Pee Dee Lumber
Regional Hazard Mitigation Plan

Final February 2018



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Acknowledgements

This regional hazard mitigation plan was made possible through the dedicated efforts of each participating jurisdiction, stakeholders, members of the public, and the project consultant. Detailed information about the planning process and individual participation can be found in the *Planning Process* section of this document.

Participating county and municipal jurisdictions are listed here in alphabetical order by county.

Anson County
Town of Ansonville
Town of Lilesville
Town of McFarlan
Town of Morven
Town of Peachland
Town of Polkton
Town of Wadesboro

Montgomery County
Town of Biscoe
Town of Candor
Town of Mount Gilead
Town of Star
Town of Troy

Richmond County
Town of Dobbins Heights
Town of Ellerbe
City of Hamlet
Town of Hoffman
Town of Norman
City of Rockingham

Scotland County
Town of East Laurinburg
Town of Gibson
City of Laurinburg
Town of Wagram

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SECTION 1
INTRODUCTION

This section provides a general introduction to the Pee Dee Lumber Regional Hazard Mitigation Plan. It consists of the following five subsections:

- 1.1 Background
- 1.2 Purpose
- 1.3 Scope
- 1.4 Authority
- 1.5 Summary of Plan Contents

1.1 BACKGROUND

Natural hazards, such as hurricanes, floods, and tornadoes, are a part of the world around us. Their occurrence is natural and inevitable, and there is little we can do to control their force and intensity. We must consider these hazards to be legitimate and significant threats to human life, safety, and property.

The Pee Dee Lumber Region is located in the south-central part of North Carolina and includes the counties of Anson, Montgomery, Richmond, and Scotland. This area is vulnerable to a wide range of natural hazards such as severe thunderstorms, floods, tornadoes, winter storms, and wildfires. It is also vulnerable to human-caused hazards, including chemical releases and hazardous material spills. These hazards threaten the life and safety of residents in the Pee Dee Lumber Region and have the potential to damage or destroy both public and private property, disrupt the local economy, and impact the overall quality of life of individuals who live, work, and vacation in the Pee Dee Lumber Region.

While the threat from hazardous events may never be fully eliminated, there is much we can do to lessen their potential impact upon our community and our citizens. By minimizing the impact of hazards upon our built environment, we can prevent such events from resulting in disasters. The concept and practice of reducing risks to people and property from known hazards is generally referred to as *hazard mitigation*.

FEMA Definition of Hazard Mitigation:
"Any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards."

Hazard mitigation techniques include both structural measures (such as strengthening or protecting buildings and infrastructure from the destructive forces of potential hazards) and non-structural measures (such as the adoption of sound land use policies and the creation of public awareness programs). It is widely accepted that the most effective mitigation measures are implemented at the local government level, where decisions on the regulation and control of development are ultimately made. A comprehensive mitigation approach addresses hazard vulnerabilities that exist today and in

the foreseeable future. Therefore, it is essential that projected patterns of future development are evaluated and considered in terms of how that growth will increase or decrease a community's overall hazard vulnerability.

A key component in the formulation of a comprehensive approach to hazard mitigation is to develop, adopt, and update a local hazard mitigation plan as needed. A hazard mitigation plan establishes the broad community vision and guiding principles for reducing hazard risk, and further proposes specific mitigation actions to eliminate or reduce identified vulnerabilities.

The four counties participating in the 2017 update of the Pee Dee Lumber Hazard Mitigation Plan have had county level or regional hazard mitigation planning that has evolved over the years, since the inception of the Disaster Mitigation Act of 2000, as described in Section 2: *Planning Process*. This regional plan draws from each of the county plans and documents the region's sustained efforts to incorporate hazard mitigation principles and practices into routine government activities and functions. At its core, the Plan recommends specific actions to minimize hazard vulnerability and protect residents from losses to those hazards that pose the greatest risk. These mitigation actions go beyond simply recommending structural solutions to reduce existing vulnerability, such as elevation, retrofitting, and acquisition projects. Local policies on community growth and development, incentives for natural resource protection, and public awareness and outreach activities are examples of other actions considered to reduce the Pee Dee Lumber Region's vulnerability to identified hazards. The Plan remains a living document, with implementation and evaluation procedures established to help achieve meaningful objectives and successful outcomes over time.

1.1.1 The Disaster Mitigation Act and the Flood Insurance Reform Act

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) in order to amend the Robert T. Stafford Disaster Relief and Emergency Assistance Act. 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) and the Pre-Disaster Mitigation (PDM) program, both 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.

Additionally, the Flood Insurance Reform Act of 2004 (P.L. 108-264) created two new grant programs, Severe Repetitive Loss (SRL) and Repetitive Flood Claim (RFC), and modified the existing Flood Mitigation Assistance (FMA) program. One of the requirements of this Act is that a FEMA-approved Hazard Mitigation Plan is now required if communities wish to be eligible for these FEMA mitigation programs.

The Pee Dee Lumber Regional Hazard Mitigation Plan, and all subsequent updates, have been prepared in coordination with FEMA Region IV and the North Carolina Division of Emergency Management (NCDEM) to ensure that the Plan meets all applicable FEMA and state requirements for hazard mitigation plans. A *Local Mitigation Plan Review Tool*, found in Appendix C, provides a summary of federal and state minimum standards and notes the location where each requirement is met within the Plan.

1.2 PURPOSE

The purpose of the Pee Dee Lumber Regional Hazard Mitigation Plan is to:

- Maintain updated information on risk and development to demonstrate progress and reflect current conditions;
- Increase public awareness and education;
- Maintain grant eligibility for participating jurisdictions; and
- Maintain compliance with state and federal legislative requirements for local hazard mitigation plans.

1.3 SCOPE

The focus of the Pee Dee Lumber Regional Hazard Mitigation Plan is on those hazards determined to be "high" or "moderate" risks to the Pee Dee Lumber Region, as determined through a detailed hazard risk assessment. Other hazards that pose a "low" or "negligible" risk will continue to be evaluated during future updates to the Plan, but they may not be fully addressed until they are determined to be of high or moderate risk. This enables the participating jurisdictions to prioritize mitigation actions based on those hazards which are understood to present the greatest risk to lives and property.

The geographic scope (i.e., the planning area) for the Plan includes the counties of Anson, Montgomery, Richmond, and Scotland, as well as their incorporated jurisdictions. **Table 1.1** lists the participating areas.

TABLE 1.1: PARTICIPATING JURISDICTIONS IN THE PEE DEE LUMBER REGIONAL HAZARD MITIGATION PLAN

Anson County		
Ansonville	Lilesville	McFarlan
Morven	Peachland	Polkton
Wadesboro		
Montgomery County		
Biscoe	Candor	Mount Gilead
Star	Troy	
Richmond County		
Dobbins Heights	Ellerbe	Hamlet
Hoffman	Norman	Rockingham
Scotland County		
East Laurinburg	Gibson	Laurinburg
Wagram		

1.4 AUTHORITY

The Pee Dee Lumber Regional Hazard Mitigation Plan has been developed in accordance with current state and federal rules and regulations governing local hazard mitigation plans and has been adopted by each participating county and local jurisdiction in accordance with standard local procedures. Copies of the adoption resolutions for each participating jurisdiction are provided in Appendix A. The Plan shall be routinely monitored and revised to maintain compliance with the following provisions, rules, and legislation:

- Section 322, Mitigation Planning, of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as enacted by Section 104 of the Disaster Mitigation Act of 2000 (P.L. 106-390);
- FEMA's Final Rule published in the Federal Register at 44 CFR Part 201; and
- Flood Insurance Reform Act of 2004 (P.L. 108-264).

1.5 SUMMARY OF PLAN CONTENTS

The contents of this Plan are designed and organized to be as reader-friendly and functional as possible. While significant background information is included on the processes used and studies completed (i.e., risk assessment, capability assessment), this information is separated from the more meaningful planning outcomes or actions (i.e., mitigation strategy, mitigation action plan).

Section 2, ***Planning Process***, provides a complete narrative description of the process used to prepare the Plan. This includes the identification of participants on the planning team and describes how the public and other stakeholders were involved. It also includes a detailed summary for each of the key meetings held, along with any associated outcomes.

The ***Community Profile***, located in Section 3, provides a general overview of the Pee Dee Lumber Region, including prevalent geographic, demographic, and economic characteristics. In addition, building characteristics and land use patterns are discussed. This baseline information provides a snapshot of the planning area and helps local officials recognize those social, environmental, and economic factors that ultimately play a role in determining the region's vulnerability to hazards.

The Risk Assessment is presented in three sections: Section 4, ***Hazard Identification***; Section 5, ***Hazard Profiles***; and Section 6, ***Vulnerability Assessment***. Together, these sections serve to identify, analyze, and assess hazards that pose a threat to the Pee Dee Lumber Region. The risk assessment also attempts to define any hazard risks that may uniquely or exclusively affect specific areas of the Pee Dee Lumber Region.

The Risk Assessment begins by identifying hazards that threaten the Pee Dee Lumber Region. Next, detailed profiles are established for each hazard, building on available historical data from past hazard occurrences, spatial extent, and probability of future occurrence. This section culminates in a hazard risk ranking based on conclusions regarding the frequency of occurrence, spatial extent, and potential impact highlighted in each of the hazard profiles. In the vulnerability assessment, North Carolina's iRisk risk information is used to evaluate known hazard risks by their relative long-term cost in expected damages. In essence, the information generated through the risk assessment serves a critical function for helping to determine the most appropriate mitigation actions to pursue and implement—enabling

the Region Hazard Mitigation Planning Committee to prioritize and focus its efforts on those hazards of greatest concern and those structures or planning areas facing the greatest risk(s).

The ***Capability Assessment***, found in Section 7, provides a comprehensive examination of the Pee Dee Lumber Region's capacity to implement meaningful mitigation actions and identifies opportunities to increase and enhance that capacity. Specific capabilities addressed in this section include planning and regulatory capability, staff and organizational (administrative) capability, technical capability, fiscal capability, and political capability. Information was obtained through the use of a detailed survey questionnaire and an inventory and analysis of existing plans, ordinances, and relevant documents. The purpose of this assessment is to identify any existing gaps, weaknesses, or conflicts in programs or activities that may hinder mitigation efforts and to identify those activities that should be built upon in establishing a successful and sustainable local hazard mitigation program.

The *Community Profile*, *Risk Assessment*, and *Capability Assessment* collectively serve as a basis for determining the goals for the Pee Dee Lumber Regional Hazard Mitigation Plan, each contributing to the development, adoption, and implementation of a meaningful and manageable *Mitigation Strategy* that is based on accurate background information.

The ***Mitigation Strategy***, found in Section 8, consists of broad goal statements as well as an analysis of hazard mitigation techniques for the Pee Dee Lumber Region to consider in reducing hazard vulnerabilities. The strategy provides the foundation for a detailed ***Mitigation Action Plan***, found in Section 9, which links specific mitigation actions for each county department or agency to locally-assigned implementation mechanisms and target completion dates. Together, these sections are designed to make the Plan both strategic, through the identification of long-term goals, and functional, through the identification of immediate and short-term actions that will guide day-to-day decision-making and project implementation.

In addition to the identification and prioritization of possible mitigation projects, emphasis is placed on the use of program and policy alternatives to help make the Pee Dee Lumber Region less vulnerable to the damaging forces of hazards while improving the economic, social, and environmental health of the community. The concept of multi-objective planning was emphasized throughout the planning process, particularly in identifying ways to link, where possible, hazard mitigation policies and programs with complimentary community goals related to disaster recovery, housing, economic development, recreational opportunities, transportation improvements, environmental quality, land development, and public health and safety.

Plan Maintenance, found in Section 10, includes the measures that each jurisdiction in the Pee Dee Lumber Region will take to ensure the Plan's continuous long-term implementation. The procedures also include the manner in which the Plan will be regularly evaluated and updated to remain a current and meaningful planning document.

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SECTION 2
PLANNING PROCESS

This section describes the planning process undertaken to develop the 2012 Pee Dee Lumber Regional Hazard Mitigation Plan. It consists of the following eight subsections:

- 2.1 Overview of Hazard Mitigation Planning
- 2.2 History of Hazard Mitigation Planning in the Pee Dee Lumber Region
- 2.3 Preparing the 2012 Plan
    - 2.3.1 The Pee Dee Lumber Regional Hazard Mitigation Planning Committee
    - 2.3.2 Community Meetings and Workshops
    - 2.3.3 Involving the Public
    - 2.3.4 Involving the Stakeholders
    - 2.3.5 Documentation of Plan Progress
- 2.4 Preparing the 2017 Plan
    - 2.4.1 The Pee Dee Lumber Regional Hazard Mitigation Planning Committee
    - 2.4.2 Community Meetings and Workshops
    - 2.4.3 Involving the Public
    - 2.4.4 Involving the Stakeholders
    - 2.4.5 Documentation of Plan Progress

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44 CFR Requirement
44 CFR Part 201.6(c)(1): The plan shall include 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.

2.1 OVERVIEW OF HAZARD MITIGATION PLANNING

Local hazard mitigation planning is the process of organizing community resources, identifying and assessing hazard risks, and determining how to best minimize or manage those risks. This process culminates in a hazard mitigation plan that identifies specific mitigation actions, each designed to achieve both short-term planning objectives and a long-term community vision.

To ensure the functionality of a hazard mitigation plan, responsibility is assigned for each proposed mitigation action to a specific individual, department, or agency along with a schedule or target completion date for its implementation (see Section 10: *Plan Maintenance*). Plan maintenance procedures are established for the routine monitoring of implementation progress, as well as the evaluation and enhancement of the mitigation plan itself. These plan maintenance procedures ensure that the Plan remains a current, dynamic, and effective planning document over time that becomes integrated into the routine local decision making process.

Communities that participate in hazard mitigation planning have the potential to accomplish many benefits, including:

- saving lives and property,
- saving money,
- speeding up recovery following disasters,
- reducing future vulnerability through wise development and post-disaster recovery and reconstruction,
- expediting the receipt of pre-disaster and post-disaster grant funding, and
- demonstrating a firm commitment to improving community health and safety.

Typically, mitigation planning is described as having the potential to produce long-term and recurring benefits by breaking the repetitive cycle of disaster loss. A core assumption of hazard mitigation is that the investments made before a hazard event will significantly reduce the demand for post-disaster assistance by lessening the need for emergency response, repair, recovery, and reconstruction. Furthermore, mitigation practices will enable local residents, businesses, and industries to re-establish themselves in the wake of a disaster, getting the community economy back on track sooner and with less interruption.

The benefits of mitigation planning go beyond solely reducing hazard vulnerability. Mitigation measures such as the acquisition or regulation of land in known hazard areas can help achieve multiple community goals, such as preserving open space, maintaining environmental health, and enhancing recreational opportunities. Thus, it is vitally important that any local mitigation planning process be integrated with other concurrent local planning efforts, and any proposed mitigation strategies must take into account other existing community goals or initiatives that will help complement or hinder their future implementation.

2.2 HISTORY OF HAZARD MITIGATION PLANNING IN THE PEE DEE LUMBER REGION

Each of the four counties and jurisdictions participating in this Plan has a previously adopted hazard mitigation plan. The FEMA approval dates for each of these plans, along with a list of the participating municipalities for each plan, are listed below:

- *Anson County Multi-Jurisdictional Hazard Mitigation Plan* (February 2012)
  - Town of Ansonville
  - Town of Lilesville
  - Town of McFarlan
  - Town of Morven
  - Town of Peachland
  - Town of Polkton
  - Town of Wadesboro
- *Montgomery County Multi-jurisdictional Hazard Mitigation Plan* (November 2004)
  - Town of Biscoe
  - Town of Candor

- Town of Mount Gilead
- Town of Star
- Town of Troy

- *Richmond County Multi-jurisdictional Natural Disaster Mitigation Plan* (July 2005)
  - Town of Dobbins Heights
  - Town of Ellerbe
  - City of Hamlet
  - Town of Hoffman
  - Town of Norman
- *City of Rockingham Hazard Mitigation Plan* (February 2010)
- *Scotland County Multi-Jurisdictional Hazard Mitigation Plan* (October 2005)
  - Town of East Laurinburg
  - Town of Gibson
  - City of Laurinburg
  - Town of Wagram

Each of these plans was developed using the multi-jurisdictional planning process recommended by the Federal Emergency Management Agency (FEMA), except for the City of Rockingham Plan which was developed for a single jurisdiction. For this plan, all of the aforementioned jurisdictions have joined to form a regional plan, making it a unique situation. All of the jurisdictions that participated in previous planning efforts have participated in the development of this regional plan; additionally, the Town of Dobbins Heights has joined the process. The process of merging all of the above plans into this regional plan is described in more detail below.

2.3 PREPARING THE 2012 PLAN

Hazard mitigation plans are required to be updated every five years to remain eligible for federal mitigation and public assistance funding for state declared disasters. To simplify planning efforts for the jurisdictions in the Pee Dee Lumber Region, Anson, Montgomery, Richmond, and Scotland Counties decided to join together to create the *Pee Dee Lumber Regional Hazard Mitigation Plan*. This allows resources to be shared amongst the participating jurisdictions and eases the administrative duties of all of the participants by combining the four existing county-level plans and the one existing city-level plan into one multi-jurisdictional plan.

To prepare the 2012 *Pee Dee Lumber Regional Hazard Mitigation Plan*, the Pee Dee Lumber Region hired Atkins as an outside consultant to provide professional mitigation planning services. To meet requirements of the Community Rating System, the region ensured that the planning process was facilitated under the direction of a professional planner. Nathan Slaughter from Atkins served as the project manager for this project and is a member of the American Institute of Certified Planners (AICP).

Per the contractual scope of work, the consultant team followed the mitigation planning process recommended by FEMA (Publication Series 386 and Local Hazard Mitigation Plan Review Guide) and recommendations provided by North Carolina Division of Emergency Management (NCEM) mitigation

planning staff[1]. The Local Mitigation Plan Review Tool, found in Appendix C, provides a detailed summary of FEMA's current minimum standards of acceptability for compliance with DMA 2000 and notes the location where each requirement is met within this Plan. These standards are based upon FEMA's Final Rule as published in the Federal Register in Part 201 of the Code of Federal Regulations (CFR). The planning team used FEMA's Local Mitigation Plan Review Guide (released October 1, 2011) for reference as they completed the Plan.

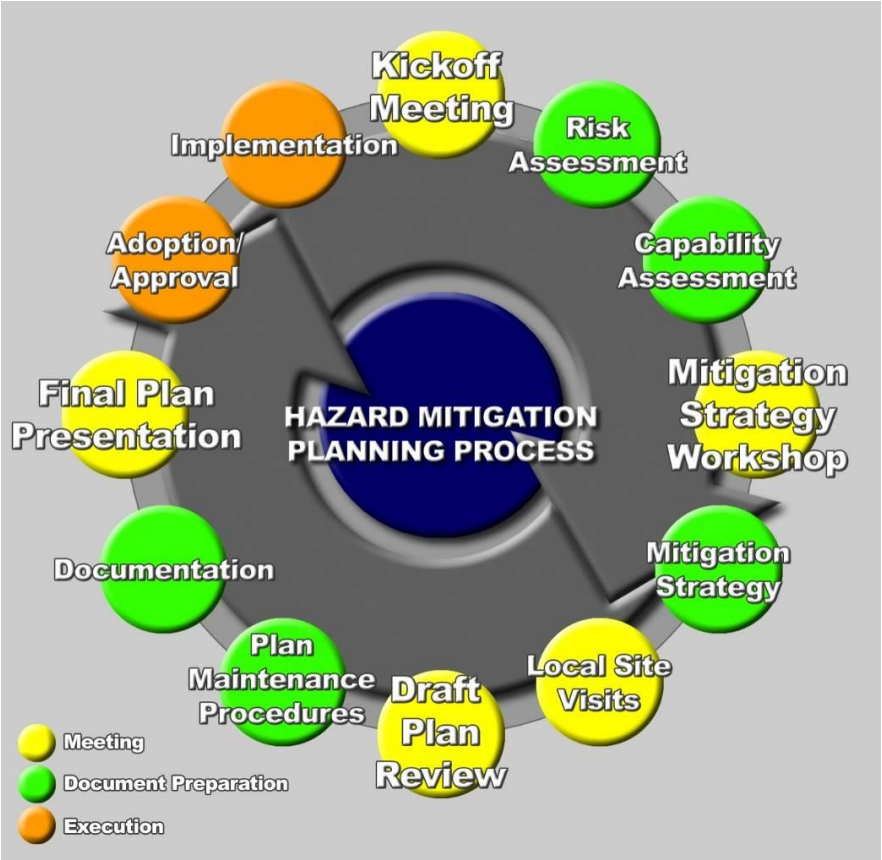
Although each participating jurisdiction had already developed a plan in the past, the combination of the four plans into one regional plan still required making some plan update revisions based on FEMA's Local Mitigation Plan Review Guide. Since all sections of the regional plan are technically new, plan update requirements do not apply. However, since this is the first regional plan among the jurisdictions, key elements from the previous approved plans are referenced throughout the document (e.g., existing actions) and required a discussion of changes made. For example, all of the risk assessment elements needed to be updated to include most recent information. It was also necessary to formulate a single set of goals for the region, but they were based on previously determined goals (Section 8: *Mitigation Strategy*). The Capability Assessment section includes updated information for all of the participating jurisdictions and the Mitigation Action Plan provides implementation status updates for all of the actions identified in the previous plans.

The process used to prepare this Plan included twelve major steps that were completed over the course of approximately eight months beginning in January 2012. Each of these planning steps (illustrated in **Figure 2.1**) resulted in critical work products and outcomes that collectively make up the Plan. Specific plan sections are further described in Section 1: *Introduction*.

Over the past five years, each participating jurisdiction has been actively working to implement their existing plans. This is documented in the Mitigation Action Plan through the implementation status updates for each of the Mitigation Actions. The Capability Assessment also documents changes and improvements in the capabilities of each participating jurisdiction to implement the Mitigation Strategy.

[1] A copy of the negotiated contractual scope of work between the participating counties and Atkins (for the 2012 plan) is available through Richmond County upon request; A copy of the negotiated contractual scope of work between the participating counties and AECOM (for the 2017 plan update) is available through Richmond County upon request

FIGURE 2.1: MITIGATION PLANNING PROCESS FOR THE PEE DEE LUMBER REGION



2.3.1 THE PEE DEE LUMBER REGIONAL HAZARD MITIGATION PLANNING COMMITTEE

In order to guide the development of this Plan, the Pee Dee Lumber counties (Anson County, Montgomery County, Richmond County, and Scotland County) created the Pee Dee Lumber Regional Hazard Mitigation Planning Committee (Regional Hazard Mitigation Planning Committee or Planning Committee). The Planning Committee represents a community-based planning team made up of representatives from various county departments and municipalities and other key stakeholders identified to serve as critical partners in the planning process.

Beginning in January 2012, the Regional Hazard Mitigation Planning Committee members engaged in regular discussions as well as local meetings and planning workshops to discuss and complete tasks associated with preparing the Plan. This working group coordinated on all aspects of plan preparation and provided valuable input to the process. In addition to regular meetings, committee members routinely communicated and were kept informed through an e-mail distribution list.

Specifically, the tasks assigned to the Regional Hazard Mitigation Planning Committee members included:

- participate in Regional Hazard Mitigation Planning Committee meetings and workshops
- provide best available data as required for the risk assessment portion of the Plan

- provide information that will help complete the local Capability Assessment section of the plan and provide copies of any mitigation or hazard-related documents for review and incorporation into the Plan
- support the development of the Mitigation Strategy, including the design and adoption of community goal statements
- help design and propose appropriate mitigation actions for their department/agency for incorporation into the Mitigation Action Plan
- review and provide timely comments on all study findings and draft plan deliverables
- support the adoption of the 2012 *Pee Dee Lumber Regional Hazard Mitigation Plan*

Table 2.1 lists the members of the Regional Hazard Mitigation Planning Committee who were responsible for participating in the development of the Plan. Committee members are listed in alphabetical order by last name.

TABLE 2.1: MEMBERS OF THE PEE DEE LUMBER REGIONAL HAZARD MITIGATION PLANNING COMMITTEE

NAME	DEPARTMENT / AGENCY
Armstrong, James	Richmond County Planning and GIS Director
Barbee, Brent	Richmond Community College
Bellamy, Karen	Cascades Tissue Group NC Inc
Blackwell, Jim	Scotland County Engineer
Broadway, Kenneth	Town of Norman Mayor
Brown, Willie	Purdue
Butler, Lee P.	Town of Hoffman, Purdue Farms
Cameron, Libby	Town of Polkton Clerk
Cunningham, Caroline	Atkins Planner
David, Angeline	Dobbins Heights Town Council Member
Diggs, Rodney	Anson County Emergency Management
Evans, John	Laurinburg Police/Fire
Furby, Belinda	Trinity Manufacturing
Gardner, Charles	Rockingham Fire Chief
Godfrey, Priscilla	First Health Richmond Memorial
Griffin, Alan	Montgomery County Emergency Management
Griffin, Lynn	Town of Peachland Clerk
Gulledge, Mark	Richmond County Sherriff's Office Chief Deputy
Haire, Holly	Richmond County Health Department
Hammond, Delores A.	Laurinburg/Scotland County Chamber
Hammond, Roylin	Scotland County Emergency Services
Hatfield, Debbie	North Carolina Emergency Management
Haugen, Richard	Rockingham Public Works Department
Haywood, Harold	City of Laurinburg General Services Director

NAME	DEPARTMENT / AGENCY
Hollis, Brice	Town of Candor Public Works
Hudson, Ronnie	Town of Gibson Mayor
Hunsucker, Grant	First Health Richmond EMS Director
Jarrell, Tommy	Richmond County Health Department
Jordan, Laura	Town of Biscoe Deputy Clerk
Kashmer, Kimberly	Progress Energy
Knight, David	Hamlet Fire and Rescue Chief
Lentz, Carol Ann	Scotland County American Red Cross
Massey, John	City of Rockingham
McGirt, Michael	Scotland County Maintenance Supervisor
McLaughlin, Diana	Town of Ansonville Clerk
McNeill, David	Progress Energy
McQuage, Stacey	Laurinburg Public Works Director
Morman, Johnnie	Richmond Interagency Transportation Director
Osborne, Chip	Richmond Community College Director of Public Safety
Pabellon, Yaitza	North Carolina Emergency Management
Park, Pamela	American Red Cross
Pierce, Tim	City of Laurinburg GIS Administrator
Powers, Steve	North Carolina Emergency Management Area Coordinator
Pratt, Houston	Town of Morven Mayor
Sessions, Mike	Anson County Utility Director
Slaughter, Nathan	Atkins Project Manager
Smartt, Pam	Scotland County American Red Cross
Smith, Bob	Richmond County Emergency Services Deputy Director
Smith, Robbie	Montgomery County Emergency Management
Spivey, Donnie	Pee Dee Electric CEO
Trotter, Shelia	Richmond County Deputy Finance Officer
Truett, William	South Piedmont Community College Facilities Director
Truitt, Humphrey	North Carolina Crime Control and Public Safety Intern
Wright, Donna	Richmond County Emergency Management

2.3.1.1 Multi-Jurisdictional Participation

The Pee Dee Lumber Regional Multi-Jurisdictional Hazard Mitigation Plan includes four counties and twenty-two incorporated municipalities. To satisfy multi-jurisdictional participation requirements, each county and its participating jurisdictions were required to perform the following tasks:

- Participate in mitigation planning workshops;
- Identify completed mitigation projects, if applicable; and
- Develop and adopt (or update) their local Mitigation Action Plan.

Each jurisdiction participated in the planning process and has developed a local Mitigation Action Plan unique to their jurisdiction. Each jurisdiction will adopt their Mitigation Action Plan separately. This provides the means for jurisdictions to monitor and update their Plan on a regular basis.

2.3.2 COMMUNITY 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. The following is a summary of the key meetings and community workshops held during the development of the plan update. In many cases, routine discussions and additional meetings were held by local staff to accomplish planning tasks specific to their department or agency, such as the approval of specific mitigation actions for their department or agency to undertake and include in the Mitigation Action Plan.

February 21, 2012
First Regional Hazard Mitigation Planning Committee Meeting

Immediately following the contractual Notice to Proceed, Atkins staff arranged for a project kickoff meeting. Donna Wright, Richmond County's Emergency Management Director and the point of contact for the project, sent an email inviting representatives from the participating counties and municipalities, NCEM, and other local organizations to the meeting.

Donna Wright started the meeting by welcoming the representatives from the Counties, participating municipal jurisdictions and other stakeholders. She then introduced Nathan Slaughter, Project Manager from Atkins.

Mr. Slaughter led the meeting of the Regional Hazard Mitigation Planning Committee and began by having attendees introduce themselves. The 36 attendees included representatives from various departments and local jurisdictions within each of the four counties participating in the plan update. Mr. Slaughter then provided an overview of the items to be discussed at the meeting and briefly reviewed each of the handouts that were distributed in the meeting packets (agenda, project description, presentation slides, GIS data inventory, Public Participation Survey, and existing mitigation actions). He then defined mitigation and gave an overview of the Disaster Mitigation Act of 2000 and NC Senate Bill 300.

Following the overview, Mr. Slaughter led the group in an "icebreaker" exercise to introduce meeting participants to various mitigation techniques. He briefly explained the six different categories of mitigation techniques: emergency services; prevention; natural resource protection; structural projects; public education and awareness; and property protection. Each attendee was then given $20 in mock currency and asked to "spend" their mitigation money as they personally deemed appropriate among the six mitigation categories. Money was "spent" by placing it in cups labeled with each of the mitigation techniques. Upon completion of the exercise, Mr. Slaughter stated that the results would be tabulated and shared with the group at the next meeting.



May 15, 2012 Pee Dee Lumber Regional Hazard Mitigation Planning Committee Meeting

Following the icebreaker exercise, Mr. Slaughter reviewed the key objectives of the project which are to:

- Merge the four County plans into one regional plan;
- Complete update of existing plans to demonstrate progress and reflect current conditions;
- Increase public awareness and education;
- Maintain grant eligibility for participating jurisdictions; and
- Maintain compliance with State and Federal requirements.

Mr. Slaughter discussed the expiration dates for each County's existing plan and listed the participating jurisdictions. Mr. Slaughter then explained the mitigation planning process and specific tasks to be accomplished for this project, including the planning process, risk assessment, capability assessment, mitigation strategy, mitigation action plan and plan maintenance procedures. For the risk assessment portion of the process, Mr. Slaughter asked each county to designate a point person to coordinate the gathering of GIS data required for the analysis. The project schedule was presented and Mr. Slaughter noted that the nine-month schedule provided ample time to produce a quality plan and meet state and federal deadlines.

The project staffing chart was presented to demonstrate the number of experienced individuals that will be working on this project. Mr. Slaughter then reviewed the roles and responsibilities of Atkins, the County leads, and the participating jurisdictions. The presentation concluded with a discussion of the next steps to be taken in the project development. He encouraged meeting participants to distribute the Public Participation Survey. An online version of the public survey was also made available and each jurisdiction was encouraged to make the link to the survey available on their local websites.

Mr. Slaughter stated that the next Regional Hazard Mitigation Planning Committee meeting would be scheduled for the month of May. The purpose of the next meeting is to discuss the findings of the risk and capability assessments and begin proposing mitigation actions and updating existing action. Mr. Slaughter asked each County to review their existing mitigation actions in preparation for the next meeting.

May 15, 2012
Second Regional Hazard Mitigation Planning Committee Meeting

Mr. Slaughter initiated the meeting with a review of the meeting handouts, which included an agenda, proposed goals for the regional plan, mitigation actions from each county's existing plan, and mitigation action worksheets for new mitigation actions. Mr. Slaughter reviewed the project schedule and stated that a draft of the Hazard Mitigation Plan would be presented to the Planning Committee in August.

He then gave the results of the icebreaker exercise from the first Planning Committee meeting, where attendees were given "money" to spend on various hazard mitigation techniques. The results were as follows:

- Emergency Services $127
- Property Protection $97
- Prevention $91
- Public Education $56
- Natural Resource Protection $55
- Structural Projects $34

Caroline Cunningham with Atkins then presented the findings of the risk assessment. She reviewed the process for preparing Hazard Profiles. She explained how each hazard falls into one of four basic categories: Atmospheric, Hydrologic, Geologic, and Other, and each must be evaluated and formally ruled out if it is not applicable to the study area, even where it seems obvious (such as in the case of volcano).

Ms. Cunningham reviewed the Hazard Profiles and the following bullets summarize the information presented:

- DROUGHT. There were eight years out of the past twelve where drought conditions were reported to be severe, extreme or exceptional in the Pee Dee Lumber Region between 2000 and 2012 and future occurrences are likely.

- HAILSTORM. There have been 164 recorded events since 1969. Future occurrences are likely.

- LIGHTNING. There have been 7 recorded lightning events since 1950, causing seven injuries, and $320,000 in reported property damages. Future occurrences are highly likely.

- TORNADOES. There have been 24 recorded tornado events in the Pee Dee Lumber Region since 1950. $32 million in property damages and 0 deaths and 36 injuries have been reported. Future occurrences are possible.

- HURRICANE AND TROPICAL STORM. NOAA data shows that 30 storm tracks have come within 75 miles of the Pee Dee Lumber Region since 1850. Six of those storms were hurricanes, 16 were tropical storms, and 8 were tropical depressions. Future occurrences are possible.

- SEVERE THUNDERSTORM WINDS. There have been 319 severe thunderstorm events since 1950 with $1.7 million in reported property damages. Future occurrences are highly likely.

- WINTER STORM. There have been 87 recorded winter events in the Pee Dee Lumber Region since 1993 resulting in $850,000 million in reported property damages. Future occurrences are highly likely.

- EARTHQUAKES. There have been 14 recorded earthquake events in the Pee Dee Lumber Region since 1886. The strongest had a recorded magnitude of VII on the Modified Mercalli Intensity scale. Future occurrences are possible.

- LANDSLIDE. There has been 1 recorded landslide events in the Pee Dee Lumber Region. There are no reports of injuries or property damages. Future occurrences are unlikely.

- DAM FAILURE. There are 10 major dams in the Pee Dee Lumber Region, all of which are classified as high hazard dams. There have been no reported breaches and future occurrences are unlikely.

- EROSION. Erosion was included in the previous Anson County and Montgomery County plans. Both plans indicated that the erosion hazard is not of great concern in these counties.

- FLOOD. There have been 84 flood events recorded in the Pee Dee Lumber Region since 1950, resulting in $200,000 in property damage. There have been 31 NFIP losses since 1978 and approximately $142,000 in claims. Three repetitive loss properties in the region account for six of the recorded losses. Future occurrences are likely.

- WILDFIRE. There have been 4,396 total fires reported in the Pee Dee Lumber Region between 2002-2011. Ms. Cunningham presented maps of high occurrence areas and asked the Regional Planning Committee to provide any local information on wildfire events.

- HAZARDOUS MATERIALS INCIDENTS. Ms. Cunningham asked the Regional Planning Committee to provide any local information and stated that the vulnerability assessment still needed to be completed. Regional Planning Committee provided information about various areas of concern regarding hazardous materials facilities. This information was incorporated into the Risk Assessment sections of the Plan. It was determined that fixed and mobile Hazmat vulnerabilities would be mapped and included in the plan but it will also be noted that there are detailed separate plans for hazardous materials incidents that contain more of a detailed assessment of this hazard.

In concluding the review of Hazard Profiles, Ms. Cunningham stated if anyone had additional information for the hazard profiles, or disagreed with any of the data presented, they should call or email her with their concerns.

The results of the hazard identification process were used to generate a Priority Risk Index (PRI), which categorizes and prioritizes potential hazards as high, moderate or low risk based on probability, impact, spatial extent, warning time, and duration. The highest PRI was assigned to Winter Storms and Freeze, followed by Severe Thunderstorms and High Wind.

Mr. Slaughter presented the Capability Assessment Findings. Atkins has developed a scoring system that was used to rank the participating jurisdictions in terms of capability in four major areas (Planning and Regulatory; Administrative and Technical; Fiscal; Political). Important capability indicators include National Flood Insurance Program (NFIP) participation, Building Code Effective Grading Schedule (BCEGS) score, Community Rating System (CRS) participation, and the Local Capability Assessment Survey conducted by Atkins.

Mr. Slaughter reviewed the Relevant Plans and Ordinances, Relevant Staff/Personnel Resources, and Relevant Fiscal Resources. All of these categories were used to rate the overall capability of the

participating counties and jurisdictions. Most jurisdictions are in the limited to moderate range for Planning and Regulatory Capability and in the limited range for Fiscal Capability. There is variation between the jurisdictions for Administrative and Technical Capability, mainly with respect to availability of planners and grant writers. Based upon the scoring methodology developed by Atkins, it was determined that all of the participating jurisdictions have limited to moderate capability to implement hazard mitigation programs and activities.

Mr. Slaughter also discussed the results of the public participation survey that was posted on several of the participating counties' websites. As of the meeting date, 178 responses had been received. Based on preliminary survey results, respondents felt that severe thunderstorms posed the greatest threat to their neighborhood, followed by tornadoes and hurricanes/tropical storms. 82 percent of the respondents were interested in making their homes more resistant to hazards. However, 64 percent of them don't know who to contact regarding reducing their risks to hazards.

Mr. Slaughter gave an overview of Mitigation Strategy Development and presented the proposed goals for the regional plan based on a review of the goals in the four existing county plans. The Regional Hazard Mitigation Planning Committee accepted the proposed goals for the regional plan. Mr. Slaughter then asked each county to provide a status update for their existing mitigation actions (completed, deleted, or deferred) by June 1, 2012. Mr. Slaughter also discussed the Mitigation Action Worksheets to be completed for any new mitigation actions and requested that all worksheets be returned by June 1, 2012.

Mr. Slaughter thanked the group for taking the time to attend and the meeting was adjourned.

2.3.3 INVOLVING THE PUBLIC

44 CFR Requirement
44 CFR Part 201.6(b)(1): The planning process shall include an opportunity for the public to comment on the plan during the drafting stage and prior to plan approval.

An important component of the mitigation planning process involves 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 city safer from the potential effects of hazards.

Public involvement in the development of the *Pee Dee Lumber Regional Hazard Mitigation Plan* was sought using three methods: (1) the second meeting of the Regional Hazard Mitigation Planning Committee was open to the public; (2) public survey instruments were made available in hard copy and online; and (3) copies of the draft Plan deliverables were made available for public review on county websites and at government offices. The public was provided two opportunities to be involved in the development of the regional plan at two distinct periods during the planning process: (1) during the drafting stage of the Plan; and (2) upon completion of a final draft Plan, but prior to official plan

approval and adoption. In addition, a public participation survey (discussed in greater detail in Section 2.6.1) was made available during the planning process at various locations throughout the Pee Dee Lumber counties and on county websites.

Each of the participating jurisdictions will hold public meetings before the final plan is officially adopted by the local governing bodies. These meetings will occur at different times once FEMA has granted conditional approval of the Plan. Adoption resolutions will be included in Appendix A.

2.3.3.1 Public Participation Survey

The Pee Dee Lumber Region was successful in getting citizens to provide input to the mitigation planning process through the use of the *Public Participation Survey*. The *Public Participation Survey* was designed to capture data and information from residents of the Pee Dee Lumber Region that might not be able to attend public meetings or participate through other means in the mitigation planning process.

Copies of the *Public Participation Survey* were distributed to the Regional Hazard Mitigation Planning Committee to be made available for residents to complete at local public offices. A link to an electronic version of the survey was also posted on each county's website. Richmond County made the link to the survey available on their cable access channel as well.

A total of 178 survey responses were received, which provided valuable input for the Regional Hazard Mitigation Planning Committee to consider in the development of the plan update. Selected survey results are presented below.

- Approximately 65 percent of survey respondents had been impacted by a disaster, mainly hurricanes (Hugo—1989, Fran—1996, and Floyd—1999), winter storms (snow storm of 2000), and tornadoes (1984).
- Respondents ranked Severe Thunderstorm/High Wind as the highest threat to their neighborhood (36 percent), followed by Tornado (27 percent), Hurricane/Tropical Storm (10 percent), and Severe Winter/Ice Storm (8 percent).
- Approximately 19 percent of respondents have taken actions to make their homes more resistant to hazards and 83 percent are interested in making their homes more resistant to hazards.
- 64 percent of respondents do not know what office to contact regarding reducing their risks to hazards.
- Emergency Services and Public Education were ranked as the most important activities for communities to pursue in reducing risks.

2.3.4 INVOLVING THE STAKEHOLDERS

44 CFR Requirement
44 CFR Part 201.6(b)(2): The planning process shall include 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 non-profit interests to be involved in the planning process.

The Regional Hazard Mitigation Planning Committee encouraged more open and widespread participation in the mitigation planning process by making the second committee meeting open to the general public. The region also went above and beyond in its local outreach efforts through the design and distribution of the *Public Participation Survey*. These opportunities were provided for local officials, residents, businesses, academia, and other private interests in the Pee Dee Lumber Region to be involved and offer input throughout the local mitigation planning process.

2.3.5 DOCUMENTATION OF PLAN PROGRESS

Progress in hazard mitigation planning for the participating jurisdictions in the Pee Dee Lumber Region is documented in this plan update. Since hazard mitigation planning efforts officially began in the participating counties with the development of the initial Hazard Mitigation Plans in the late 1990s and early 2000s, many mitigation actions have been completed and implemented in the participating jurisdictions. These actions will help reduce the overall risk to natural hazards for the people and property in the Pee Dee Lumber Region. The actions that have been completed are documented in the Mitigation Action Plan found in Section 9.

In addition, 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 7: *Capability Assessment*. The participating jurisdictions continue to demonstrate their commitment to hazard mitigation and hazard mitigation planning and have proven this by reconvening the Hazard Mitigation Planning Team to update the Plan and by continuing to involve the public in the hazard mitigation planning process.

2.4 PREPARING THE 2017 PLAN

To help prepare the Pee Dee Lumber Regional Hazard Mitigation Plan update, AECOM was hired as a consultant to provide professional mitigation planning services. To meet requirements of the NFIP's Community Rating System, the region ensured that the planning process was facilitated under the direction of a professional planner, Mr. Mike Robinson, from AECOM who served as the project manager for this project.

Per the contractual scope of work, the consultant team followed the mitigation planning process recommended by FEMA and recommendations provided by North Carolina Division of Emergency Management (NCEM) mitigation planning staff. The *Local Hazard Mitigation Plan Update Checklist*, found in Appendix B, provides a detailed summary of FEMA's current minimum standards of acceptability for compliance with DMA 2000 and notes the location where each requirement is met within this Plan. These standards are based upon FEMA's Interim Final Rule as published in the Federal Register on February 26, 2002 in Part 201 of the Code of Federal Regulations (CFR). The

planning team used FEMA's *Local Mitigation Planning Handbook* (released March 2013) for reference as they completed the Plan.

2.4.1 THE PEE DEE LUMBER REGIONAL HAZARD MITIGATION PLANNING COMMITTEE

In order to guide the development of this Plan update, the Pee Dee Lumber counties (Anson County, Montgomery County, Richmond County and Scotland County) created the Pee Dee Lumber Hazard Mitigation Planning Committee (HMPC). This committee represented a community based planning team made up of representatives from various county departments and municipalities and other key stakeholders identified to serve as critical partners in the planning process.

Beginning in September 2016, the planning committee members engaged in regular discussions as well as local meetings and planning workshops to discuss and complete tasks associated with updating the Plan. This working group coordinated on all aspects of plan preparation and provided valuable input to the process. In addition to regular meetings, committee members routinely communicated and were kept informed through an email distribution list. If committee members or stakeholders were unable to attend any individual meeting they were represented by their EM Coordinator. If members of Anson County were unable to attend then the County EM, Rodney Diggs, represented the Towns of Ansonville, Lilesville, McFarlan, Morven, Peachland, Polkton and Wadesboro. Montgomery County EM, Robbie Smith, represented the Towns of Biscoe, Candor, Mount Gilead, Star and Troy. Richmond County EM, Donna Wright, represented the Towns of Dobbins Heights, Ellerbe, Hamlet, Hoffman, Norman and Rockingham. Scotland County EM, Roylin Hammond, represented the Towns of East Laurinburg, Gibson, Laurinburg and Wagram. They were also given multiple additional resources and opportunities to participate in the update of the plan. In addition to mass emails sent out to invite everyone to the meetings there were also posts on social media and all four county websites, flyers throughout the planning area, an online public participation survey for the general public as well as stakeholders, and attendance by AECOM at the Richmond County Health Fair to allow stakeholders and the public to provide input on the plan. Unfortunately, there was no input from the Area Coordinators of the neighboring Counties.

Specifically, the tasks assigned to the Pee Dee Lumber Hazard Mitigation Planning Committee included:

- Participate in hazard mitigation planning committee meetings and workshops (described in more detail in subsection 2.4.2);
- Provide best available data as required for the *Risk Assessment* portion of the Plan;
- Complete the *Local Capability Assessment Survey* and provide copies of any mitigation or hazard-related documents for review and incorporation into the Plan;
- Support the development of the *Mitigation Strategy* portion of the Plan, including the design and adoption of a regional vision statement, regional mitigation goal statements, and regional mitigation actions;
- Review the existing mitigation actions from the previous plan, provide an update on those previously adopted mitigation actions, and propose new mitigation actions for their department/agency for incorporation into the new updated regional Plan;
- Review and provide timely comments on all study findings and draft plan deliverables; and

- Support the adoption of the Pee Dee Lumber Regional Hazard Mitigation Plan.

Table 2.2 lists the members of the HMPC who were responsible for participating in the development of the Plan. Committee members are generally listed by jurisdiction in Table 2.2 for ease of organizing and presenting the information but it should be noted that the committee worked extremely well as one regional unit thinking beyond traditional jurisdictional boundaries to focus on the mitigation planning issues and tasks at hand.

TABLE 2.1: MEMBERS OF THE PEE DEE LUMBER REGIONAL HAZARD MITIGATION PLANNING COMMITTEE

Jurisdiction or Agency	Representative	Department, Title, or Role
ANSON COUNTY		
Anson County	Rodney Diggs	EM Director
Town of Ansonville	Diane McLaughlin	Town Clerk
Town of Lilesville	Lynn Whitlock	Town Clerk
Town of McFarlan	Diane Timmons	Mayor
Town of Morven	Kelly Tarlton	Town Manager
Town of Peachland	Lynn Griffin	Town Clerk
Town of Polkton	Minnie Staton	Mayor
Town of Wadesboro	Alex Sewell	Town Manager
MONTGOMERY COUNTY		
Montgomery County	Kyle Morris	911 Coordinator/Montgomery County EM
	Robbie Smith	EM Director
Town of Biscoe	Brandon Holland	Town Manager
Town of Candor	Tammy Kellis	Town Clerk
Town of Mount Gilead	Matthew Christian	Town Manager
Town of Star	Wesley Brown	Town Utilities Manager
City of Troy	Greg Zephyr	Town Manager
RICHMOND COUNTY		
Richmond County	Brent Barbee	Executive VP & CFO Richmond Community College
	Brittany Grant	Richmond County Health Dept./Environmental Health
	Holly Haire	Environmental Health Director/ Prep. Coord.
	Robby Hall	Division of Social Services Director
	Tommy Jarrell	Health Department
	Neel Peacock	Transit Director
	Bob Smith	Emergency Management Deputy Director
	Donna Wright	Director of Emergency Services
Town of Dobbins Heights	Antonio Blue	Mayor

Jurisdiction or Agency	Representative	Department, Title, or Role
Town of Ellerbe	Lee Berry	Mayor
City of Hamlet	Marcus Abernathy	City Manager
	Todd Barnes	Operations Manager Trinity Manufacturing
	Bill Bayless	Mayor
	Chris Harwood	EHS Coordinator Trinity Manufacturing
	Scott Waters	Police Chief/Rescue Squad
	Calvin White	Fire Chief
Town of Hoffman	Tommy Hart	Mayor
Town of Norman	Kenneth Broadway	Mayor
City of Rockingham	Karen Bellamy	Environmental Manager Cascades Tissue Group NC INC.
	John Massey	City of Rockingham Planner
SCOTLAND COUNTY		
Scotland County	Roylin Hammond	EM Director
	Robert Sampson	Assistant Director EMS
Town of East Laurinburg	Donald Wayne Caulder	Mayor
	Lilly Pittman	Town Clerk
Town of Gibson	Ronnie Hudson	Mayor
	Angela Hunsucker	Town Clerk
City of Laurinburg	Mac McInnis	City Planner and Zoning Officer
Town of Wagram	Milton Farmer	Mayor
	Phyllis Lowery	Town Clerk
OTHER STAKEHOLDERS		
NCEM	Trey Cash	Hazard Mitigation Planner
	Ryan Cox	Risk Mitigation Planning Supervisor
	Chris Crew	State Hazard Mitigation Officer
	Yancey King	Area 8 Coordinator
PROJECT CONSULTANTS		
AECOM	Brent Edwards	Mitigation Planner
	William Hague	GIS Analyst
	Mike Robinson	Lead Mitigation Planner

2.4.2 COMMUNITY MEETINGS AND WORKSHOPS

September 27, 2016
Pee Dee Lumber Regional Hazard Mitigation Plan Kickoff Meeting

Immediately following the contractual Notice to Proceed, AECOMs staff arranged for a project kickoff meeting. Donna Wright, Richmond County's Emergency Management Director and the point of contact for the project, sent an email inviting representatives from the participating counties and municipalities, NCEM, and other local organizations to the meeting.

Donna Wright started the meeting by welcoming the representatives from the Counties, participating municipal jurisdictions and other stakeholders. She then introduced Mike Robinson, Project Manager from AECOM.

Mr. Robinson led the meeting of the Regional Hazard Mitigation Planning Committee and began by having attendees introduce themselves. The 18 attendees included representatives from various departments and local jurisdictions within two of the four counties participating in the plan update. Two of the four participating counties were unable to attend the kickoff meeting. Mr. Robinson then provided an overview of the items to be discussed at the meeting along with an agenda.

Mr. Robinson then began his PowerPoint presentation with an overview of the project and described to the planning committee the key project task. One important thing for this plan update was to make sure it complied with FEMAs Community Rating System (CRS) requirements to make it an approved hazard mitigation plan. Mr. Robinson then asked the committee thought about their existing regional hazard mitigation plan. While they all said they liked it Donna Wright spoke up and said it is very straight forward, but it is a large document. She also stated that while it identifies hazards it does not have any response procedures for emergencies.

Mr. Robinson explained the mitigation planning process and specific tasks to be accomplished for this project, including the planning process, risk assessment, capability assessment, mitigation strategy, mitigation action plan and plan maintenance procedures. For the risk assessment portion of the process, Mr. Robinson asked each county to designate a point person to coordinate the gathering of GIS data required for the analysis. The project schedule was presented and Mr. Robinson noted that the twelve-month schedule provided ample time to produce a quality plan and meet state and federal deadlines.

Following the planning process, Mr. Robinson went on to discuss hazard identification. He led off by asking the committee if there are any hazards they want added to or taken from the existing list. Mr. Robinson then asked “What keeps you up at night?” Right away people were saying the railroad and hazardous materials. From that Donna stated that while the railroad and hazardous materials are a concern, for her it is also dam/levee failure. She stated that in Richmond County alone they had one dam that has failed three times in the past five years.

After this discussion, Mr. Robinson led the group in a hazard identification exercise called “Mayor for a Day” to introduce meeting participants to various hazards. He briefly explained the four different categories of hazards: atmospheric, geologic, hydrologic and other (i.e. hazardous materials incident, wildfire). Each attendee was then given $20 in mock currency (a 10, 5 and five 1’s) and asked to “spend” their money as they personally deemed appropriate among the sixteen hazards. Money was “spent” by placing it in cups labeled with each of the hazards. These are the results.

- Hazardous Materials $86
- Hurricane $56
- Wildfire $35
- Winter Storm $31
- Dam/Levee Failure $28
- Other $23
- Thunderstorm $21
- Tornado $14

- Extreme Heat $14
- Lightning $9
- Drought $3
- Landslide $0
- Earthquake $0
- Hailstorm $0
- Erosion $0
- Flood $0

Mr. Robinson described that the importance of the exercise is to allow the planning committee to recognize the importance of certain hazards in their counties which allows them to shape their mitigation goals to better help their community.

Following the exercise, Mr. Robinson went on to describe the plan update process. He provided a planning team organization chart to demonstrate the process of communication and working with everyone on this project. He then described the importance of getting the public involved and gave an example of the public outreach strategy to demonstrate that. Mr. Robinson described that even though the public outreach strategy is getting the public involved, CRS requires that you hold at least two meetings open to the public.

Mr. Robinson asked the group to start thinking of possible dates to hold the next meeting. He explained that the purpose of the next meeting is to go over an overview of the final draft Public Outreach Strategy, recommendations for the *Risk Assessment*, an overview of the *Local Capability Assessment Survey* and *Safe Growth Survey*, discussion of a regional vision statement and mitigation goals, an update on data collection progress. Mr. Robinson asked each County to review their existing mitigation actions in preparation for the next meeting.

March 9, 2017
Second Regional Hazard Mitigation Planning Committee Meeting

The Public Outreach Strategy meeting was initiated by Donna Wright, Richmond County Director of Emergency Services, and was led by Mike Robinson, CFM (AECOM Lead Planner) with assistance from Brent Edwards (AECOM Planner). This meeting consisted of a detailed overview of the final draft Public Outreach Strategy, recommendations for the *Risk Assessment*, an overview of the *Local Capability Assessment Survey* and *Safe Growth Survey*, discussion of a regional vision statement and mitigation goals, an update on data collection progress, an open discussion session, and an explanation of next steps.

The meeting began with a brief welcome and opportunity for each of the 11 attendees to introduce themselves to the group.

A printed handout containing the final draft of the *Public Outreach Strategy* was distributed to the committee and a review of the document was provided via PowerPoint. The strategy follows the outline presented at the first meeting in terms of goals, outreach opportunities, etc.

The project information fact sheet was also presented to the group and additional opportunities were discussed for disseminating the fact sheet to the public. The fact sheet contains an overview of the regional mitigation planning effort; an explanation of the planning process including the six main

planning steps of *Public Outreach, Risk Assessment, Capability Assessment, Mitigation Strategy Development, Plan Maintenance*, and *Plan Adoption*; project leadership; project schedule; and contact information.

Another significant topic covered at the meeting was the online public participation survey https://www.surveymonkey.com/r/peedeelumberhmp.[2] At the time of the second meeting, screen mock-ups were shown to the group along with several sample questions. It was explained that the survey would go live around April 3, 2017 and would remain open until Friday July 21, 2017. The survey was hosted by AECOM using the SurveyMonkey web hosting service. The primary purpose of the survey was to solicit input from any interested parties in the planning area. The survey also offered individuals that were unable to attend the in-person meetings the opportunity to participate in the planning process. Information from the online survey allows the project team to better understand the types of hazards that most concern the public and the mitigation actions that are of particular interest. The survey was made accessible through hyperlinks posted on the each county's website and circulated via email, Facebook, newspaper articles, etc. Additionally, hard copies of the survey would be distributed at the second in-person public meeting on October 1, 2013 and at Richmond County's Public Heath Fair on April 3, 2017.

After discussing the public participation survey, participants stated their concerns with public meetings. A few members stated that no one ever shows up so it is difficult to get input from the public by just doing meetings. The group discussed possibly disguising a public meeting at a separate event to draw the public in. On April 3, 2017 Richmond County held a Public Health Fair at which the group decided to set up a booth for the Pee Dee Lumber Hazard Mitigation Plan Update.

A suggestion was made by AECOM to develop a regional vision statement to help define the new regional plan. The first draft of the vision statement shared with the HMPC was:

"Through a cohesive regional planning effort, create and implement an effective hazard mitigation plan that will identify and reduce risk to natural and man-made hazards in order to protect the health, safety, quality of life, environment and economy of the Pee Dee Lumber area."

After a discussion from the participants, everyone was happy with this vision statement and decided to keep it just the way it is.

A discussion also followed on the development and update of their mitigation strategies. Each County Lead Coordinator was given a hard copy of their county and municipalities previous mitigation strategies. This was given as a template for them to use in the upcoming meetings to start thinking about updating their strategies.

Another important discussion was about the *Risk Assessment*. NCEM Area Coordinator Yancey King stated his thoughts on the maps. He described that there could possibly be new floodplain mapping coming for the area which could be significantly different than the previous plan.

[2] The online survey was closed on July 21, 2017. This hyperlink is provided for documentation and reference purposes only as the link will no longer access the survey. A complete list of questions and responses can be found in Appendix D.

The meeting ended with open discussion and a list of next steps, which consisted of the following: final data collection; development of draft risk assessment results; development of draft capability assessment results; and scheduling of HMPC Meeting #3 (to be held in the form of a 4-hour Mitigation Strategy Workshop).

June 8, 2017 (10:00 – 12:00)
Third Regional Hazard Mitigation Planning Committee Meeting

The Mitigation Goals meeting was initiated by Donna Wright, Richmond County Director of Emergency Services, and was led by Mike Robinson, CFM (AECOM Lead Planner) with assistance from Brent Edwards (AECOM Planner) and William Hague (AECOM GIS Specialist). This meeting consisted of a detailed overview of the *Risk Assessment* and *Capability Assessment* findings, an update on the *Public Outreach Survey*, an open discussion session, and an explanation of next steps.

The meeting began with a brief welcome and opportunity for each of the attendees to introduce themselves to the group.

Mike Robinson started the meeting by going over the agenda for the meeting and explaining where we were in the planning process. Mr. Robinson then introduced William Hague, AECOMs' GIS Specialist, who then went into explaining the findings of the *Risk Assessment*. While going through the results, Mr. Hague told the planning committee to comment if they saw something that they did not think was correct or if other incidents had occurred in the area that were not listed on the national database but the committee considered important to put in the final plan. Donna stated that in the Dam/Levee Failure section, a big concern is with the private owned dams. She stated that there is one private dam that had failed and no one knew that it was there until it was too late. The planning committee also commented on a recent fire in Hoffman that was not stated in the national database. Mr. Hague went on to presented some new material that would be included in this plan update that were not in the previous plan, such as some new tables and statistics that have been created since the plan was last updated.

After Mr. Hague concluded the Risk Assessment results, he turned the presentation over to Brent Edwards, AECOMs' Planner. Mr. Edwards began by stating that the Capability Assessment results may look different that the previous plan. He explained that since the previous update, The Education and Outreach section was added to the survey so that could be one of the reasons the numbers are different. Mr. Edwards presented the Capability Assessment results to the committee with a table showing their capability score, capability ranking and self assessment. The table showed the jurisdictions in order of their capability score from highest to lowest. After showing the results, Mr. Edwards described the significance to the results. He told the committee that this gives you a guideline to you Mitigation Actions because if you have a low score then it proves that you don't need expensive or extravagant actions but small simple actions to help you get started. Then you might see your score go up in the next update allowing you to think of bigger actions to take.

The committee then finished up the first meeting with a working lunch break and discussed maintaining momentum through the finishing stages of this process.

June 8, 2017 (12:00 – 2:00)
Fourth Regional Hazard Mitigation Planning Committee Meeting

The Mitigation Strategy Development meeting was led by Mike Robinson, CFM (AECOM Lead Planner) with assistance from Brent Edwards (AECOM Planner) and William Hague (AECOM GIS Specialist). This meeting consisted of an overview of the existing mitigation action plans, updating those actions, a review of the regions vision statement and mitigations goals, a cardstorming exercise, an open discussion session, and an explanation of next steps.

Before Mr. Robinson began his presentation, each County Lead Coordinator was given a hard copy of their county and municipalities previous mitigation action plans. This was given as a template for them to use in the upcoming weeks while updating those actions. After the meeting was over the lead coordinators were sent an email containing their mitigation actions with new columns for their current status.

Mike Robinson started the meeting by going over the agenda for the meeting. Mr. Robinson proceeded to review the regions vision statement and asked if everyone still liked what it stated and asked if they had any comments but the committee was happy with it. Then Mr. Robinson walked through their previous goals and described how they can use these to categorize their action plans. Again the committee was happy with keeping their goals the same.

In order to get the group to start thinking about their actions and to demonstrate how their goals and actions line up Mr. Robinson decided to do a cardstorming exercise. After splitting the committee into groups they were then asked three questions:

- What would have to happen for the Pee Dee Lumber region to be more resilient to natural hazards?
- What specific actions would need to be taken to accomplish this?
- How do all of our ideas come together?

After being asked the first question the committee discussed with their groups their thoughts and ideas. Then they were asked the second question and they answered by putting their answers on large sticky not that would later be placed on the wall. Once they came up with a couple of ideas Mr. Robinson asked them the third and final question and again they answered on the sticky notes. Once all the cards had ideas on them and were on the wall, Mr. Robinson then worked with the whole room to group the similar ones together. By putting the similar ones together it would show where the planning areas priorities would be helping the jurisdictions think of their mitigation actions.

July 7, 2017
Fifth Regional Hazard Mitigation Planning Committee Meeting

The Mitigation Action Plans meeting was led by Mike Robinson, CFM (AECOM Lead Planner) with assistance from Brent Edwards (AECOM Planner). This meeting consisted of an overview of the existing mitigation action plans discussed in the previous meeting, updating those actions, a review of the Public Outreach Strategy, a discussion about the Plan Maintenance Procedures, an open discussion session, and an explanation of next steps.

The meeting began with Mr. Robinson doing the welcome and introductions and then handing over to Mr. Edwards for the remaining presentation. Mr. Edwards gave a brief overview of the Mitigation Action Plans for the people who were not present for the previous meeting. The committee the split into two groups, Anson and Richmond County, and Montgomery and Scotland County, to discuss one on one with Mr. Edwards and Mr. Robinson about their MAPs. They walked through the actions that AECOM had questions about and if they didn't know the answer they gave contact information for the people who would possibly know the status of those actions.

After walking through the MAPs, the group reconvened for the rest of the presentation. Mr. Edwards showed the committee the status of the Public Survey and showed them a table of the demographics of the completed plans. This table showed the number of completed surveys from each jurisdiction in the planning area. He concluded the Public Survey portion of the presentation by asking the group if they could make one final stride to reach a goal of 200 completed surveys by July 21.
Mr. Edwards went on to discuss the Plan Maintenance Procedures with the committee. He showed the group a few sentences pulled out of the previous plan stating that Richmond County would be the lead agency for the planning area and asked peoples thoughts on wanting to change that to a different agency or keep it the same. Everyone agreed to keep Richmond County as the lead agency for the planning area.

Mr. Edwards concluded the meeting by discussing the next steps. He told the committee that the next meeting would be on July 31 and would consist presenting a draft plan for them to review. He asked how they would like to review their plan update: one section at a time spread out over a couple of days or all at once. The group decided to receive the plan all at once for them to review.

July 31, 2017
Sixth Regional Hazard Mitigation Planning Committee Meeting

The Draft Plan Delivery meeting was led by Mike Robinson, CFM (AECOM Lead Planner) with assistance from Brent Edwards (AECOM Planner). This meeting consisted of an overview of the draft plan, a brief update on the final results of the public participation survey, a discussion about the logistics of the draft plan review, an explanation of council/commission adoption, an open discussion session, and an explanation of next steps.

The meeting began with Mr. Robinson doing the welcome and introductions and then handing over to Mr. Edwards for the remaining presentation. Mr. Edwards began by showing the committee a couple of graphs and tables for the public survey. These tables showed a breakdown of each question along with a table to correspond. The main question of focus was the locations of the residents who participated. This showed the committee not only where the people were in the planning area but found that a lot of people lived in South Carolina but felt the need to provide information on the Pee Dee Lumber plan.

Mr. Edwards also gave a brief update on the status of the Mitigation Action Plans. He stated that there were a couple of jurisdictions they were waiting to hear back from on the completion of their plans. He also announced to the committee that Robbie Smith had been going around to his jurisdictions personally helping them with the completion of the actions. He also stated that he had spent two days riding around the planning area visiting different jurisdictions to assist them with their actions.

He then presented the Table of Contents and explaining that it was left the same because the layout was good from the previous plan and the committee agreed at the beginning of the process that they liked

the way the plan looked and would be easier to read if it stayed the same. He then told the committee that the main parts they wanted them to look at were Section 6: Vulnerability Assessment, Section 7: Capability Assessment and Section 9: Mitigation Action Plans. He also stated that he wanted to make sure all of the information was correct so the main focus on these sections needed to be on content and not grammar.

Mr. Edwards then discussed with the committee the different options that are available to send back comments. These different ways included: track-changes, hand written on a PDF copy, or a simple list on a word document. All of the lead coordinators were sent copies electronically on each section so the could review and comment them however they wanted. He then explained to the committee the next steps for the approval process and how all of that will work.

Mr. Edwards concluded the meeting by presenting a hard-copy of the plan to the lead coordinator, Donna Wright, and then thanking the committee for all of their help and participation throughout the whole planning process.

2.4.3 INVOLVING THE PUBLIC

44 CFR Requirement
44 CFR Part 201.6(b)(1): The planning process shall include an opportunity for the public to comment on the plan during the drafting stage and prior to plan approval.

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 Meeting #1
Public Meeting #1 was held from 2 p.m. to 3 p.m. on Tuesday, October 27, 2016 at the Richmond County BOCC Chambers. The meeting was set up as an open floor open discussion to whoever wanted to come. An information fact sheet was created by AECOM to help the public know the key points to the meeting. The topics included: what is hazard mitigation? What is a hazard mitigation plan? Why are we updating the hazard mitigation plan now? How can the public participate in the process? What is CRS? Unfortunately, no participants from the public attended the meeting.

Public Meeting #2
Public meeting #2 was held at the Scotland County EOC on June 15, 2017 from 2 p.m. to 4 p.m. Brent Edwards and Liz Schneider attended the meeting for AECOM. They had prepared to present to the public the same results that were shown to the planning committee in the third meeting*: Risk Assessment* and *Capability Assessment* results, aerial maps of the planning area for the public to mark areas where they have seen reoccurring hazards and a computer with the Public Outreach Survey opened allowing them to fill it out at the meeting. Unfortunately, no participants from the

public attended the meeting.

Public Outreach
On Monday, April 3, 2017 Richmond County hosted a health fair for the community. They used this opportunity to reach out to the public and get their input on the plan. During this health fair, AECOM set up a booth providing information on the Regional Hazard Mitigation Plan update, opportunities for the public to complete a survey on the plan and aerial flood maps of all the counties at which the public can mark locations of different hazards as the wish. Unfortunately, the few people that stopped by the booth did not live in the planning area and were unable to accurately mark the map for specific hazard areas.

Online Public Participation Survey
As discussed in the description of the second HMP meeting, the public participation survey was opened in March 2016 and closed in July 2017. The survey consisted of about 20 questions to obtain some basic hazard information from the public. Examples of questions from the survey include:

- Have you ever experienced a hazard? If so, which ones?
- What infrastructure is most susceptible to natural hazards in your community?
- Rate the importance of certain assets in your community.
- What are steps to reduce your risk?

With the survey being online in nature, and requiring Internet access, the planning committee decided to offer an alternative by creating a shorter, simpler survey that they could print out and hand to people for them to fill out quickly. One example of this was providing the printed survey to local bus passengers. The committee collected multiple handout surveys which were then put into the online system by AECOM for inclusion in the survey database. The committee felt that this was important due to limited Internet access throughout the planning area.

After further analysis of all completed surveys, there was a significant correlation between the publics' responses and the data from the risk assessment. There were numerous similarities in the hazard ranking from the risk assessment and the hazards the public felt they were most susceptible to.

2.4.4 INVOLVING THE STAKEHOLDERS

44 CFR Requirement
44 CFR Part 201.6(b)(2): The planning process shall include 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 non-profit interests to be involved in the planning process.

The Regional Hazard Mitigation Planning Committee encouraged more open and widespread participation in the mitigation planning process by the design and distribution of the *Public Participation Survey*. The region also went above and beyond in its local outreach efforts by participation in the Richmond County Public Health Fair and providing an opportunity to complete the survey and analyze aerial maps of the community at which they could reference personal hazards within their community. These opportunities were provided for local officials, residents, businesses, academia, and other private interests in the Pee Dee Lumber Region to be involved and offer input throughout the local mitigation planning process. Input from additional stakeholders, including neighboring communities, was welcomed through the open public meetings and online survey. The neighboring Counties of Union,

Stanly, Randolph, Moore, Hoke and Robeson were all contacted and invited to participate in the committee meetings by email through their EM Coordinator. AECOM did discover that there were multiple people from neighboring communities that participated in the public survey. This could be due to the widespread information about the plan update through social media and county websites. This allowed information to get to those communities for people who possibly commute through the area or even work in the planning area but live in neighboring jurisdictions to participate and provide their input. It was also not clear from the survey that any of the priorities set forth in the plan needed to be changed for this plan update. Therefore, public participation did not provide direct influences to change established priorities. If any additional stakeholders representing other agencies and organizations participated through the Public Participation Survey, that information is unknown due to the anonymous nature of the survey.

2.4.5 DOCUMENTATION OF PLAN PROGRESS

Progress in hazard mitigation planning for the participating jurisdictions in the Pee Dee Lumber Region is documented in this plan update. Since hazard mitigation planning efforts officially began in the participating counties with the development of the initial hazard mitigation plans in the early 2000s, many mitigation actions have been completed and implemented in the participating jurisdictions. These actions will help reduce the overall risk to natural hazards for the people and property in the Pee Dee Lumber Region. The actions that have been completed are documented in the Mitigation Action Plans found in Section 7.

In addition, 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 7: *Capability Assessment*. The participating jurisdictions continue to demonstrate their commitment to hazard mitigation and hazard mitigation planning and have proven this by reconvening the Hazard Mitigation Planning Committee to update and combine the previous hazard mitigation plans into this new regional plan and by continuing to involve the public in the hazard mitigation planning process.

SECTION 3
Community Profile

This section of the Plan provides a general overview of the Pee Dee Lumber Region. It consists of the following four subsections:

- 3.1 Geography and the Environment
- 3.2 Population and Demographics
- 3.3 Housing, Infrastructure and Land Use
- 3.4 Employment and Industry

3.1 GEOGRAPHY AND THE ENVIRONMENT

The Pee Dee Lumber Region is located along the Piedmont and Inner Coastal Plain border in south-central North Carolina. For the purposes of this plan, the Pee Dee Lumber Region includes Anson, Montgomery, Richmond, and Scotland Counties. An orientation map is provided as **Figures 3.1, 3.2, 3.3, 3.4** and **3.5**.

The Pee Dee Lumber Region is a rural area; however, there are several attractions which draw visitors to the region. These attractions include the Rockingham Speedway, historic towns and sites, and several family-owned vineyards. The Sandhills Game Lands, Pee Dee Wildlife Refuge, and Blewett Falls Reservoir also offer fishing, hunting, camping, hiking, biking, horseback riding, and boating opportunities. Another unique attraction is the Town Creek Indian Mound in Mt. Gilead, which is an archaeological site that has become one of the most popular State Historic Sites in North Carolina.

The total land area of each of the participating counties is presented in **Table 3.1**.

TABLE 3.1: TOTAL LAND AREAS OF PARTICIPATING COUNTIES

County	Total Land Area
Anson County	531 square miles
Montgomery County	492 square miles
Richmond County	474 square miles
Scotland County	319 square miles

Source: US Census Bureau

The Pee Dee Lumber Region enjoys four distinct seasons with precipitation spread throughout the year. Although there are no distinct wet and dry seasons, overall, summer is the wettest season and autumn is the driest season. Annual precipitation averages between 45 and 50 inches in the region. In the summer, average high temperatures (˚F) are in the nineties while average low temperatures are in the mid-sixties. In the winter, average high temperatures reach the mid fifties while average low temperatures are near the thirties. On average, snow and sleet events do not occur much more than once or twice a year.

FIGURE 3.1: PEE DEE LUMBER REGION ORIENTATION MAP

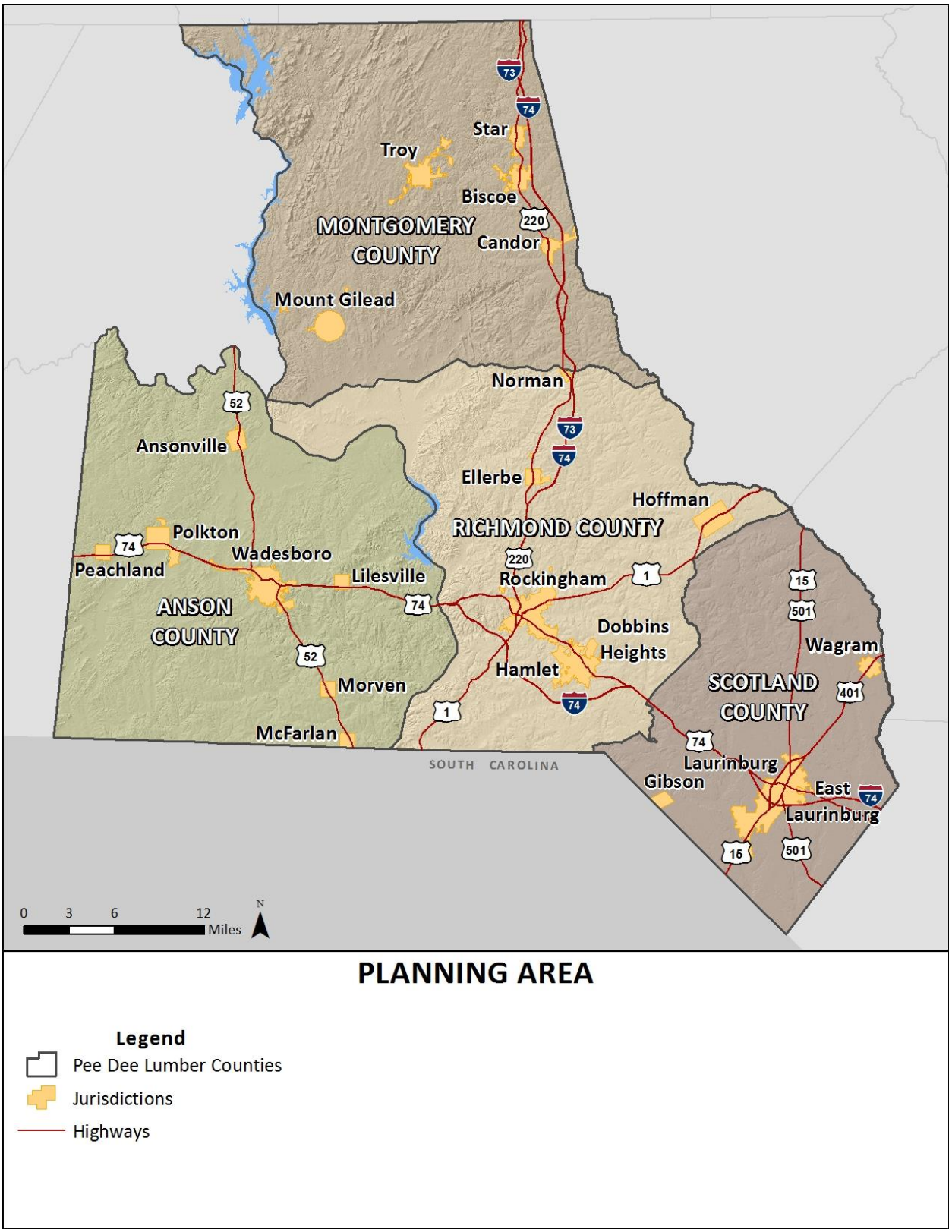


FIGURE 3.2: ANSON COUNTY ORIENTATION MAP

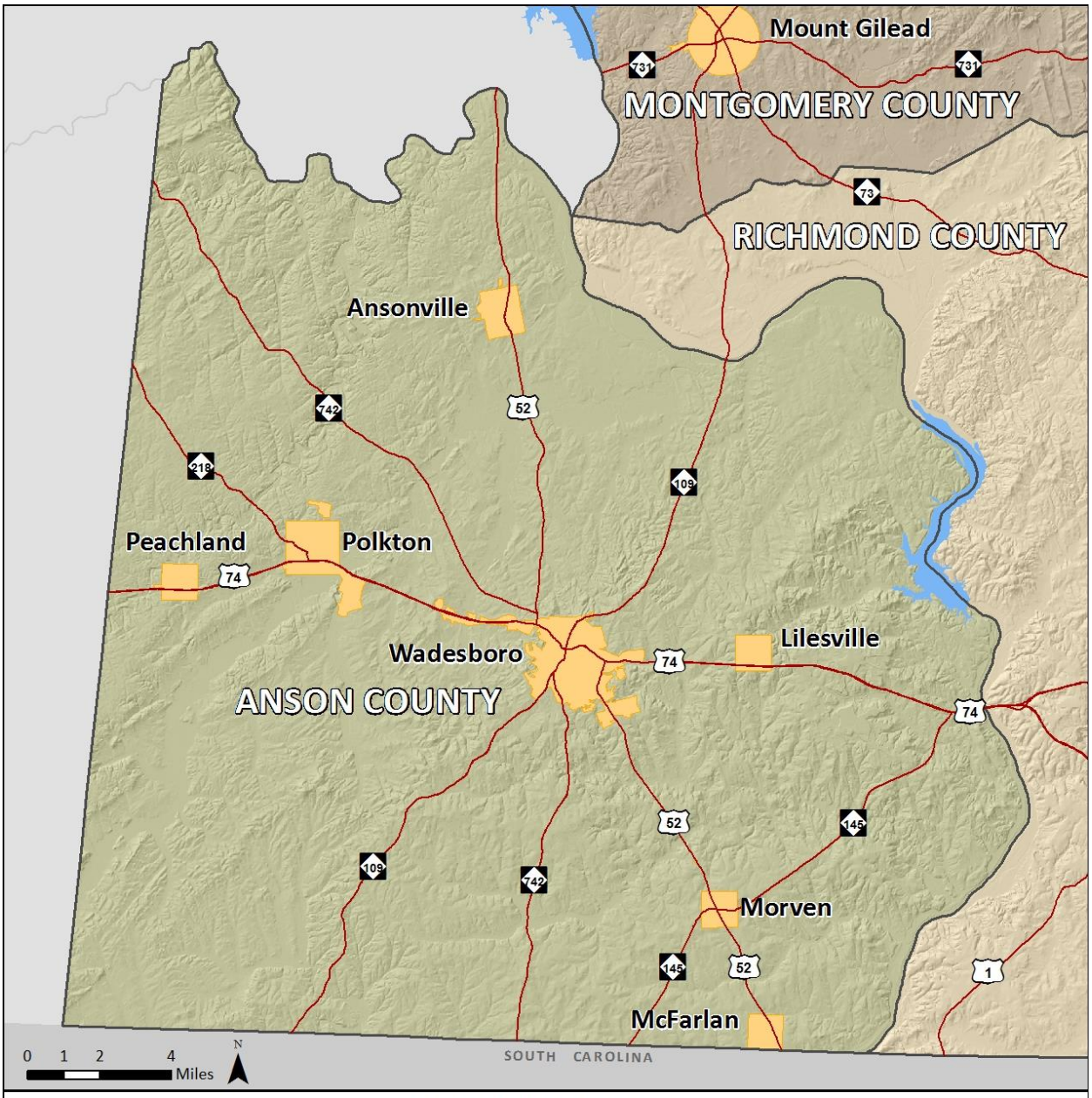
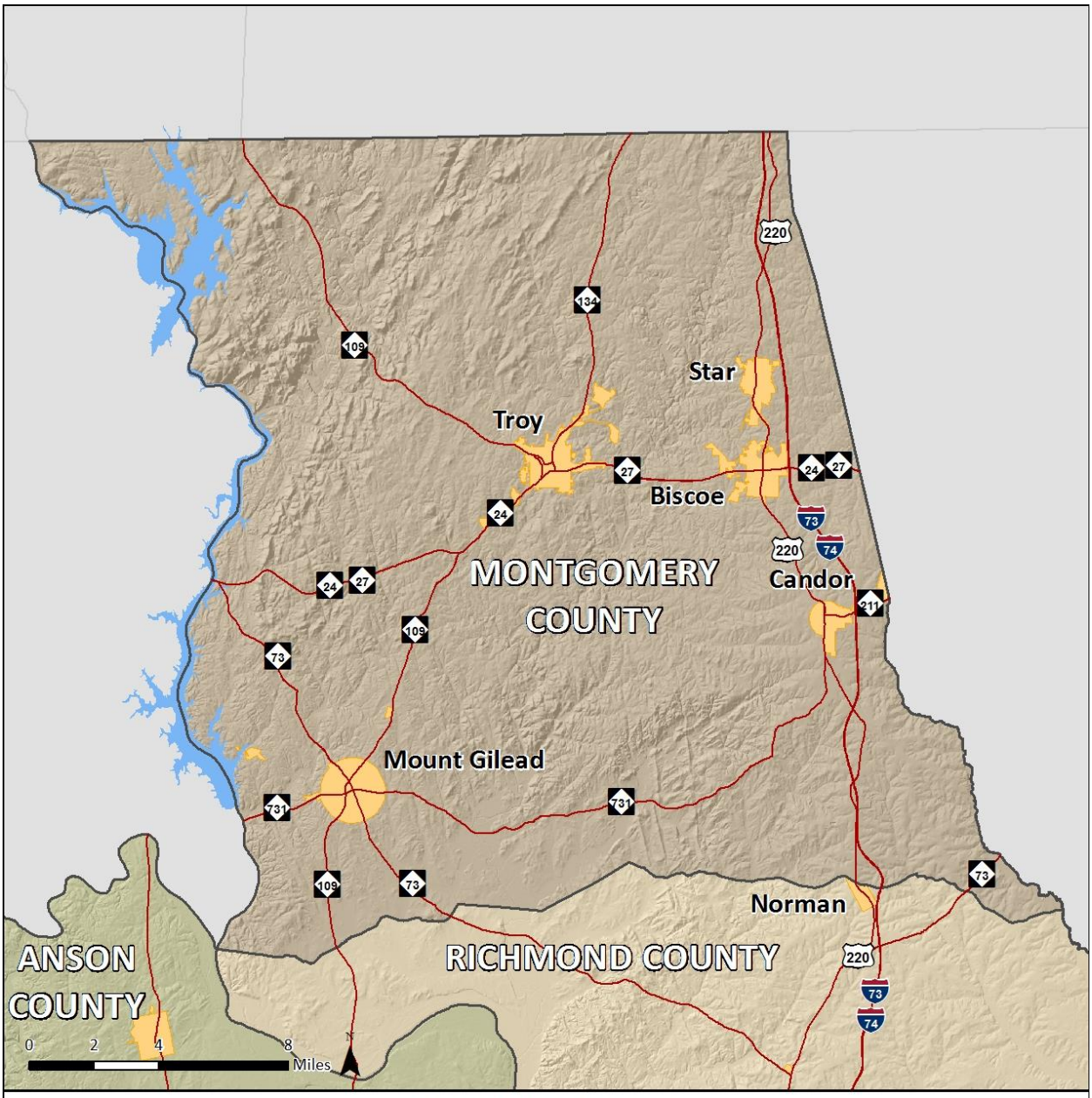


FIGURE 3.3: MONTGOMERY COUNTY ORIENTATION MAP



PLANNING AREA
MONTGOMERY COUNTY

Legend

- Pee Dee Lumber Counties
- Jurisdictions
- Highways

FIGURE 3.4: RICHMOND COUNTY ORIENTATION MAP

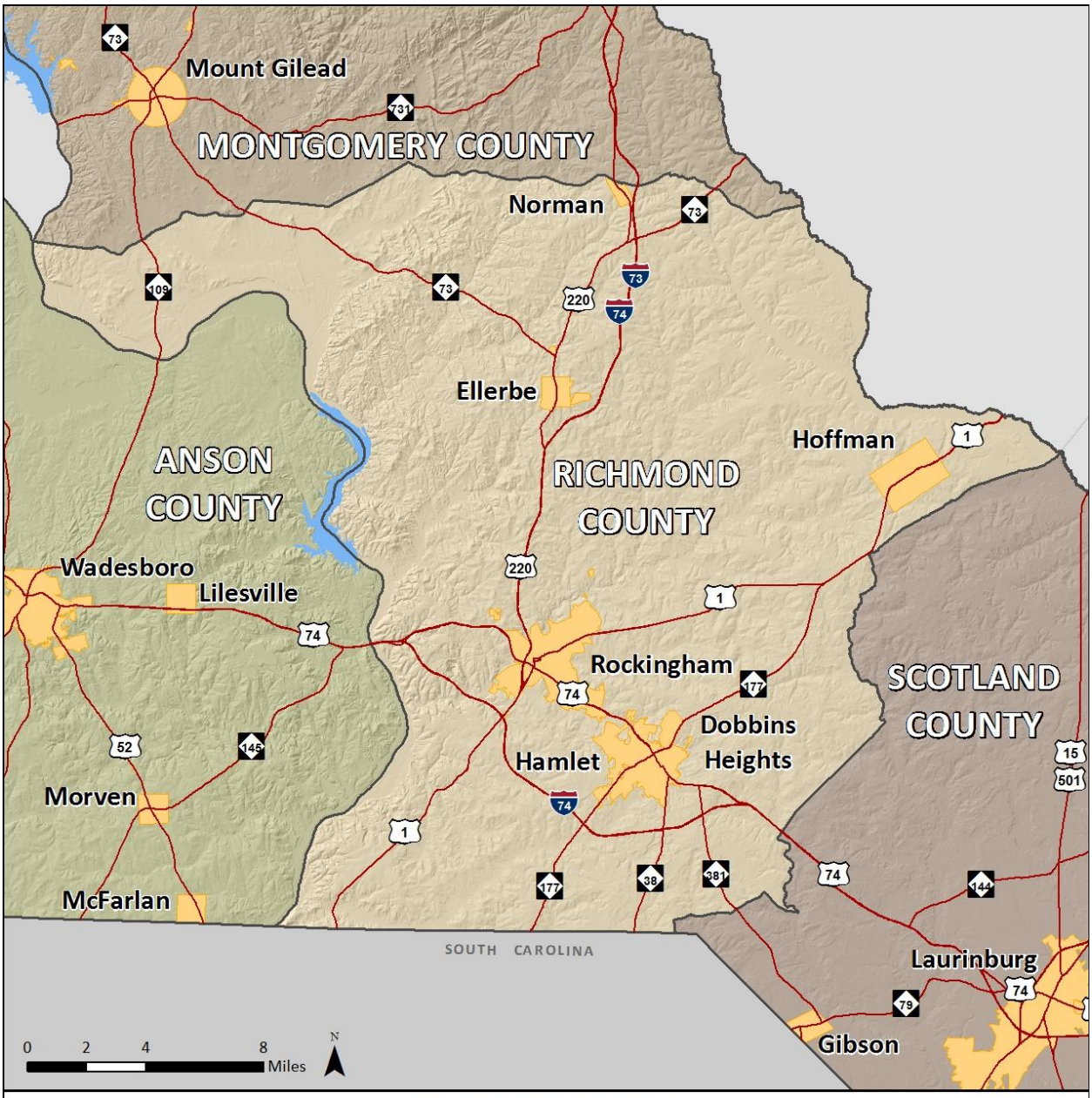
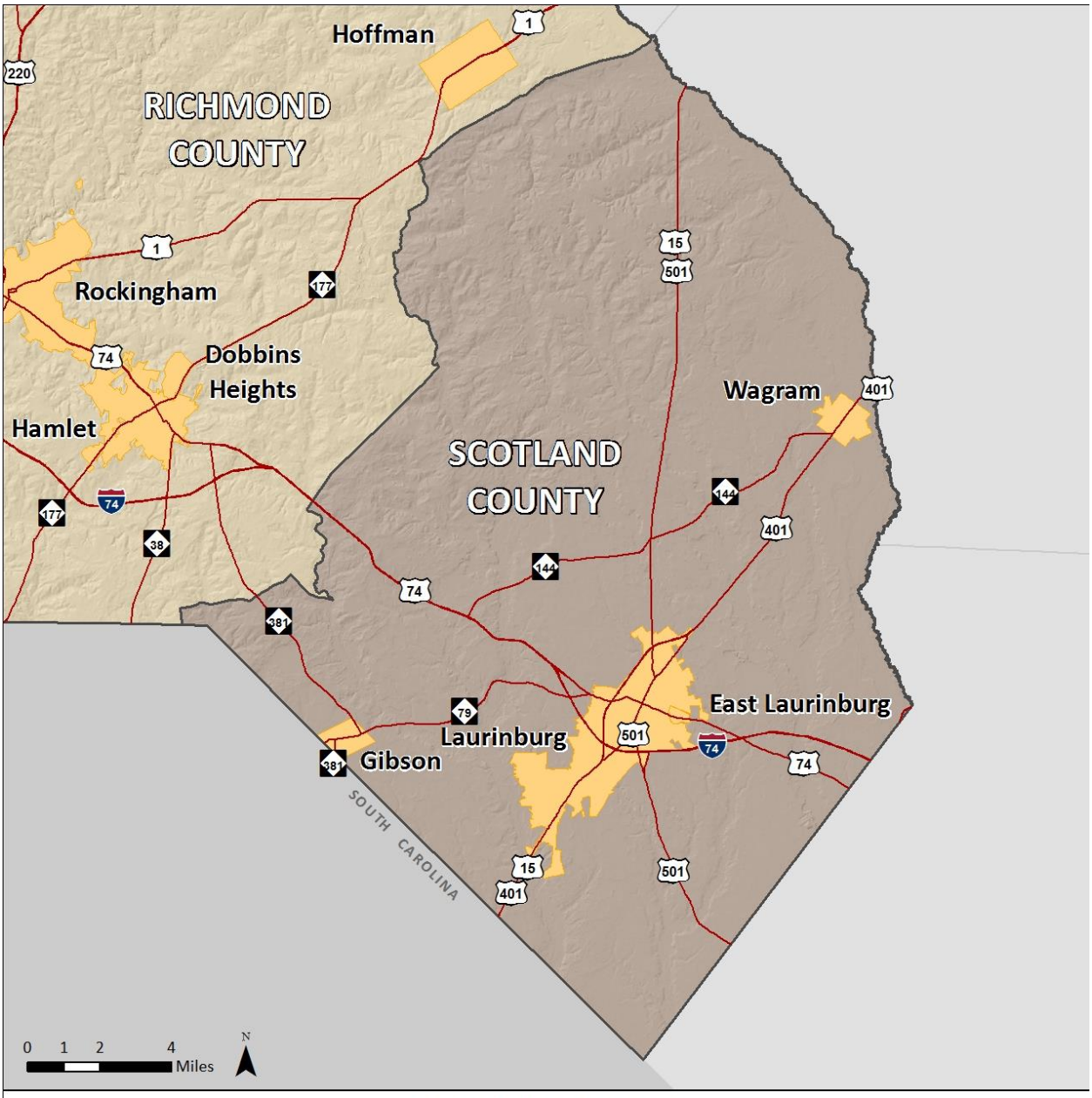


FIGURE 3.5: SCOTLAND COUNTY ORIENTATION MAP



3.2 POPULATION AND DEMOGRAPHICS

Anson County is the largest participating county by area, but it has the smallest population making it the least densely populated. Montgomery County also has similar land area and population sizes to Anson County. In contrast, Scotland County and Richmond County are about two times more densely populated than the other two counties. Between 2000 and 2010, the four counties in the Pee Dee Lumber Region saw very low or negligible population growth. There were, however, several towns and cities that experienced higher rates of growth as well as others that saw higher rates of decline. In general, those jurisdictions that experienced substantial rates of change had populations under 1,000 people. Population counts from the US Census Bureau for 1990, 2000, and 2010 for each of the participating jurisdictions are presented in **Table 3.2**.

TABLE 3.2: POPULATION COUNTS FOR PARTICIPATING JURISDICTIONS

Jurisdiction	1990 Census Population	2000 Census Population	2010 Census Population	2015 Population Estimates	% Change 2010-2015
ANSON COUNTY	**23,474**	**25,275**	**26,948**	**25,759**	**-4.4%**
Town of Ansonville	614	636	631	595	-5.7%
City of Lilesville	468	459	536	505	-5.8%
Town of McFarlan	98	89	117	111	-5.1%
Town of Morven	590	579	511	471	- 7.8%
Town of Peachland	384	554	437	414	-5.3%
Town of Polkton	662	1,195	3,375	3,495	3.6%
Town of Wadesboro	3,645	3,552	5,813	5,584	-3.9%
MONTGOMERY COUNTY	**23,346**	**26,822**	**27,798**	**27,548**	**-.9%**
Town of Biscoe	1,484	1,700	1,700	1,690	-.6%
Town of Candor	748	825	840	838	-.2%
Town of Mount Gilead	1,336	1,389	1,181	1,180	-.1%
Town of Star	775	807	876	874	-.2%
Town of Troy	3,404	3,430	3,189	3,427	7.5%
RICHMOND COUNTY	**44,518**	**46,564**	**46,639**	**45,437**	**-2.6%**
Town of Dobbins Heights	1,144	936	866	838	-3.2%
Town of Ellerbe	1,132	1,021	1,054	1,005	-4.6%
City of Hamlet	6,196	6,018	6,495	6,454	-.6%
Town of Hoffman	348	624	588	572	-2.7%
Town of Norman	105	72	138	132	-4.3%
City of Rockingham	9,399	9,672	9,558	9,220	-3.5%
SCOTLAND COUNTY	**33,754**	**35,998**	**36,157**	**35,509**	**-1.8%**
Town of East Laurinburg	302	295	300	288	-4.0%

Jurisdiction	1990 Census Population	2000 Census Population	2010 Census Population	2015 Population Estimates	% Change 2010-2015
Town of Gibson	532	584	540	519	-3.9%
City of Laurinburg	11,643	15,874	15,962	15,507	-2.9%
Town of Wagram	480	801	840	807	-3.9%

Source: US Census Bureau

Based on the 2010 Census, the median age of residents of the participating counties ranges from 38 to 40 years. The racial characteristics of the participating counties are presented in **Table 3.3**. In general, whites make up between half to two thirds of each county's population. However, Anson County is the only county to have equal sized white and black populations and Scotland County is the only county to have a sizable American Indian population.

TABLE 3.3: DEMOGRAPHICS OF PARTICIPATING COUNTIES

Jurisdiction	White Persons, Percent		Black Persons, Percent		American Indian Persons, Percent		Other Race, Percent		Persons of Hispanic Origin, Percent *	
	2010	2015	2010	2015	2010	2015	2010	2015	2010	2015
Anson County	47.2%	47.8%	48.6%	49.0%	0.6%	0.8%	3.6%	2.4%	3.0%	3.7%
Montgomery County	68.9%	77.1%	18.8%	19.0%	0.4%	1.0%	11.9%	3.0%	14.1%	15.5%
Richmond County	60.2%	62.1%	30.6%	31.6%	2.5%	3.1%	6.7%	3.2%	5.9%	6.4%
Scotland County	46.5%	46.3%	38.6%	39.1%	10.9%	11.5%	4.0%	3.1%	2.1%	2.8%

Source: US Census Bureau

*Hispanics may be of any race, so also are included in applicable race categories

3.3 HOUSING, INFRASTRUCTURE AND LAND USE

3.3.1 Housing

According to the 2010 US Census, there were 63,421 housing units in the Pee Dee Lumber Region, the majority of which are single family homes or mobile homes. Housing information for the four participating counties is presented in **Table 3.4**. As shown in the table, Montgomery County is the only county with a significant percentage of seasonal housing units.

TABLE 3.4: HOUSING CHARACTERISTICS

Jurisdiction	Housing Units (2010)	Housing Units (2016)	Median Home Value (2011-2015)
Anson County	11,576	11,486	$76,900
Montgomery County	15,914	16,110	$90,900
Richmond County	20,738	21,200	$78,600
Scotland County	15,193	15,191	$79,100

Source: US Census Bureau

3.3.2 Infrastructure

Transportation

There are two major highways that traverse the Pee Dee Lumber Region. US Route 74 is an east-west highway that runs through Anson, Richmond, and Scotland Counties as it passes through North Carolina from the Tennessee border to the coast. Route 74 connects the towns of Polkton, Wadesboro, Lilesville, Rockingham, Hamlet, Dobbins Heights, Laurinburg, and East Laurinburg. Interstate 74, once fully complete, will travel southeasterly from the Virginia border and end at US Route 74. This interstate will connect Richmond County to Scotland County. US Route 220, the second major highway, runs north-south across the state from the Virginia border to the Town of Rockingham. This highway connects the towns of Star, Biscoe, Candor, Norman, Ellerbe, and Rockingham. There are also additional highways, including Interstate 109, US Route 1, 52, 401, 501, and NC Highway 24, which travel across the individual counties and into neighboring counties.

There are several small general aviation airports within the Pee Dee Lumber Region, including Anson County Airport in Wadesboro, Montgomery County Airport in Star, Richmond County Airport in Rockingham, and Laurinburg-Maxton Airport in Stewartsville. The major airport located nearest the region is Fayetteville Regional Airport. This airport offers domestic flights on three airlines to Atlanta, Charlotte, and Washington D.C. and is located approximately 50 miles away from the center of the region. Other nearby major airports that offer more widespread domestic flights as well international flights include Charlotte Douglas International Airport, Piedmont Triad International Airport, and Raleigh-Durham International Airport.

Utilities

Electrical Power in the Pee Dee Lumber Region is provided by one public utility and several electricity cooperatives. Progress Energy provides service to all four counties in the region. Pee Dee Electric Membership Corporation also serves all four of the Pee Dee Lumber Region counties. EnergyUnited and Randolph Electric Membership Corporation are two additional cooperatives that provide power to Montgomery County residents.

Water and sewer service is provided by half of participating jurisdictions; however, many areas rely on septic systems and wells. The Counties of Anson, Montgomery, and Richmond; the Cities of Lilesville, Hamlet, Rockingham, and Laurinburg; and the Towns of Wadesboro, Biscoe, Candor, Mt. Gilead, Star, Troy, and Wagram all provide water and sewer service to residents.

Community Facilities

There are a number of public buildings and community facilities located throughout the Pee Dee Lumber Region. According to the data collected for the vulnerability assessment (Section 6.3.3), there are 39 fire stations, 13 police stations, and 55 public schools located within the study area.

Five hospitals are located in the Pee Dee Lumber Region. The largest is Scotland Memorial Hospital, a 154-bed facility located in the City of Laurinburg. The Anson Community Hospital in Wadesboro and the FirstHealth-Richmond Memorial Hospital are two comparably sized facilities with 147 beds and 141 beds, respectively. Two smaller hospitals serving the region include the 64-bed Sandhills Regional Medical Center in the City of Hamlet and the 23-bed FirstHealth-Montgomery Memorial Hospital in the Town of Troy.

The Pee Dee Lumber Region also contains numerous local parks, the Lumber River State Park, the Pee Dee National Wildlife Refuge, and the Uwharrie National Forest. These facilities offer recreational opportunities to area residents and visitors alike.

3.3.3 Land Use

The Pee Dee Lumber Region is a predominately rural area made up of sparse residential development, forestland, and agricultural land. As shown in **Figure 3.1** above, there are numerous small incorporated municipalities located throughout the study area and the majority of residential development and the region's population is clustered around these centers. The incorporated areas are also where many of the local businesses, commercial uses, and institutional uses are located.

Local land use (and associated regulations, or lack thereof) is further discussed in *Section 7: Capability Assessment.*

3.4 EMPLOYMENT AND INDUSTRY

Up until the 1960s, the Pee Dee Lumber Region was an agriculture center with an economy largely dependent on the production of cotton and tobacco. Some of the agricultural-driven economy still remains today, and peaches, corn, soybeans, strawberries, truck crops, wheat, poultry, and swine continue to be grown or raised on farms in the region. During the mid-20th century, the economic focus shifted towards manufacturing and textiles, but these industries have seen a drastic decline since the 1990s and significant numbers of job loss have plagued the area. Many towns in the region are now working to bring back small businesses, restore downtown areas, and attract tourists to the area.

According to the North Carolina Employment Security Commission, in 2011, Anson County had an average annual employment of 8,495 workers. In 2010, the Education and Health Services industry employed 22.5 percent of the County's workforce followed by Manufacturing (20.1%); Public Administration (17.9%); and Trade, Transportation, and Utilities (17.9%). From 2008 to 2010, the average annual median household income in Anson County was $33,704 compared to $44,958 for the state of North Carolina.

In 2011, Montgomery County had an average annual employment of 9,346 workers. In 2010, according to NCESC, the Manufacturing industry employed the most people, with 33.4 percent of the workforce, followed by Education and Health Services (21.3%); Trade, Transportation, and Utilities (12.7%); and

Public Administration (9.6%). The average annual median household income in Montgomery County was $33,645 from 2008 to 2010.

Richmond County had an average annual employment of 17,407 workers in 2011. According to the NCESC, in 2010, the Education and Health Services industry was the largest employment sector with 27.5 percent of the County's workforce. The other leading industries were Manufacturing (20.0%); Trade, Transportation, and Utilities (16.5%); and Public Administration (9.1%). From 2008 to 2010, the average annual median household income in Richmond County was $29,622.

The NCESC reported an annual average employment of 11,201 workers in Scotland County for 2011. In 2010, the top employment industry was again Education and Health Services, making up 30.3 percent of total employment. Other major industries were Manufacturing (16.9%); Trade, Transportation, and Utilities (16.9%); Public Administration (9.2%); and Leisure and Hospitality (9.2%). The County's average annual median household income was $28,695 from 2008 to 2010.

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SECTION 4
HAZARD IDENTIFICATION

This section describes how the Regional Hazard Mitigation Planning Team identified the hazards to be included this plan. It consists of the following five subsections:

- 4.1 Overview
- 4.2 Description of Full Range of Hazards
- 4.3 Disaster Declarations
- 4.4 Hazard Evaluation
- 4.5 Hazard Identification Results

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44 CFR Requirement

44 CFR Part 201.6(c)(2)(i): The risk assessment shall include a description of the type, 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.

4.1 OVERVIEW

The Pee Dee Lumber Region is vulnerable to a wide range of natural and human-caused hazards that threaten life and property. Current FEMA regulations and guidance under the Disaster Mitigation Act of 2000 (DMA 2000) require, at a minimum, an evaluation of a full range of natural hazards. An evaluation of human-caused hazards (i.e., technological hazards, terrorism, etc.) is encouraged, though not required, for plan approval. The Pee Dee Lumber Region has included a comprehensive assessment of both types of hazards.

Upon a review of the full range of natural hazards suggested under FEMA planning guidance, the participating counties in the Pee Dee Lumber Region (Anson County, Montgomery County, Richmond County, and Scotland County) have identified a number of hazards that are to be addressed in its Regional Hazard Mitigation Plan. These hazards were identified through an extensive process that utilized input from the Pee Dee Lumber Regional Hazard Mitigation Planning Committee members, research of past disaster declarations in the participating counties[1], and review of the North Carolina State Hazard Mitigation Plan (2010). Readily available information from reputable sources (such as federal and state agencies) was also evaluated to supplement information from these key sources.

Table 4.1 lists the full range of hazards initially identified for inclusion in the Plan and provides a brief description for each. This table includes 23 individual hazards. Some of these hazards are considered to be interrelated or cascading, but for preliminary hazard identification purposes these individual hazards are broken out separately.

Next, **Table 4.2** lists the disaster declarations in the Pee Dee Lumber Region.

[1] A complete list of disaster declarations for the Pee Dee Lumber Region can be found below in Section 4.3.

Next, **Table 4.3** documents the evaluation process used for determining which of the initially identified hazards are considered significant enough to warrant further evaluation in the risk assessment. For each hazard considered, the table indicates whether or not the hazard was identified as a significant hazard to be further assessed, how this determination was made, and why this determination was made. The table works to summarize not only those hazards that *were* identified (and why) but also those that *were not* identified (and why not). Hazard events not identified for inclusion at this time may be addressed during future evaluations and updates of the risk assessment if deemed necessary by the Regional Hazard Mitigation Planning Committee during the plan update process.

