www.NortheasternHMP.com. On this site you will find information about upcoming and past Hazard Mitigation Planning Committee meetings and public meetings, a link for the public survey, draft documents, and other mitigation planning resources.

Survey link: <https://forms.office.com/e/Kj1MPsEJBU>





Town Of Plymouth, NC

July 9 · 🌐

⋮

Northeastern NC Regional Hazard Mitigation Plan Update Information

Bertie, Hyde, Martin, Tyrrell, and Washington Counties and their incorporated communities are updating the Northeastern NC Regional Hazard Mitigation Plan and are seeking public input on changes in risks, vulnerabilities, and opportunities for mitigation. Join us for a public meeting on Tuesday, July 15th at 5pm at the Bertie County Library Community Meeting Center (102 Lancaster Ave, Windsor, NC) to learn about the plan update process, review the identified hazards, and provide your input to the planning team.

This plan update is required for all communities to maintain eligibility for pre- and post-disaster mitigation funding from FEMA. This effort will also help our communities understand vulnerability and develop ways to proactively reduce risk.

If you are unable to attend the public meeting but still want to be involved in the planning process, please take a few minutes to complete a brief public survey to provide your input on hazard risks and mitigation options. Click [here](#) or scan the QR code for the survey. Public input is critical to the planning process.



Social Media

The Northeastern NC Regional Hazard Mitigation Plan update is underway, and we need your input! Join us at the Bertie County Library Community Meeting Center (102 Lancaster Ave, Windsor, NC) for a public meeting on July 15th at 5pm. At this meeting you can learn about the plan update process, review the identified hazards, and provide your input to the planning team.

Survey link: <https://forms.office.com/e/Kj1MPsEJBU>

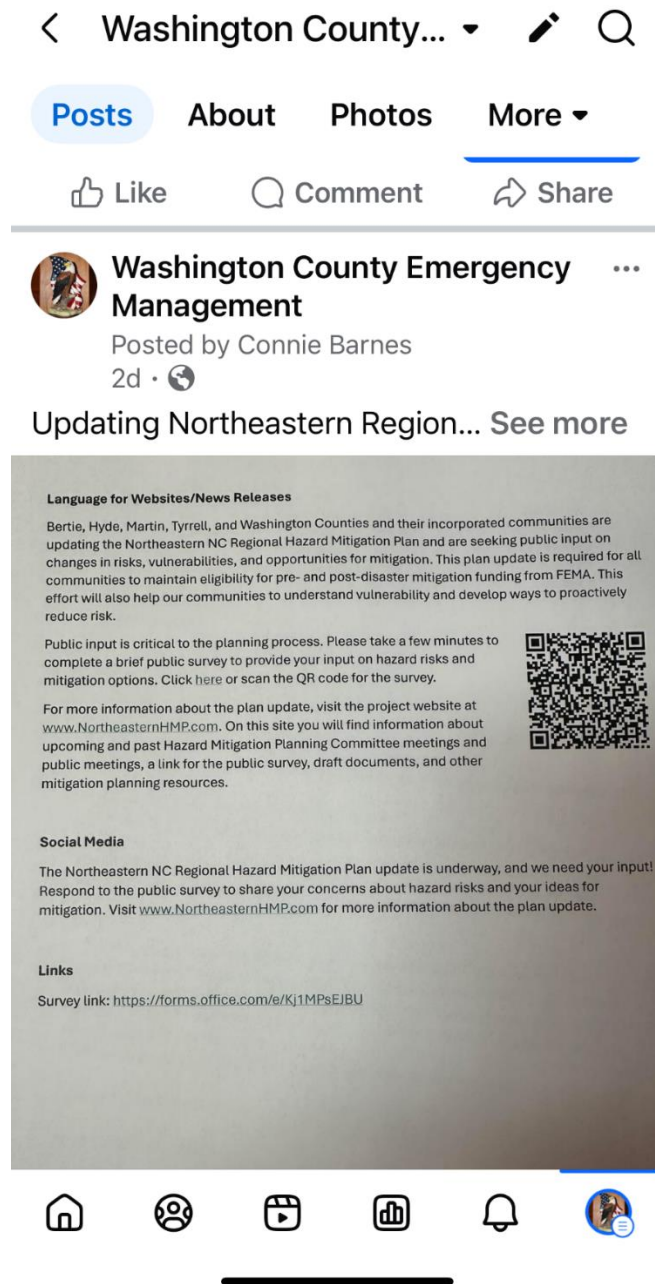
 1

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The Region received 13 responses to the survey. The following bullet points summarize significant findings from the survey. Key questions and responses are detailed in 3 responses were from Williamston, 3 from Windsor, 3 from Plymouth, and 1 each from Colerain, Oak City, Bear Grass, Creswell, and Merry Hill.

- 69% (9) of respondents reported that they had been impacted by a hazard in the Northeastern Region.
- On average, survey respondents ranked their concern about hazards impacting their community as 3.46 on a 1–5 scale.
- Hurricane & Tropical Storm was rated the most significant hazard, followed by Flood, Severe Weather, and Tornado. Dam & Levee Failure and Earthquake were consistently rated as the least significant hazards.
- 15% (2) of respondents said their homes are located in floodplains, while 23% (3) reported experiencing flooding despite living outside the floodplain. 23% (3) of respondents reported having flood insurance.
- 46% (6) of respondents reported taking steps to mitigate risk at home or in their neighborhood (examples included generators, roof/window replacement, tree maintenance, and coastal mitigation).
- 62% (8) of respondents do not know which government office to contact to learn more about hazard risks.
- Respondents favored emergency services, prevention, and property protection as the most important mitigation actions.

through Figure B.7.

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- 62% (8) of respondents do not know which government office to contact to learn more about hazard risks.
- Respondents favored emergency services, prevention, and property protection as the most important mitigation actions.