Lastly, **Table 4.4** provides a summary of the hazard identification and evaluation process noting that 15 of the 23 initially identified hazards are considered significant enough for further evaluation through this Plan's risk assessment (marked with a "☑")

4.2 DESCRIPTION OF FULL RANGE OF HAZARDS

TABLE 4.1: DESCRIPTIONS OF THE FULL RANGE OF INITIALLY IDENTIFIED HAZARDS

Hazard	Description
ATMOSPHERIC HAZARDS	
Avalanche	A rapid fall or slide of a large mass of snow down a mountainside.
Drought	A prolonged period of less than normal precipitation such that the lack of water causes a serious hydrologic imbalance. Common effects of drought include crop failure, water supply shortages, and fish and wildlife mortality. High temperatures, high winds, and low humidity can worsen drought conditions and also make areas more susceptible to wildfire. Human demands and actions have the ability to hasten or mitigate drought-related impacts on local communities.
Hailstorm	Any storm that produces hailstones that fall to the ground. This term usually used when the amount or size of the hail is considered significant. Hail is formed when updrafts in thunderstorms carry raindrops into parts of the atmosphere where the temperatures are below freezing.
Heat Wave/Extreme Heat	A heat wave may occur when temperatures hover 10 degrees or more above the average high temperature for the region and last for several weeks. Humid conditions, which add to the discomfort of high temperatures, occur when a "dome" of high atmospheric pressure traps hazy, damp air near the ground. Excessively dry and hot conditions can also lead to dust storms and low visibility. A heat wave combined with a drought can be very dangerous and have severe economic consequences on a community.

Hurricane and Tropical Storm	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 counter-clockwise in the Northern Hemisphere (or clockwise in the Southern Hemisphere) and with a diameter averaging 10 to 30 miles across. 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. When sustained winds reach or exceed 74 miles per hour the storm is deemed a hurricane. The primary damaging forces associated with these storms are high-level sustained winds, heavy precipitation and tornadoes. Coastal areas are also vulnerable to the additional forces of storm surge, wind-driven waves and tidal flooding which can be more destructive than cyclone wind. 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 extends from June through November.
Lightning	Lightning is a discharge of electrical energy resulting from the buildup of positive and negative charges within a thunderstorm, creating a "bolt" when the buildup of charges becomes strong enough. This flash of light usually occurs within the clouds or between the clouds and the ground. A bolt of lightning can reach temperatures approaching 50,000 degrees Fahrenheit. Lightning rapidly heats the sky as it flashes, but the surrounding air cools following the bolt. This rapid heating and cooling of the surrounding air causes thunder. On average, 73 people are killed each year by lightning strikes in the United States.
Nor'easter	Similar to hurricanes, nor'easters are ocean storms capable of causing substantial damage to coastal areas in the Eastern United States due to their associated 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.
Thunderstorm Wind	Thunderstorms are caused by air masses of varying temperatures meeting in the atmosphere. Rapidly rising warm moist air fuels the formation of thunderstorms. Thunderstorms may occur singularly, in lines, or in clusters. They can move through an area very quickly or linger for several hours. Thunderstorms may result in hail, tornadoes, or straight-line winds. Windstorms pose a threat to lives, property, and vital utilities primarily due to the effects of flying debris and can down trees and power lines.
Tornado	A tornado is a violently rotating column of air that has contact with the ground and is often visible as a funnel cloud. Its vortex rotates cyclonically with wind speeds ranging from as low as 40 mph to as high as 300 mph. Tornadoes are most often generated by thunderstorm activity when cool, dry air intersects and overrides a layer of warm, moist air forcing the warm air to rise rapidly. The destruction caused by tornadoes ranges from light to catastrophic depending on the intensity, size and duration of the storm.

Winter Storm and Freeze	Winter storms may include snow, sleet, freezing rain, or a mix of these wintry forms of precipitation. Blizzards, the most dangerous of all winter storms, combine low temperatures, heavy snowfall, and winds of at least 35 miles per hour, reducing visibility to only a few yards. Ice storms occur when moisture falls and freezes immediately upon impact on trees, power lines, communication towers, structures, roads and other hard surfaces. Winter storms and ice storms can down trees, cause widespread power outages, damage property, and cause fatalities and injuries to human life.
GEOLOGIC HAZARDS	
Earthquake	A sudden, rapid shaking of the Earth caused by the breaking and shifting of rock beneath the surface. This movement forces the gradual building and accumulation of energy. Eventually, strain becomes so great that the energy is abruptly released, causing the shaking at the earth's surface which we know as an earthquake. Roughly 90 percent of all earthquakes occur at the boundaries where plates meet, although it is possible for earthquakes to occur entirely within plates. Earthquakes can affect hundreds of thousands of square miles; cause damage to property measured in the tens of billions of dollars; result in loss of life and injury to hundreds of thousands of persons; and disrupt the social and economic functioning of the affected area.
Expansive Soils	Soils that will exhibit some degree of volume change with variations in moisture conditions. The most important properties affecting degree of volume change in a soil are clay mineralogy and the aqueous environment. Expansive soils will exhibit expansion caused by the intake of water and, conversely, will exhibit contraction when moisture is removed by drying. Generally speaking, they often appear sticky when wet, and are characterized by surface cracks when dry. Expansive soils become a problem when structures are built upon them without taking proper design precautions into account with regard to soil type. Cracking in walls and floors can be minor, or can be severe enough for the home to be structurally unsafe.
Landslide	The movements of a mass of rock, debris, or earth down a slope when the force of gravity pulling down the slope exceeds the strength of the earth materials that comprise to hold it in place. Slopes greater than 10 degrees are more likely to slide, as are slopes where the height from the top of the slope to its toe is greater than 40 feet. Slopes are also more likely to fail if vegetative cover is low and/or soil water content is high.
Land Subsidence	The gradual settling or sudden sinking of the Earth's surface due to the subsurface movement of earth materials. Causes of land subsidence include groundwater pumpage, aquifer system compaction, drainage of organic soils, underground mining, hydrocompaction, natural compaction, sinkholes, and thawing permafrost.
Tsunami	A series of waves generated by an undersea disturbance such as an earthquake. The speed of a tsunami traveling away from its source can range from up to 500 miles per hour in deep water to approximately 20 to 30 miles per hour in shallower areas near coastlines. Tsunamis differ from regular ocean waves in that their currents travel from the water surface all the way down to the sea floor. Wave amplitudes in deep water are typically less than one meter; they are often barely detectable to the human eye. However, as they approach shore, they slow in shallower water, basically causing the waves from behind to effectively "pile up", and wave heights to increase dramatically. As opposed to typical waves which crash at the shoreline, tsunamis bring with them a continuously flowing 'wall of water' with the potential to cause devastating damage in coastal areas located immediately along the shore.

Volcano	A mountain that opens downward to a reservoir of molten rock below the surface of the earth. While most mountains are created by forces pushing up the earth from below, volcanoes are different in that they are built up over time by an accumulation of their own eruptive products: lava, ash flows, and airborne ash and dust. Volcanoes erupt when pressure from gases and the molten rock beneath becomes strong enough to cause an explosion.
HYDROLOGIC HAZARDS	
Dam and Levee Failure	Dam failure is the collapse, breach, or other failure of a dam structure resulting in downstream flooding. In the event of a dam failure, the energy of the water stored behind even a small dam is capable of causing loss of life and severe property damage if development exists downstream of the dam. Dam failure can result from natural events, human-induced events, or a combination of the two. The most common cause of dam failure is prolonged rainfall that produces flooding. Failures due to other natural events such as hurricanes, earthquakes or landslides are significant because there is generally little or no advance warning.
Erosion	Erosion is the gradual breakdown and movement of land due to both physical and chemical processes of water, wind, and general meteorological conditions. Natural, or geologic, erosion has occurred since the Earth's formation and continues at a very slow and uniform rate each year.
Flood	The accumulation of water within a water body which results in the overflow of excess water onto adjacent lands, usually floodplains. The floodplain is the land adjoining the channel of a river, stream ocean, lake or other watercourse or water body that is susceptible to flooding. Most floods fall into the following three categories: riverine flooding, coastal flooding, or shallow flooding (where shallow flooding refers to sheet flow, ponding and urban drainage).
Storm Surge	A storm surge is a large dome of water often 50 to 100 miles wide and rising anywhere from four to five feet in a Category 1 hurricane up to more than 30 feet in a Category 5 storm. Storm surge heights and associated waves are also dependent upon the shape of the offshore continental shelf (narrow or wide) and the depth of the ocean bottom (bathymetry). 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. Storm surge arrives ahead of a storm's actual landfall and the more intense the hurricane is, the sooner the surge arrives. Storm surge can be devastating to coastal regions, causing severe beach erosion and property damage along the immediate coast. Further, water rise caused by storm surge can be very rapid, posing a serious threat to those who have not yet evacuated flood-prone areas.

OTHER HAZARDS	
Hazardous Materials Incident	Hazardous material (HAZMAT) incidents can apply to fixed facilities as well as mobile, transportation-related accidents in the air, by rail, on the nation's highways and on the water. HAZMAT incidents consist of solid, liquid and/or gaseous contaminants that are released from fixed or mobile containers, whether by accident or by design as with an intentional terrorist attack. A HAZMAT incident can last hours to days, while some chemicals can be corrosive or otherwise damaging over longer periods of time. In addition to the primary release, explosions and/or fires can result from a release, and contaminants can be extended beyond the initial area by persons, vehicles, water, wind and possibly wildlife as well.
Terror Threat	Terrorism is defined by FEMA as, "the use of force or violence against persons or property in violation of the criminal laws of the United States for purposes of intimidation, coercion, or ransom." Terrorist acts may include assassinations, kidnappings, hijackings, bomb scares and bombings, cyber attacks (computer-based), and the use of chemical, biological, nuclear and radiological weapons.
Wildfire	An uncontrolled fire burning in an area of vegetative fuels such as grasslands, brush, or woodlands. Heavier fuels with high continuity, steep slopes, high temperatures, low humidity, low rainfall, and high winds all work to increase risk for people and property located within wildfire hazard areas or along the urban/wildland interface. Wildfires are part of the natural management of forest ecosystems, but most are caused by human factors. Over 80 percent of forest fires are started by negligent human behavior such as smoking in wooded areas or improperly extinguishing campfires. The second most common cause for wildfire is lightning.

4.3 DISASTER DECLARATIONS

Disaster declarations provide initial insight into the hazards that may impact the Pee Dee Lumber Regional planning area. Since 1973, ten presidential disaster declarations have been reported in the Pee Dee Lumber Region. This includes four storms related to winter storm events, four storms related to hurricane and tropical events, and two storms related to severe storms and tornadoes.

TABLE 4.2: PEE DEE LUMBER REGION DISASTER DECLARATIONS

Year	Disaster Number	Description	Anson County	Montgomery County	Richmond County	Scotland County
1984	699	Severe Storms & Tornadoes				X
1989	827	Tornadoes	X			
1989	844	Hurricane Hugo	X	X	X	
1996	1087	Blizzard of '96		X		
1996	1103	Winter Storm		X		

Year	Disaster Number	Description	Anson County	Montgomery County	Richmond County	Scotland County
1996	1134	Hurricane Fran	X	X	X	X
1999	1292	Hurricane Floyd	X	X	X	X
2000	1312	Severe Winter Storm	X	X	X	X
2002	1448	Severe Ice Storm	X	X	X	
2004	1546	Tropical Storm Frances				X
2016	4285	Hurricane Matthew	X	X	X	X

4.4 HAZARD EVALUATION

TABLE 4.3: DOCUMENTATION OF THE HAZARD EVALUATION PROCESS

Natural Hazards Considered	Was this hazard identified as a significant hazard to be addressed in the plan at this time? (Yes or No)	How was this determination made?	Why was this determination made?
ATMOSPHERIC HAZARDS			
Avalanche	NO	• Review of US Forest Service National Avalanche Center web site • Review of the NC State Hazard Mitigation Plan • Review of FEMA's Multi-Hazard Identification and Risk Assessment • Review of previous hazard mitigation plans in the Pee Dee Lumber counties	• There is no risk of avalanche events in North Carolina. The United States avalanche hazard is limited to mountainous western states including Alaska as well as some areas of low risk in New England. • Avalanche hazard was removed from the North Carolina State Hazard Mitigation Plan after determining the mountain elevation in Western North Carolina did have enough snow not produce this hazard. • Avalanche is not included in any of previous Pee Dee Lumber county hazard mitigation plans.

Natural Hazards Considered	Was this hazard identified as a significant hazard to be addressed in the plan at this time? (Yes or No)	How was this determination made?	Why was this determination made?
Drought	YES	• Review of the NC State Hazard Mitigation Plan • Review of the North Carolina Drought Monitor website • Review of previous hazard mitigation plans in the Pee Dee Lumber counties	• There are reports of drought conditions in nine out of the last ten years in the Pee Dee Lumber Region, according to the North Carolina Drought Monitor. "Exceptional" drought levels were reached in all four of the counties. • Droughts are discussed in the NC State Hazard Mitigation Plan as a lesser hazard. • The NC State Hazard Mitigation Plan lists drought as a top hazard for the Piedmont 5 Region, which includes Anson, Montgomery and Richmond Counties, and as a hazard of concern for the Coastal Plain 6 Region, which includes Scotland County. • Drought is included in all of the previous Pee Dee Lumber hazard mitigation plans.
Hailstorm	YES	• Review of NC State Hazard Mitigation Plan • Review of FEMA's Multi-Hazard Identification and Risk Assessment • Review of NOAA NCDC Storm Events Database • Review of previous hazard mitigation plans in the Pee Dee Lumber counties	• Hailstorm events are discussed in the state plan under the Severe Thunderstorm hazard. • NCDC reports 164 hailstorm events (3/4 inch size hail to 2.5 inches) for the Pee Dee Lumber Region between 1969 and 2011. For these events there were almost $6.9 million (2012 dollars) in property damages. • Hail is addressed as an individual hazard in one of the previous county hazard mitigation plans and it is addressed as a sub-item under thunderstorms and/or winter storms in the other three plans. Given the frequency of the event, individual analysis is warranted.

Natural Hazards Considered	Was this hazard identified as a significant hazard to be addressed in the plan at this time? (Yes or No)	How was this determination made?	Why was this determination made?
Heat Wave/Extreme Heat	YES	• Review of NOAA NCDC Storm Events Database • Review of the North Carolina State Hazard Mitigation Plan • Review of previous hazard mitigation plans in the Pee Dee Lumber counties	• NCDC reported 5 extreme heat events for the Pee Dee Lumber counties. • The NC State Hazard Mitigation Plan reports the eastern portion of the state as having the highest vulnerability in the state (there are no counties at high risk). • Heat wave was identified as an individual hazard in two of the four counties' previous hazard mitigation plans and was discussed in tandem with the drought hazard in the other two plans.
Hurricane and Tropical Storm	YES	• Review of NC State Hazard Mitigation Plan • Analysis of NOAA historical tropical cyclone tracks and National Hurricane Center Website • Review of NOAA NCDC Storm Events Database • Review of historical presidential disaster declarations • FEMA Hazus-MH storm return periods • Review of previous hazard mitigation plans in the Pee Dee Lumber counties	• Hurricane and tropical storm events are discussed in the state plan and are listed as a top hazard in the Piedmont 5 and Coastal Plain 6 Regions which include the Pee Dee Lumber counties. • Since 1850, 30 storm tracks have come within 75 miles of the Pee Dee Lumber Region. • Four out of ten disaster declarations in the Pee Dee Lumber Region are directly related to hurricane and tropical storm events. • Hurricane and tropical storm hazard was addressed in all of the previous Pee Dee Lumber county plans. • A Hazus-MH 2.1 historical hurricane scenario for Fran (impacting the region today) yielded $13 million in damages (direct and indirect losses).

Natural Hazards Considered	Was this hazard identified as a significant hazard to be addressed in the plan at this time? (Yes or No)	How was this determination made?	Why was this determination made?
Lightning	YES	• Review of NC State Hazard Mitigation Plan • Review of FEMA's Multi-Hazard Identification and Risk Assessment • Review of NOAA NCDC Storm Events Database, NOAA lightning statistics • Review of previous hazard mitigation plans in the Pee Dee Lumber counties	• Lightning events are discussed in the state plan as part of the severe thunderstorm hazard. • NCDC reports 7 lightning events for the Pee Dee Lumber Region since 1950. These events have resulted in 0 deaths, 7 injuries and over $320,000 (2012 dollars) in property damage. • Although lightning is not addressed as an individual hazard in any of the previous Pee Dee Lumber county-level hazard mitigation plans, it is addressed under thunderstorms in three of the plans. Given the damage and reported death and injuries, individual analysis is warranted.
Nor'easter	NO	• Review of NC State Hazard Mitigation Plan • Review of NOAA NCDC Storm Events Database • Review of previous hazard mitigation plans in the Pee Dee Lumber counties	• Nor'easters are discussed in the state plan. The Piedmont 5 and Coastal Plain 6 Regions, which include the Pee Dee Lumber counties, have low to moderate vulnerability. • NCDC does not report any nor'easter activity for the Pee Dee Lumber Region. However, nor'easters may have affected the region as severe winter storms. In this case, the activity would be reported under winter storm events. • Nor'easters were identified in three of the four previous hazard mitigation plans for the Pee Dee Lumber counties; however, they were found to pose low to negligible risk.

Natural Hazards Considered	Was this hazard identified as a significant hazard to be addressed in the plan at this time? (Yes or No)	How was this determination made?	Why was this determination made?
Thunderstorm Wind	YES	• Review of NC State Hazard Mitigation Plan • Review of FEMA's Multi-Hazard Identification and Risk Assessment • Review of NOAA NCDC Storm Events Database • Review of previous hazard mitigation plans in the Pee Dee Lumber counties	• According to the NC State Hazard Mitigation Plan, severe thunderstorm is a top hazard in the Piedmont 5 and Coastal Plain 6 Regions which include the Pee Dee Lumber counties. • NCDC reports 319 thunderstorm wind events in the Pee Dee Lumber Region counties since 1950. These events have resulted in 1 death, 2 injuries, and over $1.7 million (2012 dollars) in property damage. • Severe thunderstorm events were addressed in all of the previous Pee Dee Lumber county plans.
Tornado	YES	• Review of NC State Hazard Mitigation Plan • Review of FEMA's Multi-Hazard Identification and Risk Assessment • Review of NOAA NCDC Storm Events Database • Review of previous hazard mitigation plans in the Pee Dee Lumber counties	• Tornado events are discussed in the NC State Hazard Mitigation Plan. • NCDC reports 24 tornado events in Pee Dee Lumber Region Counties since 1950. These events have resulted in no recorded deaths but have caused 36 injuries and over $32 million (2012 dollars) in property damage with the most severe being an F4. • Tornado events were addressed in all of the previous Pee Dee Lumber county plans.

Natural Hazards Considered	Was this hazard identified as a significant hazard to be addressed in the plan at this time? (Yes or No)	How was this determination made?	Why was this determination made?
Winter Storm and Freeze	YES	• Review of NC State Hazard Mitigation Plan • Review of FEMA's Multi-Hazard Identification and Risk Assessment • Review of historical presidential disaster declarations. • Review of NOAA NCDC Storm Events Database • Review of previous hazard mitigation plans in the Pee Dee Lumber counties	• Severe winter storms, including snow storms and ice storms, are discussed in the state plan. They are listed as a top hazard in the Piedmont 5 Region which includes Anson, Montgomery and Richmond Counties. It is also identified as a hazard of concern for the Coastal Plain 6 Region which includes Scotland County. • NCDC reports that the Pee Dee Lumber Counties have been affected by 87 snow and ice events since 1950. These events resulted in almost $850,000 (2012 dollars) in Anson County. No damage was reported in the other counties. • Four of the region's ten disaster declarations were directly related to winter storm events. • Winter storm events were addressed in all of the previous Pee Dee Lumber county plans.

Natural Hazards Considered	Was this hazard identified as a significant hazard to be addressed in the plan at this time? (Yes or No)	How was this determination made?	Why was this determination made?
GEOLOGIC HAZARDS			
Earthquake	YES	• Review of NC State Hazard Mitigation Plan • Review of previous hazard mitigation plans in the Pee Dee Lumber counties • USGS Earthquake Hazards Program web site • Review of the National Geophysical Data Center • Review of FEMA's Multi-Hazard Identification and Risk Assessment	• Earthquake events are discussed in the state plan and all of the participating counties in the Pee Dee Lumber Region are considered to have zero vulnerability to the earthquake hazard. • All of the previous plans in the Pee Dee Lumber Region address earthquake. • Earthquakes have occurred in and around the State of North Carolina in the past. The state is affected by the Charleston and the New Madrid (near Missouri) Fault lines which have generated a magnitude 8.0 earthquake in the last 200 years. • According to the National Geophysical Data Center, 14 events have been recorded in the region since 1886. The greatest MMI reported was a 7. • According to USGS seismic hazard maps, the peak ground acceleration (PGA) with a 10% probability of exceedance in 50 years for the Pee Dee Lumber Region is approximately 4%g. FEMA recommends that earthquakes be further evaluated for mitigation purposes in areas with a PGA of 3%g or more.

Natural Hazards Considered	Was this hazard identified as a significant hazard to be addressed in the plan at this time? (Yes or No)	How was this determination made?	Why was this determination made?
Expansive Soils	NO	• Review of NC State Hazard Mitigation Plan • Review of FEMA's Multi-Hazard Identification and Risk Assessment • Review of USDA Soil Conservation Service's Soil Survey • Review of previous Pee Dee Lumber county hazard mitigation plans	• Expansive soils are identified in the state plan as a top hazard for the Piedmont 5 Region. It is also identified as a hazard of concern for the Coastal Plain 6 Region. • According to FEMA and USDA sources, less than 50% of the Pee Dee Lumber Region is underlain by soils with abundant clays of "slight to moderate" swelling potential. • None of the previous Pee Dee Lumber county hazard mitigation plans identify expansive soils as a potential hazard.
Landslide	YES	• Review of NC State Hazard Mitigation Plan • Review of USGS Landslide Incidence and Susceptibility Hazard Map • Review of the North Carolina Geological Survey database of historic landslides • Review of previous Pee Dee Lumber county hazard mitigation plans	• Landslide/debris flow events are discussed in the state plan, and identified as a hazard of concern in the Piedmont 5 Region which includes three of the four Pee Dee Lumber counties. • Data provided by NCGS indicate 1 recorded landslide event in the Pee Dee Lumber Region. No damage, deaths or injuries were reported. • Three of the four previous Pee Dee Lumber county hazard mitigation plans addressed landslides.
Land Subsidence	NO	• Review of NC State Hazard Mitigation Plan • Review of previous Pee Dee Lumber county hazard mitigation plans.	• The state plan identifies subsidence as a top hazard for the Coastal Plain 6 Region and a hazard of concern for the Piedmont 5 Region. • The Coastal Plain 6 Region has the highest vulnerability to subsidence in the state. • None of the previous Pee Dee Lumber county hazard mitigation plans identifies land subsidence as a potential hazard.

Natural Hazards Considered	Was this hazard identified as a significant hazard to be addressed in the plan at this time? (Yes or No)	How was this determination made?	Why was this determination made?
Tsunami	NO	• Review of NC State Hazard Mitigation Plan • Review of previous Pee Dee Lumber county hazard mitigation plans. • Review of FEMA's Multi-Hazard Identification and Risk Assessment • Review of FEMA "How-to" mitigation planning guidance (Publication 386-2, "Understanding Your Risks – Identifying Hazards and Estimating Losses).	• Tsunamis are discussed in the state plan and described as a "greater" hazard for the state. However, the Piedmont 5 and Coastal Plain 6 Regions scored a zero for tsunami hazard risk. • Two of the previous county plans in the Pee Dee Lumber Region address tsunami but the level of risk is found to be negligible. • No record exists of a catastrophic Atlantic basin tsunami impacting the mid-Atlantic coast of the United States. • Tsunami inundation zone maps are not available for communities located along the U.S. East Coast. • FEMA mitigation planning guidance suggests that locations along the U.S. East Coast have a relatively low tsunami risk and need not conduct a tsunami risk assessment at this time.
Volcano	NO	• Review of NC State Hazard Mitigation Plan • Review of USGS Volcano Hazards Program web site	• There are no active volcanoes in North Carolina. • There has not been a volcanic eruption in North Carolina in over 1 million years. • No volcanoes are located near the Pee Dee Lumber Region.

Natural Hazards Considered	Was this hazard identified as a significant hazard to be addressed in the plan at this time? (Yes or No)	How was this determination made?	Why was this determination made?
HYDROLOGIC HAZARDS			
Dam and Levee Failure	YES	• Review of NC State Hazard Mitigation Plan • Review of North Carolina Division of Land Management web site • Review of U.S. Army Corps of Engineers National Inventory of Dams database • Review of previous hazard mitigation plans in the Pee Dee Lumber counties	• In the state plan, dam failure is identified as a top hazard in the Piedmont 5 Region and the Region has the highest vulnerability in the state. Dam failure is also listed as a hazard of concern for the Coastal Plain 6 Region. • Of the 171 dams reported on the National Inventory of Dams, 24 are high hazard (14%), (High hazard is defined as "where failure or mis-operation will probably cause loss of human life.") • No dam breaches have been reported in the Pee Dee Lumber Region. • All of the previous Pee Dee Lumber hazard mitigation county plans address dam failure.
Erosion	YES	• Review of NC State Hazard Mitigation Plan • Review of previous hazard mitigation plans in the Pee Dee Lumber counties	• Riverine erosion is identified as a hazard in two of the four previous Pee Dee Lumber county mitigation plans. • Coastal erosion is discussed in the state plan but only for coastal areas (there is no discussion of riverine erosion).

Natural Hazards Considered	Was this hazard identified as a significant hazard to be addressed in the plan at this time? (Yes or No)	How was this determination made?	Why was this determination made?
Flood	YES	• Review of NC State Hazard Mitigation Plan • Review of historical disaster declarations • Review of NOAA NCDC Storm Events Database • Review of FEMA's NFIP Community Status Book and Community Rating System (CRS) • Review of FEMA Q3 flood data for the Pee Dee Lumber Region counties • Review of previous hazard mitigation plans in the Pee Dee Lumber counties	• The flood hazard is thoroughly discussed in the state plan. • Four out of ten Presidential Disaster Declarations were hurricane or tropical storm-related which caused flooding issues. • NCDC reports that Pee Dee Lumber Region counties have been affected by 84 flood events since 1950. These events in total caused no reported deaths or injuries but an estimated $200,000 (2012 dollars) in property damages. • Each County has 100-year floodplain area: Anson (54 sq.mi); Montgomery (31 sq.mi.); Richmond (42.58 sq.mi); Scotland (31.24 sq.mi.) • A total of nine percent of the land is in the 100 year or 500 year floodplain. • 11 of the 26 jurisdictions participate in the NFIP. However, none of the jurisdictions are participants in the CRS. • All of the previous plans in the Pee Dee Lumber Region address flood hazard.
Storm Surge	NO	• Review of NC State Hazard Mitigation Plan • Review of previous hazard mitigation plans in the Pee Dee Lumber counties • Review of NOAA NCDC Storm Events Database	• Storm surge is discussed in the state plan under the hurricane hazard and indicates that the Piedmont 5 and Coastal Plain 6 Region have zero vulnerability to storm surge. • One of the county-level hazard mitigation plans in the Pee Dee Lumber Region mentioned coastal surge as part of the hurricane hazard. • No historical events were reported by NCDC • Given the inland location of the Pee Dee Lumber Region, storm surge would not affect the area.

Natural Hazards Considered	Was this hazard identified as a significant hazard to be addressed in the plan at this time? (Yes or No)	How was this determination made?	Why was this determination made?
OTHER HAZARDS			
Hazardous Materials Incident	YES	• Review of previous Pee Dee Lumber county hazard mitigation plans. • Review of EPA Toxic Release Inventory (TRI) sites. • Review of the USDOT Pipeline and Hazardous Materials Safety Administration (PHMSA) Incident Reports Database.	• Only one of the existing plans include hazardous materials incident as a hazard. • There are 57 TRI sites located in the Pee Dee Lumber Region. • According to the PHMSA, there have been 21 “serious” hazardous materials incidents reported in the Pee Dee Lumber Region.
Terror Threat	NO	• Review of previous Pee Dee Lumber county hazard mitigation plans. • Review of local official knowledge	• None of the previous Pee Dee Lumber plans include terrorism threat as a hazard. • Human-caused hazards are not required at this time.

Natural Hazards Considered	Was this hazard identified as a significant hazard to be addressed in the plan at this time? (Yes or No)	How was this determination made?	Why was this determination made?
Wildfire	YES	• Review of NC State Hazard Mitigation Plan • Review of previous Pee Dee Lumber county hazard mitigation plans. • Review of Southern Wildfire Risk Assessment (SWRA) Data • Review of the NC Division of Forest Resources website	• Wildfires are discussed in the state plan as a "greater" hazard of concern. • All of the previous counties in the Pee Dee Lumber Region addressed wildfire. • The state plan lists wildfire as a top hazard in the Coastal Plain 6 Region and as a hazard of concern in the Piedmont 5 Region. • According to the North Carolina Forestry Service, the Pee Dee Lumber Region experiences an average of 439 fires each year which burn a combined 1,754 acres. This data also indicates that Richmond and Scotland Counties are at an increased risk with an average of 187 and 140 fires annually which burn a combined 450 and 1,011 acres, respectively. • Wildfire hazard risks will increase as low-density development along the urban/wildland interface increases.

4.5 HAZARD IDENTIFICATION RESULTS

TABLE 4.4: SUMMARY RESULTS OF THE HAZARD IDENTIFICATION AND EVALUATION PROCESS

ATMOSPHERIC HAZARDS	GEOLOGIC HAZARDS
☐ Avalanche	☑ Earthquake
☑ Drought	☐ Expansive Soils
☑ Hailstorm	☑ Landslide
☑ Heat Wave	☐ Land Subsidence
☑ Hurricane and Tropical Storm	☐ Tsunami
☑ Lightning	☐ Volcano
☐ Nor'easter	**HYDROLOGIC HAZARDS**
☑ Thunderstorm Wind	☑ Dam and Levee Failure
☑ Tornado	☑ Erosion
☑ Winter Storm and Freeze	☑ Flood
	☐ Storm Surge
	OTHER HAZARDS
	☑ Hazardous Materials Incident
	☐ Terror Threat
	☑ Wildfire

☑ = Hazard considered significant enough for further evaluation in the Pee Dee Lumber Region hazard risk assessment.

It should be noted that significant portions of the Hazard Profile section that follows is based upon data derived from the National Climatic Data Center (NCDC) as owned and maintained by the National Oceanic and Atmospheric Administration (NOAA). This historical data is known to be more comprehensive for some of the hazards on the list above than others, is typically three months behind the date the data is pulled in terms of the data's currency, and is typically only available at the county level prior to 1993 (in most cases). Jurisdiction-specific information is available sporadically for events occurring after 1993. To the extent possible, additional anecdotal information was added based upon feedback from the HMPC. Also, given the regional nature of the plan and the inherent similarities in the jurisdictions which led to their grouping as part of this regional plan, all of the hazards on this list are expected to impact the planning area in a fairly uniform manner.

SECTION 5
HAZARD PROFILES

This section includes detailed hazard profiles for each of the hazards identified in the previous section (*Hazard Identification*) as significant enough for further evaluation in the Pee Dee Lumber Regional Hazard Mitigation Plan. It contains the following subsections:

- 5.1 Overview
- 5.2 Study Area
- 5.3 Drought
- 5.4 Extreme Heat
- 5.5 Hailstorm
- 5.6 Hurricane and Tropical Storm
- 5.7 Lightning
- 5.8 Thunderstorm Wind/High Wind
- 5.9 Tornado
- 5.10 Winter Storm and Freeze
- 5.11 Earthquake
- 5.12 Landslide
- 5.13 Dam and Levee Failure
- 5.14 Erosion
- 5.15 Flood
- 5.16 Hazardous Materials Incident
- 5.17 Wildfire
- 5.18 Conclusions on Hazard Risk
- 5.19 Final Determinations

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44 CFR Requirement
44 CFR Part 201.6(c)(2)(i): The risk assessment shall include a description of the type, 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

5.1 OVERVIEW

This section includes detailed hazard profiles for each of the hazards identified in the previous section (*Hazard Identification*) as significant enough for further evaluation in the Pee Dee Lumber Region's hazard risk assessment by creating a hazard profile. Each hazard profile includes a general description of the hazard, its location and extent, notable historical occurrences and the probability of future occurrences. Each profile also includes specific items noted by members of the Pee Dee Lumber Regional Hazard Mitigation Planning Committee as it relates to unique historical or anecdotal hazard information for the counties in the Pee Dee Lumber Region or a participating municipality within them.

The following hazards were identified:

- **Atmospheric**
  - Drought
  - Extreme Heat
  - Hailstorm
  - Hurricane and Tropical Storm
  - Lightning

- Severe Thunderstorm (including straight-line winds)
- Tornado
- Winter Storm and Freeze

- **Geologic**
  - Earthquake
  - Landslide
- **Hydrologic**
  - Dam and Levee Failure
  - Erosion
  - Flood
- **Other**
  - Hazardous Materials Incident
  - Wildfire

5.2 STUDY AREA

The Pee Dee Lumber Region includes four counties: Anson, Montgomery, Richmond, and Scotland. **Table 5.1** provides a summary table of the participating jurisdictions within each county. In addition, **Figure 5.1** provides a base map, for reference, of the Pee Dee Lumber Region.

TABLE 5.1: PARTICIPATING AREAS IN THE PEE DEE LUMBER REGIONAL HAZARD MITIGATION PLAN

Anson County		
Ansonville	Lilesville	McFarlan
Morven	Peachland	Polkton
Wadesboro		
Montgomery County		
Biscoe	Candor	Mount Gilead
Star	Troy	
Richmond County		
Dobbins Heights	Ellerbe	Hamlet
Hoffman	Norman	Rockingham
Scotland County		
East Laurinburg	Gibson	Laurinburg
Wagram		

FIGURE 5.1: PEE DEE LUMBER REGION BASE MAP

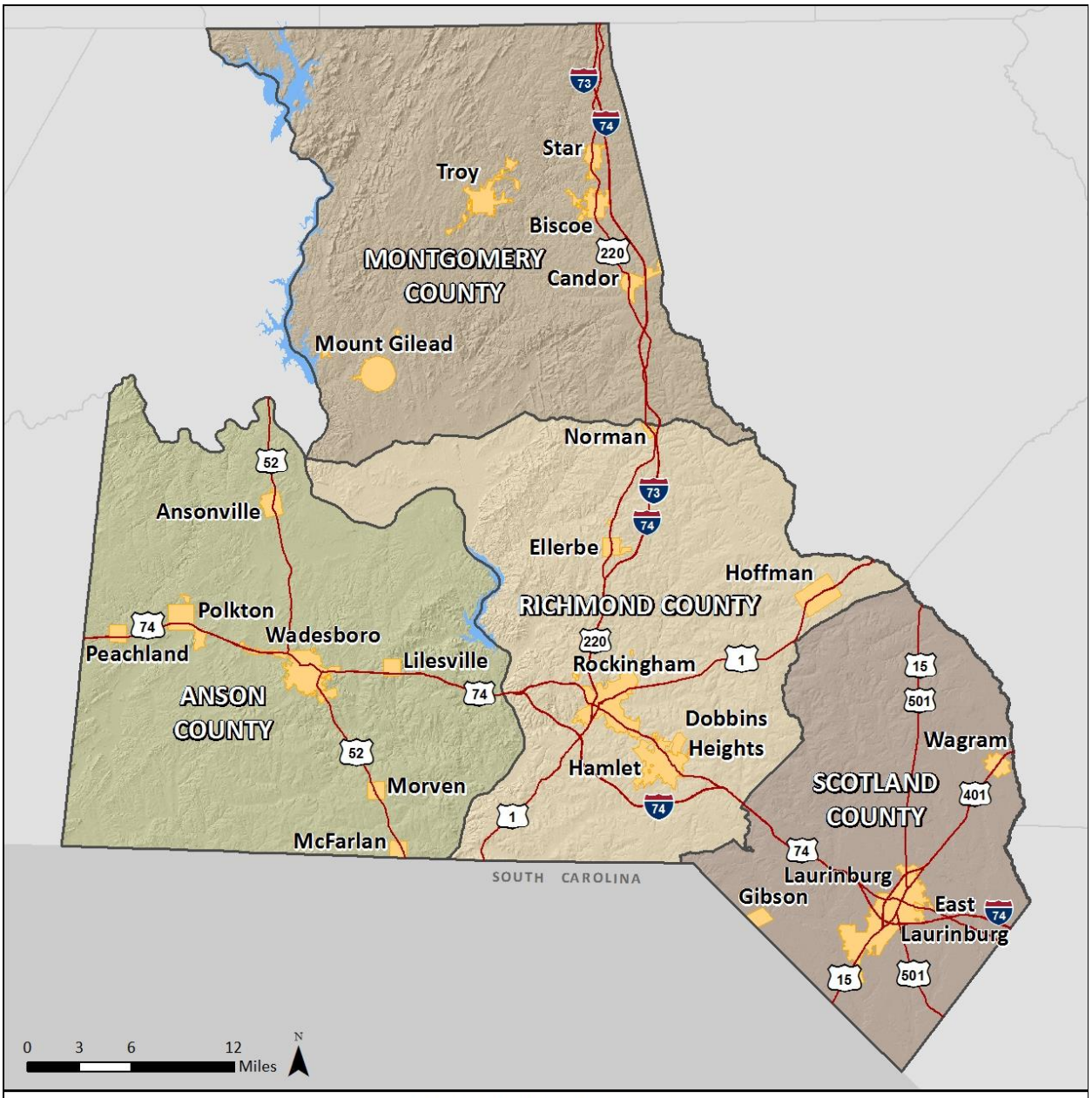


Table 5.2 lists each significant hazard for the Pee Dee Lumber Region and identifies whether or not it has been determined to be a specific hazard of concern for the 22 municipal jurisdictions and each of the four county's unincorporated areas. This is the based on the best available data and information from the Pee Dee Lumber Regional Hazard Mitigation Planning Committee. (● = hazard of concern)

TABLE 5.2 SUMMARY OF IDENTIFIED HAZARD EVENTS IN THE PEE DEE LUMBER REGION

Jurisdiction	Atmospheric								Geologic		Hydrologic			Other	
	Drought	Extreme Heat	Hailstorm	Hurricane and Tropical Storm	Lightning	Thunderstorm	Tornado	Winter Storm	Earthquake	Landslide	Dam Failure	Erosion	Flood	HAZMAT	Wildfire
Anson County															
Ansonville	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Lilesville	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
McFarlan	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Morven	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Peachland	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Polkton	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Wadesboro	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Unincorporated Area	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Montgomery County															
Biscoe	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Candor	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Mount Gilead	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Star	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Troy	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Richmond County															
Dobbins Heights	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ellerbe	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Hamlet	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Hoffman	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Norman	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Rockingham	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Scotland															
East Laurinburg	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gibson	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Laurinburg	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Wagram	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

ATMOSPHERIC HAZARDS

5.3 DROUGHT

5.3.1 Background

Drought is a normal part of virtually all climatic regions, including areas with high and low average rainfall. Drought is the consequence of a natural reduction in the amount of precipitation expected over an extended period of time, usually a season or more in length. High temperatures, high winds, and low humidity can exacerbate drought conditions. In addition, human actions and demands for water resources can hasten drought-related impacts.

Droughts are typically classified into one of four types: 1) meteorological, 2) hydrologic, 3) agricultural, or 4) socioeconomic. **Table 5.3** presents definitions for these types of drought.

TABLE 5.3 DROUGHT CLASSIFICATION DEFINITIONS

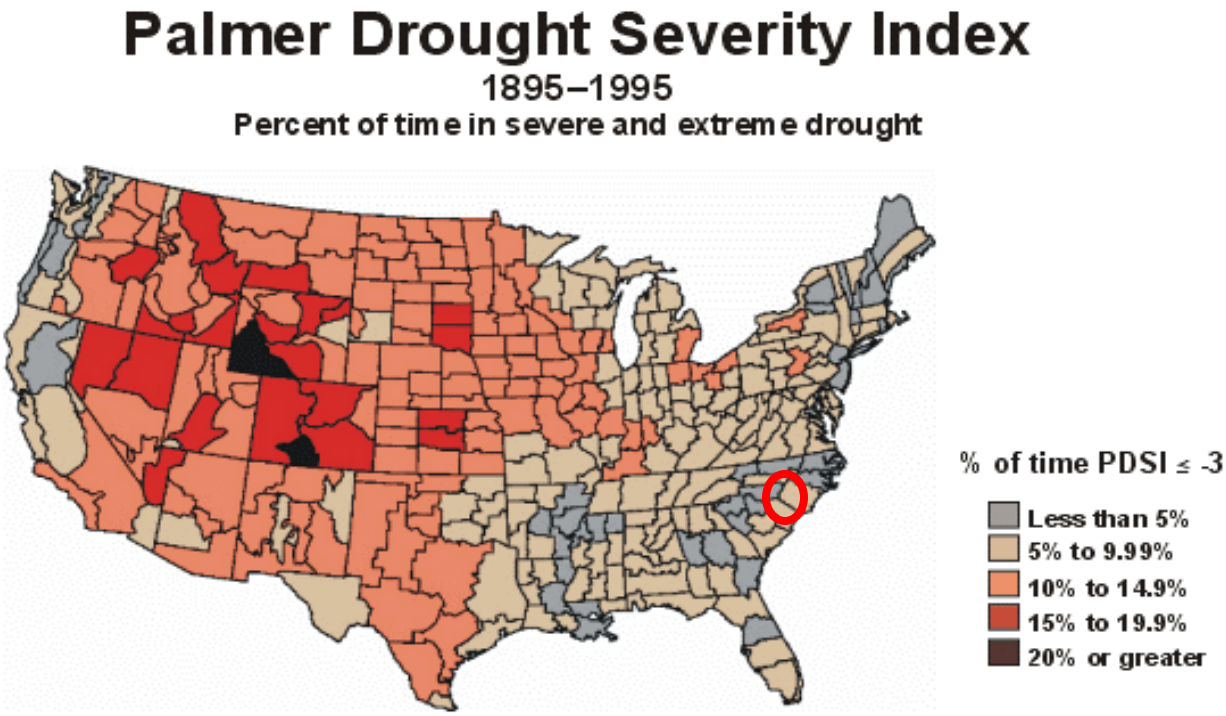
Meteorological Drought	The degree of dryness or departure of actual precipitation from an expected average or normal amount based on monthly, seasonal, or annual time scales.
Hydrologic Drought	The effects of precipitation shortfalls on stream flows and reservoir, lake, and groundwater levels.
Agricultural Drought	Soil moisture deficiencies relative to water demands of plant life, usually crops.
Socioeconomic Drought	The effect of demands for water exceeding the supply as a result of a weather-related supply shortfall.

Source: Multi-Hazard Identification and Risk Assessment: A Cornerstone of the National Mitigation Strategy, FEMA

Droughts are slow-onset hazards, but, over time, can have very damaging affects to crops, municipal water supplies, recreational uses, and wildlife. If drought conditions extend over a number of years, the direct and indirect economic impact can be significant.

The Palmer Drought Severity Index (PDSI) is based on observed drought conditions and range from -0.5 (incipient dry spell) to -4.0 (extreme drought). Evident in **Figure 5.2**, the Palmer Drought Severity Index Summary Map for the United Stated, drought affects most areas of the United States, but is less severe in the Eastern United States.

FIGURE 5.2: PALMER DROUGHT SEVERITY INDEX SUMMARY MAP FOR THE UNITED STATES



Source: National Drought Mitigation Center
(Planning area highlighted in red)

5.3.2 Location and Spatial Extent

Drought typically covers a large area and cannot be confined to any geographic or political boundaries. According to the Palmer Drought Severity Index (**Figure 5.2**), South-central North Carolina has a relatively low risk for drought hazard. However, local areas may experience much more severe and/or frequent drought events than what is represented on the Palmer Drought Severity Index map. Furthermore, it is assumed that the Pee Dee Lumber Region is uniformly exposed to drought, making the spatial extent potentially widespread. It is also notable that drought conditions typically do not cause significant damage to the built environment.

5.3.3 Historical Occurrences

Data from the North Carolina Drought Management Advisory Council and National Climatic Data Center (NCDC) were used to ascertain historical drought events in the Pee Dee Lumber Region, this was used due to the unavailability of local data.. The North Carolina Drought Management Advisory Council reports data on North Carolina drought conditions from 2000 to 2017 through the North Carolina Drought Monitor. It classifies drought conditions by county on a scale of D0 to D4:

- D0: Abnormally Dry
- D1: Moderate Drought
- D2: Severe Drought

- D3: Extreme Drought
- D4: Exceptional Drought

According to the North Carolina Drought Monitor, at least one or more of the counties in the Pee Dee Lumber Region has had drought occurrences during the last eighteen years (2000-2017) and all four counties have reached "exceptional" drought level (**Table 5.4**). In addition, **Table 5.5** shows the most severe drought classification for each year, according to North Carolina Drought Monitor classifications.

TABLE 5.4: SUMMARY OF DROUGHT OCCURRENCES IN THE PEE DEE LUMBER REGION

Location	Number Years with Drought Occurrences
Anson County	**18**
Montgomery County	**17**
Richmond County	**18**
Scotland County	**18**

Source: North Carolina Drought Monitor

TABLE 5.5: HISTORICAL DROUGHT OCCURRENCES IN THE PEE DEE LUMBER REGION

Abnormally Dry | Moderate Drought | Severe Drought | Extreme Drought | Exceptional Drought

	Anson County	Montgomery County	Richmond County	Scotland County
2000	SEVERE	SEVERE	SEVERE	**EXCEPTIONAL**
2001	**EXTREME**	**EXTREME**	SEVERE	SEVERE
2002	**EXCEPTIONAL**	**EXCEPTIONAL**	**EXCEPTIONAL**	**EXCEPTIONAL**
2003	ABNORMAL	NORMAL	ABNORMAL	ABNORMAL
2004	MODERATE	MODERATE	MODERATE	ABNORMAL
2005	SEVERE	SEVERE	SEVERE	MODERATE
2006	MODERATE	SEVERE	MODERATE	MODERATE
2007	**EXCEPTIONAL**	**EXCEPTIONAL**	**EXCEPTIONAL**	**EXCEPTIONAL**
2008	**EXCEPTIONAL**	**EXCEPTIONAL**	**EXCEPTIONAL**	**EXCEPTIONAL**
2009	MODERATE	MODERATE	MODERATE	MODERATE
2010	MODERATE	MODERATE	MODERATE	MODERATE
2011	SEVERE	MODERATE	SEVERE	SEVERE
2012	MODERATE	MODERATE	MODERATE	MODERATE
2013	MODERATE	MODERATE	MODERATE	MODERATE
2014	ABNORMAL	ABNORMAL	ABNORMAL	ABNORMAL
2015	SEVERE	ABNORMAL	ABNORMAL	ABNORMAL
2016	MODERATE	ABNORMAL	ABNORMAL	ABNORMAL
2017	ABNORMAL	ABNORMAL	ABNORMAL	ABNORMAL

Source: North Carolina Drought Monitor

As noted above, exceptional drought conditions were present in 2002 and 2006 to 2007 in Anson, Montgomery, Richmond and Scotland County. No losses were reported but it should be noted that some agricultural losses likely occurred. From 2009 to 2017 there have been no more exceptional conditions, but there have been a couple of severe conditions in 2011 and 2015.

5.3.4 Probability of Future Occurrences

Based on historical occurrence information, it is assumed that all of the Pee Dee Lumber Region has a probability level of likely (10-100 percent annual probability) for future drought events. However, historical information also indicates that there is a much lower probability for extreme, long-lasting drought conditions.

5.4 EXTREME HEAT

5.4.1 Background

Extreme heat, like drought, poses little risk to property. However, extreme heat can have devastating effects on health. Extreme heat is often referred to as a "heat wave." According to the National Weather Service, there is no universal definition for a heat wave, but the standard U.S. definition is any event lasting at least three days where temperatures reach ninety degrees Fahrenheit or higher. However, it may also be defined as an event at least three days long where temperatures are ten degrees greater than the normal temperature for the affected area. Heat waves are typically

accompanied by humidity but may also be very dry. These conditions can pose serious health threats causing an average of 1,500 deaths each summer in the United States[1].

According to the National Oceanic and Atmospheric Administration, heat is the number one weather-related killer among natural hazards, followed by frigid winter temperatures[1]. The National Weather Service devised the Heat Index as a mechanism to better inform the public of heat dangers. The Heat Index Chart, shown in **Figure 5.3**, uses air temperature and humidity to determine the heat index or apparent temperature. **Table 5.6** shows the dangers associated with different heat index temperatures. Some populations, such as the elderly and young, are more susceptible to heat danger than other segments of the population.

FIGURE 5.3: HEAT INDEX CHART

Air Temp (in F) \ Relative Humidity (in percent)	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
140	125																				
135	120	128																			
130	117	122	131																		
125	111	116	123	131	141																
120	107	111	116	123	130	139	148														
115	103	107	111	115	120	127	135	143	151												
110	99	102	105	108	112	117	123	130	137	143	150										
105	95	97	100	102	105	109	113	118	123	129	135	142	149								
100	91	93	95	97	99	101	104	107	110	115	120	126	132	138	144						
95	87	88	90	91	93	94	96	98	101	104	107	110	114	119	124	130	136				
90	83	84	85	86	87	88	90	91	93	95	96	98	100	102	106	109	113	117	122		
85	78	79	80	81	82	83	84	85	86	87	88	89	90	91	93	95	97	99	102	105	108
80	73	74	75	76	77	77	78	79	79	80	81	81	82	83	85	86	86	87	88	89	91
75	69	69	70	71	72	72	73	73	74	74	75	75	76	76	77	77	78	78	79	79	80
70	64	64	65	65	66	66	67	67	68	68	69	69	70	70	70	70	71	71	71	71	72

Source: NOAA

TABLE 5.6: HEAT DISORDERS ASSOCIATED WITH HEAT INDEX TEMPERATURE

Heat Index Temperature (Fahrenheit)	Description of Risks
80°- 90°	Fatigue possible with prolonged exposure and/or physical activity
90°- 105°	Sunstroke, heat cramps, and heat exhaustion possible with prolonged exposure and/or physical activity
105°- 130°	Sunstroke, heat cramps, and heat exhaustion likely, and heatstroke possible with prolonged exposure and/or physical activity
130° or higher	Heatstroke or sunstroke is highly likely with continued exposure

Source: National Weather Service, NOAA

[1] http://www.noaawatch.gov/themes/heat.php

In addition, NOAA has seventeen metropolitan areas participating in the Heat HealthWatch/Warning System in order to better inform and warn the public of heat dangers. A Heat HealthWatch is issued when conditions are favorable for an excessive heat event in the next 12 to 48 hours. A Heat Warning is issued when an excessive heat event is expected in the next 36 hours. Furthermore, a warning is issued when the conditions are occurring, imminent, or have a high likelihood of occurrence. Urban areas participate in the Heat Health Watch/Warning System because urban areas are at greater risk to heat affects. Stagnant atmospheric conditions trap pollutants, thus adding unhealthy air to excessively hot temperatures. In addition, the "urban heat island effect" can produce significantly higher nighttime temperatures because asphalt and concrete (which store heat longer) gradually release heat at night.

5.4.2 Location and Spatial Extent

Excessive heat typically impacts a large area and cannot be confined to any geographic or political boundaries. The entire Pee Dee Lumber Region is susceptible to extreme heat conditions.

5.4.3 Historical Occurrences

Data from the National Climatic Data Center was used to determine historical extreme heat and heat wave events in the Pee Dee Lumber Region. Two events were reported:

July 22, 1998 – *Excessive Heat* – Maximum temperatures reached between 98 and 103 degrees Fahrenheit with heat index values of around 110 degrees in the afternoon across central North Carolina.

July 23, 1999 – *Excessive Heat* – Two deaths related to heat exposure were reported in Scotland County.

One additional event was found using internet resources:

1986 – The maximum temperature ever recorded in the state was 110 degrees in Fayetteville, August 21, 1983.

In addition, information from the State Climate Office of North Carolina was reviewed to obtain historical temperatures in the region. Temperature information was reported 1870 to 2017. The recorded maximum for the Pee Dee Lumber Region is 108 degrees Fahrenheit in Hamlet (in Richmond County) in 2007 and in Mount Gilead (Montgomery County) in 1944. The National Centers for Environmental Information reports average maximum temperatures in various locations in the region. The most centralized location is in Hamlet (Richmond County). **Table 5.7** shows the average maximum temperatures from 1981 to 2010 at the Hamlet observation station which can be used as a general comparison for the region.

TABLE 5.7: AVERAGE MAXIMUM TEMPERATURE IN HAMLET, RICHMOND COUNTY

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Avg. Max (°F)	53.2	57.7	66.0	75.2	82.2	88.8	91.5	89.5	83.6	74.2	65.3	55.9

5.4.4 Probability of Future Occurrences

Based on historical occurrence information, it is assumed that all of the Pee Dee Lumber Region has a probability level of likely (10-100 percent annual probability) for future extreme heat events to impact the region.

5.5 HAILSTORM

5.5.1 Background

Hailstorms are a potentially damaging outgrowth of severe thunderstorms (thunderstorms are discussed separately in Section 5.8). Early in the developmental stages of a hailstorm, ice crystals form within a low-pressure front due to the rapid rising of warm air into the upper atmosphere and the subsequent cooling of the air mass. Frozen droplets gradually accumulate on the ice crystals until they develop to a sufficient weight and fall as precipitation. Hail typically takes the form of spheres or irregularly-shaped masses greater than 0.75 inches in diameter. The size of hailstones is a direct function of the size and severity of the storm. High velocity updraft winds are required to keep hail in suspension in thunderclouds. The strength of the updraft is a function of the intensity of heating at the Earth's surface. Higher temperature gradients relative to elevation above the surface result in increased suspension time and hailstone size.

5.5.2 Location and Spatial Extent

Hailstorms frequently accompany thunderstorms, so their locations and spatial extents coincide. It is assumed that the Pee Dee Lumber Region is uniformly exposed to severe thunderstorms; therefore, all areas of the region are equally exposed to hail which may be produced by such storms.

5.5.3 Historical Occurrences

According to the National Climatic Data Center, 164 recorded hailstorm events have affected the Pee Dee Lumber Region since 1969.[2] **Table 5.8** is a summary of the hail events in the Pee Dee Lumber Region. **Table 5.9** provides detailed information about each event that occurred in the region. Hail can occur anywhere. Hail occurrences resulted in nearly $6.9 million in property damages (2017 dollars) in the region, most of which were reported in Scotland County. Hail ranged in diameter from 0.75 inches to 4.5 inches. It should be noted that hail is notorious for causing substantial damage to cars, roofs, and other areas of the built environment that may not be reported to the National Climatic Data Center. Furthermore, high losses in Scotland County indicate that neighboring counties may also be subject to additional, unreported losses. Therefore, it is likely that damages are greater than the reported value. Additionally, a single storm event may have affected multiple counties.

[2] These hail events are only inclusive of those reported by the National Climatic Data Center (NCDC). It is likely that additional hail events have affected the Pee Dee Lumber Region. In addition to NCDC, the North Carolina Department of Insurance office was contacted for information. As additional local data becomes available, this hazard profile will be amended.

TABLE 5.8: SUMMARY OF HAIL OCCURRENCES IN THE PEE DEE LUMBER REGION

Location	Number of Occurrences	Property Damage (2017)
Anson County	**48**	**$0**
Ansonville	8	$0
Lilesville	2	$0
McFarlan	0	$0
Morven	2	$0
Peachland	0	$0
Polkton	3	$0
Wadesboro	11	$0
Unincorporated Area	23	$0
Montgomery County	**52**	**$37,594**
Biscoe	2	$0
Candor	4	$0
Mount Gilead	3	$0
Star	0	$0
Troy	13	$37,594
Unincorporated Area	30	$0
Richmond County	**34**	**$326,193**
Dobbins Heights	0	$0
Ellerbe	1	$0
Hamlet	2	$0
Hoffman	2	$0
Norman	2	$0
Rockingham	11	$326,193
Unincorporated Area	16	$0
Scotland County	**44**	**$6,523,866**
East Laurinburg	2	$0
Gibson	2	$0
Laurinburg	17	$6,523,866
Wagram	2	$0
Unincorporated Area	22	$0
PEE DEE LUMBER REGION TOTAL	**178**	**$6,887,653**

Source: National Climatic Data Center

TABLE 5.9: HISTORICAL HAIL OCCURRENCES IN THE PEE DEE LUMBER REGION

	Date	Magnitude	Deaths/Injuries	Property Damage*
Anson County				
Anson County	5/7/1958	2.00 in.	0/0	$0
Anson County	3/8/1983	1.75 in.	0/0	$0
Anson County	5/25/1986	1.75 in.	0/0	$0
Anson County	5/25/1986	3.00 in.	0/0	$0
Anson County	4/15/1987	0.88 in.	0/0	$0
Anson County	4/15/1987	0.88 in.	0/0	$0
Anson County	4/15/1987	0.88 in.	0/0	$0
Anson County	5/1/1987	1.75 in.	0/0	$0

	Date	Magnitude	Deaths/Injuries	Property Damage*
Anson County	8/29/1987	1.75 in.	0/0	$0
Anson County	5/5/1989	1.00 in.	0/0	$0
Anson County	5/22/1989	1.75 in.	0/0	$0
Anson County	4/1/1990	1.75 in.	0/0	$0
Anson County	4/1/1990	1.75 in.	0/0	$0
Anson County	5/2/1990	0.75 in.	0/0	$0
Anson County	9/10/1990	0.75 in.	0/0	$0
Anson County	7/24/1991	1.75 in.	0/0	$0
Polkton	3/24/1993	1.00 in.	0/0	$0
Anson County	5/1/1995	1.75 in.	0/0	$0
Wadesboro	7/24/1999	0.88 in.	0/0	$0
Wadesboro	4/17/2000	0.75 in.	0/0	$0
Ansonville	7/22/2000	0.75 in.	0/0	$0
Wadesboro	4/1/2001	1.00 in.	0/0	$0
Ansonville	3/31/2002	1.75 in.	0/0	$0
Wadesboro	7/1/2002	1.00 in.	0/0	$0
Anson County	5/3/2003	0.75 in.	0/0	$0
Ansonville	5/25/2003	1.00 in.	0/0	$0
Wadesboro	5/10/2005	1.75 in.	0/0	$0
Ansonville	6/19/2005	0.75 in.	0/0	$0
Wadesboro	10/21/2005	0.88 in.	0/0	$0
Morven	5/14/2006	0.88 in.	0/0	$0
Ansonville	6/11/2006	1.75 in.	0/0	$0
Ansonville	6/11/2007	0.75 in.	0/0	$0
Wadesboro	6/12/2007	1.00 in.	0/0	$0
Lilesville	7/27/2007	1.00 in.	0/0	$0
Wadesboro	7/27/2007	1.00 in.	0/0	$0
Burnsville	3/15/2008	1.75 in.	0/0	$0
Cedar Hill	5/20/2008	0.88 in.	0/0	$0
Morven	6/22/2008	1.00 in.	0/0	$0
Ansonville	8/2/2008	0.88 in.	0/0	$0
Deep Creek	8/7/2008	1.75 in.	0/0	$0
Polkton	6/9/2009	0.75 in.	0/0	$0
Polkton	6/9/2009	1.75 in.	0/0	$0
Wadesboro Junction	6/12/2009	0.75 in.	0/0	$0
South Wadesboro	7/27/2009	0.75 in.	0/0	$0
South Wadesboro	7/27/2009	0.88 in.	0/0	$0
Lilesville	8/5/2009	0.75 in.	0/0	$0
Anson County	7/17/2013	1.00 in.	0/0	$0
Ansonville	5/03/2016	1.00 in.	0/0	$0
Montgomery County				
Montgomery County	6/21/1970	2.00 in.	0/0	$0
Montgomery County	5/11/1973	1.75 in.	0/0	$0
Montgomery County	5/28/1973	1.75 in.	0/0	$0
Montgomery County	6/1/1974	0.75 in.	0/0	$0
Montgomery County	6/14/1974	0.75 in.	0/0	$0
Montgomery County	6/2/1981	1.00 in.	0/0	$0

	Date	Magnitude	Deaths/Injuries	Property Damage*
Montgomery County	6/6/1985	0.88 in.	0/0	$0
Montgomery County	7/29/1987	1.75 in.	0/0	$0
Montgomery County	8/29/1987	1.75 in.	0/0	$0
Montgomery County	4/24/1992	0.75 in.	0/0	$0
Troy	3/24/1993	1.00 in.	0/0	$0
Troy	5/19/1993	0.75 in.	0/0	$0
Montgomery County	5/19/1995	1.75 in.	0/0	$0
Troy	4/3/1998	1.00 in.	0/0	$0
Uwharie	5/27/1998	1.75 in.	0/0	$0
Troy	5/27/1998	4.50 in.	0/0	$37,594
Uwharie	6/15/1998	0.75 in.	0/0	$0
Candor	5/21/2000	1.00 in.	0/0	$0
Candor	4/1/2001	0.75 in.	0/0	$0
Troy	3/31/2002	0.88 in.	0/0	$0
Candor	7/2/2002	0.75 in.	0/0	$0
Uwharie	5/2/2003	0.75 in.	0/0	$0
Eldorado	5/3/2003	1.00 in.	0/0	$0
Troy	5/3/2003	1.00 in.	0/0	$0
Pekin	5/3/2003	1.75 in.	0/0	$0
Biscoe	5/25/2003	0.88 in.	0/0	$0
Pekin	7/19/2003	0.88 in.	0/0	$0
Troy	8/5/2003	1.75 in.	0/0	$0
Steeds	5/23/2004	0.88 in.	0/0	$0
Biscoe	4/17/2006	0.75 in.	0/0	$0
Troy	5/14/2006	1.75 in.	0/0	$0
Eldorado	5/14/2006	1.75 in.	0/0	$0
Eldorado	5/14/2006	1.75 in.	0/0	$0
Troy	5/18/2006	1.75 in.	0/0	$0
Mt Gilead	6/23/2006	0.75 in.	0/0	$0
Eldorado	6/23/2006	0.75 in.	0/0	$0
Mt Gilead	9/19/2006	0.75 in.	0/0	$0
Troy	4/12/2007	0.88 in.	0/0	$0
Emery	4/15/2007	0.75 in.	0/0	$0
Steeds	7/27/2007	0.88 in.	0/0	$0
Troy	5/11/2008	0.88 in.	0/0	$0
Capelsie	5/11/2008	0.75 in.	0/0	$0
Mt Gilead	3/15/2008	0.75 in.	0/0	$0
Candor	3/15/2008	1.75 in.	0/0	$0
Uwharie	4/14/2009	1.00 in.	0/0	$0
Abner	4/10/2009	1.00 in.	0/0	$0
Moratock	4/10/2009	2.00 in.	0/0	$0
Wadeville	5/5/2009	1.00 in.	0/0	$0
Moratock	7/20/2009	2.00 in.	0/0	$0
Troy	7/20/2009	1.00 in.	0/0	$0
Abner	7/13/2015	1.00 in.	0/0	$0
Troy	3/1/2017	1.00 in.	0/0	$0

	Date	Magnitude	Deaths/Injuries	Property Damage*
Richmond County				
Richmond County	4/27/1980	0.75 in.	0/0	$0
Richmond County	3/24/1985	0.88 in.	0/0	$0
Richmond County	6/6/1985	1.00 in.	0/0	$0
Richmond County	6/2/1989	0.75 in.	0/0	$0
Richmond County	4/1/1990	1.00 in.	0/0	$0
Richmond County	3/19/1992	1.75 in.	0/0	$0
Rockingham	3/24/1993	1.00 in.	0/0	$0
Rockingham	6/8/1996	1.75 in.	0/0	$0
Rockingham	7/5/1997	1.75 in.	0/0	$0
Hamlet	7/5/1997	1.50 in.	0/0	$0
Rockingham	5/3/2003	0.75 in.	0/0	$0
Rockingham	5/3/2003	1.75 in.	0/0	$326,193
Hoffman	5/3/2003	1.75 in.	0/0	$0
Rockingham	8/5/2003	0.88 in.	0/0	$0
Rockingham	5/14/2006	0.75 in.	0/0	$0
Rockingham	5/14/2006	0.75 in.	0/0	$0
Rockingham	6/12/2006	1.00 in.	0/0	$0
Rockingham	6/12/2007	0.75 in.	0/0	$0
Hamlet	6/26/2007	0.75 in	0/0	$0
Cognac	8/23/2007	1.00 in.	0/0	$0
Ledbetter	8/2/2008	1.00 in.	0/0	$0
Knob Hill	8/2/2008	1.75 in.	0/0	$0
Knob Hill	8/2/2008	0.75 in.	0/0	$0
Norman	8/2/2008	0.75 in.	0/0	$0
Ellerbe	6/9/2009	1.00 in.	0/0	$0
Lewarae	7/27/2009	1.00 in.	0/0	$0
Knob Hill	8/21/2011	1.00 in.	0/0	$0
Rockingham Hamlet Ar	5/22/2012	1.00 in.	0/0	$0
Knob Hill	5/22/2012	0.75 in.	0/0	$0
Rockingham	5/22/2012	0.75 in.	0/0	$0
Hoffman	8/02/2012	1.75 in.	0/0	$0
Cordova	8/02/2012	1.00 in.	0/0	$0
Norman	8/15/2012	0.75 in.	0/0	$0
Ledbetter	5/03/2016	1.00 in.	0/0	$0
Scotland County				
Scotland County	4/18/1969	1.00 in.	0/0	$0
Scotland County	6/21/1970	2.00 in.	0/0	$0
Scotland County	3/28/1984	1.00 in.	0/0	$0
Scotland County	3/24/1985	0.75 in.	0/0	$0
Scotland County	5/17/1988	1.00 in.	0/0	$0
Scotland County	4/1/1990	0.75 in.	0/0	$0
Scotland County	4/30/1990	0.75 in.	0/0	$0
Scotland County	7/3/1992	1.00 in.	0/0	$0
Scotland County	5/13/1995	0.75 in.	0/0	$0
Gibson	7/5/1997	1.50 in.	0/0	$0

	Date	Magnitude	Deaths/Injuries	Property Damage*
Wagram	3/20/1998	0.75 in.	0/0	$0
Laurinburg	5/27/1998	1.75 in.	0/0	$0
Laurinburg	7/19/1998	0.88 in.	0/0	$0
Laurel Hill	4/28/2000	0.88 in.	0/0	$0
Laurinburg	5/21/2000	0.75 in.	0/0	$0
Laurinburg	6/3/2000	1.00 in.	0/0	$0
Laurinburg	5/2/2003	0.75 in.	0/0	$0
Laurel Hill	5/3/2003	0.75 in.	0/0	$0
Laurinburg	5/3/2003	1.75 in.	0/0	$0
Laurel Hill	5/3/2003	1.75 in.	0/0	$0
Laurel Hill	5/3/2003	1.75 in.	0/0	$0
Laurel Hill	5/3/2003	1.75 in.	0/0	$0
Laurinburg	5/3/2003	1.75 in.	0/0	$6,523,866
Laurinburg	5/31/2003	1.75 in.	0/0	$0
Laurinburg	4/10/2004	0.75 in.	0/0	$0
Laurinburg	1/3/2006	0.88 in.	0/0	$0
Laurinburg	1/3/2006	0.88 in.	0/0	$0
Laurinburg	5/26/2006	0.75 in.	0/0	$0
Laurinburg	6/8/2006	1.00 in.	0/0	$0
Laurinburg	6/12/2006	1.00 in.	0/0	$0
Laurinburg	4/3/2007	0.88 in.	0/0	$0
East Laurinburg	5/5/2008	0.88 in.	0/0	$0
East Laurinburg	5/5/2008	1.00 in.	0/0	$0
Laurinburg	6/11/2008	1.75 in.	0/0	$0
Laurinburg	8/2/2008	0.75 in.	0/0	$0
Crossway	8/7/2008	0.75 in.	0/0	$0
Hasty	5/11/2009	1.00 in.	0/0	$0
Sneads Grove	6/1/2009	2.00 in.	0/0	$0
Wagram	6/9/2009	1.00 in.	0/0	$0
Hasty	6/17/2009	1.00 in.	0/0	$0
Gibson	8/17/2009	1.00 in.	0/0	$0
Crossway	7/01/2012	1.00 in.	0/0	$0
Crossway	4/19/2013	1.00 in.	0/0	$0
Hasty	6/19/2014	1.75 in.	0/0	$0

*Property damage is reported in 2017 dollars. All damage may not have been reported.
Source: National Climatic Data Center

5.5.4 Probability of Future Occurrences

Based on historical occurrence information, it is assumed that the probability of future hail occurrences is likely (10 – 100 percent annual probability). Since hail is an atmospheric hazard, it is assumed that the entire Pee Dee Lumber Region has equal exposure and future probability of this hazard occurring. It can be expected that future hail events will continue to cause minor damage to property and vehicles throughout the region.

5.6 HURRICANE AND TROPICAL STORM

5.6.1 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 counter-clockwise 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.

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 (**Table 5.10**), which rates hurricane intensity on a scale of 1 to 5, with 5 being the most intense.

TABLE 5.10: SAFFIR-SIMPSON SCALE

Category	Maximum Sustained Wind Speed (MPH)	Minimum Surface Pressure (Millibars)
1	74–95	Greater than 980
2	96–110	979–965
3	111–130	964–945
4	131–155	944–920
5	155 +	Less than 920

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 5.11** 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 5.11: 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

5.6.2 Location and Spatial Extent

Hurricanes and tropical storms threaten the entire Atlantic and Gulf seaboard of the United States. While coastal areas are most directly exposed to the brunt of landfalling storms, their impact is often felt hundreds of miles inland and they can affect the Pee Dee Lumber Region. All areas in the Pee Dee Lumber Region are equally susceptible to hurricane and tropical storms.

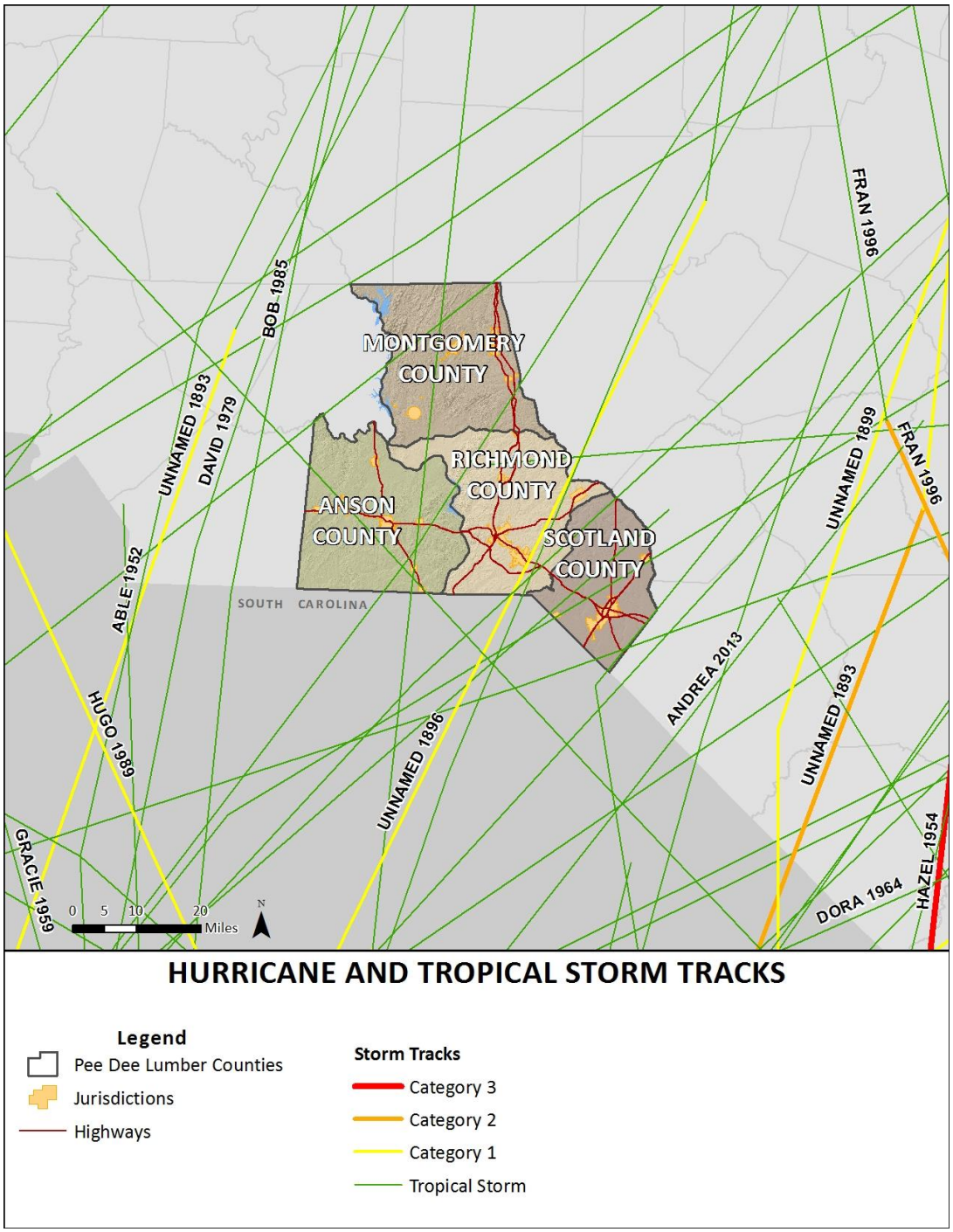
5.6.3 Historical Occurrences

According to the National Hurricane Center's historical storm track records, 51 hurricane or tropical storm tracks have passed within 75 miles of the Pee Dee Lumber Region since 1850.[3] This includes: three Category 3 hurricanes, five Category 2 hurricanes, six Category 1 hurricanes, and thirty-six tropical storms.

Of the recorded storm events, nine tropical storms and one unnamed Category 2 storm (in 1896) traversed directly through the Pee Dee Lumber Region as shown in **Figure 5.4**. **Figures 5.5, 5.6, 5.7, 5.8** show each county individually. **Table 5.12** provides for each event the date of occurrence, name (if applicable), maximum wind speed (as recorded within 75 miles of the Pee Dee Lumber Region) and Category of the storm based on the Saffir-Simpson Scale.

[3] These storm track statistics do not include extra-tropical storms. Though these related hazard events are less severe in intensity, they may cause significant local impact in terms of rainfall and high winds.

FIGURE 5.4: HISTORICAL HURRICANE STORM TRACKS WITHIN 75 MILES OF THE PEE DEE LUMBER REGION[4]



[4] It should be noted that Hurricane Matthew in 2016 has been added to the hazard history, however the storm track is beyond the 75-mile radius shown on the map above. The storm track is southeast of the planning area just beyond the extent shown in the figure above. The decision was made not to pan out to show the storm track because it would then add multiple other events that were beyond the 75-mile target radius.

FIGURE 5.5: HISTORICAL HURRICANE STORM TRACKS IN ANSON COUNTY

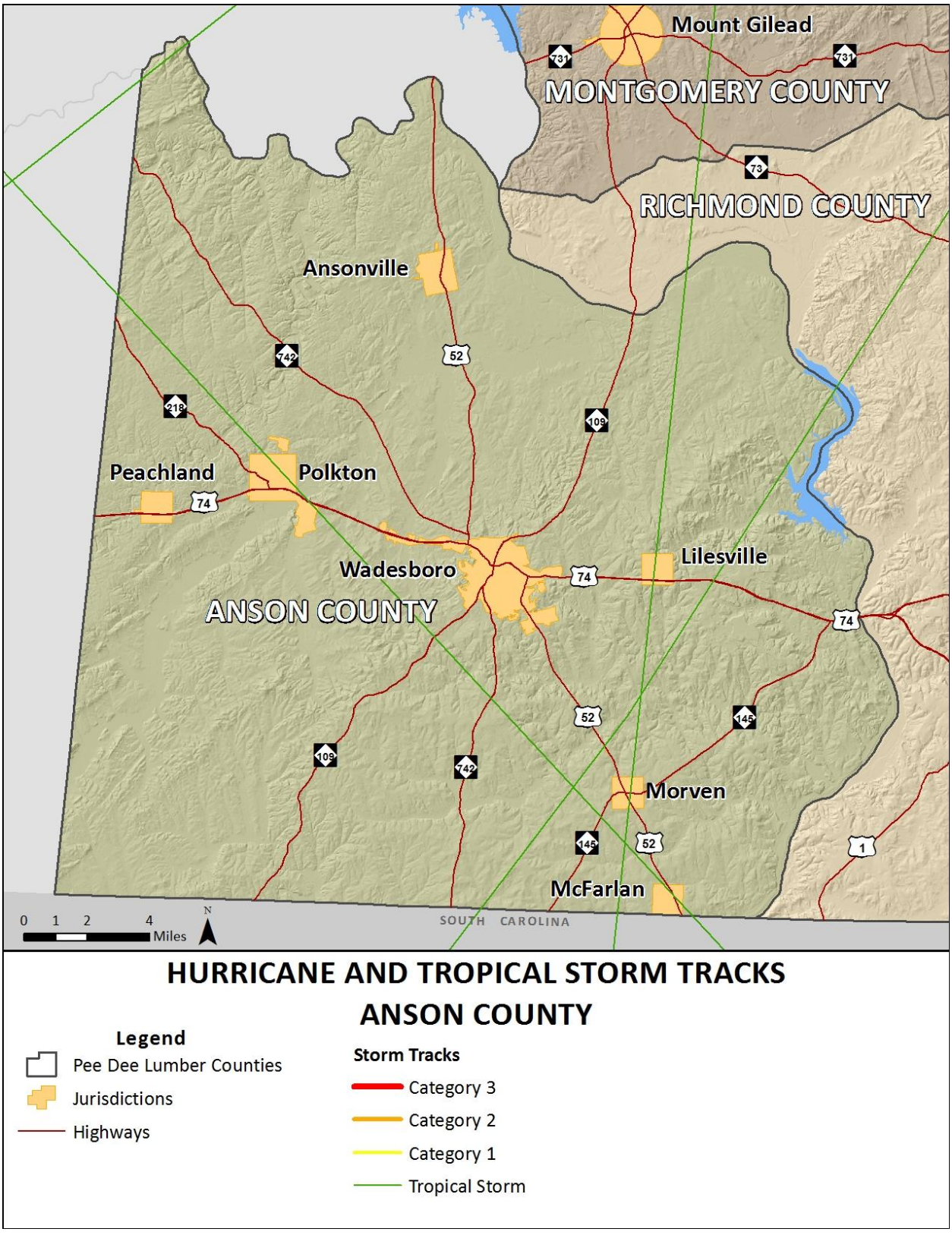


FIGURE 5.6: HISTORICAL HURRICANE STORM TRACKS IN MONTGOMERY COUNTY

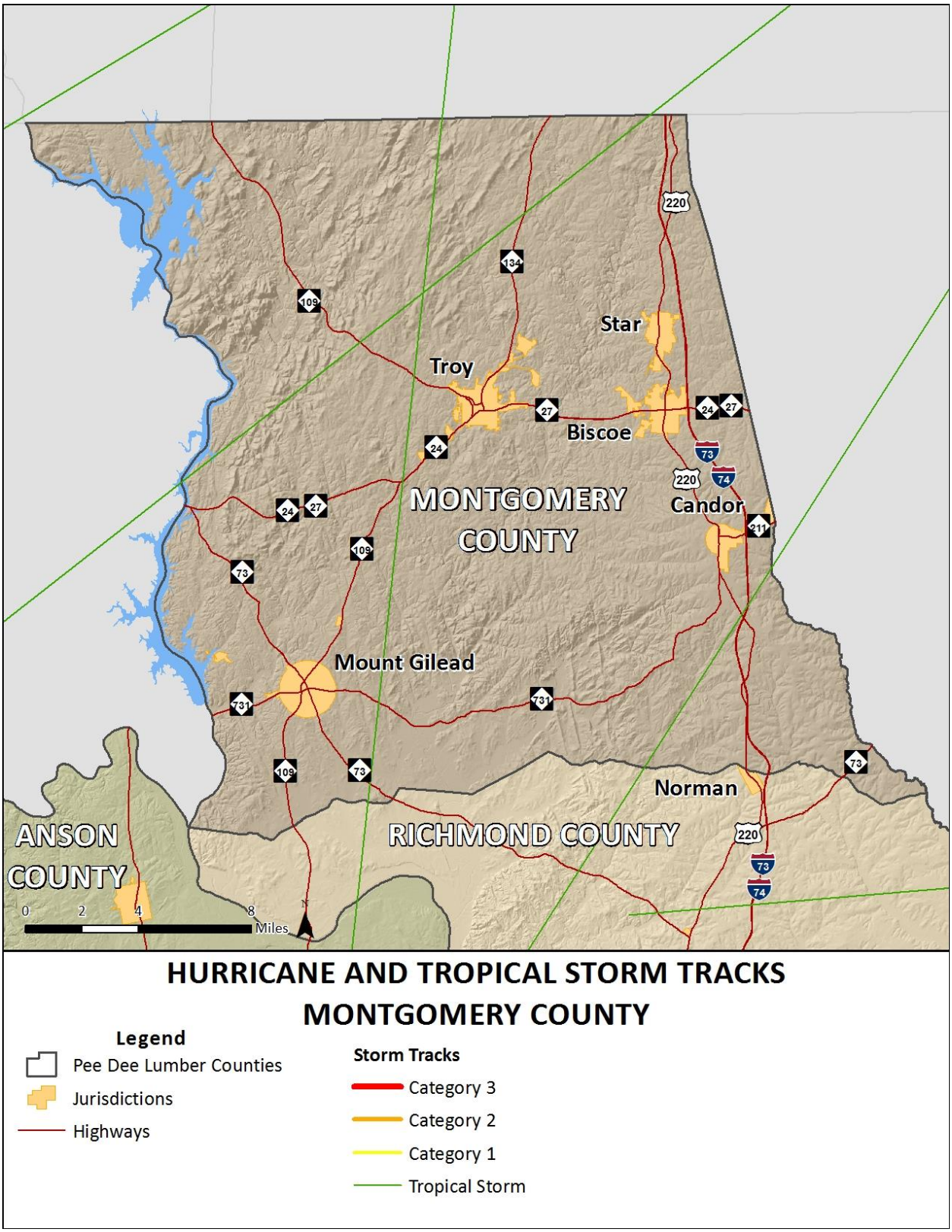


FIGURE 5.7: HISTORICAL HURRICANE STORM TRACKS IN RICHMOND COUNTY

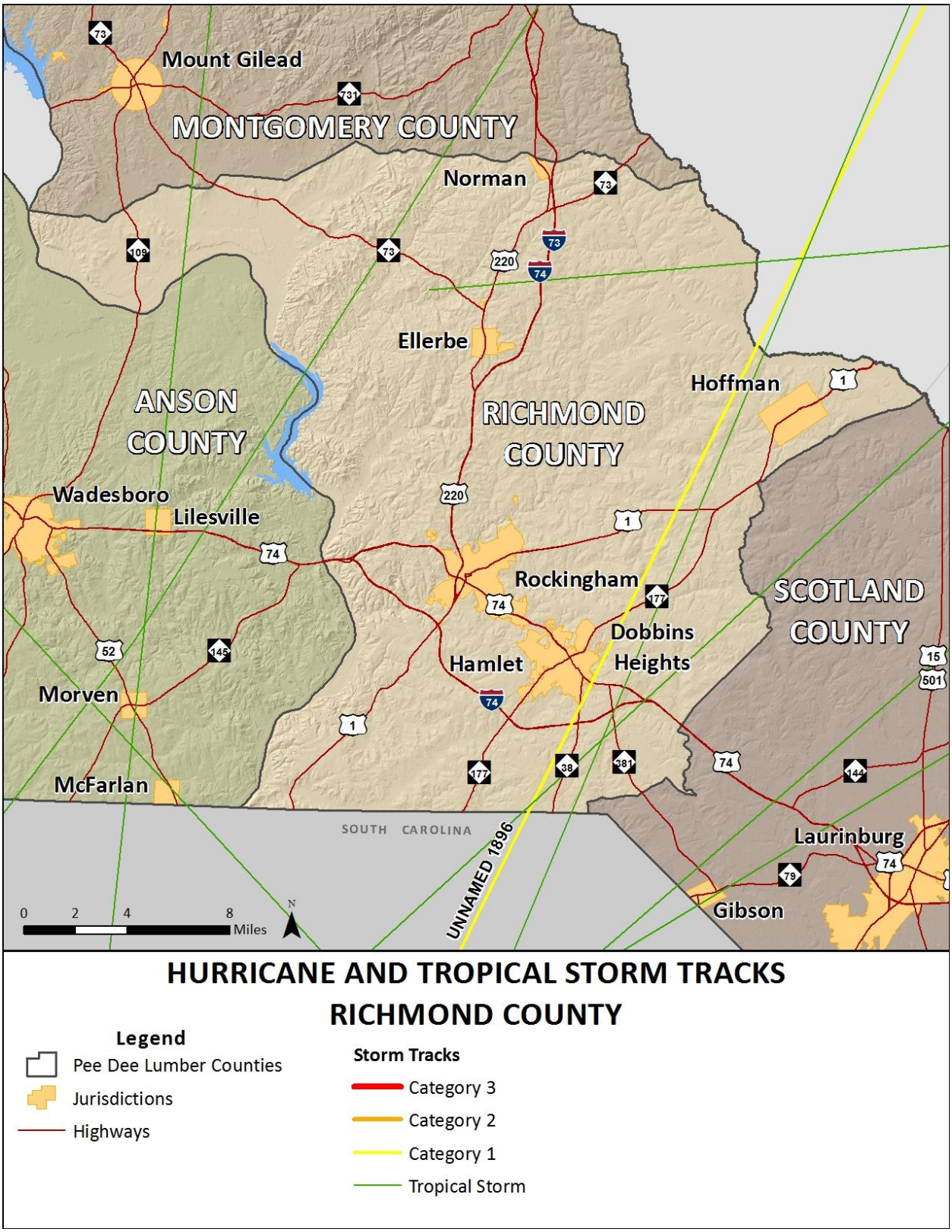
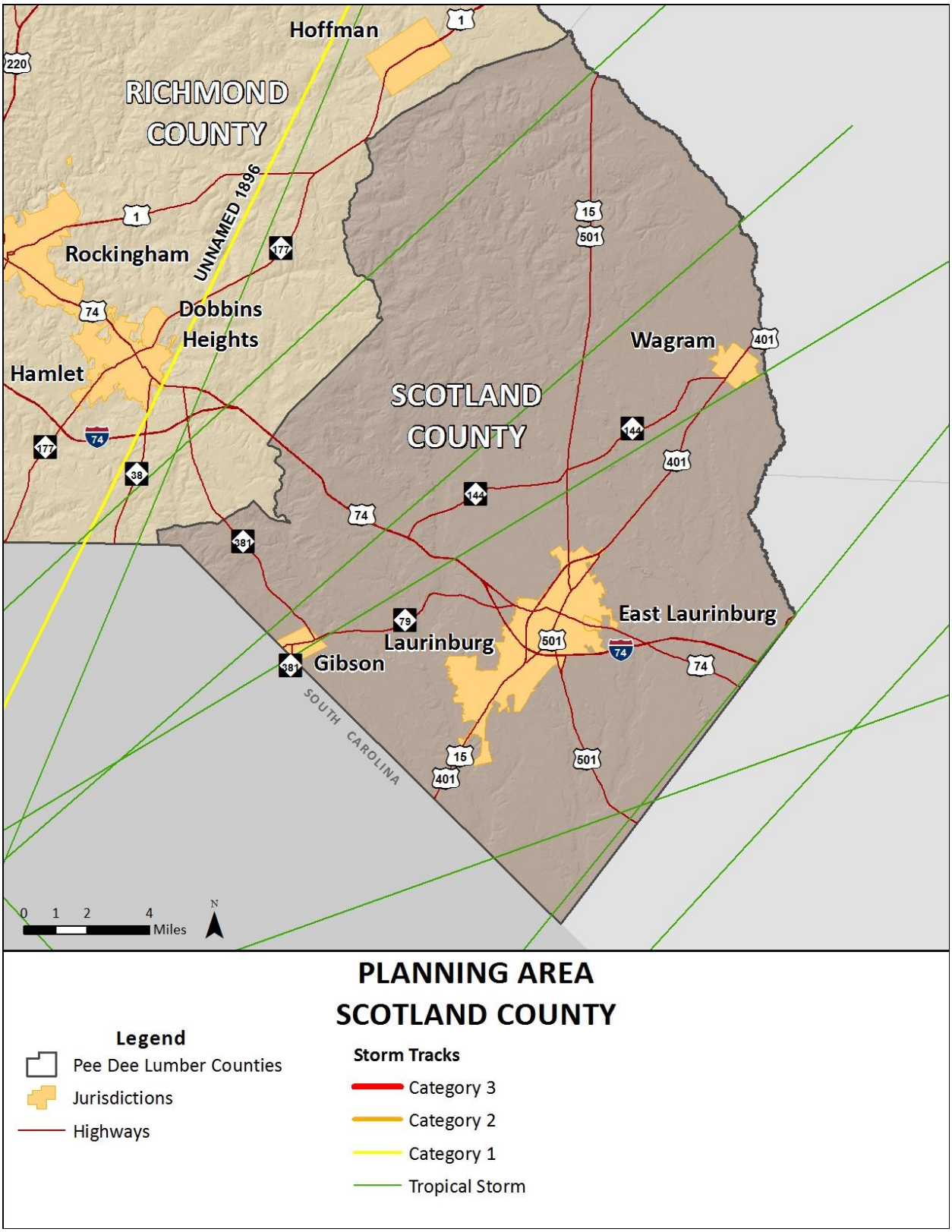


FIGURE 5.8: HISTORICAL HURRICANE STORM TRACKS IN SCOTLAND COUNTY



Source: National Oceanic and Atmospheric Administration, National Hurricane Center

TABLE 5.12: HISTORICAL STORM TRACKS WITHIN 75 MILES OF THE PEE DEE LUMBER REGION (1850–2017)

Date of Occurrence	Storm Name	Maximum Wind Speed (miles per hour)	Storm Category
8/24/1851	NOTNAMED	58	Tropical Storm
10/10/1852	NOTNAMED	58	Tropical Storm
9/9/1854	NOTNAMED	69	Tropical Storm
9/1/1856	NOTNAMED	58	Tropical Storm
9/17/1859	NOTNAMED	46	Tropical Storm
6/22/1867	NOTNAMED	69	Tropical Storm
9/28/1874	NOTNAMED	92	Category 1
9/11/1883	NOTNAMED	104	Category 2
8/25/1885	NOTNAMED	104	Category 2
6/22/1886	NOTNAMED	46	Tropical Storm
7/1/1886	NOTNAMED	58	Tropical Storm
9/10/1888	NOTNAMED	40	Tropical Storm
9/24/1889	NOTNAMED	52	Tropical Storm
6/16/1893	NOTNAMED	58	Tropical Storm
8/28/1893	NOTNAMED	86	Category 1
10/13/1893	NOTNAMED	121	Category 3
9/27/1894	NOTNAMED	81	Category 1
10/9/1894	NOTNAMED	69	Tropical Storm
9/29/1896	NOTNAMED	98	Category 2
10/31/1899	NOTNAMED	109	Category 2
7/13/1901	NOTNAMED	40	Tropical Storm
6/15/1902	NOTNAMED	40	Tropical Storm
9/14/1904	NOTNAMED	81	Category 1
9/18/1906	NOTNAMED	69	Tropical Storm
9/3/1913	NOTNAMED	63	Tropical Storm
8/3/1915	NOTNAMED	40	Tropical Storm
5/16/1916	NOTNAMED	40	Tropical Storm
7/15/1916	NOTNAMED	58	Tropical Storm
9/23/1920	NOTNAMED	63	Tropical Storm
10/3/1927	NOTNAMED	46	Tropical Storm
9/18/1928	NOTNAMED	69	Tropical Storm
9/5/1935	NOTNAMED	63	Tropical Storm
8/2/1944	NOTNAMED	69	Tropical Storm
10/20/1944	NOTNAMED	46	Tropical Storm
9/18/1945	NOTNAMED	40	Tropical Storm
8/28/1949	NOTNAMED	46	Tropical Storm
8/31/1952	ABLE	81	Category 1
10/15/1954	HAZEL	127	Category 3
8/17/1955	DIANE	69	Tropical Storm
7/29/1960	BRENDA	52	Tropical Storm
9/13/1964	DORA	52	Tropical Storm
9/5/1979	DAVID	63	Tropical Storm
9/13/1984	DIANA	75	Category 1
7/25/1985	BOB	63	Tropical Storm

Date of Occurrence	Storm Name	Maximum Wind Speed (miles per hour)	Storm Category
11/22/1985	KATE	58	Tropical Storm
8/28/1988	CHRIS	40	Tropical Storm
9/22/1989	HUGO	98	Category 2
9/6/1996	FRAN	115	Category 3
8/29/2004	GASTON	52	Tropical Storm
9/6/2008	HANNA	69	Tropical Storm
10/8/2016	MATTHEW	85	Category 1

Source: National Hurricane Center

The National Climatic Data Center reported four events associated with a hurricane or tropical storm in the Pee Dee Lumber Region between 1950 and 2011. These included Hurricane Bertha (1996), Hurricane Fran (1996), Hurricane Dennis (1999), and Hurricane Floyd (1999). However, federal records indicate that two additional disaster declarations were made in 1989 (Hurricane Hugo) and 2004 (Tropical Storm Frances).[5] Hurricane and tropical storm events can cause substantial damage in the area due to high winds and flooding.

Some additional information was available for the major storms that have impacted that area as found below:

Hurricane Hazel – October 15, 1954
Hurricane Hazel made landfall near the border between North and South Carolina and quickly moved inland. Scotland County sustained severe damage and power outages lasted for weeks. Many homes and businesses in the region sustained damages and roads were blocked for weeks.

Hurricane Hugo – September 21, 1989
Hurricane Hugo caused over $7.1 billion in damages (in the Carolinas) and 89 deaths resulting in $1.3 billion in federal assistance. Unlike most hurricanes, Hugo maintained its strength and intensity hitting Charlotte, NC with wind gusts of over 100 mph and sustained winds around 50 mph.

Hugo passed west of the Pee Dee Lumber planning area moving northwest towards Charlotte. No specific reports for damage in the Pee Dee Lumber area were found though a presidential disaster declaration was declared for Anson, Montgomery, and Richmond Counties.

Hurricane Bertha – July 12, 1996
The center track of Bertha passed about 100 miles east of the Pee Dee Lumber Planning Area. However it was large, so the outer bands impacted the area. No specific damage reports could be found for the region and the event did not result in a major disaster declaration for the area.

Hurricane Fran – September 5, 1996
This stormed pass east of the planning area but still resulting in some rainfall and wind in the area. Amounts between 0.5 inch and two inches were reported, but the most damaging impacts were from winds. A disaster declaration was declared in each of the four participating counties which included the jurisdictions within.

[5] Not all of the participating counties were declared disaster areas for these storms. A complete listing of historical disaster declarations, including the affected counties, can be found in Section 4: *Hazard Identification*.

Hurricane Dennis – September 4, 1999
No specific damage reports could be found for the region and the event did not result in a major disaster declaration for the area.

Hurricane Floyd – September 15, 1999
Floyd produced rainfall amounts between two and five inches in the Pee Dee Lumber Regional planning area. Rainfall amounts were greatest in Scotland County. A disaster declaration was declared in each of the four participating counties which included the jurisdictions within.

Tropical Storm Frances – September 7-8, 2004
Tropical Storm Frances was a slow-moving, relatively large storm that dumped heavy rains over the eastern United States. Frances passed well west of the Pee Dee Lumber Region and caused significant damage in the North Carolina Mountains. Only Scotland County received a disaster declaration for this storm.

Hurricane Matthew – October 8, 2016
Matthew was a slow-moving, large storm that produced around 20 inches of rain in North Carolina. The storm hit Central and Eastern North Carolina causing massive flooding. Flooding continued east for days after the storm hit. The Neuse and Tar rivers were still rising on October 12 before they hit peek flooding as much as five days after the storm. All four counties were included in the Presidential Disaster Declaration.

5.6.4 Probability of Future Occurrences

Given the inland location of the region, it is more likely to be affected by remnants of hurricane and tropical storm systems (as opposed to a major hurricane) which may result in flooding or high winds. Probability of being impacted is less than coastal areas, but still remains a real threat to the Pee Dee Lumber Region. Based on historical evidence, the probability level of future occurrence is possible (annual probability between 1 and 10 percent).

5.7 LIGHTNING

5.7.1 Background

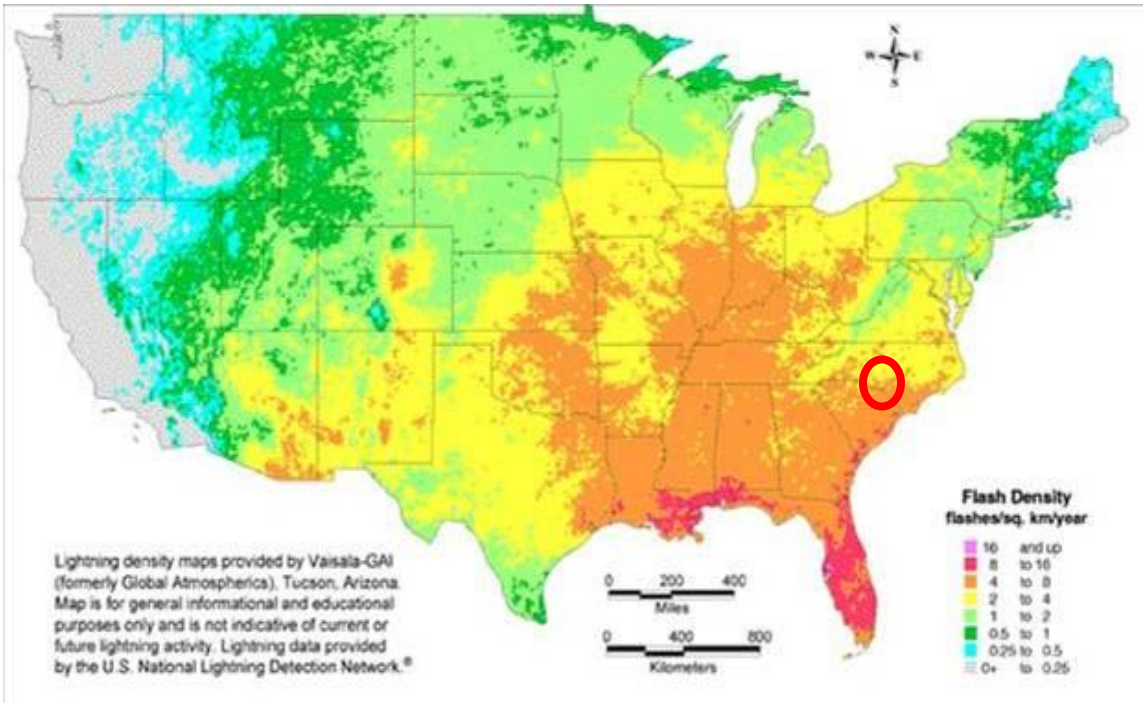
Lightning is a discharge of electrical energy resulting from the buildup of positive and negative charges within a thunderstorm, creating a “bolt” when the buildup of charges becomes strong enough. This flash of light usually occurs within the clouds or between the clouds and the ground. A bolt of lightning can reach temperatures approaching 50,000 degrees Fahrenheit. Lightning rapidly heats the sky as it flashes but the surrounding air cools following the bolt. This rapid heating and cooling of the surrounding air causes the thunder which often accompanies lightning strikes. While most often affiliated with severe thunderstorms, lightning may also strike outside of heavy rain and might occur as far as 10 miles away from any rainfall.

Lightning strikes occur in very small, localized areas. For example, they may strike a building, electrical transformer, or even a person. According to FEMA, lightning injures an average of 300 people and kills 80 people each year in the United States. Direct lightning strikes also have the ability to cause

significant damage to buildings, critical facilities, and infrastructure largely by igniting a fire. Lightning is also responsible for igniting wildfires that can result in widespread damages to property.

Figure 5.9 shows a lightning flash density map for the years 1996-2000 based upon data provided by Vaisala's U.S. National Lightning Detection Network (NLDN®).

FIGURE 5.9: LIGHTNING FLASH DENSITY IN THE UNITED STATES



Source: Vaisala U.S. National Lightning Detection Network
(Planning area highlighted in red)

5.7.2 Location and Spatial Extent

Lightning occurs randomly, therefore it is impossible to predict where and with what frequency it will strike. It is assumed that all of the Pee Dee Lumber Region is uniformly exposed to lightning.

5.7.3 Historical Occurrences

According to the National Climatic Data Center, there have been a total of 7 recorded lightning events in the Pee Dee Lumber Region since 1950.[6] These events resulted in just over $330,000 (2017 dollars) in damages, as listed in summary **Table 5.13**. Furthermore, lightning has caused seven injuries in the Pee Dee Lumber Region. Detailed information on historical lightning events can be found in **Table 5.14**.

[6] These lightning events are only inclusive of those reported by the National Climatic Data Center (NCDC). It is certain that additional lightning events have occurred in the Pee Dee Lumber Region. The State Fire Marshall's office was also contacted for additional information but none could be provided. As additional local data becomes available, this hazard profile will be amended.

TABLE 5.13: SUMMARY OF LIGHTNING OCCURRENCES IN THE PEE DEE LUMBER REGION

Location	Number of Occurrences	Property Damage (2017)
Anson County	**1**	**$89,568**
Ansonville	0	$0
Lilesville	0	$0
McFarlan	1	$79,568
Morven	0	$0
Peachland	0	$0
Polkton	0	$0
Wadesboro	0	$0
Unincorporated Area	1	$10,000
Montgomery County	**2**	**$5,305**
Biscoe	0	$0
Candor	0	$0
Mount Gilead	1	$5,305
Star	0	$0
Troy	1	$0
Unincorporated Area	0	$0
Richmond County	**0**	**$0**
Dobbins Heights	0	$0
Ellerbe	0	$0
Hamlet	0	$0
Hoffman	0	$0
Norman	0	$0
Rockingham	0	$0
Unincorporated Area	0	$0
Scotland County	**3**	**$217,180**
East Laurinburg	1	$212,180
Gibson	0	$0
Laurinburg	0	$0
Wagram	0	$0
Unincorporated Area	2	$5,305
PEE DEE LUMBER REGION TOTAL	**7**	**$330,325**

Source: National Climatic Data Center

TABLE 5.14: HISTORICAL LIGHTNING OCCURRENCES IN THE PEE DEE LUMBER REGION

	Date	Deaths/ Injuries	Property Damage*	Details
Anson County				
McFarlan	6/26/2010	0/0	$79,568	Lightning strike burned a home to the ground off of Sneedsboro Road one mile east of US Highway 52.
Montgomery County				
Troy	8/31/1998	0/0	$0	Lightning struck and destroyed an outbuilding in Troy.
Mt Gilead	7/9/2010	0/0	$5,305	
Richmond County				
-	-	-	-	-

	Date	Deaths/ Injuries	Property Damage*	Details
Scotland County				
Maxton	7/18/1995	0/7		Lightning struck a barn, sending seven farmhands to the hospital.
Crossway	6/25/2010	0/0	$5,305	Lightning damaged four computers and two televisions at the Emergency Operations Center.
East Laurinburg	6/16/2010	0/0	$212,180	Auto Recyclers was destroyed by a fire when lightning struck a business.

*Property damage is reported in 2017 dollars. All damage may not have been reported.
Source: National Climatic Data Center

5.7.4 Probability of Future Occurrences

Although there was not a high number of historical lightning events reported throughout the Pee Dee Lumber Region via NCDC data, it is a regular occurrence accompanied by thunderstorms. In fact, lightning events will assuredly happen on an annual basis, though not all events will cause damage. According to Vaisala's U.S. National Lightning Detection Network (NLDN®), the Pee Dee Lumber Region is located in an area of the country that experienced an average of 4 to 6 lightning flashes per square kilometer per year between 1997 and 2010. Therefore, the probability of future events is highly likely (100 percent annual probability). It can be expected that future lightning events will continue to threaten life and cause minor property damages throughout the region.

5.8 THUNDERSTORM WIND/HIGH WIND

5.8.1 Background

Thunderstorms can produce a variety of accompanying hazards including wind (discussed here), hail, and lightning.[7] Although thunderstorms generally affect a small area, they are very dangerous may cause substantial property damage.

Three conditions need to occur for a thunderstorm to form. First, it needs moisture to form clouds and rain. Second, it needs unstable air, such as warm air that can rise rapidly (this often referred to as the "engine" of the storm). Third, thunderstorms need lift, which comes in the form of cold or warm fronts, sea breezes, mountains, or the sun's heat. When these conditions occur simultaneously, air masses of varying temperatures meet, and a thunderstorm is formed. These storm events can occur singularly, in lines, or in clusters. Furthermore, they can move through an area very quickly or linger for several hours.