Figure B.1 – Survey Response, Community of Residence

1. Where do you live?

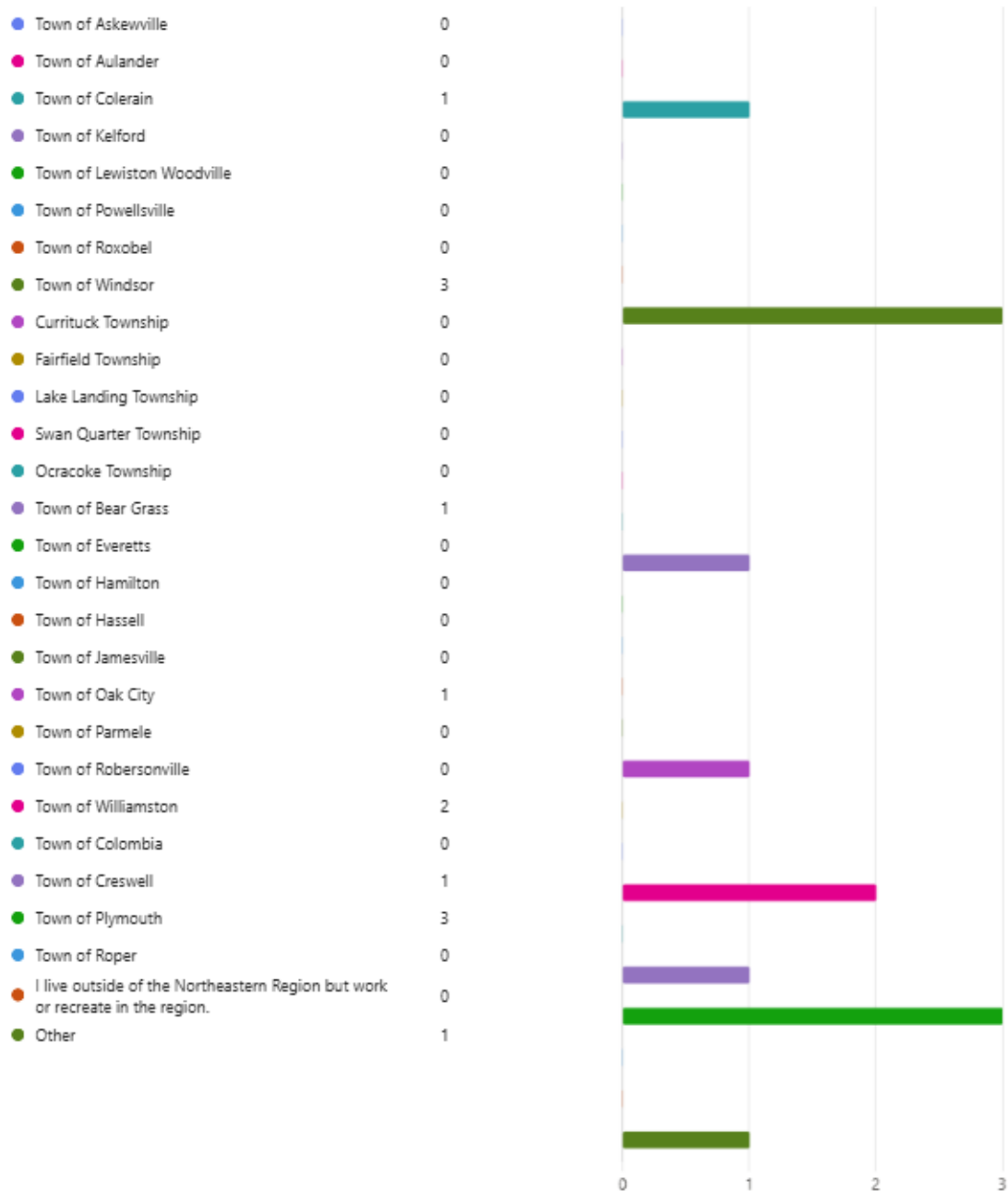


Figure B.2 – Survey Response, Disaster Impact

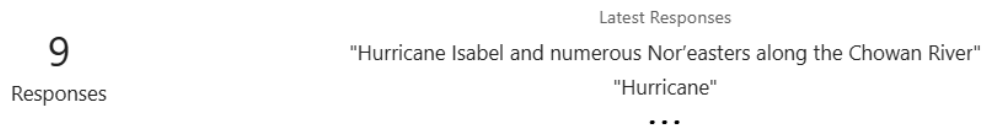
2. Have you ever experienced or been impacted by a hazard or disaster in the Northeastern Region?



Figure B.3 – Survey Response, Disaster Impact Explanation

3. If you answered "Yes" to question 2, please explain your experience and where it occurred.

[More details](#)



9 respondents (100%) answered Hurricanes for this question.

Hurricanes

flooding

Hurricane Floyd

Figure B.4 – Survey Response, Hazard Concern

4. On a scale of 1-5, how concerned are you about the possibility of your community being impacted by a hazard event? !



Figure B.5 – Survey Response, Hazard Significance Ratings

5. Please review the list of hazards below and rate each hazard based on how much risk you think it poses to your community.

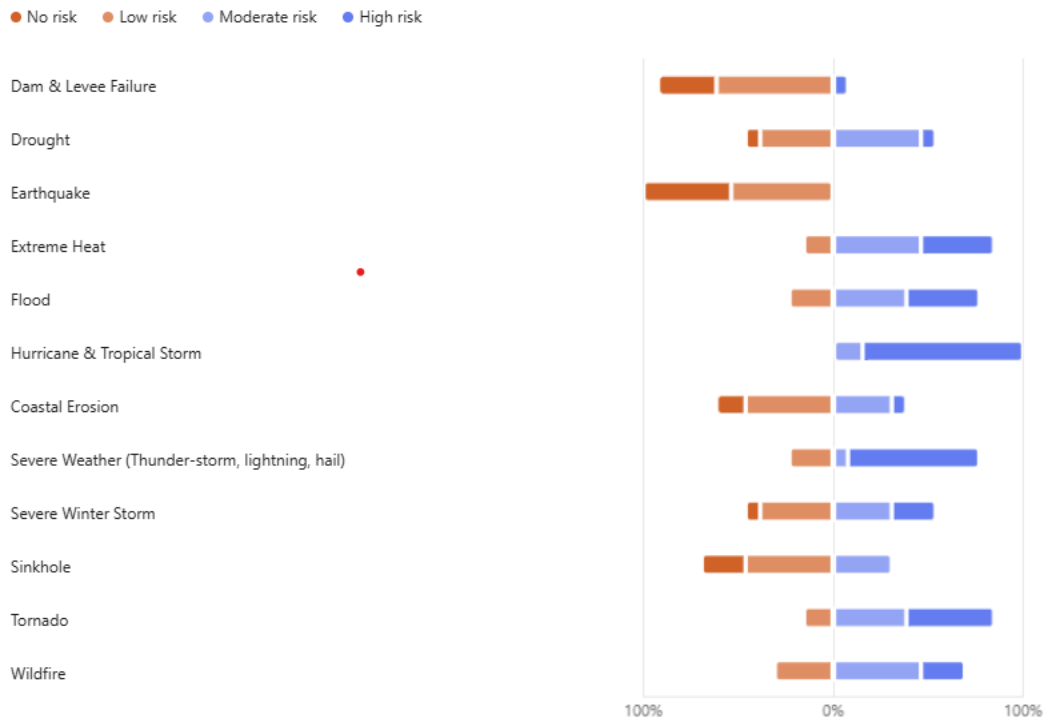


Figure B.6 – Survey Response, Floodplain Vulnerability

6. Is your home located in a floodplain?



Figure B.7 – Survey Response, Flood Insurance

7. Do you have flood insurance for your home and/or personal property?



Figure B.8 – Survey Response, Lack of Flood Insurance

8. If you do NOT have flood insurance, what is the reason?



PLAN WEBSITE OUTREACH & DRAFT DOCUMENTS



PLAN MATERIALS RESOURCES

CONTACT US

Northeastern NC Regional Hazard Mitigation Plan

This plan update is required for all communities to maintain eligibility for pre- and post-disaster mitigation funding from FEMA. This effort will also help the county and communities to identify hazard risks, understand vulnerability, and develop ways to proactively mitigate risk. Public input is vital to understanding local risks and mitigation opportunities. On this website you can find information about past and upcoming planning meetings, draft documents, and a survey on hazard risks and vulnerabilities, as well as a way to provide comments to the planning team. Check back for updates and new information throughout the planning process.

Take the Survey

Survey Link

This survey is an opportunity for you to share your opinions and participate in the mitigation planning process.

(Survey will close on November 21, 2025)

Project Timeline

Committee Meeting #1	7/15/2025
Public Meeting #1	7/15/2025
Committee Meeting #2	09/15/2025
Committee Meeting #3	11/6/2025
Committee Meeting #4	12/10/2025
Public Meeting #2	TBD
Proposed Delivery of Draft	TBD
Existing Plan Expiration	4/12/2026

Meeting Materials

07/15/2025 - Committee Meeting #1 [Minutes](#) and [Presentation](#)

07/15/2025 - Public Meeting #1 [Minutes](#) and [Presentation](#)

09/15/2025 - Committee Meeting #2 [Minutes](#) and [Presentation](#)

11/6/2025 - Committee Meeting #3 [Minutes](#) and [Presentation](#)

Draft Documents

→ Draft Risk Assessment

→ Draft Capability Assessment

PLANNING STEP 3: COORDINATE

This planning step credits the incorporation of other plans and other agencies' efforts into the development of the Hazard Mitigation Plan. Other agencies and organizations must be contacted to determine if they have studies, plans and information pertinent to the Hazard Mitigation Plan, to determine if their programs or initiatives may affect the community's program, and to see if they could support the community's efforts. To incorporate stakeholder input into the plan, a variety of stakeholders were identified by the HMPC and sent an email inviting them to attend a public meeting, review the draft plan, and provide feedback and comments. The coordination letter sent via email is provided below. A list of stakeholders detailing their involvement is provided in Table B.3.

Stakeholders were also involved through specific requests for data to support the development of the plan.

Moore, Abigail

From: Moore, Abigail
Sent: Wednesday, December 10, 2025 2:46 PM
Subject: Northeastern NC Regional Hazard Mitigation Plan Stakeholder Notice

Good afternoon,

Bertie, Hyde, Martin, Tyrrell, and Washington Counties and their incorporated jurisdictions have updated the Northeastern NC Regional Hazard Mitigation Plan and are seeking stakeholder input on the draft plan. You are receiving this email because the plan participants identified you as a stakeholder of this plan. This plan update is required for all communities to maintain eligibility for pre- and post-disaster mitigation funding from FEMA, and it will also help the participating communities to understand vulnerabilities and proactively mitigate risk.