According to the National Weather Service, more than 100,000 thunderstorms occur each year, though only about 10 percent of these storms are classified as "severe." A thunderstorm becomes "severe" occurs when the storm produces at least one of these three elements: 1) hail of three-quarters of an inch, 2) a tornado, or 3) winds of at least 58 miles per hour.

Thunderstorm events have the capability of producing straight-line winds that can cause severe destruction to communities and threaten the safety of a population. Such wind events, sometimes

[7] Lightning and hail hazards are discussed as separate hazards in this section.

separate from a thunderstorm event, are possible throughout the Pee Dee Lumber Region. A specific type of straight-line wind, called a downburst, is also discussed here.

Downbursts are also possible with thunderstorm events. Such events are an excessive burst of wind in excess of 125 miles per hour. They are often confused with tornadoes. Conversely to tornadoes, where wind flows inward, downburst wind flows outward, often resulting in straight-line winds. Downbursts are caused by down drafts from the base of a convective thunderstorm cloud. It occurs when rain-cooled air within the cloud becomes heavier than its surroundings. Thus, air rushes towards the ground in a destructive yet isolated manner. There are two types of downbursts. Downbursts less than 2.5 miles wide, duration less than 5 minutes, and winds up to 168 miles per hour are called "microbursts." Larger events greater than 2.5 miles at the surface and longer than 5 minutes with winds up to 130 miles per hour are referred to as "macrobursts."

5.8.2 Location and Spatial Extent

A thunderstorm event is an atmospheric hazard, and thus has no geographic boundaries. It is typically a widespread event that can occur in all regions of the United States. However, thunderstorms are most common in the central and southern states because atmospheric conditions in those regions are favorable for generating these powerful storms. Also, the Pee Dee Lumber Region typically experiences occasional straight-line wind events. These wind events can and have caused significant damage. It is assumed that the Pee Dee Lumber Region has uniform exposure to an hazard and the spatial extent of an impact could be large.

5.8.3 Historical Occurrences

Severe storms resulted in one disaster declaration in the Pee Dee Lumber Region in 1984.[8] According to NCDC, there have been 20 reported high wind events since 1994 and 416 reported thunderstorm wind events since 1950 in the Pee Dee Lumber Region.[9] These events caused just over $4.5 million in damages (2017 dollars). There were reports of two injuries and one fatality. **Table 5.15** and **Table 5.16** summarize this information. **Table 5.17** and **Table 5.18** presents detailed high wind and thunderstorm wind event reports including date, magnitude, and associated damages for each event. It is important to note that **Table 5.19,** high wind occurrences, differ from **Table 5.20**, thunderstorm wind occurrences, and are therefore accounted for separately.

[8]Not all of the participating counties were declared disaster areas for these storms. A complete listing of historical disaster declarations, including the affected counties, can be found in Section 4: *Hazard Identification*.

[9] These thunderstorm events are only inclusive of those reported by the National Climatic Data Center (NCDC). It is certain that additional thunderstorm events have occurred in the Pee Dee Lumber Region. As additional local data becomes available, this hazard profile will be amended.

TABLE 5.15: SUMMARY OF HIGH WIND OCCURRENCES IN THE PEE DEE LUMBER REGION

Location	Number of Occurrences	Property Damage (2017 dollars)
Anson County	**3**	**$5,609**
Montgomery County	**3**	**$5,822**
Richmond County	**9**	**$7,507**
Scotland County	**5**	**$543,125**
PEE DEE LUMBER REGION TOTAL	**20**	**$562,063**

Source: National Climatic Data Center

TABLE 5.16: SUMMARY OF THUNDERSTORM WIND OCCURRENCES IN THE PEE DEE LUMBER REGION

Location	Number of Occurrences	Property Damage (2017)
Anson County	**129**	**$159,522**
Ansonville	11	$2,500
Lilesville	2	$2,500
McFarlan	3	$0
Morven	5	$0
Peachland	12	$27,272
Polkton	10	$2,000
Wadesboro	30	$79,765
Unincorporated Area	56	$45,488
Montgomery County	**84**	**$2,336,302**
Biscoe	3	$0
Candor	4	$0
Mount Gilead	15	$273,513
Star	5	$18,414
Troy	20	$13,005
Unincorporated Area	37	$2,031,370
Richmond County	**108**	**$671,715**
Dobbins Heights	0	$0
Ellerbe	18	$1,500
Hamlet	6	$447,598
Hoffman	4	$0
Norman	1	$0
Rockingham	24	$123,873
Unincorporated Area	55	$98,744
Scotland County	**95**	**$833,633**
East Laurinburg	1	$0
Gibson	6	$5,305
Laurinburg	20	$147,301
Wagram	7	$8,185
Unincorporated Area	61	$673,842
PEE DEE LUMBER REGION TOTAL	**416**	**$4,001,172**

Source: National Climatic Data Center

TABLE 5.17: HISTORICAL WIND OCCURRENCES IN THE PEE DEE LUMBER REGION

Location	Date	Magnitude	Deaths/ Injuries	Property Damage*	Details
Anson County					
Anson County and 30 others	1/16/1998	52 kts.	0/0	$0	Strong winds with gusts to 35 mph were common across central North Carolina during the night of the 16th and into the morning hours of the 17th. Several trees were downed in almost all of the counties in central North Carolina from Winston-Salem to Raleigh/Durham to Goldsboro and Rocky Mount. A combination of the wind and very soggy soils led to many of the trees to fall.
Anson County and 30 others	3/7/2004	65 kts.	0/0	$5,558	High winds just behind a fast-moving cold front produced extensive damage across central North Carolina. In addition to trees and powerlines bring blown down, numerous structures sustained damage. Measure wind gusts were as high as 74 mph. Over 50,000 power outages were reported.
Anson County and 20 others	2/10/2010	50 kts.	0/0	$51	Numerous trees were blown down countywide blocking many roads and highways. Widespread power outages were caused by falling trees along with some minor property damage to roofs and small buildings.
Montgomery County					
Montgomery County and 8 others	2/3/1998	35 kts.	0/0	$0	Strong and gusty wind associated with a storm system that moved across North Carolina downed several trees. Although only 30 to 35 mph wind gusts were recorded, the saturated soils greatly aided the wind in downing the trees.
Montgomery County and 30 others	2/16/1998	52 kts.	0/0	$0	Strong winds with gusts to 35 mph were common across central North Carolina during the night of the 16th and into the morning hours of the 17th. Several trees were downed in almost all of the counties in central North Carolina from Winston-Salem to Raleigh/Durham to Goldsboro and Rocky Mount. A combination of the wind and very soggy soils led to many of the trees to fall.
Montgomery County and 30 others	3/7/2004	65 kts.	0/0	$5,557	High winds just behind a fast-moving cold front produced extensive damage across central North Carolina. In addition to trees

Location	Date	Magnitude	Deaths/ Injuries	Property Damage*	Details
					and powerlines bring blown down, numerous structures sustained damage. Measure wind gusts were as high as 74 mph. Over 50,000 power outages were reported.
Montgomery County and 3 others	2/10/2010	50 kts.	0/0	$265	Numerous trees were blown down countywide blocking many roads and highways. Widespread power outages were caused by falling trees along with some minor property damage to roofs and small buildings
Richmond County					
Richmond County and 30 others	3/7/2004	65 kts.	0/0	$5,557	High winds just behind a fast-moving cold front produced extensive damage across central North Carolina. In addition to trees and powerlines being blown down, numerous structures sustained damage. Measured wind gusts were as high as 74 mph. Over 50,000 power outages were reported.
Richmond County and 1 other	4/16/2007	46 kts.	0/0	$0	Numerous trees and power lines down county wide.
Richmond county and 29 others	2/10/2008	43 kts.	0/0	$188	Wind gusts in excess of 50 mph was observed throughout the county with many locations experiencing wind gusts in excess of 55 mph. Area electric utility companies reported widespread power outages from downed trees and limbs on power lines. The downed trees also resulted in numerous reports of damage to homes, and closed some local roads and interstates.
Richmond County and 24	1/7/2009	46 kts.	0/0	$1,311	Several trees fell onto parked cars as well as power lines. Over a thousand people were without power at one point in the area.
Richmond County and 29 others	11/11/2009	35 kts.	0/0	$364	Wind gusts of 40 to 45 mph along with heavy rain resulted in numerous trees falling and knocking down power lines. A building in Mebane experienced roof damage.
Richmond County and 29 others	12/9/2009	40 kts.	0/0	$36	Strong wind gusts between 45 and 55 mph resulted in numerous trees being blown down along resulting in power outages.
Richmond County and 20 others	2/10/2010	50 kts.	0/0	$51	Numerous trees were blown down countywide blocking many roads and highways. Widespread power outages were caused by the falling

Location	Date	Magnitude	Deaths/ Injuries	Property Damage*	Details
					trees along with some minor property damage to roofs and small buildings.
Richmond County	4/28/2011	49 kts.	0/0	$0	Several trees and power lines were reported down throughout Richmond County.
Richmond County	4/28/2011	49 kts.	0/0	$0	One tree was reported down on Steele Street in Rockingham, North Carolina.
Scotland County					
Scotland County and 25 others	2/16/1998	52 kts.	0/0	$0	Strong winds with gusts to 35 mph were common across central North Carolina during the night of the 16th and into the morning hours of the 17th. Several trees were downed in almost all of the counties in central North Carolina from Winston-Salem to Raleigh/Durham to Goldsboro and Rocky Mount. A combination of the wind and very soggy soils led to many of the trees to fall.
Scotland County and 30 others	3/72004	65 kts.	0/0	$5,557	High winds just behind a fast-moving cold front produced extensive damage across central North Carolina. In addition to trees and powerlines being blown down, numerous structures sustained damage. Measured wind gusts were as high as 74 mph. Over 50,000 power outages were reported.
Scotland County and 2 others	9/62008	50 kts.	0/0	$37,517	Wind gusts in excess of 50 mph blew down numerous trees across the county. Several homes experienced damage and over 20 roads were closed due to down trees.
Scotland County and 20 others	2/10/2010	50 kts.	0/0	$51	Numerous trees were blown down countywide blocking many roads and highways. Widespread power outages were caused by the falling trees along with some minor property damage to roofs and small buildings.
Scotland County and 45 others	10/8/2016	56 kts.	0/0	$500,000	Hurricane Matthew skirted by the North Carolina coast on October 8, 2016, dropping torrential rainfall of 8 to 15 inches and producing wind gusts of 50 to 70 mph across Central and Eastern North Carolina. The large swath of 8 to 15 inches of rain across Eastern and Central North Carolina, caused devastating and life threatening flash flooding, that evolved into major and record

Location	Date	Magnitude	Deaths/ Injuries	Property Damage*	Details
					setting river flooding along portions of the Neuse, Cape Fear, and Tar river basins. Matthew's inland flood waters resulted in 11 direct fatalities within the WFO RAH CWA, approximately $686 million in property damage to flooded homes and businesses, and $150 million in crop damage. Countless roads and highways were underwater, along with with numerous roads washed out, including sections of Interstates 95 and 40. Besides the 11 direct fatalities, at least 3 indirect fatalities also occurred. In addition, the associated strong wind gusts of 50 to 70 mph resulted in 1 fatality, when a tree fell onto a moving vehicle. Finally, the associated EF-1 tornado in Wayne County resulted in $75 thousand in property damage.

*Property damage is reported in 2017 dollars. All damage may not have been reported.
Source: National Climatic Data Center

TABLE 5.18: HISTORICAL THUNDERSTORM WIND OCCURRENCES IN THE PEE DEE LUMBER REGION

Location	Date	Magnitude	Deaths/Injuries	Property Damage*
Anson County				
Anson County	10/2/1969	0 kts.	0/0	$0
Anson County	6/16/1971	0 kts.	0/0	$0
Anson County	9/30/1973	0 kts.	0/0	$0
Anson County	1/25/1975	0 kts.	0/0	$0
Anson County	4/27/1982	0 kts.	0/0	$0
Anson County	6/10/1982	0 kts.	0/0	$0
Anson County	6/5/1985	0 kts.	0/0	$0
Anson County	7/29/1987	0 kts.	0/0	$0
Anson County	2/21/1989	0 kts.	0/2	$0
Anson County	5/6/1989	0 kts.	0/0	$0
Anson County	6/16/1989	0 kts.	0/0	$0
Anson County	3/1/1991	0 kts.	0/0	$0
Wadesboro	1/24/1993	0 kts.	0/0	$0
Wadesboro	4/16/1993	0 kts.	0/0	$0
Anson County	4/30/1996	0 kts.	0/0	$0
Wadesboro	5/29/1996	0 kts.	0/0	$0
Peachland	8/27/1996	50 kts.	0/0	$15,272
White Store	2/21/1997	50 kts.	0/0	$0
Wadesboro	7/20/1997	75 kts.	0/0	$0

Location	Date	Magnitude	Deaths/Injuries	Property Damage*
Wadesboro	6/30/1998	50 kts.	0/0	$0
Peachland	6/30/1998	50 kts.	0/0	$0
Wadesboro	6/29/1999	50 kts.	0/0	$0
Wadesboro	8/14/1999	0 kts.	0/0	$0
Wadesboro	8/18/2000	50 kts.	0/0	$0
Wadesboro	12/17/2000	50 kts.	0/0	$0
Peachland	4/1/2001	50 kts.	0/0	$0
Burnsville	5/13/2002	50 kts.	0/0	$0
Morven	7/3/2002	50 kts.	0/0	$0
Anson County	5/2/2003	60 kts.	0/0	$0
Wadesboro	7/21/2003	60 kts.	0/0	$36,534
Morven	7/22/2003	50 kts.	0/0	$0
Anson County	6/23/2004	50 kts.	0/0	$0
Central Portion (Anson Co.)	3/8/2005	50 kts.	0/0	$15,988
Wadesboro	7/28/2005	50 kts.	0/0	$0
Wadesboro	7/28/2005	50 kts.	0/0	$0
Ansonville	8/14/2005	50 kts.	0/0	$0
Wadesboro	1/13/2006	60 kts.	0/0	$0
Wadesboro	6/11/2006	50 kts.	0/0	$0
Wadesboro	6/11/2006	50 kts.	0/0	$0
Wadesboro	6/11/2006	50 kts.	0/0	$0
Polkton	7/15/2006	50 kts.	0/0	$0
Wadesboro	7/15/2006	50 kts.	0/0	$0
Morven	7/15/2006	50 kts.	0/0	$0
Central Portion (Anson Co.)	7/19/2006	50 kts.	0/0	$0
Polkton	7/20/2006	50 kts.	0/0	$0
Ansonville	7/22/2006	50 kts.	0/0	$0
Ansonville	8/7/2006	50 kts.	0/0	$0
Wadesboro	9/28/2006	50 kts.	0/0	$0
Burnsville	11/16/2006	50 kts.	0/0	$0
Ansonville	11/16/2006	50 kts.	0/0	$0
Wadesboro	3/2/2007	50 kts.	0/0	$0
Morven	6/13/2007	50 kts.	0/0	$0
Peachland	6/30/2007	50 kts.	0/0	$0
Ansonville	8/21/2007	50 kts.	0/0	$0
Cairo	8/23/2007	50 kts.	0/0	$0
Cairo	8/23/2007	50 kts.	0/0	$0
McFarlan	8/23/2007	50 kts.	0/0	$0
South Wadesboro	3/4/2008	50 kts.	0/0	$0
Ansonville	3/15/2008	50 kts.	0/0	$0
McFarlan	4/4/2008	50 kts.	0/0	$0
Burnsville	4/4/2008	50 kts.	0/0	$0
Morven	6/22/2008	52 kts.	0/0	$0
McFarlan	6/23/2008	52 kts.	0/0	$0
Burnsville	7/6/2008	50 kts.	0/0	$0
Burnsville	7/23/2008	50 kts.	0/0	$0

Location	Date	Magnitude	Deaths/Injuries	Property Damage*
South Wadesboro	7/31/2008	50 kts.	0/0	$0
Ansonville	8/2/2008	50 kts.	0/0	$0
Pinkston	8/2/2008	50 kts.	0/0	$0
South Wadesboro	8/2/2008	50 kts.	0/0	$0
Wadesboro	8/15/2008	50 kts.	0/0	$0
Burnsville	5/28/2009	50 kts.	0/0	$0
Burnsville	6/11/2009	50 kts.	0/0	$0
Lilesville	7/27/2009	50 kts.	0/0	$0
Polkton	7/28/2009	50 kts.	0/0	$0
Burnsville	7/31/2009	50 kts.	0/0	$0
Peachland	8/5/2009	50 kts.	0/0	$0
Polkton	8/5/2009	50 kts.	0/0	$0
Wadesboro Junction	5/28/2010	50 kts.	0/0	$12,731
Deep Creek	6/13/2010	50 kts.	0/0	$0
Ansonville	6/14/2010	50 kts.	0/0	$0
Burnsville	6/29/2010	50 kts.	0/0	$0
Ansonville	7/9/2010	50 kts.	0/0	$0
Peachland	7/13/2010	50 kts.	0/0	$0
Peachland	12/1/2010	50 kts.	0/0	$0
Polkton	4/5/2011	50 kts.	0/0	$0
Burnsville	6/12/2011	50 kts.	0/0	$0
Ansonville	6/18/2011	50 kts.	0/0	$0
Gravelton	6/18/2011	50 kts.	1/0	$0
Wadesboro Junction	6/21/2011	50 kts.	0/0	$0
South Wadesboro	7/4/2011	50 kts.	0/0	$0
Wadesboro	7/4/2011	50 kts.	0/0	$0
Burnsville	7/13/2011	50 kts.	0/0	$0
Pinkston	7/13/2011	50 kts.	0/0	$0
Peachland	7/25/2011	50 kts.	0/0	$0
Polkton	7/31/2011	50 kts.	0/0	$0
Peachland	8/8/2011	50 kts.	0/0	$0
Wadesboro	9/2/2011	50 kts.	0/0	$0
Fountain Hill	7/1/2012	50 kts.	0/0	$0
Peachland	7/1/2012	50 kts.	0/0	$0
White Shore	7/1/2012	50 kts.	0/0	$0
White Shore	7/1/2012	50 kts.	0/0	$0
Long Pine	7/1/2012	50 kts.	0/0	$0
Deep Creek	7/1/2012	50 kts.	0/0	$1,000
Polkton	7/5/2012	50 kts.	0/0	$2,000
Ansonville	7/8/2012	50 kts.	0/0	$0
Peachland	7/9/2012	50 kts.	0/0	$10,000
Ansonville	7/28/2012	50 kts.	0/0	$0
Gravelton	7/28/2012	50 kts.	0/0	$500
South Wadesboro	4/19/2013	50 kts.	0/0	$500
Pinkston	6/13/2013	50 kts.	0/0	$25,000
Pee Dee	6/27/2013	50 kts.	0/0	$0

Location	Date	Magnitude	Deaths/Injuries	Property Damage*
Polkton	6/30/2013	50 kts.	0/0	$0
Gravelton	7/17/2013	50 kts.	0/0	$0
Pinkston	2/21/2014	50 kts.	0/0	$0
Peachland	5/27/2014	50 kts.	0/0	$2,000
Polkton	10/11/2014	50 kts.	0/0	$0
Pinkston	10/11/2014	50 kts.	0/0	$0
Cedar Hill	6/1/2015	50 kts.	0/0	$0
Pinkston	6/18/2015	50 kts.	0/0	$0
South Wadesboro	6/30/2015	50 kts.	0/0	$0
Deep Creek	2/24/2016	50 kts.	0/0	$0
Polkton	2/24/2016	50 kts.	0/0	$0
Lilesville	7/8/2016	50 kts.	0/0	$2,500
Wadesboro	7/15/2016	50 kts.	0/0	$10,000
South Wadesboro	7/16/2016	50 kts.	0/0	$10,000
Cedar Hill	8/27/2016	50 kts.	0/0	$0
Bethel	4/3/2017	50 kts.	0/0	$1,000
Ansonville	5/1/2017	50 kts.	0/0	$2,500
South Wadesboro	5/5/2017	50 kts.	0/0	$5,000
Wadesboro	5/24/2017	50 kts.	0/0	$0
South Wadesboro	5/25/2017	50 kts.	0/0	$0
Anson Co ARPT	5/25/2017	50 kts.	0/0	$0
Wadesboro JCT	5/25/2017	50 kts.	0/0	$0
Burnsville	6/19/2017	50 kts.	0/0	$2,000
Burnsville	7/5/2017	50 kts.	0/0	$0
Wadesboro JCT	7/18/2017	50 kts.	0/0	$5,000
Montgomery County				
Montgomery County	4/13/1970	0 kts.	0/0	$0
Montgomery County	5/17/1973	0 kts.	0/0	$0
Montgomery County	6/1/1974	0 kts.	0/0	$0
Montgomery County	4/27/1982	0 kts.	0/0	$0
Montgomery County	6/9/1988	0 kts.	0/0	$0
Montgomery County	2/21/1989	0 kts.	0/0	$0
Montgomery County	5/5/1989	0 kts.	0/0	$0
Montgomery County	5/5/1989	0 kts.	0/0	$0
Montgomery County	6/16/1989	0 kts.	0/0	$0
Montgomery County	6/22/1990	0 kts.	0/0	$0
Montgomery County	7/18/1992	0 kts.	0/0	$0
North Mt. Gilead	5/13/1995	0 kts.	0/0	$273,513
Montgomery County	5/19/1995	0 kts.	0/0	$40,223
Montgomery County	6/11/1995	0 kts.	0/0	$0
Montgomery County	1/19/1996	0 kts.	0/0	$0
Troy	4/30/1996	0 kts.	0/0	$0
Star	7/25/1996	0 kts.	0/0	$0
Badin Lake	2/21/1997	50 kts.	0/0	$0
Troy	6/13/1997	50 kts.	0/0	$0
Troy	7/19/1998	50 kts.	0/0	$0

Location	Date	Magnitude	Deaths/Injuries	Property Damage*
Mt. Gilead	8/18/2000	50 kts.	0/0	$0
Candor	12/17/2000	50 kts.	0/0	$0
Star	9/20/2001	50 kts.	0/0	$0
Troy	5/13/2002	50 kts.	0/0	$0
Uwharie	2/22/2003	60 kts.	0/0	$0
Mt. Gilead	11/19/2003	50 kts.	0/0	$0
Mt. Gilead	7/11/2004	50 kts.	0/0	$0
Mt. Gilead	6/7/2005	50 kts.	0/0	$0
Troy	4/3/2006	50 kts.	0/0	$0
Troy	8/30/2006	50 kts.	0/0	$0
Troy	8/30/2006	50 kts.	0/0	$0
Troy	11/16/2006	50 kts.	0/0	$0
Troy	11/16/2006	50 kts.	0/0	$0
Troy	3/2/2007	50 kts.	0/0	$0
Troy	6/11/2007	50 kts.	0/0	$0
Eldorado	6/24/2007	50 kts.	0/0	$0
Mt. Gilead	7/7/2007	50 kts.	0/0	$0
Mt. Gilead	7/7/2007	50 kts.	0/0	$0
Chip	8/21/2007	50 kts.	0/0	$0
Biscoe	3/4/2008	50 kts.	0/0	$0
Biscoe	3/4/2008	50 kts.	0/0	$0
Pekin	3/4/2008	50 kts.	0/0	$0
Mt. Gilead	3/15/2008	50 kts.	0/0	$0
Troy	7/22/2008	50 kts.	0/0	$0
Eldorado	7/27/2009	50 kts.	0/0	$0
Tuckertown	7/13/2009	50 kts.	0/0	$0
Mt. Gilead	7/13/2009	50 kts.	0/0	$0
Candor	7/13/2009	50 kts.	0/0	$0
Emery	7/13/2009	50 kts.	0/0	$0
Troy	7/13/2009	50 kts.	0/0	$0
Mt. Gilead	8/5/2009	50 kts.	0/0	$0
Mt. Gilead	8/5/2009	50 kts.	0/0	$0
Eldoardo	8/22/2009	50 kts.	0/0	$0
Abner	8/22/2009	50 kts.	0/0	$0
Troy	6/14/2010	50 kts.	0/0	$5,305
Pee Dee	6/29/2010	50 kts.	0/0	$0
Moratock	6/6/2010	50 kts.	0/0	$1,061
Star	7/25/2010	50 kts.	0/0	$0
Candor	7/9/2010	50 kts.	0/0	$0
Uwharie	12/1/2010	50 kts.	0/0	$0
Coggins Mine	6/11/2011	50 kts.	0/0	$0
Troy	6/21/2011	50 kts.	0/0	$0
Pekin	7/21/2011	50 kts.	0/0	$0
Mt. Gilead	7/21/2011	50 kts.	0/0	$0
Coggins Mine	7/4/2011	50 kts.	0/0	$0
Mt. Gilead	7/4/2011	50 kts.	0/0	$0

Location	Date	Magnitude	Deaths/Injuries	Property Damage*
Tuckertown	8/6/2011	50 kts.	0/0	$0
Star	8/8/2011	50 kts.	0/0	$0
Mt. Gilead	7/9/2012	50 kts.	0/0	$0
Pekin	7/23/2012	50 kts.	0/0	$0
Wadeville	7/24/2012	50 kts.	0/0	$2,000
Okeewemee	7/28/2012	50 kts.	0/0	$0
Troy	9/1/2012	50 kts.	0/0	$0
Troy	1/30/2013	50 kts.	0/0	$200
Pee Dee	6/13/2013	61 kts.	0/0	$2,000,000
Troy	7/2/2013	50 kts.	0/0	$5,000
Moratock	1/11/2014	50 kts.	0/0	$3,000
Biscoe	2/21/2014	50 kts.	0/0	$0
Steeds	6/9/2014	50 kts.	0/0	$0
Troy	9/16/2014	50 kts.	0/0	$0
Hydro	6/2/2015	50 kts.	0/0	$0
Candor	6/2/2015	50 kts.	0/0	$0
Steeds	6/26/2015	50 kts.	0/0	$0
Mt. Gilead	2/24/2016	50 kts.	0/0	$0
Emery	6/29/2016	50 kts.	0/0	$0
Star	8/27/2016	50 kts.	0/0	$2,500
Troy	8/27/2016	50 kts.	0/0	$2,500
Tuckertown	5/5/2017	50 kts.	0/0	$0
Ophir	5/5/2017	50 kts.	0/0	$0
Capelsie	5/5/2017	50 kts.	0/0	$0
Star Montgomery Co ARP	5/5/2017	50 kts.	0/0	$1,000
Wadeville	5/24/2017	50 kts.	0/0	$0
Troy	5/24/2017	50 kts.	0/0	$0
Troy	5/24/2017	50 kts.	0/0	$0
Richmond County				
Richmond County	4/2/1970	0 kts.	0/0	$0
Richmond County	11/10/1970	0 kts.	0/0	$0
Richmond County	6/16/1971	0 kts.	0/0	$0
Richmond County	1/25/1975	0 kts.	0/0	$0
Richmond County	3/24/1975	0 kts.	0/0	$0
Richmond County	4/27/1982	0 kts.	0/0	$0
Richmond County	7/22/1983	0 kts.	0/0	$0
Richmond County	7/22/1983	0 kts.	0/0	$0
Richmond County	6/6/1985	0 kts.	0/0	$0
Richmond County	8/17/1985	0 kts.	0/0	$0
Richmond County	7/12/1987	0 kts.	0/0	$0
Richmond County	8/19/1987	0 kts.	0/0	$0
Richmond County	7/31/1988	0 kts.	0/0	$0
Richmond County	2/21/1989	0 kts.	0/0	$0
Richmond County	6/16/1989	0 kts.	0/0	$0
Richmond County	10/18/1990	0 kts.	0/0	$0
Hoffman	1/24/1993	0 kts.	0/0	$0

Location	Date	Magnitude	Deaths/Injuries	Property Damage*
Roberdell	1/24/1993	0 kts.	0/0	$0
Hamlet	1/6/1995	0 kts.	0/0	$442,448
Richmond County	5/13/1995	0 kts.	0/0	$0
Rockingham	5/29/1996	0 kts.	0/0	$0
Ex Way	5/27/1998	50 kts.	0/0	$0
Rockingham	8/31/1998	50 kts.	0/0	$112,783
Rockingham	8/14/1999	0 kts.	0/0	$1,158,731
Rockingham	6/26/2000	50 kts.	0/0	$0
Richmond County	8/18/2000	50 kts.	0/0	$0
Rockingham	12/17/2000	50 kts.	0/0	$0
Hamlet	4/1/2001	50 kts.	0/0	$0
Ellerbe	6/22/2001	50 kts.	0/0	$0
Steen Town	3/16/2002	50 kts.	0/0	$0
Rockingham	5/13/2002	50 kts.	0/0	$0
Roberdel	7/3/2002	50 kts.	0/0	$0
Ellerbe	11/11/2002	50 kts.	0/0	$0
Richmond County	5/2/2003	60 kts.	0/0	$0
Rockingham	5/2/2004	50 kts.	0/0	$0
Rockingham	6/23/2004	50 kts.	0/0	$0
Ellerbe	7/10/2004	50 kts.	0/0	$0
Ellerbe	3/8/2005	56 kts.	0/0	$0
Rockingham	5/26/2006	50 kts.	0/0	$0
Ellerbe	6/23/2006	50 kts.	0/0	$0
Rockingham	7/15/2006	50 kts.	0/0	$0
Rockingham	7/15/2006	50 kts.	0/0	$0
Hamlet	7/19/2006	50 kts.	0/0	$0
Rockingham	7/19/2006	50 kts.	0/0	$0
Ellerbe	7/28/2006	50 kts.	0/0	$0
Rockingham	9/28/2006	50 kts.	0/0	$0
Mangum	6/13/2007	50 kts.	0/0	$0
Plainview	4/4/2008	50 kts.	0/0	$0
Hoffman	6/1/2008	50 kts.	0/0	$0
Longwood Park	7/6/2008	50 kts.	0/0	$0
Hoffman	7/31/2008	50 kts.	0/0	$0
Hoffman	7/31/2008	50 kts.	0/0	$0
Ellerbe	7/16/2009	50 kts.	0/0	$0
Ellerbe	7/16/2009	50 kts.	0/0	$0
Ellerbe	8/11/2009	50 kts.	0/0	$0
Rockingham Hamlet AR	6/14/2010	50 kts.	0/0	$0
Covington	6/15/2010	50 kts.	0/0	$0
Knob Hill	6/29/2010	50 kts.	0/0	$0
Roberdel	6/29/2010	50 kts.	0/0	$4,244
Roberdel	6/29/2010	50 kts.	0/0	$0
East Rockingham	7/16/2010	50 kts.	0/0	$0
East Rockingham	12/1/2010	50 kts.	0/0	$0
Knob Hill	4/28/2011	50 kts.	0/0	$5,150

Location	Date	Magnitude	Deaths/Injuries	Property Damage*
Knob Hill	4/28/2011	50 kts.	0/0	$0
Knob Hill	4/28/2011	50 kts.	0/0	$0
Rockingham	4/28/2011	50 kts.	0/0	$0
Rockingham	4/28/2011	50 kts.	0/0	$0
Rockingham	4/28/2011	50 kts.	0/0	$0
Rockingham	4/28/2011	50 kts.	0/0	$3,090
Rockingham	4/28/2011	50 kts.	0/0	$0
Everetts Mill	6/12/2011	50 kts.	0/0	$0
Knob Hill	6/18/2011	50 kts.	0/0	$0
Ellerbe	6/21/2011	50 kts.	0/0	$0
Hamlet	7/22/2011	50 kts.	0/0	$5,150
Ellerbe	8/21/2011	50 kts.	0/0	$0
Ellerbe	8/21/2011	50 kts.	0/0	$0
Rockingham	8/21/2011	50 kts.	0/0	$0
Mangum	8/29/2011	50 kts.	0/0	$0
(HFF)Mackell AAF HOF	12/7/2011	50 kts.	0/0	$0
Roberdel	5/22/2012	50 kts.	0/0	$2,500
Roberdel	6/22/2012	50 kts.	0/0	$0
Covington	7/5/2012	50 kts.	0/0	$0
Ellerbe	7/5/2012	50 kts.	0/0	$0
Rockingham	7/9/2012	50 kts.	0/0	$1,000
Roberdel	7/24/2012	50 kts.	0/0	$1,000
Steen Town	7/24/2012	50 kts.	0/0	$5,000
Diggs	7/24/2012	50 kts.	0/0	$2,000
Norman	8/15/2012	50 kts.	0/0	$0
Osborne	1/30/2013	50 kts.	0/0	$3,000
Knob Hill	6/13/2013	50 kts.	0/0	$50,000
Rockingham	6/26/2013	50 kts.	0/0	$3,000
Hamlet	6/27/2013	50 kts.	0/0	$0
Lewarae	7/17/2013	50 kts.	0/0	$0
Mangum	2/21/2014	50 kts.	0/0	$1,000
East Rockingham	6/17/2014	50 kts.	0/0	$1,000
Steen Town	6/19/2014	50 kts.	0/0	$0
Roberdel	6/18/2015	50 kts.	0/0	$0
Ellerbe	6/26/2015	50 kts.	0/0	$0
Ellerbe	6/30/2015	50 kts.	0/0	$0
Derby	7/8/2015	50 kts.	0/0	$0
Ellerbe	7/7/2016	50 kts.	0/0	$1,000
(HFF)Mackell AAF HOF	7/8/2016	51 kts.	0/0	$0
Hamlet	7/16/2016	50 kts.	0/0	$0
Longwood Park	7/16/2016	50 kts.	0/0	$0
Roberdel	4/3/2017	50 kts.	0/0	$30,000
Ellerbe	5/25/2017	50 kts.	0/0	$0
Ellerbe	7/5/2017	50 kts.	0/0	$0
Roberdel	7/5/2017	50 kts.	0/0	$0
West Rockingham	7/23/2017	50 kts.	0/0	$1,000

Location	Date	Magnitude	Deaths/Injuries	Property Damage*
East Rockingham	7/23/2017	50 kts.	0/0	$2,000
Ellerbe	9/1/2017	50 kts.	0/0	$500
Scotland County				
Scotland County	6/28/1957	0 kts.	0/0	$0
Scotland County	4/29/1959	0 kts.	0/0	$0
Scotland County	1/24/1965	0 kts.	0/0	$0
Scotland County	1/25/1975	0 kts.	0/0	$0
Scotland County	5/23/1975	0 kts.	0/0	$0
Scotland County	2/11/1981	0 kts.	0/0	$0
Scotland County	7/4/1983	0 kts.	0/0	$0
Scotland County	8/23/1983	0 kts.	0/0	$0
Scotland County	3/20/1984	0 kts.	0/0	$0
Scotland County	6/15/1984	0 kts.	0/0	$0
Scotland County	6/5/1985	52 kts.	0/0	$0
Scotland County	6/6/1985	0 kts.	0/0	$0
Scotland County	7/4/1985	0 kts.	0/0	$0
Scotland County	7/2/1986	0 kts.	0/0	$0
Scotland County	7/13/1986	0 kts.	0/4	$0
Scotland County	7/21/1986	0 kts.	0/0	$0
Scotland County	8/3/1986	0 kts.	0/0	$0
Scotland County	7/7/1987	0 kts.	0/0	$0
Scotland County	7/7/1987	0 kts.	0/0	$0
Scotland County	8/21/1987	0 kts.	0/0	$0
Scotland County	6/22/1988	0 kts.	0/0	$0
Scotland County	6/16/1989	0 kts.	0/0	$0
Scotland County	6/16/1989	0 kts.	0/0	$0
Scotland County	7/8/1990	0 kts.	0/0	$0
Laurel Hill	1/7/1995	0 kts.	0/0	$241,335
Laurinburg	5/13/1995	0 kts.	0/0	$144,801
Scotland County	5/19/1995	0 kts.	0/0	$104,579
Laurinburg	6/26/1995	59 kts.	0/0	$0
Laurinburg	5/29/1996	0 kts.	0/0	$0
Laurinburg	6/24/1996	0 kts.	0/0	$0
Laurinburg	7/2/1996	0 kts.	0/0	$0
Wagram	7/22/1996	0 kts.	0/0	$0
Laurinburg	6/22/1997	50 kts.	0/0	$0
Scotland County	4/1/2001	50 kts.	0/0	$0
Laurinburg	6/22/2001	50 kts.	0/0	$0
Scotland County	3/16/2002	60 kts.	0/0	$0
Laurel Hill	8/19/2002	50 kts.	0/0	$0
Wagram	7/10/2004	50 kts.	0/0	$0
Laurinburg	3/8/2005	50 kts.	0/0	$0
Laurinburg	6/21/2006	50 kts.	0/0	$0
Wagram	6/21/2006	50 kts.	0/0	$0
Gibson	7/15/2006	50 kts.	0/0	$0
Laurel Hill	7/15/2006	50 kts.	0/0	$0

Location	Date	Magnitude	Deaths/Injuries	Property Damage*
Scotland County	9/28/2006	50 kts.	0/0	$0
Laurinburg	6/4/2007	50 kts.	0/0	$0
Gibson	6/26/2007	50 kts.	0/0	$0
Gibson	6/26/2007	50 kts.	0/0	$0
Laurinburg	6/26/2007	50 kts.	0/0	$0
Laurinburg	6/26/2007	50 kts.	0/0	$0
Laurinburg	3/4/2008	50 kts.	0/0	$0
Laurinburg	3/4/2008	50 kts.	0/0	$0
Sneads Grove	3/15/2008	50 kts.	0/0	$0
Laurinburg	6/11/2008	50 kts.	0/0	$0
Laurinburg	6/11/2008	50 kts.	0/0	$0
Laurel Hill	7/30/2008	50 kts.	0/0	$0
Laurinburg	7/30/2008	50 kts.	0/0	$0
Laurel Hill	8/2/2008	50 kts.	0/0	$112,551
Old Hundred	8/2/2008	50 kts.	0/0	$0
Sneads Grove	8/10/2008	50 kts.	0/0	$0
Wagram	5/2/2009	52 kts.	0/0	$2,185
Hasty	5/11/2009	78 kts.	0/0	$191,227
Oak Hill	6/1/2009	50 kts.	0/0	$0
Gibson	7/31/2009	50 kts.	0/0	$0
Laurel Hill	7/31/2009	50 kts.	0/0	$0
Gibson	5/31/2010	50 kts.	0/0	$0
Scotch Grove	5/31/2010	50 kts.	0/0	$0
Gibson	6/15/2010	50 kts.	0/0	$5,305
Crossway	7/8/2010	50 kts.	0/0	$0
Crossway	4/28/2011	50 kts.	0/0	$0
Hasty	4/28/2011	50 kts.	0/0	$0
Oak Hill	4/28/2011	52 kts.	0/0	$0
Laurinburg	6/12/2011	50 kts.	0/0	$0
Laurel Hill	6/22/2011	50 kts.	0/0	$0
Laurinburg	6/22/2011	50 kts.	0/0	$0
Crossway	6/23/2011	50 kts.	0/0	$0
Scotch Grove	7/6/2011	50 kts.	0/0	$1,030
Oak Hill	7/13/2011	50 kts.	0/0	$4,120
Sneads Grove	8/21/2011	50 kts.	0/0	$0
Elmore	9/30/2011	50 kts.	0/0	$0
Sneads Grove	5/14/2012	50 kts.	0/0	$0
Laurel Hill	5/14/2012	50 kts.	0/0	$0
East Laurinburg	6/23/2012	51 kts.	0/0	$0
Springfield	6/13/2013	50 kts.	0/0	$10,000
Sneads Grove	6/13/2013	50 kts.	0/0	$1,000
Springfield	7/17/2013	50 kts.	0/0	$0
Wagram	6/26/2015	50 kts.	0/0	$1,000
Sneads Grove	6/26/2015	50 kts.	0/0	$0
Crossway	6/30/2015	50 kts.	0/0	$0
Springfield	6/5/2016	50 kts.	0/0	$2,500

Location	Date	Magnitude	Deaths/Injuries	Property Damage*
Laurinburg	6/5/2016	50 kts.	0/0	$2,500
Wagram	6/5/2016	50 kts.	0/0	$2,500
Wagram	6/5/2016	50 kts.	0/0	$2,500
Old Hundred	7/11/2016	50 kts.	0/0	$0
Sneads Grove	7/11/2016	50 kts.	0/0	$2,500
Old Hundred	7/23/2017	50 kts.	0/0	$3,000

*Property damage is reported in 2017 dollars. All damage may not have been reported.
Source: National Climatic Data Center

December 25, 2002
A windstorm reaching 80 miles per hour impacted the region, disrupting power across the region for up to three days.

May 15, 2012
During the Hazard Mitigation Strategy meeting, the local project point of contact (and Richmond County Emergency Manager) had to leave to the meeting to assess a wind event situation. Some houses had experienced damaged and many trees were down. It was thought to be the result of straight-line winds.

5.8.4 Probability of Future Occurrences

Given the high number of previous events, it is certain that thunderstorm events will occur in the future. This results in a probability level of highly likely (100 percent annual probability) for the entire planning area.

5.9 TORNADO

5.9.1 Background

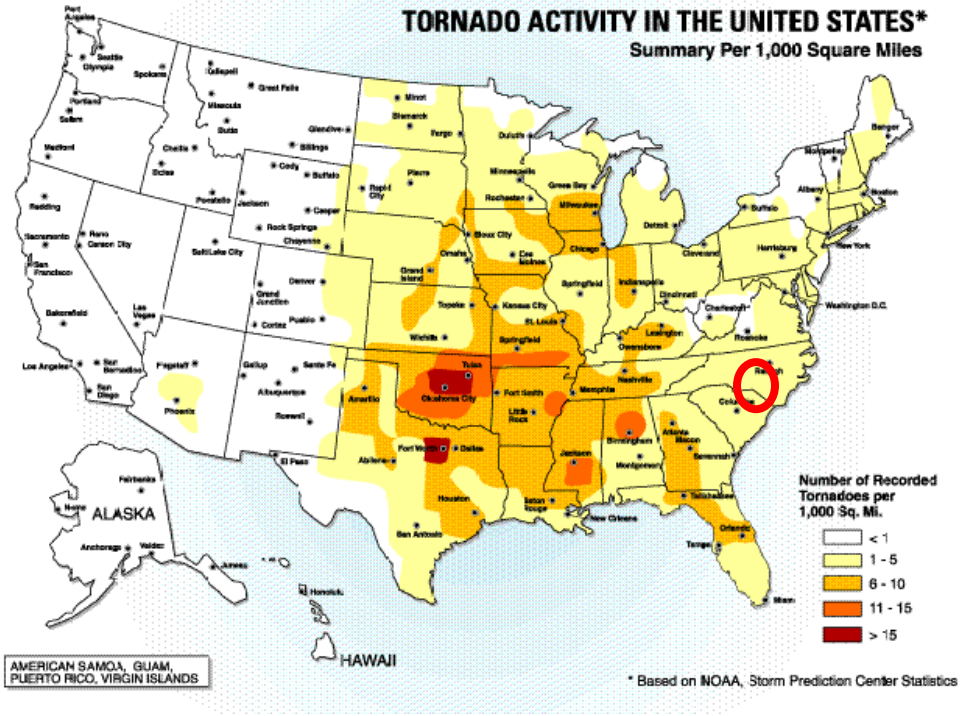
A tornado is a violent windstorm characterized by a twisting, funnel-shaped cloud extending to the ground. Tornadoes are most often generated by thunderstorm activity (but sometimes result from hurricanes and other tropical storms) when cool, dry air intersects and overrides a layer of warm, moist air forcing the warm air to rise rapidly. The damage caused by a tornado is a result of the high wind velocity and wind-blown debris, also accompanied by lightning or large hail. According to the National Weather Service, tornado wind speeds normally range from 40 miles per hour to more than 300 miles per hour. The most violent tornadoes have rotating winds of 250 miles per hour or more and are capable of causing extreme destruction and turning normally harmless objects into deadly missiles.

Each year, an average of over 800 tornadoes is reported nationwide, resulting in an average of 80 deaths and 1,500 injuries.[10] According to the NOAA Storm Prediction Center (SPC), the highest concentration of tornadoes in the United States has been in Oklahoma, Texas, Kansas, and Florida respectively. Although the Great Plains region of the Central United States does favor the development of the largest and most dangerous tornadoes (earning the designation of "tornado alley"), Florida

[10] NOAA, 2009.

experiences the greatest number of tornadoes per square mile of all U.S. states (SPC, 2002). **Figure 5.10** shows tornado activity in the United States based on the number of recorded tornadoes per 1,000 square miles.

FIGURE 5.10: TORNADO ACTIVITY IN THE UNITED STATES



Source: Federal Emergency Management Agency
(Planning area highlighted in red)

Tornadoes are more likely to occur during the months of March through May and are most likely to form in the late afternoon and early evening. Most tornadoes are a few dozen yards wide and touch down briefly, but even small short-lived tornadoes can inflict tremendous damage. Highly destructive tornadoes may carve out a path over a mile wide and several miles long.

The destruction caused by tornadoes ranges from light to inconceivable depending on the intensity, size, and duration of the storm. Typically, tornadoes cause the greatest damage to structures of light construction, including residential dwellings (particularly mobile homes). Tornadic magnitude is reported according to the Fujita and Enhanced Fujita Scales. Tornado magnitudes prior to 2005 were determined using the traditional version of the Fujita Scale (**Table 5.21**). Tornado magnitudes that were determined in 2005 and later were determined using the Enhanced Fujita Scale (**Table 5.22**).

TABLE 5.19: THE FUJITA SCALE (EFFECTIVE PRIOR TO 2005)

F-SCALE NUMBER	INTENSITY	WIND SPEED	TYPE OF DAMAGE DONE
F0	GALE TORNADO	40–72 MPH	Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages to sign boards.
F1	MODERATE TORNADO	73–112 MPH	The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages may be destroyed.
F2	SIGNIFICANT TORNADO	113–157 MPH	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.
F3	SEVERE TORNADO	158–206 MPH	Roof and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted.
F4	DEVASTATING TORNADO	207–260 MPH	Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.
F5	INCREDIBLE TORNADO	261–318 MPH	Strong frame houses lifted off foundations and carried considerable distances to disintegrate; automobile sized missiles fly through the air in excess of 100 meters; trees debarked; steel re-enforced concrete structures badly damaged.
F6	INCONCEIVABLE TORNADO	319–379 MPH	These winds are very unlikely. The small area of damage they might produce would probably not be recognizable along with the mess produced by F4 and F5 wind that would surround the F6 winds. Missiles, such as cars and refrigerators would do serious secondary damage that could not be directly identified as F6 damage. If this level is ever achieved, evidence for it might only be found in some manner of ground swirl pattern, for it may never be identifiable through engineering studies.

Source: National Weather Service

TABLE 5.20 THE ENHANCED FUJITA SCALE (EFFECTIVE 2005 AND LATER)

EF-SCALE NUMBER	INTENSITY PHRASE	3 SECOND GUST (MPH)	TYPE OF DAMAGE DONE
EF0	GALE	65–85	Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages to sign boards.
EF1	MODERATE	86–110	The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages may be destroyed.
EF2	SIGNIFICANT	111–135	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.
EF3	SEVERE	136–165	Roof and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted.
EF4	DEVASTATING	166–200	Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.
EF5	INCREDIBLE	Over 200	Strong frame houses lifted off foundations and carried considerable distances to disintegrate; automobile sized missiles fly through the air in excess of 100 meters; trees debarked; steel re-enforced concrete structures badly damaged.

Source: National Weather Service

5.9.2 Location and Spatial Extent

Tornadoes occur throughout the state of North Carolina, and thus the Pee Dee Lumber Region. Tornadoes typically impact a relatively small area, but damage may be extensive. Event locations are completely random and it is not possible to predict specific areas that are more susceptible to tornado strikes over time. Therefore, it is assumed that the Pee Dee Lumber Region is uniformly exposed to this hazard as shown in **Figures 5.11, 5.12, 5.13, 5.14** and **5.15**.

5.9.3 Historical Occurrences

According to the National Climatic Data Center, there have been a total of 24 recorded tornado events in the Pee Dee Lumber Region since 1950 (**Table 5.23**), resulting in over $32 million (2017 dollars) in property damages.[11] In addition, nine injuries were reported (**Table 5.24**). The magnitude of these tornadoes ranges from F2 to F4 in intensity, although an F5 event is possible. It is important to note that only tornadoes that have been reported are factored into this risk assessment. It is likely that a high number of occurrences have gone unreported over the past 62 years.

[11] These tornado events are only inclusive of those reported by the National Climatic Data Center (NCDC). It is likely that additional tornadoes have occurred in the Pee Dee Lumber Region. As additional local data becomes available, this hazard profile will be amended.

FIGURE 5.11: TORNADO ACTIVITY IN THE PEE DEE LUMBER REGION

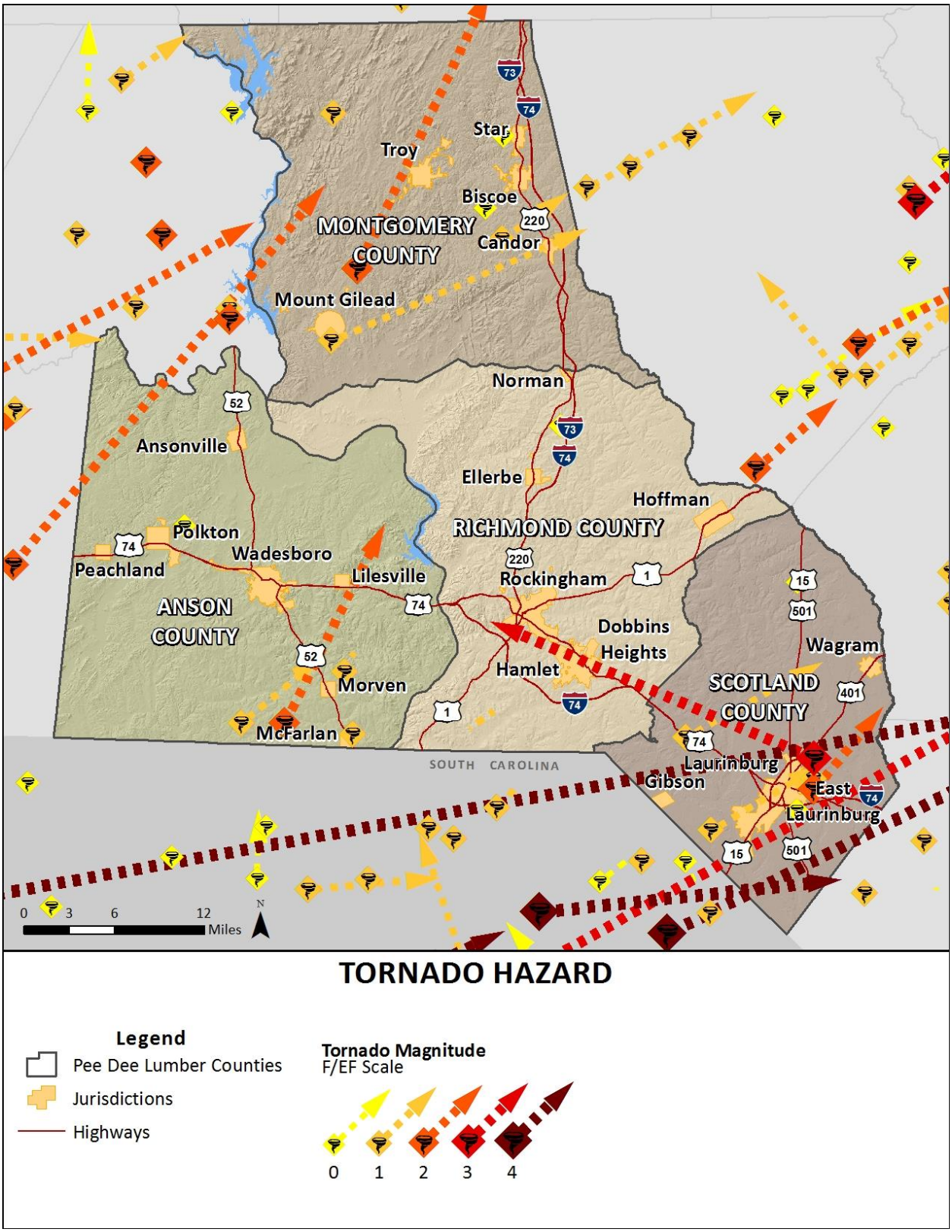


FIGURE 5.12: TORNADO ACTIVITY IN ANSON COUNTY

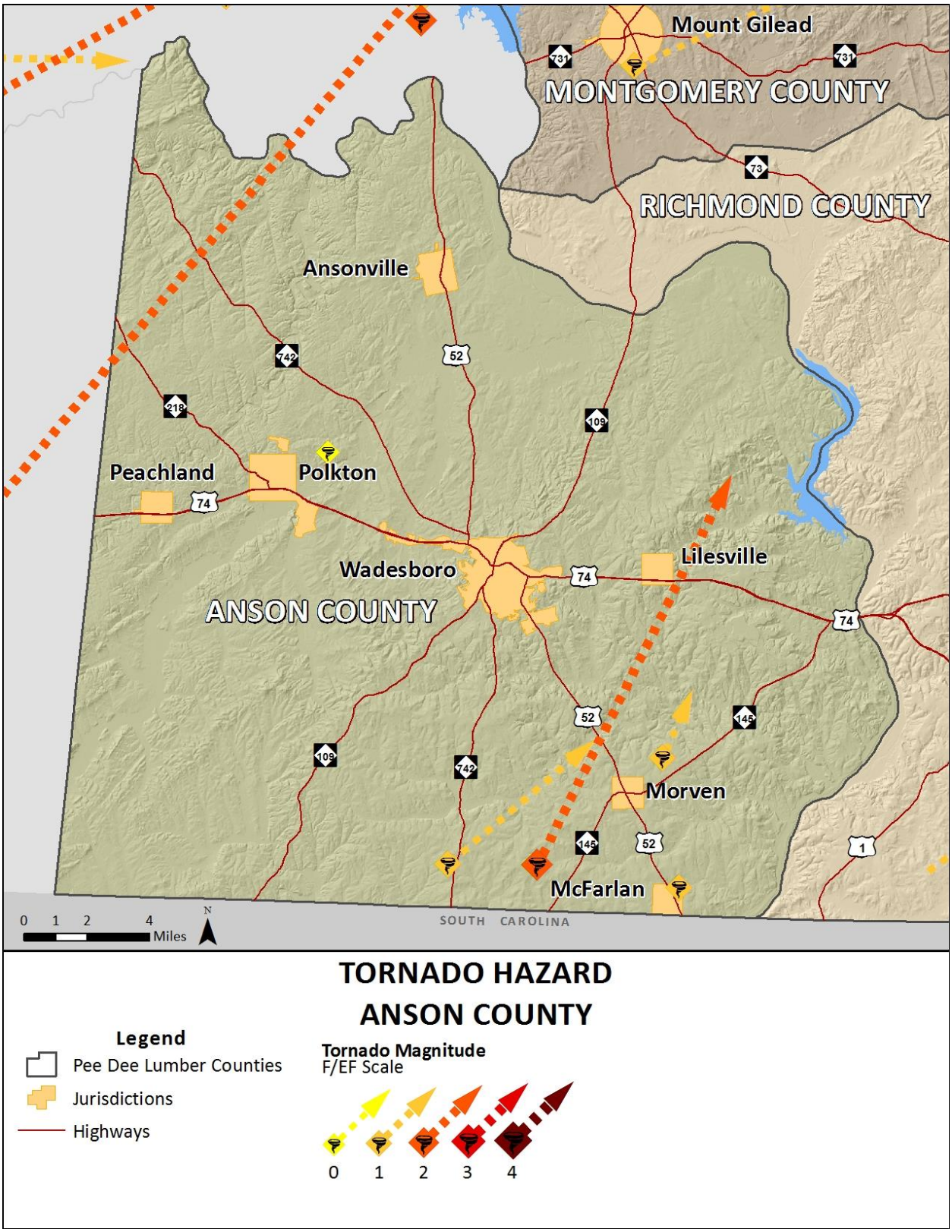


FIGURE 5.13: TORNADO ACTIVITY IN MONTGOMERY COUNTY

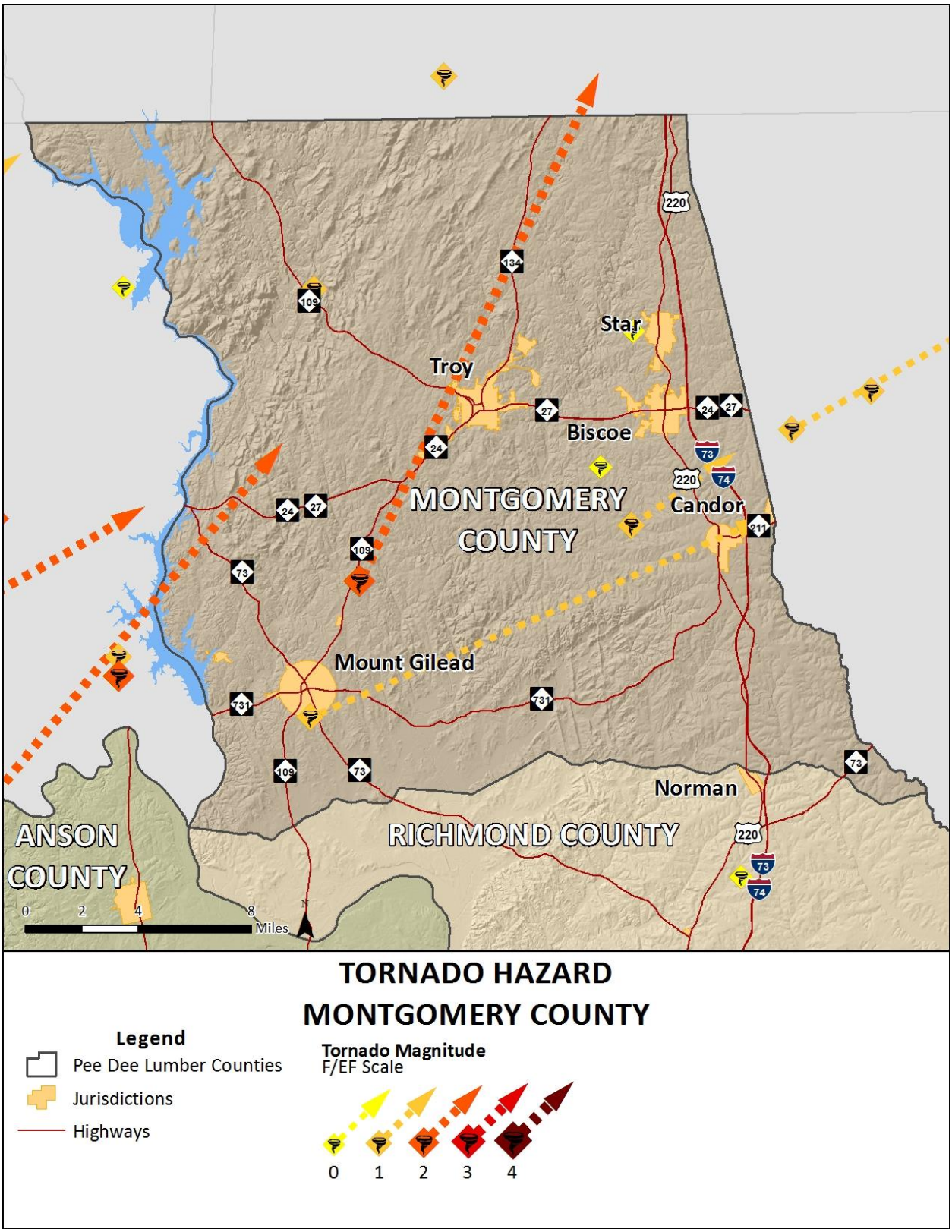


FIGURE 5.14: TORNADO ACTIVITY IN RICHMOND COUNTY

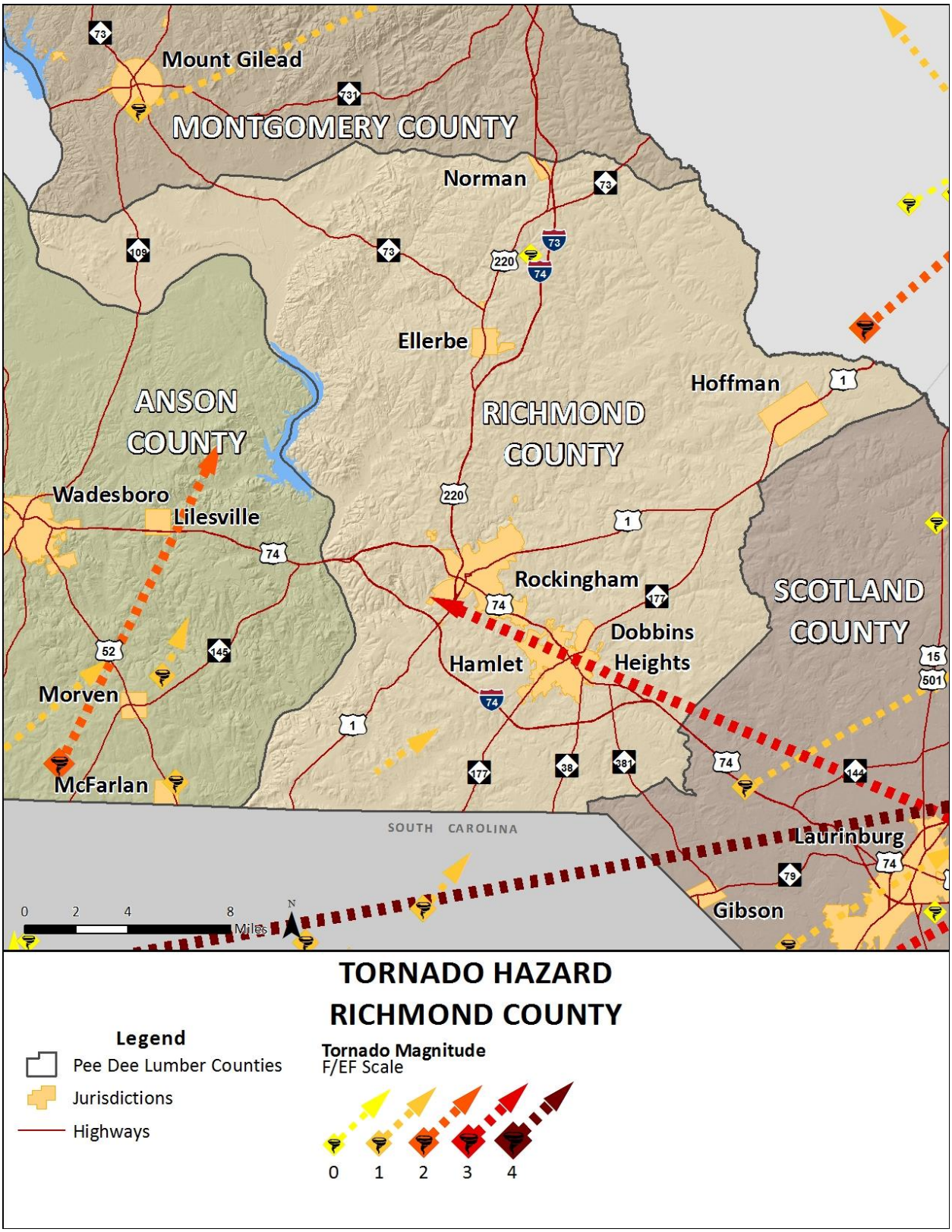


FIGURE 5.15: TORNADO ACTIVITY IN SCOTLAND COUNTY

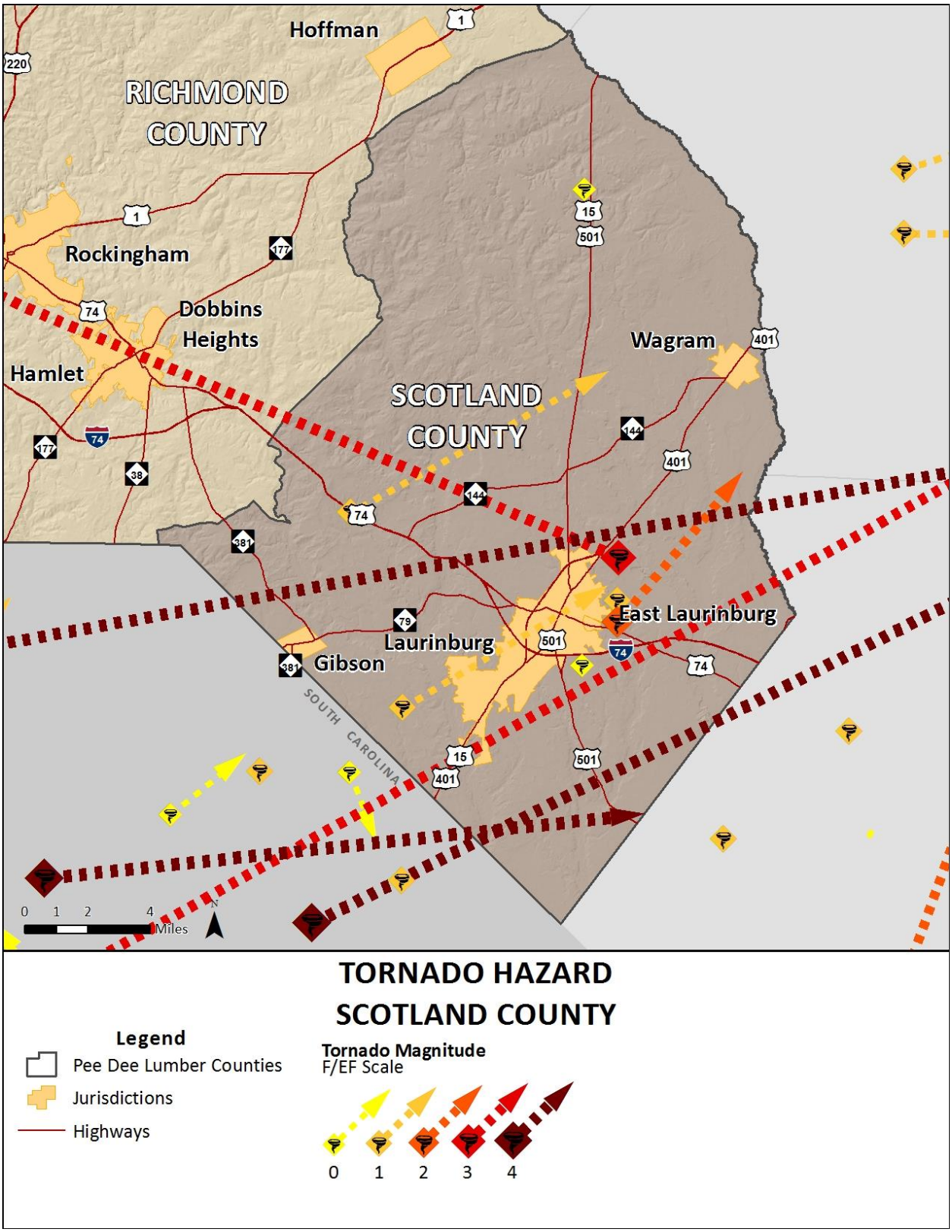


TABLE 5.21: SUMMARY OF TORNADO OCCURRENCES IN THE PEE DEE LUMBER REGION

Location	Number of Occurrences	Property Damage (2017)
Anson County	**4**	**$5,051,696**
Ansonville	0	$0
Lilesville	0	$0
McFarlan	0	$0
Morven	1	$0
Peachland	0	$0
Polkton	0	$0
Wadesboro	1	$0
Unincorporated Area	2	$5,051,696
Montgomery County	**7**	**$12,422,802**
Biscoe	0	$0
Candor	0	$0
Mount Gilead	0	$0
Star	1	$0
Troy	0	$0
Unincorporated Area	6	$12,422,802
Richmond County	**4**	**$1,480,311**
Dobbins Heights	0	$0
Ellerbe	0	$0
Hamlet	0	$0
Hoffman	0	$0
Norman	0	$0
Rockingham	0	$0
Unincorporated Area	4	$1,480,311
Scotland County	**10**	**$13,321,503**
East Laurinburg	0	$0
Gibson	0	$0
Laurinburg	1	$0
Wagram	0	$0
Unincorporated Area	9	$13,321,503
PEE DEE LUMBER REGION TOTAL	**24**	**$32,276,312**

Source: National Climatic Data Center

TABLE 5.22: HISTORICAL TORNADO IMPACTS IN THE PEE DEE LUMBER REGION

Location	Date	Magnitude	Deaths/ Injuries	Property Damage*	Details
Anson County					
Anson County	5/15/1976	F2	0/4	$107,890	
Anson County	5/5/1989	F1	0/1	$4,943,806	
Wadesboro	5/31/2003	F0	0/0	$0	
Morven	9/7/2004	F1	0/0	$0	
Montgomery County					
Montgomery County	5/14/1950	F1	0/0	$25,361	
Montgomery County	2/21/1954	F1	0/0	$228,398	

Location	Date	Magnitude	Deaths/ Injuries	Property Damage*	Details
Montgomery County	5/28/1973	F0	0/0	$1,380,073	
Montgomery County	5/15/1976	F2	0/7	$10,788,970	
Montgomery County	6/9/1988	F1	0/0	$0	
Montgomery County	9/29/1999	F0	0/0	$0	The thunderstorm that produced damage in Albemarle spawned yet another tornado after it moved into Montgomery County. On Buck Mountain Road, in the Uwharrie Forest, trees and power lines were blown down. The ranger described a distinct path of uprooted and snapped trees.
Star	9/27/2004	F0	0/0	$0	A tornado touched down in Star. A tree was blown down on to a home, and several outbuildings were destroyed at that same residence. At another residence, a large 100-year-old barn was moved about two feet off its foundation, a large chicken coop was destroyed. Siding and structural damage was sustained to the house, and the chimney was blown off. Several trees were snapped or uprooted along the tornado's path.
Richmond County					
Richmond County	8/29/1964	F3	0/0	$238	
Richmond County	5/11/1973	F1	0/0	$1,380,073	
Richmond County	9/27/2004	F0	0/0	$0	A tornado touched down briefly in far northeast Richmond County, along Jones Spring Church Road and State Road 1458, blowing down trees and power lines.
Diggs	5/14/2012	EF1	0/0	$100,000	At approximately 12:55 pm a weak and very brief tornado touched down in a forested area about 8.5 miles southwest of Rockingham and produced a small area of tree damage which included uprooted and snapped pine trees. The next area of damage along the discontinuous damage path was about one-tenth of a mile to the northeast of the first touchdown. Much of the damage in this area was minor and included roof covering and shingle damage and broken tree limbs. There was a small area of enhanced damage that included numerous snapped and downed trees, a carport that was lifted and tossed approximately 250 yards, a small tin and aluminum framed

Location	Date	Magnitude	Deaths/ Injuries	Property Damage*	Details
					garage that was leveled and significant damage to the roof of a single story home, with a loss of approximately 30 percent of its roof. Numerous windows were also broken and the vinyl siding on one side of the home was completely stripped. This damage was consistent with wind speeds of approximately 90 mph. The width of the damage path was approximately 100 yards at this location. The tornado then appeared to lift and the final touchdown and notable damage area was located approximately 6.8 miles south-southwest of Rockingham. Damage in this area included a significant swath of downed and snapped pine trees. The tornado then lifted at approximately 12:58 pm. In addition to the brief tornado touch down along the 2 mile path, there was some minor straight-line wind damage along or near the path.
Scotland County					
Scotland County	4/8/1957	F4	0/8	$2,181,903	
Scotland County	8/29/1964	F3	0/15	$1,982,542	
Scotland County	4/18/1969	F3	0/0	$1,669,063	
Scotland County	10/9/1976	F2	0/0	$1,978,897	
Scotland County	3/28/1984	F4	0/0	$5,899,709	
Scotland County	4/14/1984	F1	0/0	$58,997	
Scotland County	3/29/1991	F1	0/1	$449,955	
Scotland County	11/4/1992	F0	0/0	$437	
Scotland County	8/12/2004	F1	0/0	$0	A tornado touched down near Old Hundred and traveled northeast to Silver Hill. Trees were blown down in Old Hundred, and damage was sustained to a shed roof and to the ceiling and roof of the school bus garage at a Scotland County Schools department of transportation site on McFarland Road. A mobile home was shifted off its foundation near Sneads Grove. Trees and power lines were blown down in Silver Hill.

Location	Date	Magnitude	Deaths/ Injuries	Property Damage*	Details
Laurinburg	8/29/2004	F0	0/0	$0	A tornado touched down just south of Laurinburg. Part of a roof was blown off of a house, and shingles were torn off of several other homes. Several pine trees were snapped.

*Property Damage is reported in 2017 dollars. All damages may not have been reported.
Source: National Climatic Data Center

5.9.4 Probability of Future Occurrences

According to historical information, tornado events are not typically an annual occurrence for the region. However, conditions in the area are favorable for tornado development, particularly in the spring and fall months. While the majority of the reported tornado events are small in terms of size, intensity, and duration, they do pose a significant threat should the Pee Dee Lumber Region experience a direct tornado strike. Based on historical occurrences and typical atmospheric conditions, the probability of future tornado occurrences affecting the Pee Dee Lumber Region is likely (10 – 100 percent annual probability).

5.10 WINTER STORM AND FREEZE

5.10.1 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 of 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. However, it 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 of the winter storm elements – snow, low temperatures, sleet, ice, et cetera – have the potential to cause significant hazard to a community. Even small accumulations can down power lines and trees limbs and create hazardous driving conditions. Furthermore, communication and power may be disrupted for days.

5.9.2 Location and Spatial Extent

Nearly the entire continental United States 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. Winter storm events have the potential to impact the entire Pee Dee Lumber Region and each participating areas has equal exposure to its occurrence.

5.9.3 Historical Occurrences

Winter weather has resulted in four disaster declarations in the Pee Dee Lumber Region. This includes the Blizzard of 1996, a subsequent 1996 winter storm, a severe winter storm in 2000, and a severe ice storm in 2002.[12] According to the National Climatic Data Center, there have been a total of 112 recorded winter storm events in the Pee Dee Lumber Region since 1993 (**Table 5.25**).[13] These events resulted in nearly $850,000 (2017 dollars) in damages. Those events with reported damages are presented in **Table 5.26**. **Figure 5.16**shows the maximum recorded one-day snow fall and the minimum recorded temperature within the planning area. **Figures 5.17, 5.18, 5.19** and **5.20** show each individual County.

[12] Not all of the participating counties were declared disaster areas for these events. A complete listing of historical disaster declarations, including the affected counties, can be found in Section 4: *Hazard Identification*.

[13] These ice and winter storm events are only inclusive of those reported by the National Climatic Data Center (NCDC). It is likely that additional winter storm conditions have affected the Pee Dee Lumber. In addition, the 87 events are reported by county, so many of these storms likely affected all of the counties. The dollar amount of damages provided by NCDC is divided by the number of affected counties to reflect a damage estimate for each county.

FIGURE 5.16: SUMMARY OF WINTER STORM EVENTS IN THE PEE DEE LUMBER REGION

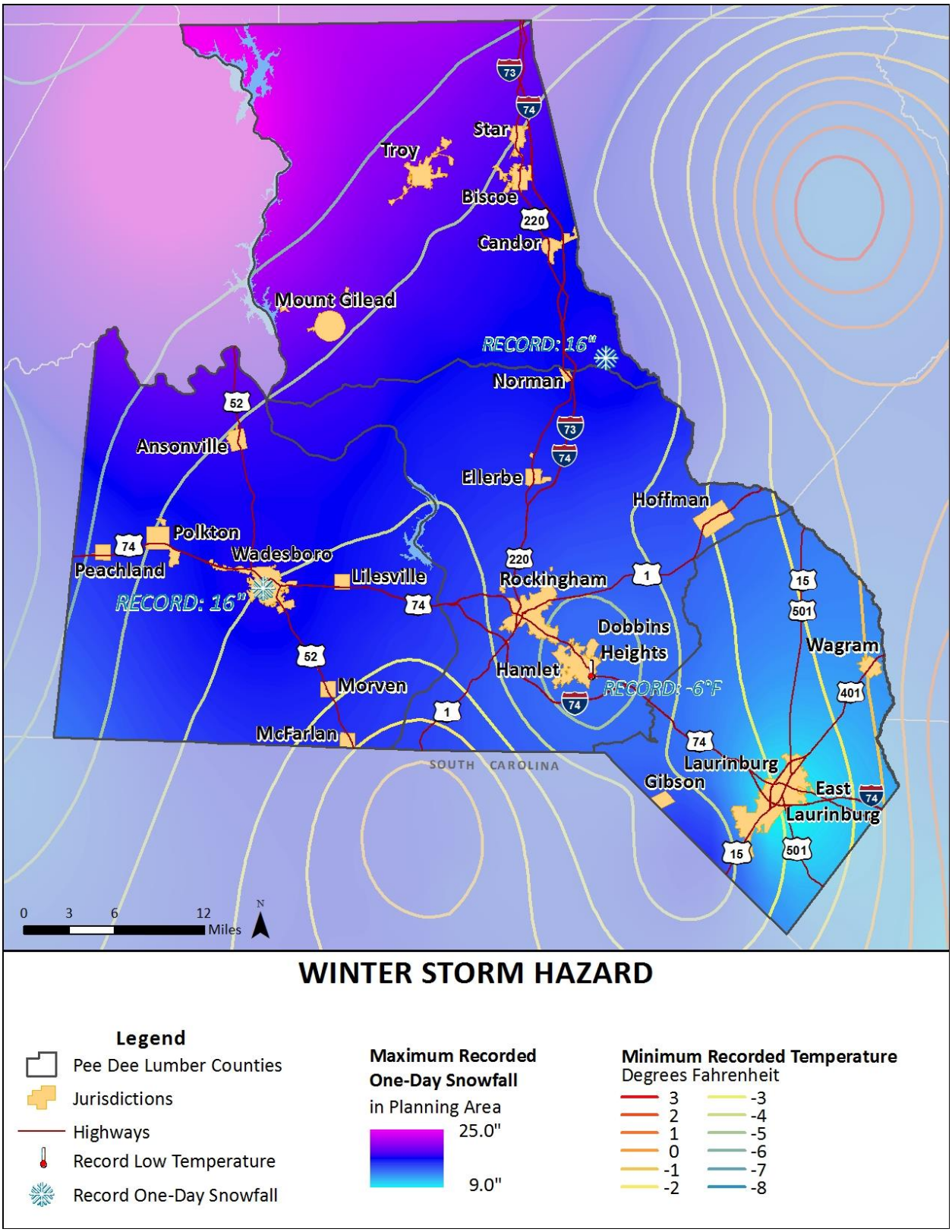


FIGURE 5.17: SUMMARY OF WINTER STORM EVENTS IN ANSON COUNTY

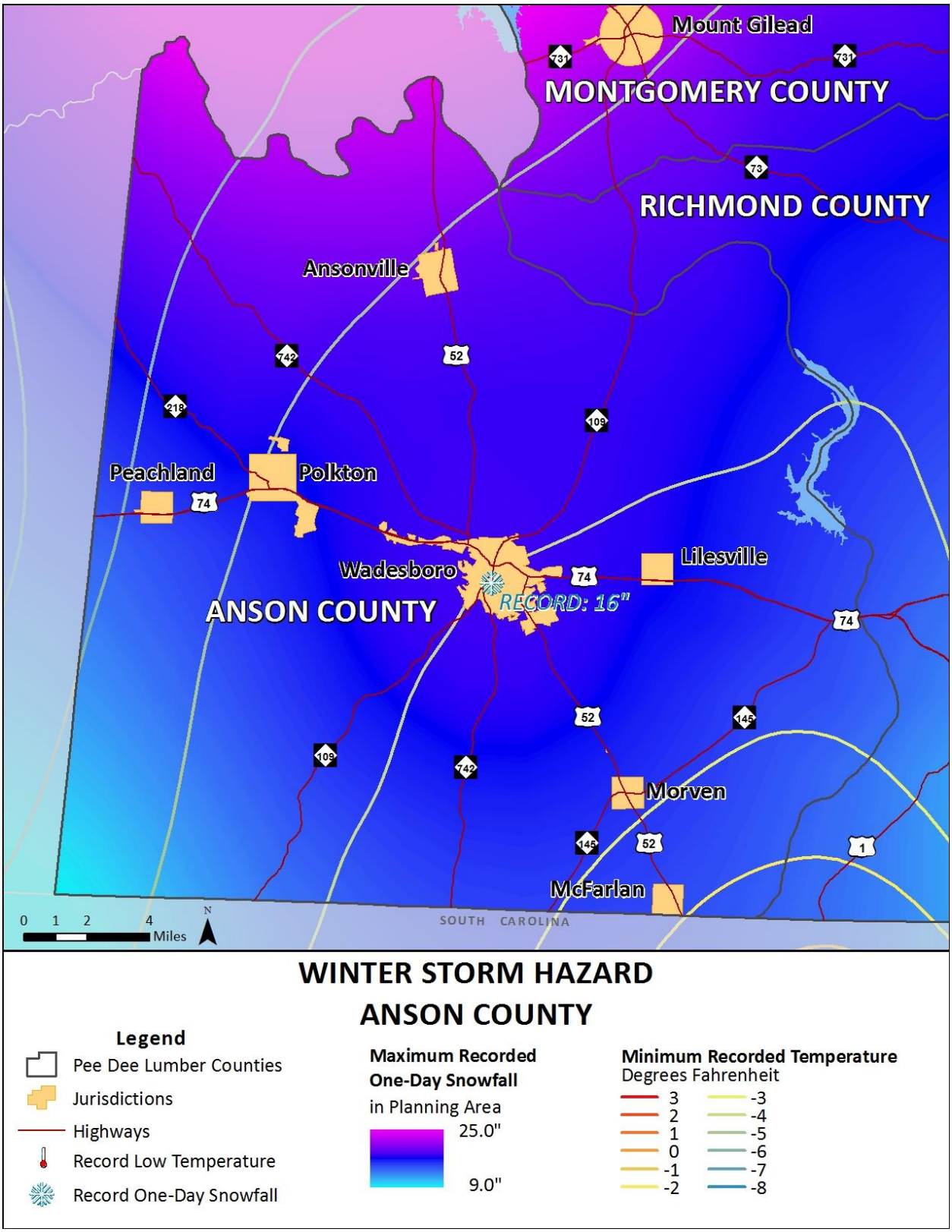


FIGURE 5.18: SUMMARY OF WINTER STORM EVENTS IN MONTGOMERY COUNTY

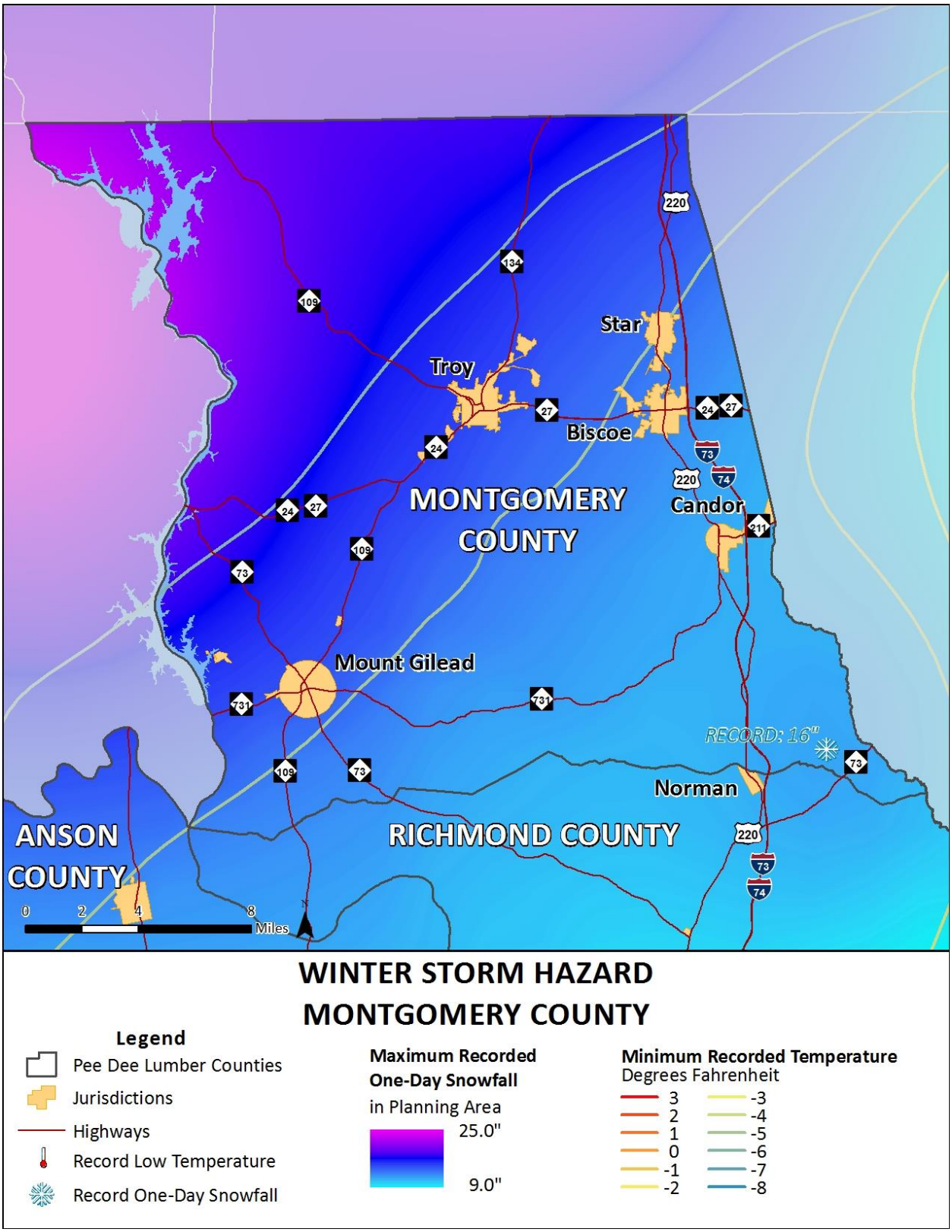


FIGURE 5.19: SUMMARY OF WINTER STORM EVENTS IN RICHMOND COUNTY

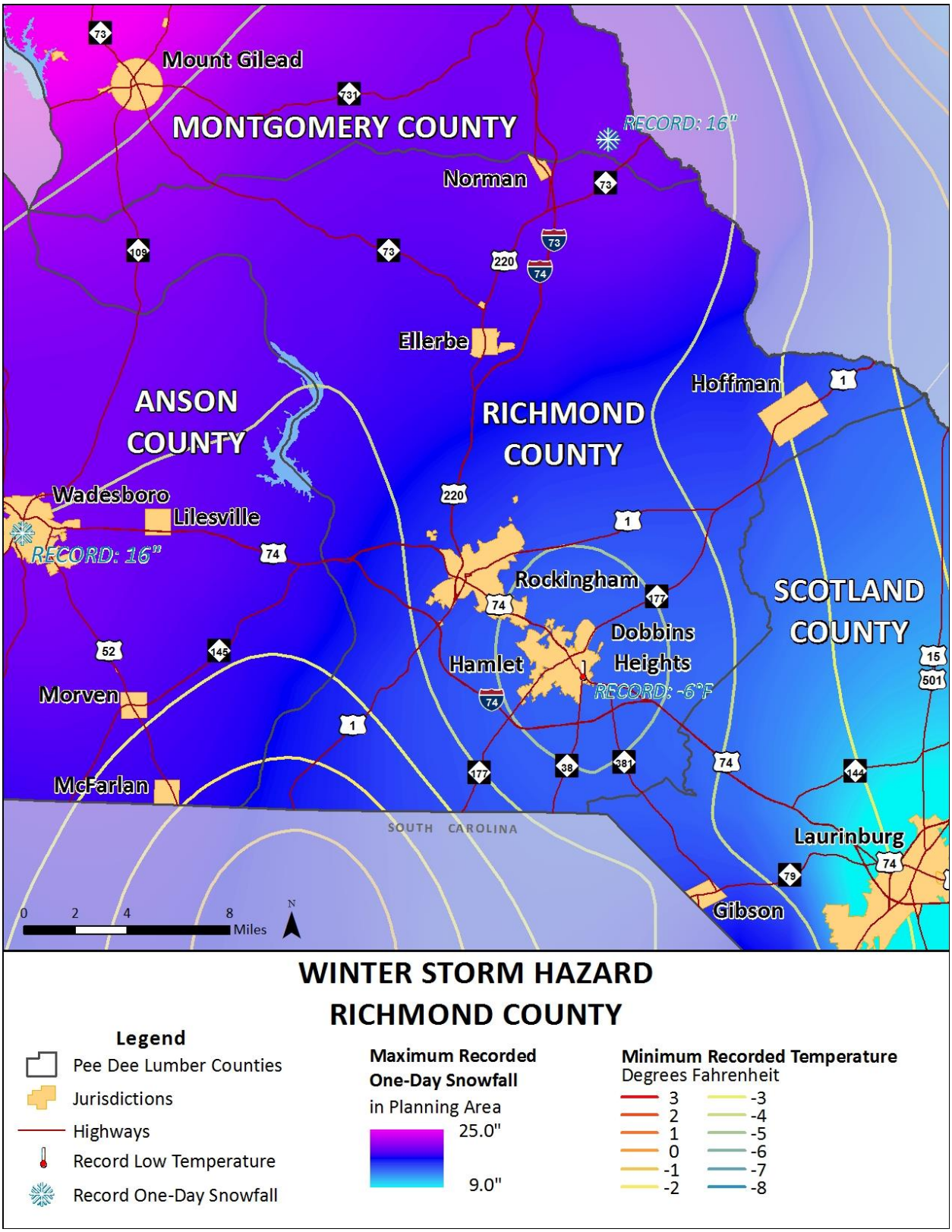


FIGURE 5.20: SUMMARY OF WINTER STORM EVENTS IN SCOTLAND COUNTY

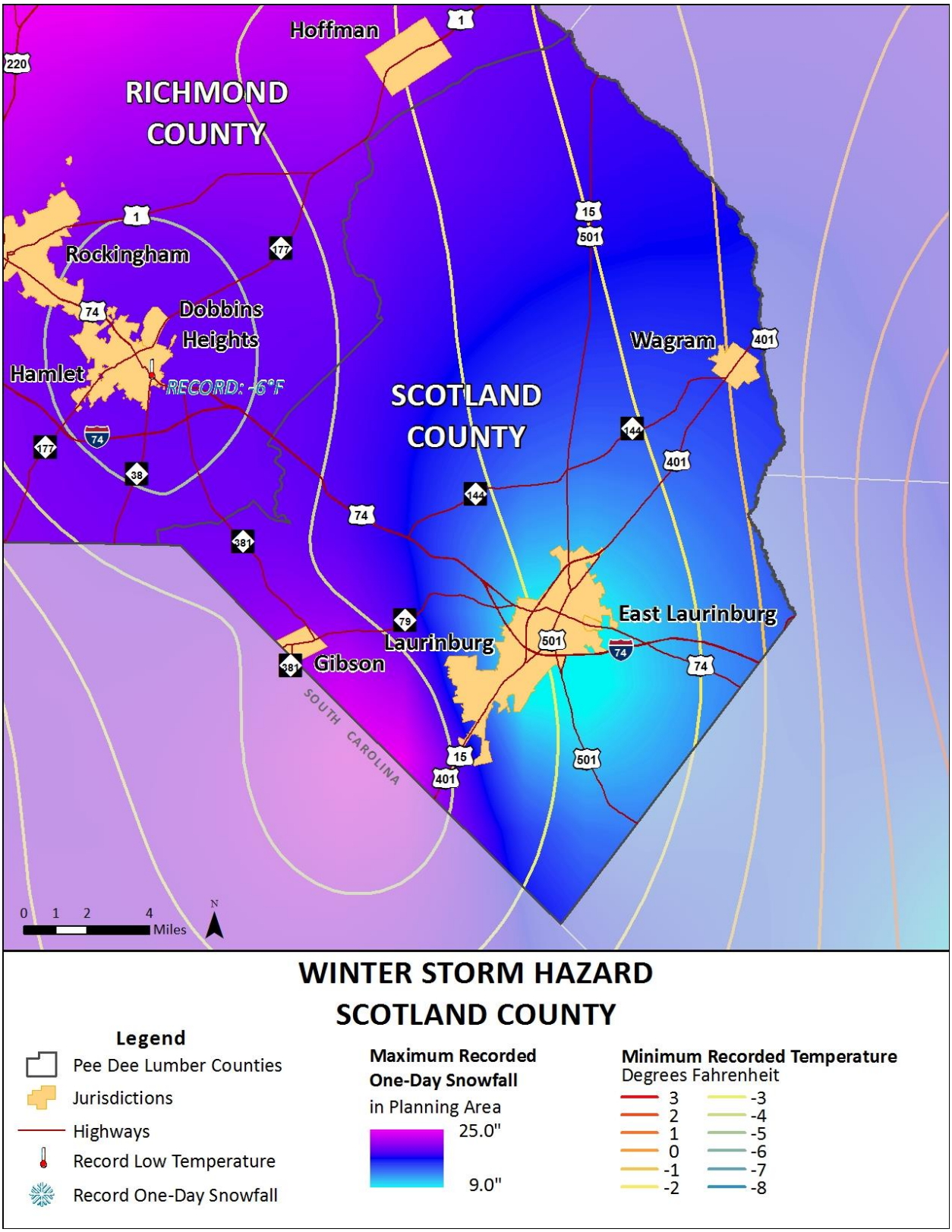


TABLE 5.23: SUMMARY OF WINTER STORM EVENTS IN THE PEE DEE LUMBER REGION

Location	Number of Occurrences	Property Damage (2017)
Anson County	36	$849,045
Montgomery County	27	$0
Richmond County	18	$0
Scotland County	31	$0
PEE DEE LUMBER REGION TOTAL	**112**	**$849,045**

Source: National Climatic Data Center

TABLE 5.24: HISTORICAL WINTER STORM IMPACTS IN THE PEE DEE LUMBER REGION

Location	Date	Type of Storm	Deaths/Injuries	Property Damage*
Anson County				
Statewide	3/12/1993	Winter Storm	2/10	$849,045
Anson County	1/6/1996	Ice Storm	0/0	$0
Anson County	1/11/1996	Ice Storm	0/0	$0
Anson County	2/2/1996	Ice Storm	0/0	$0
Anson County and 12 others	1/19/1998	Heavy Snow	0/0	$0
Anson County and 30 others	12/23/1998	Ice Storm	0/0	$0
Anson County and 30 others	1/18/2000	Winter Storm	0/0	$0
Anson County and 30 others	1/22/2000	Winter Storm	0/0	$0
Anson County and 30 others	1/24/2000	Winter Storm	0/0	$0
Anson County and 29 others	1/28/2000	Winter Storm	0/0	$0
Anson County and 24 others	11/19/2000	Heavy Snow	0/0	$0
Anson County and 30 others	1/3/2002	Winter Storm	0/0	$0
Anson County and 25 others	12/4/2002	Winter Storm	0/0	$0
Anson County and 25 others	2/16/2003	Winter Storm	0/0	$0
Anson County and 30 others	1/26/2004	Winter Storm	0/0	$0
Anson County and 25 others	2/26/2004	Winter Storm	0/0	$0
Anson County and 5 others	2/1/2007	Winter Storm	0/0	$0
Anson County and 5 others	2/1/2007	Winter Weather	0/0	$0
Anson County and 20 others	1/17/2008	Winter Weather	0/0	$0
Anson County and 19 others	1/19/2008	Winter Storm	0/0	$0
Anson County and 19 others	1/19/2008	Winter Weather	0/0	$0
Anson County and 1 other	1/20/2009	Winter Storm	0/0	$0
Anson County and 3 others	2/4/2009	Winter Weather	0/0	$0
Anson County and 10 others	1/29/2010	Winter Storm	0/0	$0
Anson County and 4 others	2/12/2010	Winter Storm	0/0	$0
Anson County and 4 others	2/12/2010	Winter Weather	0/0	$0
Anson County and 8 others	12/16/2010	Winter Weather	0/0	$0
Anson County and 1 other	12/25/2010	Winter Storm	0/0	$0
Anson County and 3 others	1/10/2011	Winter Storm	0/0	$0
Anson County and 3 others	1/10/2011	Winter Weather	0/0	$0
Anson County and 19 others	1/28/2014	Winter Storm	0/0	$0
Anson County and 12 others	1/28/2014	Winter Weather	0/0	$0
Anson County and 30 others	2/12/2014	Winter Storm	0/0	$0
Anson County and 31 others	2/16/2015	Winter Storm	0/0	$0
Anson County and 28 others	1/22/2016	Winter Storm	0/0	$0

Location	Date	Type of Storm	Deaths/Injuries	Property Damage*
Anson County	1/7/2017	Winter Weather	0/0	$0
Montgomery County				
Montgomery County and 12 others	1/19/1998	Heavy Snow	0/0	$0
Montgomery County and 24 others	11/19/2000	Heavy Snow	0/0	$0
Montgomery County	1/18/2007	Winter Weather	0/0	$0
Montgomery County	2/1/2007	Winter Storm	0/0	$0
Montgomery County	1/17/2008	Winter Weather	0/0	$0
Montgomery County	1/19/2008	Winter Weather	0/0	$0
Montgomery County	1/20/2009	Winter Storm	0/0	$0
Montgomery County	2/4/2009	Winter Weather	0/0	$0
Montgomery County	3/2/2009	Winter Storm	0/0	$0
Montgomery County	1/29/2010	Winter Storm	0/0	$0
Montgomery County	2/12/2010	Winter Storm	0/0	$0
Montgomery County	3/2/2010	Winter Weather	0/0	$0
Montgomery County	12/16/2010	Winter Weather	0/0	$0
Montgomery County	12/25/2010	Winter Storm	0/0	$0
Montgomery County	1/10/2011	Winter Storm	0/0	$0
Montgomery County	1/28/2014	Winter Weather	0/0	$0
Montgomery County	2/11/2014	Winter Weather	0/0	$0
Montgomery County	2/12/2014	Winter Storm	0/0	$0
Montgomery County	2/16/2015	Winter Storm	0/0	$0
Montgomery County	1/22/2016	Winter Storm	0/0	$0
Montgomery County	2/15/2016	Winter Weather	0/0	$0
Montgomery County	1/7/2017	Winter Weather	0/0	$0
Richmond County				
Richmond County	1/19/1998	Heavy Snow	0/0	$0
Richmond County	2/1/2007	Winter Weather	0/0	$0
Richmond County	1/17/2008	Winter Weather	0/0	$0
Richmond County	1/19/2008	Winter Weather	0/0	$0
Richmond County	1/20/2009	Winter Storm	0/0	$0
Richmond County	2/4/2009	Winter Weather	0/0	$0
Richmond County	1/30/2010	Winter Storm	0/0	$0
Richmond County	2/12/2010	Winter Storm	0/0	$0
Richmond County	12/16/2010	Winter Weather	0/0	$0
Richmond County	12/25/2010	Winter Storm	0/0	$0
Richmond County	1/10/2011	Winter Storm	0/0	$0
Richmond County	1/28/2014	Winter Storm	0/0	$0
Richmond County	2/11/2014	Winter Weather	0/0	$0
Richmond County	2/12/2014	Winter Storm	0/0	$0
Richmond County	2/16/2015	Winter Storm	0/0	$0
Richmond County	1/22/2016	Winter Storm	0/0	$0
Richmond County	2/15/2016	Winter Weather	0/0	$0
Richmond County	1/7/2017	Winter Weather	0/0	$0
Scotland County				
Scotland County	1/29/1972	Heavy Snow/Ice	0/0	$0
Scotland County	12/25/1984	Extreme Cold	0/0	$0

Location	Date	Type of Storm	Deaths/Injuries	Property Damage*
Scotland County	2/3/1996	Extreme Cold	0/0	$0
Scotland County	1/6/1996	Ice Storm	0/0	$0
Scotland County	1/11/1996	Ice Storm	0/0	$0
Scotland County	2/2/1996	Ice Storm	0/0	$0
Scotland County	12/23/1998	Ice Storm	0/0	$0
Scotland County	1/18/2000	Winter Storm	0/0	$0
Scotland County	1/22/2000	Winter Storm	0/0	$0
Scotland County	1/24/2000	Winter Storm	0/0	$0
Scotland County	1/28/2000	Winter Storm	0/0	$0
Scotland County	1/3/2002	Winter Storm	0/0	$0
Scotland County	1/26/2004	Winter Storm	0/0	$0
Scotland County	2/26/2004	Winter Storm	0/0	$0
Scotland County	12/26/2004	Winter Storm	0/0	$0
Scotland County	2/1/2007	Winter Weather	0/0	$0
Scotland County	1/19/2008	Winter Storm	0/0	$0
Scotland County	1/17/2008	Winter Weather	0/0	$0
Scotland County	1/20/2009	Winter Storm	0/0	$0
Scotland County	2/4/2009	Winter Weather	0/0	$0
Scotland County	12/25/2010	Winter Storm	0/0	$0
Scotland County	1/30/2010	Winter Storm	0/0	$0
Scotland County	2/12/2010	Winter Storm	0/0	$0
Scotland County	12/16/2010	Winter Weather	0/0	$0
Scotland County	1/10/2011	Winter Storm	0/0	$0
Scotland County	1/28/2014	Winter Storm	0/0	$0
Scotland County	2/11/2014	Winter Storm	0/0	$0
Scotland County	2/12/2014	Winter Storm	0/0	$0
Scotland County	2/16/2015	Winter Storm	0/0	$0
Scotland County	1/22/2016	Winter Storm	0/0	$0
Scotland County	1/7/2017	Winter Weather	0/0	$0

*Property Damage is reported in 2017 dollars. All damages may not have been reported.
Source: National Climatic Data Center

This area does not receive snow or ice storms annually on a regular basis. Conversely, some winter seasons may yield several snowfall events. The winter of 2002-2003 saw as many as five winter storm events in the Region. The Pee Dee Lumber Region also varies in the amount of snow it may receive. For example, Montgomery County has snow accumulations ranging from one inch to twenty-five inches.

For each county the highest recorded snowfall amount was as follows (unless noted, no ice events were reported:

- Anson: 5 to 15 inches (2010)
- Montgomery: 25 inches snow (2000)
- Richmond: 8 inches snow (2011)
- Scotland: 9 inches snow(2011); ice events reported in 1996 (no amount provided)

As with all hazards, not all events may be reported. Notable years of snow for the region include the 2010 (Christmas Snow), 2000, and 1996 (Blizzard of 1996 -disaster declaration in Montgomery County).

5.9.4 Probability of Future Occurrences

Winter storm events will continue to impact the Pee Dee Lumber Region though not necessary each year and with varying degrees of severity. According to recorded historical information, the Pee Dee Lumber Region experiences an average of 1.3 winter storm events each year. Therefore, the annual probability is likely (10-100 percent).

GEOLOGIC HAZARDS

5.11 EARTHQUAKE

5.11.1 Background

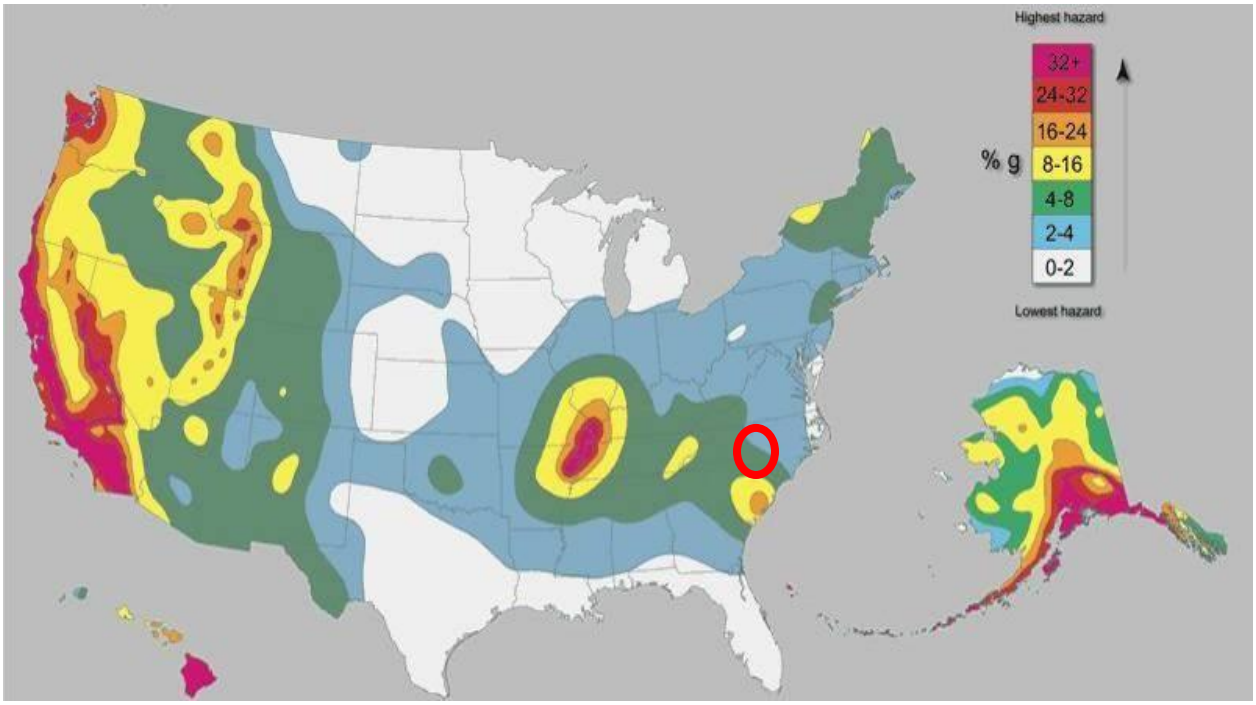
An earthquake is movement or trembling of the ground produced by sudden displacement of rock in the Earth's crust. Earthquakes result from crustal strain, volcanism, landslides, or the collapse of caverns. Earthquakes can affect hundreds of thousands of square miles, cause damage to property measured in the tens of billions of dollars, result in loss of life and injury to hundreds of thousands of persons, and disrupt the social and economic functioning of the affected area.

Most property damage and earthquake-related deaths are caused by the failure and collapse of structures due to ground shaking. The level of damage depends upon the amplitude and duration of the shaking, which are directly related to the earthquake size, distance from the fault, site, and regional geology. Other damaging earthquake effects include landslides, the down-slope movement of soil and rock (mountain regions and along hillsides), and liquefaction, in which ground soil loses the ability to resist shear and flows much like quick sand. In the case of liquefaction, anything relying on the substrata for support can shift, tilt, rupture, or collapse.

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.

The greatest earthquake threat in the United States is along tectonic plate boundaries and seismic fault lines located in the central and western states; however, the Eastern United State does face moderate risk to less frequent, less intense earthquake events. **Figure 5.21**shows relative seismic risk for the United States.

FIGURE 5.21: UNITED STATES EARTHQUAKE HAZARD MAP



Source: United States Geological Survey
(Planning area highlighted in red)

Earthquakes are measured in terms of their magnitude and intensity. Magnitude is measured using the Richter Scale, an open-ended logarithmic scale that describes the energy release of an earthquake through a measure of shock wave amplitude (**Table 5.27**). Each unit increase in magnitude on the Richter Scale corresponds to a 10-fold increase in wave amplitude, or a 32-fold increase in energy. Intensity is most commonly measured using the Modified Mercalli Intensity (MMI) Scale based on direct and indirect measurements of seismic effects. The scale levels are typically described using roman numerals, ranging from "I" corresponding to imperceptible (instrumental) events to "XII" for catastrophic (total destruction). A detailed description of the Modified Mercalli Intensity Scale of earthquake intensity and its correspondence to the Richter Scale is given in **Table 5.28**.

TABLE 5.25: RICHTER SCALE

RICHTER MAGNITUDES	EARTHQUAKE EFFECTS
< 3.5	Generally not felt, but recorded.
3.5 - 5.4	Often felt, but rarely causes damage.
5.4 - 6.0	At most slight damage to well-designed buildings. Can cause major damage to poorly constructed buildings over small regions.
6.1 - 6.9	Can be destructive in areas up to about 100 kilometers across where people live.
7.0 - 7.9	Major earthquake. Can cause serious damage over larger areas.
8 or >	Great earthquake. Can cause serious damage in areas several hundred kilometers across.

Source: Federal Emergency Management Agency

TABLE 5.26: MODIFIED MERCALLI INTENSITY SCALE FOR EARTHQUAKES

SCALE	INTENSITY	DESCRIPTION OF EFFECTS	CORRESPONDING RICHTER SCALE MAGNITUDE
I	INSTRUMENTAL	Detected only on seismographs.	
II	FEEBLE	Some people feel it.	< 4.2
III	SLIGHT	Felt by people resting; like a truck rumbling by.	
IV	MODERATE	Felt by people walking.	
V	SLIGHTLY STRONG	Sleepers awake; church bells ring.	< 4.8
VI	STRONG	Trees sway; suspended objects swing, objects fall off shelves.	< 5.4
VII	VERY STRONG	Mild alarm; walls crack; plaster falls.	< 6.1
VIII	DESTRUCTIVE	Moving cars uncontrollable; masonry fractures, poorly constructed buildings damaged.	
IX	RUINOUS	Some houses collapse; ground cracks; pipes break open.	< 6.9
X	DISASTROUS	Ground cracks profusely; many buildings destroyed; liquefaction and landslides widespread.	< 7.3
XI	VERY DISASTROUS	Most buildings and bridges collapse; roads, railways, pipes and cables destroyed; general triggering of other hazards.	< 8.1
XII	CATASTROPHIC	Total destruction; trees fall; ground rises and falls in waves.	> 8.1

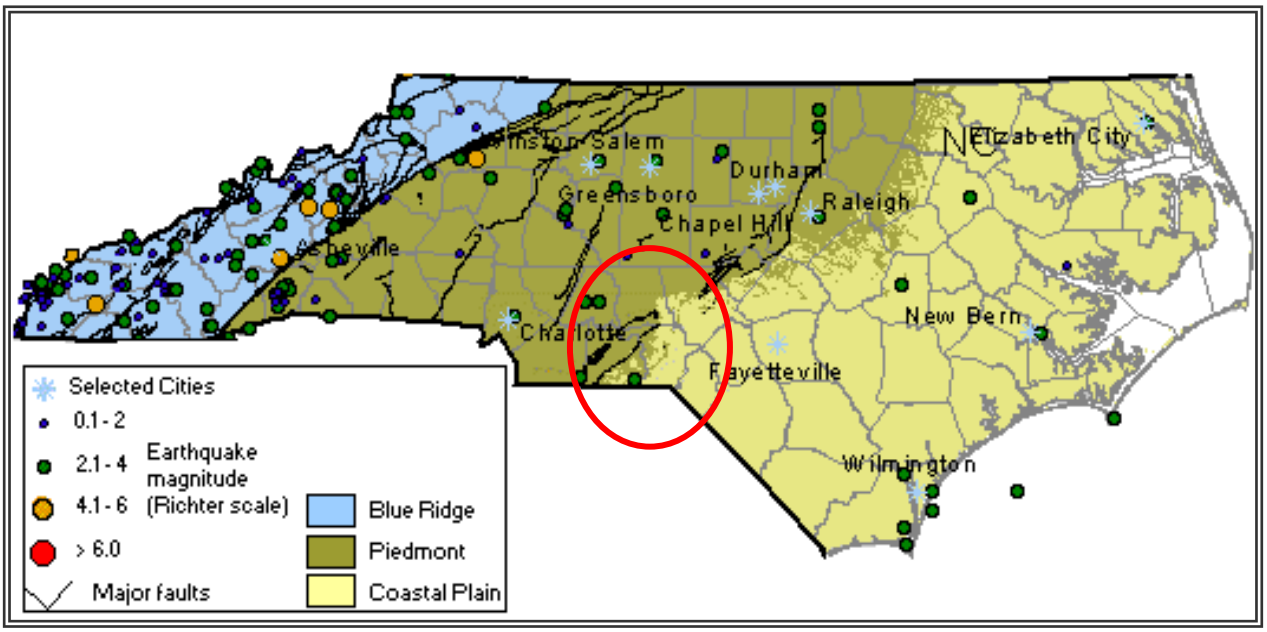
Source: Federal Emergency Management Agency

5.11.2 Location and Spatial Extent

Approximately two-thirds of North Carolina is subject to earthquakes, with the western and southeast region most vulnerable to a very damaging earthquake. The entire Pee Dee Lumber Region could be impacted by an earthquake, though damage is unlikely.

The state is affected by both the Charleston Fault in South Carolina and New Madrid Fault in Tennessee. Both of these faults have generated earthquakes measuring greater than 8 on the Richter Scale during the last 200 years. In addition, there are several smaller fault lines throughout North Carolina. **Figure 5.22** is a map showing geological and seismic information for North Carolina.

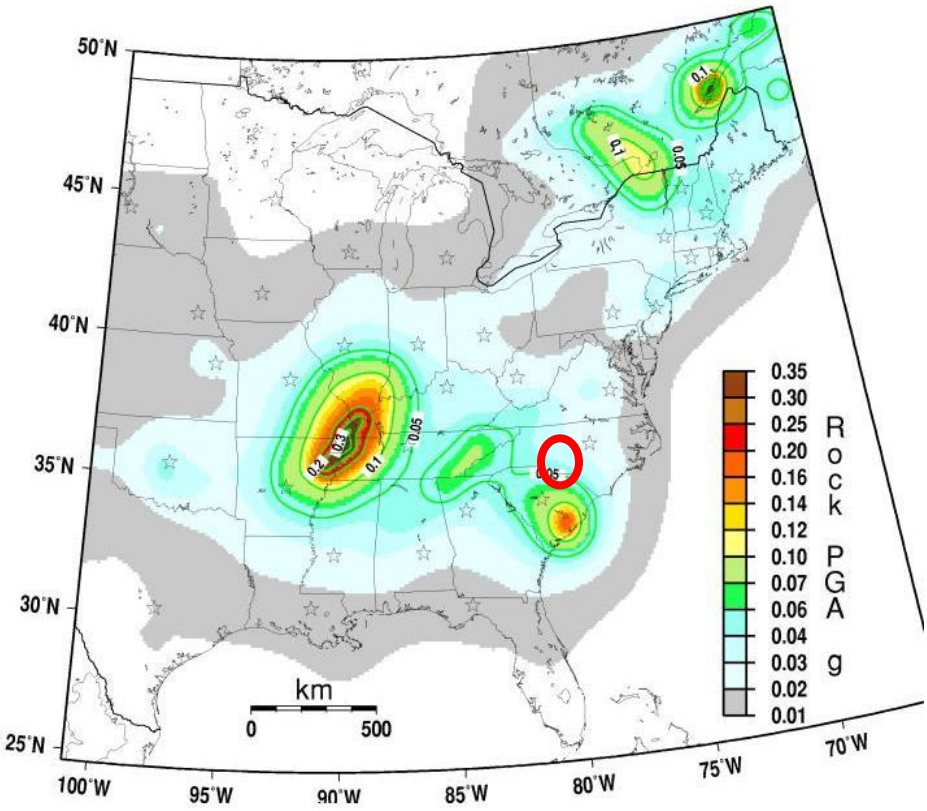
FIGURE 5.22: GEOLOGICAL AND SEISMIC INFORMATION FOR NORTH CAROLINA



Source: North Carolina Geological Survey

Figure 5.23 shows the intensity level associated with the Pee Dee Lumber Region, based on the national USGS map of peak acceleration with 10 percent probability of exceedance in 50 years. It is the probability that ground motion will reach a certain level during an earthquake. The data show peak horizontal ground acceleration (the fastest measured change in speed, for a particle at ground level that is moving horizontally due to an earthquake) with a 10 percent probability of exceedance in 50 years. The map was compiled by the U.S. Geological Survey (USGS) Geologic Hazards Team, which conducts global investigations of earthquake, geomagnetic, and landslide hazards. According to this map, all of the Pee Dee Lumber Region lies within an approximate zone of level "3" to "4" ground acceleration. This indicates that the region as a whole exists within an area of moderate seismic risk.

FIGURE 5.23: PEAK ACCELERATION WITH 10 PERCENT PROBABILITY OF EXCEEDANCE IN 50 YEARS



Source: USGS, 2008
(Planning area highlighted in red)

5.11.3 Historical Occurrences

At least 14 earthquakes are known to have affected the Pee Dee Lumber Region since 1886. The strongest of these measured a VII on the Modified Mercalli Intensity (MMI) scale. **Table 5.29** provides a summary of earthquake events reported by the National Geophysical Data Center between 1638 and 1985. **Table 5.30** presents a detailed occurrence of each event including the date, distance for the epicenter, and Modified Mercalli Intensity (if known). [14] **Figure 5.24** shows a view of a portion of the fault lines and epicenters on the east coast where the planning area would most likely experience an earthquake from. **Figures 5.25, 5.26, 5.27** and **5.28** show the peak ground acceleration for each County

[14] Due to reporting mechanisms, not all earthquakes events were recorded during this time. Furthermore, some are missing data, such as the epicenter location, due to a lack of widely used technology. In these instances, a value of "unknown" is reported.

FIGURE 5.24: EARTHQUAKE HAZARD MAP

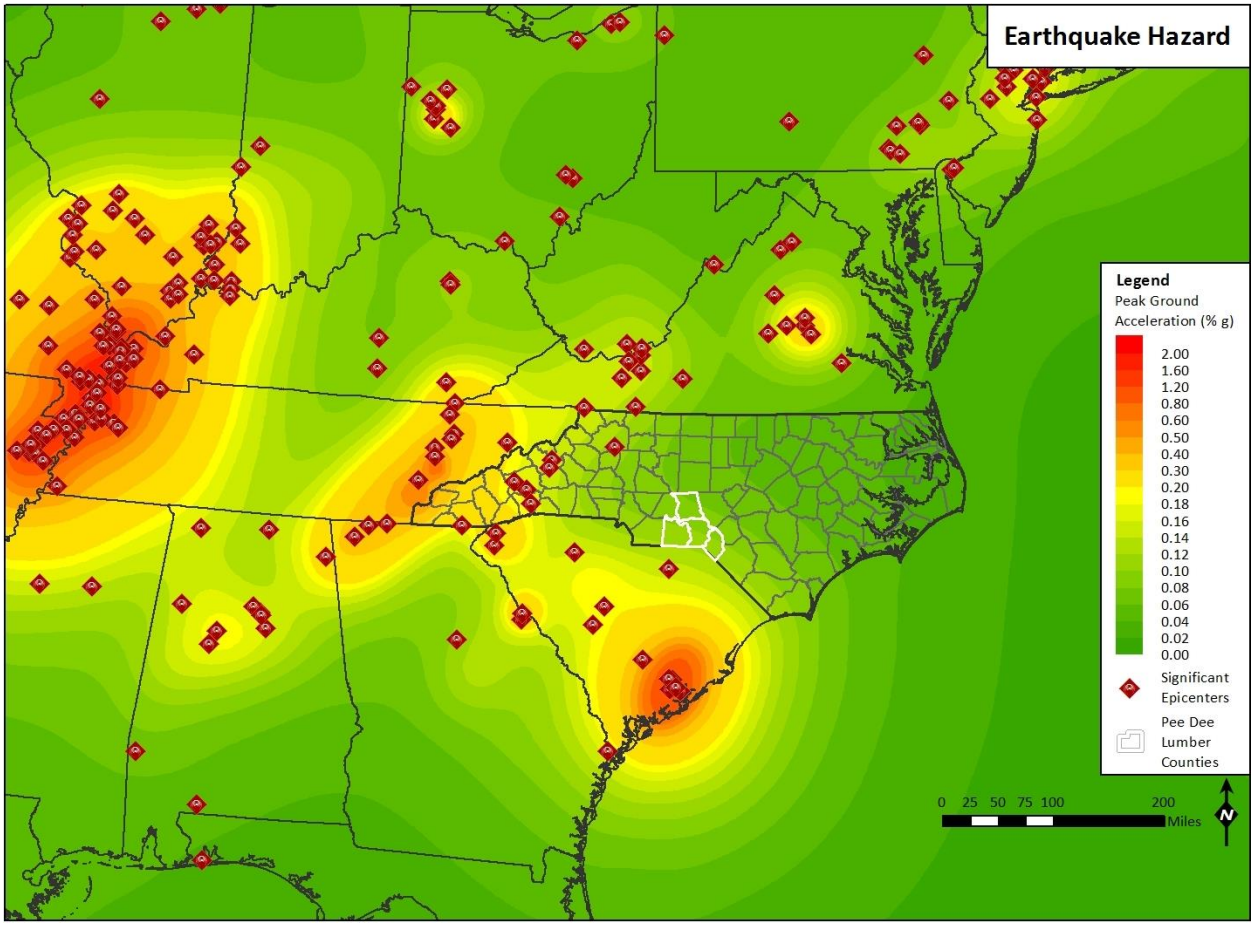


FIGURE 5.25: EARTHQUAKE HAZARD MAP ANSON COUNTY

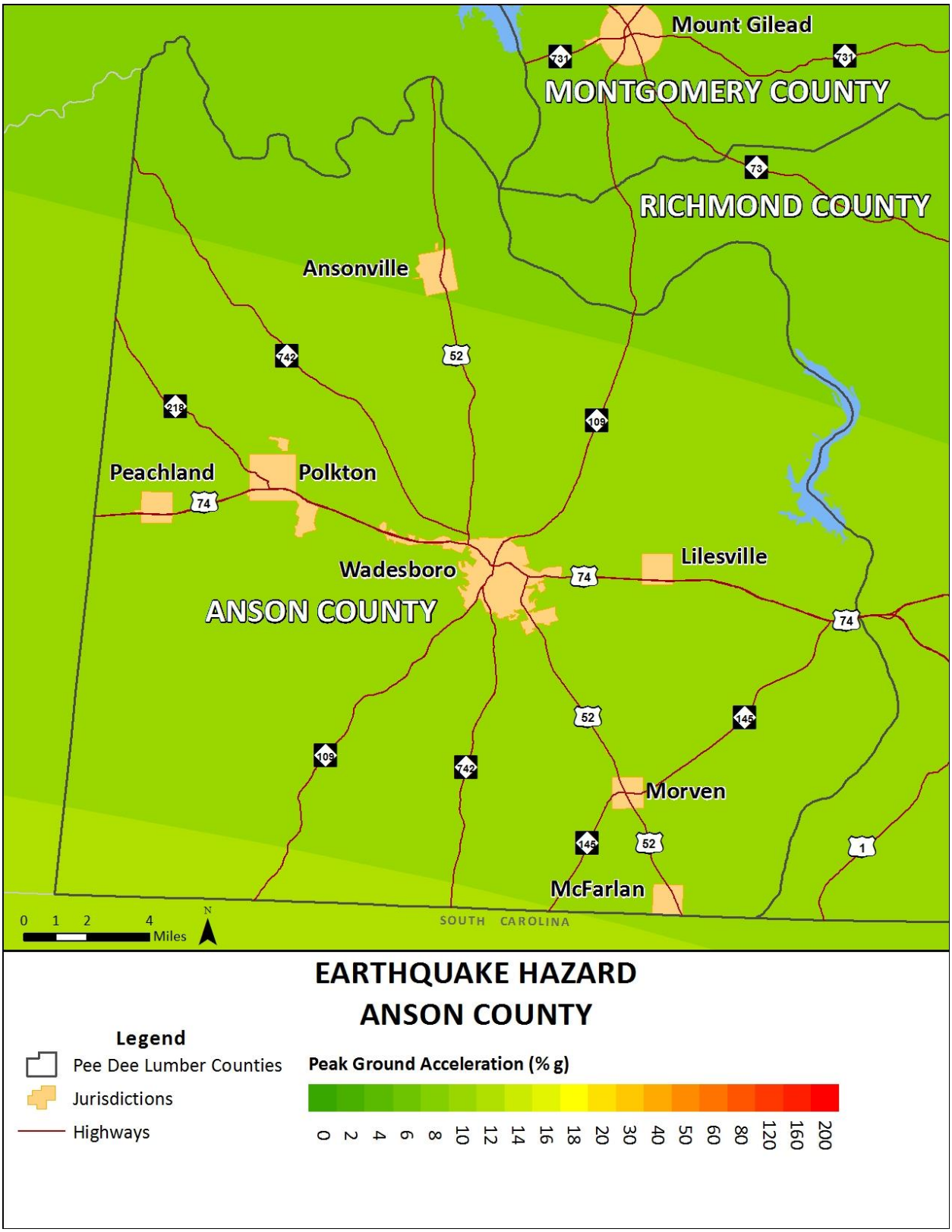


FIGURE 5.26: EARTHQUAKE HAZARD MAP MONTGOMERY COUNTY

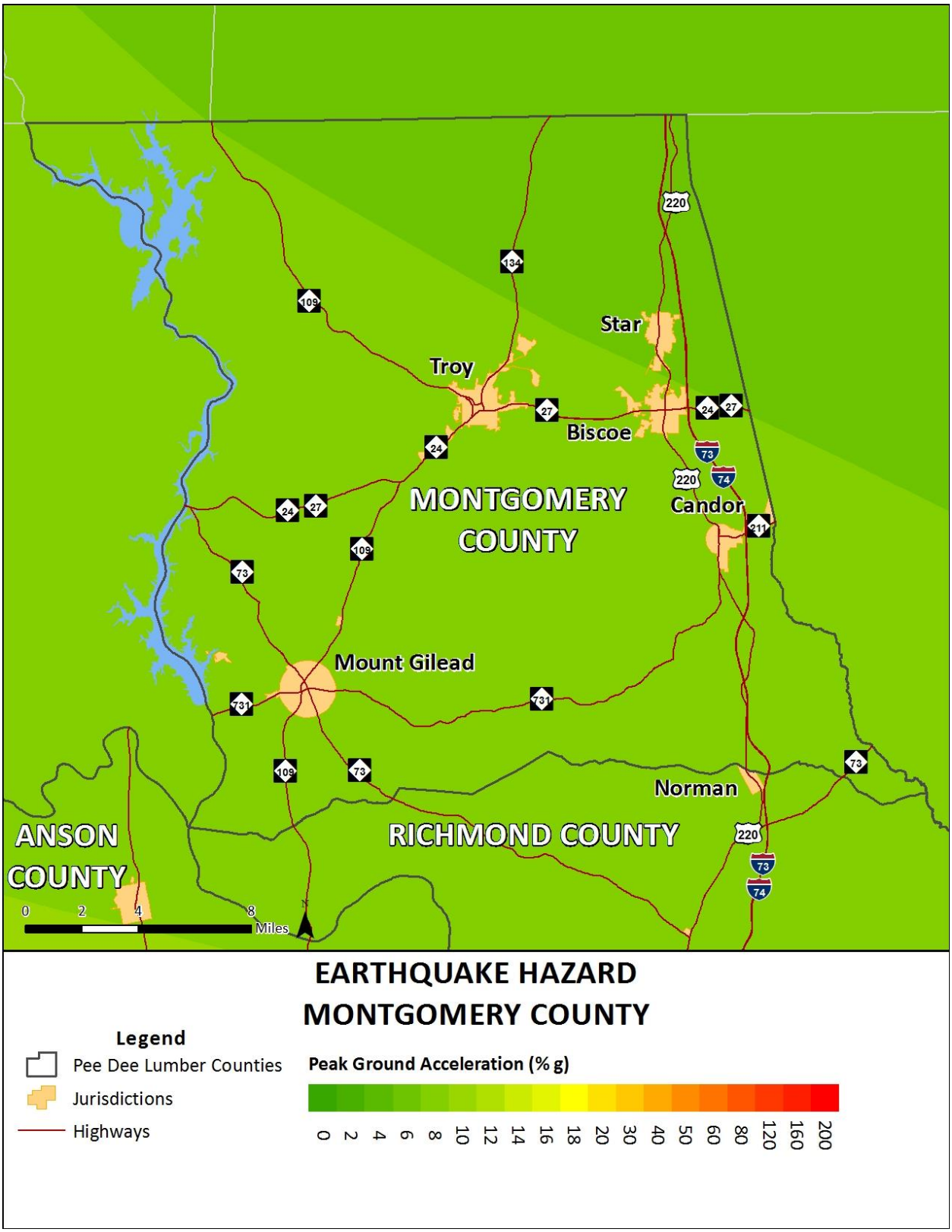


FIGURE 5.27: EARTHQUAKE HAZARD MAP RICHMOND COUNTY

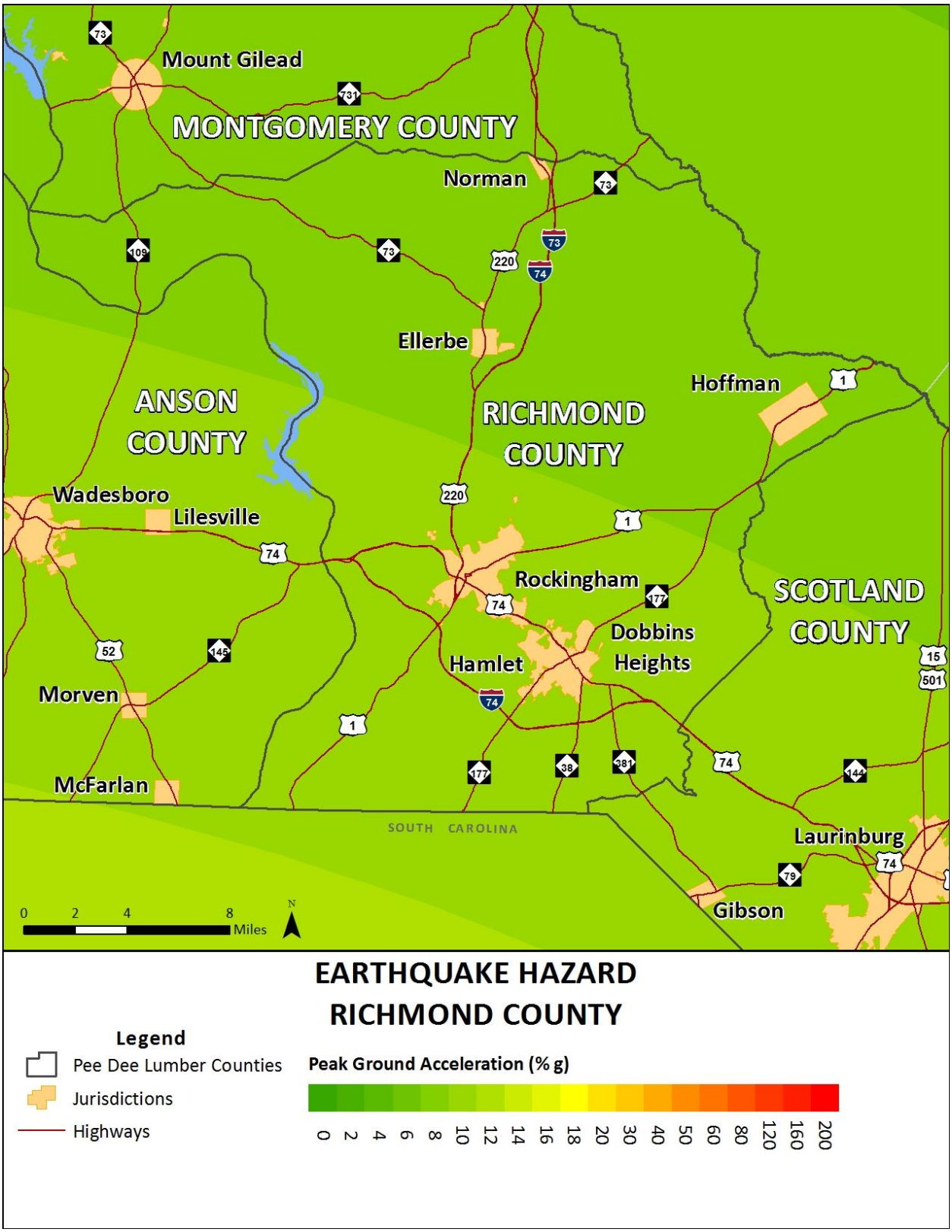


FIGURE 5.28: EARTHQUAKE HAZARD MAP SCOTLAND COUNTY

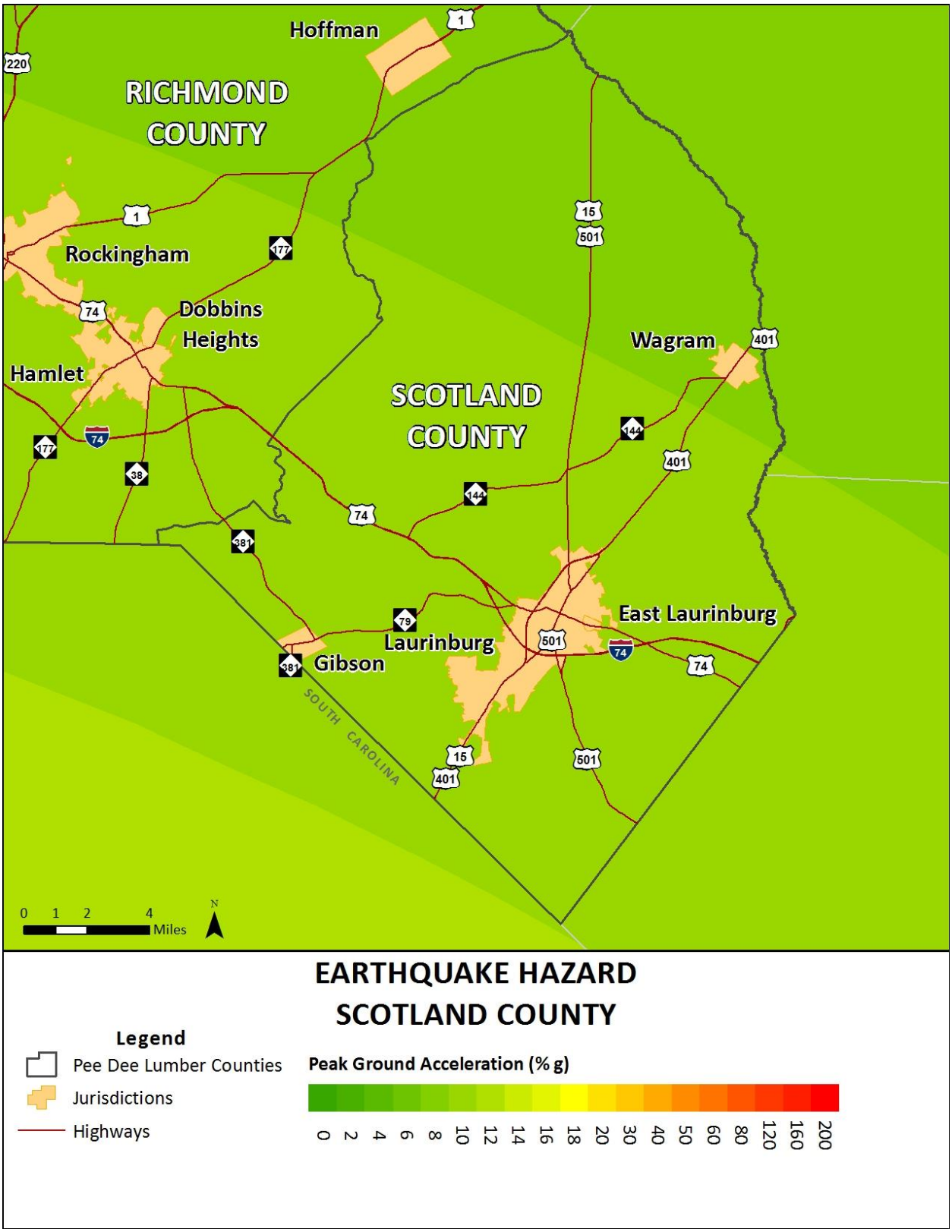


TABLE 5.27: SUMMARY OF SEISMIC ACTIVITY IN THE PEE DEE LUMBER REGION

Location	Number of Occurrences	Greatest MMI Reported	Richter Scale Equivalent
Anson County	**5**	**VI (strong)**	**< 5.4**
Ansonville	1	VI	
Lilesville	1	III	
McFarlan	1	IV	
Morven	1	IV	
Peachland	0	--	
Polkton	0	--	
Wadesboro	1	V	
Unincorporated Area	0	--	
Montgomery County	**1**	**VII (very strong)**	**< 6.1**
Biscoe	0	--	
Candor	0	--	
Mount Gilead	0	--	
Star	0	--	
Troy	1	VII	
Unincorporated Area	0	--	
Richmond County	**5**	**V (slightly strong)**	< 4.8
Dobbins Heights	0	--	
Ellerbe	2	IV	
Hamlet	1	IV	
Hoffman	0	--	
Norman	0	--	
Rockingham	1	V	
Unincorporated Area	0	--	
Scotland County	**3**	**VI (strong)**	**< 5.4**
East Laurinburg	0	--	
Gibson	2	III	
Laurinburg	1	VI	
Wagram	0	--	
Unincorporated Area	0	--	
PEE DEE LUMBER REGION TOTAL	**14**	**VII**	**< 6.1**

Source: National Geophysical Data Center

TABLE 5.28: SIGNIFICANT SEISMIC EVENTS IN THE PEE DEE LUMBER REGION (1638 -1985)

Location	Date	MMI
Anson County		
Ansonville	9/1/1886	VI
Wadesboro	9/1/1886	V
Lilesville	10/27/1959	III
McFarlan	10/27/1959	IV
Morven	10/27/1959	IV
Montgomery County		
Troy	9/1/1886	VII

Location	Date	MMI
Richmond County		
Rockingham	9/1/1886	V
Ellerbe	10/27/1959	IV
Hamlet	10/27/1959	IV
Rockingham	10/27/1959	IV
Ellerbe	11/20/1969	IV
Scotland County		
Laurinburg	9/1/1886	VI
Gibson	10/27/1959	III
Gibson	11/22/1974	IV

In addition to those earthquakes specifically affecting the Pee Dee Lumber Region, a list of earthquakes that have caused damage throughout North Carolina is presented below in **Table 5.31.**

TABLE 5.29: EARTHQUAKES WHICH HAVE CAUSED DAMAGE IN NORTH CAROLINA

Date	Location	Richter Scale (Magnitude)	MMI (Intensity)	MMI in North Carolina
12/16/1811 - 2	NE Arkansas	8.0	X	VI
12/18/1811 - 3	NE Arkansas	8.0	X	VI
01/23/1812	New Madrid, MO	8.4	XI	VI
02/071812	New Madrid, MO	8.7	XII	VI
04/29/1852	Wytheville, VA	5.0	VI	VI
08/31/1861	Wilkesboro, NC	5.1	VII	VII
12/23/1875	Central Virginia	5.0	VII	VI
08/31/1886	Charleston, SC	7.3	X	VII
05/31/1897	Giles County, VA	5.8	VIII	VI
01/01/1913	Union County, SC	4.8	VII	VI
02/21/1916	Asheville, NC	5.5	VII	VII
07/08/1926	Mitchell County, NC	5.2	VII	VII
11/03/1928	Newport, TN	4.5	VI	VI
05/13/1957	McDowell County, NC	4.1	VI	VI
07/02/1957	Buncombe County, NC	3.7	VI	VI
11/24/1957	Jackson County, NC	4.0	VI	VI
10/27/1959 *†	Chesterfield, SC	4.0	VI	VI
07/13/1971	Newry, SC	3.8	VI	VI
11/30/1973	Alcoa, TN	4.6	VI	VI
11/13/1976	Southwest Virginia	4.1	VI	VI
05/05/1981	Henderson County, NC	3.5	VI	VI

*This event is accounted for in the Pee Dee Lumber occurrences.

†Conflicting reports on this event, intensity in North Carolina could have been either V or VI

Source: This information compiled by Dr. Kenneth B. Taylor and provided by Tiawana Ramsey of NCEM. Information was compiled from the National Earthquake Center, Earthquakes of the US by Carl von Hake (1983), and a compilation of newspaper reports in the Eastern Tennessee Seismic Zone compiled by Arch Johnston, CERI, Memphis State University (1983).

5.11.4 Probability of Future Occurrences

The probability of significant, damaging earthquake events affecting the Pee Dee Lumber is unlikely. However, it is likely that future earthquakes resulting in light to moderate perceived shaking and damages ranging from none to very light will affect the region. The annual probability level for the region is estimated between 1 and 10 percent (possible).

5.12 LANDSLIDE

5.12.1 Background

A landslide is the downward and outward movement of slope-forming soil, rock, and vegetation, which is driven by gravity. Landslides may be triggered by both natural and human-caused changes in the environment, including heavy rain, rapid snow melt, steepening of slopes due to construction or erosion, earthquakes, volcanic eruptions, and changes in groundwater levels.

There are several types of landslides: rock falls, rock topple, slides, and flows. Rock falls are rapid movements of bedrock, which result in bouncing or rolling. A topple is a section or block of rock that rotates or tilts before falling to the slope below. Slides are movements of soil or rock along a distinct surface of rupture, which separates the slide material from the more stable underlying material. Mudflows, sometimes referred to as mudslides, mudflows, lahars or debris avalanches, are fast-moving rivers of rock, earth, and other debris saturated with water. They develop when water rapidly accumulates in the ground, such as heavy rainfall or rapid snowmelt, changing the soil into a flowing river of mud or “slurry.” Slurry can flow rapidly down slopes or through channels and can strike with little or no warning at avalanche speeds. Slurry can travel several miles from its source, growing in size as it picks up trees, cars, and other materials along the way. As the flows reach flatter ground, the mudflow spreads over a broad area where it can accumulate in thick deposits.

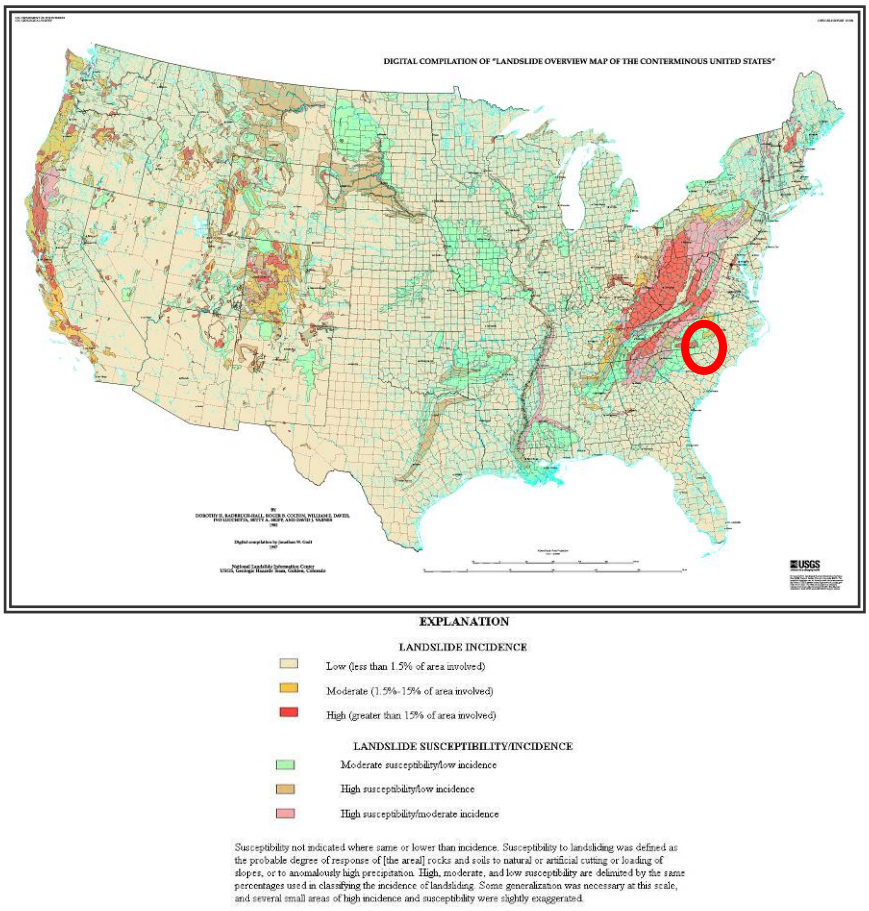
Landslides are typically associated with periods of heavy rainfall or rapid snow melt and tend to worsen the effects of flooding that often accompanies these events. In areas burned by forest and brush fires, a lower threshold of precipitation may initiate landslides. Some landslides move slowly and cause damage gradually, whereas others move so rapidly that they can destroy property and take lives suddenly and unexpectedly.

Among the most destructive types of debris flows are those that accompany volcanic eruptions. A spectacular example in the United States was a massive debris flow resulting from the 1980 eruptions of Mount St. Helens, Washington. Areas near the bases of many volcanoes in the Cascade Mountain Range of California, Oregon, and Washington are at risk from the same types of flows during future volcanic eruptions.

Areas that are generally prone to landslide hazards include previous landslide areas, the bases of steep slopes, the bases of drainage channels, and developed hillsides where leach-field septic systems are used. Areas that are typically considered safe from landslides include areas that have not moved in the past, relatively flat-lying areas away from sudden changes in slope, and areas at the top or along ridges set back from the tops of slopes.

According to the United States Geological Survey, each year landslides cause $5.1 billion (2009 dollars) in damage and between 25 and 50 deaths in the United States.[15] **Figure 5.29**delineates areas where large numbers of landslides have occurred and areas that are susceptible to landsliding in the conterminous United States.[16]

FIGURE 5.29: LANDSLIDE OVERVIEW MAP OF THE CONTERMINOUS UNITED STATES



Source: USGS
(Planning area highlighted in red)

5.12.2 Location and Spatial Extent

Landslides occur along steep slopes when the pull of gravity can no longer be resisted (often due to heavy rain throughout the Appalachian Mountain region). Human development can also exacerbate risk by building on previously undevelopable steep slopes and constructing roads by cutting through mountains.

According to **Figures 5.30, 5.31, 5.32, 5.33** and **5.34** below, the greatest landside activity occurs in the northwestern corner of the region, including parts of Anson County and Montgomery County. The

[15] United States Geological Survey (USGS). United States Department of the Interior. "Landslide Hazards – A National Threat." 2005.
[16] This map layer is provided in the U.S. Geological Survey Professional Paper 1183, Landslide Overview Map of the Conterminous United States, available online at: http://landslides.usgs.gov/html_files/landslides/nationalmap/national.html.

remainder of the region has a low incidence occurrence rate; however, the northwestern half has moderate susceptibility to landslides. This also indicates that landslides are possible throughout the Pee Dee Lumber Region. However, areas with steep slopes are more susceptible to this hazard. Historical occurrence information and generally flat topography indicate very little landsliding activity.

FIGURE 5.30: LANDSLIDE SUSCEPTIBILITY MAP OF THE PEE DEE LUMBER REGION

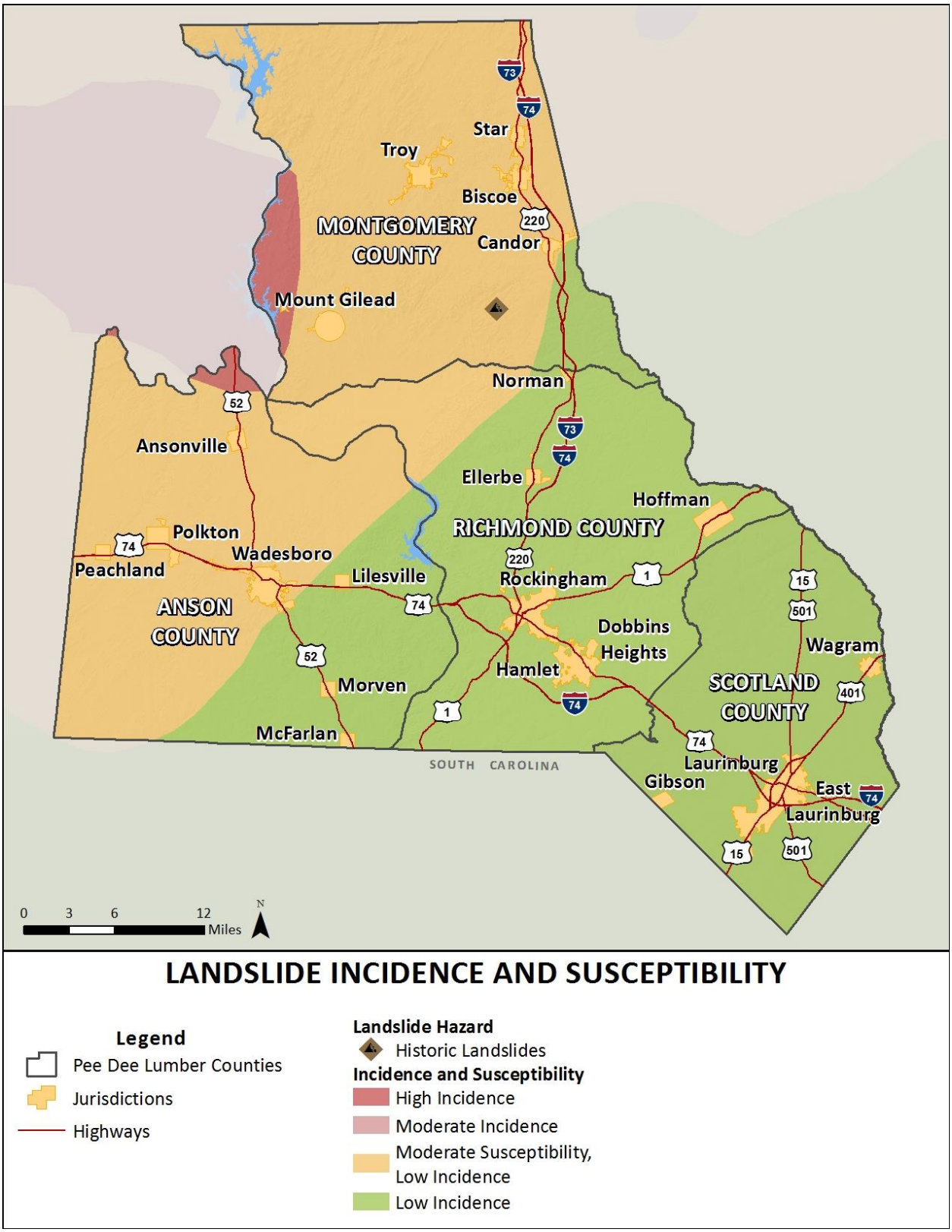


FIGURE 5.31: LANDSLIDE SUSCEPTIBILITY MAP OF ANSON COUNTY

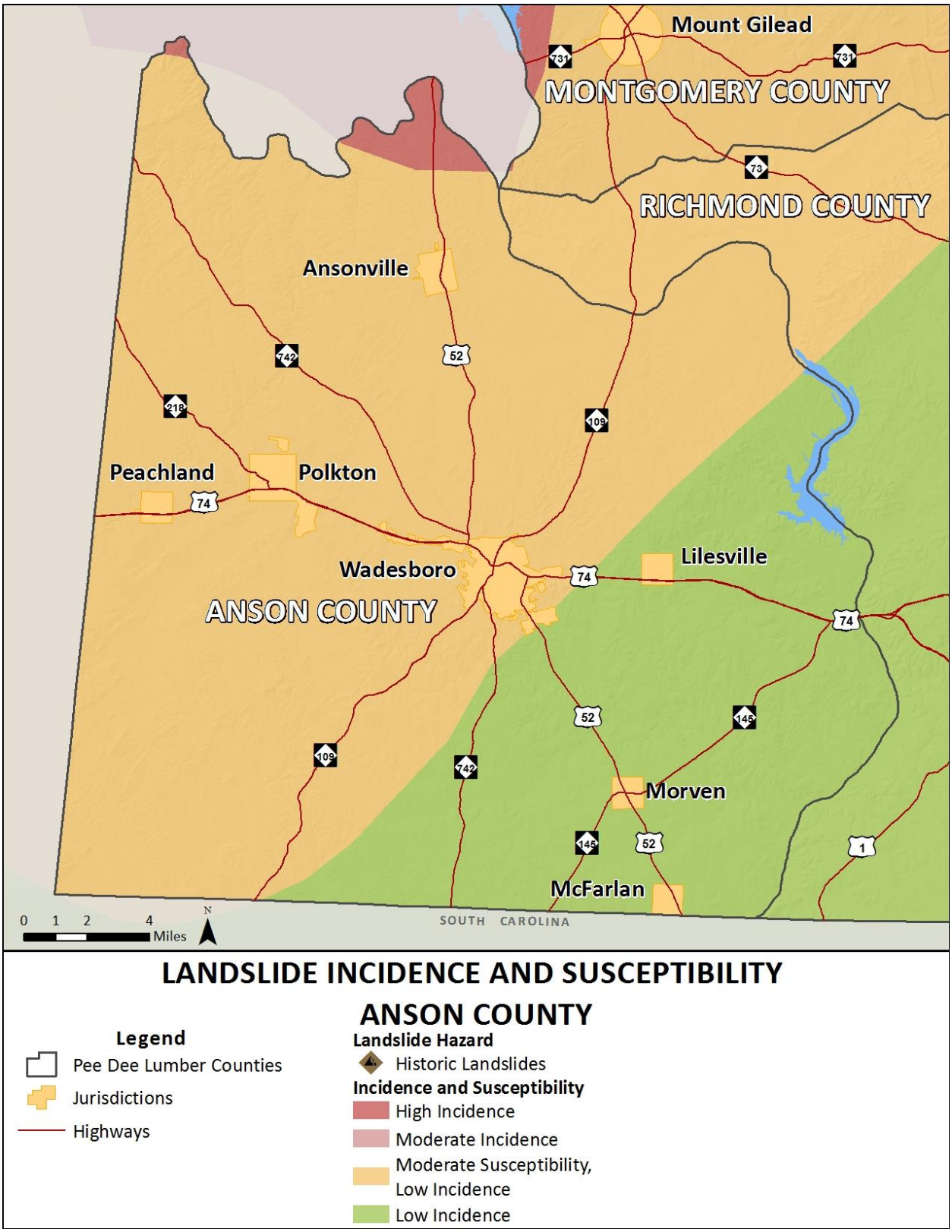


FIGURE 5.32: LANDSLIDE SUSCEPTIBILITY MAP OF MONTGOMERY COUNTY

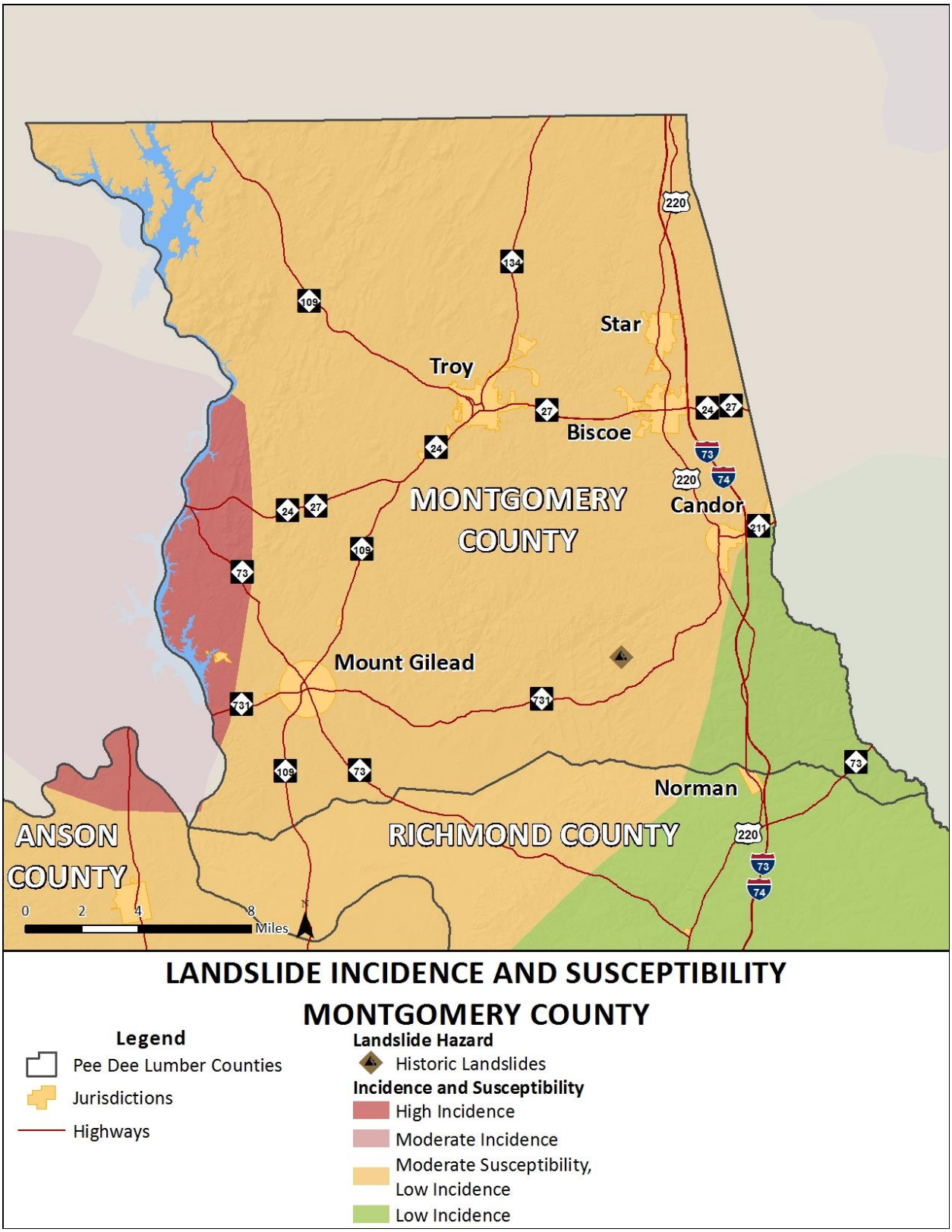


FIGURE 5.33: LANDSLIDE SUSCEPTIBILITY MAP OF RICHMOND COUNTY

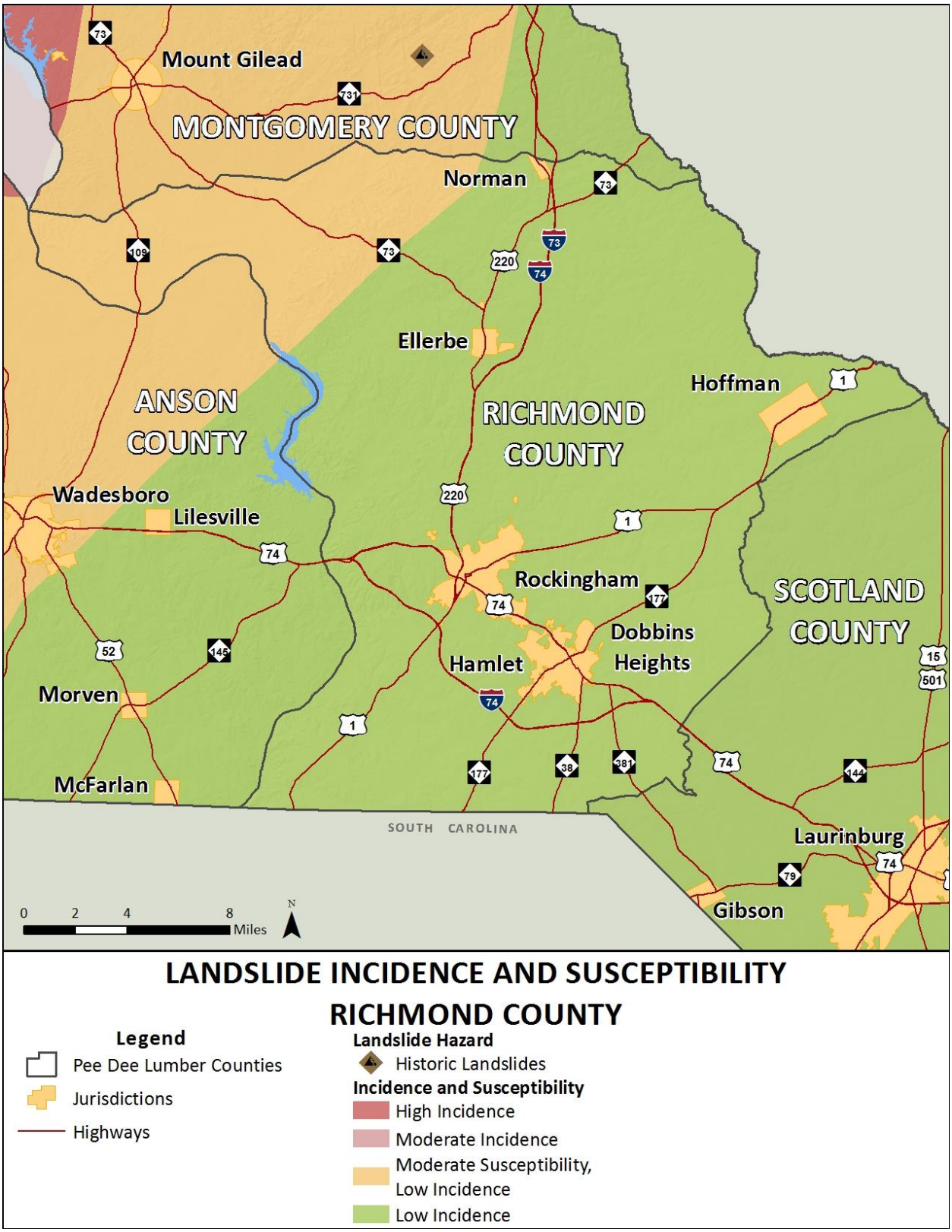
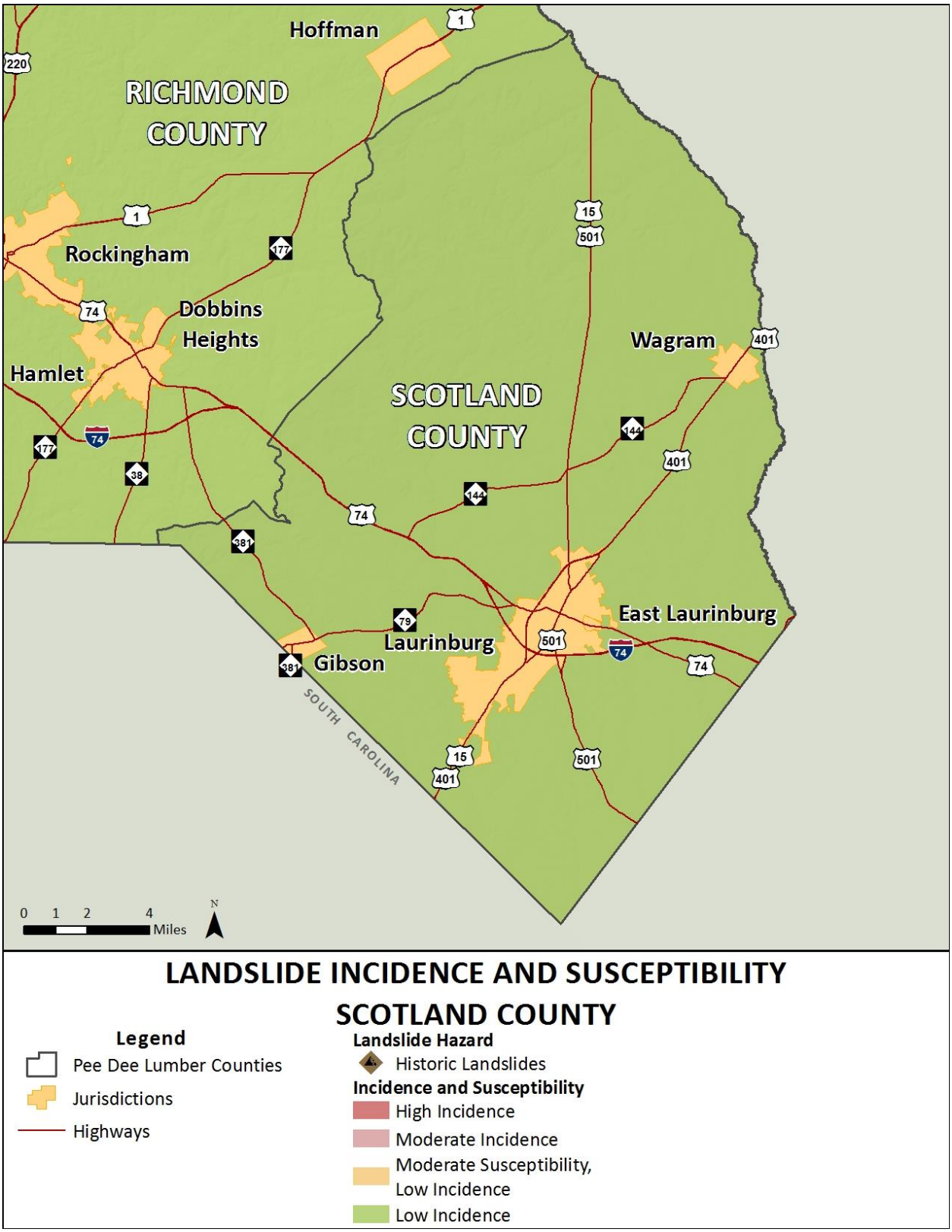


FIGURE 5.34: LANDSLIDE SUSCEPTIBILITY MAP OF SCOTLAND COUNTY



Source: Susceptibility – USGS; historical occurrence – North Carolina Geological Survey

5.12.3 Historical Occurrences

As shown in **Figure 5.34** above, just one landslide event has been reported in the region. No damage or injuries were reported with this event.

After reaching out to USGS, at this time North Carolina does not collect data on landslide events.

5.12.4 Probability of Future Occurrences

Based on historical information and the USGS susceptibility index, the probability of future landslide events is unlikely (less than one percent annual probability). Local conditions may become more favorable for landslides due to heavy rain, for example. This would increase the likelihood of occurrence. It should also be noted that some areas in the Pee Dee Lumber Region have greater risk than others given factors such as steepness on slope and modification of slopes.

HYDROLOGIC HAZARDS

5.13 DAM AND LEVEE FAILURE

5.13.1 Background

Worldwide interest in dam and levee safety has risen significantly in recent years. Aging infrastructure, new hydrologic information, and population growth in floodplain areas downstream from dams and near levees have resulted in an increased emphasis on safety, operation, and maintenance.

There are approximately 80,000 dams in the United States today, the majority of which are privately owned. Other owners include state and local authorities, public utilities, and federal agencies. The benefits of dams are numerous: they provide water for drinking, navigation, and agricultural irrigation. Dams also provide hydroelectric power, create lakes for fishing and recreation, and save lives by preventing or reducing floods.

Though dams have many benefits, they also can pose a risk to communities if not designed, operated, and maintained properly. In the event of a dam failure, the energy of the water stored behind even a small dam is capable of causing loss of life and great property damage if development exists downstream. If a levee breaks, scores of properties may become submerged in floodwaters and residents may become trapped by rapidly rising water. The failure of dams and levees has the potential to place large numbers of people and great amounts of property in harm's way.

5.13.2 Location and Spatial Extent

The North Carolina Division of Land Resources provides information on dams, including a hazard potential classification. There are three hazard classifications—high, intermediate, and low—that correspond to qualitative descriptions and quantitative guidelines. **Table 5.32** explains these classifications.

TABLE 5.30: NORTH CAROLINA 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
High	Loss of human life*	Probable loss of 1 or more human lives
	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: North Carolina Division of Land Resources

According to the North Carolina Division of Land Management, there are 24 high hazard dams in the Pee Dee Lumber Region.[17] The Richmond Mill Dam in Scotland County was also reported as a critical facility in Scotland County. **Figures 5.35, 5.36, 5.37, 5.38** and **5.39** shows the dam location for most dams in the region. These high hazard dams are listed in **Table 5.33**. According to a consensus of local government officials and the Regional Mitigation Planning Committee, a majority of these dams would not pose a threat in a breach or failure occurrence.

[17] The list of high hazard dams obtained from the North Carolina Division of Land Resources was reviewed and amended by local officials to the best of their knowledge and based on existing hazard mitigation plans.

FIGURE 5.35: PEE DEE LUMBER REGION DAM LOCATION AND HAZARD RANKING

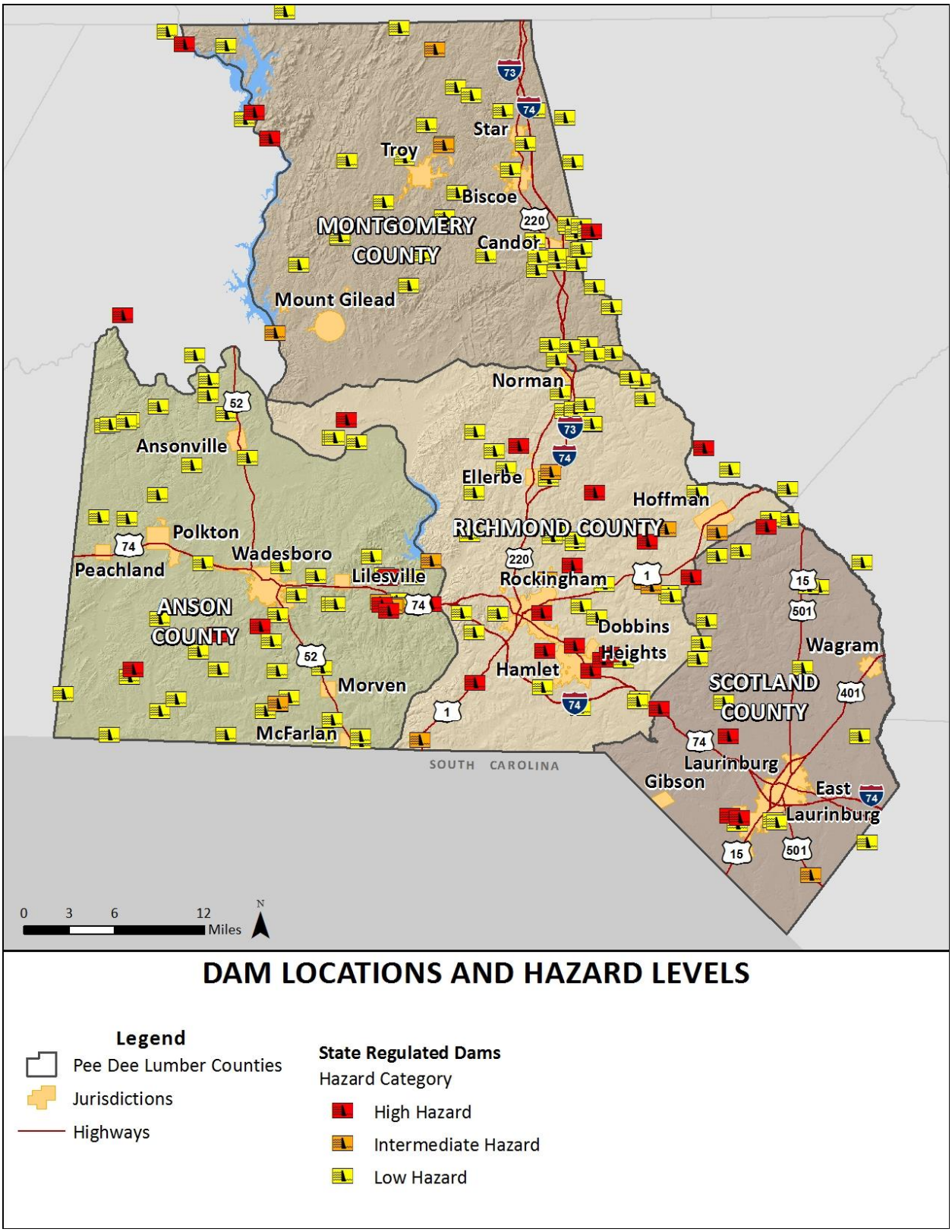


FIGURE 5.36: ANSON COUNTY DAM LOCATION AND HAZARD RANKING

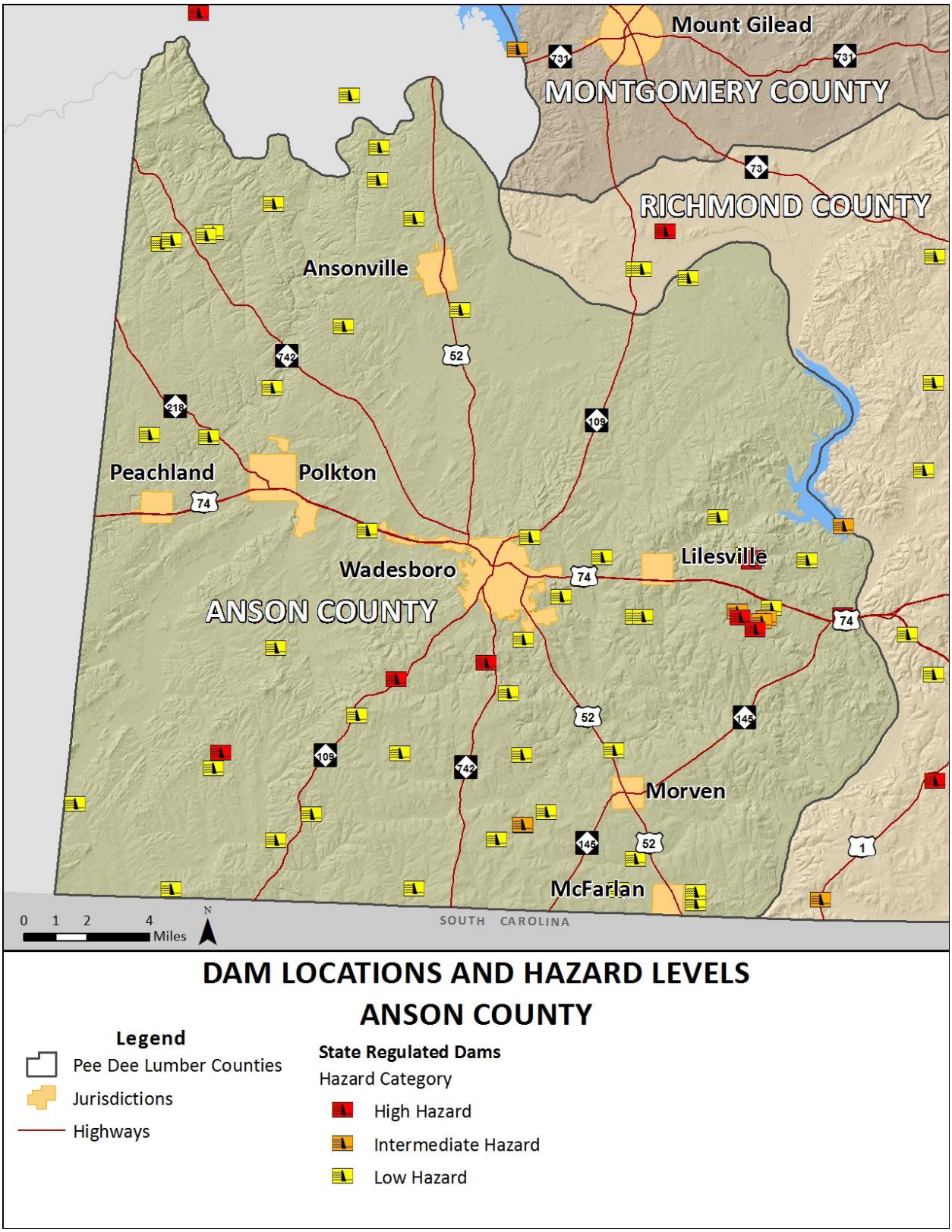


FIGURE 5.37: MONTGOMERY COUNTY DAM LOCATION AND HAZARD RANKING

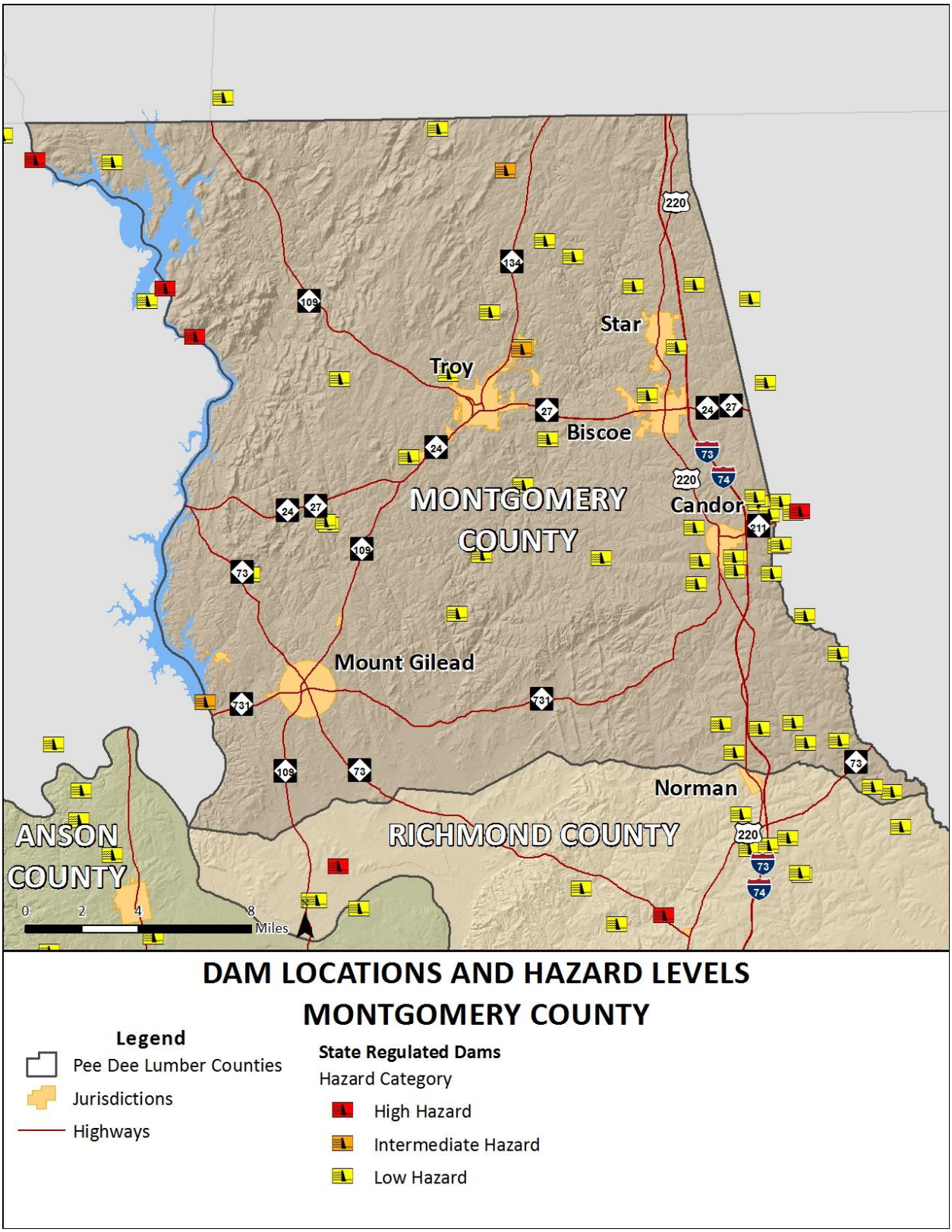


FIGURE 5.38: RICHMOND COUNTY DAM LOCATION AND HAZARD RANKING

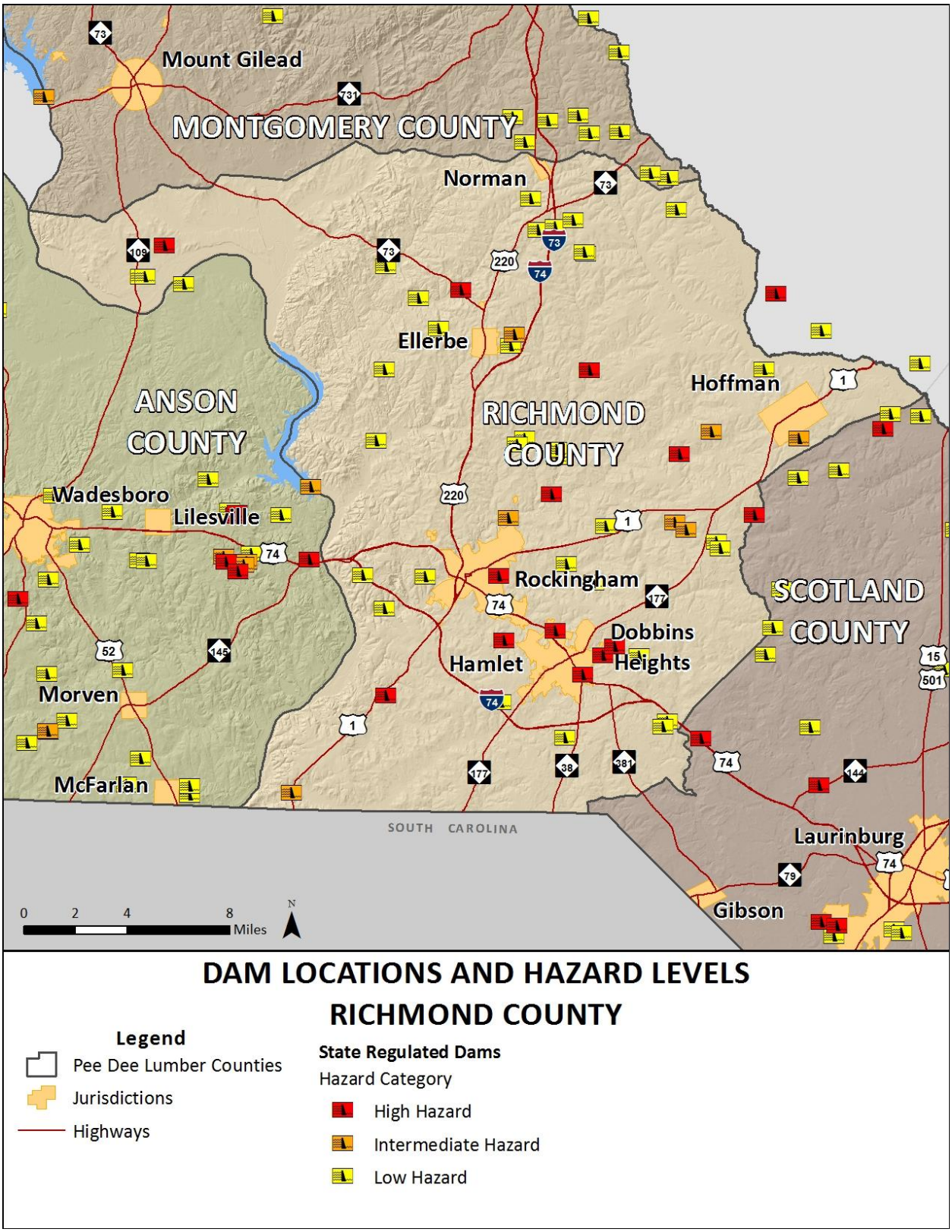
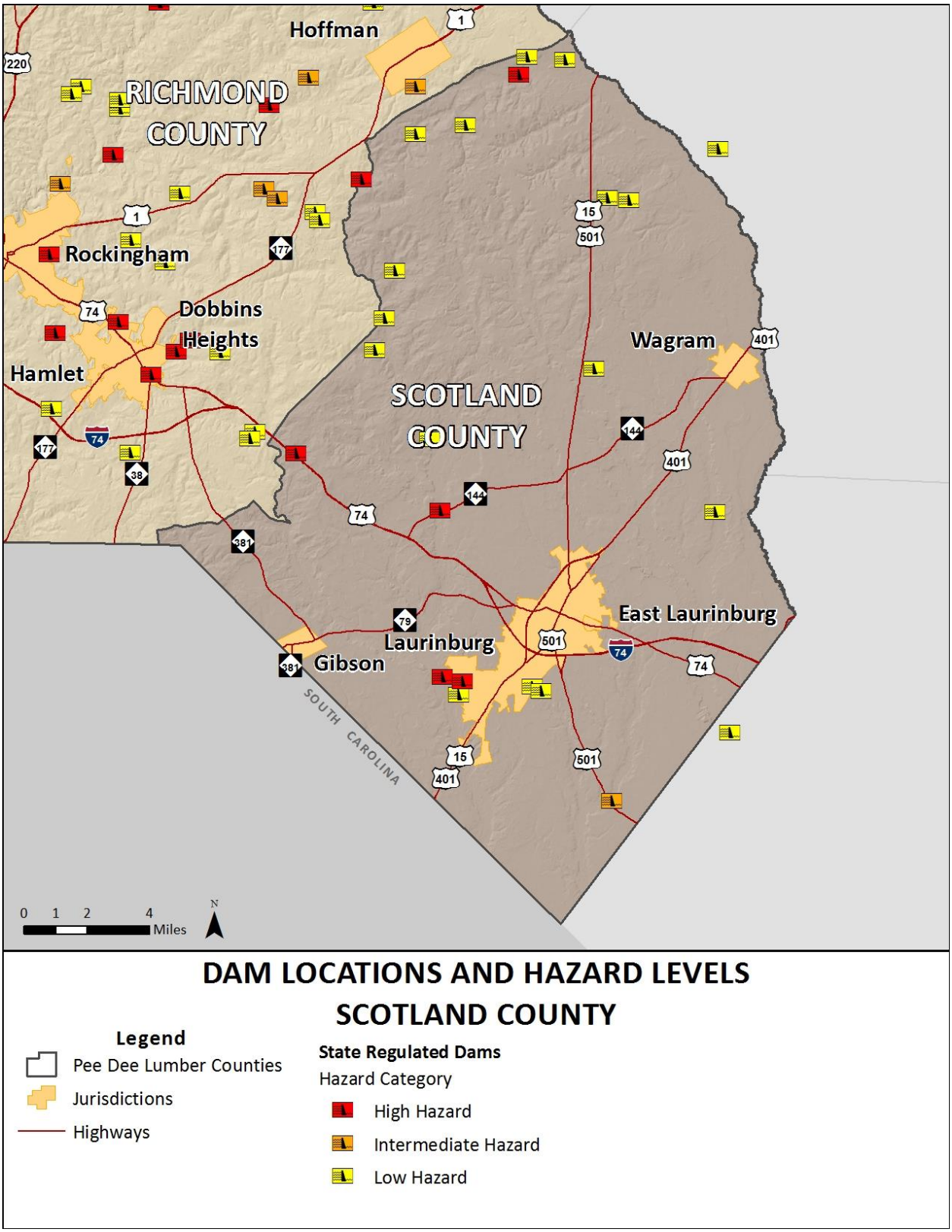


FIGURE 5.39: SCOTLAND COUNTY DAM LOCATION AND HAZARD RANKING



Source: North Carolina Division of Land Resource; existing plans

TABLE 5.31: PEE DEE LUMBER REGION HIGH HAZARD DAMS

Dam Name	Hazard Potential	Surface Area (acres)	Max Capacity (Ac-ft)
Anson County			
BONSAL TAILINGS DAM	High	8	252
BV HENDRICK TAILINGS DAM	High	570	*Listed as zero*
E&D SHEPPARD DAM	High	3	24
LITTLE LAKE DAM	High	3	70
WADESBORO LAKE DAM	High	80	84
WHITE STORE LAKE DAM	High	28	291
Montgomery County			
YADKIN FALLS DAM	High	204	unknown
YADKIN NARROW DAM	High	5,355	unknown
TILLERY DAM	High	5,260	0 (unreported)
Richmond County			
BLEWETT FALLS DAM	High	2,560	0 (unreported)
LEDBETTER LAKE DAM	High	*Listed as zero*	*Listed as zero*
ROBERDALE DAM		80	1312
HAMLET CITY LAKE DAM	High	*Listed as zero*	*Listed as zero*
BOYD LAKE DAM	High	*Listed as zero*	*Listed as zero*
HAMLET CITY LAKE UPPER	High	*Listed as zero*	*Listed as zero*
WALL LAKE DAM	High	13	92
RANKIN DAM	High	*Listed as zero*	*Listed as zero*
MCKINNEY LAKE DAM	High	73	824
HINSON LAKE DAM	High	*Listed as zero*	*Listed as zero*
WIGGINS LAKE DAM	High	*Listed as zero*	11
MILLSTONE 4-H CAMPUS	High	*Listed as zero*	38
Scotland County			
RICHMOND MILL DAM	High	300	1382
BIG MUDDY LAKE BRAGG	High	60	569
FAIR LAKE DAM	High	8	54
FAMILY WORSHIP CENTER CHURCH LAKE DAM	High	9	43

Source: North Carolina Division of Land Management (2002); associated information (Hazus-MH)

5.13.3 Historical Occurrences

The Ledbetter Lake Dam near Rockingham (Richmond County) was leaking in the past. According to an article from the Richmond County Daily Journal, the leak was considered a level two event, indicating that immediate failure is not expected but failure in the near future was a possibility.[18] Richmond County Emergency Services contacted NCDENR and nearby residents. Owners of the dam lowered the lake level and hired an engineer to further assess the structural integrity of the dam. The 37-foot dam was built in the late 1800's, so it is aging. Richmond County emergency officials notified nearby residents; officials estimate only five to six houses are in the flood hazard area. The photos below

indicate the dam and leak.[18] From 2016 to 2017 the dam was successfully repaired and is no longer leaking.

There has been one failure that occurred with a private owned dam discussed in a meeting with the planning committee but no other data is available for further analysis. No additional leaks or breaches have been reported in the Region.





5.13.4 Probability of Future Occurrence

Given the current dam inventory and historic data, a dam breach is unlikely (less than 1 percent annual probability) in the future. However, several dams do pose a significant threat included Yakin Narrow Dam, Tillery Dam, and Blewett Falls Dam. No further analysis will be completed in Section 6: *Vulnerability Assessment* as more sophisticated dam breach plans (typically completed by the U.S. Army Corp of Engineers) are in place for the dams of concern in the region.

5.14 EROSION

5.14.1 Background

Erosion is the gradual breakdown and movement of land due to both physical and chemical processes of water, wind, and general meteorological conditions. Natural, or geologic, erosion has occurred since the Earth's formation and continues at a very slow and uniform rate each year.

There are two types of soil erosion: wind erosion and water erosion. Wind erosion can cause significant soil loss. Winds blowing across sparsely vegetated or disturbed land can pick up soil particles and carry them through the air, thus displacing them. Water erosion can occur over land or in streams and

[18]Kurry, Dawn (18 July 2012). Ledbetter Dam is Leaking. YourDailyJournal.com (Richmond Daily Journal). http://www.yourdailyjournal.com/view/full_story/19436064/article-Ledbetter-Dam-is-leaking?instance=popular

channels. Water erosion that takes place over land may result from raindrops, shallow sheets of water flowing off the land, or shallow surface flow, which becomes concentrated in low spots. Stream channel erosion may occur as the volume and velocity of water flow increases enough to cause movement of the streambed and bank soils. Major storms, such hurricanes in coastal areas, may cause significant erosion by combining high winds with heavy surf and storm surge to significantly impact the shoreline.

An area's potential for erosion is determined by four factors: soil characteristics, vegetative cover, topography climate or rainfall, and topography. Soils composed of a large percentage of silt and fine sand are most susceptible to erosion. As the clay and organic content of these soils increases, the potential for erosion decreases. Well-drained and well-graded gravels and gravel-sand mixtures are the least likely to erode. Coarse gravel soils are highly permeable and have a good capacity for absorption, which can prevent or delay the amount of surface runoff. Vegetative cover can be very helpful in controlling erosion by shielding the soil surface from falling rain, absorbing water from the soil, and slowing the velocity of runoff. Runoff is also affected by the topography of the area including size, shape, and slope. The greater the slope length and gradient, the more potential an area has for erosion. Climate can affect the amount of runoff, especially the frequency, intensity, and duration of rainfall and storms. When rainstorms are frequent, intense, or of long duration, erosion risks are high. Seasonal changes in temperature and rainfall amounts define the period of highest erosion risk of the year.

During the past 20 years, the importance of erosion control has gained the increased attention of the public. Implementation of erosion control measures consistent with sound agricultural and construction operations is needed to minimize the adverse effects associated with harmful chemicals run-off due to wind or water events. The increase in government regulatory programs and public concern has resulted in a wide range of erosion control products, techniques, and analytical methodologies in the United States. The preferred method of erosion control in recent years has been the restoration of vegetation.

Sinkholes are mentioned in this section as an associated hazard to erosion. While sinkhole topography is not a major concern in the area, human-caused sinkholes are possible. The three general types of sinkholes are: subsidence, solution, and collapse. *Subsidence sinkholes* form gradually where the overburden (the sediments and water that rest on the limestone) 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. *Collapse sinkholes* are most common in areas where the overburden 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.

Sinkholes occur in many shapes, from steep-walled holes to bowl or cone shaped depressions. Sinkholes are 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 is exacerbated 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 and insurance claims for damages as a result of sinkholes has increased 1,200 percent from 1987 to 1991, costing nearly $100 million.
Human-caused sinkholes are also possible as a result of erosion.

5.14.2 Location and Spatial Extent

Erosion in the Pee Dee Lumber Region is typically caused by flash flooding events. Erosion occurs in the Pee Dee Lumber Region, particularly along the banks of rivers and streams, but it is not an extreme threat to any of the participating counties and jurisdictions. This hazard ranked "low" in the previous Anson County and Montgomery County hazard mitigation plans and were only mentioned as secondary hazards in the Richmond County and Scotland County plans.

Sinkhole occurrences may occur in places where an underground water pipe resides.

5.14.3 Historical Occurrences

Several sources were vetted to identify areas of erosion in the Pee Dee Lumber Region. This includes searching local newspapers, interviewing local officials, and reviewing previous hazard mitigation plans. No historical erosion occurrences were found in these sources.

No areas of erosion concern were reported by the planning committee.

A sinkhole occurred on July 29, 2012 along Highway 74 in Wadesboro. The sinkhole is roughly fifty feet wide and 25 feet deep. It was caused by increased water pressure in the area due to heavy rain. A gorge behind the highway flooded during the rain event. According to a local news source, the pipe is 30-years old and was unable to handle the increased capacity.[19] The sinkhole has damaged two homes and disrupted several businesses and a homeless shelter in the area due to the blocked road. In addition, two motorists traveling in the same car had to be taken to the hospital when the car fell into the sinkhole. The road repairs are expected to take nearly six weeks. Additional photos below from WCNC show the extent of the damage.[20]

[19] http://www.wcnc.com/news/slideshows/Photos--Wadesboro-sinkhole-165741636.html
[20] NewsChannel 26 Staff (August 10, 2012). Massive Sinkhole Opens Up in Wadesboro. WCNC.com http://www.wcnc.com/news/local/Massive-sinkhole-opens-up-in-Wadesboro-165739186.html?gallery=y&img=0&c=y



5.14.4 Probability of Future Occurrences

Erosion remains a natural, dynamic, and continuous process for the Pee Dee Lumber Region, and it will continue to occur. The annual probability level assigned for erosion is possible (between 1 and 10 percent annually). However, given the lack of historical events, location, and threat to life or property, no further analysis will be done in Section 6: *Vulnerability Assessment*.

5.15 FLOOD

5.15.1 Background

Flooding is the most frequent and costly natural hazard in the United States and is a hazard that has caused more than 10,000 deaths since 1900. Nearly 90 percent of presidential disaster declarations result from natural events where flooding was a major component.

Floods generally result from excessive precipitation and can be classified under two categories: general floods, precipitation over a given river basin for a long period of time along with storm-induced wave action, and flash floods, the product of heavy localized precipitation in a short time period over a given location. The severity of a flooding event is typically determined by a combination of several major factors, including stream and river basin topography and physiography, precipitation and weather patterns, recent soil moisture conditions, and the degree of vegetative clearing and impervious surface.

General floods are usually long-term events that may last for several days. The primary types of general flooding include riverine, coastal, and urban flooding. Riverine flooding is a function of excessive precipitation levels and water runoff volumes within the watershed of a stream or river. Coastal flooding is typically a result of storm surge, wind-driven waves, and heavy rainfall produced by hurricanes, tropical storms, and other large coastal storms. Urban flooding occurs where manmade development has obstructed the natural flow of water and decreased the ability of natural groundcover to absorb and retain surface water runoff.

Most flash flooding is caused by slow-moving thunderstorms in a local area or by heavy rains associated with hurricanes and tropical storms. However, flash flooding events may also occur from a dam or levee failure within minutes or hours of heavy amounts of rainfall or from a sudden release of water held by a retention basin or other stormwater control facility. Although flash flooding occurs most often along mountain streams, it is also common in urbanized areas where much of the ground is covered by impervious surfaces.

The periodic flooding of lands adjacent to rivers, streams, and shorelines (land known as a floodplain) is a natural and inevitable occurrence that can be expected to take place based upon established recurrence intervals. The recurrence interval of a flood is defined as the average time interval, in years, expected between a flood event of a particular magnitude and an equal or larger flood. Flood magnitude increases with increasing recurrence interval.

Floodplains are designated by the frequency of the flood that is large enough to cover them. For example, the 10-year floodplain will be covered by the 10-year flood and the 100-year floodplain by the 100-year flood. Flood frequencies, such as the 100-year flood, are determined by plotting a graph of the size of all known floods for an area and determining how often floods of a particular size occur. Another way of expressing the flood frequency is the chance of occurrence in a given year, which is the percentage of the probability of flooding each year. For example, the 100-year flood has a 1 percent chance of occurring in any given year and the 500-year flood has a 0.2 percent chance of occurring in any given year.

5.15.2 Location and Spatial Extent

There are areas in the Pee Dee Lumber Region that are susceptible to flood events. Special flood hazard areas in the Pee Dee Lumber Region were mapped using Geographic Information System (GIS) and FEMA Flood Insurance Rate Maps (FIRM).[21] This includes Zone A (1-percent annual chance floodplain), Zone AE (1-percent annual chance floodplain with elevation), Zone X500 (0.2-percent annual chance floodplain). According to GIS analysis, of the 1,839 square miles that make up the Pee Dee Lumber Region (including the area of Anson County, Montgomery County, Richmond County, and Scotland County), there are 158.32 square miles of land in zones A and AE (1-percent annual chance floodplain/100-year floodplain) and 2.06 square miles of land in zone X500 (0.2-percent annual chance floodplain/500-year floodplain). This equates to approximately nine percent of total land in a regulated flood zone. The county totals are presented below in **Table 5.34**.

TABLE 5.32: SUMMARY OF FLOODPLAIN AREAS IN THE PEE DEE LUMBER REGION

Location	100-year area (square miles)	500-year area (square miles)
Anson County	54.27	0.98
Montgomery County	30.90	0.30
Richmond County	42.56	0.78
Scotland County	30.59	1.11
PEE DEE LUMBER REGION TOTAL	**158.32**	**2.06**

It is important to note that while FEMA digital flood data is recognized as best available data for planning purposes, it does not always reflect the most accurate and up-to-date flood risk. Flooding and flood-related losses often do occur outside of delineated special flood hazard areas. **Figure 5.40** illustrates the location and extent of currently mapped special flood hazard areas for the Pee Dee Lumber Region. **Figures 5.41, 5.42, 5.43, 5.44, 5.45, 5.46, 5.47** and **5.48** illustrates Anson County and its jurisdictions, **Figures 5.49, 5.50, 5.51, 5.52, 5.53** and **5.54** illustrates Montgomery County and its

[21] The county-level FIRM data used for the Pee Dee Lumber Region were updated as follows: Anson County (2008); Montgomery County (2009); Richmond County (2014); Scotland County (2014).

jurisdictions, **Figures 5.55, 5.56, 5.57, 5.58, 5.59, 5.60** and **5.61** illustrates Richmond County and its jurisdictions, **Figures 5.62, 5.63, 5.64, 5.65** and **5.66** illustrates Richmond County and its jurisdictions based on best available FEMA Flood Insurance Rate Map (FIRM) data.