To learn more about the plan update and to review the draft plan, please visit www.NortheasternHMP.com. If you would like to share any information or feedback that might be relevant to the plan and local mitigation efforts, please send it to me at abigail.moore@wsp.com by Thursday, December 18, 2025 or submit your comments via the plan website.

We appreciate any input you may wish to share and thank you for your assistance with this planning effort!

Abby Moore, AICP, CFM
 Hazard Mitigation & Resilience Planner
 She/Her

T +1 919-767-1112

WSP
 4021 Stirrup Creek Drive, Suite 100
 Durham, NC 27703

wsp.com



Table B.3 – Stakeholder List

First Name	Last Name	Organization
<i>Non-Profit Organizations</i>		
Tammy	Forrester	American Red Cross, Northeastern North Carolina Chapter, Executive Director
Bill	Blake	Albemarle Area United Way
<i>Educational Institutions</i>		
Dr. Otis	Smallwood	Bertie County Schools, Superintendent
Dr. Michelle	White	Martin County Schools, Superintendent
Dr. David	White	Washington County Schools, Superintendent
Ms. Brianna	Williams	Tyrrell County Schools, Superintendent
Dr. Melanie	Shaver	Hyde County Schools, Superintendent
Tabitha	Miller	Martin Community College, President
<i>Surrounding Municipalities</i>		
Drew	Pearson	Dare County Emergency Management, Director
Chris	Newkirk	Beaufort County Emergency Management, Planning & Mitigation Specialist
Jonas	Hill	Pitt County Planning Director
Daniel	Webb	Edgecombe County Emergency Services, Director
James	Ellen	Halifax County Emergency Services, Director
Tony	Burnette	Northampton Emergency Management Coordinator
Patrick	Dilday	Hertford County Emergency Management, Director
Robert	Daniel	Chowan County Planning Department, Director
<i>Federal Government</i>		
Jason	Hunter	FEMA Region 4, Chief, Floodplain Management & Insurance Branch
Valerie	Anderson	FEMA Region 4, Natural Hazards Program Specialist
Dewana	Davis	FEMA Region 4, Insurance Specialist
Roy	McClure	FEMA NFIP/CRS Specialist
Kymberly	Kudla	FEMA Mitigation Planning Specialist
David	Holcomb	ISO/CRS Specialist
Mike	Bratcher	ISO/CRS Specialist
Katherine	Smith	USGS Climate Adaptation Science Center
<i>State Government</i>		
Steve	Garrett	State NFIP Coordinator
Steve	McGugan	State Hazard Mitigation Officer
Linda	Culpepper	DEQ Division of Water Resources, Director
C.W. "Win"	Bridgers	NCDOT Division 1, Division Engineer
Hannah	Thompson-Welch	NC Forest Service, Wildfire Mitigation Specialist
<i>Business Community</i>		
April	Cooper	Martin County Chamber of Commerce, Executive Director
		Washington County Chamber of Commerce
Lewis	Hoggard	Windsor Bertie Chamber of Commerce, Director
		Hyde County Chamber of Commerce, President

APPENDIX C MITIGATION ALTERNATIVES

44 CFR Subsection D §201.6(c)(3)(ii): [The mitigation strategy section shall include] a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new buildings and infrastructure. All plans approved by FEMA after October 1, 2008, must also address the jurisdiction's participation in the NFIP, and continued compliance with NFIP requirements, as appropriate.

As part of the process of developing the mitigation action plans found in Section 7, the HMPC reviewed and considered a comprehensive range of mitigation options before selecting the actions identified for implementation. This section summarizes the full range of mitigation measures evaluated and considered by the HMPC, including a review of the categories of mitigation measures outlined in the 2017 CRS Coordinator's Manual, a discussion of current local implementation and CRS credits earned for those measures, and a list of the specific mitigation projects considered and recommended for implementation.

Mitigation alternatives identified for implementation by the HMPC were evaluated and prioritized using the criteria discussed in Section 6 of this plan.

C.1 CATEGORIES OF MITIGATION MEASURES CONSIDERED

The HMPC analyzed viable mitigation options that addressed each of the identified hazards and supported the identified goals and objectives. As part of the review of mitigation alternatives, the HMPC was provided with the following list of mitigation categories which are utilized as part of the CRS planning process.

- Prevention
- Property Protection
- Natural Resource Protection
- Structural Projects
- Emergency Services
- Public Information and Outreach

Action ideas within each of these categories were discussed and considered for inclusion in the plan. The HMPC was encouraged to select actions to pursue within most if not all of these categories so as to develop a comprehensive approach to hazard mitigation.

C.2 ALTERNATIVE MITIGATION MEASURES PER CATEGORY

This section presents a summary review of the mitigation measures that were considered by the HMPC. Note: the CRS credit recommendations are based on the 2017 CRS Coordinator's Manual and the 2021 Addendum.

C.2.1 PREVENTATIVE AND REGULATORY MEASURES

Preventative measures are designed to keep a problem—such as flooding—from occurring or from getting worse. The objective of preventative measures is to ensure that future development is not exposed to damage and does not cause an increase in damages to other properties. Building, zoning, planning and code enforcement offices usually administer preventative measures. Some examples of types of preventative measures include:

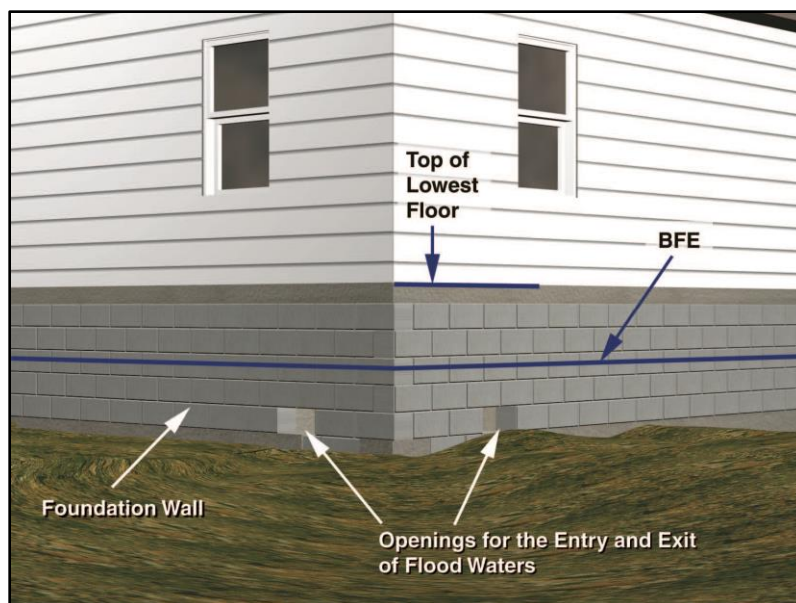
- Building codes
- Zoning ordinance
- Comprehensive or land use plan
- Open space preservation
- Floodplain regulations
- Subdivision regulations
- Stormwater management regulations

BUILDING CODES

Building codes provide one of the best methods for addressing natural hazards. When properly designed and constructed according to code, the average building can withstand many of the impacts of natural hazards. Hazard protection standards for all new and improved or repaired buildings can be incorporated into the local building code. Building codes can ensure that the first floors of new buildings are constructed to be higher than the elevation of the 100-year flood (the flood that is expected to have a one percent chance of occurring in any given year). This is shown in Figure B.1.

Just as important as having code standards is the enforcement of the code. Adequate inspections are needed during the course of construction to ensure that the builder understands the requirements and is following them. Making sure a structure is properly elevated and anchored requires site inspections at each step.

Figure C.1 – Building Codes and Flood Elevations



Source: FEMA Publication: *Above the Flood: Elevating Your Floodprone House*, 2000

ASCE 24 is a referenced standard in the International Building Code. Any building or structure that falls within the scope of the IBC that is proposed in a flood hazard area is to be designed in accordance with ASCE 24. Freeboard is required as a function of the nature of occupancy and the flood zone. Dwellings and most other buildings have 1-foot of freeboard; certain essential facilities have 2-3 feet; only agricultural facilities, temporary facilities and minor storage facilities are allowed to have their lowest floors at the BFE.