FIGURE 5.40: SPECIAL FLOOD HAZARD AREAS IN THE PEE DEE LUMBER REGION

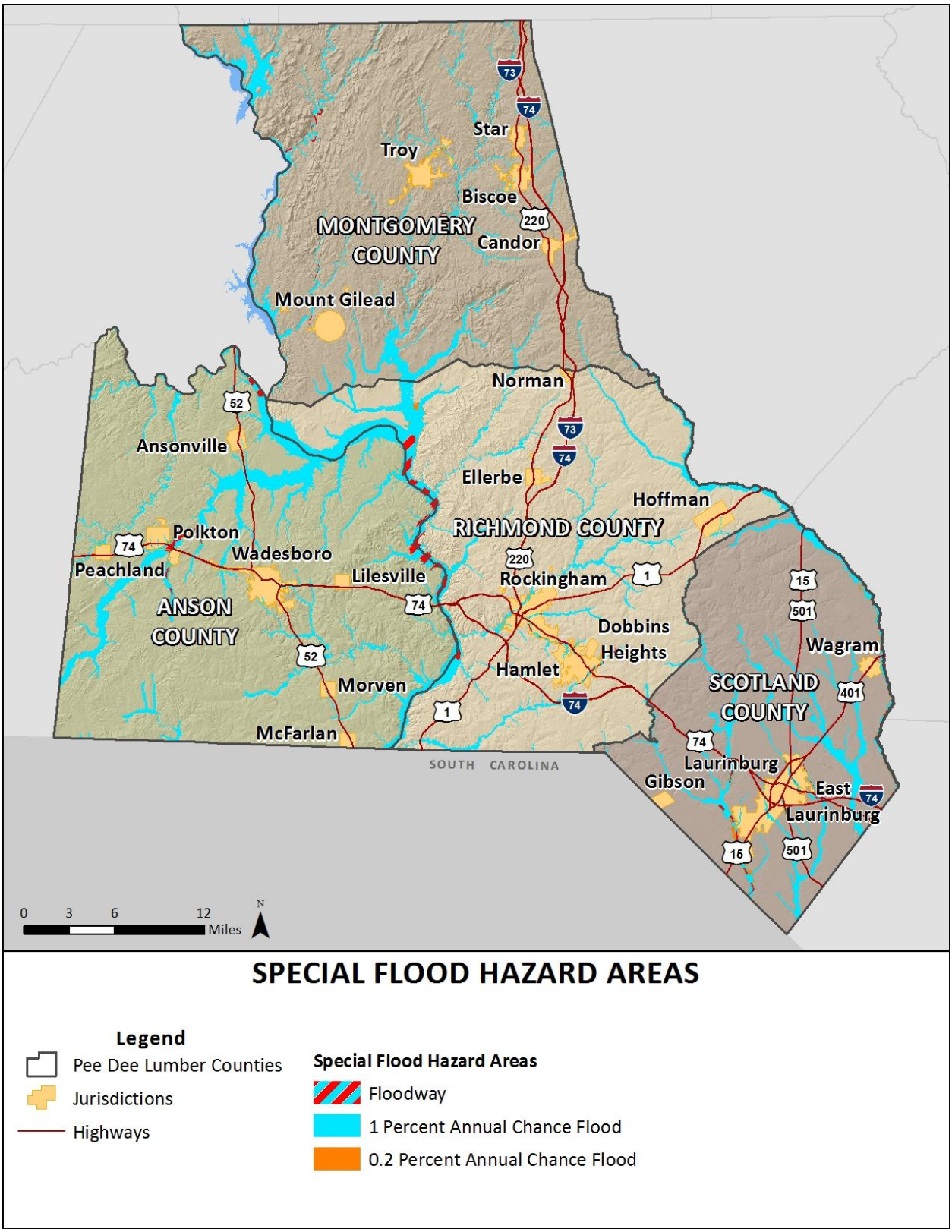


FIGURE 5.41: SPECIAL FLOOD HAZARD AREAS IN ANSON COUNTY

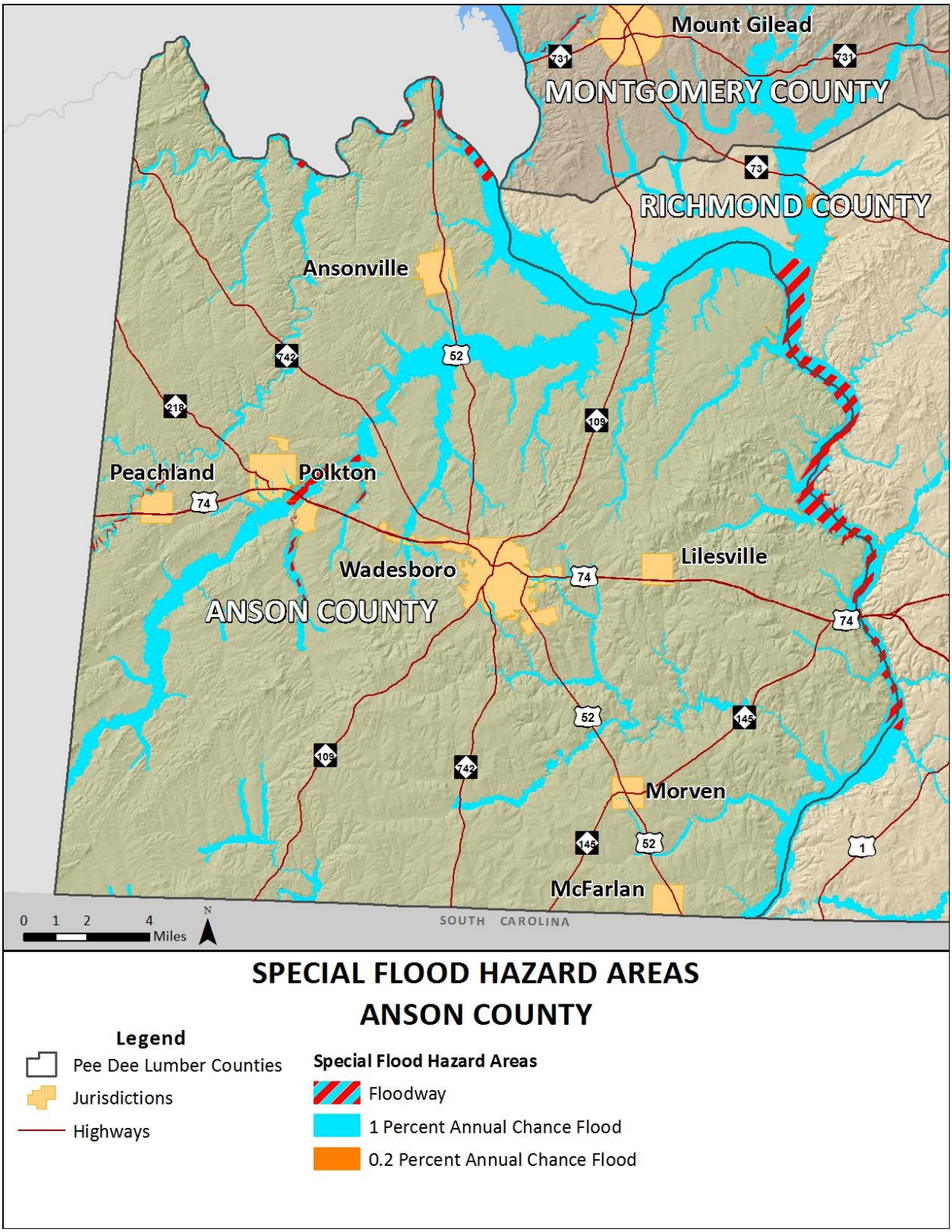


FIGURE 5.42: SPECIAL FLOOD HAZARD AREAS IN THE TOWN OF ANSONVILLE

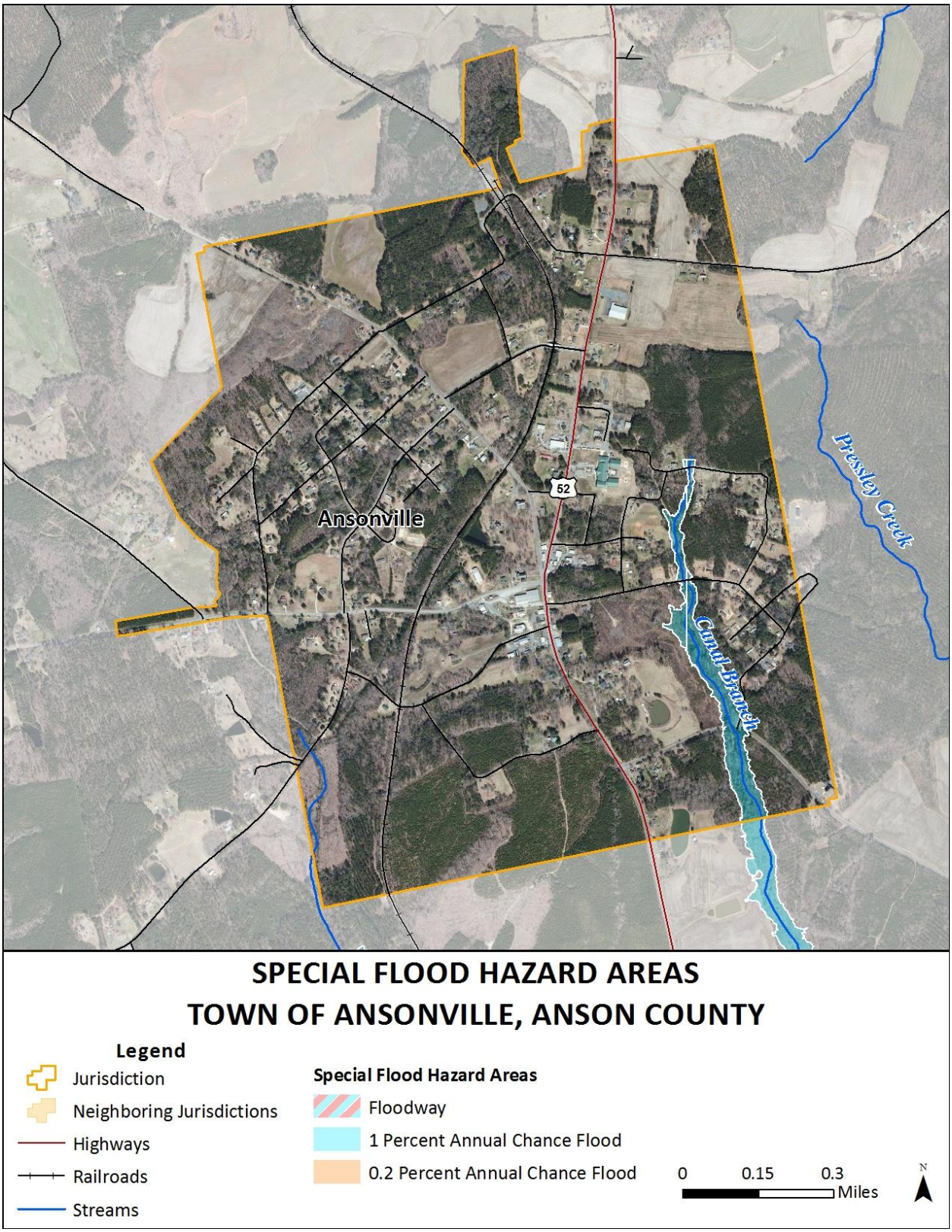


FIGURE 5.43: SPECIAL FLOOD HAZARD AREAS IN THE TOWN OF LILESVILLE

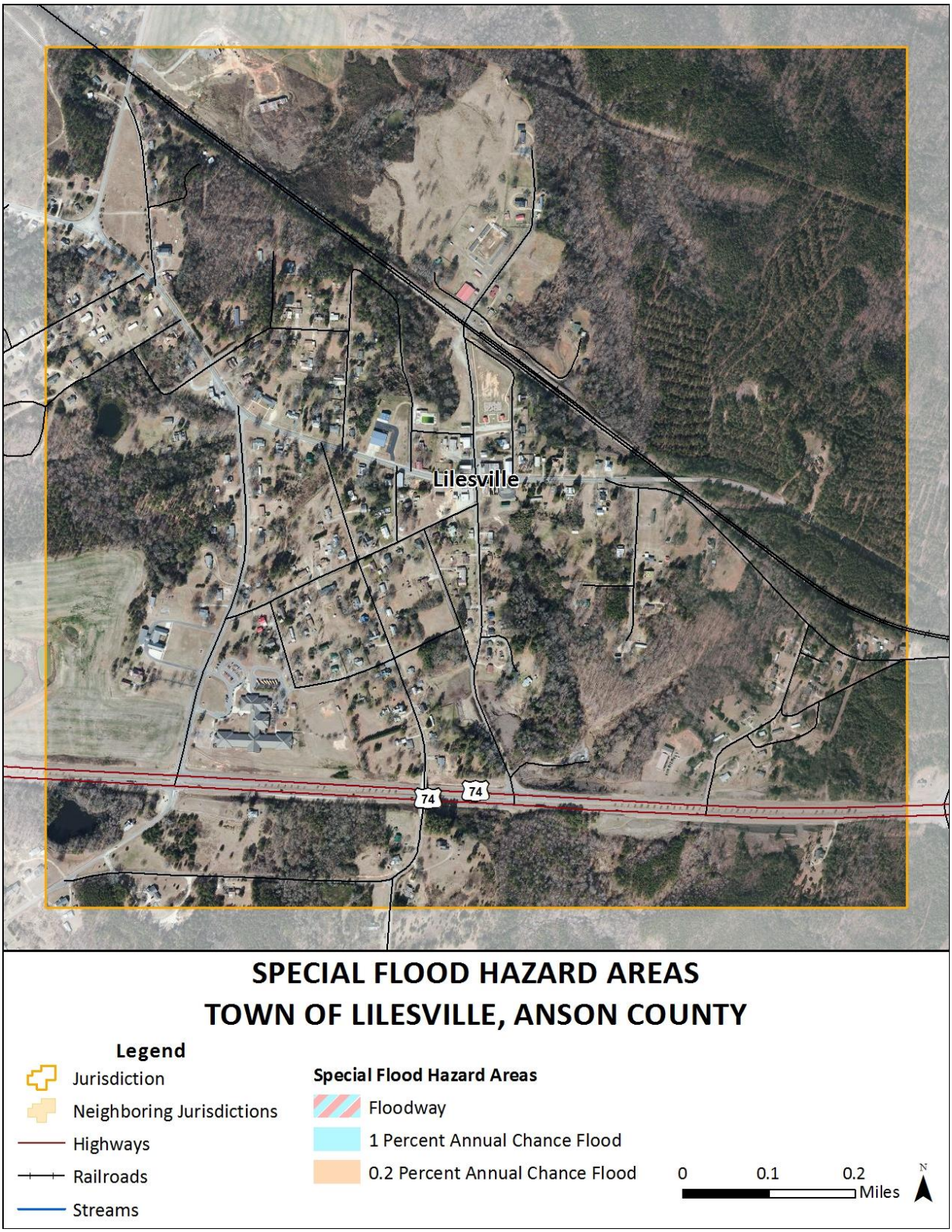


FIGURE 5.44: SPECIAL FLOOD HAZARD AREAS IN THE TOWN OF MCFALRAN

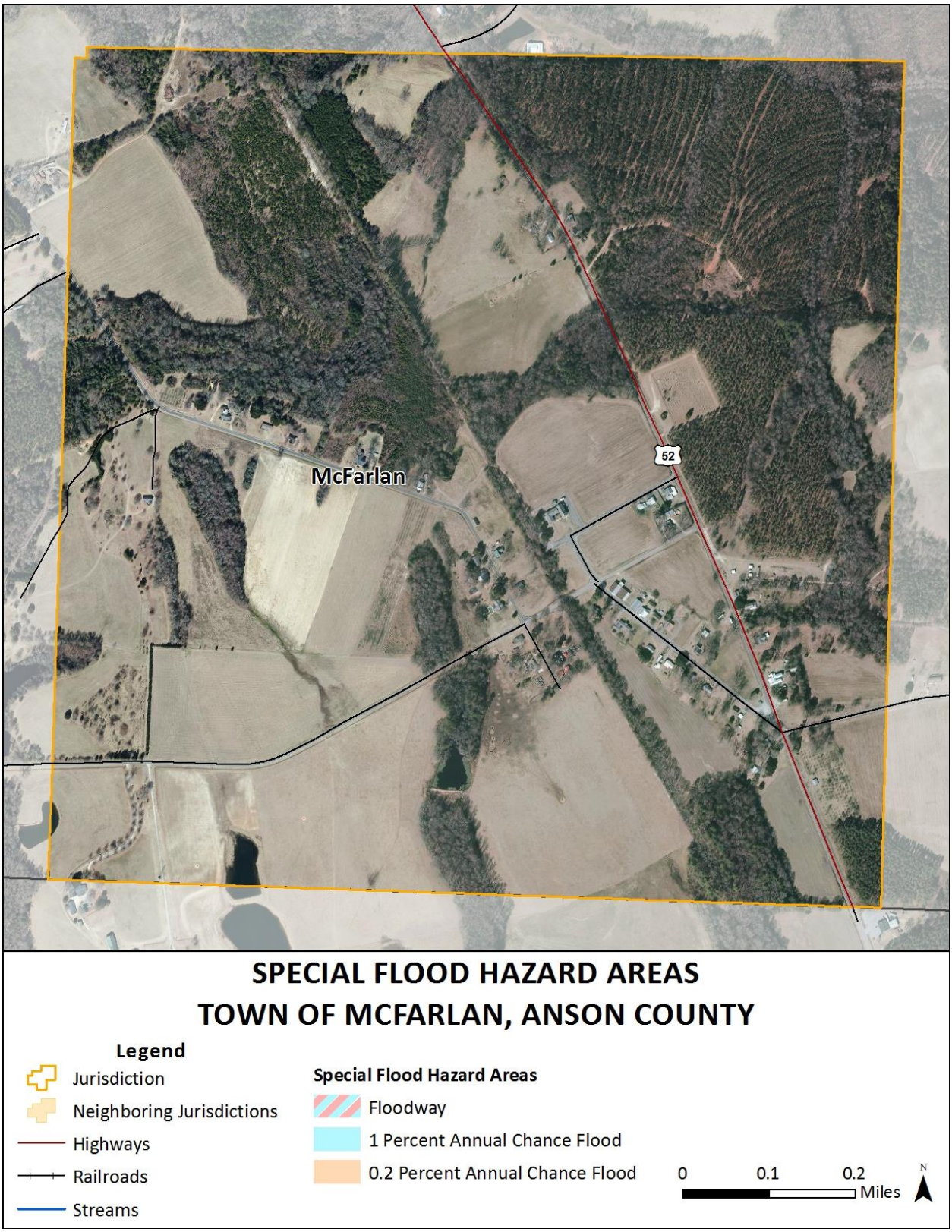


FIGURE 5.45: SPECIAL FLOOD HAZARD AREAS IN THE TOWN OF MORVEN

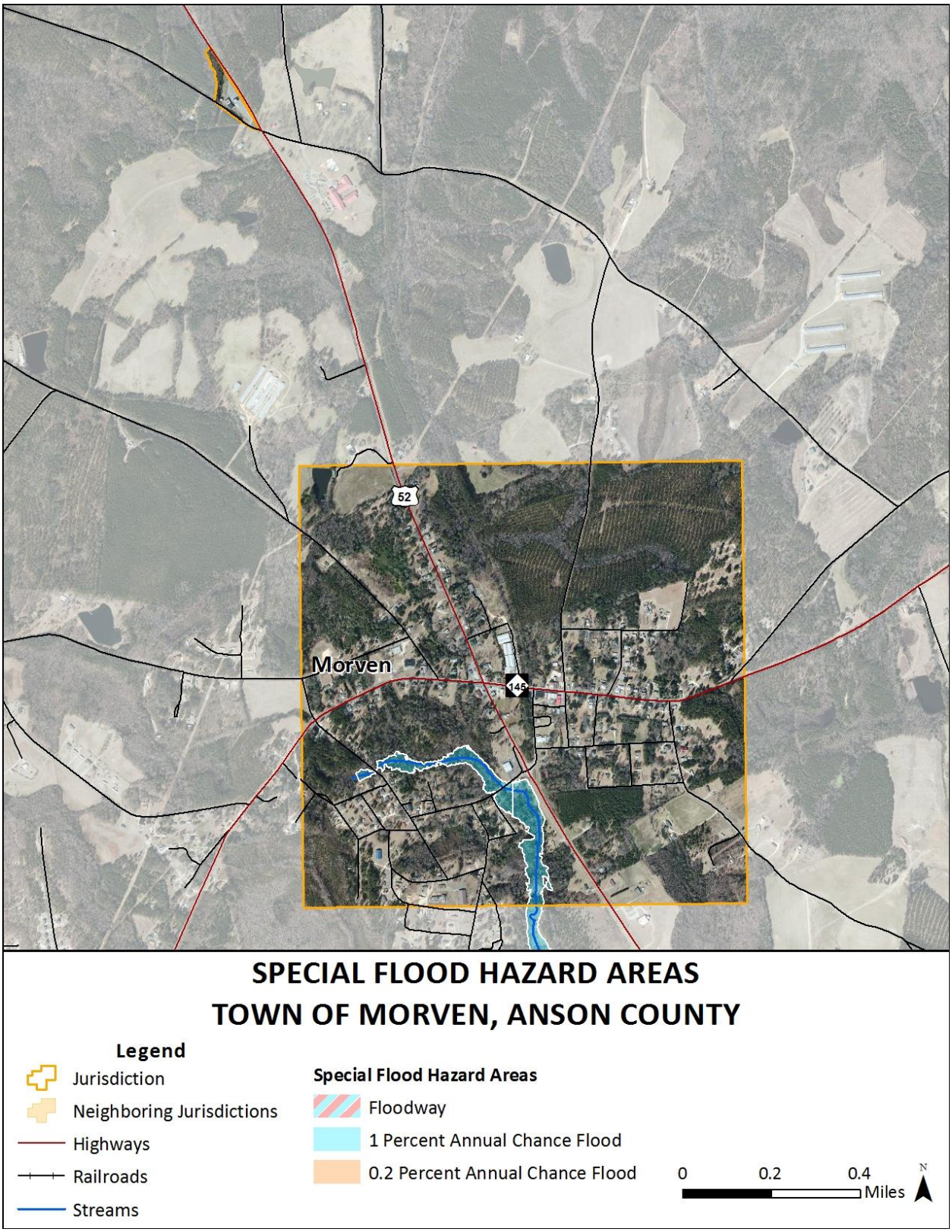


FIGURE 5.46: SPECIAL FLOOD HAZARD AREAS IN THE TOWN OF PEACHLAND

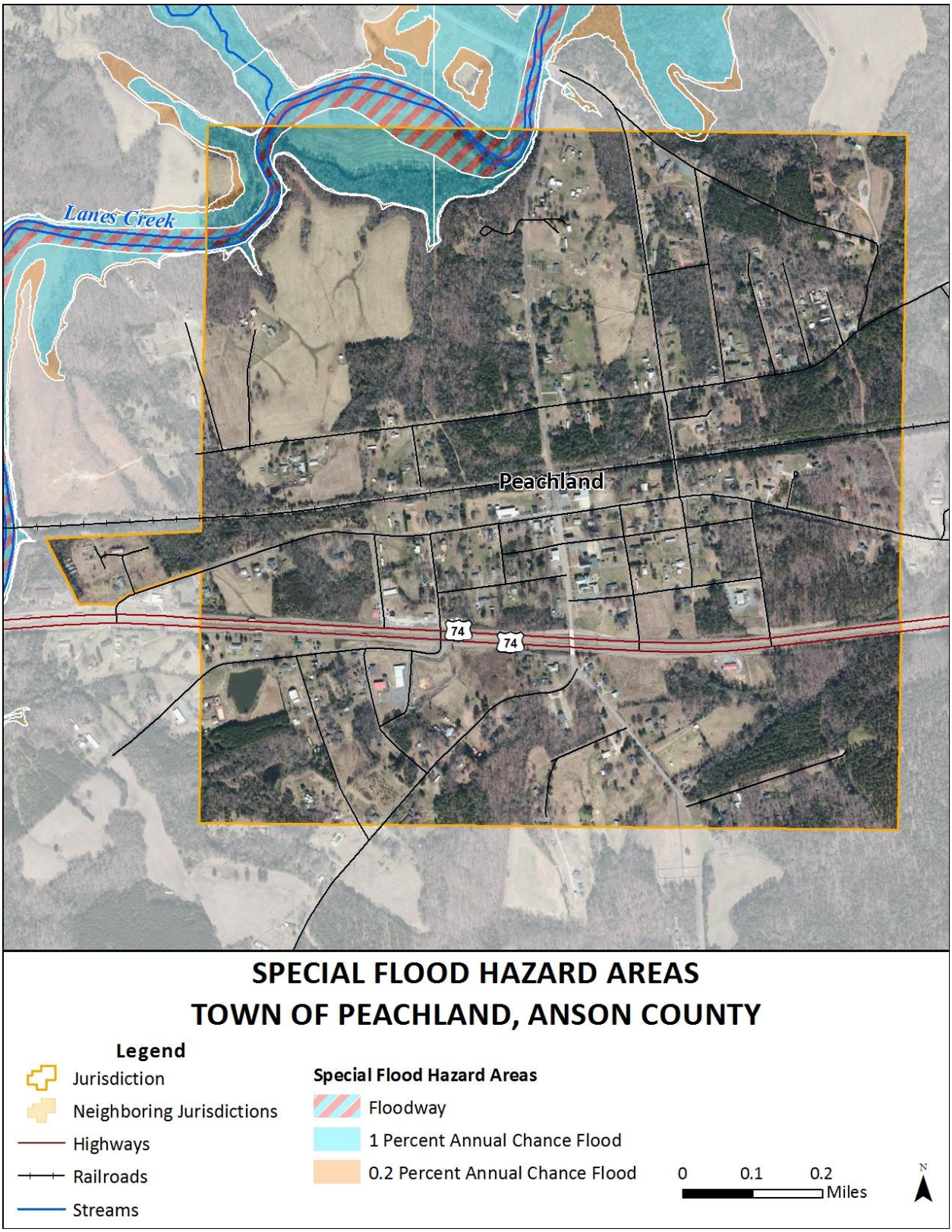


FIGURE 5.47: SPECIAL FLOOD HAZARD AREAS IN THE TOWN OF POLKTON

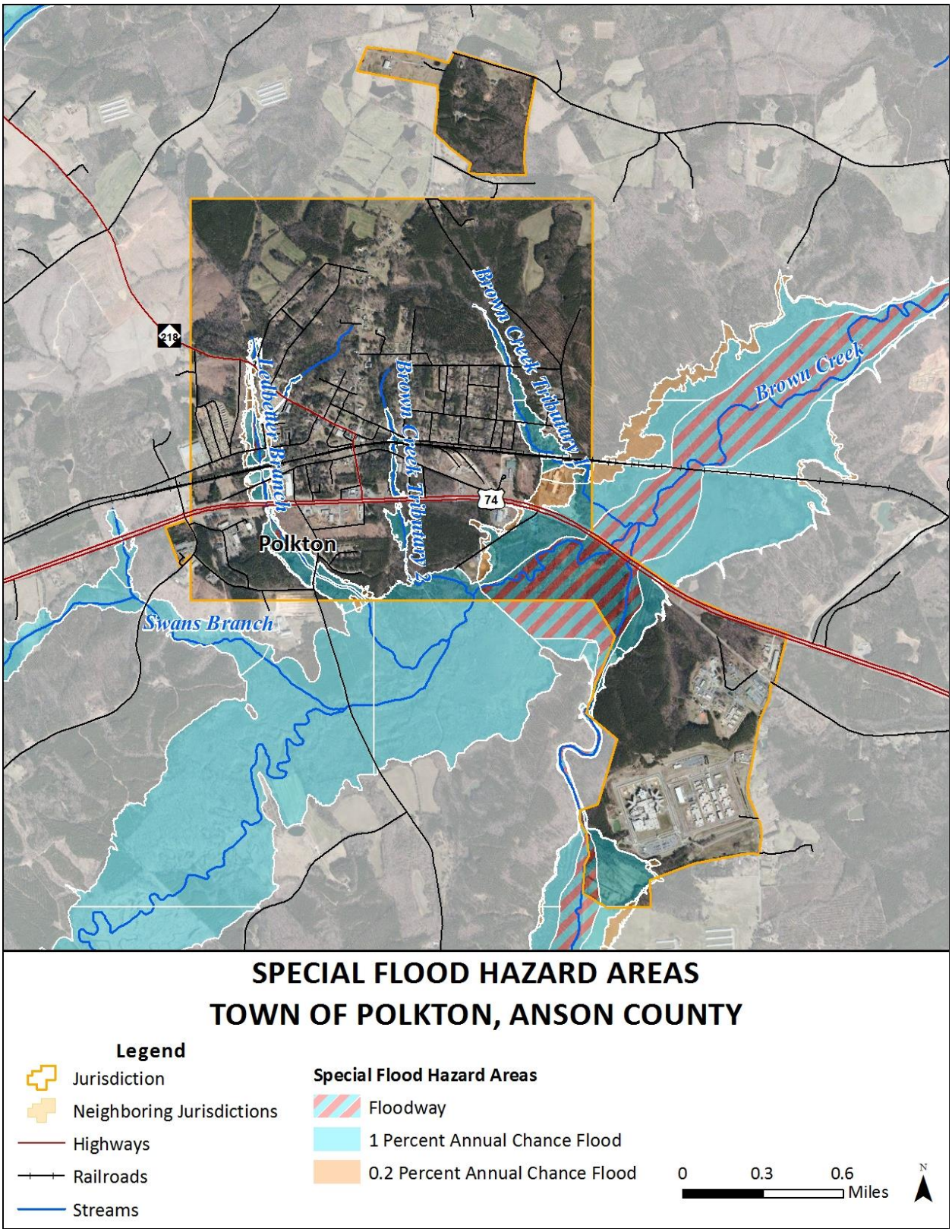


FIGURE 5.48: SPECIAL FLOOD HAZARD AREAS IN THE TOWN OF WADESBORO

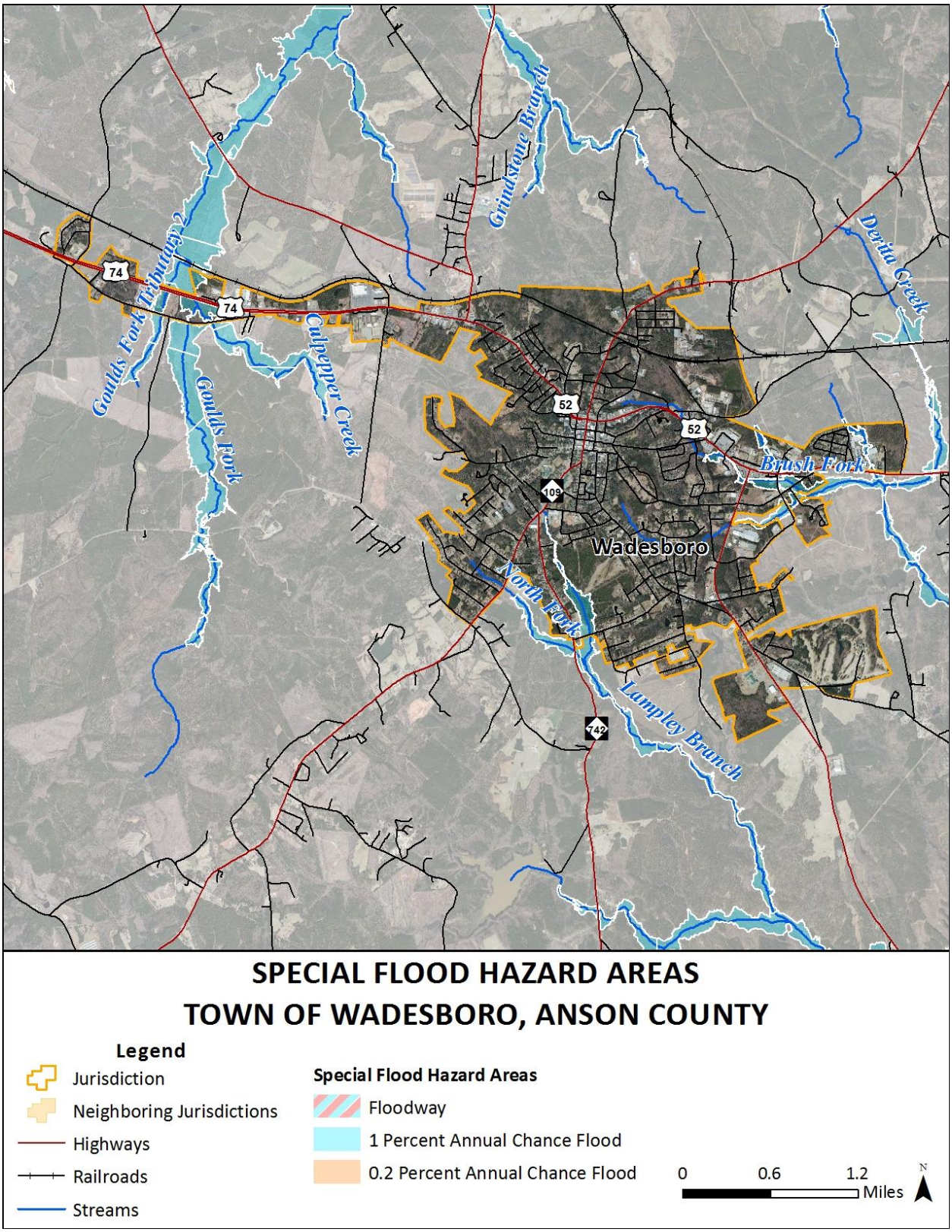


FIGURE 5.49: SPECIAL FLOOD HAZARD AREAS IN MONTGOMERY COUNTY

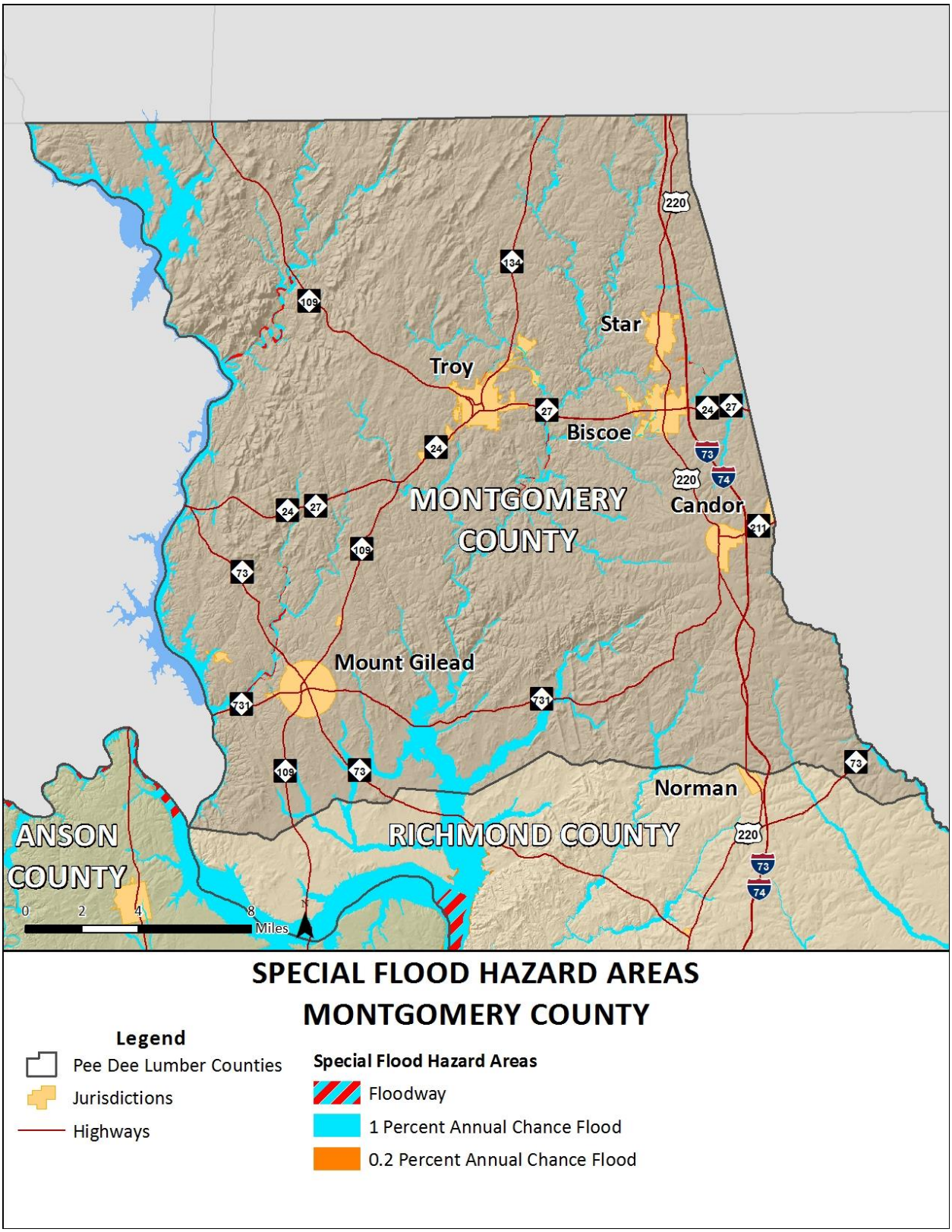


FIGURE 5.50: SPECIAL FLOOD HAZARD AREAS IN THE TOWN OF BISCOE

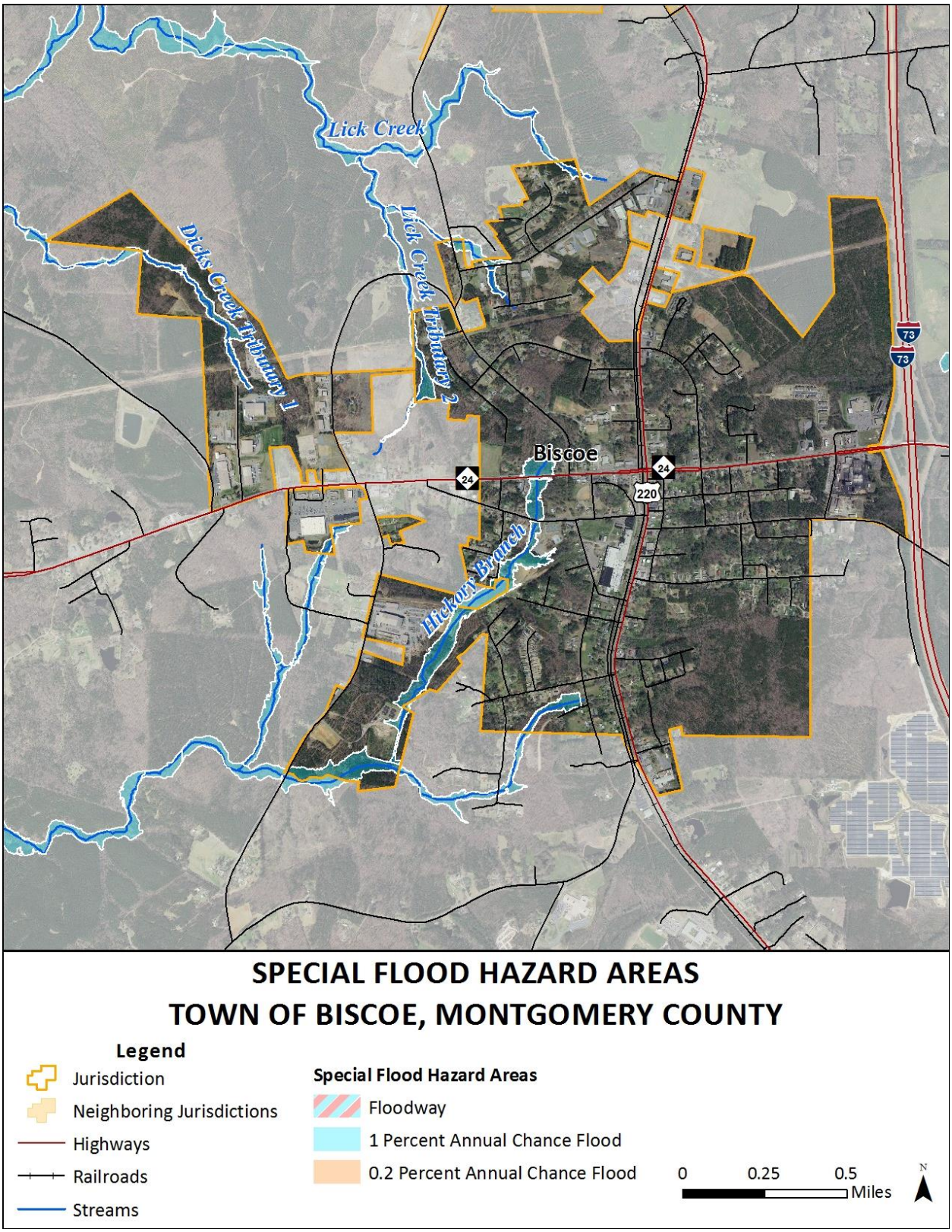


FIGURE 5.51: SPECIAL FLOOD HAZARD AREAS IN THE TOWN OF CANDOR

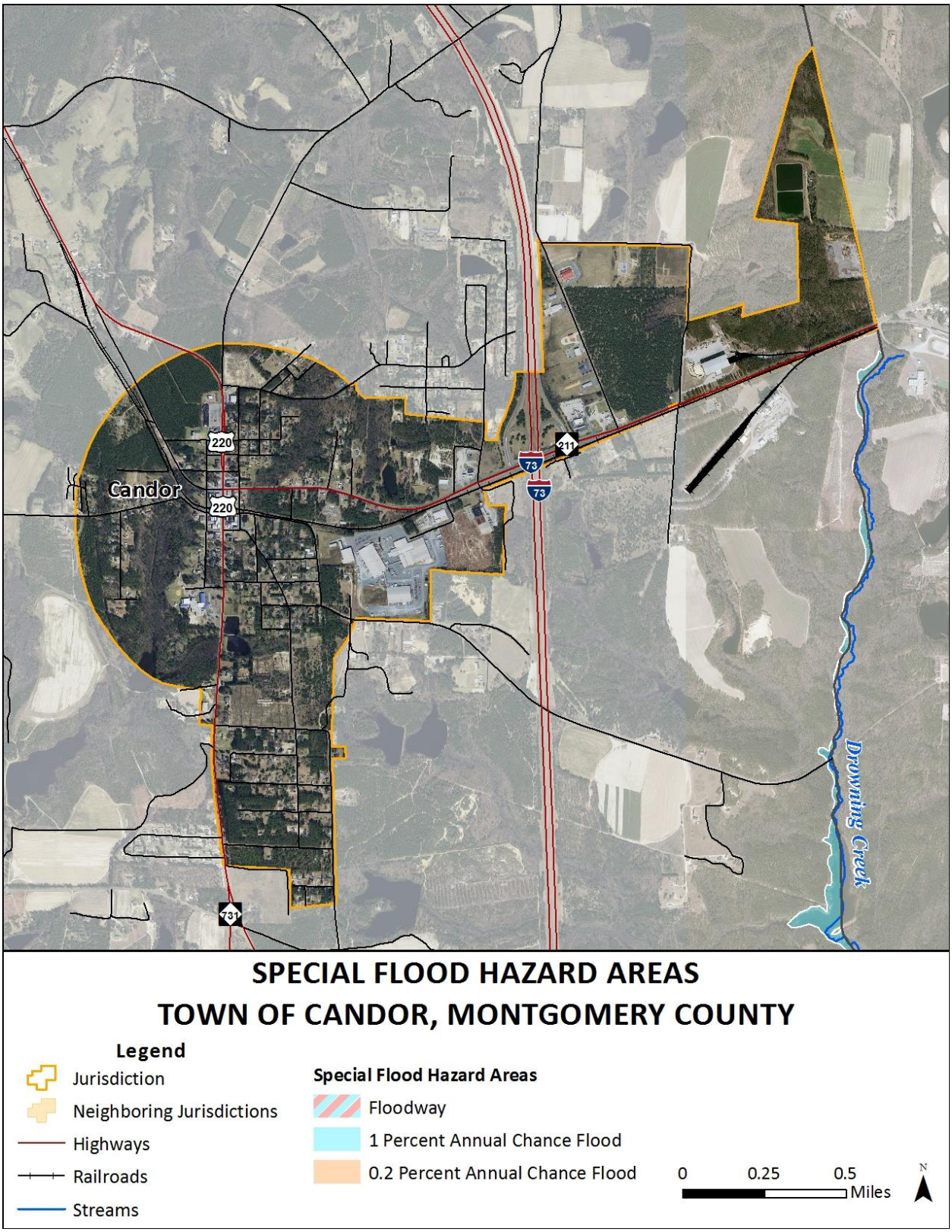


FIGURE 5.52: SPECIAL FLOOD HAZARD AREAS IN THE TOWN OF MOUNT GILEAD

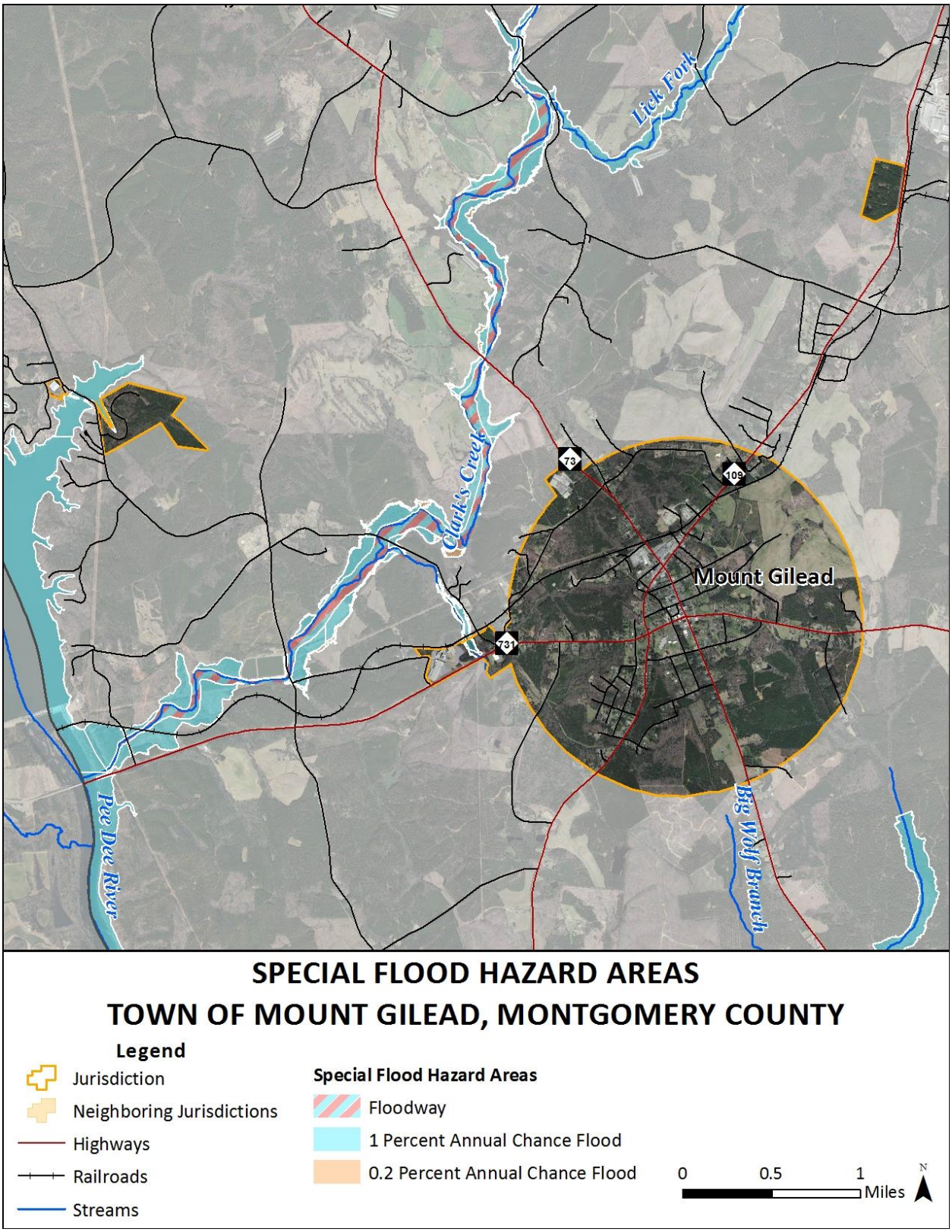


FIGURE 5.53: SPECIAL FLOOD HAZARD AREAS IN THE TOWN OF STAR

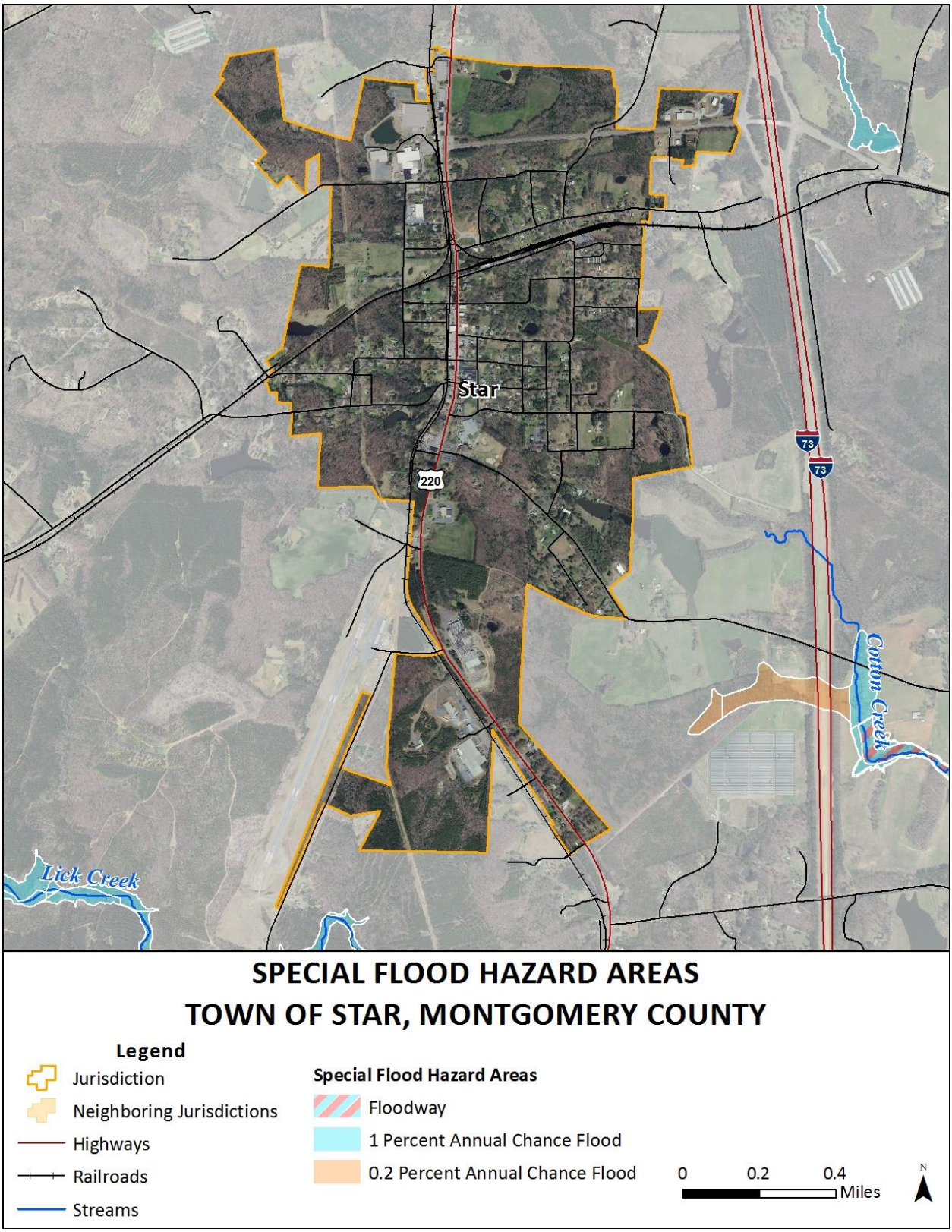


FIGURE 5.54: SPECIAL FLOOD HAZARD AREAS IN THE TOWN OF TROY

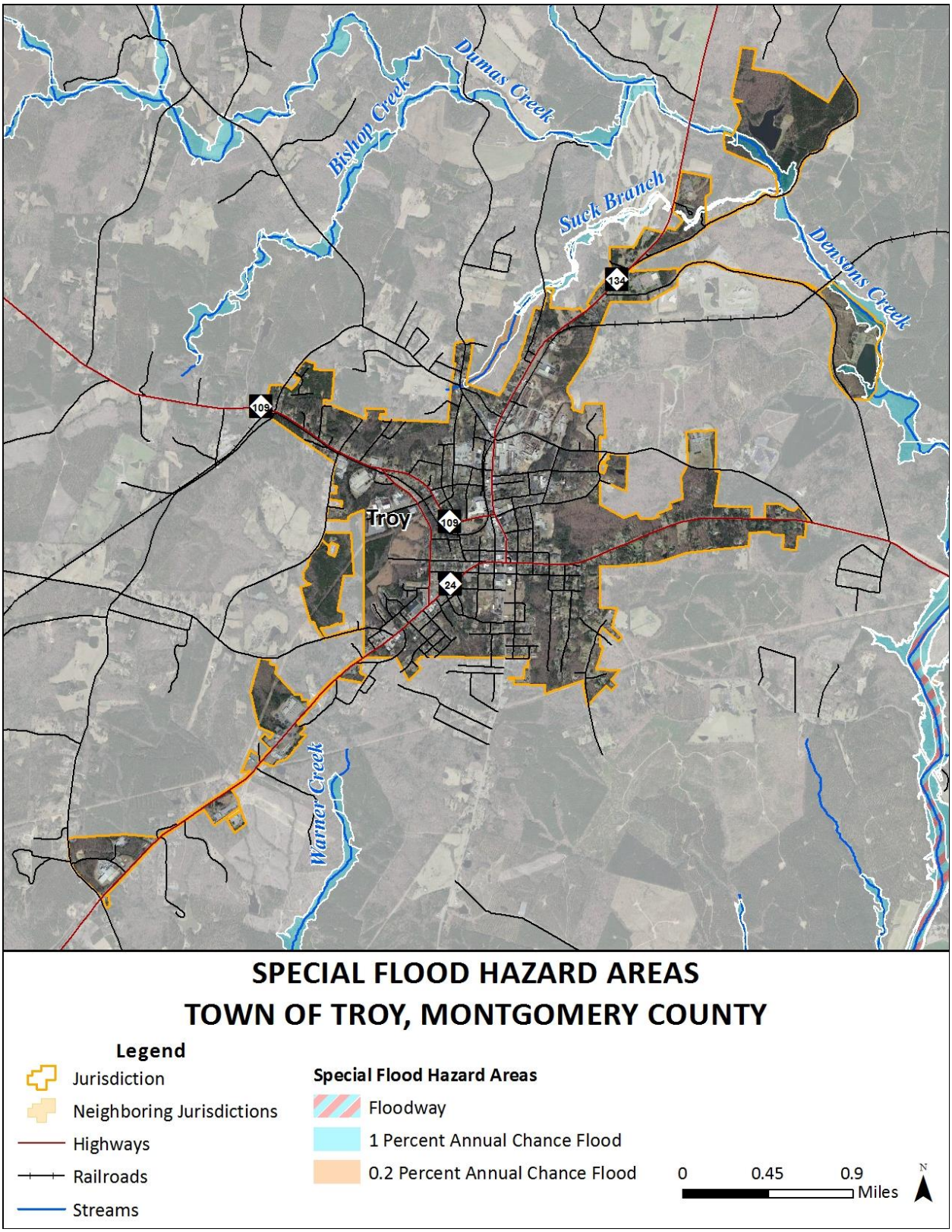


FIGURE 5.55: SPECIAL FLOOD HAZARD AREAS IN RICHMOND COUNTY

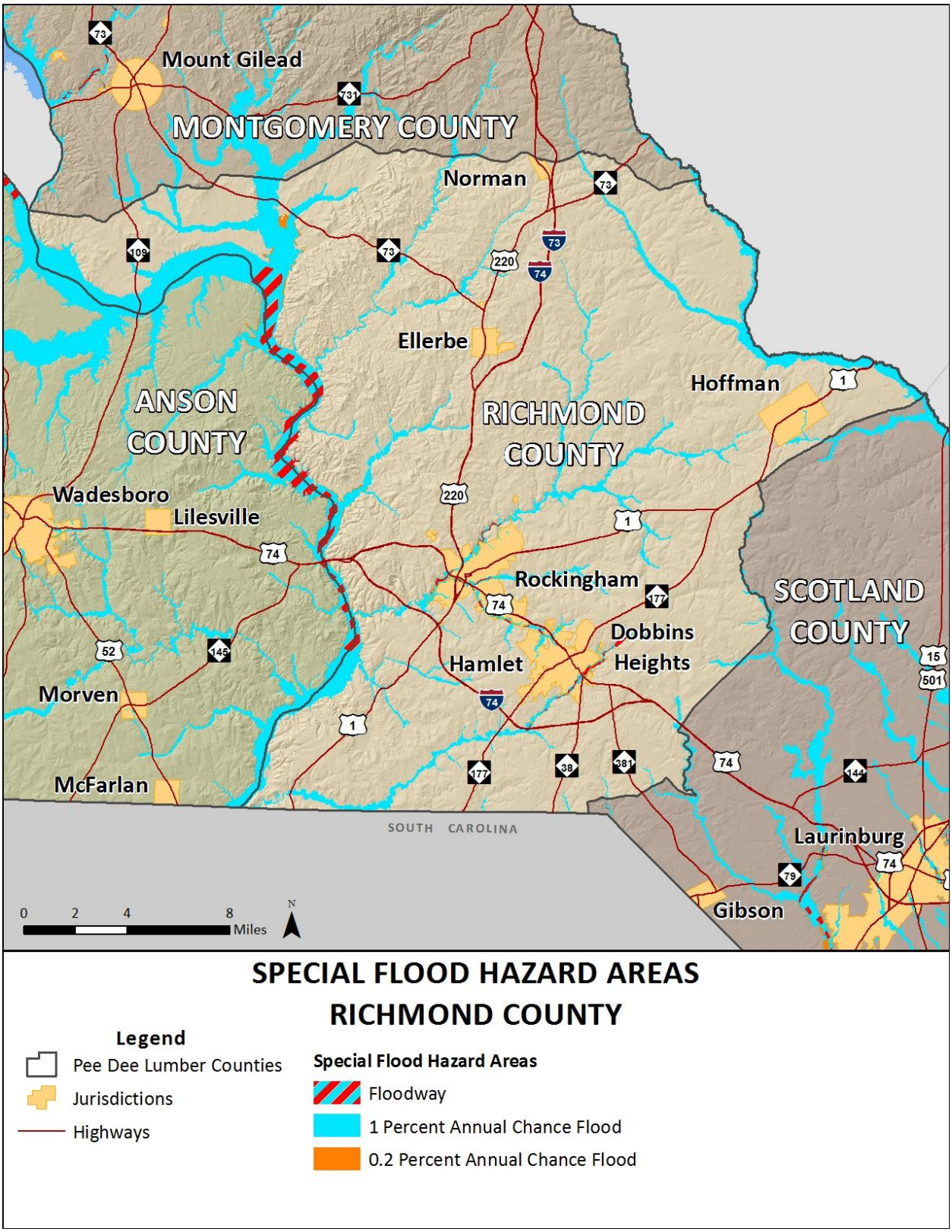


FIGURE 5.56: SPECIAL FLOOD HAZARD AREAS IN THE TOWN OF DOBBINS HEIGHTS

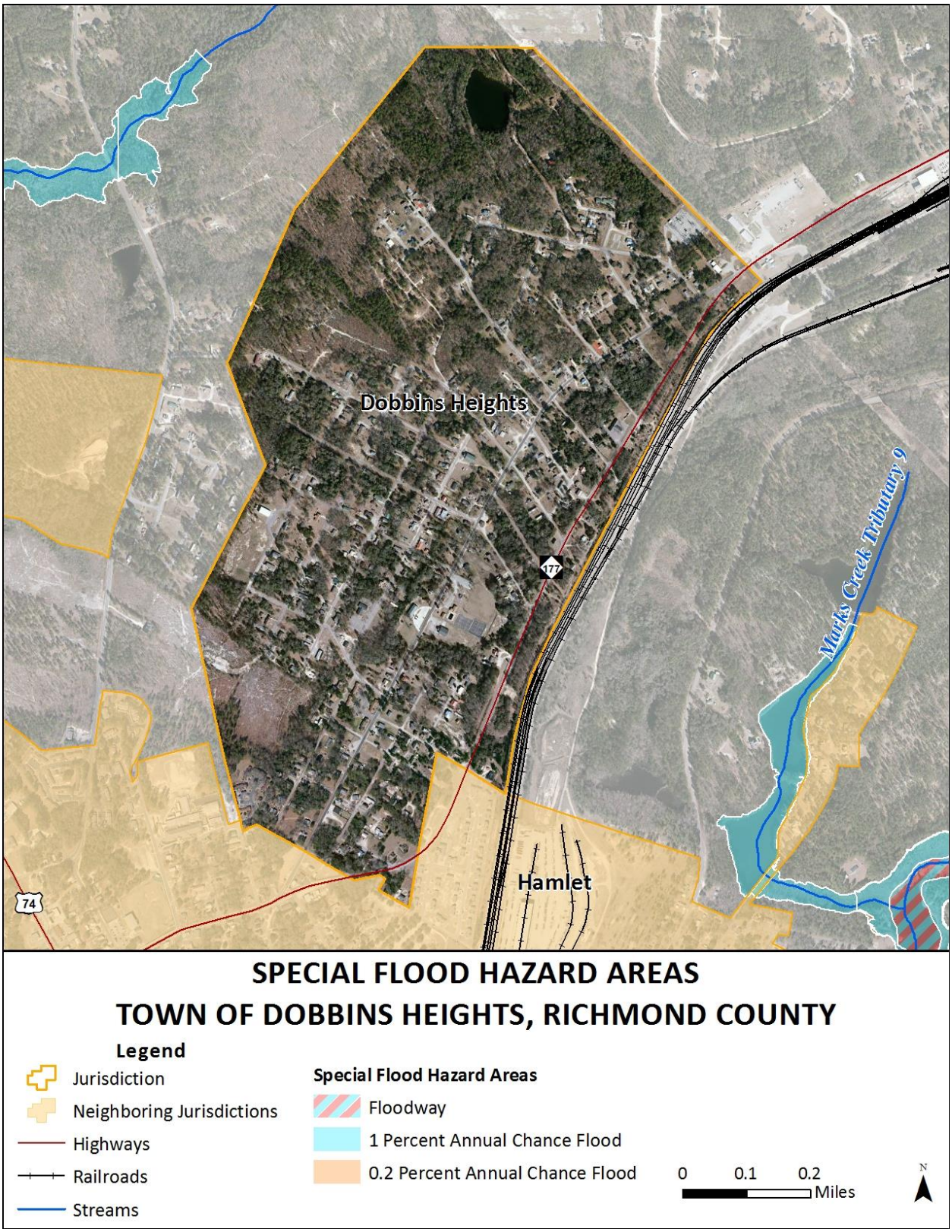


FIGURE 5.57: SPECIAL FLOOD HAZARD AREAS IN THE TOWN OF ELLERBE

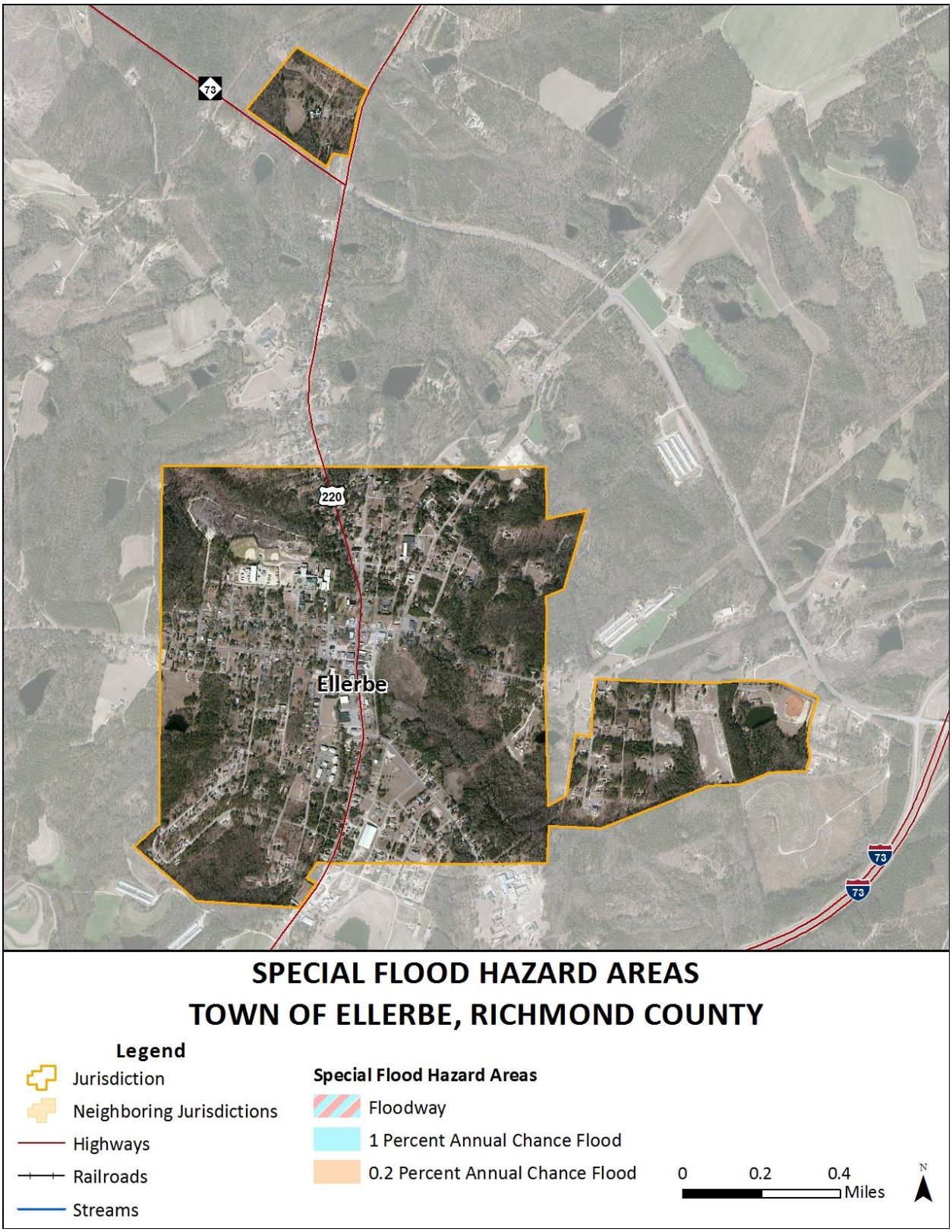


FIGURE 5.58: SPECIAL FLOOD HAZARD AREAS IN THE CITY OF HAMLET

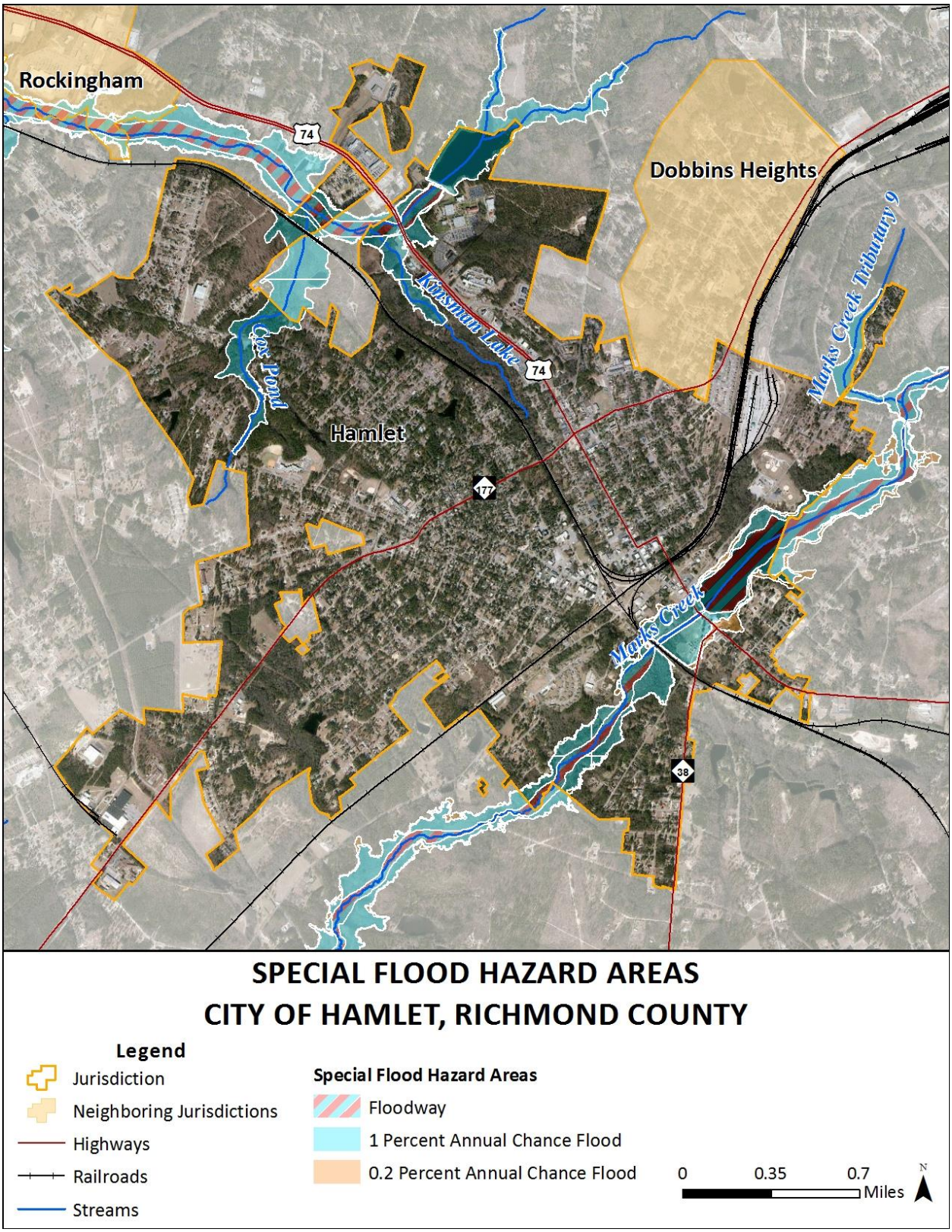


FIGURE 5.59: SPECIAL FLOOD HAZARD AREAS IN THE TOWN OF HOFFMAN

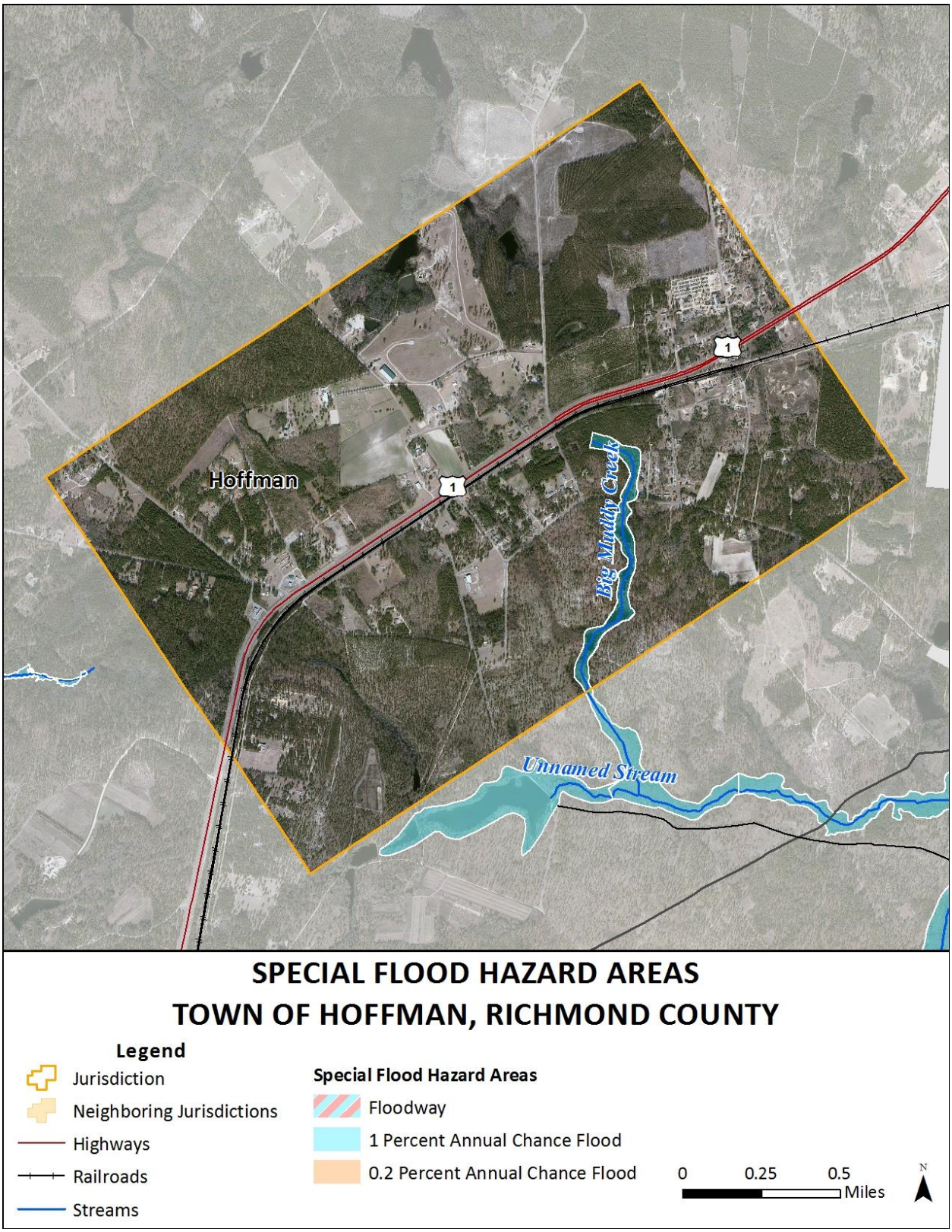


FIGURE 5.60: SPECIAL FLOOD HAZARD AREAS IN THE TOWN OF NORMAN

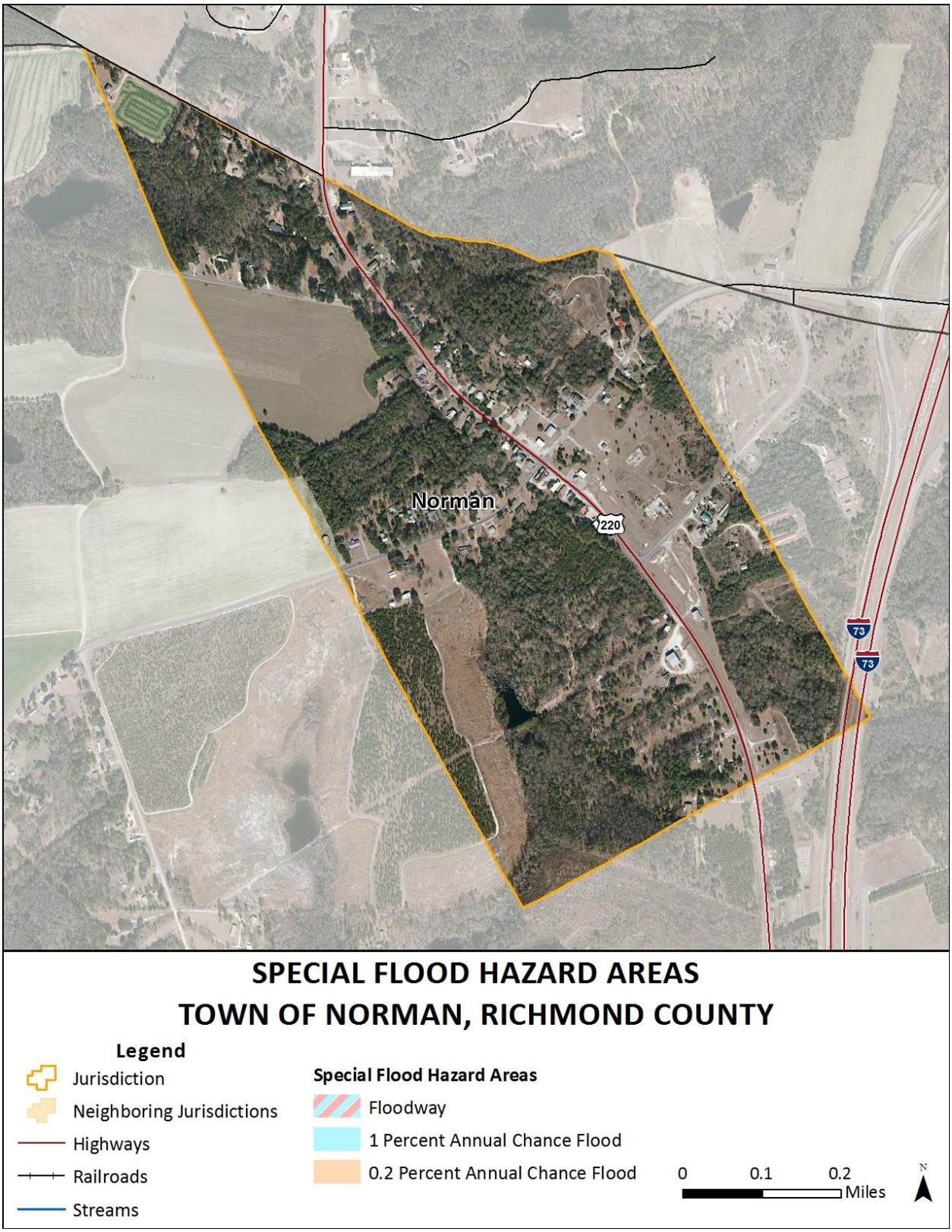


FIGURE 5.61: SPECIAL FLOOD HAZARD AREAS IN THE CITY OF ROCKINGHAM

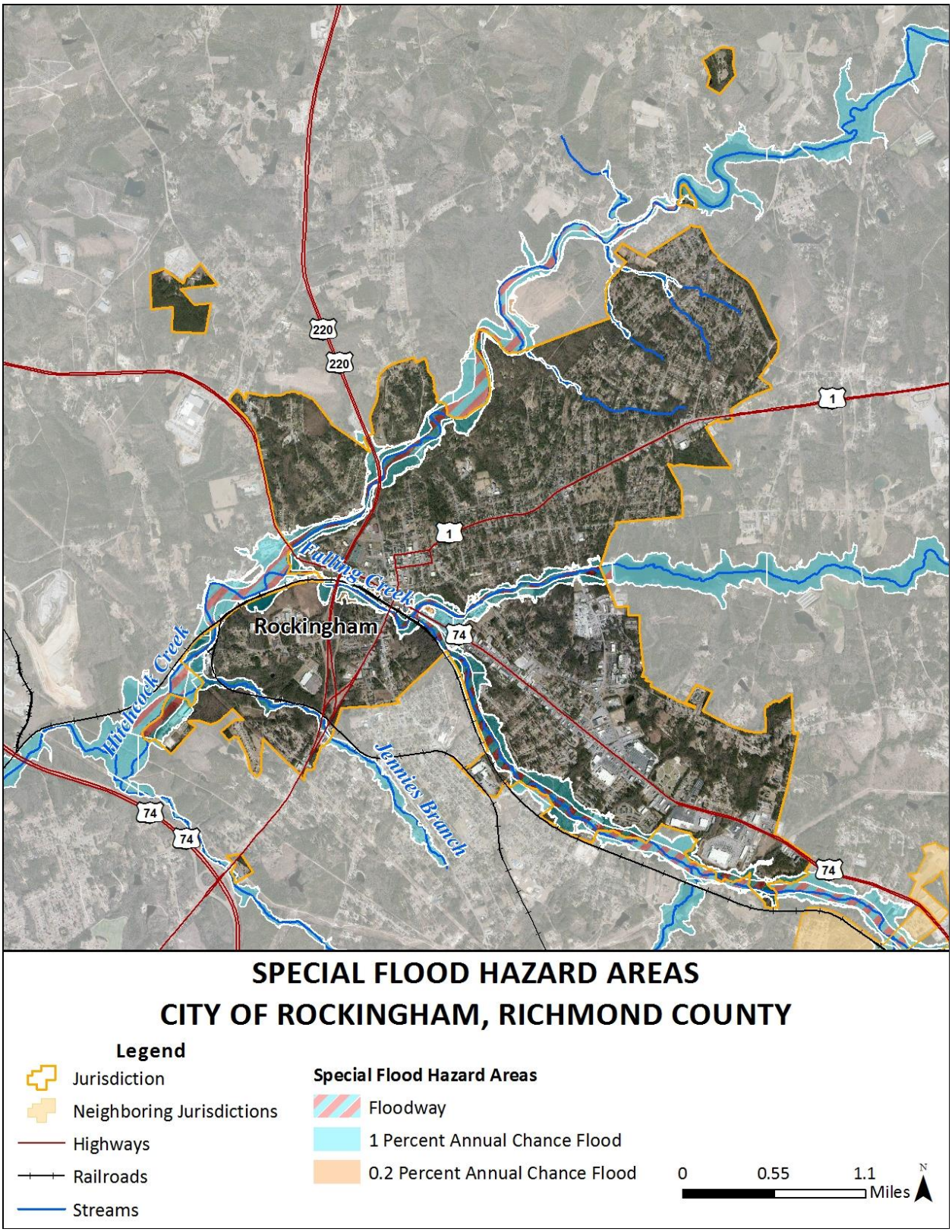


FIGURE 5.62: SPECIAL FLOOD HAZARD AREAS IN SCOTLAND COUNTY

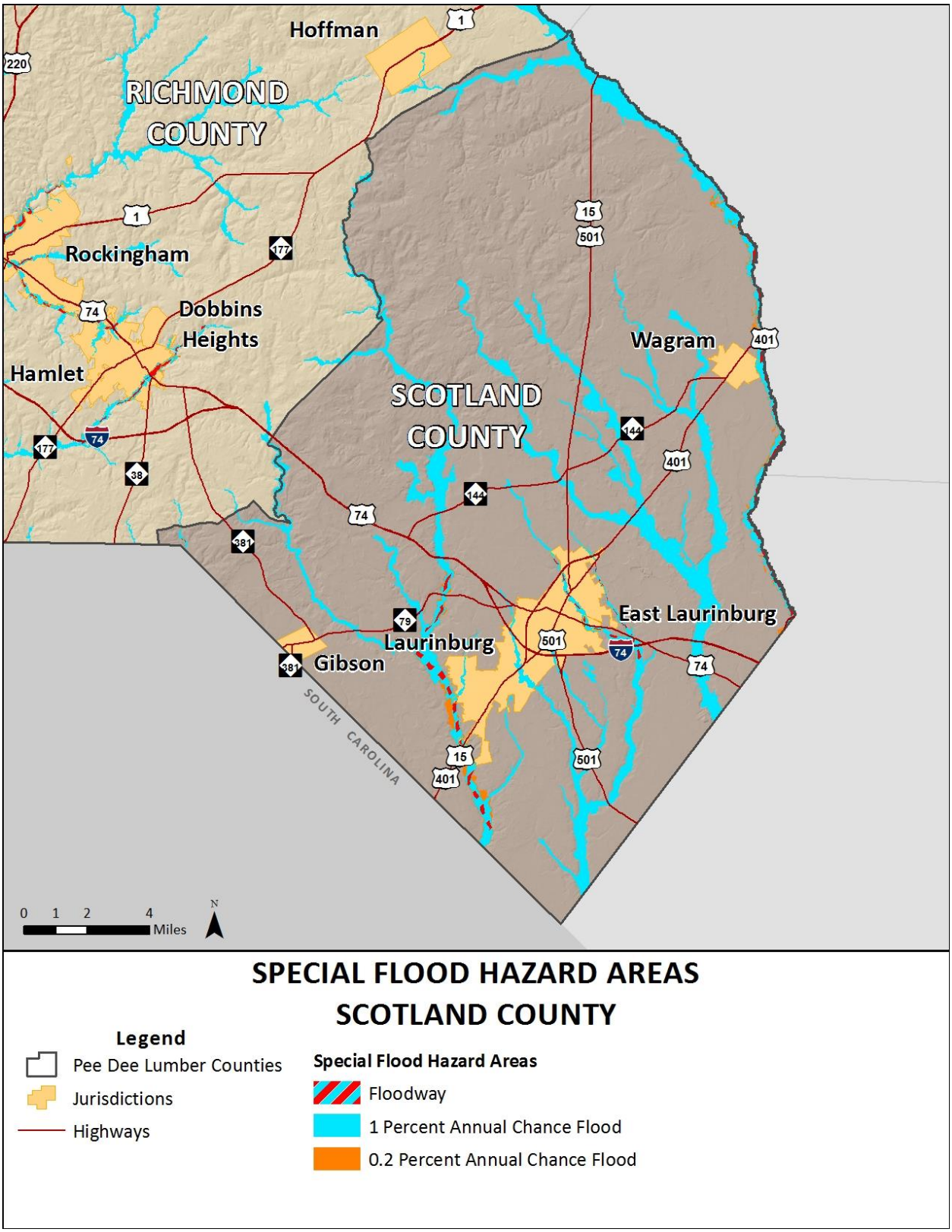


FIGURE 5.63: SPECIAL FLOOD HAZARD AREAS IN THE TOWN OF EAST LAURINBURG

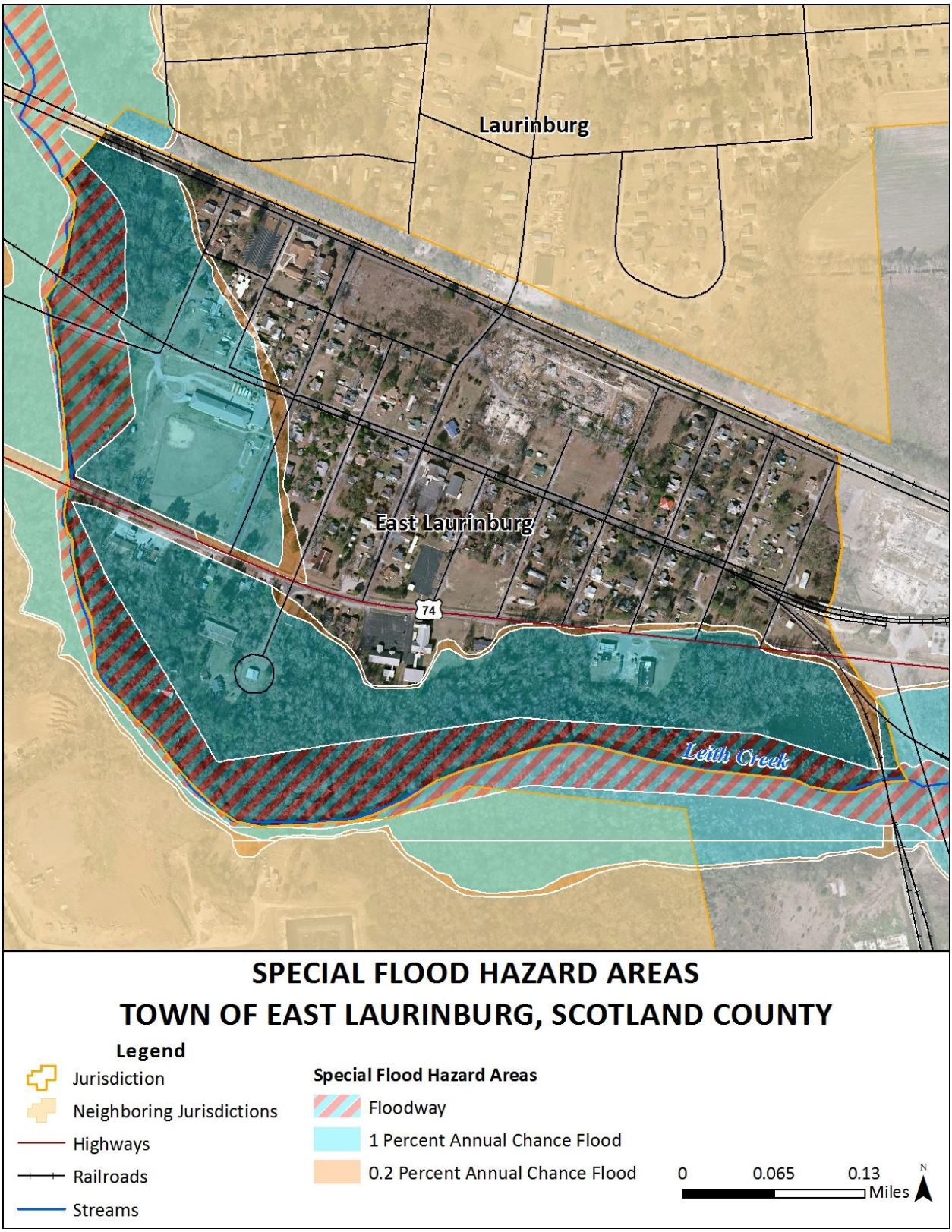


FIGURE 5.64: SPECIAL FLOOD HAZARD AREAS IN THE TOWN OF GIBSON



FIGURE 5.65: SPECIAL FLOOD HAZARD AREAS IN THE CITY OF LAURINBURG

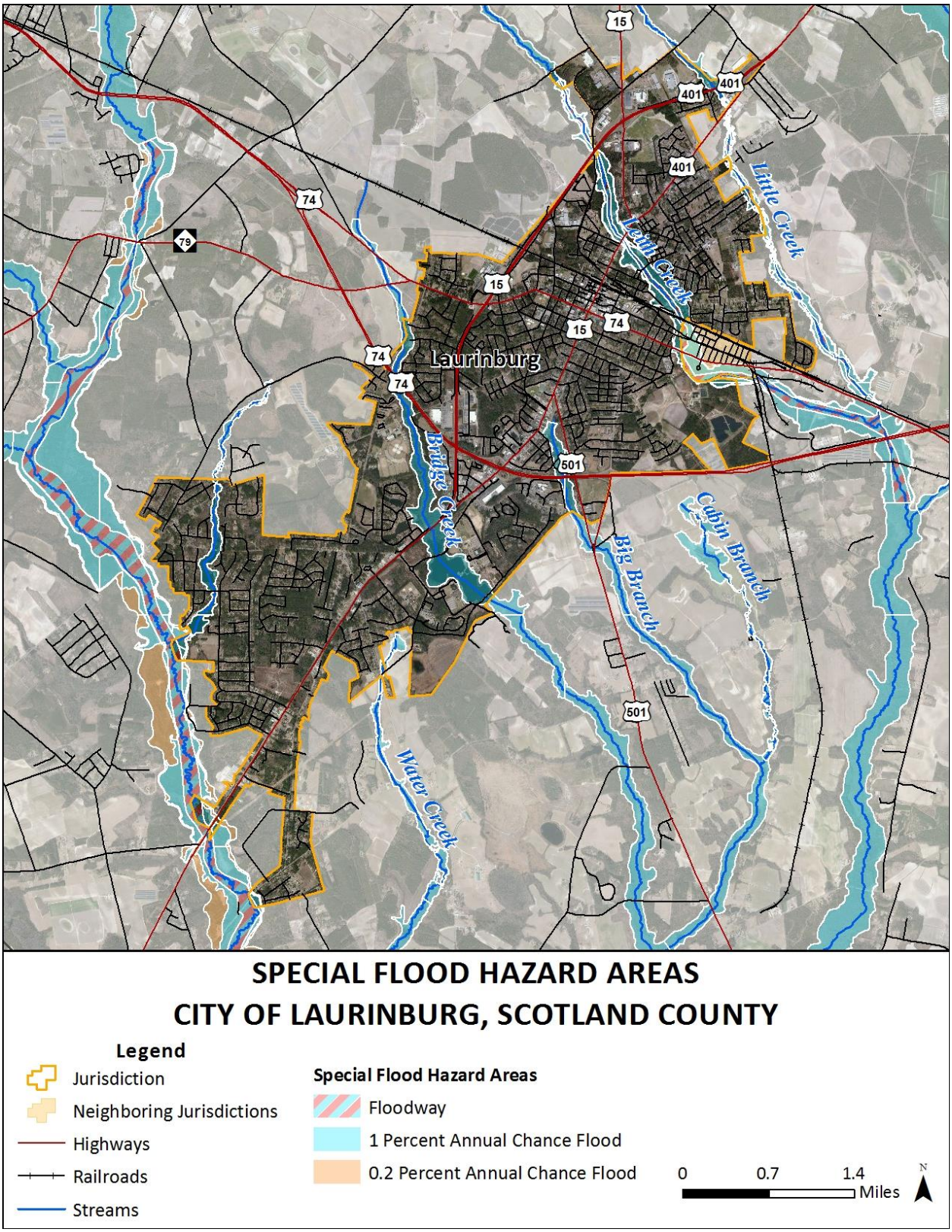
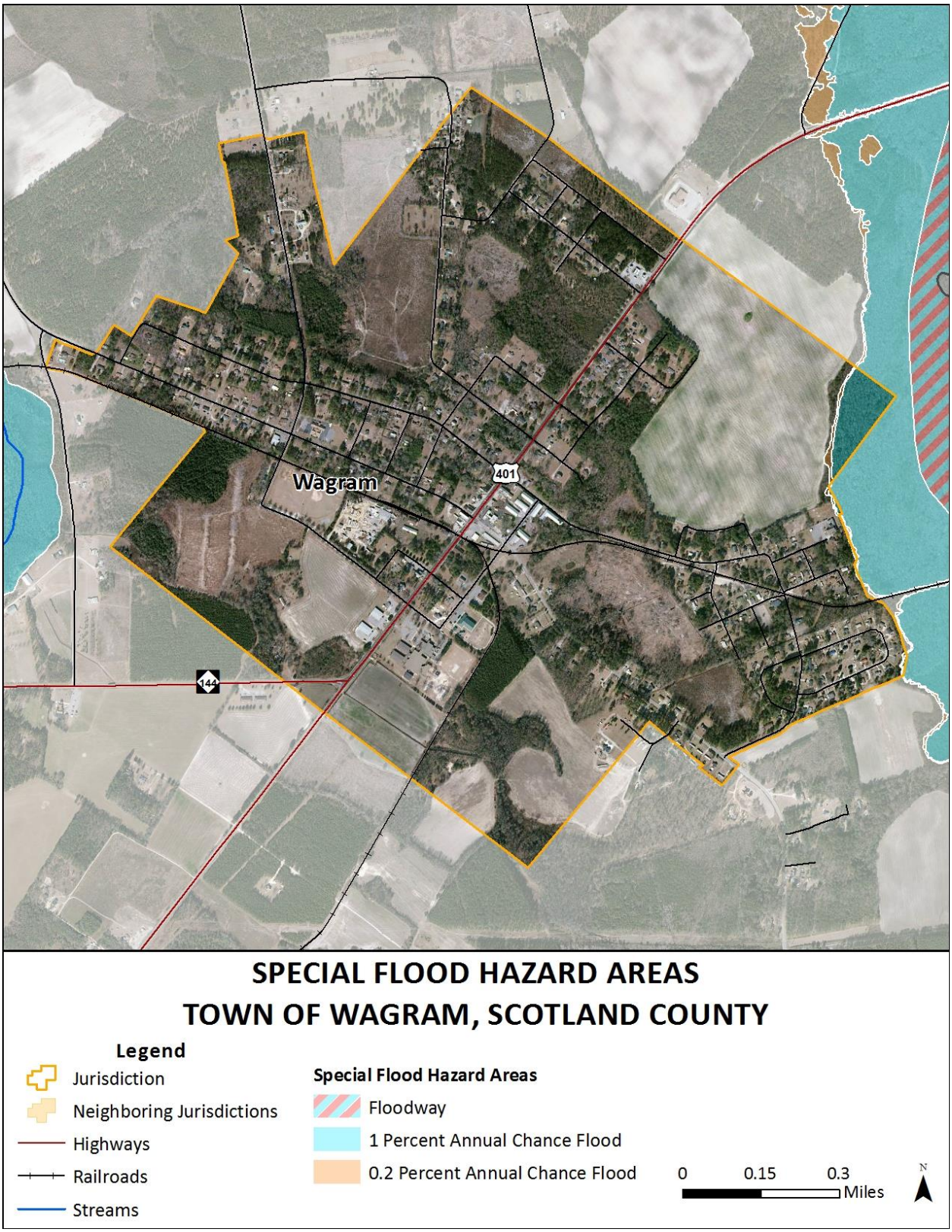


FIGURE 5.66: SPECIAL FLOOD HAZARD AREAS IN THE TOWN OF WAGRAM



Source: Federal Emergency Management Agency

5.15.3 Historical Occurrences

Information from the National Climatic Data Center was used to ascertain historical flood events. The National Climatic Data Center reported a total of 106 flood events throughout the Pee Dee Lumber Region since 1950.[22] A summary of these events is presented in **Table 5.35**. These events accounted for over $3 million (2017 dollars) in property damage due to flood events throughout the region.[23] Specific information on flood events for each county, including date, type of flooding, and deaths and injuries, can be found in **Table 5.36**.

TABLE 5.33: SUMMARY OF FLOOD OCCURRENCES IN THE PEE DEE LUMBER REGION

Location	Number of Occurrences	Property Damage (2017)
Anson County	**35**	**$9,320**
Ansonville	6	$0
Lilesville	0	$0
McFarlan	0	$0
Morven	1	$0
Peachland	0	$0
Polkton	3	$0
Wadesboro	8	$0
Unincorporated Area	17	$9,320
Montgomery County	**30**	**$0**
Biscoe	1	$0
Candor	0	$0
Mount Gilead	4	$0
Star	0	$0
Troy	4	$0
Unincorporated Area	21	$0
Richmond County	**20**	**$74,067**
Dobbins Heights	0	$0
Ellerbe	2	$45,000
Hamlet	1	$0
Hoffman	0	$0
Norman	0	$0
Rockingham	3	$28,138
Unincorporated Area	13	$929
Scotland County	**21**	**$3,000,000**
East Laurinburg	0	$0
Gibson	0	$0
Laurinburg	7	$0
Wagram	2	$0
Unincorporated Area	12	$3,000,000
PEE DEE LUMBER REGION TOTAL	**106**	**$3,083,387**

Source: National Climatic Data Center

[22] These events are only inclusive of those reported by NCDC. It is likely that additional occurrences have occurred and have gone unreported.
[23] The total damage amount was averaged over the number of affected counties when multiple counties were involved in the flood event.

TABLE 5.34: HISTORICAL FLOOD EVENTS IN THE PEE DEE LUMBER REGION

	Date	Type	Deaths/Injuries	Property Damage*
Anson County				
Statewide	3/23/1993	Flash Floods	0/0	$0
White Store Dam	10/11/1996	Flash Flood	0/0	$0
White Store Dam	10/12/1996	Flash Flood	0/0	$0
Anson County	7/24/1997	Flash Flood	0/0	$0
Ansonville	1/6/1998	Flash Flood	0/0	$0
Wadesboro	1/23/1998	Urban/Small Stream Flood	0/0	$0
Anson County	9/4/1998	Flash Flood	0/0	$0
Anson County	9/29/1999	Flash Flood	0/0	$0
Ansonville	7/23/2000	Flash Flood	0/0	$0
Morven	8/4/2000	Flash Flood	0/0	$0
Ansonville	9/22/2000	Flash Flood	0/0	$0
Anson County and 20 others	3/20/2003	Flood	0/0	$9,320
Anson County and 12 others	4/10/2003	Flood	0/0	$0
Polkton	6/16/2003	Flash Flood	0/0	$0
Ansonville	6/18/2003	Flash Flood	0/0	$0
East Portion (Anson County)	7/19/2003	Flash Flood	0/0	$0
Anson County	9/8/2004	Flash Flood	0/0	$0
Wadesboro	7/1/2005	Flash Flood	0/0	$0
Anson County	6/14/2006	Flash Flood	0/0	$0
Gravelton	7/6/2008	Flash Flood	0/0	$0
South Wadesboro	8/2/2008	Flash Flood	0/0	$0
White Store	8/17/2008	Flash Flood	0/0	$0
Pee Dee	9/10/2008	Flash Flood	0/0	$0
Wadesboro	1/25/2010	Flash Flood	0/0	$0
Wadesboro	2/5/2010	Flood	0/0	$0
Ansonville	8/19/2010	Flash Flood	0/0	$0
Pinkston	5/21/2013	Flash Flood	0/0	$0
Pinkston	6/30/2013	Flash Flood	0/0	$0
Wadesboro	3/07/2014	Flood	0/0	$0
Wadesboro	10/3/2015	Flash Flood	0/0	$0
Polkton	10/3/2015	Flash Flood	0/0	$0
Pinkston	12/22/2015	Flash Flood	0/0	$0
Polkton	12/23/2015	Flash Flood	0/0	$0
Ansonville	10/8/2016	Flash Flood	0/0	$0
South Wadesboro	7/18/2017	Flash Flood	0/0	$0
Montgomery County				
Montgomery County	7/23/1997	Flash Flood	0/0	$0
Montgomery County	7/24/1997	Flash Flood	0/0	$0
Candor	2/17/1998	Flash Flood	0/0	$0
Mt Gilead	3/19/1998	Flash Flood	0/0	$0
Mt Gilead	4/9/1998	Flash Flood	0/0	$0
Biscoe	7/16/1998	Flash Flood	0/0	$0

	Date	Type	Deaths/Injuries	Property Damage*
Montgomery County	9/4/1998	Flash Flood	0/0	$0
Montgomery County	9/29/1999	Flash Flood	0/0	$0
Montgomery County	9/29/1999	Flash Flood	0/0	$0
Pekin	6/25/2000	Flash Flood	0/0	$0
Eldorado	6/25/2001	Flash Flood	0/0	$0
Southwest Portion (Montgomery County)	6/16/2003	Flash Flood	0/0	$0
South Portion (Montgomery County)	6/16/2003	Flash Flood	0/0	$0
Eldorado	6/18/2003	Flash Flood	0/0	$0
South Portion (Montgomery County)	7/19/2003	Flash Flood	0/0	$0
South Portion (Montgomery County)	7/31/2003	Flash Flood	0/0	$0
Northwest Portion (Montgomery County)	8/4/2003	Flash Flood	0/0	$0
South Portion (Montgomery County)	8/5/2003	Flash Flood	0/0	$0
North Portion (Montgomery County)	8/10/2003	Flash Flood	0/0	$0
Troy	9/8/2004	Flash Flood	0/0	$0
Central Portion (Montgomery County)	6/14/2006	Flash Flood	0/0	$0
Troy	6/23/2006	Flash Flood	0/0	$0
Eldorado	6/23/2006	Flash Flood	0/0	$0
Troy	6/23/2006	Flash Flood	0/0	$0
Troy	8/30/2006	Flash Flood	0/0	$0
Pee Dee	2/6/2010	Flood	0/0	$0
Moratock	8/20/2010	Flash Flood	0/0	$0
Mt Gilead	3/7/2014	Flood	0/0	$0
Pee Dee	12/30/2015	Flash Flood	0/0	$0
Steeds	10/8/2016	Flash Flood	0/0	$0
Richmond County				
Richmond County	7/24/1997	Flash Flood	0/0	$0
Richmond County and 19 others	1/27/1998	Flood	0/0	$0
Richmond County	9/29/1999	Flash Flood	0/0	$0
Richmond County	8/4/2000	Flash Flood	0/0	$0
Rockingham	8/4/2000	Flash Flood	0/0	$0
Richmond County and 20 others	3/20/2003	Flood	0/0	$929
Rockingham	6/12/2003	Flash Flood	0/0	$0
Richmond County	7/19/2003	Flash Flood	0/0	$0
Hamlet	7/29/2003	Flash Flood	0/0	$0
North Portion (Richmond County)	8/8/2003	Flash Flood	0/0	$0
Rockingham	6/16/2004	Flash Flood	0/0	$0
Ellerbe	6/23/2006	Flash Flood	0/0	$0
Rockingham	9/10/2008	Flash Flood	0/0	$28,138
North Cordova	2/5/2010	Flood	0/0	$0
Mangum	9/30/2010	Flash Flood	0/0	$0

	Date	Type	Deaths/Injuries	Property Damage*
West Rockingham	10/2/2015	Flash Flood	0/0	$0
Derby	9/29/2016	Flash Flood	0/0	$0
Ellerbe	10/8/2016	Flash Flood	0/0	$45,000
Lewarae	7/23/2017	Flash Flood	0/0	$0
Scotland County				
Scotland County	7/24/1997	Flash Flood	0/0	$0
Scotland County	10/17/1999	Flash Flood	0/0	$0
South Portion (Scotland County)	8/4/2000	Flash Flood	0/0	$0
North Portion (Scotland County)	8/4/2000	Flash Flood	0/0	$0
Laurinburg	9/2/2000	Flash Flood	0/0	$0
Wagram	11/12/2002	Flash Flood	0/0	$0
Wagram	6/12/2003	Flash Flood	0/0	$0
Sneads Grove	7/19/2003	Flash Flood	0/0	$0
Laurinburg	8/5/2003	Flash Flood	0/0	$0
Laurinburg	7/28/2004	Flash Flood	0/0	$0
Elmore	7/10/2008	Flash Flood	0/0	$0
Laurinburg	8/2/2008	Flash Flood	0/0	$0
Laurinburg	8/17/2008	Flash Flood	0/0	$0
South Fork	3/23/1993	Flash Flood	0/0	$0
Scotland County	9/8/2004	Flood	0/0	$0
Elmore	7/10/2008	Flash Flood	0/0	$0
Laurinburg	8/2/2008	Flash Flood	0/0	$0
Laurinburg	8/17/2008	Flash Flood	0/0	$0
Crossway	6/9/2015	Flash Flood	0/0	$0
Sneads Grove	6/26/2015	Flash Flood	0/0	$0
Green Pond	10/8/2016	Flash Flood	0/0	$3,000,000

All damages may not have been reported.
Source: National Climatic Data Center

5.15.4 Historical Summary of Insured Flood Losses

According to FEMA flood insurance policy records as of August 2017, there have been 24 flood losses reported in the Pee Dee Lumber Region through the National Flood Insurance Program (NFIP) since 1970, totaling over $340,000 in claims payments. A summary of these figures for each Pee Dee Lumber county is provided in **Table 5.37**. It should be emphasized that these numbers include only those losses to structures that were insured through the NFIP policies, and for losses in which claims were sought and received. It is likely that many additional instances of flood loss in the Pee Dee Lumber Region have occurred but were either uninsured, denied claims payment, or not reported.

TABLE 5.35: SUMMARY OF INSURED FLOOD LOSSES IN THE PEE DEE LUMBER REGION

Location	Flood Losses	Claims Payments
Anson County	**2**	**$17,593**
Ansonville	(S)	(S)
Lilesville	0	$0
McFarlan	*	*
Morven	*	*

Location	Flood Losses	Claims Payments
Peachland	0	$0
Polkton	0	$0
Wadesboro	1	$6,580
Unincorporated Area	1	$11,013
Montgomery County	**4**	**$44,139**
Biscoe	*	*
Candor	*	*
Mount Gilead	*	*
Star	*	*
Troy	0	$0
Unincorporated Area	4	$44,139
Richmond County	**16**	**$246,611**
Dobbins Heights	*	*
Ellerbe	*	*
Hamlet	2	$34,996
Hoffman	*	*
Norman	*	*
Rockingham	9	$132,055
Unincorporated Area	5	$79,560
Scotland County	**2**	**$32,327**
East Laurinburg	0	$0
Gibson	*	*
Laurinburg	2	$32,327
Wagram	*	*
Unincorporated Area	0	$0
PEE DEE LUMBER REGION TOTAL	**24**	**$340,670**

*These communities do not participate in the National Flood Insurance Program. Therefore, no values are reported.
(S) - Suspended
Source: FEMA, NFIP

5.15.5 Repetitive Loss Properties

FEMA defines a repetitive loss property as any insurable building for which two or more claims of more than $1,000 were paid by the NFIP within any rolling 10-year period, since 1978. A repetitive loss property may or may not be currently insured by the NFIP. Currently there are over 122,000 repetitive loss properties nationwide.

Currently, there are 2 non-mitigated repetitive loss properties located in the Pee Dee Lumber Country Region (both in Rockingham, Richmond County), which accounted for 4 losses and more than $47,500 in claims payments under the NFIP. The average claim amount for these properties is $11,878. Both properties are commercial in type. Without mitigation, these properties will likely continue to experience flood losses. **Table 5.38** presents detailed information on repetitive loss properties and NFIP claims and policies for the Pee Dee Lumber Region.

TABLE 5.36: SUMMARY OF REPETITIVE LOSS PROPERTIES IN THE PEE DEE LUMBER REGION

Location	Number of Properties	Types of Properties	Number of Losses	Building Payments	Content Payments	Total Payments	Average Payment
Anson County	**0**		**0**	**$0**	**$0**	**$0**	**$0**
Ansonville	0	--	0	$0	$0	$0	$0
Lilesville	0	--	0	$0	$0	$0	$0
McFarlan	0	--	0	$0	$0	$0	$0
Morven	0	--	0	$0	$0	$0	$0
Peachland	0	--	0	$0	$0	$0	$0
Polkton	0	--	0	$0	$0	$0	$0
Wadesboro	0	--	0	$0	$0	$0	$0
Unincorporated Area	0	--	0	$0	$0	$0	$0
Montgomery County	**0**		**0**	**$0**	**$0**	**$0**	**$0**
Biscoe	0	--	0	$0	$0	$0	$0
Candor	0	--	0	$0	$0	$0	$0
Mount Gilead	0	--	0	$0	$0	$0	$0
Star	0	--	0	$0	$0	$0	$0
Troy	0	--	0	$0	$0	$0	$0
Unincorporated Area	0	--	0	$0	$0	$0	$0
Richmond County	**2**		**4**	**$90,490**	**$0**	**$90,490**	**$18,098**
Dobbins Heights	0	--	0	$0	$0	$0	$0
Ellerbe	0	--	0	$0	$0	$0	$0
Hamlet	0	--	0	$0	$0	$0	$0
Hoffman	0	--	0	$0	$0	$0	$0
Norman	0	--	0	$0	$0	$0	$0
Rockingham	2	2 Non-residential	4	$90,490	$0	$90,490	$18,098
Unincorporated Area	0	--	0	$0	$0	$0	$0
Scotland County	**0**		**0**	**$0**	**$0**	**$0**	**$0**
East Laurinburg	0	--	0	$0	$0	$0	$0
Gibson	0	--	0	$0	$0	$0	$0
Laurinburg	0	--	0	$0	$0	$0	$0
Wagram	0	--	0	$0	$0	$0	$0
Unincorporated Area	0	--	0	$0	$0	$0	$0
PEE DEE LUMBER REGION TOTAL	**2**		**4**	**$90,490**	**$0**	**$90,490**	**$18,098**

Source: National Flood Insurance Program

5.15.6 Probability of Future Occurrences

Flood events will remain a threat in the Pee Dee Lumber Region, and the probability of future occurrences will remain likely (between 10 and 100 percent annual probability).

OTHER HAZARDS

5.16 HAZARDOUS MATERIALS INCIDENTS

5.16.1 Background

Hazardous materials can be found in many forms and quantities that can potentially cause death; serious injury; long-lasting health effects; and damage to buildings, homes, and other property in varying degrees. Such materials are routinely used and stored in many homes and businesses and are also shipped daily on the nation's highways, railroads, waterways, and pipelines. This subsection on the hazardous material hazard is intended to provide a general overview of the hazard, and the threshold for identifying fixed and mobile sources of hazardous materials is limited to general information on rail, highway, and FEMA-identified fixed HAZMAT sites determined to be of greatest significance as appropriate for the purposes of this plan.

Hazardous material (HAZMAT) incidents can apply to fixed facilities as well as mobile, transportation-related accidents in the air, by rail, on the nation's highways, and on the water. Approximately 6,774 HAZMAT events occur each year, 5,517 of which are highway incidents, 991 are railroad incidents, and 266 are due to other causes.[24] In essence, HAZMAT incidents consist of solid, liquid, and/or gaseous contaminants that are released from fixed or mobile containers, whether by accident or by design as with an intentional terrorist attack. A HAZMAT incident can last hours to days, while some chemicals can be corrosive or otherwise damaging over longer periods of time. In addition to the primary release, explosions and/or fires can result from a release, and contaminants can be extended beyond the initial area by persons, vehicles, water, wind, and possibly wildlife as well.

HAZMAT incidents can also occur as a result of or in tandem with natural hazard events, such as floods, hurricanes, tornadoes, and earthquakes, which in addition to causing incidents can also hinder response efforts. In the case of Hurricane Floyd in September 1999, communities along the Eastern United States were faced with flooded junkyards, disturbed cemeteries, deceased livestock, floating propane tanks, uncontrolled fertilizer spills, and a variety of other environmental pollutants that caused widespread toxological concern.

Hazardous material incidents can include the spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment of a hazardous material, but exclude: (1) any release which results in exposure to poisons solely within the workplace with respect to claims which such persons may assert against the employer of such persons; (2) emissions from the engine exhaust of a motor vehicle, rolling stock, aircraft, vessel or pipeline pumping station engine; (3) release of source, byproduct, or special nuclear material from a nuclear incident; and (4) the normal application of fertilizer.