COMPREHENSIVE OR LAND USE PLAN

Building codes provide guidance on how to build in hazardous areas. Planning and zoning activities direct development away from these areas, particularly floodplains and wetlands. They do this by designating land uses that are compatible with the natural conditions of land that is prone to flooding, such as open space or recreation. Communities in the Northeastern NC Region prepare land use plans in compliance with North Carolina Coastal Area Management Act (CAMA) requirements.

OPEN SPACE PRESERVATION

Keeping the floodplain and other hazardous areas open and free from development is the best approach to preventing damage to new developments. Open space can be maintained in agricultural use or can serve as parks, greenway corridors and golf courses.

Comprehensive and capital improvement plans should identify areas to be preserved by acquisition and other means, such as purchasing an easement. With an easement, the owner is free to develop and use private property, but property taxes are reduced, or a payment is made to the owner if the owner agrees to not build on the part set aside in the easement.

Although there are some federal programs that can help acquire or reserve open lands, open space lands and easements do not always have to be purchased. Developers can be encouraged to dedicate park land and required to dedicate easements for drainage and maintenance purposes.

ZONING ORDINANCE

Zoning enables a community to designate what uses are acceptable on a given parcel. Zoning can ensure compatibility of land use with the land's level of suitability for development. Planning and zoning activities can also provide benefits by allowing developers more flexibility in arranging improvements on a parcel of land through the planned development approach. Zoning regulations describe what type of land use and specific activities are permitted in each district, and how to regulate how buildings, signs, parking, and other construction may be placed on a lot. Zoning regulations also provide procedures for rezoning and other planning applications. The zoning map and zoning regulations provide properties with certain rights to development. Most municipalities in the region developed zoning ordinances in the last five years.

FLOODPLAIN REGULATIONS

A Flood Damage Prevention Ordinance sets development standards for Special Flood Hazard Areas (SFHAs). Communities participating in the National Flood Insurance Program (NFIP) are required to adopt a flood damage prevention ordinance that meets at least the minimum standards of the NFIP; however, a community can incorporate higher standards for increased protection. For example, communities can adopt higher regulatory freeboard requirements, cumulative substantial damage definitions, fill restrictions, and other standards.

Another important consideration in floodplain regulations is the protection of natural and beneficial functions and the preservation of natural barriers such as vegetation. Vegetation along a stream bank is extremely beneficial for the health of the stream. Trees and other plants have an extensive root system that strengthen stream banks and help prevent erosion. Vegetation that has sprouted up near streams

should remain undisturbed unless removing it will significantly reduce a threat of flooding or further destruction of the stream channel.

STORMWATER MANAGEMENT REGULATIONS

Stormwater runoff is increased when natural ground cover is replaced by urban development. Development in the watershed that drains to a river can aggravate downstream flooding, overload the community's drainage system, cause erosion, and impair water quality. There are three ways to prevent flooding problems caused by stormwater runoff:

- 1 Regulating development in the floodplain to ensure that it will be protected from flooding and that it won't divert floodwaters onto other properties;
- 2 Regulating all development to ensure that the post-development peak runoff will not be greater than it was under pre-development conditions; and
- 3 Set construction standards so buildings are protected from shallow water.

REDUCING FUTURE FLOOD LOSSES

Zoning and comprehensive planning can work together to reduce future flood losses by directing development away from hazard prone areas. Creating or maintaining open space is the primary way to reduce future flood losses.

Planning for open space must also be supplemented with development regulations to ensure that stormwater runoff is managed, and that development is protected from flooding. Enforcement of the flood damage prevention ordinance and the flood protection elevation requirement provides an extra level of protection for buildings constructed in the planning area.

Stormwater management and the requirement that post-development runoff cannot exceed pre-development conditions is one way to prevent future flood losses. Retention and detention requirements also help to reduce future flood losses.

LOCAL IMPLEMENTATION RECOMMENDATIONS

The CRS encourages strong building codes. It provides credit in two ways: points are awarded based on the community's Building Code Effectiveness Grading Schedule (BCEGS) classification and points are awarded for adopting the International Code series. In North Carolina, communities are limited by the State Building Code Council which has not implemented the most current version of the International Building Code.

CRS credits are available for regulations that encourage developers to preserve floodplains or other hazardous areas away from development. There is no credit for a plan, only for the enforceable regulations that are adopted pursuant to a plan. Communities in the Northeastern NC Region could receive credit for Activity 430 – Higher Regulatory Standards and for Activity 420 – Open Space Preservation for preserving parcels within the SFHA as open space. Preserving flood prone areas as open space is one of the highest priorities of the Community Rating System. Participating communities could also receive credit for Activity 450 – Stormwater Management for enforcing regulations for stormwater management and soil and erosion control.

Table C.1 – Prevention Mitigation Options and Recommended Projects

Action #	Mitigation Action	Reason for Pursuing / Not Pursuing	Funding
Prevention Measures Considered by HMPC and Not Recommended			
-	Join the CRS program.	This is not a priority for small communities with very few flood insurance policies.	n/a

Action #	Mitigation Action	Reason for Pursuing / Not Pursuing	Funding
-	Continue to enforce all regulations outlined under the NC State Building Code.	This measure is an established day to day function of participating communities	n/a
Prevention Measures and Funding Recommended for Implementation			
H9	Continue to support the efforts of Tideland Electric and NCDOT in maintaining the county's right-of-way and utility easements. This effort involves the trimming and pruning of trees that pose an imminent threat to the county's limited infrastructure system. Maintaining clear access into and out of the county, as well as protection of the county's electrical and communications networks, is critical to effective response during natural hazard events.	Hyde County continues to work closely with all utility providers to ensure that right of ways and utility easements are properly maintained in an effort to minimize damage associated with natural hazard events.	General Fund, Electric Service Providers
H16	Work to implement all recommendations outlined within the Hurricane Matthew Resilient Redevelopment Plan.	Implementing recommendations from this plan will ensure better-built buildings that are more likely to protect people and hold up against future hurricanes and storms.	General Fund, NCDPS, NCDOT, NCDEQ
W3	Monitor all land development codes, including the county and town Flood Damage Prevention Ordinances, on an annual basis to ensure that they are up-to-date and address current issues and concerns. This review will also be conducted following substantial natural hazard events.	Washington County continues to closely monitor the impacts that natural hazards have on the County's built environment. These factors will be incorporated into decisions regarding amendment to the County's land development regulations.	General Fund, NCDPS

C.2.2 PROPERTY PROTECTION MEASURES

Generally, natural hazards do not damage vacant areas; the major impact of hazards is to people and improved property. Property protection measures are used to modify buildings or property that are subject to damage in order to reduce their vulnerability. Property protection measures fall under three approaches:

- Modify the site to keep the hazard from reaching the building;
- Modify the building (retrofit) so it can withstand the impacts of the hazard; and
- Insure the property to provide financial relief after the damage occurs.

Property protection measures are normally implemented by the property owner, although in many cases technical and financial assistance can be provided by a government agency.

KEEPING THE HAZARD AWAY

In some cases, properties can be modified so the hazard does not reach the damage-prone improvements. For example, a berm can be built to prevent floodwaters from reaching a house.

BARRIERS

A flood protection barrier can be built of dirt or soil (a "berm") or concrete or steel (a "floodwall"). Careful design is needed so as not to create flooding or drainage problems on neighboring properties. Depending on how porous the ground is, if floodwaters will stay up for more than an hour or two, the design needs to account for leaks, seepage of water underneath, and rainwater that will fall inside the perimeter. This is usually done with a sump or drain to collect the internal groundwater and surface water and a pump and pipe to pump the internal drainage over the barrier. Barriers can only be built so high. They can be overtopped by a flood higher than expected. Barriers made of earth are susceptible to erosion from rain and floodwaters if not properly sloped, covered with grass, and properly maintained.