5.16.2 Location and Spatial Extent

As a result of the 1986 Emergency Planning and Community Right to Know Act (EPCRA), the Environmental Protection Agency provides public information on hazardous materials. One facet of this

[24] FEMA, 1997.

program is to collect information from industrial facilities on the releases and transfers of certain toxic agents. This information is then reported in the Toxic Release Inventory (TRI). TRI sites indicate where such activity is occurring. The Pee Dee Lumber Region has 57 TRI sites. These sites are shown in **Figures 5.67, 5.68, 5.69, 5.70** and **5.71.**

FIGURE 5.67: TOXIC RELEASE INVENTORY (TRI) SITES IN THE PEE DEE LUMBER REGION

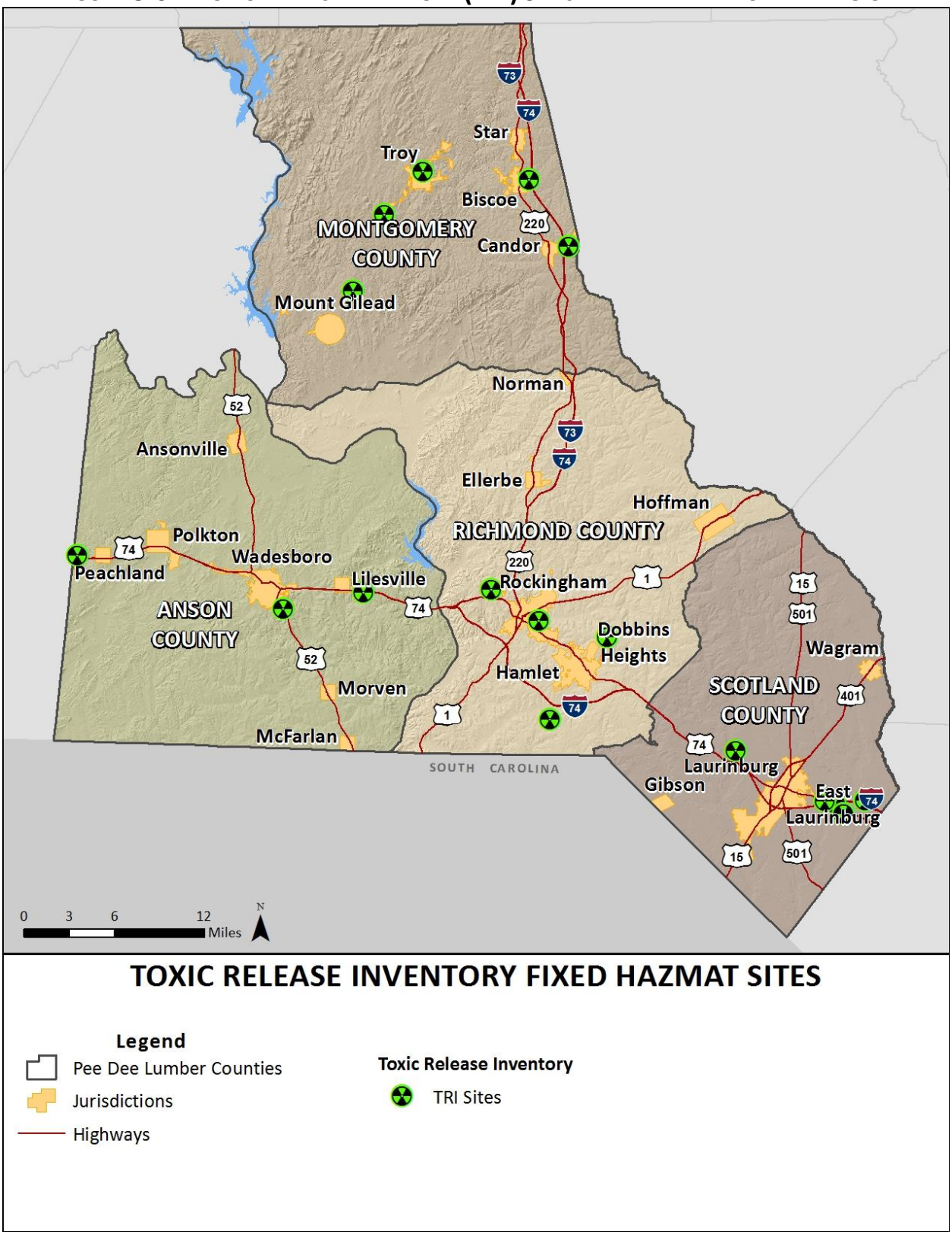


FIGURE 5.68: TOXIC RELEASE INVENTORY (TRI) SITES IN ANSON COUNTY

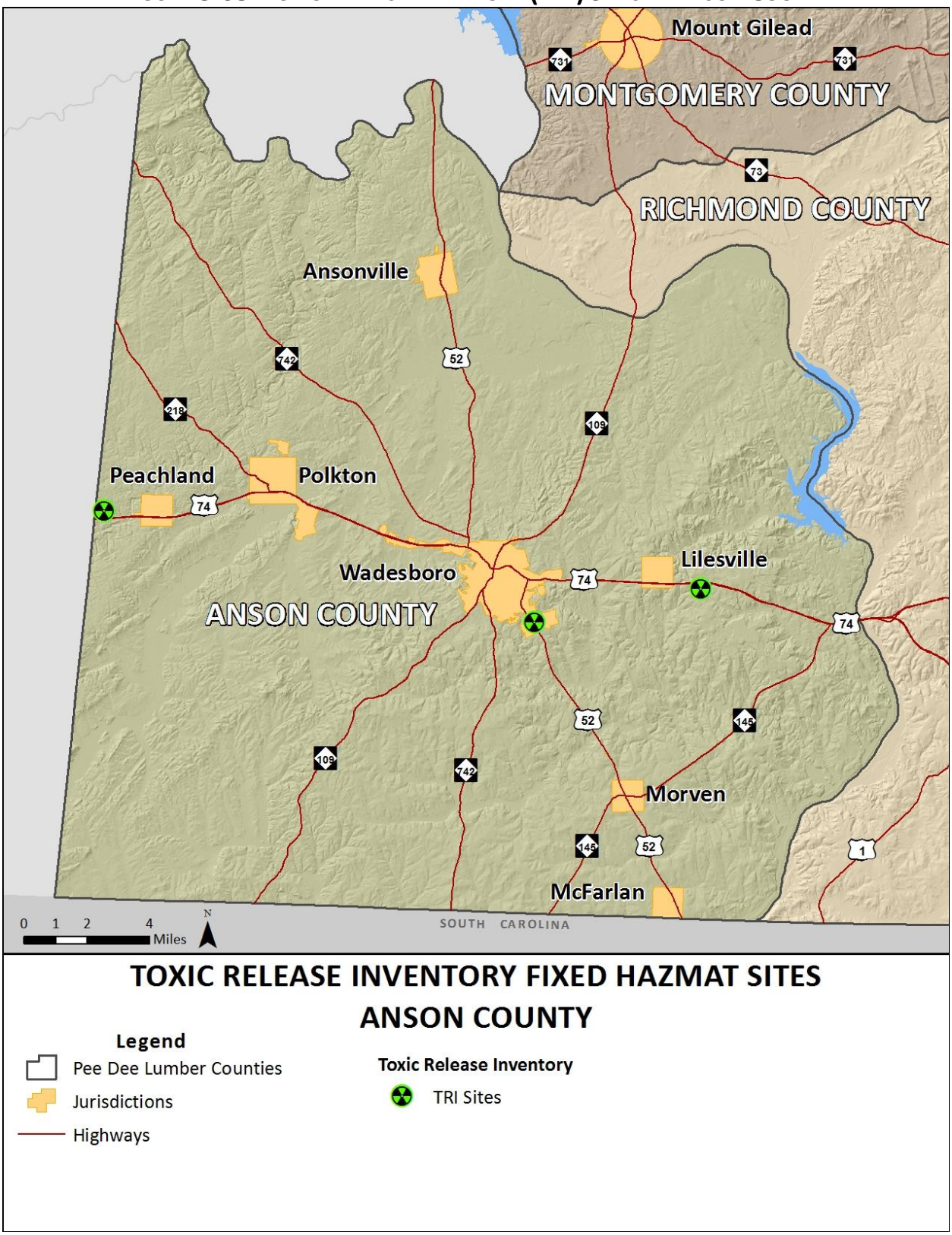


FIGURE 5.69: TOXIC RELEASE INVENTORY (TRI) SITES IN MONTGOMERY COUNTY

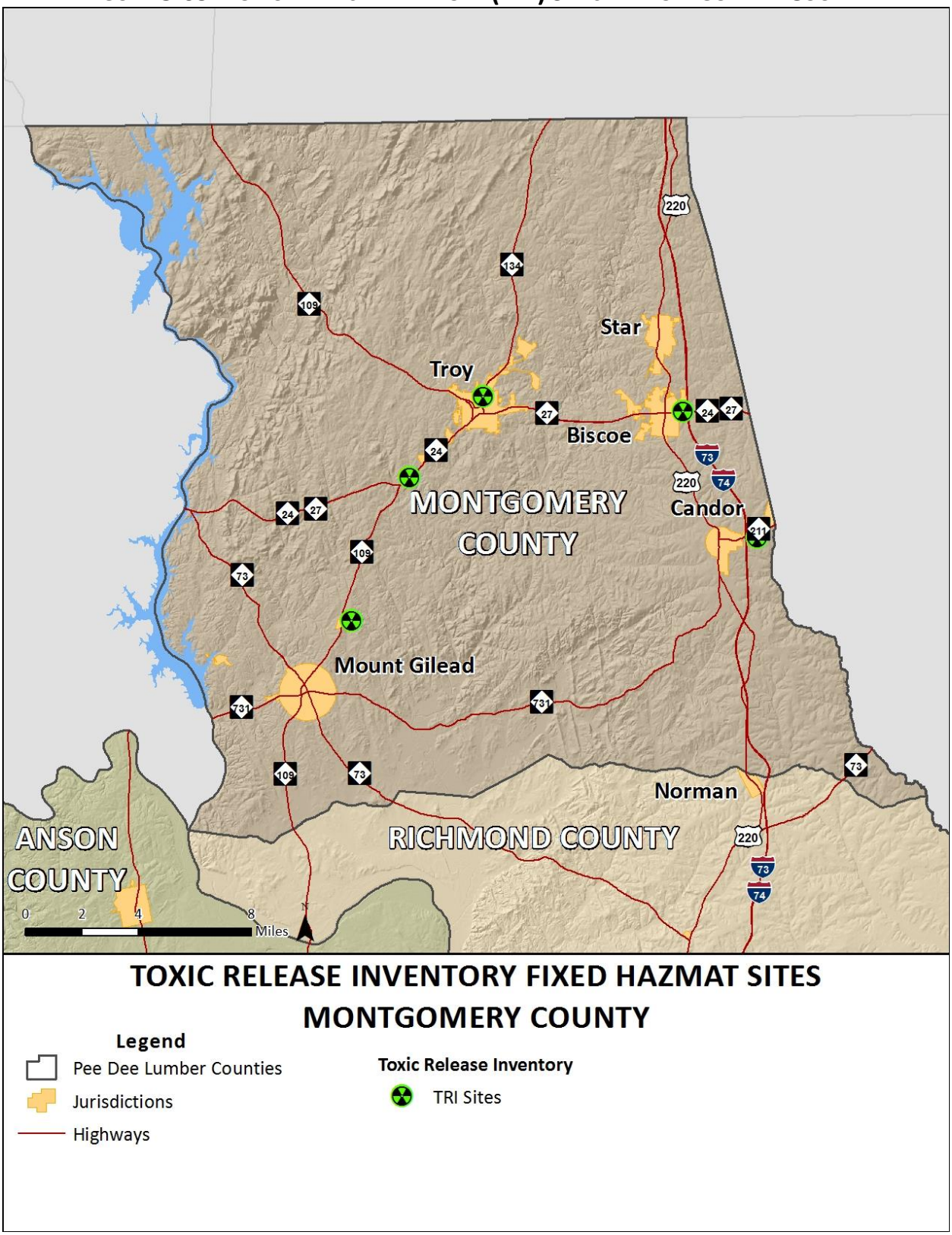


FIGURE 5.70: TOXIC RELEASE INVENTORY (TRI) SITES IN RICHMOND COUNTY

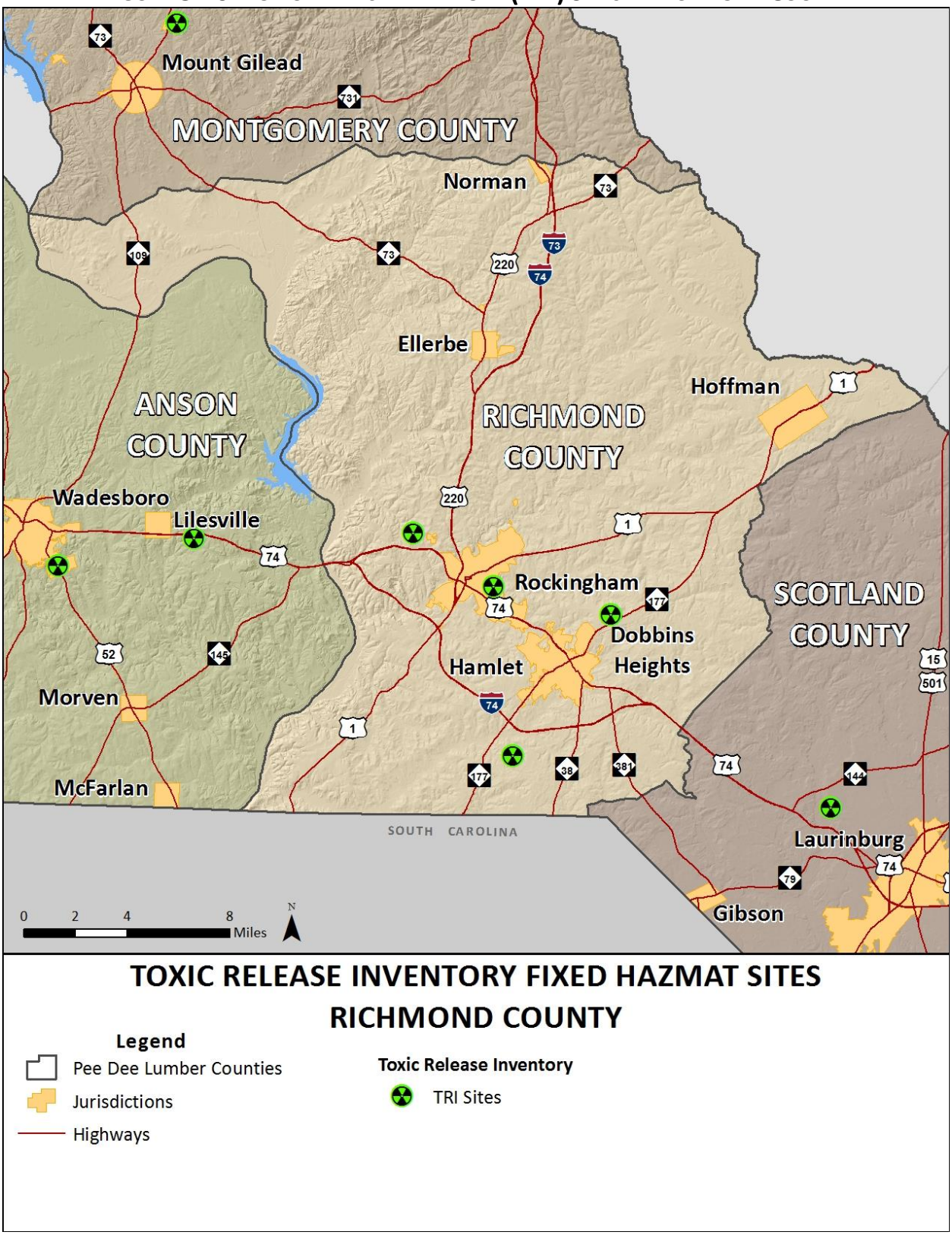
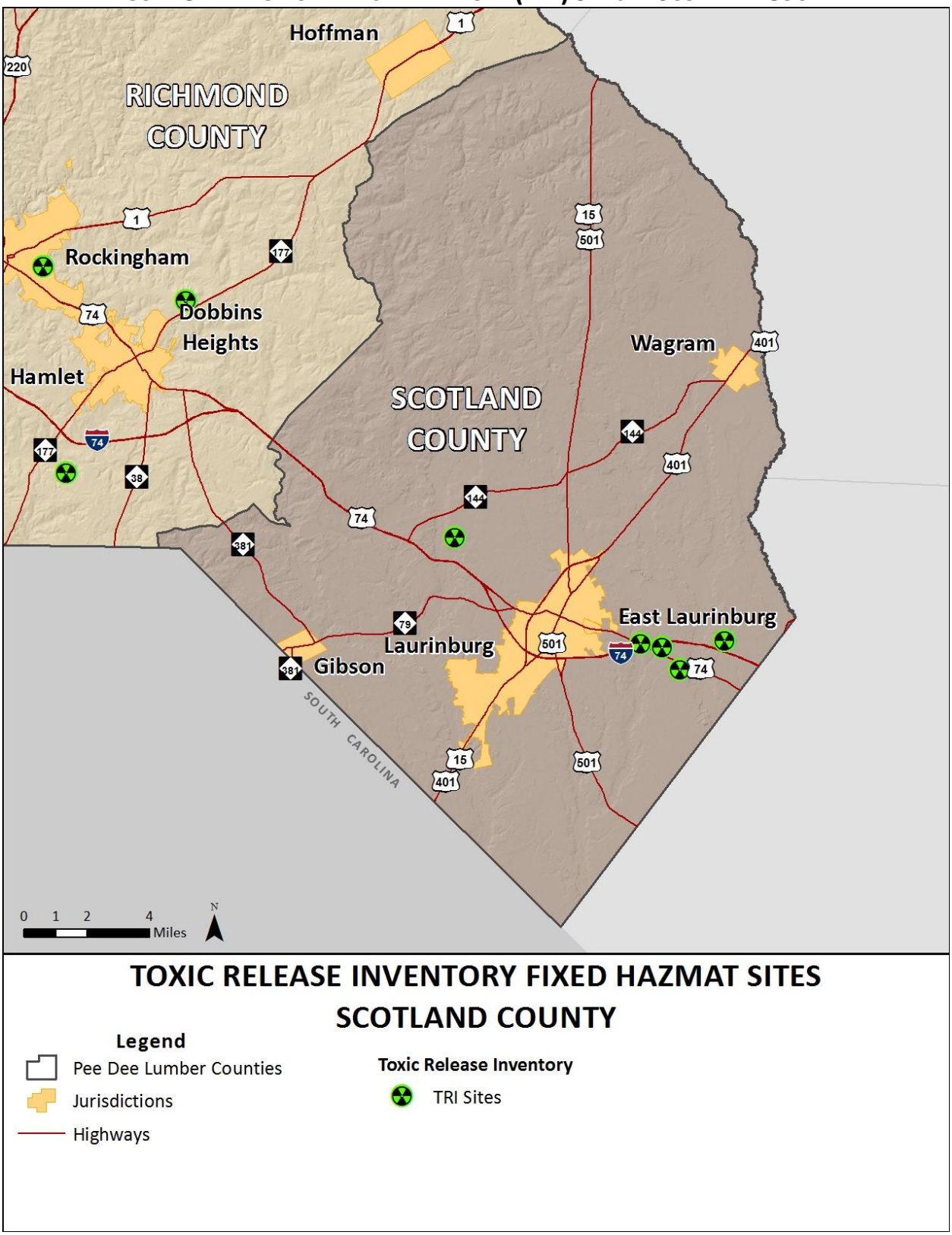


FIGURE 5.71: TOXIC RELEASE INVENTORY (TRI) SITES IN SCOTLAND COUNTY



Source: EPA

In addition to "fixed" hazardous materials locations, hazardous materials may also impact the region via roadways and rail. Many roads in the region are narrow and winding, making hazardous material transport in the area especially treacherous. All roads that permit hazardous material transport are considered potentially at risk to an incident. Additional analysis will be performed on fixed sites and mobile corridors in Section 6: *Vulnerability Assessment*.

5.16.3 Historical Occurrences

The U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA) lists historical occurrences throughout the nation. A "serious incident" (highlighted in yellow in **Table 5.38** below) is 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.

However, prior to 2002, a hazardous materials "serious incident" was defined as follows:

- a fatality or major injury due to a hazardous material,
- closure of a major transportation artery or facility or evacuation of six or more person due to the presence of hazardous material, or
- a vehicle accident or derailment resulting in the release of a hazardous material.

Table 5.39 presents a summary of HAZMAT incidents reported in the Pee Dee Lumber Region. This is followed by **Table 5.40** which presents detailed information on historic HAZMAT incidents reported in the Pee Dee Lumber Region.

TABLE 5.37: SUMMARY OF HAZMAT INCIDENTS IN THE PEE DEE LUMBER REGION

Location	Number of Occurrences	Property Damage (2017)
Anson County	**15**	**$154,736**
Ansonville	-	-
Lilesville	4	$38
McFarlan	-	-
Morven	-	-
Peachland	1	-
Polkton	1	-
Wadesboro	9	$154,698
Unincorporated Area	-	-
Montgomery County	**13**	**$964,509**
Biscoe	3	$14,004
Candor	-	-
Mount Gilead	2	$949,930

Location	Number of Occurrences	Property Damage (2017)
Star	-	-
Troy	4	$488
Unincorporated Area	2	$127
Richmond County	**128**	**$2,097,989**
Dobbins Heights	-	-
Ellerbe	-	-
Hamlet	119	$127,450
Hoffman	1	$35,718
Norman	-	-
Rockingham	7	$5,803
Unincorporated Area	1	-
Scotland County	**27**	**$12,854**
East Laurinburg	-	-
Gibson	-	-
Laurinburg	22	$12,854
Wagram	-	-
Unincorporated Area	5	-
PEE DEE LUMBER REGION TOTAL	**183**	**$3,230,088**

Source: National Climatic Data Center

TABLE 5.38: SUMMARY OF HAZMAT INCIDENTS IN THE PEE DEE LUMBER REGION

Report Number	Date	City	Mode	Serious Incident?	Fatalities/ Injuries	Damages ($)	Quantity Released
Anson County							
I-1975100627	10/2/1975	Wadesboro	Rail	No	0/0	$0	0
I-1976020208	12/22/1975	Wadesboro	Rail	No	0/0	$0	4 LGA
I-1980060357	5/29/1980	Wadesboro	Highway	No	0/0	$0	55 LGA
I-1984050100	4/25/1984	Wadesboro	Highway	No	0/0	$0	0.0630 LGA
I-1984050475	5/14/1984	Wadesboro	Highway	No	0/0	$0	0.5 LGA
I-1985030270	2/21/1985	Wadesboro	Highway	No	0/0	$0	5 LGA
I-1988080448	8/1/1988	Lilesville	Rail	No	0/0	$0	10 LGA
I-1988100573	10/5/1988	Wadesboro	Highway	Yes	0/0	$0	1,875 LGA
I-1991080353	7/29/1991	Wadesboro	Highway	No	0/0	$288	5 LGA
I-1991110525	11/16/1991	Lilesville	Highway	No	0/0	$9	3 LGA
I-2000010034	12/22/1999	Lilesville	Highway	No	0/0	$29	20 LGA
I-2000050256	4/17/2000	Lilesville	Highway	No	0/0	$0	0.007813 LGA
I-2002010960	9/23/2000	Wadesboro	Highway	Yes	0/0	$154,410	269 LGA
I-2002060080	2/18/2002	Peachland	Highway	No	0/0	$0	2 LGA
I-2003071515	7/2/2003	Polkton	Rail	No	0/0	$0	0
Montgomery County							
I-1971040030	2/5/1971	Biscoe	Highway	No	0/0	$0	0
I-1984030096	2/13/1984	Pee Dee	Rail	No	0/0	$0	0.0070 LGA
I-1986090539	9/8/1986	Troy	Highway	No	0/0	$0	4.50 LGA
I-1987080088	7/9/1987	Troy	Highway	No	0/0	$0	0.0630 LGA

Report Number	Date	City	Mode	Serious Incident?	Fatalities/ Injuries	Damages ($)	Quantity Released
I-1990050077	4/28/1990	Pee Dee	Rail	Yes	0/0	$0	8,000 LGA
I-1990080672	7/16/1990	Troy	Highway	No	0/0	$385	2 LGA
I-1991060492	4/24/1991	Troy	Highway	No	0/1	$63	1 LGA
I-1992040254	3/27/1992	Wadeville	Highway	No	0/0	$44	10 LGA
I-1998080965	7/8/1998	Ether	Highway	No	0/0	$83	5 LGA
I-1975100575	11/18/2005	Biscoe	Highway	No	0/0	$3,690	25 LGA
I-2006040665	3/26/2006	Biscoe	Highway	Yes	0/0	$10,314	200 LGA
I-2009060363	6/22/2009	Mt. Gilead	Highway	No	0/0	$0	10 LGA
I-2010080348	2/28/2010	Mt. Gilead	Highway	Yes	0/0	$949,930	7,500 LGA
Richmond County							
I-1974010387	1/11/1974	Hamlet	Rail	No	0/0	0	0
I-1974010386	1/20/1974	Hamlet	Rail	No	0/0	0	0
I-1974040129	3/29/1974	Hamlet	Rail	No	0/0	0	0
I-1974040330	4/12/1974	Hamlet	Rail	No	0/0	0	0
I-1975070288	6/26/1975	Hamlet	Rail	No	0/0	0	0
I-1975080097	7/26/1975	Hamlet	Rail	No	0/0	0	0
I-1975090447	8/29/1975	Hamlet	Rail	No	0/0	0	0
I-1975100767	9/21/1975	Hamlet	Rail	No	0/0	0	0
I-1975090948	9/25/1975	Richmond	Highway	No	0/0	0	0
I-1975100645	10/3/1975	Rockingham	Highway	No	0/0	0	0
I-1975120183	11/12/1975	Hamlet	Rail	No	0/0	0	0
I-1975120578	12/12/1975	Hamlet	Rail	No	0/0	0	0
I-1976010361	12/30/1975	Hamlet	Rail	No	0/0	0	10 LGA
I-1976010429	1/6/1976	Hamlet	Highway	Yes	0/0	0	1,500 LGA
I-1976070322	7/6/1976	Hamlet	Rail	No	0/0	0	5 LGA
I-1977040650	3/31/1977	Rockingham	Rail	Yes	0/1	0	10,100 SLB
I-1977050903	5/16/1977	Rockingham	Highway	No	0/0	0	0
I-1978020232	2/1/1978	Rockingham	Highway	No	0/0	0	1 LGA
I-1978030631	3/10/1978	Rockingham	Highway	No	0/0	0	0
I-1978031351	3/21/1978	Rockingham	Highway	No	0/0	0	0
I-1978041373	4/3/1978	Hamlet	Rail	Yes	0/0	0	250 LGA
I-1979040974	4/7/1979	Hamlet	Rail	Yes	0/0	0	1,286 LGA
I-1979101230	10/3/1979	Hamlet	Rail	No	0/0	0	1 LGA
I-1979111279	10/30/1979	Hamlet	Rail	No	0/0	0	0
I-1980011023	12/28/1979	Hamlet	Rail	No	0/0	0	20 LGA
I-1981020816	1/19/1981	Hamlet	Rail	No	0/0	0	0
I-1982040349	3/20/1982	Hamlet	Rail	No	0/0	0	1 SLB
I-1987040184	4/4/1987	Hamlet	Rail	No	0/0	0	1.88 LGA
I-1987050250	5/2/1987	Hamlet	Rail	No	0/0	0	14 LGA
I-1987070638	7/17/1987	Hamlet	Rail	No	0/0	0	5 LGA
I-1987110093	10/29/1987	Hamlet	Rail	No	0/0	0	100 LGA
I-1988020060	1/29/1988	Hamlet	Rail	No	0/0	0	2 LGA
I-1988070121	6/21/1988	Hamlet	Rail	Yes	0/0	0	20,000 LGA
I-1988080295	7/24/1988	Hamlet	Rail	No	0/1	0	1 LGA
I-1988080305	7/27/1988	Hamlet	Rail	No	0/0	0	1 LGA
I-1988110114	10/19/1988	Hamlet	Rail	No	0/0	0	1 LGA

Report Number	Date	City	Mode	Serious Incident?	Fatalities/ Injuries	Damages ($)	Quantity Released
I-1989030248	3/2/1989	Hamlet	Rail	No	0/0	0	1 LGA
I-1989040535	4/16/1989	Hamlet	Rail	No	0/0	0	1.25 LGA
I-1989080626	8/4/1989	Hamlet	Rail	No	0/0	0	1.25 LGA
I-1989100458	10/7/1989	Hamlet	Rail	No	0/0	0	2 LGA
I-1989110344	11/13/1989	Hamlet	Rail	No	0/0	0	8 LGA
I-1990050151	4/26/1990	Hamlet	Rail	No	0/0	0	0.625 LGA
I-1990070133	6/28/1990	Hamlet	Rail	Yes	0/0	$46,942	4,500 LGA
I-1991070129	5/14/1991	Hamlet	Rail	No	0/0	$90	5 LGA
I-1991070203	6/22/1991	Hamlet	Rail	No	0/0	0	0
I-1991070724	7/11/1991	Hamlet	Rail	No	0/0	0	1 LGA
I-1991100019	9/6/1991	Hamlet	Rail	No	0/0	0	2 LGA
I-1991100799	9/12/1991	Hamlet	Rail	No	0/0	$18	10 LGA
I-1991110374	10/10/1991	Hamlet	Rail	No	0/0	0	1 LGA
I-1992010220	12/1/1991	Hamlet	Rail	No	0/0	$7	1 LGA
I-1992010575	1/9/1992	Hamlet	Rail	No	0/0	$35	10 LGA
I-1992020620	1/12/1992	Hamlet	Rail	No	0/0	$17	3 LGA
I-1992040091	2/4/1992	Hamlet	Rail	No	0/0	$3	1 LGA
I-1992040512	3/3/1992	Hamlet	Rail	Yes	0/0	0	40,000 SLB
I-1992060832	6/22/1992	Hamlet	Rail	No	0/0	$9	1 LGA
I-1992070818	7/20/1992	Hamlet	Rail	No	0/0	0	0
I-1992090924	8/23/1992	Hamlet	Rail	No	0/0	0	0
I-1992090733	8/23/1992	Hamlet	Rail	No	0/0	0	2 LGA
I-1992090950	9/11/1992	Hamlet	Rail	No	0/0	0	1 LGA
I-1993010622	1/4/1993	Hamlet	Rail	No	0/0	0	2 LGA
I-1993081038	8/4/1993	Hamlet	Rail	No	0/0	$8	2 LGA
I-1993120959	11/30/1993	Hamlet	Rail	No	0/0	0	1 LGA
I-1994040784	3/20/1994	Hamlet	Rail	Yes	0/0	$3,343	320 LGA
I-1994050374	3/30/1994	Hamlet	Rail	No	0/0	0	1 LGA
I-1994061050	5/18/1994	Hamlet	Rail	No	0/0	0	5 LGA
I-1994061793	5/21/1994	Hamlet	Rail	No	0/0	0	1 LGA
I-1994091249	5/28/1994	Hamlet	Highway	No	0/0	$4033	8 LGA
I-1994081397	8/15/1994	Hamlet	Rail	No	0/0	0	3 LGA
I-1994120802	11/23/1994	Hamlet	Rail	No	0/0	0	0
I-1995010289	12/5/1994	Hamlet	Rail	No	0/0	0	1 LGA
I-1995030788	2/22/1995	Hamlet	Rail	No	0/0	0	1 LGA
I-1995030787	2/22/1995	Hamlet	Rail	No	0/0	0	1 LGA
I-1995061240	4/2/1995	Hoffman	Highway	Yes	0/0	$35,718	200 LGA
I-1995060247	5/19/1995	Hamlet	Rail	No	0/0	0	5 LGA
I-1995080895	8/7/1995	Hamlet	Rail	No	0/0	0	3 LGA
I-1995120217	11/13/1995	Hamlet	Rail	No	0/0	0	1 LGA
I-1996010385	12/17/1995	Hamlet	Rail	No	0/0	0	0
I-1996060341	5/6/1996	Hamlet	Rail	No	0/0	0	1 LGA
I-1996060367	5/18/1996	Hamlet	Rail	No	0/0	$6,429	1 LGA
I-1996070154	5/27/1996	Hamlet	Rail	No	0/0	0	5 LGA
I-1996070616	6/6/1996	Hamlet	Rail	No	0/0	0	1 LGA
I-1996070616	6/6/1996	Hamlet	Rail	No	0/0	0	0

Report Number	Date	City	Mode	Serious Incident?	Fatalities/ Injuries	Damages ($)	Quantity Released
I-1996080341	7/6/1996	Hamlet	Rail	No	0/0	0	1 LGA
I-1996081318	8/15/1996	Hamlet	Rail	No	0/0	0	1 LGA
I-1997010168	12/12/1996	Hamlet	Rail	No	0/0	0	1 LGA
I-1997020136	1/8/1997	Hamlet	Rail	No	0/0	0	1 LGA
I-1997020512	1/28/1997	Rockingham	Highway	No	0/0	$5,803	75 LGA
I-1997030307	2/18/1997	Hamlet	Rail	No	0/0	0	0
I-1997070219	6/5/1997	Hamlet	Rail	No	0/0	0	5 LGA
I-1997070224	6/14/1997	Hamlet	Rail	No	0/0	$779	10 LGA
I-1997100761	9/12/1997	Hamlet	Rail	No	0/0	0	0
I-1997100763	9/12/1997	Hamlet	Rail	No	0/0	0	0
I-1998010602	12/6/1997	Hamlet	Rail	No	0/0	0	0
I-1998020280	1/26/1998	Hamlet	Rail	No	0/0	$1,128	10 LGA
I-1998080415	7/13/1998	Hamlet	Rail	No	0/0	0	1 LGA
I-1998091134	8/19/1998	Hamlet	Rail	No	0/0	0	10 LGA
I-1998091131	8/21/1998	Hamlet	Rail	No	0/0	0	5 LGA
I-1999072128	7/2/1999	Hamlet	Rail	Yes	0/0	$8,811	500 LGA
I-1999072127	7/2/1999	Hamlet	Rail	Yes	0/0	$8,811	500 LGA
I-1999090398	8/8/1999	Hamlet	Rail	No	0/0	0	1 LGA
I-2000030790	2/27/2000	Hamlet	Rail	No	0/0	0	1 LGA
I-2000030789	2/27/2000	Hamlet	Rail	No	0/0	0	1 LGA
I-2000101228	10/4/2000	Hamlet	Rail	No	0/0	0	2 LGA
I-2000121495	12/2/2000	Hamlet	Rail	No	0/0	$7	1 LGA
I-2002020496	12/1/2001	Hamlet	Rail	No	0/0	0	1 LGA
I-2002020501	12/14/2001	Hamlet	Rail	No	0/0	0	100 LGA
I-2002060090	4/16/2002	Hamlet	Rail	No	0/0	0	50 LGA
I-2002060096	4/20/2002	Hamlet	Rail	No	0/0	0	1 LGA
I-2002061756	6/6/2002	Hamlet	Rail	Yes	0/0	0	155 LGA
I-2003091252	8/29/2003	Hamlet	Rail	No	0/0	0	1 LGA
I-2004010042	12/1/2003	Hamlet	Rail	No	0/0	$1,579	2 LGA
I-2004060271	5/5/2004	Hamlet	Rail	Yes	0/0	0	16,000 LGA
I-2005110465	10/24/2005	Hamlet	Rail	No	0/0	$4,305	5 LGA
I-2006020316	1/17/2006	Hamlet	Rail	No	0/0	$1,182	2 LGA
I-2006081036	7/29/2006	Hamlet	Rail	No	0/0	$1,791	0 GCF
I-2006110177	10/15/2006	Hamlet	Rail	No	0/0	$2,394	2 LGA
I-2006120472	11/25/2006	Hamlet	Rail	No	0/0	$4,788	1 LGA
I-2007040111	3/19/2007	Hamlet	Rail	Yes	0/0	$9,274	400 LGA
X-2007060292	6/11/2007	Hamlet	Rail	No	0/0	$2,319	20 LGA
X-2007120069	11/14/2007	Hamlet	Rail	No	0/0	0	3 LGA
X-2008080365	8/11/2008	Hamlet	Rail	No	0/0	$2,319	2 LGA
X-2008100057	9/17/2008	Hamlet	Rail	No	0/0	$1,137	1 LGA
X-2010020209	1/27/2010	Hamlet	Rail	No	0/0	$2,663	1 LGA
X-2010040084	4/11/2010	Hamlet	Rail	No	0/0	$4,265	5 LGA
X-2010070228	7/11/2010	Hamlet	Rail	No	0/0	$4,663	2 LGA
X-2010100241	10/18/2010	Hamlet	Rail	No	0/0	$1,061	1 LGA
X-2011020267	2/20/2011	Hamlet	Rail	No	0/0	$1,545	0.5 LGA
X-2011070025	6/21/2011	Hamlet	Rail	No	0/0	$1,875	5 LGA

Report Number	Date	City	Mode	Serious Incident?	Fatalities/ Injuries	Damages ($)	Quantity Released
X-2013120128	11/20/2013	Rockingham	Rail	No	0/1	$3,000	0.5 LGA
Scotland County							
I-1971080150	8/11/1971	Laurinburg	Highway	No	0/0	$0	0
I-1973030224	3/6/1973	Laurinburg	Highway	No	1/3	$0	0
I-1975070360	5/14/1975	Laurinburg	Highway	No	0/0	$0	0
I-1975060376	5/31/1975	Laurel Hill	Rail	No	0/0	$0	0
I-1976030780	3/16/1976	Laurel Hill	Highway	No	0/0	$0	7 LGA
I-1976080626	8/1/1976	Laurel Hill	Rail	Yes	0/1	$0	19,670 LGA
I-1976080843	8/11/1976	Laurinburg	Highway	No	0/0	$0	9 LGA
I-1976100869	10/22/1976	Laurinburg	Highway	No	0/0	$0	0
I-1977080160	7/26/1977	Laurinburg	Highway	No	0/0	$0	1 LGA
I-1977081676	7/27/1977	Laurinburg	Highway	No	0/0	$0	0
I-1977101412	10/25/1977	Laurinburg	Highway	No	0/0	$0	0
I-1979061533	6/18/1979	Laurinburg	Highway	No	0/0	$0	2 LGA
I-1982090263	8/27/1982	Laurinburg	Highway	No	0/0	$0	5 LGA
I-1983010018	12/17/1982	Laurinburg	Highway	Yes	0/0	$0	6,000 LGA
I-1983120171	11/22/1983	Laurel Hill	Highway	No	0/0	$0	0
I-1984030219	2/21/1984	Laurinburg	Highway	No	0/0	$0	0 LGA
I-1984050310	5/3/1984	Laurinburg	Highway	No	0/0	$0	60 LGA
I-1985050180	5/2/1985	Laurinburg	Highway	No	0/0	$0	5 LGA
I-1986100036	9/29/1986	Laurinburg	Highway	No	0/0	$0	30 LGA
I-1988090411	8/17/1988	Laurinburg	Highway	No	0/0	$0	20 LGA
I-1988110324	11/1/1988	Laurinburg	Highway	No	0/0	$0	1 LGA
I-1993030241	3/2/1993	Laurinburg	Highway	No	0/0	$5,264	1 LGA
I-1993081259	8/2/1993	Laurinburg	Highway	No	0/0	$679	2 SLB
I-1995101050	9/19/1995	Laurinburg	Highway	No	0/0	782	6 LGA
I-1998090367	8/3/1998	Laurinburg	Highway	No	0/0	$3,158	5 LGA
I-1998110754	11/12/1998	Laurel Hill	Rail	No	0/0	$0	50 LGA
E-2010060249	5/2/2010	Laurinburg	Highway	No	0/0	$2,971	15 LGA
E-2016101107	9/1/2016	Laurinburg	Highway	No	0/0	$0	25 LGA

Source: USDOT PHMSA

5.16.4 Probability of Future Occurrence

Given the location of 57 toxic release inventory sites in the Pee Dee Lumber Region and several serious roadway incidents, it is possible that a hazardous material incident may occur in the region (1 to 10 percent annual probability). County and town officials are mindful of this possibility and take precautions to prevent such an event from occurring. This hazard is recognized as one of the greatest threats to the Pee Dee Lumber Region. Furthermore, there are detailed plans in place to respond to an occurrence.

5.17 WILDFIRE

5.17.1 Background

A wildfire is any outdoor fire (i.e. grassland, forest, brush land) that is not under control, supervised, or prescribed.[25] Wildfires are part of the natural management of forest ecosystems, but may also be caused by human factors.

Nationally, over 80 percent of forest fires are started by negligent human behavior such as smoking in wooded areas or improperly extinguishing campfires. The second most common cause for wildfire is lightning. In North Carolina, a majority of fires are caused by debris burning.

There are three classes of wildland fires: surface fire, ground fire, and crown fire. A surface fire is the most common of these three classes and burns along the floor of a forest, moving slowly and killing or damaging trees. A ground fire (muck fire) is usually started by lightning or human carelessness and burns on or below the forest floor. Crown fires spread rapidly by wind and move quickly by jumping along the tops of trees. Wildfires are usually signaled by dense smoke that fills the area for miles around.

Wildfire probability depends on local weather conditions, outdoor activities such as camping, debris burning, and construction, and the degree of public cooperation with fire prevention measures. Drought conditions and other natural hazards (such as tornadoes, hurricanes, etc.) increase the probability of wildfires by producing fuel in both urban and rural settings.

Many individual homes and cabins, subdivisions, resorts, recreational areas, organizational camps, businesses, and industries are located within high wildfire hazard areas. Furthermore, the increasing demand for outdoor recreation places more people in wildlands during holidays, weekends, and vacation periods. Unfortunately, wildland residents and visitors are rarely educated or prepared for wildfire events that can sweep through the brush and timber and destroy property within minutes.

Wildfires can result in severe economic losses as well. Businesses that depend on timber, such as paper mills and lumber companies, experience losses that are often passed along to consumers through higher prices and sometimes jobs are lost. The high cost of responding to and recovering from wildfires can deplete state resources and increase insurance rates. The economic impact of wildfires can also be felt in the tourism industry if roads and tourist attractions are closed due to health and safety concerns.

State and local governments can impose fire safety regulations on home sites and developments to help curb wildfire. Land treatment measures such as fire access roads, water storage, helipads, safety zones, buffers, firebreaks, fuel breaks, and fuel management can be designed as part of an overall fire defense system to aid in fire control. Fuel management, prescribed burning, and cooperative land management planning can also be encouraged to reduce fire hazards.

[25] Prescription burning, or "controlled burn," undertaken by land management agencies is the process of igniting fires under selected conditions, in accordance with strict parameters.

5.17.2 Location and Spatial Extent

The entire region is at risk to a wildfire occurrence. However, several factors such as drought conditions or high levels of fuel on the forest floor, may make a wildfire more likely. Conversely, areas of high development limit wildfire risk. Areas in the urban-wildland interface (where development abuts forest or open land), however, are particularly susceptible to wildfire hazard. The urban more developed areas in Richmond and Scotland Counties (including Rockingham and Laurinburg), are prime examples of this. When large wildfires burn on these open lands, it can be difficult to stop its spread to the built environment, thus endangering structures and population.

5.17.3 Historical Occurrences

Figures 5.72, 5.73, 5.74, 5.75 and **5.76** show the Fire Occurrence Areas (FOA) in the Pee Dee Lumber Region based on data from the Southern Wildfire Risk Assessment. This data is based on historical fire ignitions and is reported as the number of fires that occur per 1,000 acres each year.

FIGURE 5.72: HISTORIC WILDFIRE EVENTS IN THE PEE DEE LUMBER REGION

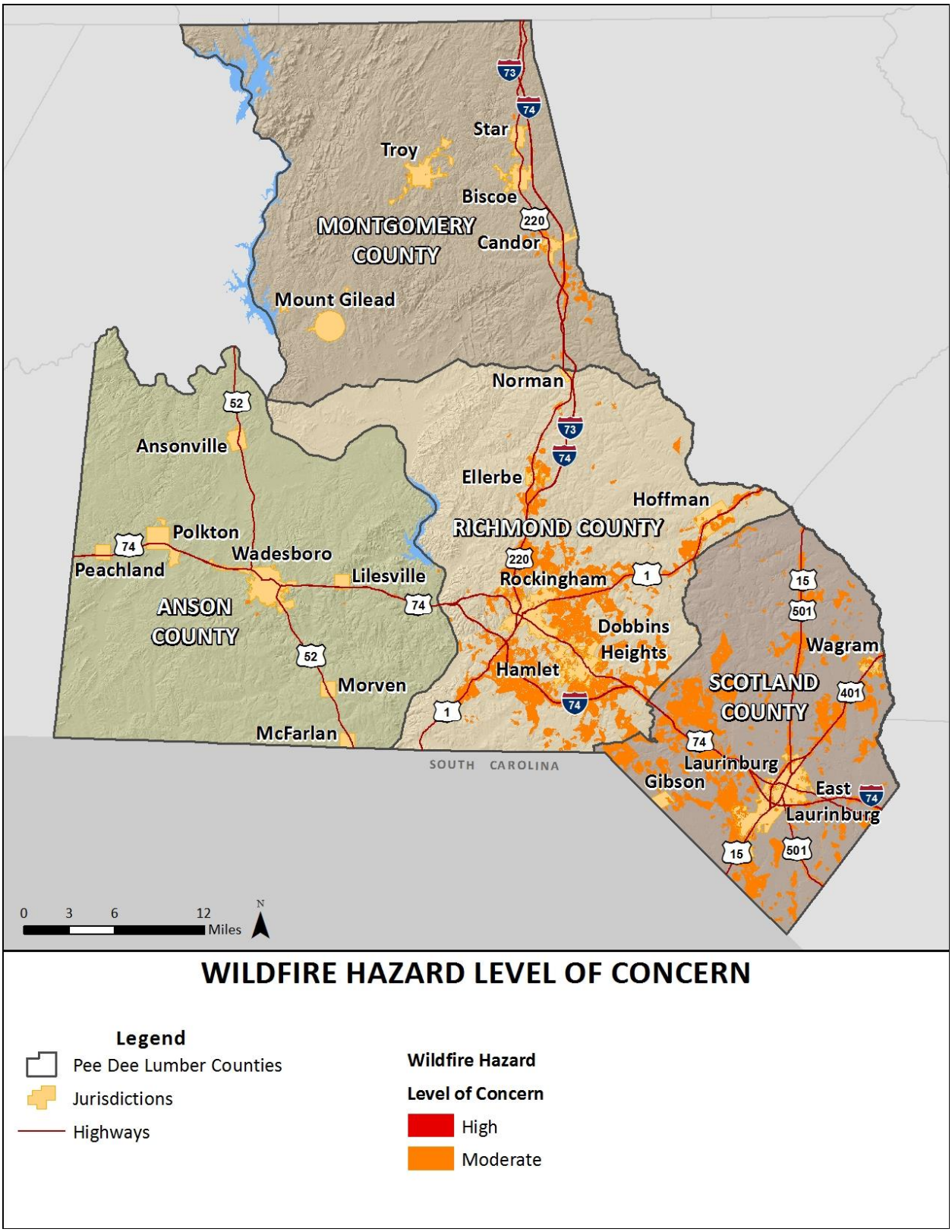


FIGURE 5.73: HISTORIC WILDFIRE EVENTS IN ANSON COUNTY

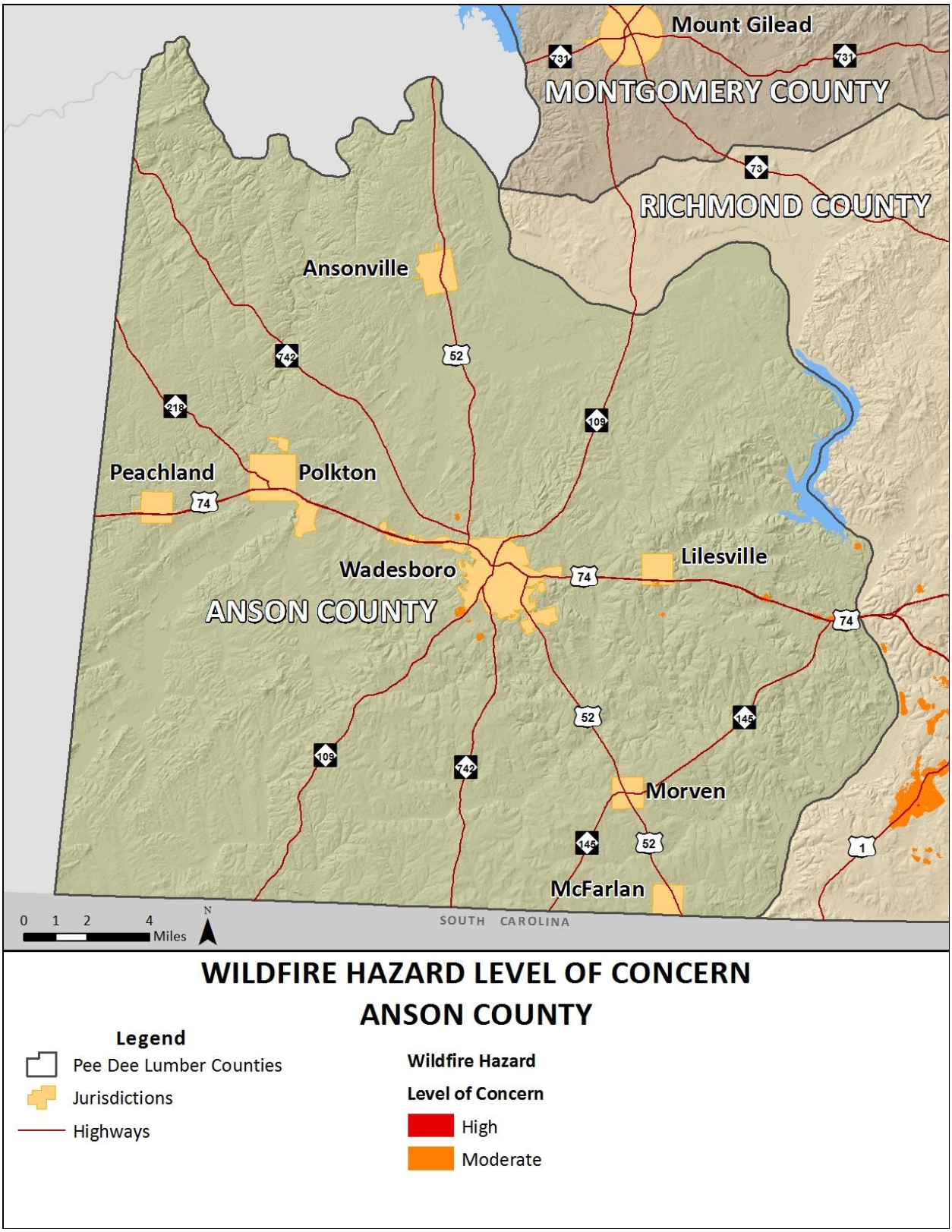


FIGURE 5.74: HISTORIC WILDFIRE EVENTS IN MONTGOMERY COUNTY

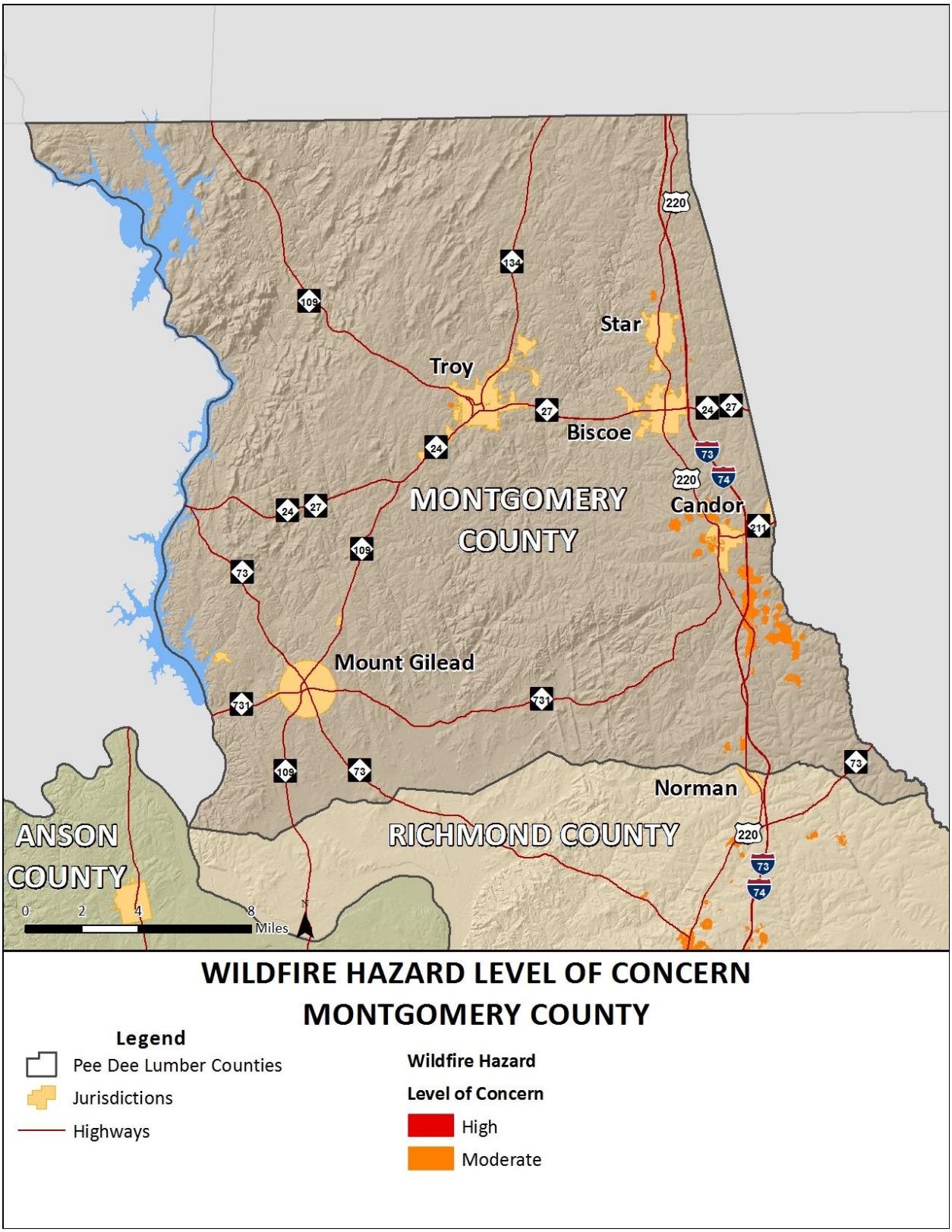


FIGURE 5.75: HISTORIC WILDFIRE EVENTS IN RICHMOND COUNTY

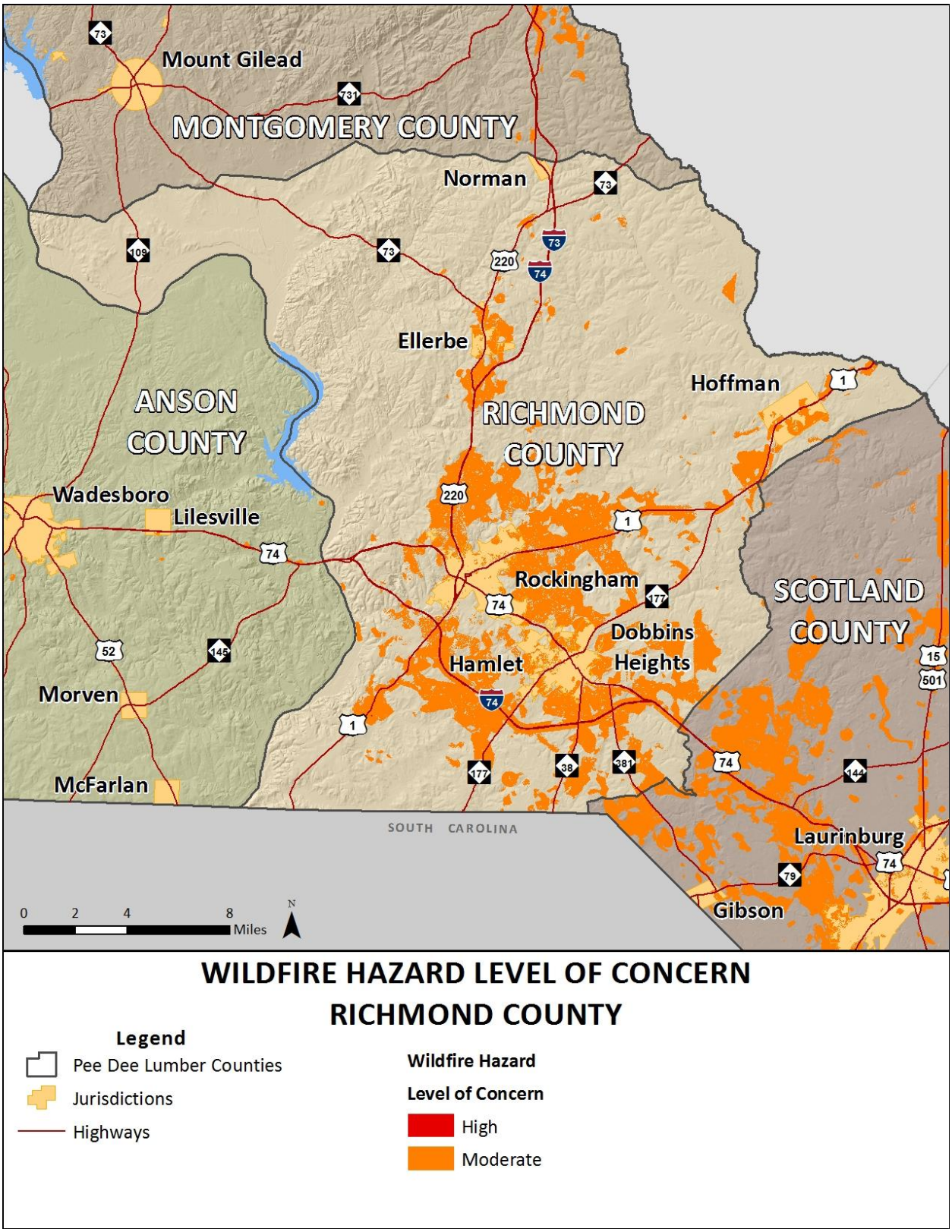
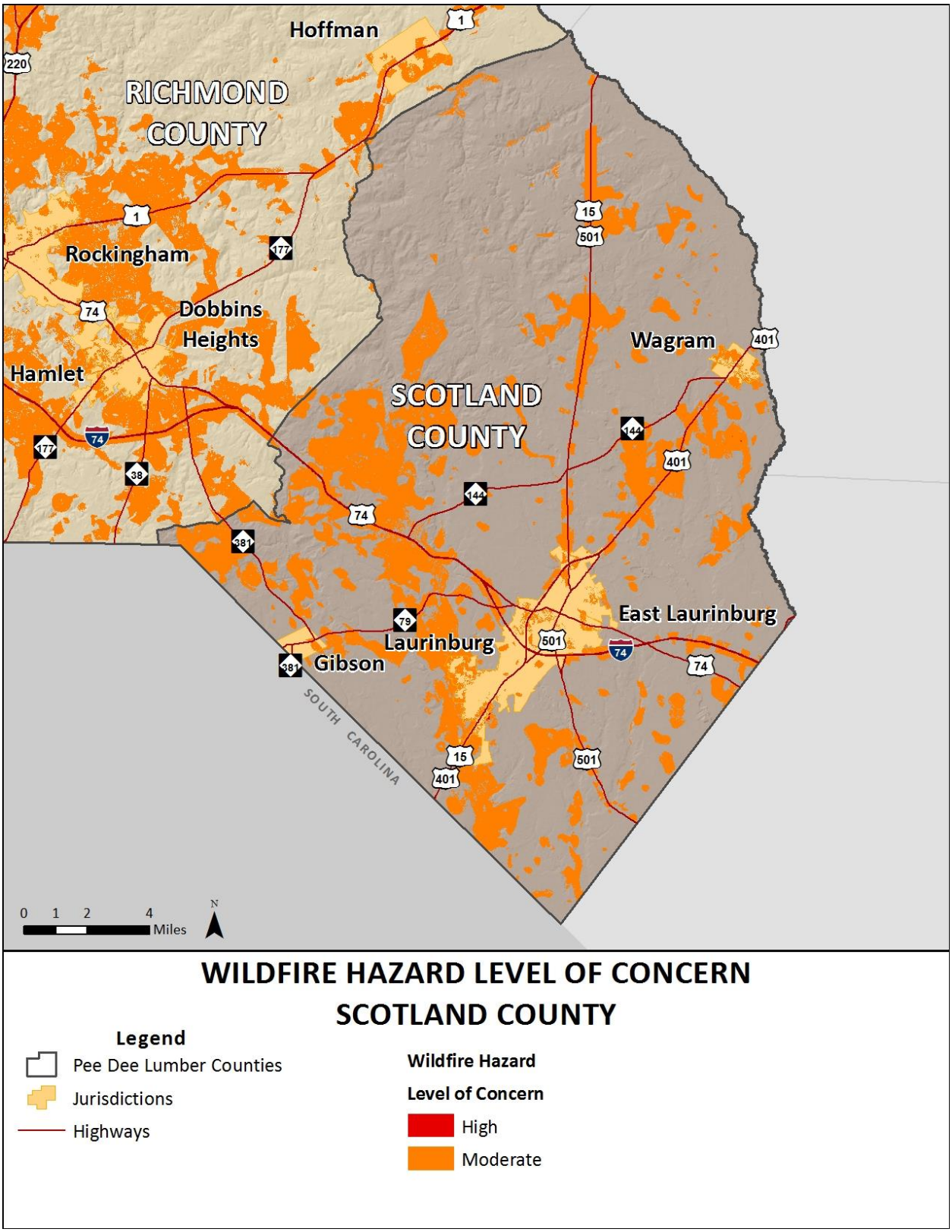


FIGURE 5.76: HISTORIC WILDFIRE EVENTS IN SCOTLAND COUNTY



Source: Southern Wildfire Risk Assessment

Based on data from the North Carolina Division of Forest Resources from 2002 to 2016, the Pee Dee Lumber Region experienced an average of 439 wildfires annually which burned a combined 1,754 acres, on average. **Table 5.41** provides a summary table for wildfire occurrences in the Pee Dee Lumber Region. **Table 5.42** lists the number of reported wildfire occurrences in the participating counties between the years 2002 and 2011.

TABLE 5.39: SUMMARY TABLE OF ANNUAL WILDFIRE OCCURRENCES (2002 -2016)*

	Anson County	Montgomery County	Richmond County	Scotland County	Pee Dee Lumber Region
Average Number of Fires per year	54	58	187	140	439
Average Number of Acres Burned per year	167	126	450	1,011	1,754
Average Number of Acres Burned per fire	3.1	2.2	2.4	7.2	4.0

*These values reflect averages over a 10 year period.
Source: North Carolina Division of Forest Resources

TABLE 5.40: HISTORICAL WILDFIRE OCCURRENCES IN THE PEE DEE LUMBER REGION

Year	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Anson County										
Number of Fires	42	12	32	65	67	67	76	60	94	24
Number of Acres Burned	241.0	51.7	274.0	174.4	129.5	87.6	307.3	92.9	161.6	171.7
Montgomery County										
Number of Fires	51	14	66	48	78	92	78	45	63	40
Number of Acres Burned	262.1	41.3	87.2	59.2	94.3	126.5	197.0	71.0	158.1	160.1
Richmond County										
Number of Fires	187	108	239	182	218	259	117	173	192	211
Number of Acres Burned	379.0	181.1	704.6	587.8	721.5	471.3	237.2	114.0	497.3	601.3
Scotland County										
Number of Fires	209	106	142	152	161	179	109	64	97	177
Number of Acres Burned	1,674.9	792.8	645.4	1,527.8	1,097.8	1,491.7	873.5	329.2	1,053.4	625.8

Source: North Carolina Division of Forest Resources

5.17.4 Probability of Future Occurrences

Wildfire events will be an ongoing occurrence in the Pee Dee Lumber Region. The likelihood of wildfires increases during drought cycles and abnormally dry conditions. Fires are likely to stay small in size but could increase due local climate and ground conditions. Risk is elevated in Richmond and Scotland Counties as indicated by higher numbers of historical fires and fire size in those counties. The probability assigned to the Pee Dee Lumber Region for future wildfire events is likely (a 10 and 100 percent annual probability).

5.18 CONCLUSIONS ON HAZARD RISK

The hazard profiles presented in this section were developed using best available data and result in what may be considered principally a qualitative assessment as recommended by FEMA in its "How-to" guidance document titled *Understanding Your Risks: Identifying Hazards and Estimating Losses* (FEMA Publication 386-2). It relies heavily on historical and anecdotal data, stakeholder input, and professional and experienced judgment regarding observed and/or anticipated hazard impacts. It also carefully considers the findings in other relevant plans, studies, and technical reports. No localized hazards of concern were identified by the individual jurisdictions beyond the hazards already included in this plan.

5.18.1 Hazard Extent

Table 5.43 describes the extent of each natural hazard identified for the Pee Dee Lumber Region. The extent of a hazard is defined as its severity or magnitude, as it relates to the planning area.

TABLE 5.41 EXTENT OF PEE DEE LUMBER REGION HAZARDS

Atmospheric Hazards	
Drought	Drought extent is defined by the North Carolina Drought Monitor Classifications which include Abnormally Dry, Moderate Drought, Severe Drought, Extreme Drought, and Exceptional Drought. According to the North Carolina Drought Monitor Classifications, the most severe drought condition is Exceptional. The participating jurisdictions have received this ranking over the ten year reporting period. Exceptional drought conditions were present in 2002 and 2006 to 2007 in Anson, Montgomery, Richmond and Scotland County.
Extreme Heat	The extent of extreme heat can be defined by the maximum temperature reached. The highest temperature recorded in the Pee Dee Lumber Region is 108 degrees Fahrenheit in Hamlet (in Richmond County) in 2007 and in Mount Gilead (Montgomery County) in 1944.
Hailstorm	Hail extent can be defined by the size of the hail stone. The largest hail stone reported in the Pee Dee Lumber Region was 4.5 inches recorded in the Town of Troy in May 1998. It should be noted that future events may exceed this.
Hurricane and Tropical Storm	Hurricane extent is defined by the Saffir-Simpson Scale which classifies hurricanes into Category 1 through Category 5 (Table 5.10). The greatest classification of hurricane to impact the Pee Dee Lumber Region was a Category 3 storm. Three storms of this intensity have passed with 75 miles of the region. However, the strongest storm to pass directly through the region was an unnamed Category 2 hurricane in 1896.

Lightning	According to the NOAA flash density map (Figure 5.5), the majority of the Pee Dee Lumber Region is located in an area that experiences 4 to 6 lightning flashes per square kilometer per year. It should be noted that future lightning occurrences may exceed these figures.
Tornado	Tornado hazard extent is measured by tornado occurrences in the US provided by FEMA (Figure 5.7) as well as the Fujita/Enhanced Fujita Scale (Tables 5.15 and 5.16). The greatest magnitude reported was an F4 (last reported on March 28, 1984 in Scotland County).
Severe Thunderstorm	Thunderstorm extent is defined by the number of thunder events and wind speeds reported. According to a 62-year history from the National Climatic Data Center, the strongest recorded wind event in the Pee Dee Lumber Region was reported in the unincorporated area of Scotland County known as Hasty (near Laurinburg) on May 11, 2009 at 78 knots (approximately 90 mph). It should be noted that future events may exceed these historical occurrences.
Winter Storm and Freeze	The extent of winter storms can be measured by the amount of snowfall received (in inches). The greatest 24-hour snowfall was reported in Anson County and Montgomery County at 16 inches in 2000.
Geologic Hazards	
Earthquake	Earthquake extent can be measured by the Richter Scale (Table 5.25) and the Modified Mercalli Intensity (MMI) scale (Table 5.26). According to data provided by the National Geophysical Data Center, the greatest MMI to impact the region was reported in Montgomery County with a MMI of VII (very strong) with a correlating Richter Scale measurement of approximately 6.1. This was recorded in September of 1886 in the Town of Troy.
Landslide	As noted above in the landslide profile, the landslide data provided by the North Carolina Geological survey is incomplete. Only one landslide was reported in the Region so extent is difficult to characterize. However, there are areas classified as high susceptibility/high incident where activity is recorded as greater that 15% based on USGS data. North Carolina does not currently map or research landslide susceptibility due to political will.
Hydrologic Hazards	
Dam Failure	Dam Failure extent is defined using the North Carolina Division of Land Resources criteria (Table 5.31). Of the 10 major dams in the Pee Dee Lumber Region, all 10 are classified as high-hazard.
Erosion	The extent of erosion can be defined by the measurable rate of erosion that occurs. There are no erosion rate records located in the Pee Dee Lumber Region. If additional data becomes available in future plan updates, it will be included.

Flood

Flood extent can be measured by the amount of land and property in the floodplain as well as flood height and velocity. The amount of land in the floodplain accounts for nine percent of the total land area in the Pee Dee Lumber Region.

Flood depth and velocity are recorded via United States Geological Survey stream gages throughout the region. While a gage does not exist for each participating jurisdiction, there is one located near many areas. The greatest peak discharge recorded for the area was near the Town of Rockingham (Richmond County) reported at the Pee Dee River in 1908. Water reached a discharge of 276,000 cubic feet per second and the stream height was recorded at 31.3 feet. Additional peak discharge readings and stream heights are in the table below.

Location/ Jurisdiction	Date	Peak Discharge (cfs)	Stream Height (ft)
Anson County			
Palmetto Branch at Town of Ansonville	7/28/1965	556	25.0
South Fork Creek near Town of Morven	2/14/1960	2,080	18.6
Brown Creek near Town of Polkton	9/18/1945	17,300	17.7
North Fork Creek near Town of Wadesboro	6/4/1937	2,410	6.4
Montgomery County			
Little River near Town of Star	7/23/1997	15,400	18.6
Richmond County			
Drowning Creek near Town of Hoffman	9/18/1945	10,900	10.3
Pee Dee River near City of Rockingham	8/17/1908	276,000	31.3
Scotland County			
Big Shoe Heel Creek near City of Laurinburg	9/10/2004	1,200	5.5

The highest recorded river height/flood height, as shown in the table above, was 31.3 feet on the Pee Dee River near the City of Rockingham in August 1908.

Other Hazards

Hazardous Materials Incident

According to USDOT PHMSA, the largest hazardous materials incident reported in the region is 40,000 SLB released on a railroad in Hamlet (Richmond County) and 20,000 LGA also released on a railroad in Hamlet (Richmond County). It should be noted that larger events are possible.

Wildfire	Wildfire data was provided by the North Carolina Division of Forest Resources and is reported annually by county from 2002-2011. The greatest number of fires to occur was in Richmond County and the greatest number of acres burned occurred in Scotland County. Analyzing the data by county indicates the following wildfire hazard extent for each county. However, it should be noted that larger fires and more frequent fires are possible. ***Anson County*** The greatest number of fires to occur in any year was 94 fires in 2010. The greatest number of acres to burn in a single year occurred in 2008 when 307 acres were burned. ***Montgomery County*** The greatest number of fires to occur in any year was 92 fires in 2007. The greatest number of acres to burn in a single year occurred in 2002 when 262 acres were burned. ***Richmond County*** The greatest number of fires to occur in any year was 259 fires in 2007. The greatest number of acres to burn in a single year occurred in 2006 when 722 acres were burned. ***Scotland County*** The greatest number of fires and acres burned occurred in the same year (2002). 209 fires burned a total of 1,675 acres.

5.18.2 Priority Risk Index

In order to draw some meaningful planning conclusions on hazard risk for the Pee Dee Lumber Region, the results of the hazard profiling process were used to generate countywide hazard classifications according to a "Priority Risk Index" (PRI). The purpose of the PRI is to categorize and prioritize all potential hazards for the Pee Dee Lumber Region as high, moderate, or low risk. Combined with the asset inventory and quantitative vulnerability assessment provided in the next section, the summary hazard classifications generated through the use of the PRI allows for the prioritization of those high hazard risks for mitigation planning purposes, and more specifically, the identification of hazard mitigation opportunities for the Pee Dee Lumber Region to consider as part of their proposed mitigation strategy.

The prioritization and categorization of identified hazards for the Pee Dee Lumber Region is based principally on the PRI, a tool used to measure the degree of risk for identified hazards in a particular planning area. The PRI is used to assist the Pee Dee Lumber Regional Hazard Mitigation Planning Committee in gaining consensus on the determination of those hazards that pose the most significant threat to the Pee Dee Lumber counties based on a variety of factors. The PRI is not scientifically based, but is rather meant to be utilized as an objective planning tool for classifying and prioritizing hazard risks in the Pee Dee Lumber Region based on standardized criteria.

The application of the PRI results in numerical values that allow identified hazards to be ranked 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 has been assigned a value (1 to 4) and an agreed upon weighting factor[26], as summarized in **Table 5.44**. To calculate the PRI value for a given hazard, the assigned risk value for each category is multiplied by the weighting factor. The sum of all five categories equals the final PRI value, as demonstrated in the example equation below:

PRI VALUE = [(PROBABILITY x .30) + (IMPACT x .30) + (SPATIAL EXTENT x .20) + (WARNING TIME x .10) + (DURATION x .10)]

According to the weighting scheme and point system applied, the highest possible value for any hazard is 4.0. When the scheme is applied for the Pee Dee Lumber Region, the highest PRI value is 3.3 (winter storm and freeze hazard). Prior to being finalized, PRI values for each identified hazard were reviewed and accepted by the members of the Regional Hazard Mitigation Planning Committee.

[26] The Regional Hazard Mitigation Planning Committee, based upon any unique concerns or factors for the planning area, may adjust the PRI weighting scheme during future plan updates.

TABLE 5.42: PRIORITY RISK INDEX FOR THE PEE DEE LUMBER REGION

PRI Category	Degree of Risk			Assigned Weighting Factor
	Level	Criteria	Index Value	
Probability	Unlikely	Less than 1% annual probability	1	30%
	Possible	Between 1 and 10% annual probability	2	
	Likely	Between 10 and 100% annual probability	3	
	Highly Likely	100% annual probability	4	
Impact	Minor	Very few injuries, if any. Only minor property damage and 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 more than one day.	2	
	Critical	Multiple deaths/injuries possible. More than 25% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for more than one 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 for 30 days or more.	4	
Spatial Extent	Negligible	Less than 1% of area affected	1	20%
	Small	Between 1 and 10% of area affected	2	
	Moderate	Between 10 and 50% of area affected	3	
	Large	Between 50 and 100% of area affected	4	
Warning Time	More than 24 hours	Self explanatory	1	10%
	12 to 24 hours	Self explanatory	2	
	6 to 12 hours	Self explanatory	3	
	Less than 6 hours	Self explanatory	4	
Duration	Less than 6 hours	Self explanatory	1	10%
	Less than 24 hours	Self explanatory	2	
	Less than one week	Self explanatory	3	
	More than one week	Self explanatory	4	

5.18.3 Priority Risk Index Results

Table 5.45 summarizes the degree of risk assigned to each category for all initially identified hazards based on the application of the PRI. Assigned risk levels were based on the detailed hazard profiles developed for this section, as well as input from the Regional Hazard Mitigation Planning Committee. The results were then used in calculating PRI values and making final determinations for the risk assessment.

TABLE 5.43: SUMMARY OF PRI RESULTS FOR THE PEE DEE LUMBER REGION

Hazard	Category/Degree of Risk					
	Probability	Impact	Spatial Extent	Warning Time	Duration	PRI Score
Atmospheric Hazards						
Drought	Likely	Minor	Moderate	More than 24 hours	More than 1 week	**2.3**
Extreme Heat	Likely	Limited	Large	More than 24 hours	Less than 1 week	**2.7**
Hailstorm	Likely	Minor	Moderate	Less than 6 hours	Less than 6 hours	**2.3**
Hurricane and Tropical Storm	Possible	Minor	Large	More than 24 hours	Less than 24 hours	**2.0**
Lightning	Highly Likely	Minor	Negligible	Less than 6 hours	Less than 6 hours	**2.2**
Thunderstorm Wind/High Wind	Highly Likely	Critical	Large	12 to 24 hours	Less than 6 hours	**3.0**
Tornado	Likely	Critical	Small	Less than 6 hours	Less than 6 hours	**2.7**
Winter Storm and Freeze	Likely	Limited	Large	More than 24 hours	Less than 1 week	**2.6**
Geologic Hazards						
Earthquake	Possible	Minor	Moderate	Less than 6 hours	Less than 6 hours	**2.0**
Landslide	Unlikely	Critical	Small	Less than 6 hours	Less than 6 hours	**1.9**
Hydrologic Hazards						
Dam and Levee Failure	Unlikely	Critical	Moderate	More than 24 hours	Less than 6 hours	**2.0**
Erosion	Possible	Minor	Small	More than 24 hours	More than 1 week	**1.8**
Flood	Possible	Limited	Small	6 to 12 hours	Less than 1 week	**2.1**
Other Hazards						
Hazardous Materials Incident	Possible	Limited	Small	Less than 6 hours	Less than 24 hours	**2.3**
Wildfire	Likely	Minor	Small	Less than 6 hours	Less than 1 week	**2.1**

5.19 FINAL DETERMINATIONS

The conclusions drawn from the hazard profiling process for the Pee Dee Lumber Region, including the PRI results and input from the Regional Hazard Mitigation Planning Committee, resulted in the classification of risk for each identified hazard according to three categories: High Risk, Moderate Risk, and Low Risk (**Table 5.46**). For purposes of these classifications, risk is expressed in relative terms according to the estimated impact that a hazard will have on human life and property throughout all of the Pee Dee Lumber Region. A more quantitative analysis to estimate potential dollar losses for each hazard has been performed separately, and is described in Section 6: *Vulnerability Assessment*. It should

be noted that although some hazards are classified below as posing low risk, their occurrence of varying or unprecedented magnitudes is still possible in some cases and their assigned classification will continue to be evaluated during future plan updates.

TABLE 5.44: CONCLUSIONS ON HAZARD RISK FOR THE PEE DEE LUMBER REGION

HIGH RISK	Thunderstorm Wind/High Wind Hazardous Material Incident Tornado
MODERATE RISK	Extreme Heat Winter Storm and Freeze Hailstorm Wildfire Flood Hurricane and Tropical Storm Lightning Drought
LOW RISK	Earthquake Dam and Levee Failure Landslide Erosion

SECTION 6
VULNERABILITY ASSESSMENT

This section identifies and quantifies the vulnerability of the Pee Dee Lumber Region to the significant hazards identified in the previous sections (*Hazard Identification and Profiles*). It consists of the following subsections:

- 6.1 Overview
- 6.2 Methodology
- 6.3 Explanation of Data Sources
- 6.4 Asset Inventory
- 6.5 Vulnerability Assessment Results
- 6.6 Conclusions on Hazard Vulnerability

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44 CFR Requirement
44 CFR Part 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. The description shall include an overall summary of each hazard and its impact on the community. 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 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; (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.

6.1 OVERVIEW

This section builds upon the information provided in Section 4: *Hazard Identification and* Section 5*: Hazard Profiles* by identifying and characterizing an inventory of assets in the Pee Dee Lumber Region. In addition, the potential impact and expected amount of damages caused to these assets by each identified hazard event is assessed. The primary objective of the vulnerability assessment is to quantify exposure and the potential loss estimates for each hazard. In doing so, the Pee Dee Lumber counties and their participating jurisdictions may better understand their unique risks to identified hazards and be better prepared to evaluate and prioritize specific hazard mitigation actions.

This section begins with an explanation of the methodology applied to complete the vulnerability assessment, followed by a summary description of the asset inventory as compiled for the Pee Dee Lumber Region. The remainder of this section focuses on the results of the assessment conducted.

6.2 METHODOLOGY

This vulnerability assessment was conducted using three distinct methodologies: (1) A stochastic risk assessment; (2) a geographic information system (GIS)-based analysis; and (3) a risk modeling software analysis. Each approach provides estimates for the potential impact of hazards by using a common, systematic framework for evaluation, including historical occurrence information provided in the *Hazard*

Identification and *Analysis* sections. A brief description of the three different approaches is provided on the following pages.

6.2.1 Stochastic Risk Assessment

The stochastic risk assessment methodology was applied to analyze hazards of concern that were outside the scope of hazard risk models and the GIS-based risk assessment. This includes hazards that do not have geographically-definable boundaries and are therefore excluded from spatial analysis through GIS. A stochastic risk methodology was used for the following hazards:

- Dam Failure
- Drought
- Erosion
- Hailstorm
- Lightning
- Thunderstorm Wind/High Wind
- Tornado
- Winter Storm and Freeze

Many of the hazards listed above are considered atmospheric and have the potential to affect all existing and future buildings and populations. This applies to Drought, Erosion, Hailstorm, Lightning, Thunderstorm Wind/High Wind, Tornado, and Winter Storm and Freeze. The only one excluded from this categorization is Dam Failure. This hazard will only impact those existing and future structures and populations in the breach area.[1]

For many of these hazards listed above, no additional analysis was performed. When possible, annualized loss estimates were determined using the best available data on historical losses from sources including NOAA's National Climatic Data Center records, Pee Dee Lumber Region county hazard mitigation plans, and local knowledge. Annualized loss is the estimated long-term weighted average value of losses to property in any single year in a specified geographic area (i.e., municipal jurisdiction or county). Annualized loss estimates were generated by totaling the amount of property damage over the period of time for which records were available, and calculating the average annual loss. Given the standard weighting analysis, losses can be readily compared across hazards providing an objective approach for evaluating mitigation alternatives.

For the dam failure[2], drought, and erosion, no data with historical property damages was available. Therefore, annualized potential losses for these hazards are presumed to be negligible.

The results for these hazards are found at the end of this section in **Table 6.13**.

[1] Determining the breach area is beyond the scope of this plan. Although an estimate could be determined using GIS analysis, such results could be misleading for determining actual risk areas. For regulated dams, the U.S. Army Corps of Engineers works to maintain dam inundation maps.

[2] As noted in Section 5: *Hazard Profiles*, Dam failure could be catastrophic to areas in the inundation area. Due to a lack of a data, no additional analysis was performed. Furthermore, local Pee Dee Lumber Region officials indicate that separate dam failure plans have been completed for their counties to identify risk and response measures.

6.2.2 GIS-Based Analysis

Other hazards have specified geographic boundaries that permit additional using Geographic Information Systems (GIS). These hazards include:

- Flood
- Hazardous Material Incident
- Landslide
- Wildfire

The objective of the GIS-based analysis was to determine the estimated vulnerability of critical facilities and populations for the identified hazards in the Pee Dee Lumber Region using best available geospatial data. Digital data was collected from local, regional, state, and national sources for hazards and buildings. This included local tax assessor records for individual parcels and buildings and geo-referenced point locations for identified assets (critical facilities and infrastructure, special populations, etc.) when available. ESRI® ArcGIS™ 10.2.2 was used to assess hazard vulnerability utilizing digital hazard data, as well as local building data. Using these data layers, hazard vulnerability can be quantified by estimating the assessed building value for parcels and/or buildings determined to be located in identified hazard areas. To estimate vulnerable populations in hazard areas, digital Census 2010 data by census tract was obtained. This was intersected with hazard areas to determine exposed population counts. Unfortunately, due to the large scale of census tracts, the results are limited, but will be revised with population by census block becomes available. The results of the analysis provided an estimate of the number of people and critical facilities, as well as the replacement value of buildings, determined to be potentially at risk to those hazards with delineable geographic hazard boundaries.

6.2.3 Risk Modeling Software Analysis

A risk modeling software was used for the following hazards:

- Earthquake
- Hurricane and Tropical Storm

There are several models that exist to model hazards. Hazus-MH was used in this vulnerability assessment to address the aforementioned hazards.

Hazus-MH

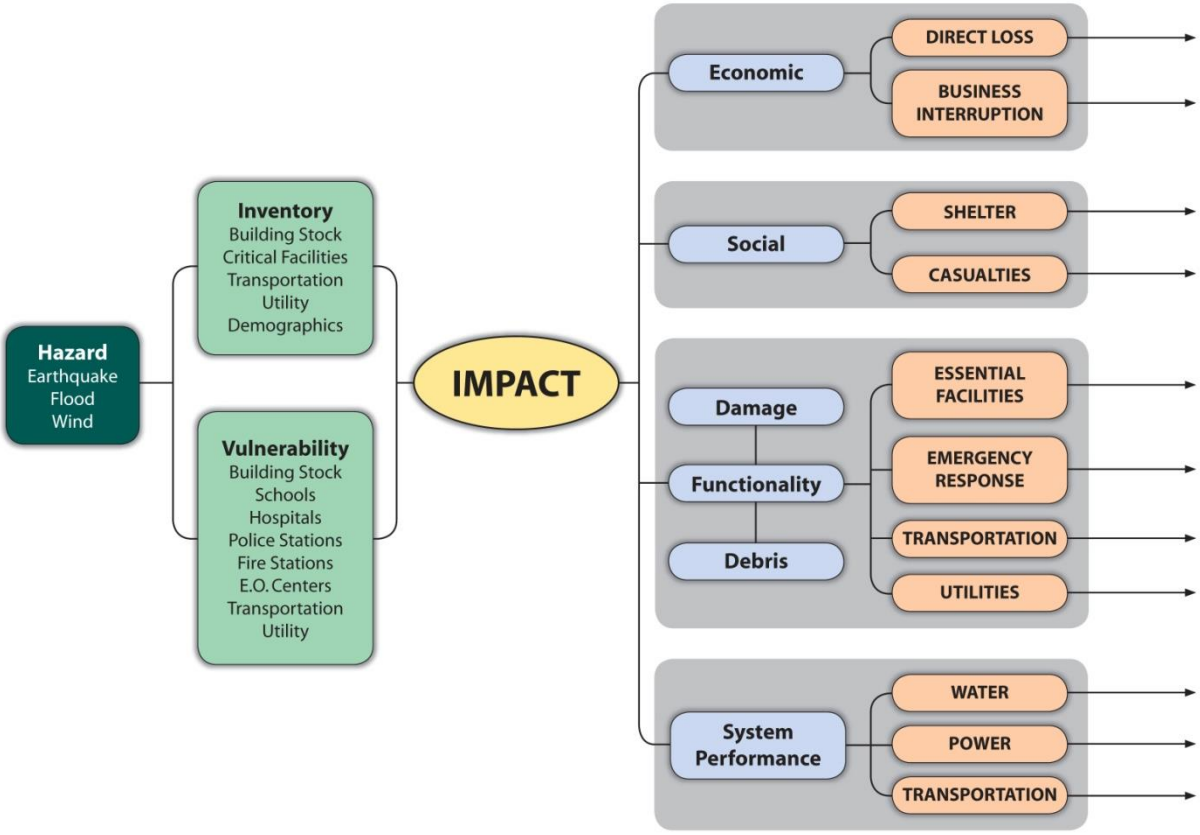
Hazus-MH ("Hazus") is a standardized loss estimation software program developed by FEMA. It is built upon an integrated GIS platform to conduct analysis at a regional level (i.e., not on a structure-by-structure basis). The Hazus risk assessment methodology is parametric, in that distinct hazard and inventory parameters (e.g., wind speed and building types) can be modeled using the software to determine the impact (i.e., damages and losses) on the built environment.



The Pee Dee Lumber Regional Risk Assessment utilized Hazus-MH to produce hazard damage loss estimations for hazards for the planning area. At the time this analysis was completed, Hazus-MH 2.1 was used to estimate potential damages from hurricane winds earthquake hazards using Hazus-MH methodology. Although the program can also model losses for flood and storm surge, those models were not used in this Risk Assessment.

Figure 6.1 illustrates the conceptual model of the Hazus-MH methodology.

FIGURE 6.1: CONCEPTUAL MODEL OF HAZUS-MH METHODOLOGY



Hazus-MH is capable of providing a variety of loss estimation results. In order to be consistent with other hazard assessments, annualized losses are presented when possible. Some additional results based on location-specific scenarios may also be presented to provide a complete picture of hazard vulnerability.

Loss estimates provided in this vulnerability assessment are based on best available data and methodologies. The results are an approximation of risk. These estimates should be used to understand relative risk from hazards and potential losses. Uncertainties are inherent in any loss estimation methodology, arising in part from incomplete scientific knowledge concerning natural hazards and their effects on the built environment. Uncertainties also result from approximations and simplifications that are necessary for a comprehensive analysis (e.g., incomplete inventories, non-specific locations, demographics, or economic parameters).

All conclusions are presented in "Conclusions on Hazard Vulnerability" at the end of this section.

6.3 EXPLANATION OF DATA SOURCES

Earthquake

Hazus-MH 2.1 (as described above) was used to assess earthquake vulnerability. Two level one (default inventory) probabilistic scenarios were run. The first scenario modeled a 1,000-year return period (measure of severity), magnitude 5 event to determine structural losses. The second scenario ran several return periods to determine annualized loss. In order to determine annualized loss, default Hazus-MH earthquake damage functions and methodology were used to determine the probability of damage for 100-, 250- 500-, 750- , 1,000-, 1,500-, and 2,500-year events (return periods). Results are generated in Hazus-MH at the census tract level and presented in the plan at the county level.

Flood

FEMA Flood Insurance Rate Maps (FIRM) flood data was used to determine flood vulnerability. FIRM data can be used in ArcGIS for mapping purposes and, they identify several features including floodplain boundaries and base flood elevations. Identified areas on the FIRM represent some features of a Flood Insurance Rate Maps including the 100-year flood areas (1.0-percent annual chance flood), and the 500-year flood areas (0.2-percent annual chance flood). For the vulnerability assessment, state building data and critical facilities were overlaid on the 100-year floodplain areas and 500-year floodplain areas. It should be noted that such an analysis does not account for building elevation.

Hurricane and Tropical Storm Wind

Hazus-MH 2.1 (as described above) was used to assess wind vulnerability. For the hurricane wind analysis, a probabilistic scenario was created to estimate the annualized loss damage in the Pee Dee Lumber Region. Default Hazus wind speed data, damage functions, and methodology were used in to determine the probability of damage for 100-, 500-, and 1,000-year frequency events (also known as a return period) in the scenario. Results are generated in Hazus-MH at the 2000 U.S. Census tract level and presented in this plan at the county level.

Hazardous Materials Incident

For the fixed hazardous materials incident analysis, Toxic Release Inventory (TRI) data was used. The Toxics Release Inventory is a publicly available database from the federal Environmental Protection Agency (EPA) that contains information on toxic chemical releases and other waste management activities reported annually by certain covered industry groups as well as federal facilities. This inventory was established under the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) and expanded by the Pollution Prevention Act of 1990. Each year, facilities that meet certain activity thresholds must report their releases and other waste management activities for listed toxic chemicals to EPA and to their state or tribal entity. A facility must report if it meets the following three criteria:

- The facility falls within one of the following industrial categories: manufacturing; metal mining; coal mining; electric generating facilities that combust coal and/or oil; chemical wholesale distributors; petroleum terminals and bulk storage facilities; RCRA Subtitle C treatment, storage, and disposal (TSD) facilities; and solvent recovery services;
- Has 10 or more full-time employee equivalents; and
- Manufactures or processes more than 25,000 pounds or otherwise uses more than 10,000 pounds of any listed chemical during the calendar year. Persistent, bioaccumulative, and toxic

(PBT) chemicals are subject to different thresholds of 10 pounds, 100 pounds, or 0.1 grams depending on the chemical.

For the mobile hazardous materials incident analysis, transportation data including major highways and railroads were obtained from the North Carolina Department of Transportation. This data is ArcGIS compatible, lending itself to buffer analysis to determine risk.

Wildfire

The data used to determine vulnerability to wildfire in the Pee Dee Lumber Region is based on GIS data called the Southern Wildfire Risk Assessment (SWRA). It was provided for use in this plan by the North Carolina Division of Forest Resources. A specific layer, known as "Level of Concern" (LOC) was used to determine vulnerability of people and property. The LOC is presented on a scale of 1 to 100. It combines a Wildfire Susceptibility Index (WFSI) with a Fire Effects Index (FEI). The primarily purpose of the LOC data is to highlight areas of concern that may be conducive to mitigation actions. Due to the assumptions made, it is not a true probability. However, it does provide a comparison of risk throughout the region.

6.4 ASSET INVENTORY

An inventory of geo-referenced assets within the Pee Dee Lumber counties and jurisdictions was compiled in order to identify and characterize those properties potentially at risk to the identified hazards[3]. By understanding the type and number of assets that exist and where they are located in relation to known hazard areas, the relative risk and vulnerability for such assets can be assessed. Under this assessment, two categories of physical assets were created and then further assessed through GIS analysis. Additionally, social assets are addressed to determine population at risk to the identified hazards. These are presented below in Section 6.4.2.

6.4.1 Physical and Improved Assets

The two categories of physical assets consist of:

1. Building Footprints: Includes all building footprints in the Pee Dee Lumber Region as provided by North Carolina Emergency Management. The information has been expressed in terms of the number of building footprints and the estimated value that may be exposed to the identified hazards.

2. Critical Facilities: Critical facilities vary by jurisdiction. For this Vulnerability Assessment, critical facilities provided by the North Carolina Department of Emergency Management were used. It should be noted that this listing is not all-inclusive for assets located in the region, but it is anticipated that it will be expanded during future plan updates as more geo-referenced data becomes available for use in GIS analysis.

[3] While potentially not all-inclusive for the Pee Dee Lumber Region, "georeferenced" assets include those assets for which specific location data is readily available for connecting the asset to a specific geographic location for purposes of GIS analysis.

Table 6.1 lists the number of buildings and the total building value of improvements for participating areas of the Pee Dee Lumber Region (study area of vulnerability assessment).[4]

TABLE 6.1: IMPROVED PROPERTY IN THE PEE DEE LUMBER REGION

Location	Number of Buildings	Total Assessed Value of Improvements
Anson County	**14,772**	**$2,700,014,741**
Ansonville	316	$44,892,727
Lilesville	251	$36,071,750
McFarlan	56	$4,071,737
Morven	328	$38,249,471
Peachland	280	$24,906,235
Polkton	518	$163,482,371
Wadesboro	2,586	$740,717,393
Unincorporated	10,437	$1,647,623,057
Montgomery County	**18,878**	**$3,887,856,908**
Biscoe	685	$88,559,087
Candor	425	$86,597,039
Mount Gilead	662	$77,834,691
Star	526	$41,233,162
Troy	1,388	$383,960,660
Unincorporated Area	15,192	$3,209,672,269
Richmond County	**30,980**	**$5,254,816,878**
Dobbin Heights	471	$19,566,385
Ellerbe	733	$33,979,059
Hamlet	2,918	$443,270,262
Hoffman	298	$18,136,728
Norman	175	$5,225,048
Rockingham	5,499	$2,282,942,500
Unincorporated Area	20,886	$2,451,696,896
Scotland County	**19,403**	**$2,192,362,527**
East Laurinburg	182	$7,099,457
Gibson	299	$19,202,181
Laurinburg	7,457	$932,276,925
Wagram	461	$33,696,066
Unincorporated Area	11,004	$1,200,087,898
PEE DEE LUMBER REGION TOTAL	**84,033**	**$14,035,051,054**

Table 6.2 lists the fire stations, police stations, emergency operations centers (EOCs), medical care facilities, schools, administrative buildings, airport buildings, and "other" buildings located in the Pee Dee Region. In addition, **Figure 6.2** shows the locations of most essential facilities in the Pee Dee Region. **Figures 6.3**, **6.4**, **6.5** and **6.6** show those locations for each county.

[4] Real building value was used in lieu of total assessed values for improvements when possible. This information is based on tax assessor records as joined to digital parcel data. This data does not include dollar figures for tax-exempt improvements such as publicly-owned buildings and facilities.