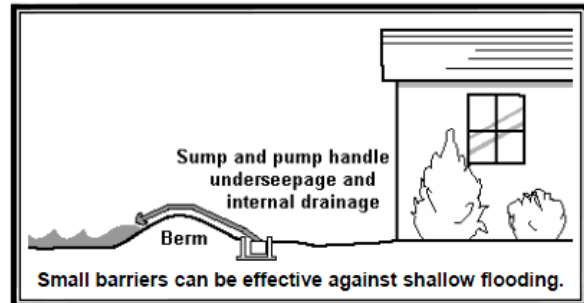


MODIFY THE BUILDING

There are several common methods to keep a flood from reaching and damaging a building:

- Move the building out of the flood-prone area.
- Elevate the building above the flood level.
- Demolish the building.
- Replace the building with a new one that is elevated above the flood level.
- Retrofit the building to reduce the impact of flooding when it occurs.

Elevation, acquisition, and pilot reconstruction are the most effective types to consider for the planning area for flood mitigation. Note that building retrofits can also be applicable to mitigation of other hazards.



RELOCATION

Moving a building out of a flood prone area to higher ground is the surest and safest way to protect it from flooding. While almost any building can be moved, the cost increases for heavier structures, such as those with exterior brick and stone walls, and for large or irregularly shaped buildings. Relocation is also preferred for large lots that include buildable areas outside the floodplain or where the owner has a new flood-free lot (or portion of the existing lot) available.

BUILDING ELEVATION

Raising a building above the flood level can be almost as effective as moving it out of the floodplain. Water flows under the building, causing little or no damage to the structure or its contents. Raising a building above the flood level is cheaper than moving it and can be less disruptive to a neighborhood. Elevation has proven to be an acceptable and reasonable means of complying with floodplain regulations that require new, substantially improved, and substantially damaged buildings to be elevated above the base flood elevation.

DEMOLITION

Some buildings, especially heavily damaged or repetitively flooded ones, are not worth the expense to protect them from future damages. It is cheaper to demolish them and either replace them with new, flood protected structures, or relocate the occupants to a safer site. Demolition is also appropriate for buildings that are difficult to move – such as larger, slab foundation or masonry structures – and for dilapidated structures that are not cost-beneficial to protect.



PILOT RECONSTRUCTION

If a building is not in good shape, elevating it may not be worthwhile or it may even be dangerous. An alternative is to demolish the structure and build a new one on the site that meets or exceeds all flood protection codes. FEMA funding programs refer to this approach as "pilot reconstruction." It is still a pilot program, and not a regularly funded option. Certain rules must be followed to qualify for federal funds for pilot reconstruction.

RETROFITTING

An alternative to keeping the hazard away from a building is to modify or retrofit the site or building to minimize or prevent damage. There are a several techniques to do this, as described below.

— Dry Floodproofing

Dry floodproofing means making all areas below the flood protection level watertight. Walls are coated with waterproofing compounds or plastic sheeting. Openings, such as doors, windows and vents, are closed, either permanently, with removable shields, or with sandbags. Dry floodproofing of new and existing nonresidential buildings in the regulatory floodplain is permitted under state, FEMA and local regulations. Dry floodproofing of existing residential buildings in the floodplain is also permitted as long as the building is not substantially damaged or being substantially improved. Owners of buildings located outside the regulatory floodplain can always use dry floodproofing techniques.

Dry floodproofing is only effective for shallow flooding, such as repetitive drainage problems. It does not protect from the deep flooding along lakes and larger rivers caused by hurricanes or other storms.

— Wet Floodproofing

The alternative to dry floodproofing is wet floodproofing: water is let in and everything that could be damaged by a flood is removed or elevated above the flood level. Structural components below the

flood level are replaced with materials that are not subject to water damage. For example, concrete block walls are used instead of wooden studs and gypsum wallboard. The furnace, water heater and laundry facilities are permanently relocated to a higher floor. Where the flooding is not deep, these appliances can be raised on blocks or platforms.

INSURANCE

Technically, insurance does not mitigate damage caused by a natural hazard. However, it does help the owner repair, rebuild, and hopefully afford to incorporate some of the other property protection measures in the process. Insurance offers the advantage of protecting the property, so long as the policy is in force, without requiring human intervention for the measure to work.

— Private Property

Although most homeowner's insurance policies do not cover a property for flood damage, an owner can insure a building for damage by surface flooding through the NFIP. Flood insurance coverage is provided for buildings and their contents damaged by a "general condition of surface flooding" in the area. Most people purchase flood insurance because it is required by the bank when they get a mortgage or home improvement loan. Usually these policies just cover the building's structure and not the contents. Contents coverage can be purchased separately. Renters can buy contents coverage, even if the owner does not buy structural coverage on the building. Most people don't realize that there is a 30-day waiting period to purchase a flood insurance policy and there are limits on coverage.

— Public Property

Governments can purchase commercial insurance policies. Larger local governments often self-insure and absorb the cost of damage to one facility, but if many properties are exposed to damage, self-insurance can drain the government's budget. Communities cannot expect federal disaster assistance to make up the difference after a flood.

LOCAL IMPLEMENTATION RECOMMENDATIONS

The CRS provides the most credit points for acquisition and relocation under Activity 520, because this measure permanently removes insurable buildings from the floodplain. Communities in the Northeastern NC Region could receive credit for Activity 520 – Acquisition and Relocation, for acquiring and relocating buildings from the SFHA. The HMPC recommended pursuing the purchase of repetitive loss buildings and other buildings which are subject to flood damage in order to reduce future losses and return this land to open space. At minimum, the committee recommended property protection mitigation strategies for these properties, such as elevation or floodproofing, as funding becomes available.

The CRS also credits barriers and elevating existing buildings under Activity 530. The credit for Activity 530 is based on the combination of flood protection techniques used and the level of flood protection provided. Points are calculated for each protected building. Bonus points are provided for the protection of repetitive loss buildings and critical facilities. Communities could receive credit for Activity 360 – Flood Protection Assistance by providing advice and assistance to homeowners who may want to flood proof their home or business. Advice is provided both on property protection techniques and on financial assistance programs to help fund mitigation.

Flood insurance information for each community is provided in Section 5 and in greater detail in the county annexes. There is no credit for purchasing flood insurance, but the CRS does provide credit for local public information programs that, among other topics, explain flood insurance to property owners. The CRS also reduces the premiums for those people who do buy NFIP coverage. Communities in the Northeastern NC Region could receive credit for Activity 330 – Outreach Projects. The HMPC has recommended outreach to property owners on the availability of flood insurance, including ICC coverage, which provides additional funds to repetitive loss properties and substantially damaged properties to

offset the cost of improvements needed to bring these properties up to code. This information will be provided in the county library and given to local contractors.

Table C.2 – Property Protection Mitigation Options and Recommended Projects

Action #	Mitigation Action	Reason for Pursuing / Not Pursuing	Funding
Property Protection Measures Considered by HMPC and Not Recommended			
-	Pursue grant funding for building relocations	Requires willing homeowner participants. Prioritizing acquisitions or elevations instead of relocations.	n/a
Property Protection Measures and Funding Recommended for Implementation			
H1	Consider revising the county's Flood Damage Prevention Ordinance to increase the current established two-foot freeboard requirement regarding base flood elevation for new structures developed within the Flood Hazard Area. This effort will also address any necessary updates required by the National Flood Insurance Program (NFIP).	Hyde County will continue to monitor the County's needs regarding required finished floor elevation. As flooding events occur, the County will assess current standards and adjust as necessary.	General Fund
W4	Through implementation of this plan, consider increasing the County's required freeboard within the county's FDPO.	Washington County will review the County's minimal design standards within the defined special flood hazard area to ensure that those standards are adequate to address the potential impacts of recently occurring flooding events.	General Fund, NCDPS
H3	Continue to maintain, operate, and carry out all activities outlined within the Swan Quarter Watershed Project Operation and Maintenance Checklist. This effort includes ensuring functionality of the Swan Quarter Dike.	Hyde County continues to monitor the status of the Swan Quarter flood control system and associated maintenance protocols. This will continue through implementation of this plan.	General Fund, NCDPS

C.2.3 NATURAL RESOURCE PROTECTION

Resource protection activities are generally aimed at preserving (or in some cases restoring) natural areas. These activities enable the naturally beneficial functions of fields, floodplains, wetlands, and other natural lands to operate more effectively. Natural and beneficial functions of watersheds, floodplains and wetlands include:

- Reduction in runoff from rainwater and stormwater in pervious areas
- Infiltration that absorbs overland flood flow
- Removal and filtering of excess nutrients, pollutants and sediments
- Storage of floodwaters
- Absorption of flood energy and reduction in flood scour

- Water quality improvement
- Groundwater recharge
- Habitat for flora and fauna
- Recreational and aesthetic opportunities

As development occurs, many of the above benefits can be achieved through regulatory steps for protecting natural areas or natural functions. This section covers the resource protection programs and standards that can help mitigate the impact of natural hazards, while they improve the overall environment. Six areas were reviewed:

- Wetland protection
- Erosion and sedimentation control
- Stream/River restoration
- Best management practices
- Dumping regulations
- Farmland protection

WETLAND PROTECTION

Wetlands are often found in floodplains and topographically depressed areas of a watershed. Many wetlands receive and store floodwaters, thus slowing and reducing downstream flows. They also serve as a natural filter, which helps to improve water quality, and they provide habitat for many species of fish, wildlife and plants.



EROSION AND SEDIMENTATION CONTROL

Farmlands and construction sites typically contain large areas of bare exposed soil. Surface water runoff can erode soil from these sites, sending sediment into downstream waterways. Erosion also occurs along stream banks and shorelines as the volume and velocity of flow or wave action destabilize and wash away the soil. Sediment suspended in the water tends to settle out where flowing water slows down. This can clog storm drains, drain tiles, culverts and ditches and reduce the water transport and storage capacity of river and stream channels, lakes and wetlands.

There are two principal strategies to address these problems: minimize erosion and control sedimentation. Techniques to minimize erosion include phased construction, minimal land clearing, and stabilizing bare ground as soon as possible with vegetation and other soil stabilizing practices.

STREAM/RIVER RESTORATION

There is a growing movement that has several names, such as "stream conservation," "bioengineering," or "riparian corridor restoration." The objective of these approaches is to return streams, stream banks and adjacent land to a more natural condition, including the natural meanders. Another term is "ecological restoration," which restores native indigenous plants and animals to an area.

A key component of these efforts is to use appropriate native plantings along the banks that resist erosion. This may involve retrofitting the shoreline with willow cuttings, wetland plants, or rolls of landscape material covered with a natural fabric that decomposes after the banks are stabilized with plant roots.

In all, restoring the right vegetation to a stream has the following advantages:

- Reduces the amount of sediment and pollutants entering the water
- Enhances aquatic habitat by cooling water temperature

- Provides food and shelter for both aquatic and terrestrial wildlife
- Can reduce flood damage by slowing the velocity of water
- Increases the beauty of the land and its property value
- Prevents property loss due to erosion
- Provides recreational opportunities, such as hunting, fishing and bird watching
- Reduces long-term maintenance costs

Communities are required by state and federal regulations to monitor storm water drainage outfalls and control storm water runoff.

BEST MANAGEMENT PRACTICES

Point source pollutants come from pipes such as the outfall of a municipal wastewater treatment plant. They are regulated by the US EPA. Nonpoint source pollutants come from non-specific locations and harder to regulate. Examples of nonpoint source pollutants are lawn fertilizers, pesticides, other chemicals, animal wastes, oils from street surfaces and industrial areas, and sediment from agriculture, construction, mining and forestry. These pollutants are washed off the ground's surface by stormwater and flushed into receiving storm sewers, ditches and streams.

The term "best management practices" (BMPs) refers to design, construction and maintenance practices and criteria that minimize the impact of stormwater runoff rates and volumes, prevent erosion, protect natural resources and capture nonpoint source pollutants (including sediment). They can prevent increases in downstream flooding by attenuating runoff and enhancing infiltration of stormwater. They also minimize water quality degradation, preserve beneficial natural features onsite, maintain natural base flows, minimize habitat loss, and provide multiple usages of drainage and storage facilities.

DUMPING REGULATIONS

BMPs usually address pollutants that are liquids or are suspended in water that are washed into a lake or stream. Dumping regulations address solid matter, such as shopping carts, appliances and landscape waste that can be accidentally or intentionally thrown into channels or wetlands. Such materials may not pollute the water, but they can obstruct even low flows and reduce the channels' and wetlands' abilities to convey or clean stormwater.

Many cities have nuisance ordinances that prohibit dumping garbage or other "objectionable waste" on public or private property. Waterway dumping regulations need to also apply to "non-objectionable" materials, such as grass clippings or tree branches, which can kill ground cover or cause obstructions in channels. Regular inspections to catch violations should be scheduled.

Many people do not realize the consequences of their actions. They may, for example, fill in the ditch in their front yard without realizing that is needed to drain street runoff. They may not understand how re-grading their yard, filling a wetland, or discarding leaves or branches in a watercourse can cause a problem to themselves and others. Therefore, a dumping enforcement program should include public information materials that explain the reasons for the rules as well as the penalties.

FARMLAND PROTECTION

Farmland protection is an important piece of comprehensive planning and zoning throughout the United States. The purpose of farmland protection is to provide mechanisms for prime, unique, or important agricultural land to remain as such, and to be protected from conversion to nonagricultural uses.

Frequently, farm owners sell their land to residential or commercial developers and the property is converted to non-agricultural land uses. With development comes more buildings, roads and other

infrastructure. Urban sprawl occurs, which can lead to additional stormwater runoff and emergency management difficulties.

Farms on the edge of cities are often appraised based on the price they could be sold for to urban developers. This may drive farmers to sell to developers because their marginal farm operations cannot afford to be taxed as urban land. The Farmland Protection Program in the United States Department of Agriculture's 2002 Farm Bill (Part 519) allows for funds to go to state, tribal, and local governments as well as nonprofit organizations to help purchase easements on agricultural land to protect against the development of the land.

LOCAL IMPLEMENTATION RECOMMENDATIONS

There is credit for preserving open space in its natural condition or restored to a state approximating its natural condition. The credit is based on the percentage of the floodplain that can be documented as wetlands protected from development by ownership or local regulations. Communities in the Northeastern NC Region could receive credit for Activity 420 – Open Space Preservation for preserving a portion of the SFHA as open space.

Additionally, credit is available for Activity 540 – Drainage System Maintenance. Having a portion of the drainage system inspected regularly throughout the year and maintenance performed as needed would earn a community credit. Communities could also get credit under this activity for providing a listing of problem sites that are inspected more frequently, and for implementing an ongoing Capital Improvements Program.

Credit is available for the Erosion and Sediment Control (ESC) element under Activity 450 for regulating activities throughout the watershed to minimize erosion on construction sites that could result in sedimentation and water pollution. The HMPC previously proposed developing a Comprehensive Water Management Plan to monitor water supplies.

Table C.3 – Natural Resource Protection Mitigation Options and Recommended Projects

Action #	Mitigation Action	Reason for Pursuing / Not Pursuing	Funding
Natural Resource Protection Measures Considered by HMPC and Not Recommended			
-	Enforce and support the US Army Corps of Engineers Non-Coastal Wetland Regulations	This is an established day to day function.	n/a
Natural Resource Protection Measures and Funding Recommended for Implementation			
W18	Maintain a contract with a qualified post-disaster recovery service provider. This contract will include the provision of essential services and equipment, including generators, and will include documentation required for reimbursement from FEMA/NCEM.	By maintaining this contract, the County has plans in place to quickly and easily clean up after any disaster.	General Fund, NCDPS, FEMA
H14	Develop a Comprehensive Water Management Plan to monitor the County's water supply and impose water restriction measures as deemed necessary during extreme drought conditions.	The creation of a plan and implementation of restrictions will help protect health and safety of citizens.	General Fund

C.2.4 EMERGENCY SERVICES MEASURES

Emergency services measures protect people during and after a disaster. A good emergency management program addresses all hazards, and it involves all local government departments. This section reviews emergency services measures following a chronological order of responding to an emergency. It starts with identifying an impending problem (threat recognition) and continues through post-disaster activities.

THREAT RECOGNITION

The first step in responding to a hazard event is to know when weather conditions are such that an event could occur. With a proper and timely threat recognition system, adequate warnings can be disseminated.