TABLE 6.2: CRITICAL FACILITY INVENTORY IN THE PEE DEE REGION

Location	EOC	Fire Stations	Law Enforce-ment Stations	Hospitals	Schools	Airports	Airport (Military)	Community Colleges	University	Power Plant	Water Treatment Plant	Waste-water Treatment Plant
Anson County	1	7	4	1	8	1	0	1	0	2	1	1
Montgomery County	1	11	6	1	11	1	0	1	0	3	1	4
Richmond County	1	10	3	2	16	0	1	1	0	2	3	2
Scotland County	1	8	3	1	14	1	0	0	1	0	1	2
PEE DEE LUMBER REGION TOTAL	4	36	16	5	49	3	1	3	1	7	6	9

Source: Local county data and Hazus-MH

FIGURE 6.2: CRITICAL FACILITY LOCATIONS IN THE PEE DEE LUMBER REGION

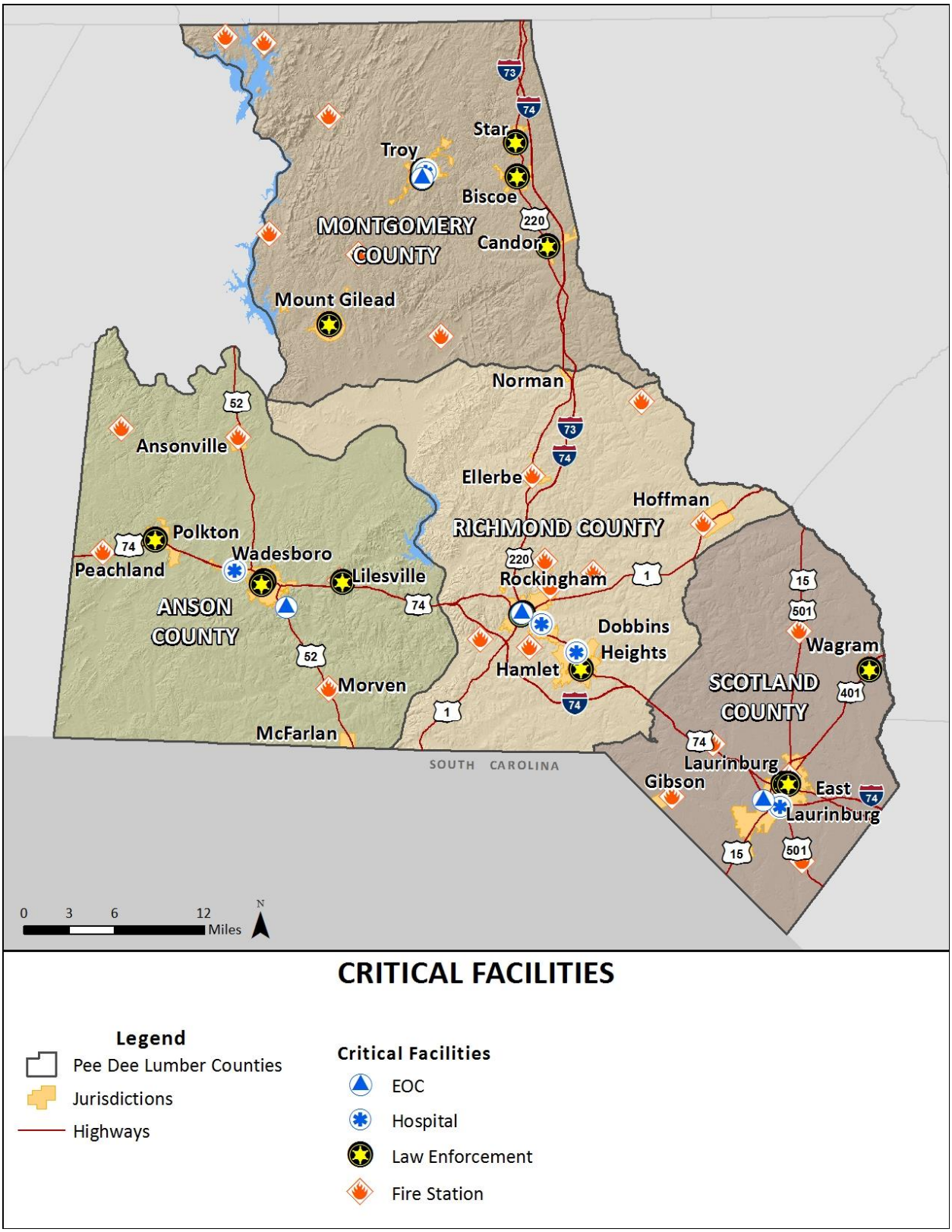


FIGURE 6.3: CRITICAL FACILITY LOCATIONS IN ANSON COUNTY

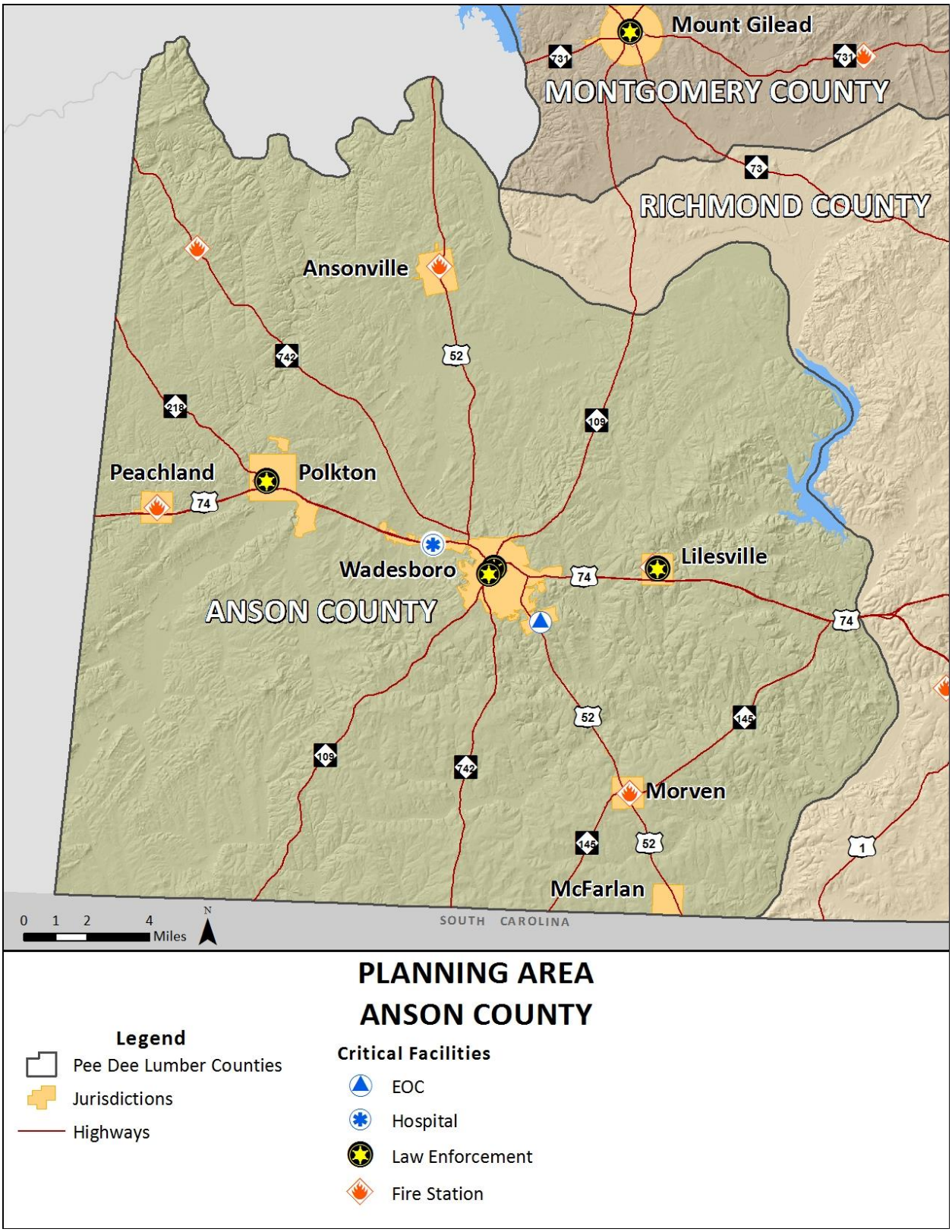


FIGURE 6.4: CRITICAL FACILITY LOCATIONS IN MONTGOMERY COUNTY

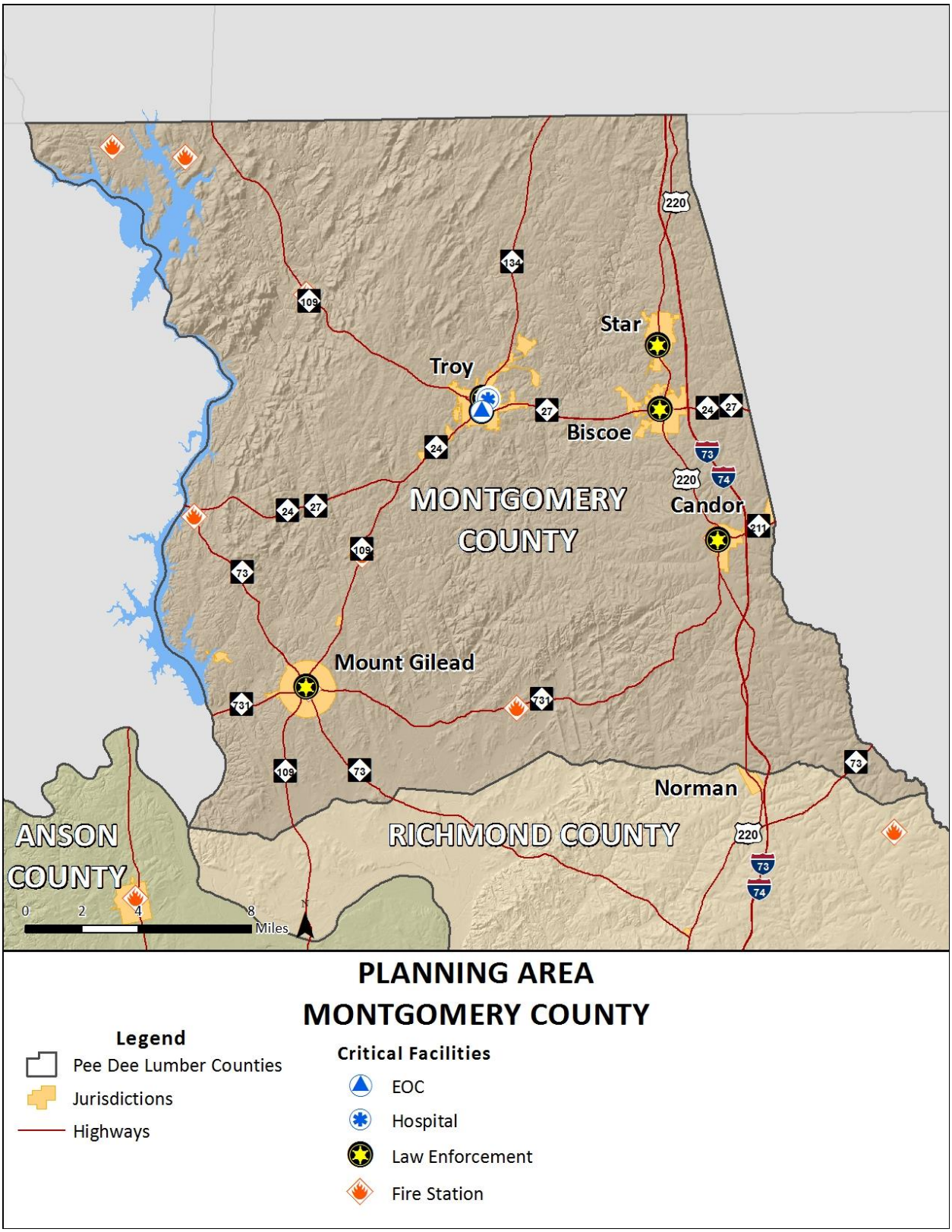


FIGURE 6.5: CRITICAL FACILITY LOCATIONS IN RICHMOND COUNTY

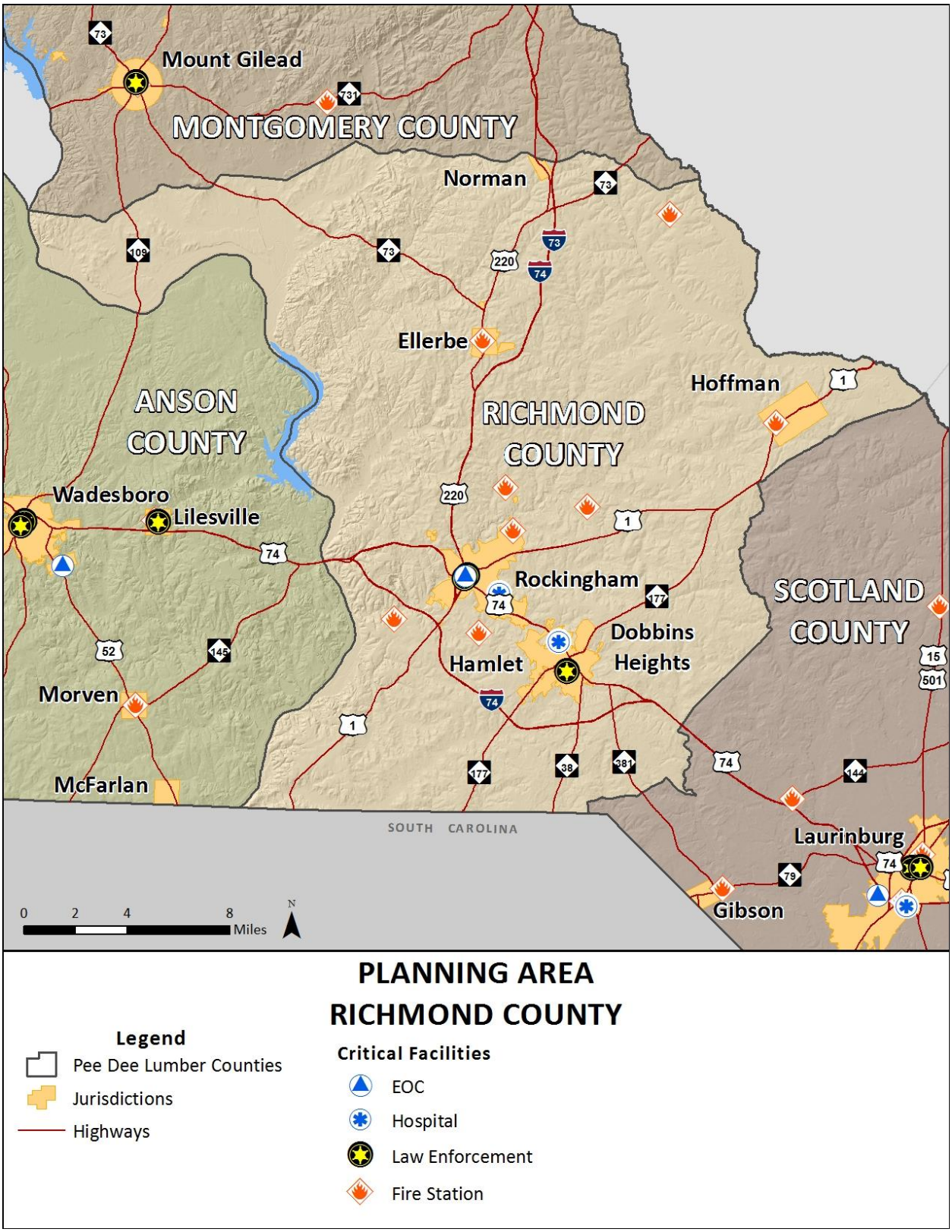
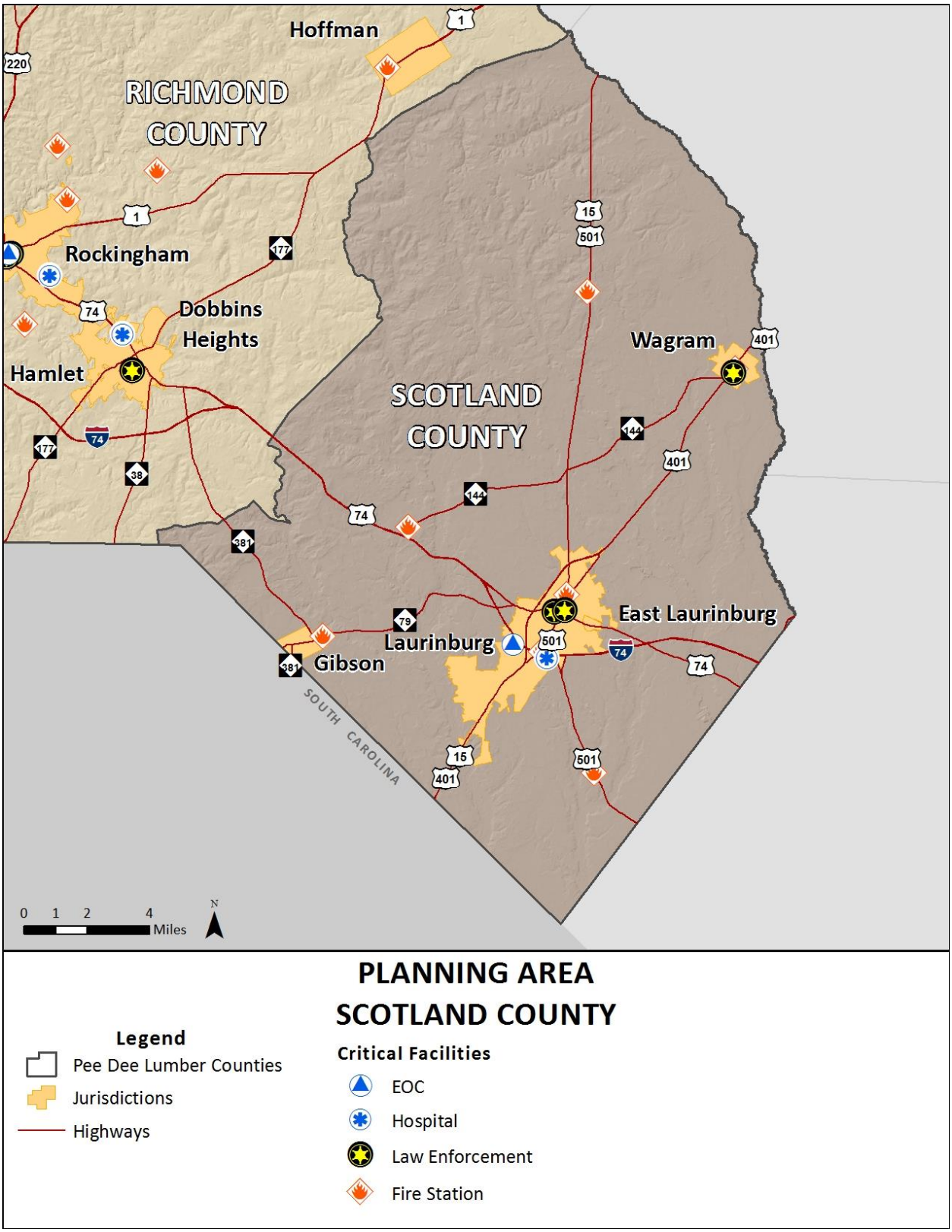


FIGURE 6.6: CRITICAL FACILITY LOCATIONS IN SCOTLAND COUNTY



6.4.2 Social Vulnerability

In addition to identifying those assets potentially at risk to identified hazards, it is important to identify and assess those particular segments of the resident population in the Pee Dee Lumber Region that are potentially at risk to these hazards.

Table 6.3 lists the population by jurisdiction according to U.S. Census 2010 population estimates. Unfortunately, estimates were not available at the census block level, limited the results to county-wide estimates. The total population in the Pee Dee Lumber Region according to Census data was 137,542 persons. Additional population estimates are presented in Section 3: *Community Profile*.

TABLE 6.3: TOTAL POPULATION IN THE PEE DEE LUMBER REGION

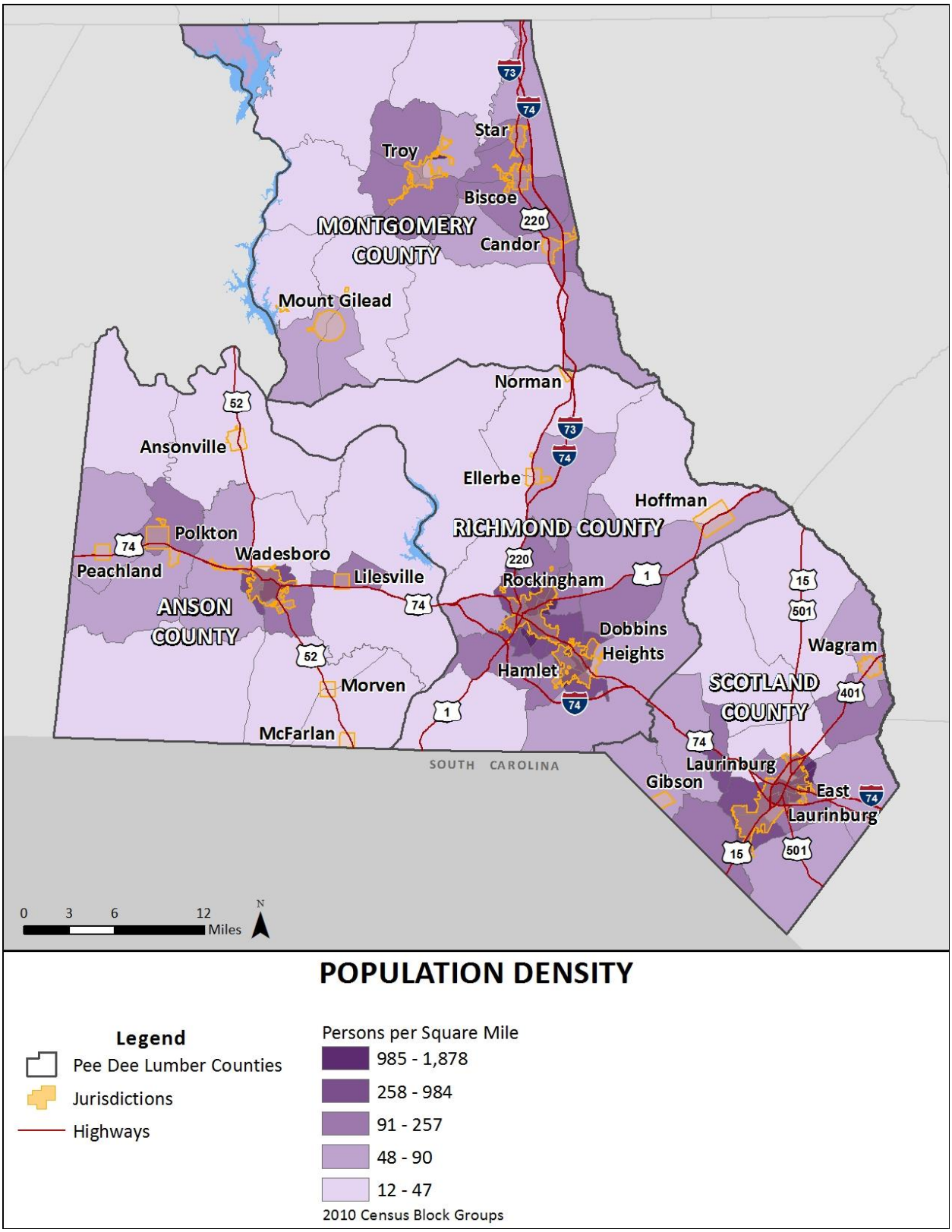
Location	2015 Population Estimates
Anson County	**25,159**
Montgomery County	**27,548**
Richmond County	**45,437**
Scotland County	**35,509**
PEE DEE LUMBER REGION TOTAL	**133,653**

Source: U.S. Census 2010

In addition, **Figure 6.7** illustrates the population density by Census Block Group as it was reported by the U.S. Census Bureau in 2010.[5]

[5] Population by census block was not available at the time this plan was completed.

FIGURE 6.7: POPULATION DENSITY IN THE PEE DEE LUMBER REGION



Source: U.S. Census Bureau, 2010

6.5 VULNERABILITY ASSESSMENT RESULTS

As noted earlier, only hazards with a specific geographic boundary, modeling tools, or sufficient historical data allow for further analysis. Those results are presented here. All other hazards are assumed to impact the entire planning region or, due to lack of data, analysis would not lead to credible results. This includes dam and levee failure, drought, erosion, hailstorm, lightning, thunderstorm wind, tornado, and winter storm and freeze. The total region exposure, and thus risk, was presented in **Table 6.1**.

Although the aforementioned hazards are not further analyzed in this section, vulnerability is presented in terms of annualized loss at the end of this section.

It should also be noted that all current and future buildings and populations are risk to drought, erosion, hailstorm, lightning, thunderstorm wind, tornado, winter storm and freeze, hurricane winds, earthquake, hazardous materials spill, and wildfire. The dam and levee failure, flood, and landslide hazards have definable boundaries where specific locations are at greater risk.

The hazards presented in this subsection include: hurricane and tropical storm winds, earthquake, landslide, flood, hazardous materials incident, and wildfire.

6.5.1 Hurricane and Tropical Storm

Historical evidence indicates that the Pee Dee Lumber Region has a significant risk to the hurricane and tropical storm hazard. There have been three disaster declarations due to hurricanes (Hurricane Fran, Hurricane Floyd, and Tropical Storm Frances) in the region. Thirty hurricane storm tracks have come near or traversed through the Pee Dee Lumber Region, as shown and discussed in Section 5: *Hazard Profiles*.

Hurricanes and tropical storms can cause damage through numerous additional hazards such as flooding, erosion, tornadoes, and high winds and precipitation, thus it is difficult to estimate total potential losses from these cumulative effects. The current Hazus-MH hurricane model only analyzes hurricane winds and is not capable of modeling and estimating cumulative losses from all hazards associated with hurricanes; therefore only hurricane winds are analyzed in this section. It can be assumed that all existing and future buildings and populations are at risk to the hurricane and tropical storm hazard. Hazus-MH 2.1 was used to determine annualized losses for the region as shown below in **Table 6.4.** Only losses to buildings are reported, in order to best match annualized losses reported for other hazards.

TABLE 6.4: ANNUALIZED LOSS ESTIMATIONS FOR HURRICANE WIND HAZARD

Location	Annualized Loss ($)
Anson County	**$314,760**
Ansonville	$10,000
Lilesville	$180
McFarlan	$2,980
Morven	$13,930

Location	Annualized Loss ($)
Peachland	$9,320
Polkton	$15,100
Wadesboro	$99,450
Unincorporated	$163,800
Montgomery County	**$378,300**
Biscoe	$28,230
Candor	$24,370
Mount Gilead	$28,000
Star	$12,670
Troy	$59,730
Unincorporated Area	$225,300
Richmond County	**$905,970**
Dobbin Heights	$19,960
Ellerbe	$25,800
Hamlet	$167,180
Hoffman	$12,780
Norman	$4,280
Rockingham	$261,170
Unincorporated Area	$414,800
Scotland County	**$1,171,260**
East Laurinburg	$27,380
Gibson	$23,420
Laurinburg	$677,700
Wagram	$24,530
Unincorporated Area	$418,230
PEE DEE LUMBER REGION TOTAL	**$2,770,290**

Social Vulnerability

Given some equal susceptibility across the entire Pee Dee Lumber Region, it is assumed that the total population is at risk to the hurricane and tropical storm hazard.

Critical Facilities

Given equal vulnerability across the Pee Dee Lumber Region, all current and future critical facilities are considered to be at risk. Some buildings may perform better than others in the face of such an event due to construction and age, among factors. Determining individual building response is beyond the scope of this plan. However, this plan will consider mitigation action for especially vulnerable and/or critical facilities to mitigation against the effects of the hurricane hazard.

In conclusion, a hurricane and tropical storm event has the potential to impact existing and future buildings, critical facilities, and populations in the Pee Dee Lumber Region.

6.5.2 Earthquake

As the Hazus model suggests below, and historical occurrences confirm, any earthquake activity in the area is likely to inflict minor damage to the planning area.

For the earthquake hazard vulnerability assessment, two probabilistic scenarios were run. The first was used to determine structural losses from a magnitude 5, 1,000-year event. The second was created to estimate the annualized loss for the region.

The results of the analyses are reported at the U.S. Census tract level. Therefore, loss estimates are presented by county as not all jurisdictions could be determined separately. Losses reported included losses due to structure failure and do not include losses to contents, inventory, or business interruption. **Table 6.5** summarizes the findings from the magnitude 5 event and **Table 6.6** summarizes the annualized loss estimation.

TABLE 6.5: STRUCTURAL LOSS ESTIMATIONS FOR EARTHQUAKE HAZARD

Location	Total Structural Loss	Total Structural Exposure (Hazus-MH inventory)	Percent of Building Stock Impacted
Anson County	$5,445,120	$1,233,415,000	0.4%
Montgomery County	$4,668,940	$1,676,452,000	0.3%
Richmond County	$10,816,180	$2,551,087,000	0.4%
Scotland County	$9,143,070	$1,919,788,000	0.5%
PEE DEE LUMBER REGION TOTAL	**$30,073,310**	**$7,380,742,000**	**1.6%**

Source: Hazus-MH 2.1

TABLE 6.6: STRUCTURAL ANNUALIZED LOSS ESTIMATIONS FOR EARTHQUAKE HAZARD

Location	Total Structural Loss
Anson County	$26,600
Montgomery County	$24,800
Richmond County	$54,400
Scotland County	$47,800
PEE DEE LUMBER REGION TOTAL	**$153,600**

Source: Hazus-MH 2.1

Social Vulnerability

It can be assumed that all existing and future populations are at risk to the earthquake hazard.

Critical Facilities

The Hazus probabilistic analysis indicated that no critical facilities (in the Hazus-MH inventory) would sustain measurable damage in an earthquake event. However, all critical facilities should be considered at-risk to minor damage, should an event occur.

In conclusion, an earthquake has the potential to impact all existing and future buildings, facilities, and populations in the Pee Dee Lumber Region. While the Pee Dee Lumber Region may not experience a large earthquake (the greatest on record is a magnitude VII MMI), localized damage is possible with an occurrence. Specific vulnerabilities for these assets will be greatly dependent on their individual design and the mitigation measures in place, where appropriate. Such site-specific vulnerability determinations are outside the scope of this assessment but will be considered during future plan updates.

6.5.3 Landslide

Although scientific data indicates that the Pee Dee Lumber Region is susceptible to landslide events, there are few reports of occurrence and no reports of damage. Therefore, it is difficult to calculate a reliable annualized loss figure. While a single event could cause several thousand dollars in damage, annualizing these losses over time while likely yield a loss value close to zero, or negligible.

In order to complete the vulnerability assessment for landslides in the Pee Dee Lumber Region, GIS analysis was used. The potential dollar value of exposed land and property total can be determined using the USGS Landslide Susceptibility Index (detailed in Section5: *Hazard Profiles*), county level tax parcel data, and GIS analysis. **Table 6.7** presents the potential at-risk property where available. Two areas were analyzed – areas of high incidence and areas of low incidence/moderate susceptibility. Only a small portion in the western portion of the region falls into the high incidence area (located in Montgomery and Anson counties. The moderate susceptibility area covers land in Anson, Montgomery, and Richmond counties.

TABLE 6.7: TOTAL POTENTIAL AT-RISK PARCELS FOR THE LANDSLIDE HAZARD

Location	Number of Buildings At Risk		Total Improved Value of Buildings At Risk ($)	
Incident Level	Moderate Susceptibility/Low Incidence	High Incidence	Moderate Susceptibility/Low Incidence	High Incidence
Anson County	**10,610**	**64**	**$1,708,969,045**	**$5,078,900**
Ansonville	316	0	$44,892,727	$0
Lilesville	0	0	$0	$0
McFarlan	0	0	$0	$0
Morven	0	0	$0	$0
Peachland	280	0	$2,490,625	$0
Polkton	518	0	$163,482,371	$0
Wadesboro	2,576	0	$736,120,223	$0
Unincorporated Area	6,920	64	$761,983,099	$8,873,791
Montgomery County	**15,356**	**1,885**	**$2,592,282,788**	**$1,227,382,974**
Biscoe	685	0	$88,559,087	$0
Candor	421	0	$80,831,908	$0
Mount Gilead	660	2	$74,695,667	$3,139,024
Star	493	0	$41,233,162	$0
Troy	1,333	0	$383,960,660	$0
Unincorporated Area	**11,764**	**1,883**	**$1,923,002,304**	**$$1,224,243,950**
Richmond County	**647**	**0**	**$34,579,380**	$0
Dobbin Heights	0	0	$0	$0
Ellerbe	0	0	$0	$0
Hamlet	0	0	$0	$0
Hoffman	0	0	$0	$0
Norman	0	0	$0	$0
Rockingham	0	0	$0	$0
Unincorporated Area	647	0	$34,579,380	$0
Scotland County	**0**	**0**	**$0**	**$0**

Location	Number of Buildings At Risk		Total Improved Value of Buildings At Risk ($)	
Incident Level	Moderate Susceptibility/Low Incidence	High Incidence	Moderate Susceptibility/Low Incidence	High Incidence
East Laurinburg	0	0	**$0**	**$0**
Gibson	0	0	**$0**	**$0**
Laurinburg	0	0	**$0**	**$0**
Wagram	0	0	**$0**	**$0**
Unincorporated Area	0	0	**$0**	**$0**
PEE DEE LUMBER REGION TOTAL	**26,613**	**1,949**	**$4,335,831,213**	**$1,236,256,765**

Source: USGS, NC Risk Data

Social Vulnerability

Census population is presented for the region at the tract level. This means that population estimates could be quite inaccurate and it is not possible to complete the analysis at the municipal level. The estimated population in the high incidence area is 4,000 persons based on area census tracts. The estimated populations in the moderate susceptibility/low incidence area is 43,000 persons.

Critical Facilities

The critical facility analysis revealed that there is 1 fire station and 1 power station in the high incidence area in Montgomery County Additionally, there are 17 schools, 15 fire stations, , 2 airports, 2 hospitals, and 9 law enforcement facilities located in the moderate susceptibility area within Anson and Montgomery counties.

In conclusion, a landslide has the potential to impact all existing and future buildings, facilities, and populations in the identified risk area. Of particular concern is the high incidence area located in the western portion of the study area in Anson and Montgomery Counties. Some areas are at a higher risk than others. For example, steep slopes and modified slopes bear a greater risk than flat areas. Specific vulnerabilities for these assets will be greatly dependent on their individual design and the mitigation measures in place, where appropriate. Such site-specific vulnerability determinations are outside the scope of this assessment but will be considered during future plan updates.

6.5.4 Flood

Historical evidence indicates that the Pee Dee Lumber Region is susceptible to flood events. A total of 84 flood events have been reported by the National Climatic Data Center resulting in nearly $200,000 dollars in reported damages. On an annualized level, these damages amounted to $9,964 for the Pee Dee Lumber Region. Annualized figures by county are presented at the end of this section in **Table 6.13**.

In order to assess flood risk, a GIS-based analysis was used to estimate exposure to flood events using Flood Insurance Rate Map (FIRM) data in combination with local tax assessor records for each of the Pee Dee Lumber Counties. The determination of assessed value at-risk (exposure) was calculated using GIS analysis by summing the total assessed building values for only those improved properties that were confirmed to be located within an identified floodplain. **Table 6.8** presents the potential at-risk property. Both the number of parcels and the approximate value are presented.

TABLE 6.8: ESTIMATED EXPOSURE OF PARCELS TO THE FLOOD HAZARD

Level of Flood Event	1-percent ACF		0.2-percent ACF		Total percent of value in a floodplain
Location	Approx. Number of Buildings	Approx. Improved Value	Approx. Number of Buildings	Approx. Improved Value	
Anson County	**35**	**$25,218,040**	**5**	**$915,500**	**1.3%**
Ansonville	0	0	0	0	0.0%
Lilesville	0	0	0	0	0.0%
McFarlan	0	0	0	0	0.0%
Morven	4	$115,563	0	0	0.3%
Peachland	0	0	0	0	0.0%
Polkton	16	$3,569,968	9	$9,991,846	8.3%
Wadesboro	7	$18,599,591	0	0	2.5%
Unincorporated	8	$2,932,918	2	$362,047	0.2%
Montgomery County	**60**	**$12,765,993**	4	**$402,419**	**0.3%**
Biscoe	4	$1,072,075	0	0	1.2%
Candor	0	0	0	0	0.0%
Mount Gilead	0	$0	0	0	0.0%
Star	0	0	0	0	0.0%
Troy	0	$0	3	$287,600	0.1%
Unincorporated Area	56	$11,693,918	1	$114,819	0.4%
Richmond County	**232**	**$38,026,854**	39	**$4,350,850**	**0.8%**
Dobbin Heights	0	$0	0	0	0.0%
Ellerbe	0	0	0	0	0.0%
Hamlet	16	$744,836	11	$405,479	0.3%
Hoffman	0	0	0	0	0.0%
Norman	0	0	0	0	0.0%
Rockingham	94	$26,603,334	24	$2,635,869	1.3%
Unincorporated Area	122	$10,678,684	4	$1,309,502	0.5%
Scotland County	**270**	**$73,009,844**	54	**$3,439,973**	**3.5%**
East Laurinburg	34	$1,539,564	5	$319,672	26.2%
Gibson	0	0	0	0	0.0%
Laurinburg	97	$27,426,227	13	$657,190	3.0%
Wagram	0	0	0	0	0.0%
Unincorporated Area	139	$44,044,053	36	$2,463,111	3.9%
PEE DEE LUMBER REGION TOTAL	**597**	**$149,020,731**	**108**	**$18,547,135**	**1.2%**

Source: FEMA FIRM; County-level parcel data

Social Vulnerability

Since 2010 population was only available at the tract level, it was difficult to determine a reliable figure on population at risk to flood. **Figures 6.8, 6.9**, **6.10**, **6.11** and **6.12** is presented to gain a better understanding of at-risk population.

FIGURE 6.8 : SPECIAL FLOOD HAZARD AREAS

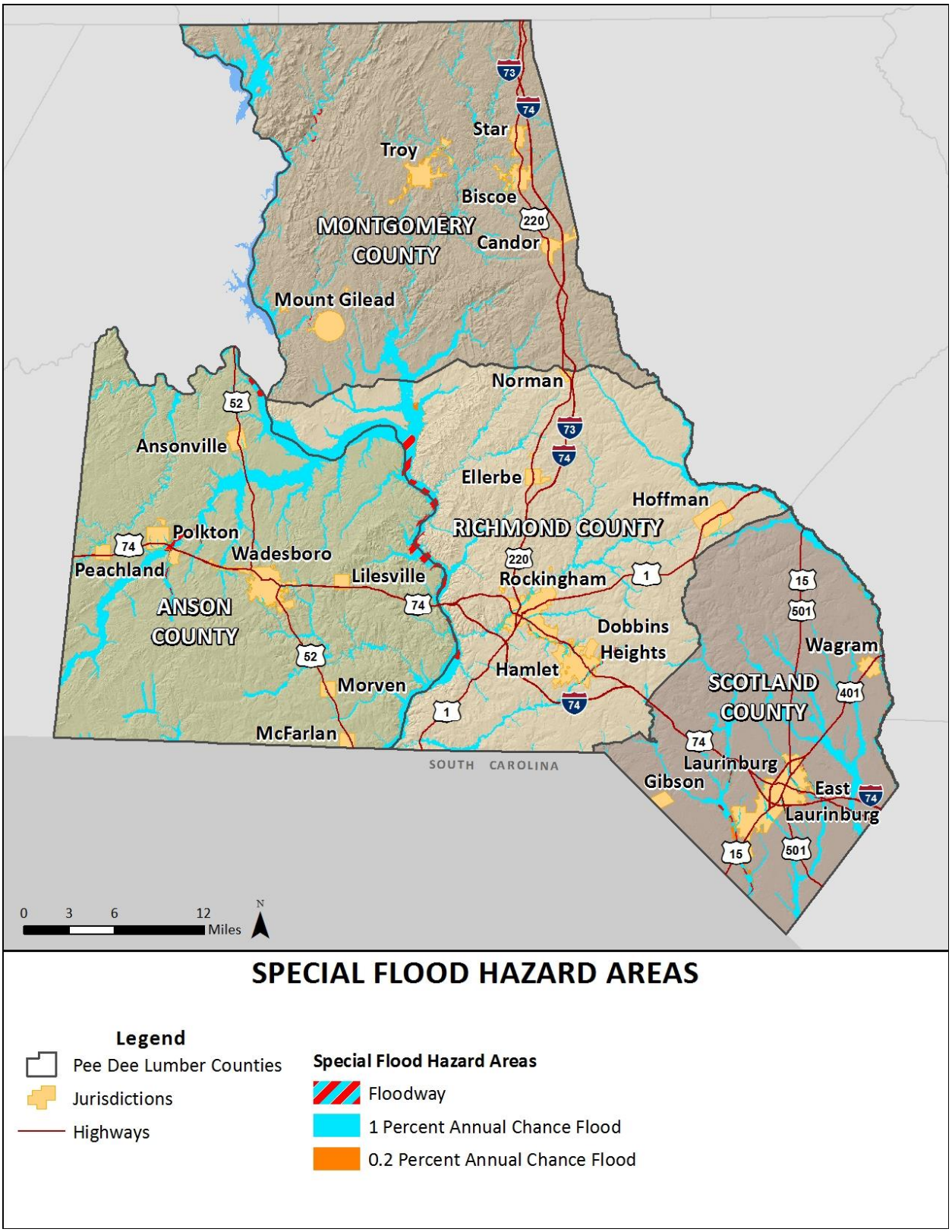


FIGURE 6.9 : SPECIAL FLOOD HAZARD AREAS ANSON COUNTY

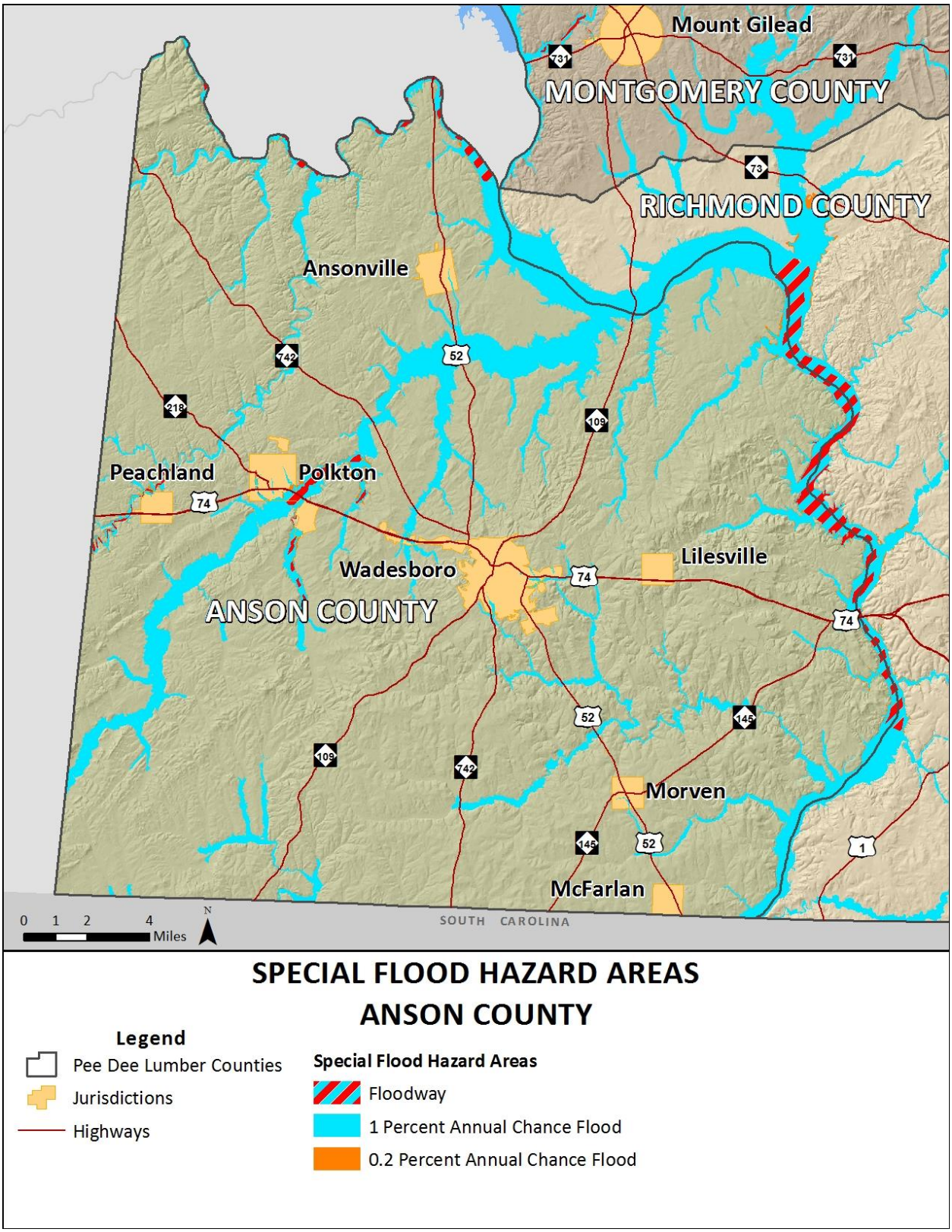


FIGURE 6.10 : SPECIAL FLOOD HAZARD AREAS MONTGOMERY COUNTY

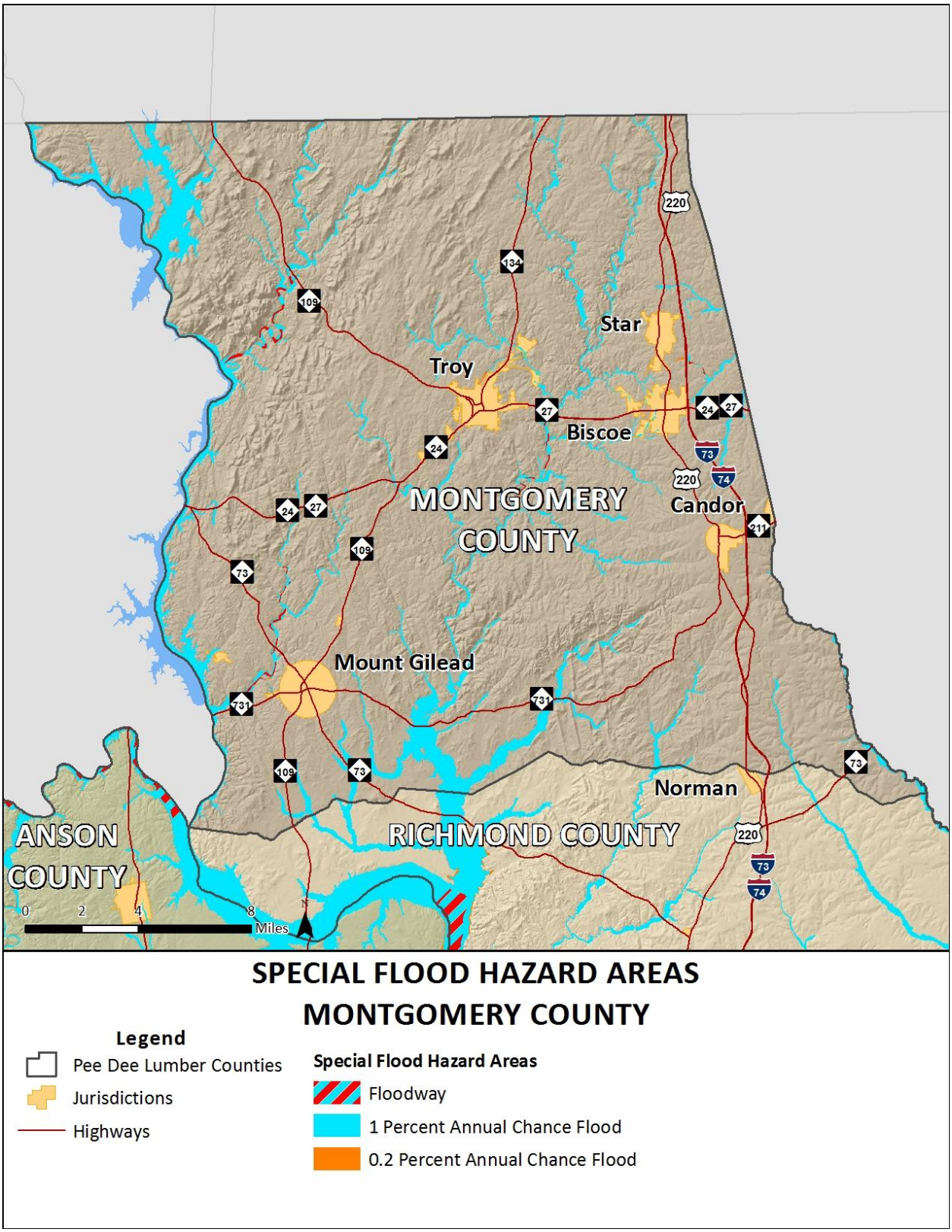


FIGURE 6.11 : SPECIAL FLOOD HAZARD AREAS RICHMOND COUNTY

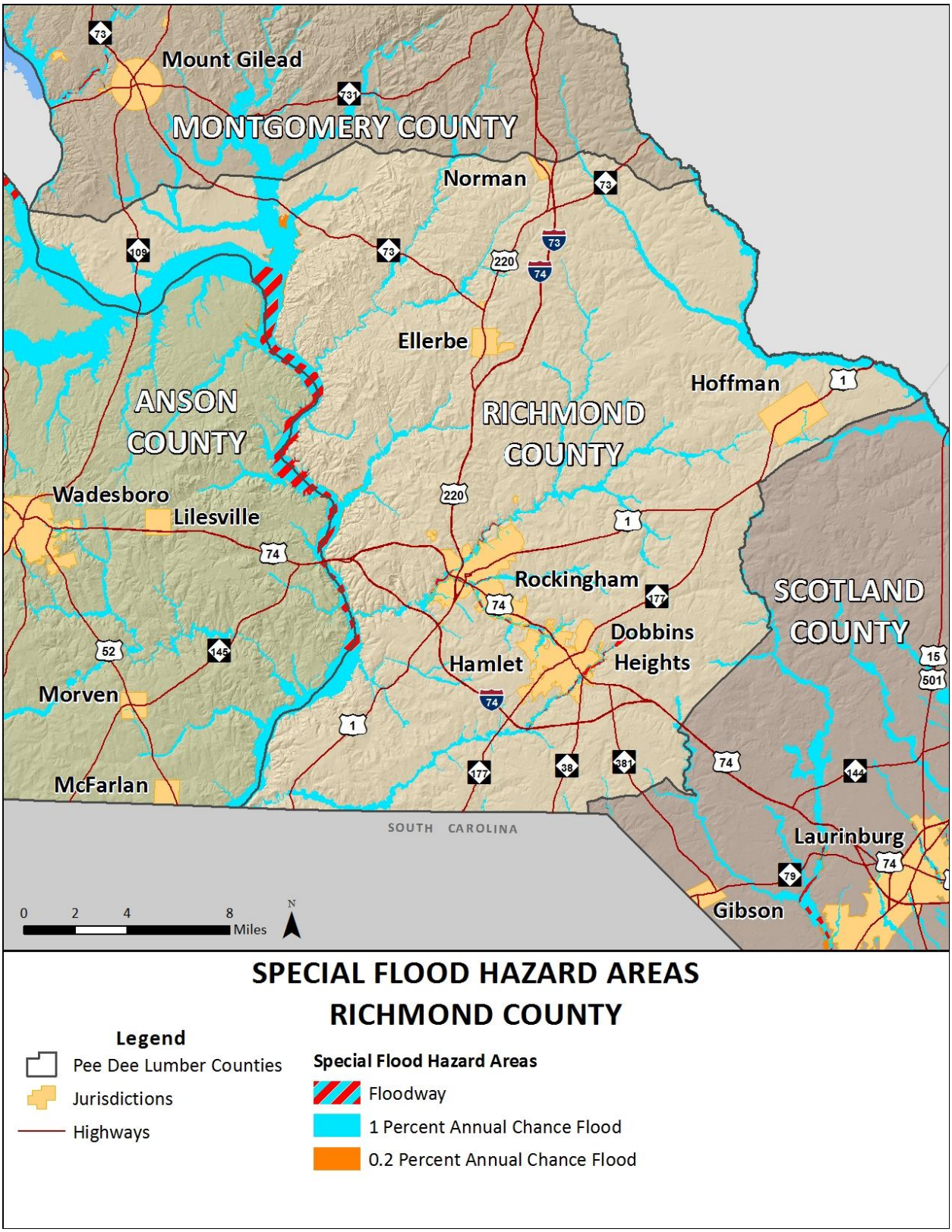
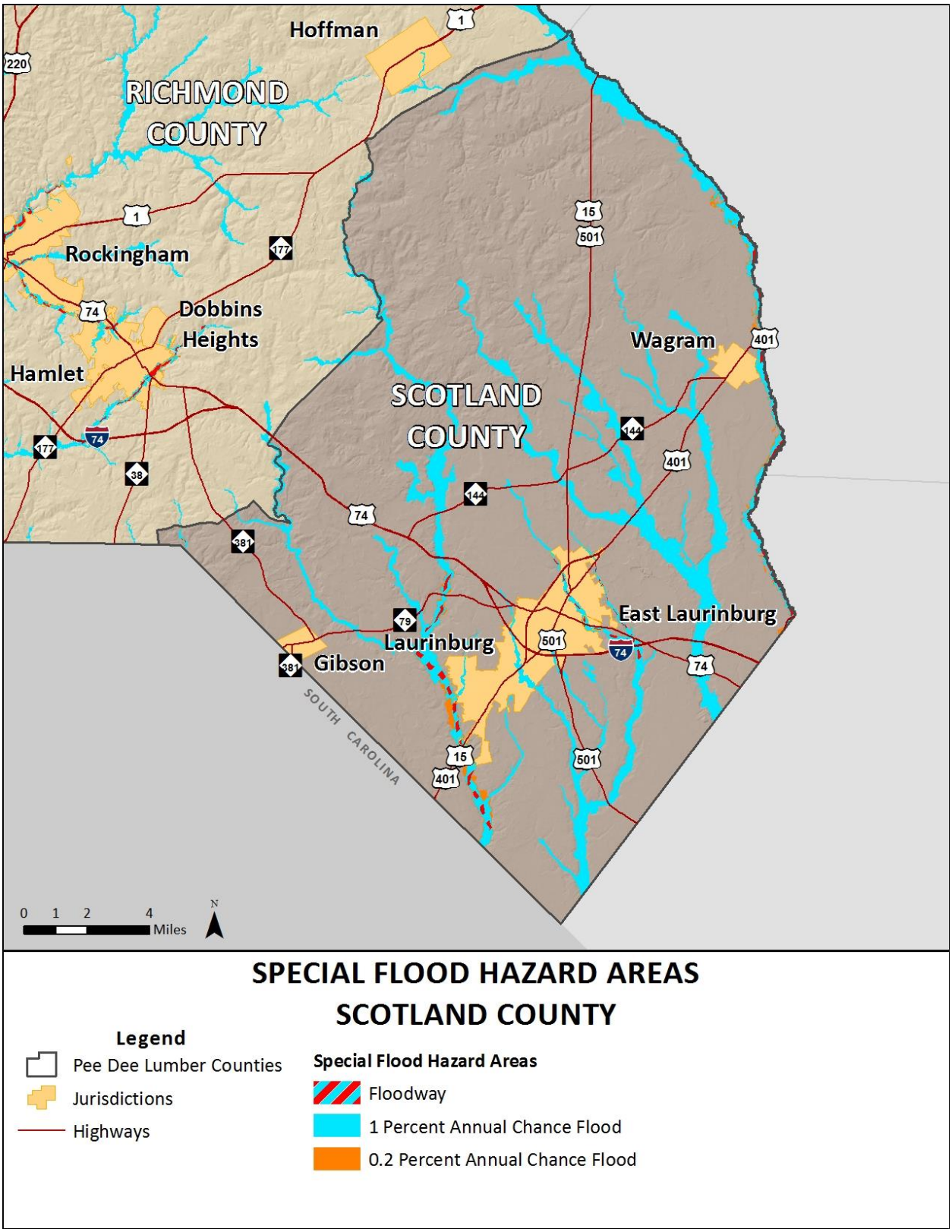


FIGURE 6.12 : SPECIAL FLOOD HAZARD AREAS SCOTLAND COUNTY



Source: FEMA DFIRM

Critical Facilities

The critical facility analysis revealed that there are nine critical facilities located in the floodplain.(Please note, as previously mentioned, this analysis does not consider building elevation, which may negate risk.) Facilities include a fire station and university building in Scotland County, four hydroelectric power plant facilities in Anson and Montgomery counties, a water treatment plant in Richmond County, and two wastewater treatment plants in Richmond and Scotland counties.

In conclusion, a flood has the potential to impact many existing and future buildings, critical facilities, and populations in the Pee Dee Lumber Region, though some areas are at a higher risk than others. All types of structures in a floodplain are at-risk, though elevated structures will have a reduced risk. Such site-specific vulnerability determinations are outside the scope of this assessment but will be considered during future plan updates. Furthermore, areas subject to repetitive flooding should be analyzed for potential mitigation actions.

6.5.5 Hazardous Materials Incident

Historical evidence and existing Toxic Release Inventory sites indicate that the Pee Dee Lumber Region is highly susceptible to hazardous materials events. In fact, this appears to be one of the greatest threats to the region. Although there are few reports of damage, incidents reported yield an annualized loss estimate of $70,000 for the region. However, one major event has the potential to cause much greater damages.

Most hazardous materials incidents that occur are contained and suppressed before destroying any property or threatening lives. However, they can have a significant negative impact. Such events can cause multiple deaths, completely shut down facilities for 30 days or more, and cause more than 50 percent of affected properties to be destroyed or suffer major damage. In a hazardous materials incident, solid, liquid, and/or gaseous contaminants may be released from fixed or mobile containers. Weather conditions will directly affect how the hazard develops. Certain chemicals may travel through the air or water, affecting a much larger area than the point of the incidence itself. Non-compliance with fire and building codes, as well as failure to maintain existing fire and containment features, can substantially increase the damage from a hazardous materials release. The duration of a hazardous materials incident can range from hours to days. Warning time is minimal to none.

In order to conduct the vulnerability assessment for this hazard, GIS analysis was used for fixed and mobile areas. In both scenarios, two sizes of buffers—500 and 2,500 meters—were used. These areas are assumed to respect the different levels of effect: immediate (primary) and secondary. Primary and secondary impact sites were selected based on guidance from FEMA 426, Reference Manual to Mitigate Potential Terrorist Attacks Against Buildings and engineering judgment. For the fixed site analysis, geo-referenced TRI listed toxic sites in the Pee Dee Lumber Region, along with buffers, were used for analysis as shown in **Figures 6.13, 6.14**, **6.15**, **6.16** and **6.17.** For the mobile analysis, the major roads (Interstate highway, U.S. highway, and State highway) and railroads, where hazardous materials are primarily transported that could adversely impact people and buildings, were used for the GIS buffer analysis. **Figures 6.18, 6.19**, **6.20**, **6.21**, **6.22** show the areas used for mobile toxic release buffer analysis. The results indicate the approximate number of building footprints, improved value, as shown in **Table 6.9** (fixed sites) and **Tables 6.10** and **6.11** (mobile sites).[6]

[6] Note that parcels included in the 2,500 meter analysis are also included in the 500 meter analysis.

FIGURE 6.13 : TRI SITES WITH BUFFERS IN THE PEE DEE LUMBER REGION

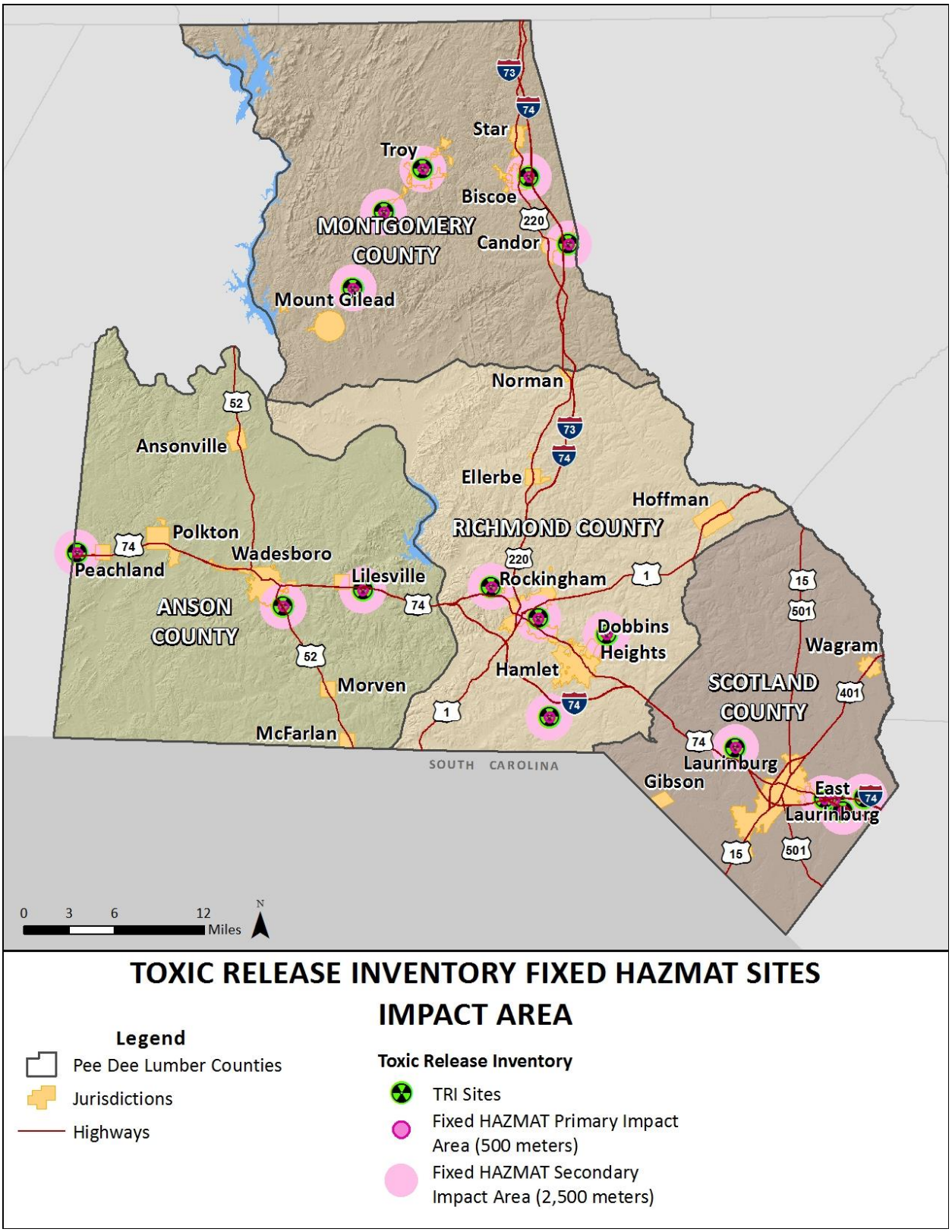


FIGURE 6.14 : TRI SITES WITH BUFFERS IN ANSON COUNTY

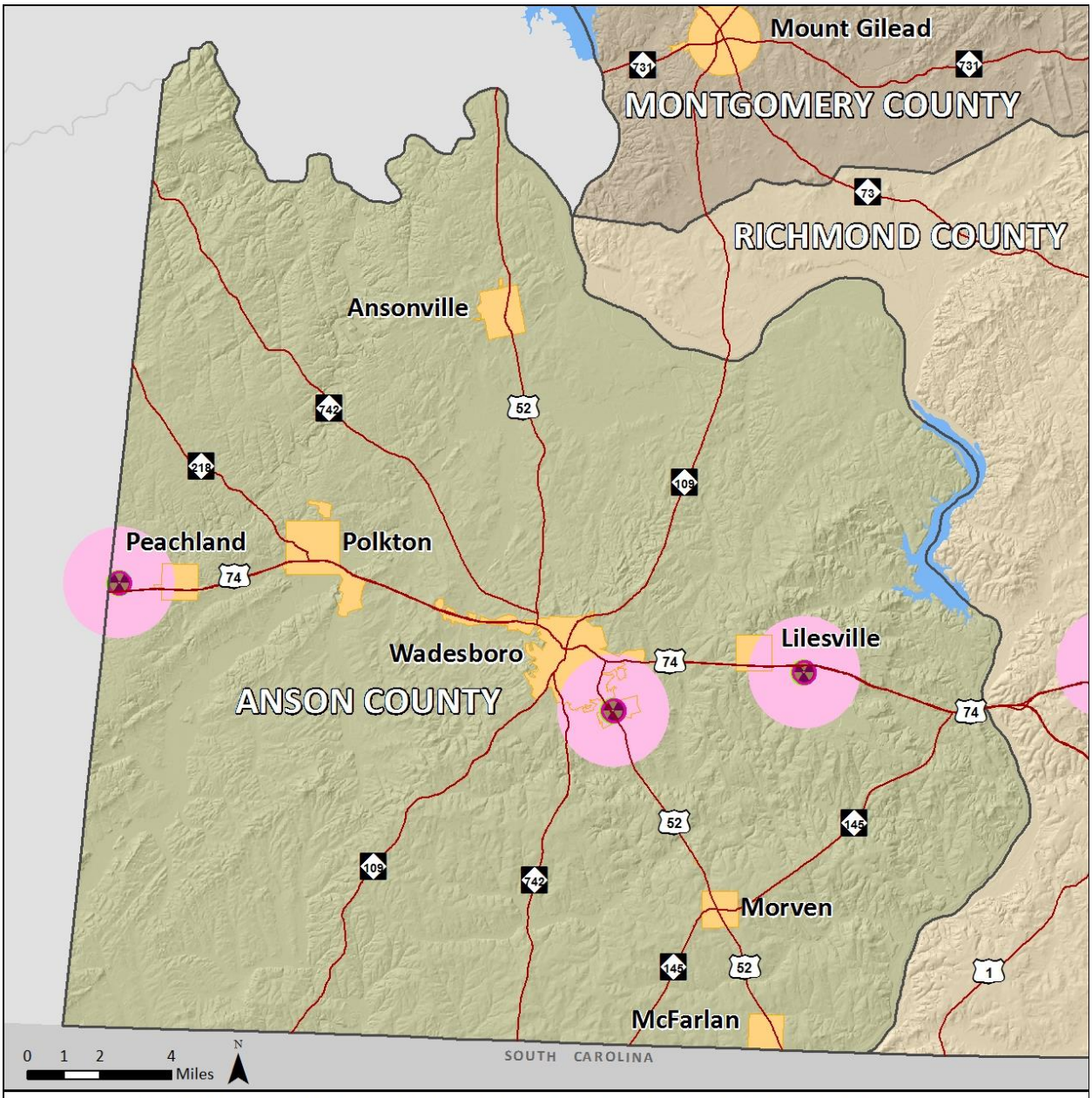


FIGURE 6.15 : TRI SITES WITH BUFFERS IN MONTGOMERY COUNTY

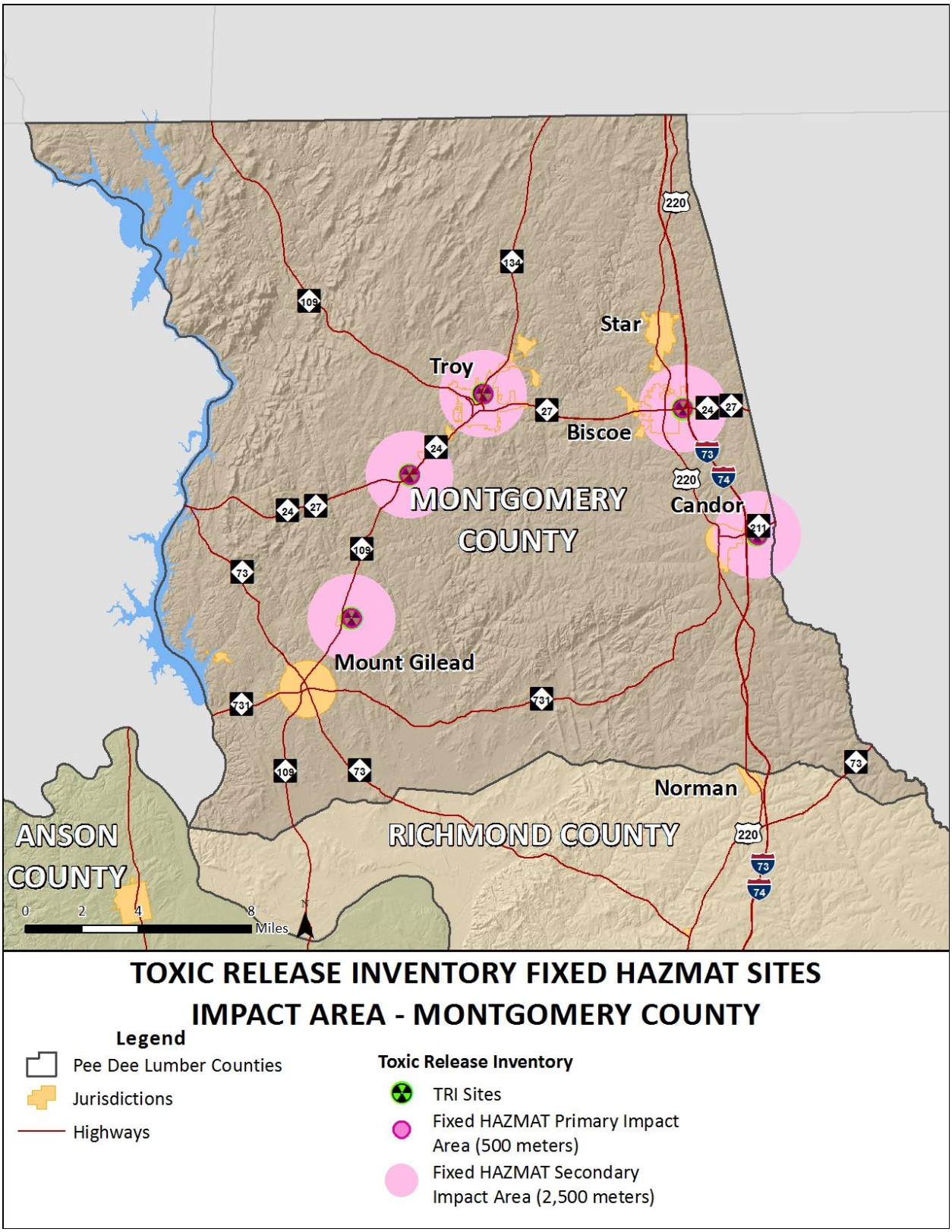
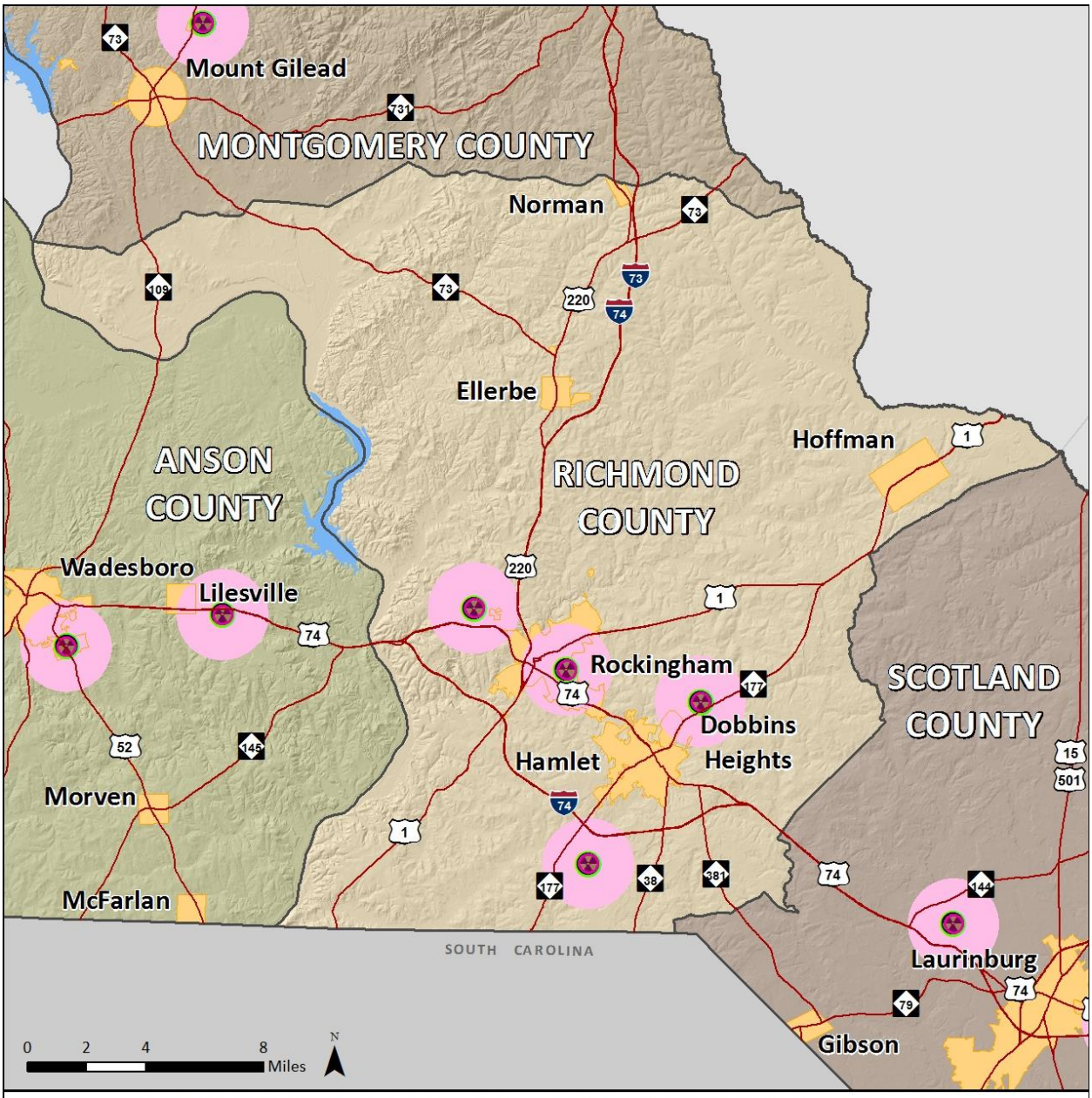


FIGURE 6.16 : TRI SITES WITH BUFFERS IN RICHMOND COUNTY



TOXIC RELEASE INVENTORY FIXED HAZMAT SITES
IMPACT AREA - RICHMOND COUNTY

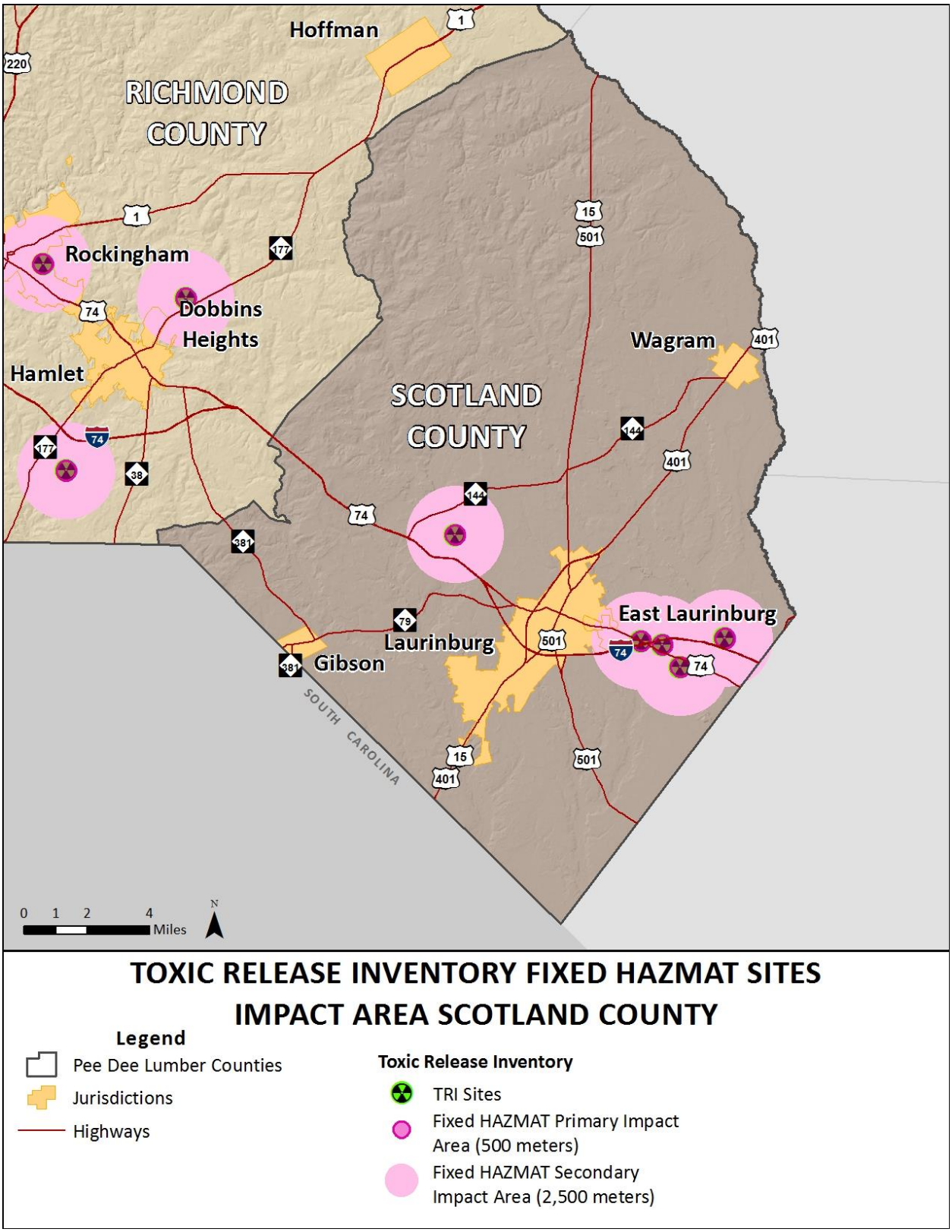
Legend

- Pee Dee Lumber Counties
- Jurisdictions
- Highways

Toxic Release Inventory

- TRI Sites
- Fixed HAZMAT Primary Impact Area (500 meters)
- Fixed HAZMAT Secondary Impact Area (2,500 meters)

FIGURE 6.17 : TRI SITES WITH BUFFERS IN SCOTLAND COUNTY



Source: EPA

TABLE 6.9: EXPOSURE OF IMPROVED PROPERTY TO HAZARDOUS MATERIALS (FIXED SITES)

Level of Concern	500-meter buffer		2,500-meter buffer	
Location	**Approx. Number of Buildings**	**Approx. Improved Value**	**Approx. Number of Buildings**	**Approx. Improved Value**
Anson County	**97**	**$63,891,426**	**1,650**	**$373,452,195**
Ansonville	-	-	-	-
Lilesville	-	-	**103**	**$9,387,710**
McFarlan	-	-	-	-
Morven	-	-	-	-
Peachland	-	-	**95**	**$7,634,399**
Polkton	-	-	-	-
Wadesboro	**42**	**$44,232,203**	**772**	**$227,207,026**
Unincorporated	55	$19,659,223	680	$129,223,060
Montgomery County	**284**	**$65,774,747**	**3978**	**$517,321,445**
Biscoe	39	$8,670,450	669	$67,803,335
Candor	4	$899,756	329	$80,265,483
Mount Gilead	-	-	-	-
Star	-	-	7	$182,210
Troy	199	$36,840,359	1301	$173,294,713
Unincorporated Area	42	$19,364,182	1672	$195,775,704
Richmond County	**242**	**$1,042,441,148**	**6167**	**$2,284,723,829**
Dobbin Heights	-	-	288	$11,508,074
Ellerbe	-	-	-	-
Hamlet	-	13	$1,502,852	-
Hoffman	-	-	-	-
Norman	-	-	-	-
Rockingham	152	$21,294,136	3379	$1,073,153,145
Unincorporated Area	90	$1,021,147,012	2487	$1,198,559,758
Scotland County	**106**	**$50,314,834**	**1699**	**$329,340,178**
East Laurinburg	-	-	58	$1,316,729
Gibson	-	-		
Laurinburg	-	-	144	$5,224,302
Wagram	-	-		
Unincorporated Area	106	$50,314,834	1414	$315,520,406
PEE DEE LUMBER REGION TOTAL	**729**	**$1,222,422,155**	**13494**	**$3,504,837,647**

FIGURE 6.18 : MOBILE HAZMAT BUFFERS IN THE PEE DEE LUMBER REGION

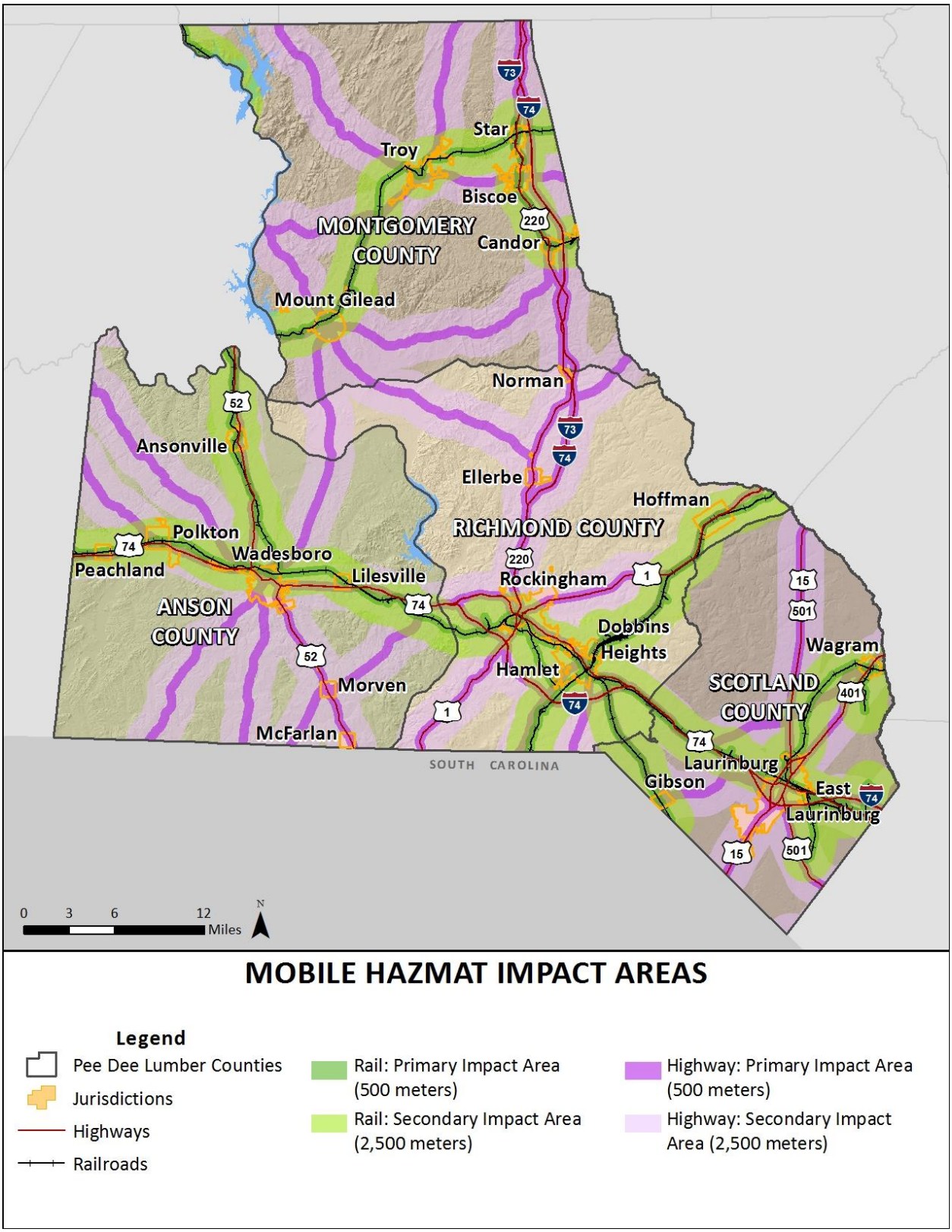
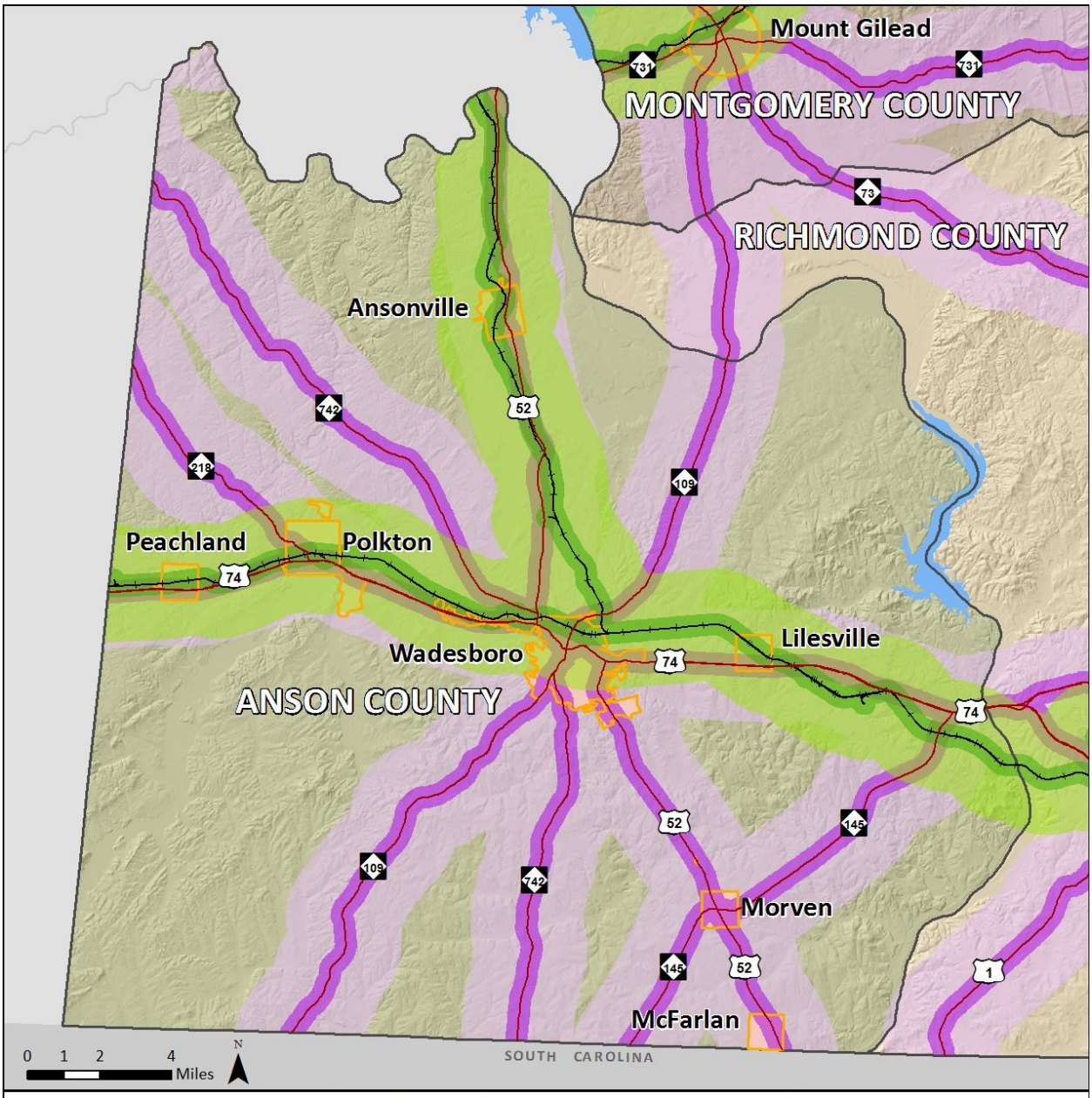


FIGURE 6.19 : MOBILE HAZMAT BUFFERS IN ANSON COUNTY



MOBILE HAZMAT IMPACT AREAS
ANSON COUNTY

Legend

- Pee Dee Lumber Counties
- Jurisdictions
- Highways
- Railroads
- Rail: Primary Impact Area (500 meters)
- Rail: Secondary Impact Area (2,500 meters)
- Highway: Primary Impact Area (500 meters)
- Highway: Secondary Impact Area (2,500 meters)

FIGURE 6.20 : MOBILE HAZMAT BUFFERS IN MONTGOMERY COUNTY

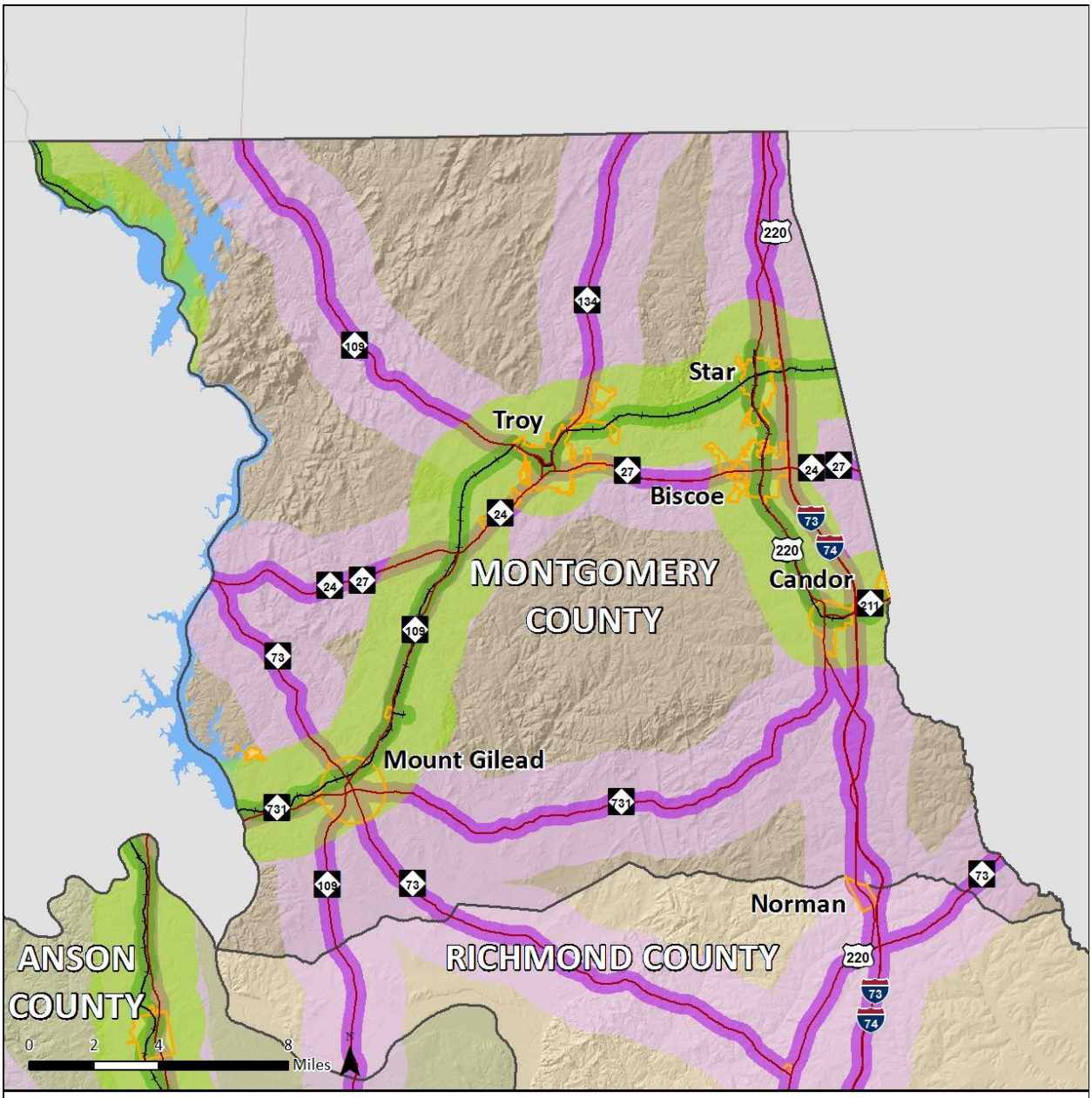
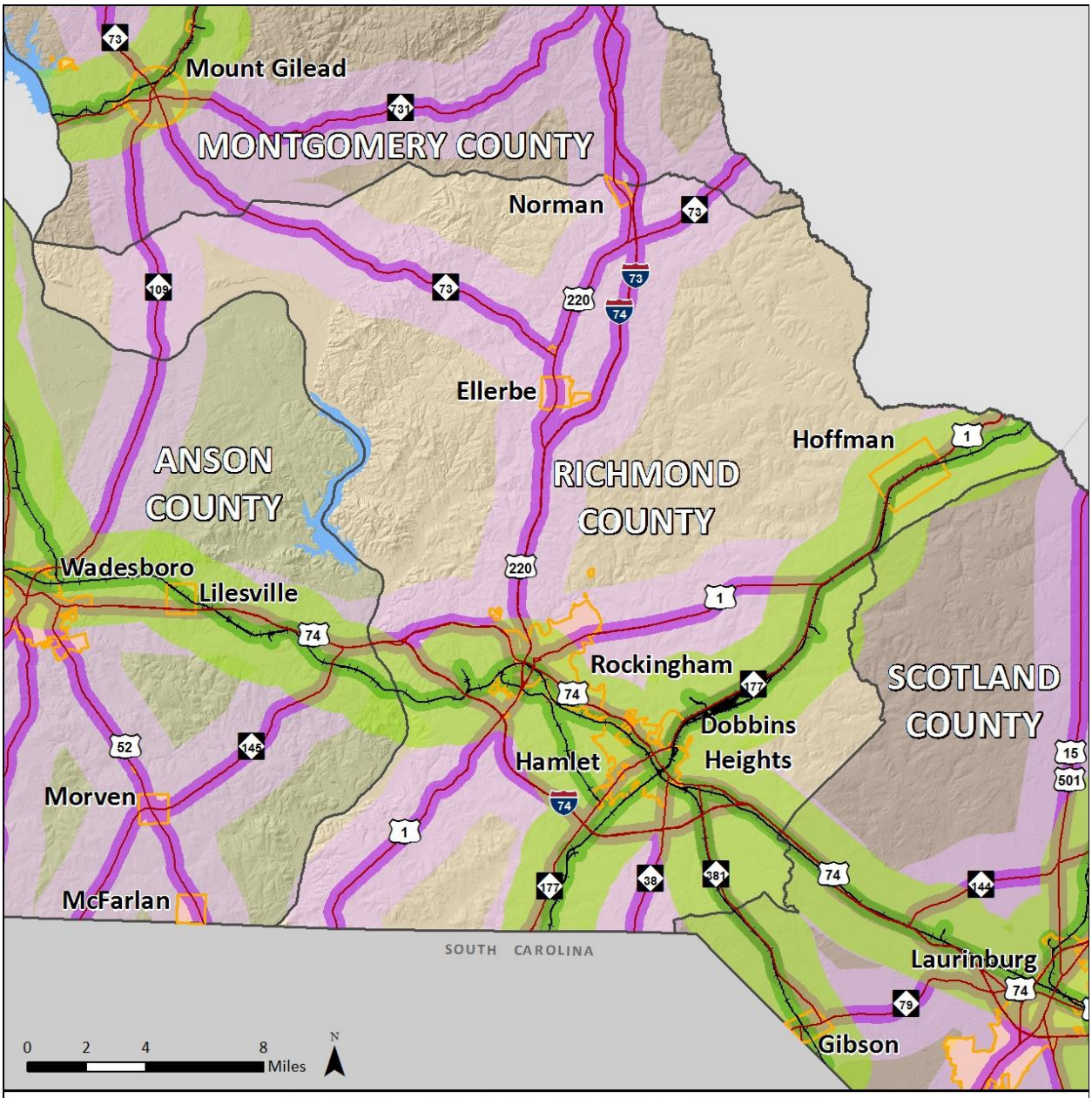


FIGURE 6.21 : MOBILE HAZMAT BUFFERS IN RICHMOND COUNTY



MOBILE HAZMAT IMPACT AREAS
RICHMOND COUNTY

Legend

- Pee Dee Lumber Counties
- Jurisdictions
- Highways
- Railroads
- Rail: Primary Impact Area (500 meters)
- Rail: Secondary Impact Area (2,500 meters)
- Highway: Primary Impact Area (500 meters)
- Highway: Secondary Impact Area (2,500 meters)

FIGURE 6.22 : MOBILE HAZMAT BUFFERS IN SCOTLAND COUNTY

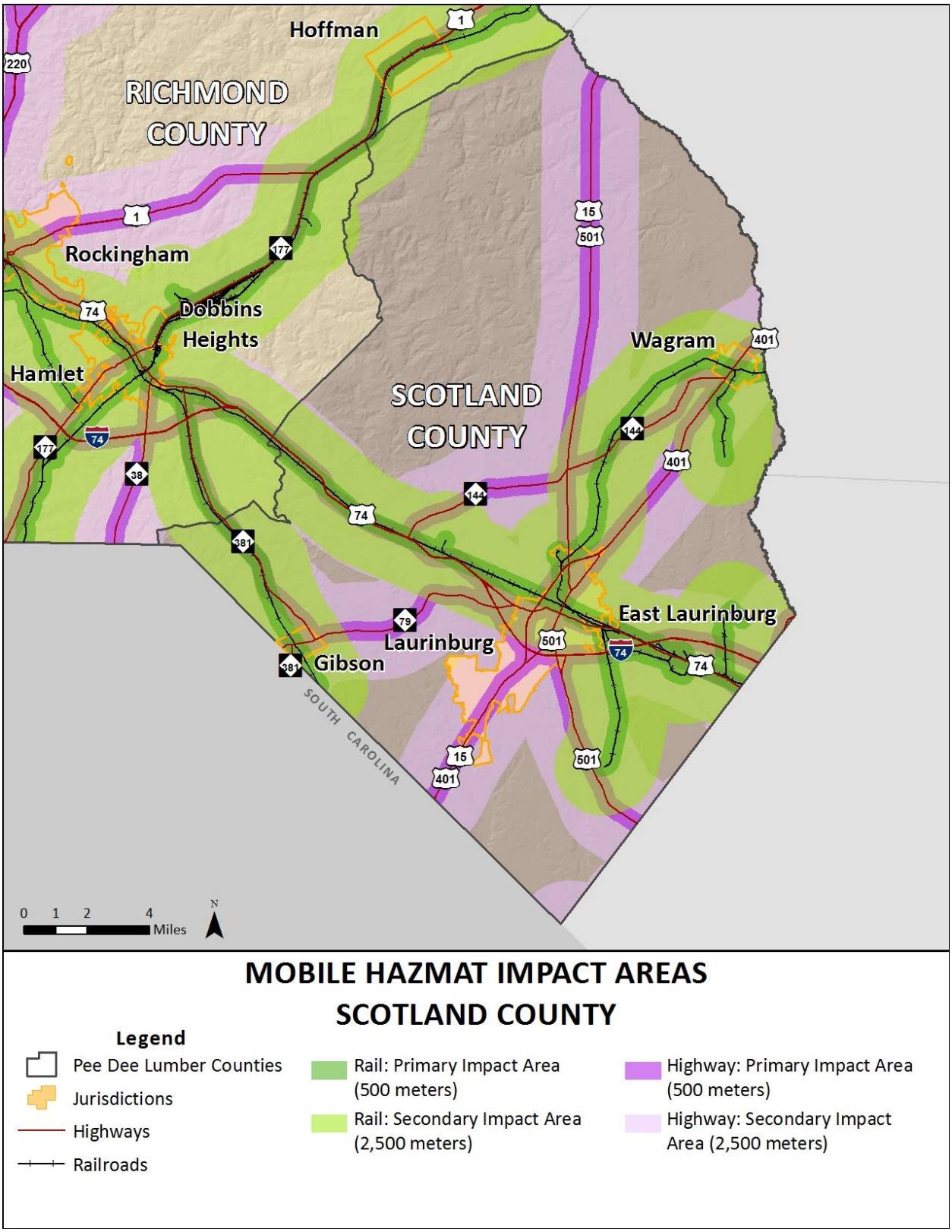


TABLE 6.10: EXPOSURE OF IMPROVED PROPERTY TO HAZARDOUS MATERIALS SPILL

(MOBILE ANALYSIS - ROAD)

Level of Concern	500-meter buffer		2,500-meter buffer	
Location	Approx. Number of Parcels	Approx. Improved Value	Approx. Number of Parcels	Approx. Improved Value
Anson County	**6,381**	**$1,361,324,829**	**12,342**	**$2,511,918,411**
Ansonville	157	$34,615,827	316	$44,892,727
Lilesville	115	$23,165,012	251	$36,071,750
McFarlan	48	$3,896,738	56	$4,071,737
Morven	315	$37,876,499	328	$38,249,471
Peachland	193	$21,744,150	280	$24,906,235
Polkton	357	$80,592,378	518	$163,482,371
Wadesboro	2,116	$665,464,110	2,586	$740,717,393
Unincorporated	3,080	$493,970,115	8,807	$1,459,526,727
Montgomery County	**7,242**	**$797,237,437**	**12,802**	**$3,237,614,827**
Biscoe	572	$76,619,383	685	$88,559,087
Candor	392	$85,216,387	425	$86,597,039
Mount Gilead	608	$71,128,294	660	$74,695,667
Star	359	$33,693,224	493	$41,233,162
Troy	1,136	$160,532,998	1,333	$383,960,660
Unincorporated Area	4,175	$370,047,151	9,206	$2,562,569,212
Richmond County	**11,585**	**$1,846,139,165**	**24,891**	**$5,058,431,384**
Dobbin Heights	373	$15,284,518	468	$19,566,385
Ellerbe	494	$27,289,192	618	$33,979,059
Hamlet	1,884	$305,795,892	2,914	$443,270,262
Hoffman	225	$14,334,867	293	$18,136,728
Norman	135	$5,225,048	135	$5,225,048
Rockingham	3,074	$1,044,888,746	4,729	$2,282,878,192
Unincorporated Area	5,400	$433,320,902	15,734	$2,255,375,710
Scotland County	**8,249**	**$971,250,000**	**15,840**	**$1,822,313,347**
East Laurinburg	168	$7,099,457	168	$7,099,457
Gibson	283	$17,944,768	295	$19,202,181
Laurinburg	4,296	$599,284,765	6,768	$919,900,186
Wagram	199	$20,112,797	455	$33,696,066
Unincorporated Area	3,208	$317,772,062	8,054	$832,791,656
PEE DEE LUMBER REGION TOTAL	**33,457**	**$4,975,951,431**	**65,875**	**$12,630,277,969**

TABLE 6.11: EXPOSURE OF IMPROVED PROPERTY TO HAZARDOUS MATERIALS SPILL (MOBILE ANALYSIS - RAIL)

Level of Concern	500-meter buffer		2,500-meter buffer	
Location	Approx. Number of Parcels	Approx. Improved Value	Approx. Number of Parcels	Approx. Improved Value
Anson County	**2,095**	**$512,641,969**	**6,482**	**$1,828,723,591**
Ansonville	203	$36,496,326	316	$44,892,727

Level of Concern	500-meter buffer		2,500-meter buffer	
Location	Approx. Number of Parcels	Approx. Improved Value	Approx. Number of Parcels	Approx. Improved Value
Lilesville	191	$16,935,876	251	$36,071,750
McFarlan	0	$0	0	$0
Morven	0	$0	0	$0
Peachland	226	$21,683,805	280	$24,906,235
Polkton	331	$71,311,686	518	$163,482,371
Wadesboro	412	$186,174,422	2,074	$620,162,726
Unincorporated Area	732	$180,039,854	3,043	$939,207,782
Montgomery County	**3,424**	**$1,649,094,409**	**8,722**	**$2,942,021,502**
Biscoe	440	$38,784,808	685	$88,559,087
Candor	284	$72,778,266	425	$86,597,039
Mount Gilead	264	$26,976,280	660	$74,695,667
Star	434	$36,992,430	493	$41,233,162
Troy	739	$99,198,894	1,333	$383,960,660
Unincorporated Area	1,263	$1,374,363,731	5,126	$2,266,975,887
Richmond County	**6,354**	**$1,924,483,545**	**15,747**	**$4,328,020,835**
Dobbin Heights	316	$13,149,584	468	$19,566,385
Ellerbe	0	$0	0	$0
Hamlet	1,665	$330,063,315	2,914	$443,270,262
Hoffman	227	$14,233,710	293	$18,136,728
Norman	0	$0	0	$0
Rockingham	835	$1,223,391,723	3,563	$2,188,611,089
Unincorporated Area	3,311	$343,645,213	8,509	$1,658,436,371
Scotland County	**3,533**	**$354,762,191**	**10,787**	**$1,202,214,174**
East Laurinburg	168	$7,099,457	168	$7,099,457
Gibson	219	$13,100,422	295	$19,202,181
Laurinburg	1,157	$125,808,690	4,571	$471,465,214
Wagram	358	$29,247,218	455	$33,696,066
Unincorporated Area	1,566	$172,228,808	5,198	$661,127,455
PEE DEE LUMBER REGION TOTAL	**15,406**	**$4,440,982,114**	**41,738**	**$10,300,980,102**

Social Vulnerability

Given high susceptibility across the entire Pee Dee Lumber Region, it is assumed that the total population is at risk. It should be noted that areas of population concentration (near urban areas, for example) may be at an elevated risk due to a greater burden to evacuate population quickly.

Critical Facilities

Fixed Site Analysis:

The critical facility analysis for fixed TRI sites revealed that there are6facilities located in a primary TRI site buffer zone. This includes 1 EOC, 1 fire station, 1 law enforcement station, 1 hospital, 1 school, and 1 power plant.

The secondary buffer zone analysis revealed 37 facilities at risk. This includes 3 EOC's, 5 fire stations, 7 law enforcement stations, 2 hospitals, 14 schools, 1 airport, 1 community college, 1 power plant, 1 water treatment plant, and 2 wastewater treatment plants.

Mobile Analysis:
The critical facility analysis for transportation corridors revealed that there are 104 facilities in the primary transportation hazard area including 4 EOC's,28 fire stations, 14 law enforcement stations, 4 hospitals, 37 schools, 3 airports, 3 community colleges, 1 university, 2 power plants, 3 water treatment plants ,and 5 wastewater treatment plants.

The secondary buffer analysis revealed132 facilities in the transportation hazard area including 4 EOC's, 32 fire stations, 15 law enforcement Stations, 5 hospitals, 48 schools, 4 airports, 3 community colleges, 1 university, 5 power plants, 5 water treatment plants, and 9 wastewater treatment plants.

In conclusion, a hazardous material incident has the potential to impact many existing and future buildings, critical facilities, and populations in the Pee Dee Lumber Region. Those areas in a primary buffer area at the highest risk, though all areas carry some vulnerability due to variations in condition that could alter the impact area (direction and speed of wind, volume of release, etc).

6.5.6 Wildfire

Although historical evidence indicates that the Pee Dee Lumber Region is susceptible to wildfire events, there are few reports of damage. Therefore, it is difficult to calculate a reliable annualized loss figure. Annualized loss is considered negligible though it should be noted that a single event could result in significant damages throughout the region.

To estimate exposure to wildfire, the approximate number of parcels and their associated improved value was determined using GIS analysis. For the critical facility analysis, areas of concern were intersected with critical facility locations.

Figures 6.23, 6.24, **6.25**, **6.26**, **6.27** show the areas of analysis, where any grid cell is greater than or equal to 1.0. This map targets areas of particular concern. **Table 6.12** shows the results of the analysis.