The National Weather Service (NWS) is the prime agency for detecting meteorological threats. Severe weather warnings are transmitted through NOAA's Weather Radio System. Local emergency managers can then provide more site-specific and timely recognition after the Weather Service issues a watch or a warning. A flood threat recognition system predicts the time and height of a flood crest. This can be done by measuring rainfall, soil moisture, and stream flows upstream of the community and calculating the subsequent flood levels. North Carolina Emergency Management's Flood Inundation Mapping & Alert Network (FIMAN) provides real-time water levels and flood inundation information for much of North Carolina.

On smaller rivers and streams not covered by FIMAN, locally established rainfall and river gauges are needed to establish a flood threat recognition system. The NWS may issue a "flash flood watch." This is issued to indicate current or developing hydrologic conditions that are favorable for flash flooding in and close to the watch area, but the occurrence is neither certain nor imminent. These events are so localized and so rapid that a "flash flood warning" may not be issued, especially if no remote threat recognition equipment is available. In the absence of a gauging system on small streams, the best threat recognition system is to have local personnel monitor rainfall and stream conditions. While specific flood crests and times will not be predicted, this approach will provide advance notice of potential local or flash flooding.

WARNING

The next step in emergency response following threat recognition is to notify the public and staff of other agencies and critical facilities. More people can implement protection measures if warnings are early and include specific detail.

The NWS issues notices to the public using two levels of notification:

- Watch: conditions are right for flooding, thunderstorms, tornadoes or winter storms.
- Warning: a flood, tornado, etc., has started or been observed.

A more specific warning may be disseminated by the community in a variety of ways. The following are the more common methods:

- CodeRED countywide mass telephone emergency communication system
- Commercial or public radio or TV stations
- The Weather Channel
- Cable TV emergency news inserts
- Telephone trees/mass telephone notification
- NOAA Weather Radio
- Tone activated receivers in key facilities
- Outdoor warning sirens

- Sirens on public safety vehicles
- Door-to-door contact
- Mobile public address systems
- Email notifications

Just as important as issuing a warning is telling people what to do in case of an emergency. A warning program should include a public information component.

STORMREADY

The National Weather Service (NWS) established the StormReady program to help local governments improve the timeliness and effectiveness of hazardous weather-related warnings for the public. To be officially StormReady, a community must:



- Establish a 24-hour warning point and emergency operations center
- Have more than one way to receive severe weather warnings and forecasts and to alert the public
- Create a system that monitors weather conditions locally
- Promote the importance of public readiness through community seminars
- Develop a formal hazardous weather plan, which includes training severe weather spotters and holding emergency exercises

Being designated an NWS StormReady community is a good measure of a community's emergency warning program for weather hazards.

RESPONSE

The protection of life and property is the most important task of emergency responders. Concurrent with threat recognition and issuing warnings, a community should respond with actions that can prevent or reduce damage and injuries. Typical actions and responding parties include the following:

- Activating the emergency operations center (emergency preparedness)
- Closing streets or bridges (police or public works)
- Shutting off power to threatened areas (utility company)
- Passing out sand and sandbags (public works)
- Holding children at school or releasing children from school (school superintendent)
- Opening evacuation shelters (the American Red Cross)
- Monitoring water levels (public works)
- Establishing security and other protection measures (police)

An emergency action plan ensures that all bases are covered and that the response activities are appropriate for the expected threat. These plans are developed in coordination with the agencies or offices that are given various responsibilities.

Emergency response plans should be updated annually to keep contact names and telephone numbers current and to ensure that supplies and equipment that will be needed are still available. They should be critiqued and revised after disasters and exercises to take advantage of the lessons learned and of changing conditions. The end result is a coordinated effort implemented by people who have experience working together so that available resources will be used in the most efficient manner possible.

EVACUATION AND SHELTER

There are six key components to a successful evacuation:

- Adequate warning
- Adequate routes
- Proper timing to ensure the routes are clear
- Traffic control
- Knowledgeable travelers
- Care for special populations (e.g., disabled persons, prisoners, hospital patients, schoolchildren)

Those who cannot get out of harm's way need shelter. Typically, the American Red Cross will staff a shelter and ensure that there is adequate food, bedding, and wash facilities. Shelter management is a specialized skill. Managers must deal with problems like scared children, families that want to bring in their pets, and the potential for an overcrowded facility.

LOCAL IMPLEMENTATION RECOMMENDATIONS

Flash flood warnings are issued by National Weather Service Offices, which have the local and county warning responsibility. Flood warnings are forecasts of coming floods, are distributed to the public by the NOAA Weather Radio, commercial radio and television, and through local emergency agencies. The warning message tells the expected degree of flooding, the affected river, when and where flooding will begin, and the expected maximum river level at specific forecast points during flood crest.

Communities in the Northeastern NC Region could receive credit for Activity 610 – Flood Warning Program for maintaining a program that provides timely identification of impending flood threats, disseminates warnings to appropriate floodplain residents, and coordinates flood response activities. Community Rating System credits are based on the number and types of warning media that can reach the community's flood prone population. Depending on the location, communities can receive credit for the telephone calling system and more credits for additional measures, like telephone trees. Being designated as a StormReady community also provides credit.

Table C.4 – Emergency Services Mitigation Options and Recommended Projects

Action #	Mitigation Action	Reason for Pursuing / Not Pursuing	Funding
Emergency Services Measures Considered by HMPC and Not Recommended			
-	Establish telephone trees to activate for emergency warning during emergencies.	Prioritizing other emergency warning investments.	n/a
Emergency Services Measures and Funding Recommended for Implementation			
H7	Review the vulnerability of all critical facilities identified in this plan as a component of annual county Emergency Operations Plan updates. This effort will involve an assessment of whether facilities are readily accessible before, during, or after a natural hazard event has transpired. The county will also consider all information and data outlined in this plan when making determinations on the location of all future critical facilities.	Hyde County reviews the effectiveness and security of County shelter facilities on an annual basis through the County's annual review of its Emergency Operations Plan, as well as the annual tabletop exercise.	General Fund

Action #	Mitigation Action	Reason for Pursuing / Not Pursuing	Funding
W1	Continue to seek funding for assistance in constructing a new dedicated EOC. The county's existing facility is adequate; however, there is a need for a new and dedicated facility.	Washington County has been working towards establishing a new EOC for many years. The County will continue to look for opportunities to move forward with this project.	General Fund, NCDPS, FEMA
H8	Continue to participate in and support the Disaster Assistance Working Group (DAWG). This effort includes maintaining a mutual aid agreement with DAWG, which makes all available Hyde County resources available to participating counties in the event of a disaster. Coordination of all county resources in concert with DAWG will be handled through the group's E-Plan web-based portal. All resources are updated as a component of the NC State Resource Management System.	Hyde County continues to support the efforts of the Disaster Assistance Working Group and the group's efforts to further emergency service effectiveness throughout the region.	General Fund, NCDPS

C.2.5 STRUCTURAL PROJECTS

Four general types of flood control projects are reviewed here: levees, reservoirs, diversions, and dredging. These projects have three advantages not provided by other mitigation measures:

- They can stop most flooding, protecting streets and landscaping in addition to buildings.
- Many projects can be built without disrupting citizens' homes and businesses.
- They are constructed and maintained by a government agency, a more dependable long-term management arrangement than depending on many individual private property owners.

However, as shown below, structural measures also have shortcomings. The appropriateness of using flood control depends on individual project area circumstances.

Advantages

- They may provide the greatest amount of protection for land area used
- Because of land limitations, they may be the only practical solution in some circumstances
- They can incorporate other benefits into structural project design, such as water supply and recreational uses
- Regional detention may be more cost-efficient and effective than requiring numerous small detention basins

Disadvantages

- They can disturb the land and disrupt the natural water flows, often destroying wildlife habitat
- They require regular maintenance
- They are built to a certain flood protection level that can be exceeded by larger floods
- They can create a false sense of security
- They promote more intensive land use and development in the floodplain

LEVEES AND FLOODWALLS

Probably the best-known flood control measure is a barrier of earth (levee) or concrete (floodwall) erected between the watercourse and the property to be protected. Levees and floodwalls confine water to the stream channel by raising its banks. They must be well designed to account for large floods, underground seepage, pumping of internal drainage, and erosion and scour.

RESERVOIRS AND DETENTION

Reservoirs reduce flooding by temporarily storing flood waters behind dams or in storage or detention basins. Reservoirs lower flood heights by holding back, or detaining, runoff before it can flow downstream. Flood waters are detained until the flood has subsided, and then the water in the reservoir or detention basin is released or pumped out slowly at a rate that the river can accommodate downstream.

Reservoirs can be dry and remain idle until a large rain event occurs. Or they may be designed so that a lake or pond is created. The lake may provide recreational benefits or water supply (which could also help mitigate a drought).



Retention pond

Flood control reservoirs are most commonly built for one of two purposes. Large reservoirs are constructed to protect property from existing flood problems. Smaller reservoirs, or detention basins, are built to protect property from the stormwater runoff impacts of new development.

DIVERSION

A diversion is a new channel that sends floodwaters to a different location, thereby reducing flooding along an existing watercourse. Diversions can be surface channels, overflow weirs, or tunnels. During normal flows, the water stays in the old channel. During floods, the floodwaters spill over to the diversion channel or tunnel, which carries the excess water to a receiving lake or river.

LOCAL IMPLEMENTATION RECOMMENDATIONS

Structural flood control projects that provide at least 100-year flood protection and that result in revisions to the Flood Insurance Rate Map are not credited by the CRS so as not to duplicate the larger premium reduction provided by removing properties from the mapped floodplain. Other flood control projects can be accepted by offering a 25-year flood protection.

Table C.5 – Structural Projects Mitigation Options and Recommended Projects

Action #	Mitigation Action	Reason for Pursuing / Not Pursuing	Funding
Structural Project Measures Considered by HMPC and Not Recommended			
-	Consider if floodwalls may be needed to protect any critical facilities or infrastructure.	Low priority due to potential to worsen flooding elsewhere.	n/a
Structural Project Measures and Funding Recommended for Implementation			
H17	Hyde County will continue to work diligently on efforts to address the recovery of the Village of Ocracoke from the impacts of Hurricane Dorian. The County will exhaust all resources available to carry this effort out.	The health and safety of citizens and the tourism economy depend on recovery efforts post-disaster.	General Fund, NCDPS, NCDOT, NCDEQ

C.2.6 PUBLIC INFORMATION

OUTREACH PROJECTS

Outreach projects are the first step in the process of orienting property owners to the hazards they face and to the concept of property protection. They are designed to encourage people to seek out more information in order to take steps to protect themselves and their properties.

Awareness of the hazard is not enough; people need to be told what they can do about the hazard. Thus, projects should include information on safety, health and property protection measures. Research has shown that a properly run local information program is more effective than national advertising or publicity campaigns. Therefore, outreach projects should be locally designed and tailored to meet local conditions.

Community newsletters/direct mailings: The most effective types of outreach projects are mailed or distributed to everyone in the community. In the case of floods, they can be sent only to floodplain property owners.

News media: Local newspapers can be strong allies in efforts to inform the public. Local radio stations and cable TV channels can also help. These media offer interview formats and cable TV may be willing to broadcast videos on the hazards.

LIBRARIES AND WEBSITES

The two previous activities tell people that they are exposed to a hazard. The next step is to provide information to those who want to know more. The community library and local websites are obvious places for residents to seek information on hazards, hazard protection, and protecting natural resources.

Books and pamphlets on hazard mitigation can be given to libraries, and many of these can be obtained for free from state and federal agencies. Libraries also have their own public information campaigns with displays, lectures and other projects, which can augment the activities of the local government. Today, websites are commonly used as research tools. They provide fast access to a wealth of public and private sites for information. Through links to other websites, there is almost no limit to the amount of up to date information that can be accessed on the Internet.

In addition to online floodplain maps, websites can link to information for homeowners on how to retrofit for floods or a website about floods for children.

TECHNICAL ASSISTANCE

HAZARD INFORMATION

Residents and business owners that are aware of the potential hazards can take steps to avoid problems or reduce their exposure to flooding. Communities can easily provide map information from FEMA's FIRMs and Flood Insurance Studies. They may also assist residents in submitting requests for map amendments and revisions when they are needed to show that a building is located outside the mapped floodplain.

Some communities supplement what is shown on the FIRM with information on additional hazards, flooding outside mapped areas and zoning. When the map information is provided, community staff can explain insurance, property protection measures and mitigation options that are available to property owners. They should also remind inquirers that being outside the mapped floodplain is no guarantee that a property will never flood.

PROPERTY PROTECTION ASSISTANCE

While general information provided by outreach projects or the library is beneficial, most property owners do not feel ready to retrofit their buildings without more specific guidance. Local building department staffs are experts in construction. They can provide free advice, not necessarily to design a protection measure, but to steer the owner onto the right track. Building or public works department staffs can provide the following types of assistance:

- Visit properties and offer protection suggestions
- Recommend or identify qualified or licensed contractors
- Inspect homes for anchoring of roofing and the home to the foundation
- Explain when building permits are needed for home improvements.

PUBLIC INFORMATION PROGRAM

A Program for Public Information (PPI) is a document that receives CRS credit. It is a review of local conditions, local public information needs, and a recommended plan of activities. A PPI consists of the following parts, which are incorporated into this plan:

- The local flood hazard
- The property protection measures appropriate for the flood hazard
- Flood safety measures appropriate for the local situation
- The public information activities currently being implemented within the community, including those being carried out by non-government agencies
- Goals for the community's public information program
- The outreach projects that will be done each year to reach the goals
- The process that will be followed to monitor and evaluate the projects

LOCAL IMPLEMENTATION RECOMMENDATIONS

Communities in the Northeastern NC Region could receive credit under Activity 330 – Outreach Projects as well as Activity 350 – Flood Protection Information. Credit is available for targeted and general outreach projects. Credit is also provided for making publications relating to floodplain management available in the reference section of the local library.

Table C.6 – Public Information and Outreach Mitigation Options and Recommended Projects

Action #	Mitigation Action	Reason for Pursuing / Not Pursuing	Funding
Public Information and Outreach Measures Considered by HMPC and Not Recommended			
-	Develop a Program for Public Information	Limited administrative support to develop and maintain a PPI.	n/a
Public Information and Outreach Measures and Funding Recommended for Implementation			
H4	Continue to maintain and map GIS-based data related to floodplain management and mitigation. These efforts will involve maintaining the most recent Flood Insurance Rate Maps (FIRMS), as well as GIS locations for each property either acquired or mitigated under through current and past Mitigation Grant Projects.	Hyde County will develop a GIS database, to work in concert with the information provided in this plan, to be utilized for guidance regarding development policy and regulation.	General Fund

APPENDIX C: MITIGATION ALTERNATIVES

Action #	Mitigation Action	Reason for Pursuing / Not Pursuing	Funding
W9	Work with local real estate agencies to ensure that agents are informing clients when property for sale is located within an SFHA. The county will provide these agencies with brochures documenting the concerns relating to development located within flood-prone areas and ways that homeowners may make their homes more disaster-resistant to strong winds, lightning, and heavy rains.	This effort is integral to the County's Community Rating System Program and will continue through implementation of this plan. Maintaining a high CRS rating is a high priority for the County.	General Fund, Municipal Administrations
H5	Make a variety of materials related to flood insurance, flood protection, floodplain management, increased cost of compliance coverage, information on floodplains, and listings of qualified contractors familiar with floodproofing and elevation techniques, available through various methods including: • Placing materials in the county library • Disseminating information to local contractors	The Hyde County Building Inspections Department continues to maintain materials associated with floodplain protection that are available to County residents.	General Fund, NCDPS
W7	Mail a notice once annually to all property owners whose land is located within a special flood hazard area. The notice should clearly state that the recipient's property is susceptible to flooding and provide information pertinent to emergency evacuation and post-disaster recovery. Additionally, the county will notify all property owners once annually via mail, either through individual mailers or utility bill inserts, of the hazards associated with flooding and other hazards resulting from severe weather events.	This effort is currently underway and relates to the County's ongoing Community Rating System Program. These efforts will continue through implementation of his plan.	General Fund, NCDPS

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