FIGURE 6.23: AREAS OF CONCERN FOR WILDFIRE ANALYSIS

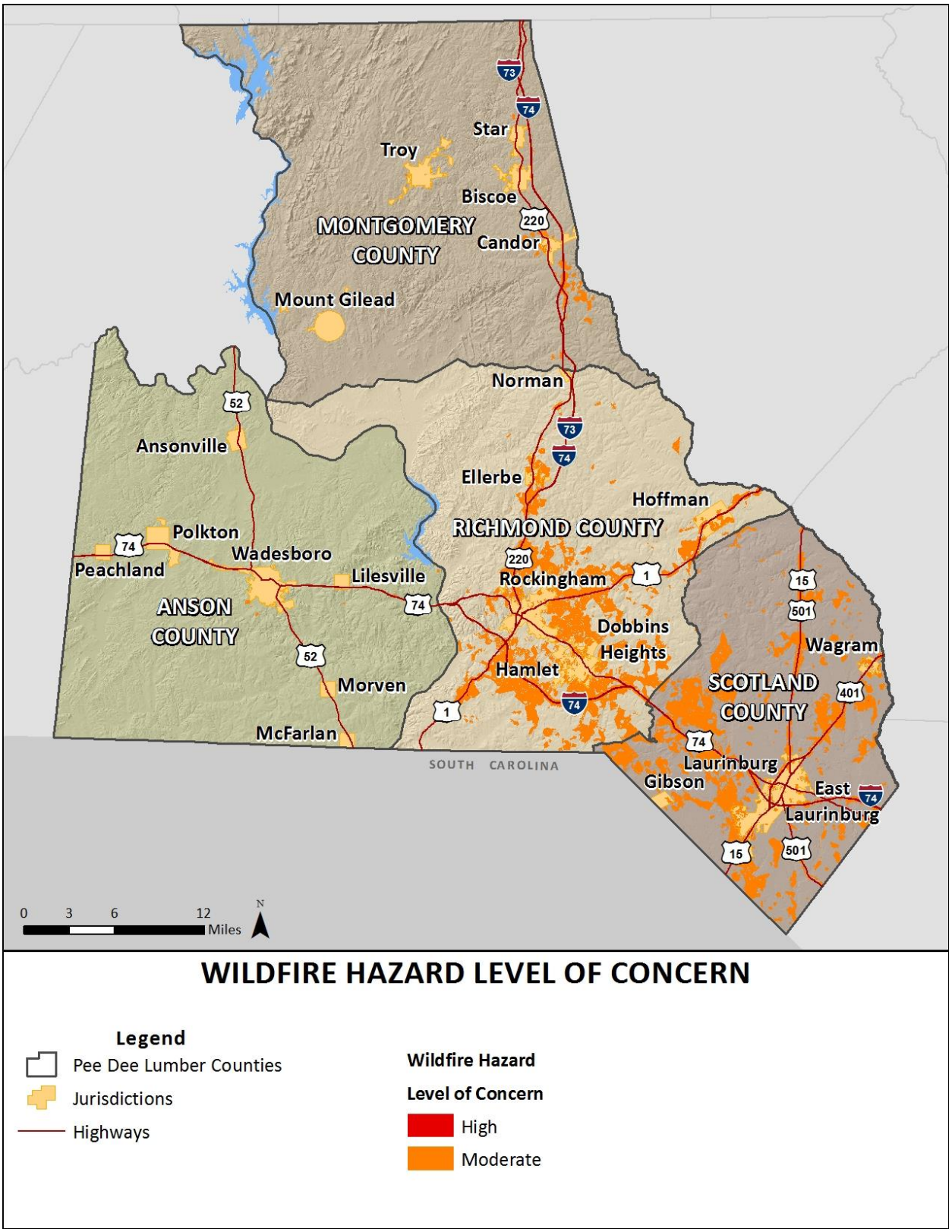


FIGURE 6.24: AREAS OF CONCERN FOR WILDFIRE ANALYSIS IN ANSON COUNTY

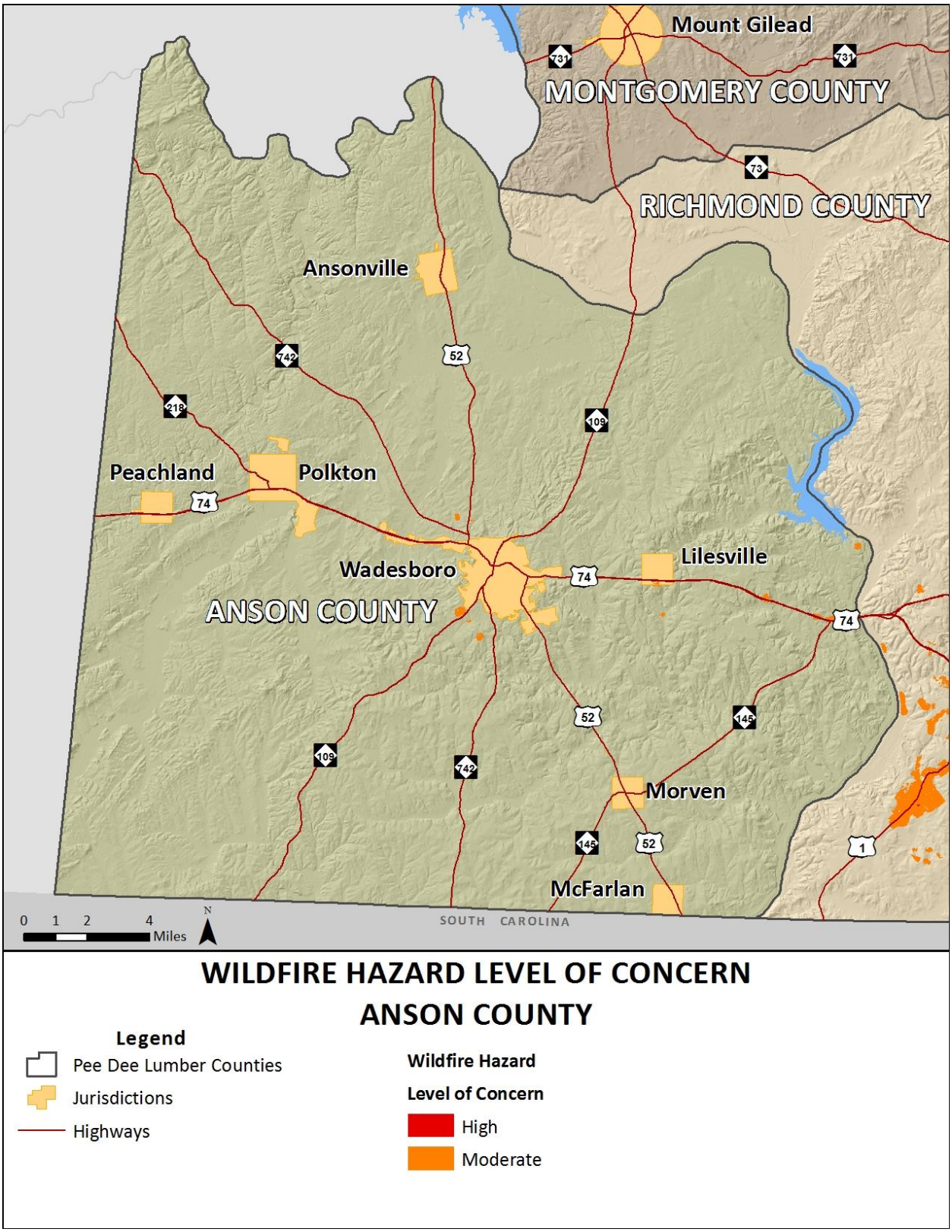


FIGURE 6.25: AREAS OF CONCERN FOR WILDFIRE ANALYSIS IN MONTGOMERY COUNTY

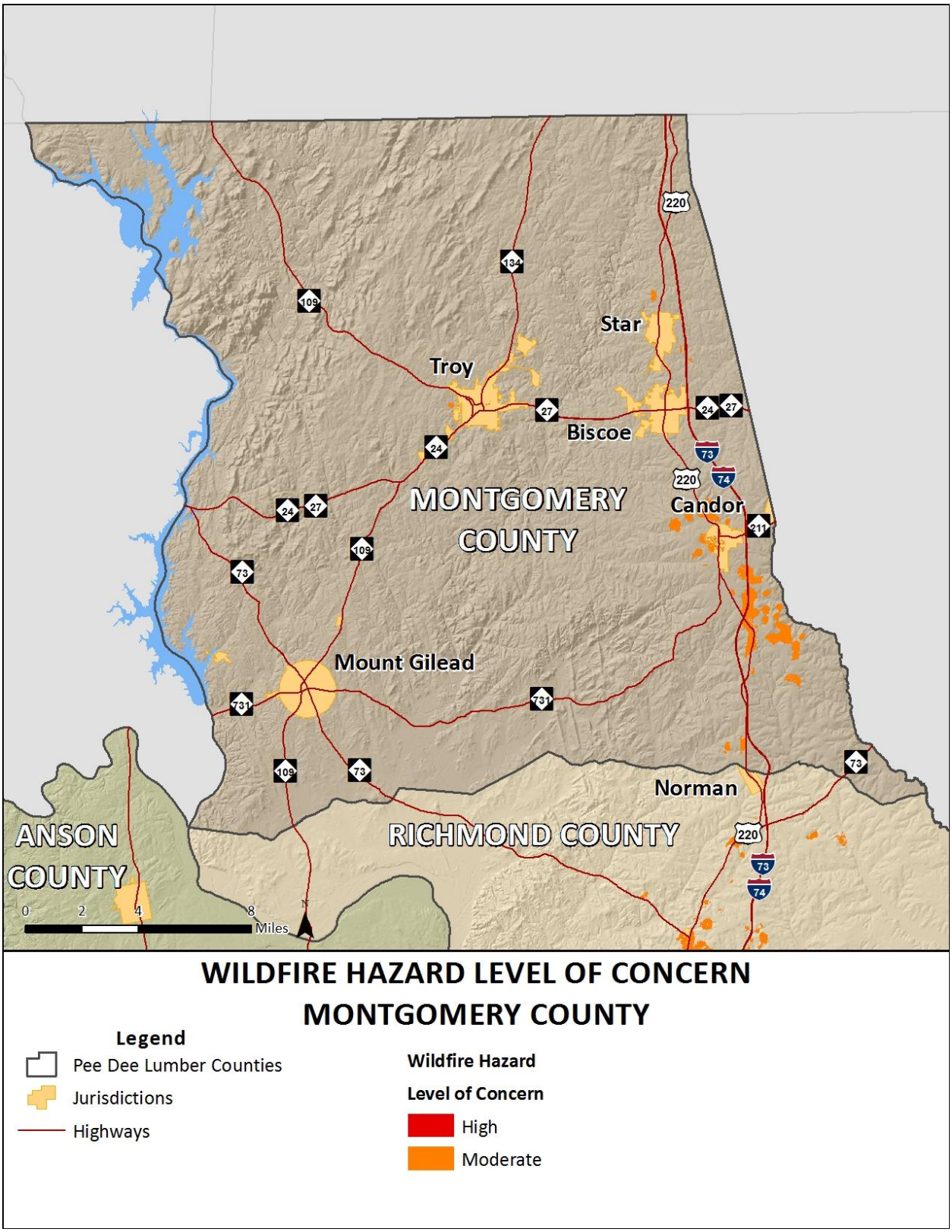


FIGURE 6.26: AREAS OF CONCERN FOR WILDFIRE ANALYSIS IN RICHMOND COUNTY

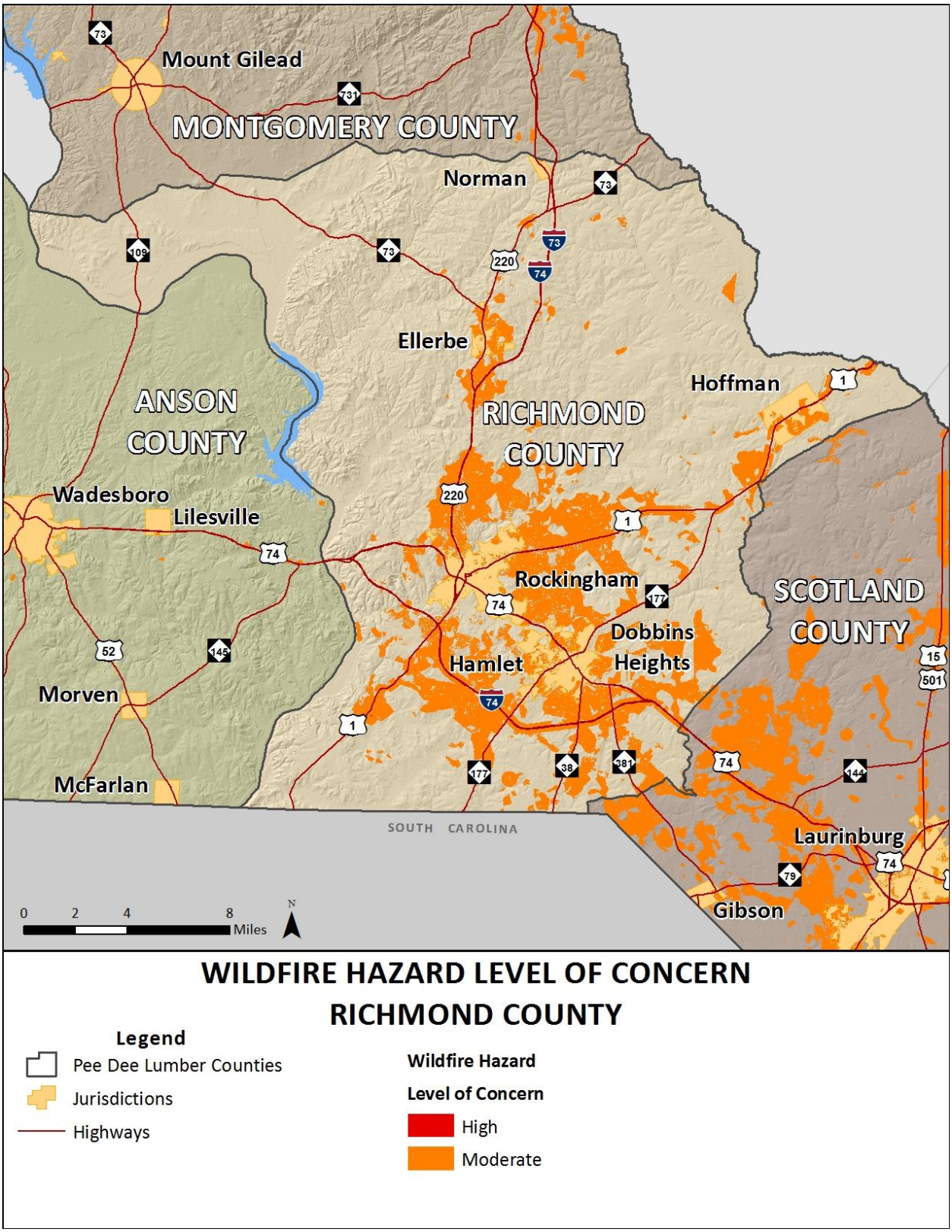
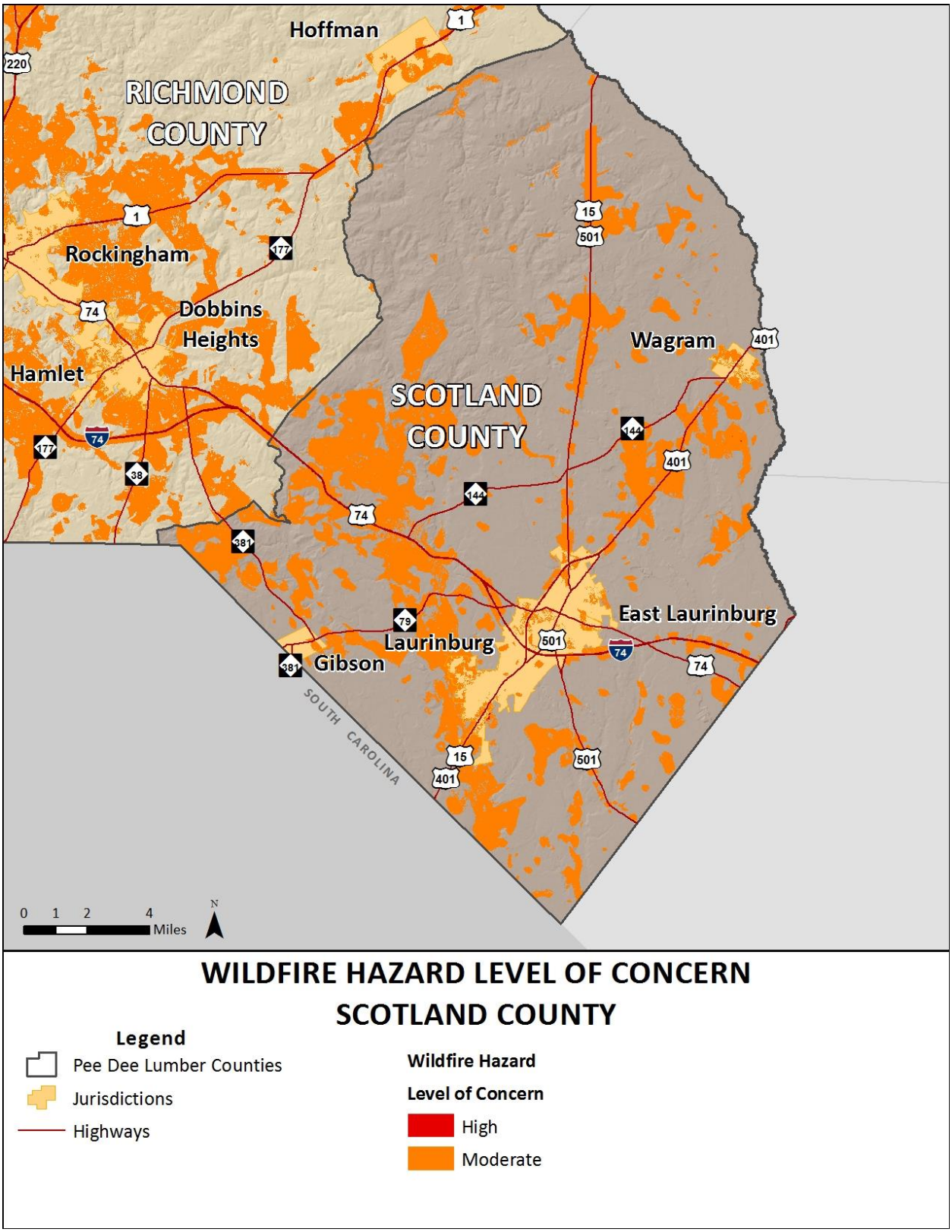


FIGURE 6.27: AREAS OF CONCERN FOR WILDFIRE ANALYSIS IN SCOTLAND COUNTY



Source: Southern Wildfire Risk Assessment Data

TABLE 6.12: EXPOSURE OF IMPROVED PROPERTY TO WILDFIRE AREAS OF CONCERN

Level of Concern	Moderate		High	
Location	Approx. Number of Buildings	Approx. Improved Value	Approx. Number of Buildings	Approx. Improved Value
Anson County	**32**	**$42,500,130**	-	-
Ansonville	-	-	-	-
Lilesville	**5**	**$840,839**	-	-
McFarlan	-	-	-	-
Morven	-	-	-	-
Peachland	-	-	-	-
Polkton	-	-	-	-
Wadesboro	-	-	-	-
Unincorporated	**27**	**$41,659,291**	-	-
Montgomery County	**317**	**$28,982,784**	-	-
Biscoe	-	-	-	-
Candor	**82**	**$8,895,167**	-	-
Mount Gilead	-	-	-	-
Star	**2**	**$21,555**	-	-
Troy	**9**	**$7,541,437**	-	-
Unincorporated Area	**224**	**$12,524,625**	-	-
Richmond County	**8,522**	**$772,500,746**	-	-
Dobbin Heights	46	$2,522,392	-	-
Ellerbe	206	$11,744,272	-	-
Hamlet	581	$94,182,989	-	-
Hoffman	104	$6,152,451	-	-
Norman	7	$224,900	-	-
Rockingham	654	$73,743,119	-	-
Unincorporated Area	6,924	$583,930,623	-	-
Scotland County	**5,381**	**$642,951,275**	**5**	**$248,530**
East Laurinburg	21	$1,735,834	-	-
Gibson	31	$3,283,747	-	-
Laurinburg	1,196	$17,1785,957	5	$248,530
Wagram	253	$23,026,639	-	-
Unincorporated Area	3,837	$438,729,891	-	-
PEE DEE LUMBER REGION TOTAL	**14,252**	**$1,486,934,935**	**5**	**$248,530**

Social Vulnerability

Since 2010 population was only available at the tract level, it was difficult to determine a reliable figure on population at risk to flood.

Critical Facilities

The critical facility analysis revealed that there are 54 critical facilities in wildfire areas of concern, including 1 EOC, 15 fire stations, 9 law enforcement stations, 2 hospitals, 17 schools, 2 airports, 2 community colleges, 2 ower plants, 1 water treatment plant, and 3 wastewater treatment plants.

In conclusion, a wildfire event has the potential to impact many existing and future buildings, critical facilities, and populations in the Pee Dee Lumber Region.

6.6 CONCLUSIONS ON HAZARD VULNERABIILTY

The results of this vulnerability assessment are useful in at least three ways:

- Improving our understanding of the risk associated with the natural and technological hazards in the Pee Dee Lumber Region through better understanding of the complexities and dynamics of risk, how levels of risk can be measured and compared, and the myriad of factors that influence risk. An understanding of these relationships is critical in making balanced and informed decisions on managing the risk.
- Providing a baseline for policy development and comparison of mitigation alternatives. The data used for this analysis presents a current picture of risk in the Pee Dee Lumber Region. Updating this risk "snapshot" with future data will enable comparison of the changes in risk with time. Baselines of this type can support the objective analysis of policy and program options for risk reduction in the region.
- Comparing the risk among the hazards addressed. The ability to quantify the risk to all these hazards relative to one another helps in a balanced, multi-hazard approach to risk management at each level of governing authority. This ranking provides a systematic framework to compare and prioritize the very disparate hazards that are present in the Pee Dee Lumber Region. This final step in the risk assessment provides the necessary information for local officials to craft a mitigation strategy to focus resources on only those hazards that pose the most threat to the Pee Dee Lumber counties.

Exposure to hazards can be an indicator of vulnerability. Economic exposure can be identified through locally assessed values for improvements (buildings), and social exposure can be identified by estimating the population exposed to each hazard. This information is especially important for decision-makers to use in planning for evacuation or other public safety related needs.

The types of assets included in these analyses include all building types in the participating jurisdictions. Specific information about the types of assets that are vulnerable to the identified hazards is included in each hazard subsection (for example all building types are considered at risk to the winter storm hazard and commercial, residential, and government owned facilities are at risk to repetitive flooding, etc).

Table 6.13 presents a summary of annualized loss for each hazard in the Pee Dee Lumber Region. Due to the reporting of hazard damages primarily at the county level, it was difficult to determine an accurate annualized loss estimate for each municipality. Therefore, an annualized loss was determined through the damage reported through historical occurrences at the county level. These values should be used as an additional planning tool or measure risk for determining hazard mitigation strategies throughout the region.

TABLE 6.13: ANNUALIZED LOSS FOR THE PEE DEE LUMBER REGION

Event	Anson County	Montgomery County	Richmond County	Scotland County	Total
Dam Failure	Negligible	Negligible	Negligible	Negligible	Negligible
Drought	Negligible	Negligible	Negligible	Negligible	Negligible
Erosion	Negligible	Negligible	Negligible	Negligible	Negligible
Hail	$1,076	$246	$15,297	$155	$16,774
Hurricane & Tropical Storm	$314,760	$378,300	$905,970	$1,171,260	$2,770,290
Landslide	Negligible	Negligible	Negligible	Negligible	Negligible
Lightning	$4,742	$265	-	$10,874	$15,881
Thunderstorm Wind/High Wind	$1,622	$6,693	$35,007	$13,686	$57,008
Tornado	$126,292	$207,046	$34,507	$222,025	$589,870
Winter Storm & Freeze	$28,308	-	-	-	$28,301
Flood	$466	-	$9,498	-	$9,964
Earthquake	$26,600	$24,800	$54,400	$47,800	$153,600
HAZMAT Incident	$3,868	$24,113	$41,960	$321	$70,262
Wildfire	Negligible	Negligible	Negligible	Negligible	Negligible

Due to the fact that the Pee Dee Lumber region is a fairly rural area overall, there is no major ongoing development in the region's cities, towns, roadways etc. that impacts hazard risk. There are also no indications of major future development projects within the region. Therefore, it has been determined that the counties' and all of the participating jurisdictions' vulnerability has had no significant change since the previous plan. Further analysis will be done in the next plan update as new resources and information becomes available.

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SECTION 7
CAPABILITY ASSESSMENT

This section of the Plan discusses the capability of the counties and municipalities in the Pee Dee Lumber Region to implement hazard mitigation activities. It consists of the following four subsections:

- 7.1 What is a Capability Assessment?
- 7.2 Conducting the Capability Assessment
- 7.3 Capability Assessment Findings
- 7.4 Conclusions on Local Capability

7.1 WHAT IS A CAPABILITY ASSESSMENT

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[1]. As in any planning process, it is important to try to establish which goals, objectives, and/or 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, or 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. A 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 Pee Dee Lumber Region serves as a critical planning step and an integral part of the foundation for designing an effective hazard mitigation strategy. Coupled with the Risk Assessment, the Capability Assessment helps identify and target meaningful mitigation actions for incorporation in the Mitigation Strategy portion of the Regional Hazard Mitigation Plan. It not only helps establish the goals and objectives for the region to pursue under this Plan, but it also ensures that those goals and objectives are realistically achievable under given local conditions.

[1] While the Final Rule for implementing the Disaster Mitigation Act of 2000 does not require a local capability assessment to be completed for local hazard mitigation plans, it is a critical step in developing a mitigation strategy that meets the needs of the region while taking into account their own unique abilities. The Rule does state that a community's mitigation strategy should be "based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools" (44 CFR, Part 201.6(c)(3)).

7.2 CONDUCTING THE CAPABILITY ASSESSMENT

In order to facilitate the inventory and analysis of local government capabilities within the Pee Dee Lumber counties and municipalities, a detailed Capability Assessment Survey was completed for each of the participating jurisdictions based on the information found in existing hazard mitigation plans and local government websites. The survey questionnaire compiled 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, educational, and technical capabilities, such as access to local budgetary and personnel resources for mitigation purposes. The current political climate, an important consideration for any local planning or decision making process, was also evaluated with respect to hazard mitigation.

At a minimum, survey results provide an extensive inventory of existing local plans, ordinances, programs, and resources that are in place or under development in addition to their overall effect on hazard loss reduction. However, the survey instrument can also serve to identify gaps, weaknesses, or conflicts that counties and local jurisdictions can recast as opportunities for specific actions to be proposed as part of the hazard mitigation strategy.

The information collected in 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.

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. The results of this capability assessment provide critical information for developing an effective and meaningful mitigation strategy.

7.3 CAPABILITY ASSESSMENT FINDINGS

The findings of the capability assessment are summarized in this Plan to provide insight into the relevant capacity of the Pee Dee Lumber Region to implement hazard mitigation activities. All information is based upon the review of existing hazard mitigation plans and local government websites through the Capability Assessment Survey and input provided by local government officials during meetings of the Pee Dee Lumber Regional Hazard Mitigation Planning Committee.

7.3.1 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; 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.

This assessment is designed to provide a general overview of the key planning and regulatory tools and programs that are in place or under development for the Pee Dee Lumber Region along with their potential effect on loss reduction. This information will help identify opportunities to address existing gaps, weaknesses, or conflicts with other initiatives in addition to integrating the implementation of this Plan with existing planning mechanisms where appropriate.

Table 7.1 provides a summary of the relevant local plans, ordinances, and programs already in place or under development for the Pee Dee Lumber Region. A filled in circle (●) indicates that the given item is currently in place and being implemented. An half filled in circle (◖) indicates that the given item is currently being developed for future implementation. An open circle (○) indicates that the given item is covered at the county level. Each of these local plans, ordinances, and programs should be considered available mechanisms for incorporating the requirements of the Pee Dee Lumber Regional Hazard Mitigation Plan.

TABLE 7.1: RELEVANT PLANS, ORDINANCES, AND PROGRAMS

Planning / Regulatory Tool	ANSON COUNTY	Ansonville	Lilesville	McFarlan	Morven	Peachland	Polkton	Wadesboro	MONTGOMERY COUNTY	Biscoe	Candor	Mount Gilead	Star	Troy	RICHMOND COUNTY	Dobbins Heights	Ellerbe	Hamlet	Hoffman	Norman	Rockingham	SCOTLAND COUNTY	East Laurinburg	Gibson	Laurinburg	Wagram
Hazard Mitigation Plan	●	○	○	○	○	○	○	○	●	○	○	○	○	○	●	○	○	○	○	○	○	●	○	○	○	○
Comprehensive Land Use Plan	◖	●				●	◖		●	◖	●	●	○	◖	●	○	○	○	○	○	●	●	○	○	●	○
Floodplain Management Plan	●	●	○	○	○	○	●	○	●	○	○	○	○	○								◖			◖	
Open Space Management Plan (Parks & Rec/Greenway Plan)							◖				●								◖		●	◖			◖	
Stormwater Management Plan/Ordinance		●																				◖			◖	
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	◖											●	●													

Planning / Regulatory Tool	ANSON COUNTY	Ansonville	Lilesville	McFarlan	Morven	Peachland	Polkton	Wadesboro	MONTGOMERY COUNTY	Biscoe	Candor	Mount Gilead	Star	Troy	RICHMOND COUNTY	Dobbins Heights	Ellerbe	Hamlet	Hoffman	Norman	Rockingham	SCOTLAND COUNTY	East Laurinburg	Gibson	Laurinburg	Wagram
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 (NFIP)	●	●	●	○	○	●	○	○	●	○	○	○	○	○							●	●	○	○	●	○
NFIP Community Rating System	●	○	○	○	○	○	○	○														◖			◖	

A more detailed discussion on the region's planning and regulatory capability follows.

7.3.2 Emergency Management

Hazard mitigation is widely recognized as one of the four primary phases of emergency management. The three other phases include preparedness, response, and recovery. In reality, each phase is interconnected with hazard mitigation, as **Figure 7.1** suggests. Opportunities to reduce potential losses through mitigation practices are most often implemented before disaster strikes, such as the elevation of flood prone structures or the continuous enforcement of policies that prevent and regulate development that is vulnerable to hazards due to its location, design, or other characteristics. Mitigation opportunities will also be presented during immediate preparedness or response activities, such as installing storm shutters in advance of a hurricane, and certainly during the long-term recovery and redevelopment process following a hazard event.

FIGURE 7.1: 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. As a result, the Capability Assessment Survey asked several questions across a range of emergency management plans in order to assess the Pee Dee Lumber Region's willingness to plan and their level of technical planning proficiency.

Hazard Mitigation Plan: A hazard mitigation plan represents a community's blueprint for how it intends to reduce the impact of natural and 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.

Disaster Recovery Plan: A disaster recovery plan serves to guide the physical, social, environmental, and economic recovery and reconstruction process following a disaster. 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.

- Of the four counties participating in this multi-jurisdictional plan update, two have adopted a disaster recovery plan and the other two are currently under development.

Emergency Operations Plan: An emergency operations plan outlines responsibilities and the means by which resources are deployed during and following an emergency or disaster.

- Anson County, Montgomery County, Richmond County, and Scotland each maintain emergency operations plans through their respective Emergency Management Departments.
- Anson County maintains a countywide emergency operations plan that covers all of its municipalities (The Towns of Ansonville, Lilesville, McFarlan, Morven, Peachland, Polkton, and Wadesboro).

- The Towns of Ansonville, Polkton, Biscoe, Candor and Troy each maintain an emergency response plan.
- The City of Rockingham has adopted a city emergency operations 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.

- In the previous plan, none of the counties participating in this multi-jurisdictional plan had adopted a continuity of operations plan. For the plan update, Montgomery and Richmond County have adopted a continuity of operations plan, while Anson and Scotland County's are under development.
- The Towns of Ansonville, Star and Troy each maintain a continuity of operations plan.

7.3.3 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 are not designed as such. Therefore, the Capability Assessment Survey also asked questions regarding general planning capabilities and the degree to which hazard mitigation is integrated into other on-going planning efforts in the Pee Dee Lumber Region.

Comprehensive Land Use Plan: A comprehensive land use 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.

- Anson County adopted an update to its Future Land Use Plan in 2009 and the Town of Polkton adopted its first Future Land Use Plan in 2010. Both of them are currently being updated.
- Montgomery County adopted a comprehensive land use plan along with Candor and Mount Gilead. Mount Gilead adopted a Land Development Plan in 1998 that recognizes flood hazards and steep banks as development constraints. However, neither the County nor its municipalities have a current land use map.
- The Towns of Biscoe and Troy currently have comprehensive land use plan under development.
- Richmond County has adopted a Strategic Land Use Plan (2000). The City of Rockingham is the only municipality in the County that has adopted its own land use plan and it identifies the future intended land uses in the city.
- Scotland County and the City of Laurinburg have each adopted a land use plan.

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.

- Anson County currently has a capital improvements plan under development while the Towns of Ansonville, Peachland and the City of Lilesville have plans in place.
- Montgomery County and all of the participating jurisdictions have capital improvements plans in place *e*xcept for the Town of Candor which is under development.
- The City of Rockingham maintains a five-year capital improvement plan that is updated on an annual basis in an attempt forecast and plan for capital expenditures.
- Scotland County and the City of Laurinburg have capital improvements plans 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.

- Anson County has a historic preservation plan in development and plans to adopt it by the next plan update.
- The Towns of Mount Gilead and Star have historic preservation plans in place.

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.

- Although Anson County has adopted a zoning ordinance, the majority of the unincorporated County is not zoned. The County is currently working to update the ordinance and complete countywide zoning to accommodate growth while preserving environmentally sensitive areas. All of the municipalities in the County have adopted zoning ordinances except for the Towns of McFarlan and Morven.
- Montgomery County adopted countywide zoning in 2000 and all of the municipalities in the County also have zoning ordinances in place.
- Richmond County also enforces a countywide zoning ordinance, but only the Town of Hoffman has adopted city zoning ordinances.
- Scotland County and the City of Laurinburg both have adopted and enforce 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.

- Anson County has a subdivision ordinance that was adopted by the Board of County Commissioners and applies to all areas of unincorporated Anson County. The Towns of Peachland, Polkton, and Wadesboro have also adopted subdivision ordinances.
- Montgomery County has adopted a subdivision ordinance that includes regulations requiring developers to install adequate drainage facilities to reduce exposure to flood damage. The Towns of Biscoe, Mount Gilead, and Troy also have some subdivision regulations in place.
- Richmond County has a subdivision ordinance in place that includes regulations prohibiting land subject to flooding, irregular drainage conditions, or excessive flooding from being platted for residential use unless the hazards can be and are corrected.
- The Scotland County Commissioners have adopted a subdivision ordinance that regulates the division of land within the unincorporated areas of the County. The stated intents include preventing flood damage, preventing and controlling erosion, and preserving natural vegetation and cover. The City of Laurinburg also includes subdivision regulations in its Unified Land Development Ordinance.

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.

- North Carolina has a state compulsory building code, which applies throughout the state; however, jurisdictions may adopt codes if approved as providing adequate minimum standards. All of the participating counties have adopted a building code. The building code is enforced by each county's building inspector.
- The Cities of Rockingham and Laurinburg have their own inspections departments that enforce the building code within their city limits.

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).[2] 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*. 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 concept 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 the 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.

[2] Participation in BCEGS is voluntary and may be declined by local governments if they do not wish to have their local building codes evaluated.

7.3.4 Floodplain Management

Flooding represents the greatest natural hazard facing the nation. At the same time, 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 assessment as a key indicator for measuring local capability.

In order for a county or municipality to participate in the NFIP, they must adopt a local flood damage prevention ordinance that requires jurisdictions to follow established minimum building standards in the floodplain. These standards require that all new buildings and substantial improvements to existing buildings will be protected from damage by a 100-year flood event and that new development in the floodplain will 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.

Table 7.2 provides NFIP policy and claim information for each participating jurisdiction in the Pee Dee Lumber Region.

TABLE 7.2: NFIP POLICY AND CLAIM INFORMATION

Jurisdiction	Date Joined NFIP	Current Effective Map Date	NFIP Policies in Force	Insurance in Force	Closed Claims	Total Payments to Date
ANSON COUNTY	6/18/90	10/16/08	3	$980,000	1	$11,012.97
Ansonville	5/19/05(S)	9/3/08	--	--	--	--
Lilesville**	4/13/12	9/3/08	--	--	--	--
McFarlan**	--	--	--	--	--	--
Morven*	--	10/16/08	--	--	--	--
Peachland	7/1/87	10/16/08	--	--	--	--
Polkton	8/20/08	10/16/08	--	--	--	--
Wadesboro	8/19/86	10/16/08(M)	4	$1,105,000	1	$6,579.63
MONTGOMERY COUNTY	2/20/97	6/16/09	22	$5,170,800	3	$44,138.46
Biscoe*	--	6/16/09	--	--	--	--
Candor**	--	--	--	--	--	--
Mount Gilead*	--	6/16/09	--	--	--	--
Star**	--	--	--	--	--	--
Troy	1/2/08	6/16/09	2	$700,000	--	--
RICHMOND COUNTY	9/6/89	9/3/08	40	$4,030,000	3	$79,559.05
Dobbins Heights**	--	--	--	--	--	--
Ellerbe**	--	--	--	--	--	--
Hamlet	7/2/87	9/3/08	3	$643,900	2	$34,995.96
Hoffman*	--	9/3/08	--	--	--	--
Norman**	--	--	--	--	--	--
Rockingham	9/6/89	9/3/08	27	$4,798,300	8	$132,054.64
SCOTLAND COUNTY	12/16/88	7/7/14	14	$2,772,400	--	--
East Laurinburg	8/15/07	7/7/14	1	$28,000	--	--
Gibson*	--	--	--	--	--	--
Laurinburg	1/3/86	7/7/14	25	$6,624,400	1	$32,326.63
Wagram	7/25/14	7/7/14	--	--	--	--

(S) – Suspended Community
(M) – No Elevation Determined, all Zone A, C and X
Source: NFIP claims and policy information as of 2/19/18; NFIP Community Status information as of 2/19/18
*- The non-participating communities denoted with an * have been in contact with the NC NFIP Outreach Coordinator regarding participation in the NFIP. At this time the elected officials are reviewing and taking the recommendation under advisement and will render a decision as their priorities allow.
** The non-participating communities denoted with ** have no SFHA within the town boundaries.

Community Rating System: An additional indicator of floodplain management capability is the active participation of local jurisdictions in the Community Rating System (CRS). The CRS is an incentive-based program that encourages counties and municipalities to undertake defined flood mitigation activities that go beyond the minimum requirements of the NFIP by adding extra local measures to provide protection from flooding. All of the 18 creditable CRS mitigation activities are assigned a range of point values. As points are accumulated and reach identified thresholds, communities can apply for an improved CRS class rating. Class ratings, which range from 10 to 1, are tied to flood insurance premium reductions as shown in **Table 7.3**. As class rating improves (the lower the number the better), the percent reduction in flood insurance premiums for NFIP policyholders in that community increases.

TABLE 7.3: CRS PREMIUM DISCOUNTS, BY CLASS

CRS Class	Premium Reduction
1	45%
2	40%
3	35%
4	30%
5	25%
6	20%
7	15%
8	10%
9	5%
10	0

Source: *FEMA*

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. Changes were made with the intent to make the CRS more user-friendly and make extensive technical assistance available for communities who request it.

- None of the jurisdictions currently participate in the CRS. Participation in the CRS program should be considered as a mitigation action by the counties and municipalities. The program would be most beneficial to Richmond County, Montgomery County, the City of Laurinburg, and the City of Rockingham, which have 35, 33, 25, and 22 NFIP policies, respectively.

Flood Damage Prevention Ordinance: A flood damage prevention ordinance establishes minimum building standards in the floodplain with the intent to minimize public and private losses due to flood conditions.

- All communities participating in the NFIP are required to adopt a local flood damage prevention ordinance. All four of the counties participating in this hazard mitigation plan also participate in the NFIP and they all have adopted flood damage prevention regulations. The following municipalities are also NFIP participants: Ansonville (Suspended), Lilesville (no SFHA identified), Peachland, Polkton, Wadesboro, Troy, Hamlet, Rockingham, East Laurinburg, Laurinburg and Wagram.

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.

- Anson County and the Towns of Ansonville and Polkton have developed floodplain management plans.

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.

- None of the participating counties or municipalities have an open space management plan.
- Anson County and all of its municipalities have however adopted a Voluntary Agriculture Ordinance to encourage the preservation and protection of farmland from non-farm development.

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.

- Richmond County is the only participating county that has adopted a stormwater management plan.
- The City of Laurinburg is the only participating municipality that has adopted a stormwater management ordinance.
- Anson County and the Town of Polkton have developed the Yadkin-Pee Dee River Basin Plan to help control runoff and pollution of stormwater within these two river basins. The plan includes provisions for protection of riparian buffers along all water bodies and use of swales, created wetlands, and detention or retention ponds.

7.3.6 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 Capability Assessment Survey was used to capture information on administrative and technical capability through the identification of available staff and personnel resources.

Table 7.4 provides a summary of the Capability Assessment Survey results for the Pee Dee Lumber Region with regard to relevant staff and personnel resources. A filled in circle (●)indicates the presence of a staff member(s) in that jurisdiction with the specified knowledge or skill. An open circle (○) indicates that the given item is covered at the county level.

TABLE 7.4: RELEVANT STAFF / PERSONNEL RESOURCES

Staff / Personnel Resource	ANSON COUNTY	Ansonville	Lilesville	McFarlan	Morven	Peachland	Polkton	Wadesboro	MONTGOMERY COUNTY	Biscoe	Candor	Mount Gilead	Star	Troy	RICHMOND COUNTY	Dobbins Heights	Ellerbe	Hamlet	Hoffman	Norman	Rockingham	SCOTLAND COUNTY	East Laurinburg	Gibson	Laurinburg	Wagram
Planners with knowledge of land development / 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													●	●								●	○	○	○	○
Scientists familiar with the hazards of the community																										
Staff with education or expertise to assess the community's vulnerability to hazards	●	○	○	○	○	○	○	●				●			●	○	○	○	○	○	●			●		●
Personnel skilled in GIS and/or HAZUS			●						●	●	○	●	○	○	●	○	○	○	○	○	●	●	○	○	●	○
Resource development staff or grant writers			●						●	●	●	○	○	○							●					
Maintenance programs to reduce risk		●	●				●	●	●	●	○	●	●	●							●	●	○	○	●	○
Warning systems/services	●	○	●	○	○	○	○	●	●	●	●	○	○	●	●	○	○	○	○	○	○	●	○	○	○	○
Mutual Aid Agreements	●	●	●	○	○	○	●	●	●	●	●	●	●	●	●	○	○	○	○	○	●	●	○	○	○	○

Credit for having a floodplain manager was given to those jurisdictions that have a flood damage prevention ordinance, and therefore an appointed floodplain administrator, regardless of whether the appointee was dedicated solely to floodplain management. Credit was given for having a scientist familiar with the hazards of the community if a jurisdiction has a Cooperative Extension Service or Soil and Water Conservation Department. Credit was also given for having staff with education or expertise

to assess the community's vulnerability to hazards if a staff member from the jurisdiction was a participant on the existing hazard mitigation plan's planning committee.

7.3.7 Fiscal Capability

The ability of a local government to take action is often closely associated with the amount of money available to implement policies and projects. 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 homes, which can require a substantial commitment from local, state, and federal funding sources.

The Capability Assessment Survey was used to capture information on the region's fiscal capability through the identification of locally available financial resources.

Table 7.5 provides a summary of the results for the Pee Dee Lumber Region with regard to relevant fiscal resources. A filled in circle (●)indicates that the given fiscal resource is locally available for hazard mitigation purposes (including match funds for state and federal mitigation grant funds) according to the previous county hazard mitigation plans.

TABLE 7.5: RELEVANT FISCAL RESOURCES

Fiscal Tool / Resource	ANSON COUNTY	Ansonville	Lilesville	McFarlan	Morven	Peachland	Polkton	Wadesboro	MONTGOMERY COUNTY	Biscoe	Candor	Mount Gilead	Star	Troy	RICHMOND COUNTY	Dobbins Heights	Ellerbe	Hamlet	Hoffman	Norman	Rockingham	SCOTLAND COUNTY	East Laurinburg	Gibson	Laurinburg	Wagram
Capital Improvement Programming	●	●							●	●		●		●			●	●		●	●	●	●	●	●	●
Community Development Block Grants (CDBG)	●	●			●				●	●		●	●	●			●	●	●	●	●	●				
Special Purpose Taxes (or taxing districts)	●								●			●					●	●		●		●	●	●	●	●
Gas / Electric Utility Fees																						●			●	
Water / Sewer Fees	●	●						●	●	●		●	●	●			●	●			●	●			●	
Stormwater Utility Fees																										
Development Impact Fees									●			●														
General Obligation Bonds Bonds												●									●	●				
Revenue Bonds												●									●					
Special Tax Bonds	●											●									●	●				

7.3.8 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 7.6 provides a summary of the results for the Pee Dee Lumber Region with regard to relevant education and outreach resources. A filled in circle (●) indicates that the given resource is locally available for hazard mitigation purposes. An open circle (○) indicates that the given item is covered at the county level.

TABLE 7.6: EDUCATION AND OUTREACH RESOURCES

Fiscal Tool / Resource	ANSON COUNTY	Ansonville	Lilesville	McFarlan	Morven	Peachland	Polkton	Wadesboro	MONTGOMERY COUNTY	Biscoe	Candor	Mount Gilead	Star	Troy	RICHMOND COUNTY	Dobbins Heights	Ellerbe	Hamlet	Hoffman	Norman	Rockingham	SCOTLAND COUNTY	East Laurinburg	Gibson	Laurinburg	Wagram
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 Communities certification																						●				
Public-private partnership initiatives addressing disaster-related issues															●							●				

7.3.9 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 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 Capability Assessment Survey was used to capture information on political capability of the Pee Dee Lumber Region. Previous county-level hazard mitigation plans were reviewed for 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 (i.e., building codes, floodplain management, etc.).

- The previous county hazard mitigation plans identified existing ordinances that address natural hazards or are related to hazard mitigation such as emergency management, flood damage prevention, watershed protection, zoning, and subdivision.
- Anson County has had difficulty in effectively or consistently using and implementing the previously adopted hazard mitigation plan. The County is dedicated to correcting any deficiencies with reporting, updating, and implementing the hazard mitigation plan.
- Montgomery County has extremely limited resources and has limited capacity to effectively mitigate against most natural hazards. The County is committed to building local government capacity to more adequately evaluate and address the identified hazards and hazard-prone areas.
- Most Richmond County residents are quite knowledgeable about the potential hazards that face their communities, and in recent years, they have become more familiar with mitigation. This knowledge combined with the recent history of natural disasters in North Carolina creates a political climate that is favorable for supporting and advancing future mitigation.
- Scotland County has tried to insert mitigation into everyday decision-making to help de-politicize the issue. Public education and awareness campaigns about the economic efficiency and social utility of mitigation can be used to help foster general acceptance by County residents, and in turn politicians.

7.4 CONCLUSIONS ON LOCAL CAPABILITY

In order to form meaningful conclusions on the assessment of local capability, a quantitative scoring methodology was designed and applied to results of the Capability Assessment Survey. This methodology attempts to assess the overall level of capability of the Pee Dee Lumber Region to implement hazard mitigation actions.

The overall capability to implement hazard mitigation actions varies among the participating jurisdictions. For planning and regulatory capability, the majority of the jurisdictions are in the limited range. There is more variation in the administrative and technical capability among the jurisdictions with larger jurisdictions generally having greater staff and technical resources. All of jurisdictions are in the limited range for fiscal capability.

Table 7.7 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 Assessment Survey. According to the assessment, the average local capability score for all responding jurisdictions is 40, which falls into the “Moderate” capability ranking. This approach, further described below, assesses the level of capability for each jurisdiction in the Pee Dee Lumber Region. It is important to note that the score received by each participating jurisdiction is not intended to compare

one to the other. Rather, the scoring system is intended to assist each jurisdiction to develop mitigation actions that reflect their abilities and help to identify areas that can be improved through the adoption of specific mitigation actions addressing these weaknesses.

POINTS SYSTEM FOR CAPABILITY RANKING

Scoring:

0-24 points = Limited overall capability 25-55 points = Moderate overall capability 56-103 points = High overall capability

I. Planning and Regulatory Capability (Up to 55 points)

Yes=3 points Under Development or Under County Jurisdiction=1 No=0 points

- Hazard Mitigation Plan
- Comprehensive Land Use Plan
- Floodplain Management Plan
- Participate in the NFIP
- Participate in CRS Program
- BCEGS Grade of 1 to 5

Yes=2 points Under Development or County Jurisdiction=1 No=0 points

- Open Space Management / Parks & Rec. Plan
- Stormwater Management Plan
- Emergency Operations Plan
- SARA Title III
- Radiological Emergency Plan
- Continuity of Operations Plan
- Evacuation Plan
- Disaster Recovery Plan
- Flood Damage Prevention Ordinance
- Post-disaster Redevelopment/Recovery Ordinance
- Community Wildfire Protection Plan
- BCEGS Grade of 6 to 9

Yes=1 point No=0 points

- Capital Improvements Plan
- Economic Development Plan
- Historic Preservation Plan
- Transportation Plan
- Zoning Ordinance
- Subdivision Ordinance
- Site Plan Review Requirements
- Unified Development Ordinance
- Building Code
- Fire Code
- Participate in NFIP Program

II. Administrative and Technical Capability (Up to 18 points)

Yes=2 points No=0 points

- 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
- Emergency manager
- Floodplain manager

Yes=1 point No=0 points

- Land surveyors
- Scientist familiar with the hazards of the community
- Staff with education or expertise to assess the community's 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

III. Fiscal Capability (Up to 11 points)

Yes=1 point No=0 points

- Capital Improvement Programming
- Community Development Block Grants
- Special Purpose Taxes
- Gas / Electric Utility Fees
- Water / Sewer Fees
- Stormwater Utility Fees
- Development Impact Fees
- General Obligation Bonds
- Revenue Bonds
- Special Tax Bonds
- Other

IV. Education and Outreach Capability (Up to 7 points)

Yes=1 point No=0 points

- 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 Communities certification
- Public-private partnership initiatives addressing disaster-related issues

- Other

V. Self-Assessment of Overall Capability (Up to 12 points)

High=2 points Moderate=1 points Low=0 points (Self-ranked by jurisdiction)

- Technical Capability
- Fiscal Capability
- Administrative Capability
- Education and Outreach Capability
- Political Capability
- Overall Capability

Note: This methodology is based on best available information. If a jurisdiction did not provide information on one of the above items, a point value of zero (0) was assigned for that item.

TABLE 7.7: CAPABILITY ASSESSMENT RESULTS

Jurisdiction	Overall Capability Score	Overall Capability Rating
ANSON COUNTY	60	High
Ansonville	49	Moderate
Lilesville	34	Moderate
McFarlan	27	Moderate
Morven	28	Moderate
Peachland	34	Moderate
Polkton	37	Moderate
Wadesboro	33	Moderate
MONTGOMERY COUNTY	57	High
Biscoe	46	Moderate
Candor	36	Moderate
Mount Gilead	48	Moderate
Star	40	Moderate
Troy	49	Moderate
RICHMOND COUNTY	56	Moderate
Dobbins Heights	29	Moderate

Jurisdiction	Overall Capability Score	Overall Capability Rating
Ellerbe	33	Moderate
Hamlet	33	Moderate
Hoffman	33	Moderate
Norman	32	Moderate
Rockingham	57	High
SCOTLAND COUNTY	53	High
East Laurinburg	29	Moderate
Gibson	30	Moderate
Laurinburg	39	Moderate
Wagram	30	Moderate

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 or weaknesses 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 9; therefore, each jurisdiction addresses their ability to expand on and improve their existing capabilities through the identification of their Mitigation Actions.

7.4.1 Linking the Capability Assessment with the Risk Assessment and the Mitigation Strategy

The conclusions of the Risk Assessment and Capability Assessment serve as the foundation for the development of a meaningful hazard mitigation strategy. During the process of identifying specific mitigation actions to pursue, the Regional Hazard Mitigation Planning Committee considered not only each jurisdiction's level of hazard risk, but also their existing capability to minimize or eliminate that risk.

SECTION 8
MITIGATION STRATEGY

This section of the Plan provides the blueprint for the participating jurisdictions in the Pee Dee Lumber Region to follow in order to become less vulnerable to its identified hazards. It is based on general consensus of the Pee Dee Lumber Regional Hazard Mitigation Planning Committee and the findings and conclusions of the *Capability Assessment* and *Risk Assessment*. It consists of the following five subsections:

- 8.1 Introduction
- 8.2 Mitigation Goals
- 8.3 Identification and Analysis of Mitigation Techniques
- 8.4 Selection of Mitigation Techniques for the Pee Dee Lumber Region
- 8.5 Plan Update Requirement

8.1 INTRODUCTION

The intent of the Mitigation Strategy is to provide the Pee Dee Lumber Region with the goals that will serve as guiding principles for future mitigation policy and project administration, along with an analysis of mitigation techniques deemed available to meet those goals and reduce the impact of identified hazards. It is designed to be comprehensive, strategic, and functional in nature:

- In being *comprehensive*, the development of the strategy includes a thorough review of all hazards and identifies extensive mitigation measures intended to not only reduce the future impacts of high risk hazards, but also to help the region achieve compatible economic, environmental, and social goals.
- In being *strategic*, the development of the strategy ensures that all policies and projects proposed for implementation are consistent with pre-identified, long-term planning goals.
- In being *functional,* each proposed mitigation action is linked to established priorities and assigned to specific departments or individuals responsible for their implementation with target completion deadlines. When necessary, funding sources are identified that can be used to assist in project implementation.

The first step in designing the Mitigation Strategy includes the identification of mitigation goals. Mitigation goals represent broad statements that are achieved through the implementation of more specific mitigation actions. These actions include both hazard mitigation policies (such as the regulation of land in known hazard areas through a local ordinance) and hazard mitigation projects that seek to address specifically targeted hazard risks (such as the acquisition and relocation of a repetitive loss structure).

The second step involves the identification, consideration, and analysis of available mitigation measures to help achieve the identified mitigation goals. This is a long-term, continuous process sustained through the development and maintenance of this Plan. Alternative mitigation measures will continue

to be considered as future mitigation opportunities are identified, as data and technology improve, as mitigation funding becomes available, and as this Plan is maintained over time.

The third and last step in designing the Mitigation Strategy is the selection and prioritization of specific mitigation actions for the Pee Dee Lumber Region (provided separately in Section 9: *Mitigation Action Plan*). Each county and participating jurisdiction has its own Mitigation Action Plan (MAP) that reflects the needs and concerns of that jurisdiction. The MAP represents an unambiguous and functional plan for action and is considered to be the most essential outcome of the mitigation planning process.

The MAP includes a prioritized listing of proposed hazard mitigation actions (policies and projects) for the Pee Dee Lumber counties and jurisdictions to complete. Each action has accompanying information, such as those departments or individuals assigned responsibility for implementation, potential funding sources, and an estimated target date for completion. The MAP provides those departments or individuals responsible for implementing mitigation actions with a clear roadmap that also serves as an important tool for monitoring success or progress over time. The cohesive collection of actions listed in the MAP can also serve as an easily understood menu of mitigation policies and projects for those local decision makers who want to quickly review the recommendations and proposed actions of the Regional Hazard Mitigation Plan.

In preparing each Mitigation Action Plan for the Pee Dee Lumber Region, officials considered the overall hazard risk and capability to mitigate the effects of hazards as recorded through the risk and capability assessment process, in addition to meeting the adopted mitigation goals and unique needs of the community.

8.1.1 Mitigation Action Prioritization

For the 2017 Pee Dee Lumber Regional plan, the Regional Hazard Mitigation Planning Committee members were tasked with establishing a priority for each action at the second Regional Hazard Mitigation Planning Committee meeting. Each jurisdiction categorized its actions as having a low, moderate/medium, or high priority[1], primarily based on an assessment of the need for the specific action, the potential beneficial effects (health, safety, quality of life, environmental) from implementation of the action, and the projected cost of implementation. A secondary factor was the current availability of funding. Prioritization of the proposed mitigation actions was based on the following six factors and priorities did not change between the 2012 plan and the 2018 plan update:

- Effect on overall risk to life and property
- Ease of implementation
- Political and community support
- A general economic cost/benefit review[2]

1 Mitigation actions with a "high" priority were determined to be the most cost-effective and most compatible with the jurisdiction's unique needs. Actions with a "moderate" priority were determined to be cost-effective and compatible with jurisdictional needs, but may be more challenging to complete administratively or fiscally than "high" priority actions. Actions with a "low" priority were determined to be important community needs, but the community likely identified several potential challenges in terms of implementation (e.g., lack of funding, technical obstacles, etc.). A more detailed cost/benefit analysis will be applied to particular projects prior to the application for or obligation of funding, as appropriate.

[2] Only a general economic cost/benefit review was considered by the Regional Hazard Mitigation Planning Committee through the process of selecting and prioritizing mitigation actions. Mitigation actions with "high" priority were determined to be the

- Funding availability
- Continued compliance with the NFIP

The point of contact for each county helped coordinate the prioritization process by reviewing each action and working with the lead agency/department responsible to determine a priority for each action using the six factors listed above.

Using these criteria, actions were classified as high, moderate, or low priority by the participating jurisdiction officials.

8.2 MITIGATION GOALS

44 CFR Requirement
44 CFR Part 201.6(c)(3)(i): The mitigation strategy shall include a description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

The primary goal of all local governments is to promote the public health, safety, and welfare of its citizens. In keeping with this standard, the Pee Dee Lumber counties and the participating municipalities have developed five goal statements for local hazard mitigation planning in the region. In developing these goals, the previous four county hazard mitigation plans were reviewed to determine areas of consistency. The project consultant reviewed the goals from each of the four existing plans that were combined to form this regional plan. Many of the goals were similar and, therefore, regional goals were formulated based on commonalities found between the goals in each plan. **Table 8.1** provides a listing of all of the existing mitigation goals from the four plans that are being combined.

As a result of reviewing the existing goals, five proposed goals were presented to the Regional Hazard Mitigation Planning Committee for their consideration. The proposed goals were reviewed, voted on, and accepted by the Planning Committee at their second meeting. This process of combining goals from the previous plans served to highlight the planning process that had occurred in each county prior to joining this regional planning effort. Each goal, purposefully broad in nature, serves to establish parameters that were used in developing more mitigation actions. The Pee Dee Lumber Regional Mitigation Goals are presented in **Table 8.2**. Consistent implementation of actions over time will ensure that community goals are achieved.

These proposed goals were decided on for the 2012 plan. During the 2017 planning process AECOM went over these goals with the planning committee and it was decided to not make any changes because the committee felt that the existing goals are still valid, appropriate and effective, and no changes are needed for the current planning cycle.

most cost effective and most compatible with the participating jurisdictions' unique needs. A more detailed cost/benefit analysis will be applied to particular projects prior to the application for or obligation of funding, as appropriate.

TABLE 8.1: EXISTING MITIGATION GOALS

	Former Plan Reference			
Goal	Anson County	Montgomery County	Richmond County	Scotland County
Protect the public health, safety and welfare by **increasing public awareness of hazards** and by encouraging collective and individual responsibility for mitigation hazard risks.	X		X	X
Improve **technical capability** to respond to hazards and to improve the effectiveness of hazard mitigation actions.	X			
Enhance existing or create new **policies and ordinances that will help reduce the damaging effects** of natural hazards.	X		X	
Protect the most **vulnerable populations, buildings, and critical facilities** through the implementation of cost-effective and technically feasible mitigation actions.	X		X	
To build **local government capacity to mitigate** against the impact of natural hazards		X	X	
To identify and protect **critical services, facilities and infrastructure**.		X		X
To protect **persons and property** and reduce damage and loss to existing **community assets** against the impact of natural disasters.		X		X
To support and promote **disaster resistant future development**.		X		
To protect **natural resources and farmland**.				X
To **minimize expenditure** of public money for costly **flood control** projects.				X
To **minimize the need for rescue and relief efforts** associated with flooding and generally undertaken at the expense of the general public.				X

Goal	Former Plan Reference			
	Anson County	Montgomery County	Richmond County	Scotland County
To **minimize prolonged business interruptions**.				X
To help **maintain a stable tax base** by providing for the **sound use and development of flood prone areas.**				X
To insure that potential home **buyers are notified of property flood designatio**n area.				X
To do all these things in a manner that is **equitable to all citizens** of the County.				X

TABLE 8.2: PEE DEE LUMBER REGIONAL MITIGATION GOALS

		Former Plan Reference			
	Proposed Goal	Anson County	Montgomery County	Richmond County	Scotland County
Goal #1	Increase public awareness of hazard mitigation and hazard risk.	Goal 1		Goal 4	Goal 5
Goal #2	Enhance existing or create new policies and ordinances that will help reduce the damaging effects of natural hazards.	Goal 3		Goal 2	
Goal #3	Increase capabilities to support and implement effective mitigation measures.	Goal 2	Goal 1	Goal 1	
Goal #4	Protect the most vulnerable populations, buildings, and critical facilities through the implementation of cost-effective and technically feasible mitigation projects.	Goal 4	Goal 2,3	Goal 3	Goal 1, 7
Goal #5	Encourage conservation of natural environments including forests, surface waters, wetlands, floodplains, and stream corridors.				Goal 2

8.3 IDENTIFICATION AND ANALYSIS OF MITIGATION TECHNIQUES

44 CFR Requirement
44 CFR Part 201.6(c)(3)(ii): The mitigation strategy shall include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effect of each hazard, with particular emphasis on new and existing buildings and infrastructure.

In formulating the Mitigation Strategy for the Pee Dee Lumber Region, a wide range of activities were considered in order to help achieve the established mitigation goals, in addition to addressing any specific hazard concerns. These activities were discussed during the Pee Dee Lumber Regional Hazard Mitigation Planning Committee meetings. In general, all activities considered by the Regional Hazard Mitigation Planning Committee can be classified under one of the following six broad categories of mitigation techniques: Prevention, Property Protection, Natural Resource Protection, Structural Projects, Emergency Services, and Public Awareness and Education. These are discussed in detail below.

8.3.1 Prevention

Preventative activities are intended to keep hazard problems from getting worse, and are typically administered through government programs or regulatory actions that influence the way land is developed and buildings are built. They are particularly effective in reducing a community's future vulnerability, especially in areas where development has not occurred or capital improvements have not been substantial. Examples of preventative activities include:

- Planning and zoning
- Building codes
- Open space preservation
- Floodplain regulations
- Stormwater management regulations
- Drainage system maintenance
- Capital improvements programming
- Riverine / fault zone setbacks

8.3.2 Property Protection

Property protection measures involve the modification of existing buildings and structures to help them better withstand the forces of a hazard, or removal of the structures from hazardous locations. Examples include:

- Acquisition
- Relocation
- Building elevation
- Critical facilities protection
- Retrofitting (e.g., windproofing, floodproofing, seismic design techniques, etc.)

- Safe rooms, shutters, shatter-resistant glass
- Insurance

8.3.3 Natural Resource Protection

Natural resource protection activities reduce the impact of natural hazards by preserving or restoring natural areas and their protective functions. Such areas include floodplains, wetlands, steep slopes, and sand dunes. Parks, recreation, or conservation agencies and organizations often implement these protective measures. Examples include:

- Floodplain protection
- Watershed management
- Riparian buffers
- Forest and vegetation management (e.g., fire resistant landscaping, fuel breaks, etc.)
- Erosion and sediment control
- Wetland preservation and restoration
- Habitat preservation
- Slope stabilization

8.3.4 Structural Projects

Structural mitigation projects are intended to lessen the impact of a hazard by modifying the environmental natural progression of the hazard event through construction. They are usually designed by engineers and managed or maintained by public works staff. Examples include:

- Reservoirs
- Dams / levees / dikes / floodwalls
- Diversions / detention / retention
- Channel modification
- Storm sewers

8.3.5 Emergency Services

Although not typically considered a “mitigation” technique, emergency service measures do minimize the impact of a hazard event on people and property. These commonly are actions taken immediately prior to, during, or in response to a hazard event. Examples include:

- Warning systems
- Evacuation planning and management
- Emergency response training and exercises
- Sandbagging for flood protection
- Installing temporary shutters for wind protection

8.3.6 Public Education and Awareness

Public education and awareness activities are used to advise residents, elected officials, business owners, potential property buyers, and visitors about hazards, hazardous areas, and mitigation techniques they can use to protect themselves and their property. Examples of measures to educate and inform the public include:

- Outreach projects
- Speaker series / demonstration events
- Hazard map information
- Real estate disclosure
- Library materials
- School children educational programs
- Hazard expositions

8.4 SELECTION OF MITIGATION TECHNIQUES FOR THE PEE DEE LUMBER REGION

In order to determine the most appropriate mitigation techniques for the communities in the Pee Dee Lumber Region, the Regional Hazard Mitigation Planning Committee members thoroughly reviewed and considered the findings of the *Capability Assessment* and *Risk Assessment* to determine the best activities for their respective communities. Other considerations included the effect of each mitigation action on overall risk to life and property, its ease of implementation, its degree of political and community support, its general cost-effectiveness, and funding availability (if necessary).

8.5 PLAN UPDATE REQUIREMENT

In keeping with FEMA requirements for plan updates, the Mitigation Actions identified in the previous Pee Dee Lumber Regional Hazard Mitigation Plan were evaluated to determine their 2017 implementation status. Updates on the implementation status of each action are provided. The mitigation actions provided in Section 9*: Mitigation Action Plan* include the mitigation actions from the previous plan as well as any new mitigation actions proposed through the 2017 planning process.

SECTION 9
MITIGATION ACTION PLAN

This section describes the planning process undertaken by the Counties and municipalities in the Pee Dee Lumber Region in the update of their 2017 Regional Hazard Mitigation Plan. It consists of the following two subsections:

- 9.1 Overview
- 9.2 Mitigation Action Plans

44 CFR Requirement
44 CFR Part 201.6(c)(3)(iii): The mitigation strategy shall include an action plan describing how the actions identified in paragraph (c)(2)(ii) of this section will be prioritized, implemented, and administered by the local jurisdiction.

9.1 OVERVIEW

As described in the previous section, the Mitigation Action Plan, or MAP, provides a functional plan of action for each jurisdiction. It is designed to achieve the mitigation goals established in Section 8: *Mitigation Strategy* and will be maintained on a regular basis according to the plan maintenance procedures established in Section 10: *Plan Maintenance*.

Each proposed mitigation action has been identified as an effective measure (policy or project) to reduce hazard risk for the Pee Dee Lumber Region. Each action is listed in the MAP in conjunction with background information such as hazard(s) addressed, relative priority, and estimated cost. Other information provided in the MAP includes potential funding sources to implement the action should funding be required (not all proposed actions are contingent upon funding). Most importantly, implementation mechanisms are provided for each action, including the designation of a lead agency or department responsible for carrying the action out as well as a timeframe for its completion. These implementation mechanisms ensure that the Pee Dee Lumber Regional Hazard Mitigation Plan remains a functional document that can be monitored for progress over time. The proposed actions are not listed in priority order, though each has been assigned a priority level of “high,” “moderate,” or “low” as described below and in Section 8 (page 8.2).

The Mitigation Action Plan is organized by mitigation strategy category (Prevention, Property Protection, Natural Resource Protection, Structural Projects, Emergency Services, or Public Education and Awareness). The following are the key elements described in the Mitigation Action Plan:

- Hazard(s) Addressed—Hazard which the action addresses.
- Relative Priority—High, moderate, or low priority as assigned by the jurisdiction.
- Lead Agency/Department—Department responsible for undertaking the action.
- Estimated Cost—Anticipated cost of the action.
- Potential Funding Sources—Local, State, or Federal sources of funds are noted here, where applicable.

- Original Implementation Schedule—Date by which the action the action should be completed. More information is provided when possible.
- 2017 Status & Narrative Explanation – Indication of completion, progress, deferment, or no change since the previous plan and a brief description of the 2017 status. If the action is new, that will be noted here.

Some actions listed below state that the given jurisdiction is not able to implement those actions at this time. Since these actions are being implemented as a County process, the jurisdictions wish to maintain these actions as theirs and not the County's for future implementation at the local level when funding and resources become available.

9.2 MITIGATION ACTION PLANS

The mitigation actions proposed by each of the participating jurisdictions are listed in 26 individual MAPs on the following pages. **Table 9.1** shows the location of each jurisdiction's MAP within this section as well as the number of mitigation actions proposed by each jurisdiction. Mitigation actions from previous mitigation plans that applied to all jurisdictions in a County were assigned to each jurisdiction so that each jurisdiction may weigh-in on the progress made in implementing that action in their jurisdiction.

TABLE 9.1: INDIVIDUAL MAP LOCATIONS

Location	Page	Number of Mitigation Actions
Anson County	**9:3**	**24**
Ansonville	9:13	23
Lilesville	9:23	23
McFarlan	9:33	23
Morven	9:43	23
Peachland	9:53	23
Polkton	9:63	23
Wadesboro	9:73	23
Montgomery County	**9:83**	**25**
Biscoe	9:89	14
Candor	9:95	13
Mount Gilead	9:99	16
Star	9:105	13
Troy	9:109	21
Richmond County	**9:115**	**26**
Dobbins Heights	9:123	10
Ellerbe	9:129	15
Hamlet	9:137	15
Hoffman	9:145	10
Norman	9:149	10
Rockingham	9:153	31
Scotland County	**9:169**	**18**
East Laurinburg	9:177	19
Gibson	9:185	19
Laurinburg	9:191	19
Wagram	9:199	19

Anson County Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
Prevention									
P-1	Complete the zoning process in the unincorporated areas of Anson County and the Town of Polkton.	All	High	County Planning and Zoning	Unknown	Local	2011-2012	2018-2023.	County is currently working on completing the zoning for these areas.
P-2	Update the zoning district and permitted uses section of the zoning ordinance to identify appropriate districts and uses. Restrict inappropriate districts and uses in environmentally sensitive areas.	Flood	High	County Planning and Zoning	Unknown	Local	January 2011-July 2011	2018-2023.	No progress has been made in the last five years. Continue to await county zoning.
P-3	Create an Environmental Protection Overlay District that permits floating overlay zones and identifies specific areas in need of special protection for flood hazard areas, watershed protection areas, federal and state freshwater wetlands.	Flood	Moderate	County Planning and Zoning	Unknown	Local	January 2011-December 2011	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-4	Investigate developing effective watershed protection, stormwater, soil erosion, and sediment control plans for commercial developments and major residential housing development projects.	All	Moderate	County Planning and Zoning	Unknown	Local; State	January 2011-June 2013	2018-2023.	No progress has been made on this since the previous plan.
P-5	Create regulations that protect existing forested areas especially in areas buffering and maintaining the integrity of seasonal, intermittent, and perennial waterways located throughout the county.	All	Moderate	County Planning and Zoning	Unknown	Local; State	January 2011-December 2013	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-6	Investigate the feasibility of developing a "Future Open Space & Parks" Map and Ordinance that supports the dedication of floodplains and other environmentally significant areas.	All	Low	County Planning and Zoning	Unknown	Local; State	January 2011-December 2013	2018-2023.	No progress has been made on this since the previous plan.
P-7	Develop highway corridor plans for Highways US 74, US 52, NC 109, and NC 218 to regulate development and provide emergency evacuation routes.	All	Moderate	County Planning and Zoning	Unknown	State; Federal	January 2011-June 2014	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-8	Building Inspections for NFIP enforcement. The Anson County Building Inspection Department will administer the 2008 Flood Prevention Ordinance for Anson County and the Towns of Ansonville, Lilesville, McFarlan, Morven, Peachland, and Wadesboro. This will deter future property losses from natural hazards.	Flood	High	County Building Inspections	Unknown	Local; State; Federal	2011-2023	2011- 2023.	Floodplain development permits are issued and inspections are performed by the Anson County Building Inspections and Permitting Department. This was performed on a routine basis as needed over the past five year period.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-9	Building Inspections for Flood Damaged Structures. Any and all portions of buildings that have been submerged for any length of time will be inspected for flood related damage as well as other conditions that may be dangerous to life, health or other property. Plan for Damaged Structures: 1. Overall damage assessment/data collection (visual inspection from roadways). 2. Data compiled and geographical areas assigned to teams. 3. Second detailed assessment by area teams. 4. Portions of walls, floors, ceilings, etc. that have been exposed to water will be opened for evaluation.	All	High	County Building Inspections	Unknown	Local; State; Federal	2011-2023	2011- 2023.	The county will continue to inspect houses that have been flooded.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
	5. All construction that is repaired, replaced, dried, or sealed will be inspected before covered. 6. Structure inspected for certificate of compliance. Policy and procedures related to storm damage and disconnected utility services: 1) inform public via television, radio and newspaper of the necessary steps to have utilities restored; 2) restrict travel as necessary while collecting damage assessment data; 3) conduct inspections on first come, first serve basis; 4) work overtime to expedite utility reconnections.								
P-10	Investigate "green" buildings and design options.	Drought; Heat	Low	County Planning and Zoning; County Building Inspections	Unknown	Local; State	January 2011-December 2013	2018-2023.	The County is looking into ways to improve the design of future buildings

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-11	Develop a policy to minimize public services to proposed new structures that will be located in 100-year floodplain areas.	Flood	Moderate	County Planning and Zoning	Unknown	Staff time only	2006-2007	2018-2023.	No progress has been made on this since the previous plan.
P-12	Update the Subdivision Ordinance by reviewing and incorporating hazard mitigation objectives.	All	Moderate	County Planning and Zoning	Unknown	Staff time only	2006-2007	2018-2023.	No progress has been made on this since the previous plan.
P-13	Review and revise the Planning Ordinance to allow for clustering of residential lots.	Flood	Moderate	County Planning and Zoning	Unknown	Staff time only	2005-2006	2018-2023.	No progress has been made on this since the previous plan.
Property Protection									
PP-1	Explore funding sources and encourage conservation groups to work with land owners to dedicate environmentally sensitive areas for open space.	All	High	County Planning and Zoning	Unknown	Local	January 2011-June 2014	2018-2023.	No progress has been made on this since the previous plan.
PP-2	Create and maintain a list of repetitive flood loss properties.	Flood	Moderate	County Planning and Zoning	Unknown	Staff time only	2006-2007	2007-2023.	The list will continue to be monitored.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
PP-3	Seek grant funding for mitigation opportunities eligible under the most current version of the UHMA Guidance and Public Assistance 406 mitigation Guidance at the time of application. Projects could include but are not limited to: acquisition, elevation, mitigation reconstruction, and wet/dry flood proofing to commercial and/or residential structures as applicable; redundant power to critical facilities, wind retrofits to critical facilities, storm shelters and other activities that reduce to the loss of life and property.	All hazards	High	Emergency Management, Engineering and/or Planning Departments of each jurisdiction	Project Cost, Staff Hours, and applicable cost share	Federal and State Grants, Local Operating Budget	2018- 2023	2018-2023	New Action.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
Emergency Services									
ES-1	Ensure adequate warning in case of major hazard events.	All	High	County Emergency Services	Unknown	Local; State; Federal	January 2011-December 2013	Completed 2013.	We now have multiple ways to warn public
ES-2	Improve shelter capacities with alternate power/heat sources.	Winter Storm	High	County Emergency Services	Unknown	Local; State; Federal	January 2011-December 2013	Completed 2013.	Generator and switch gear put at shelter location
ES-3	Establish program to maintain continuity of government operations.	All	High	County Emergency Services	Unknown	Local; State; Federal	January 2011-December 2013	2018-2023.	Working on COOP plan
ES-4	Identify alternate Emergency Operations Center locations.	All	High	County Emergency Services	Unknown	Local; State; Federal	January 2011-December 2013	2018-2023.	Will be in COOP Plan
ES-5	Identify alternate routes from major arteries in the County.	All	High	County Emergency Services	Unknown	Local; State; Federal	January 2011-December 2013	2018-2023.	Working with DOT to find alternate routes
Public Education and Awareness									
PEA-1	Maintain and display a zoning map demonstrating zoning, overlay districts, and high hazard areas.	All	High	County Planning and Zoning; County GIS	Unknown	Local	January 2011-December 2011	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
PEA-2	Work with the Brown Creek Soil Representative who has received training on erosion and sedimentation control methods and on floodplain surveying certification. On an annual basis, this person visit sites to assist property owners and developers with problems associated with drainage, erosion, and flooding.	Flood	High	Brown Creek Soil	Unknown	Local; State	2011-2023	2011- 2023.	Brown Creek Soil has representatives with the proper training and experience to visit on an annual basis for evaluations.
PEA-3	Make information about mitigation available to the public via the County website and social networking outlets.	All	Moderate	County Emergency Management	Unknown	Local	2013-2017	2018-2023.	Plan will be posted to web site

Town of Ansonville Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
Prevention									
P-1	Update the zoning district and permitted uses section of the zoning ordinance to identify appropriate districts and uses. Restrict inappropriate districts and uses in environmentally sensitive areas.	Flood	High	County Planning and Zoning	Unknown	Local	January 2011-July 2011	2018-2023.	No progress has been made in the last five years. Continue to await county zoning.
P-2	Create an Environmental Protection Overlay District that permits floating overlay zones and identifies specific areas in need of special protection for flood hazard areas, watershed protection areas, federal and state freshwater wetlands.	Flood	Moderate	County Planning and Zoning	Unknown	Local	January 2011-December 2011	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-3	Investigate developing effective watershed protection, stormwater, soil erosion, and sediment control plans for commercial developments and major residential housing development projects.	All	Moderate	County Planning and Zoning	Unknown	Local; State	January 2011-June 2013	2018-2023.	No progress has been made on this since the previous plan.
P-4	Create regulations that protect existing forested areas especially in areas buffering and maintaining the integrity of seasonal, intermittent, and perennial waterways located throughout the county.	All	Moderate	County Planning and Zoning	Unknown	Local; State	January 2011-December 2013	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-5	Investigate the feasibility of developing a "Future Open Space & Parks" Map and Ordinance that supports the dedication of floodplains and other environmentally significant areas.	All	Low	County Planning and Zoning	Unknown	Local; State	January 2011-December 2013	2018-2023.	No progress has been made on this since the previous plan.
P-6	Develop highway corridor plans for Highways US 74, US 52, NC 109, and NC 218 to regulate development and provide emergency evacuation routes.	All	Moderate	County Planning and Zoning	Unknown	State; Federal	January 2011-June 2014	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-7	Building Inspections for NFIP enforcement. The Anson County Building Inspection Department will administer the 2008 Flood Prevention Ordinance for Anson County and the Towns of Ansonville, Lilesville, McFarlan, Morven, Peachland, and Wadesboro. This will deter future property losses from natural hazards.	Flood	High	County Building Inspections	Unknown	Local; State; Federal	2011-2023	2011- 2023.	Floodplain development permits are issued and inspections are performed by the Anson County Building Inspections and Permitting Department. This was performed on a routine basis as needed over the past five year period.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-8	Building Inspections for Flood Damaged Structures. Any and all portions of buildings that have been submerged for any length of time will be inspected for flood related damage as well as other conditions that may be dangerous to life, health or other property. Plan for Damaged Structures: 1. Overall damage assessment/data collection (visual inspection from roadways). 2. Data compiled and geographical areas assigned to teams. 3. Second detailed assessment by area teams. 4. Portions of walls, floors, ceilings, etc. that have been exposed to water will be opened for evaluation.	All	High	County Building Inspections	Unknown	Local; State; Federal	2011-2023	2011- 2023.	The county will continue to inspect houses that have been flooded.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
	5. All construction that is repaired, replaced, dried, or sealed will be inspected before covered. 6. Structure inspected for certificate of compliance. Policy and procedures related to storm damage and disconnected utility services: 1) inform public via television, radio and newspaper of the necessary steps to have utilities restored; 2) restrict travel as necessary while collecting damage assessment data; 3) conduct inspections on first come, first serve basis; 4) work overtime to expedite utility reconnections.								
P-9	Investigate "green" buildings and design options.	Drought; Heat	Low	County Planning and Zoning; County Building Inspections	Unknown	Local; State	January 2011-December 2013	2018-2023.	The County is looking into ways to improve the design of future buildings

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-10	Develop a policy to minimize public services to proposed new structures that will be located in 100-year floodplain areas.	Flood	Moderate	County Planning and Zoning	Unknown	Staff time only	2006-2007	2018-2023.	No progress has been made on this since the previous plan.
P-11	Update the Subdivision Ordinance by reviewing and incorporating hazard mitigation objectives.	All	Moderate	County Planning and Zoning	Unknown	Staff time only	2006-2007	2018-2023.	No progress has been made on this since the previous plan.
P-12	Review and revise the Planning Ordinance to allow for clustering of residential lots.	Flood	Moderate	County Planning and Zoning	Unknown	Staff time only	2005-2006	2018-2023.	No progress has been made on this since the previous plan.
Property Protection									
PP-1	Explore funding sources and encourage conservation groups to work with landowners to dedicate environmentally sensitive areas for open space.	All	High	County Planning and Zoning	Unknown	Local	January 2011-June 2014	2018-2023.	No progress has been made on this since the previous plan.
PP-2	Create and maintain a list of repetitive flood loss properties.	Flood	Moderate	County Planning and Zoning	Unknown	Staff time only	2006-2007	2007-2023.	The list will continue to be monitored.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
PP-3	Seek grant funding for mitigation opportunities eligible under the most current version of the UHMA Guidance and Public Assistance 406 mitigation Guidance at the time of application. Projects could include but are not limited to: acquisition, elevation, mitigation reconstruction, and wet/dry flood proofing to commercial and/or residential structures as applicable; redundant power to critical facilities, wind retrofits to critical facilities, storm shelters and other activities that reduce to the loss of life and property.	All	High	Emergency Management, Engineering and/or Planning Departments of each jurisdiction	Project Cost, Staff Hours, and applicable cost share	Federal and State Grants, Local Operating Budget	2018- 2023	2018- 2023	New Action.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
Emergency Services									
ES-1	Ensure adequate warning in case of major hazard events.	All	High	County Emergency Services	Unknown	Local; State; Federal	January 2011-December 2013	Completed 2013.	We now have multiple ways to warn public
ES-2	Improve shelter capacities with alternate power/heat sources.	Winter Storm	High	County Emergency Services	Unknown	Local; State; Federal	January 2011-December 2013	Completed 2013.	Generator and switch gear put at shelter location
ES-3	Establish program to maintain continuity of government operations.	All	High	County Emergency Services	Unknown	Local; State; Federal	January 2011-December 2013	2018-2023.	Working on COOP plan
ES-4	Identify alternate Emergency Operations Center locations.	All	High	County Emergency Services	Unknown	Local; State; Federal	January 2011-December 2013	2018-2023.	Will be in COOP Plan
ES-5	Identify alternate routes from major arteries in the County.	All	High	County Emergency Services	Unknown	Local; State; Federal	January 2011-December 2013	2018-2023.	Working with DOT to find alternate routes
Public Education and Awareness									
PEA-1	Maintain and display a zoning map demonstrating zoning, overlay districts, and high hazard areas.	All	High	County Planning and Zoning; County GIS	Unknown	Local	January 2011-December 2011	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
PEA-2	Work with the Brown Creek Soil Representative who has received training on erosion and sedimentation control methods and on floodplain surveying certification. On an annual basis, this person visit sites to assist property owners and developers with problems associated with drainage, erosion, and flooding.	Flood	High	Brown Creek Soil	Unknown	Local; State	2011-2023	2011- 2023.	Brown Creek Soil has representatives with the proper training and experience to visit on an annual basis for evaluations.
PEA-3	Coordinate with the County to make information about mitigation available to the public via the County website and social networking outlets.	All	Moderate	County Emergency Management, Town of Ansonville	Unknown	Local	2013-2017	2018-2023.	Plan will be posted to web site

City of Lilesville Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Date of Action	Implementation Schedule	Narrative Explanation
Prevention									
P-1	Update the zoning district and permitted uses section of the zoning ordinance to identify appropriate districts and uses. Restrict inappropriate districts and uses in environmentally sensitive areas.	Flood	High	County Planning and Zoning	Unknown	Local	January 2011-July 2011	2018-2023	No progress has been made in the last five years. Continue to await county zoning.
P-2	Create an Environmental Protection Overlay District that permits floating overlay zones and identifies specific areas in need of special protection for flood hazard areas, watershed protection areas, federal and state freshwater wetlands.	Flood	Moderate	County Planning and Zoning	Unknown	Local	January 2011-December 2011	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Date of Action	Implementation Schedule	Narrative Explanation
P-3	Investigate developing effective watershed protection, stormwater, soil erosion, and sediment control plans for commercial developments and major residential housing development projects.	All	Moderate	County Planning and Zoning	Unknown	Local; State	January 2011-June 2013	2018-2023.	No progress has been made on this since the previous plan.
P-4	Create regulations that protect existing forested areas especially in areas buffering and maintaining the integrity of seasonal, intermittent, and perennial waterways located throughout the county.	All	Moderate	County Planning and Zoning	Unknown	Local; State	January 2011-December 2013	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Date of Action	Implementation Schedule	Narrative Explanation
P-5	Investigate the feasibility of developing a "Future Open Space & Parks" Map and Ordinance that supports the dedication of floodplains and other environmentally significant areas.	All	Low	County Planning and Zoning	Unknown	Local; State	January 2011-December 2013	2018-2023.	No progress has been made on this since the previous plan.
P-6	Develop highway corridor plans for Highways US 74, US 52, NC 109, and NC 218 to regulate development and provide emergency evacuation routes.	All	Moderate	County Planning and Zoning	Unknown	State; Federal	January 2011-June 2014	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Date of Action	Implementation Schedule	Narrative Explanation
P-7	Building Inspections for NFIP enforcement. The Anson County Building Inspection Department will administer the 2008 Flood Prevention Ordinance for Anson County and the Towns of Ansonville, Lilesville, Peachland, and Wadesboro. This will deter future property losses from natural hazards.	Flood	High	County Building Inspections	Unknown	Local; State; Federal	2011-2017	2017- 2023	Floodplain development permits are issued and inspections are performed by the Anson County Building Inspections and Permitting Department. This was performed on a routine basis as needed over the past five year period.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Date of Action	Implementation Schedule	Narrative Explanation
P-8	Building Inspections for Flood Damaged Structures. Any and all portions of buildings that have been submerged for any length of time will be inspected for flood related damage as well as other conditions that may be dangerous to life, health or other property. Plan for Damaged Structures: 1. Overall damage assessment/data collection (visual inspection from roadways). 2. Data compiled and geographical areas assigned to teams. 3. Second detailed assessment by area teams. 4. Portions of walls, floors, ceilings, etc. that have been exposed to water will be opened for evaluation.	All	High	County Building Inspections	Unknown	Local; State; Federal	2011-2023	2011- 2023.	The county will continue to inspect houses that have been flooded.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Date of Action	Implementation Schedule	Narrative Explanation
	5. All construction that is repaired, replaced, dried, or sealed will be inspected before covered. 6. Structure inspected for certificate of compliance. Policy and procedures related to storm damage and disconnected utility services: 1) inform public via television, radio and newspaper of the necessary steps to have utilities restored; 2) restrict travel as necessary while collecting damage assessment data; 3) conduct inspections on first come, first serve basis; 4) work overtime to expedite utility reconnections.								
P-9	Investigate "green" buildings and design options.	Drought; Heat	Low	County Planning and Zoning; County Building Inspections	Unknown	Local; State	January 2011-December 2013	2018-2023.	The County is looking into ways to improve the design of future buildings

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Date of Action	Implementation Schedule	Narrative Explanation
P-10	Develop a policy to minimize public services to proposed new structures that will be located in 100-year floodplain areas.	Flood	Moderate	County Planning and Zoning	Unknown	Staff time only	2006-2007	2018-2023.	No progress has been made on this since the previous plan.
P-11	Update the Subdivision Ordinance by reviewing and incorporating hazard mitigation objectives.	All	Moderate	County Planning and Zoning	Unknown	Staff time only	2006-2007	2018-2023.	No progress has been made on this since the previous plan.
P-12	Review and revise the Planning Ordinance to allow for clustering of residential lots.	Flood	Moderate	County Planning and Zoning	Unknown	Staff time only	2005-2006	2018-2023.	No progress has been made on this since the previous plan.
Property Protection									
PP-1	Explore funding sources and encourage conservation groups to work with landowners to dedicate environmentally sensitive areas for open space.	All	High	County Planning and Zoning	Unknown	Local	January 2011-June 2014	2018-2023.	No progress has been made on this since the previous plan.
PP-2	Create and maintain a list of repetitive flood loss properties.	Flood	Moderate	County Planning and Zoning	Unknown	Staff time only	2006-2007	2007-2023.	The list will continue to be monitored.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Date of Action	Implementation Schedule	Narrative Explanation
PP-3	Seek grant funding for mitigation opportunities eligible under the most current version of the UHMA Guidance and Public Assistance 406 mitigation Guidance at the time of application. Projects could include but are not limited to: acquisition, elevation, mitigation reconstruction, and wet/dry flood proofing to commercial and/or residential structures as applicable; redundant power to critical facilities, wind retrofits to critical facilities, storm shelters and other activities that reduce to the loss of life and property.	All	High	Emergency Management, Engineering and/or Planning Departments of each jurisdiction	Project Cost, Staff Hours, and applicable cost share	Federal and State Grants, Local Operating Budget	2018- 2023	2018- 2023	New Action.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Date of Action	Implementation Schedule	Narrative Explanation
Emergency Services									
ES-1	Ensure adequate warning in case of major hazard events.	All	High	County Emergency Services	Unknown	Local; State; Federal	January 2011-December 2013	Completed 2013.	We now have multiple ways to warn public
ES-2	Improve shelter capacities with alternate power/heat sources.	Winter Storm	High	County Emergency Services	Unknown	Local; State; Federal	January 2011-December 2013	Completed 2013.	Generator and switch gear put at shelter location
ES-3	Establish program to maintain continuity of government operations.	All	High	County Emergency Services	Unknown	Local; State; Federal	January 2011-December 2013	2018-2023.	Working on COOP plan
ES-4	Identify alternate Emergency Operations Center locations.	All	High	County Emergency Services	Unknown	Local; State; Federal	January 2011-December 2013	2018-2023.	Will be in COOP Plan
ES-5	Identify alternate routes from major arteries in the County.	All	High	County Emergency Services	Unknown	Local; State; Federal	January 2011-December 2013	2018-2023.	Working with DOT to find alternate routes
Public Education and Awareness									
PEA-1	Maintain and display a zoning map demonstrating zoning, overlay districts, and high hazard areas.	All	High	County Planning and Zoning; County GIS	Unknown	Local	January 2011-December 2011	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Date of Action	Implementation Schedule	Narrative Explanation
PEA-2	Work with the Brown Creek Soil Representative who has received training on erosion and sedimentation control methods and on floodplain surveying certification. On an annual basis, this person visit sites to assist property owners and developers with problems associated with drainage, erosion, and flooding.	Flood	High	Brown Creek Soil	Unknown	Local; State	2011-2023	2011- 2023.	Brown Creek Soil has representatives with the proper training and experience to visit on an annual basis for evaluations.
PEA-3	Coordinate with the County to make information about mitigation available to the public via the County website and social networking outlets.	All	Moderate	County Emergency Management, Town of Ansonville	Unknown	Local	2013-2017	2018-2023.	Plan will be posted to web site

Town of McFarlan Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
Prevention									
P-1	Update the zoning district and permitted uses section of the zoning ordinance to identify appropriate districts and uses. Restrict inappropriate districts and uses in environmentally sensitive areas.	Flood	High	County Planning and Zoning	Unknown	Local	January 2011-July 2011	2018-2023.	No progress has been made in the last five years. Continue to await county zoning.
P-2	Create an Environmental Protection Overlay District that permits floating overlay zones and identifies specific areas in need of special protection for flood hazard areas, watershed protection areas, federal and state freshwater wetlands.	Flood	Moderate	County Planning and Zoning	Unknown	Local	January 2011-December 2011	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-3	Investigate developing effective watershed protection, stormwater, soil erosion, and sediment control plans for commercial developments and major residential housing development projects.	All	Moderate	County Planning and Zoning	Unknown	Local; State	January 2011-June 2013	2018-2023.	No progress has been made on this since the previous plan.
P-4	Create regulations that protect existing forested areas especially in areas buffering and maintaining the integrity of seasonal, intermittent, and perennial waterways located throughout the county.	All	Moderate	County Planning and Zoning	Unknown	Local; State	January 2011-December 2013	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-5	Investigate the feasibility of developing a "Future Open Space & Parks" Map and Ordinance that supports the dedication of floodplains and other environmentally significant areas.	All	Low	County Planning and Zoning	Unknown	Local; State	January 2011-December 2013	2018-2023.	No progress has been made on this since the previous plan.
P-6	Develop highway corridor plans for Highways US 74, US 52, NC 109, and NC 218 to regulate development and provide emergency evacuation routes.	All	Moderate	County Planning and Zoning	Unknown	State; Federal	January 2011-June 2014	2018-2023.	No progress has been made on this since the previous plan.
P-7	**DESCRIPTION REVISED IN 2018.** The Town of McFarlan will continue to reassess participation in the NFIP as new flood maps become available.	Flood	High	County Building Inspections	Unknown	Local; State; Federal	2011-2023	2011- 2023.	At this time the elected officials are reviewing and taking the recommendation under advisement and will render a decision as their priorities will allow.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-8	Building Inspections for Flood Damaged Structures. Any and all portions of buildings that have been submerged for any length of time will be inspected for flood related damage as well as other conditions that may be dangerous to life, health or other property. Plan for Damaged Structures: 1. Overall damage assessment/data collection (visual inspection from roadways). 2. Data compiled and geographical areas assigned to teams. 3. Second detailed assessment by area teams. 4. Portions of walls, floors, ceilings, etc. that have been exposed to water will be opened for evaluation.	All	High	County Building Inspections	Unknown	Local; State; Federal	2011-2023	2011- 2023.	The county will continue to inspect houses that have been flooded.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
	5. All construction that is repaired, replaced, dried, or sealed will be inspected before covered. 6. Structure inspected for certificate of compliance. Policy and procedures related to storm damage and disconnected utility services: 1) inform public via television, radio and newspaper of the necessary steps to have utilities restored; 2) restrict travel as necessary while collecting damage assessment data; 3) conduct inspections on first come, first serve basis; 4) work overtime to expedite utility reconnections.								
P-9	Investigate "green" buildings and design options.	Drought; Heat	Low	County Planning and Zoning; County Building Inspections	Unknown	Local; State	January 2011-December 2013	2018-2023.	The County is looking into ways to improve the design of future buildings

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-10	Develop a policy to minimize public services to proposed new structures that will be located in 100-year floodplain areas.	Flood	Moderate	County Planning and Zoning	Unknown	Staff time only	2006-2007	2018-2023.	No progress has been made on this since the previous plan.
P-11	Update the Subdivision Ordinance by reviewing and incorporating hazard mitigation objectives.	All	Moderate	County Planning and Zoning	Unknown	Staff time only	2006-2007	2018-2023.	No progress has been made on this since the previous plan.
P-12	Review and revise the Planning Ordinance to allow for clustering of residential lots.	Flood	Moderate	County Planning and Zoning	Unknown	Staff time only	2005-2006	2018-2023.	No progress has been made on this since the previous plan.
Property Protection									
PP-1	Explore funding sources and encourage conservation groups to work with landowners to dedicate environmentally sensitive areas for open space.	All	High	County Planning and Zoning	Unknown	Local	January 2011-June 2014	2018-2023.	No progress has been made on this since the previous plan.
PP-2	Create and maintain a list of repetitive flood loss properties.	Flood	Moderate	County Planning and Zoning	Unknown	Staff time only	2006-2007	2007-2023.	The list will continue to be monitored.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
PP-3	Seek grant funding for mitigation opportunities eligible under the most current version of the UHMA Guidance and Public Assistance 406 mitigation Guidance at the time of application. Projects could include but are not limited to: acquisition, elevation, mitigation reconstruction, and wet/dry flood proofing to commercial and/or residential structures as applicable; redundant power to critical facilities, wind retrofits to critical facilities, storm shelters and other activities that reduce to the loss of life and property.	All	High	Emergency Management, Engineering and/or Planning Departments of each jurisdiction	Project Cost, Staff Hours, and applicable cost share	Federal and State Grants, Local Operating Budget	2018- 2023	2018- 2023	New Action.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
Emergency Services									
ES-1	Ensure adequate warning in case of major hazard events.	All	High	County Emergency Services	Unknown	Local; State; Federal	January 2011-December 2013	Completed 2013.	We now have multiple ways to warn public
ES-2	Improve shelter capacities with alternate power/heat sources.	Winter Storm	High	County Emergency Services	Unknown	Local; State; Federal	January 2011-December 2013	Completed 2013.	Generator and switch gear put at shelter location
ES-3	Establish program to maintain continuity of government operations.	All	High	County Emergency Services	Unknown	Local; State; Federal	January 2011-December 2013	2018-2023.	Working on COOP plan
ES-4	Identify alternate Emergency Operations Center locations.	All	High	County Emergency Services	Unknown	Local; State; Federal	January 2011-December 2013	2018-2023.	Will be in COOP Plan
ES-5	Identify alternate routes from major arteries in the County.	All	High	County Emergency Services	Unknown	Local; State; Federal	January 2011-December 2013	2018-2023.	Working with DOT to find alternate routes
Public Education and Awareness									
PEA-1	Maintain and display a zoning map demonstrating zoning, overlay districts, and high hazard areas.	All	High	County Planning and Zoning; County GIS	Unknown	Local	January 2011-December 2011	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
PEA-2	Work with the Brown Creek Soil Representative who has received training on erosion and sedimentation control methods and on floodplain surveying certification. On an annual basis, this person visit sites to assist property owners and developers with problems associated with drainage, erosion, and flooding.	Flood	High	Brown Creek Soil	Unknown	Local; State	2011-2023	2011- 2023.	Brown Creek Soil has representatives with the proper training and experience to visit on an annual basis for evaluations.
PEA-3	Coordinate with the County to make information about mitigation available to the public via the County website and social networking outlets.	All	Moderate	County Emergency Management, Town of Ansonville	Unknown	Local	2013-2017	2018-2023.	Plan will be posted to web site

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Town of Morven Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
Prevention									
P-1	Update the zoning district and permitted uses section of the zoning ordinance to identify appropriate districts and uses. Restrict inappropriate districts and uses in environmentally sensitive areas.	Flood	High	County Planning and Zoning	Unknown	Local	January 2011-July 2011	2018-2023.	No progress has been made in the last five years. Continue to await county zoning.
P-2	Create an Environmental Protection Overlay District that permits floating overlay zones and identifies specific areas in need of special protection for flood hazard areas, watershed protection areas, federal and state freshwater wetlands.	Flood	Moderate	County Planning and Zoning	Unknown	Local	January 2011-December 2011	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-3	Investigate developing effective watershed protection, stormwater, soil erosion, and sediment control plans for commercial developments and major residential housing development projects.	All	Moderate	County Planning and Zoning	Unknown	Local; State	January 2011-June 2013	2018-2023.	No progress has been made on this since the previous plan.
P-4	Create regulations that protect existing forested areas especially in areas buffering and maintaining the integrity of seasonal, intermittent, and perennial waterways located throughout the county.	All	Moderate	County Planning and Zoning	Unknown	Local; State	January 2011-December 2013	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-5	Investigate the feasibility of developing a "Future Open Space & Parks" Map and Ordinance that supports the dedication of floodplains and other environmentally significant areas.	All	Low	County Planning and Zoning	Unknown	Local; State	January 2011-December 2013	2018-2023.	No progress has been made on this since the previous plan.
P-6	Develop highway corridor plans for Highways US 74, US 52, NC 109, and NC 218 to regulate development and provide emergency evacuation routes.	All	Moderate	County Planning and Zoning	Unknown	State; Federal	January 2011-June 2014	2018-2023.	No progress has been made on this since the previous plan.
P-7	**DESCRIPTION REVISED 2018.** The Town of Morven has been in contact with the NC NFIP Outreach Coordinator regarding participation in the NFIP.	Flood	High	County Building Inspections	Unknown	Local; State; Federal	2011-2023		2011- 2023. At this time the elected officials are reviewing and taking the recommendation under advisement and will render a decision as their priorities will allow.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-8	Building Inspections for Flood Damaged Structures. Any and all portions of buildings that have been submerged for any length of time will be inspected for flood related damage as well as other conditions that may be dangerous to life, health or other property. Plan for Damaged Structures: 1. Overall damage assessment/data collection (visual inspection from roadways). 2. Data compiled and geographical areas assigned to teams. 3. Second detailed assessment by area teams. 4. Portions of walls, floors, ceilings, etc. that have been exposed to water will be opened for evaluation.	All	High	County Building Inspections	Unknown	Local; State; Federal	2011-2023	2011- 2023.	The county will continue to inspect houses that have been flooded.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
	5. All construction that is repaired, replaced, dried, or sealed will be inspected before covered. 6. Structure inspected for certificate of compliance. Policy and procedures related to storm damage and disconnected utility services: 1) inform public via television, radio and newspaper of the necessary steps to have utilities restored; 2) restrict travel as necessary while collecting damage assessment data; 3) conduct inspections on first come, first serve basis; 4) work overtime to expedite utility reconnections.								
P-9	Investigate "green" buildings and design options.	Drought; Heat	Low	County Planning and Zoning; County Building Inspections	Unknown	Local; State	January 2011-December 2013	2018-2023.	The County is looking into ways to improve the design of future buildings

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-10	**DESCRIPTION REVISED 2018.** Develop a policy to minimize public services to proposed new structures that will be located in any flood-prone area.	Flood	Moderate	County Planning and Zoning	Unknown	Staff time only	2006-2007	2018-2023.	No progress has been made on this since the previous plan.
P-11	Update the Subdivision Ordinance by reviewing and incorporating hazard mitigation objectives.	All	Moderate	County Planning and Zoning	Unknown	Staff time only	2006-2007	2018-2023.	No progress has been made on this since the previous plan.
P-12	Review and revise the Planning Ordinance to allow for clustering of residential lots.	Flood	Moderate	County Planning and Zoning	Unknown	Staff time only	2005-2006	2018-2023.	No progress has been made on this since the previous plan.
Property Protection									
PP-1	Explore funding sources and encourage conservation groups to work with landowners to dedicate environmentally sensitive areas for open space.	All	High	County Planning and Zoning	Unknown	Local	January 2011-June 2014	2018-2023.	No progress has been made on this since the previous plan.
PP-2	Create and maintain a list of repetitive flood loss properties.	Flood	Moderate	County Planning and Zoning	Unknown	Staff time only	2006-2007	2007-2023.	The list will continue to be monitored.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
PP-3	Seek grant funding for mitigation opportunities eligible under the most current version of the UHMA Guidance and Public Assistance 406 mitigation Guidance at the time of application. Projects could include but are not limited to: acquisition, elevation, mitigation reconstruction, and wet/dry flood proofing to commercial and/or residential structures as applicable; redundant power to critical facilities, wind retrofits to critical facilities, storm shelters and other activities that reduce to the loss of life and property.	All	High	Emergency Management, Engineering and/or Planning Departments of each jurisdiction	Project Cost, Staff Hours, and applicable cost share	Federal and State Grants, Local Operating Budget	2018- 2023	2018-2023	New Action.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
Emergency Services									
ES-1	Ensure adequate warning in case of major hazard events.	All	High	County Emergency Services	Unknown	Local; State; Federal	January 2011-December 2013	Completed 2013.	We now have multiple ways to warn public
ES-2	Improve shelter capacities with alternate power/heat sources.	Winter Storm	High	County Emergency Services	Unknown	Local; State; Federal	January 2011-December 2013	Completed 2013.	Generator and switch gear put at shelter location
ES-3	Establish program to maintain continuity of government operations.	All	High	County Emergency Services	Unknown	Local; State; Federal	January 2011-December 2013	2018-2023.	Working on COOP plan
ES-4	Identify alternate Emergency Operations Center locations.	All	High	County Emergency Services	Unknown	Local; State; Federal	January 2011-December 2013	2018-2023.	Will be in COOP Plan
ES-5	Identify alternate routes from major arteries in the County.	All	High	County Emergency Services	Unknown	Local; State; Federal	January 2011-December 2013	2018-2023.	Working with DOT to find alternate routes
Public Education and Awareness									
PEA-1	Maintain and display a zoning map demonstrating zoning, overlay districts, and high hazard areas.	All	High	County Planning and Zoning; County GIS	Unknown	Local	January 2011-December 2011	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
PEA-2	Work with the Brown Creek Soil Representative who has received training on erosion and sedimentation control methods and on floodplain surveying certification. On an annual basis, this person visit sites to assist property owners and developers with problems associated with drainage, erosion, and flooding.	Flood	High	Brown Creek Soil	Unknown	Local; State	2011-2023	2011- 2023.	Brown Creek Soil has representatives with the proper training and experience to visit on an annual basis for evaluations.
PEA-3	Coordinate with the County to make information about mitigation available to the public via the County website and social networking outlets.	All	Moderate	County Emergency Management, Town of Ansonville	Unknown	Local	2013-2017	2018-2023.	Plan will be posted to web site

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Town Peachland Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
Prevention									
P-1	Update the zoning district and permitted uses section of the zoning ordinance to identify appropriate districts and uses. Restrict inappropriate districts and uses in environmentally sensitive areas.	Flood	High	County Planning and Zoning	Unknown	Local	January 2011-July 2011	2018-2023.	No progress has been made in the last five years. Continue to await county zoning.
P-2	Create an Environmental Protection Overlay District that permits floating overlay zones and identifies specific areas in need of special protection for flood hazard areas, watershed protection areas, federal and state freshwater wetlands.	Flood	Moderate	County Planning and Zoning	Unknown	Local	January 2011-December 2011	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-3	Investigate developing effective watershed protection, stormwater, soil erosion, and sediment control plans for commercial developments and major residential housing development projects.	All	Moderate	County Planning and Zoning	Unknown	Local; State	January 2011-June 2013	2018-2023.	No progress has been made on this since the previous plan.
P-4	Create regulations that protect existing forested areas especially in areas buffering and maintaining the integrity of seasonal, intermittent, and perennial waterways located throughout the county.	All	Moderate	County Planning and Zoning	Unknown	Local; State	January 2011-December 2013	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-5	Investigate the feasibility of developing a "Future Open Space & Parks" Map and Ordinance that supports the dedication of floodplains and other environmentally significant areas.	All	Low	County Planning and Zoning	Unknown	Local; State	January 2011-December 2013	2018-2023.	No progress has been made on this since the previous plan.
P-6	Develop highway corridor plans for Highways US 74, US 52, NC 109, and NC 218 to regulate development and provide emergency evacuation routes.	All	Moderate	County Planning and Zoning	Unknown	State; Federal	January 2011-June 2014	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-7	Building Inspections for NFIP enforcement. The Anson County Building Inspection Department will administer the 2008 Flood Prevention Ordinance for Anson County and the Towns of Ansonville, Lilesville, McFarlan, Morven, Peachland, and Wadesboro. This will deter future property losses from natural hazards.	Flood	High	County Building Inspections	Unknown	Local; State; Federal	2011-2023	2011- 2023.	Floodplain development permits are issued and inspections are performed by the Anson County Building Inspections and Permitting Department. This was performed on a routine basis as needed over the past five year period.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-8	Building Inspections for Flood Damaged Structures. Any and all portions of buildings that have been submerged for any length of time will be inspected for flood related damage as well as other conditions that may be dangerous to life, health or other property. Plan for Damaged Structures: 1. Overall damage assessment/data collection (visual inspection from roadways). 2. Data compiled and geographical areas assigned to teams. 3. Second detailed assessment by area teams. 4. Portions of walls, floors, ceilings, etc. that have been exposed to water will be opened for evaluation.	All	High	County Building Inspections	Unknown	Local; State; Federal	2011-2023	2011- 2023.	The county will continue to inspect houses that have been flooded.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
	5. All construction that is repaired, replaced, dried, or sealed will be inspected before covered. 6. Structure inspected for certificate of compliance. Policy and procedures related to storm damage and disconnected utility services: 1) inform public via television, radio and newspaper of the necessary steps to have utilities restored; 2) restrict travel as necessary while collecting damage assessment data; 3) conduct inspections on first come, first serve basis; 4) work overtime to expedite utility reconnections.								
P-9	Investigate "green" buildings and design options.	Drought; Heat	Low	County Planning and Zoning; County Building Inspections	Unknown	Local; State	January 2011-December 2013	2018-2023.	The County is looking into ways to improve the design of future buildings

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-10	Develop a policy to minimize public services to proposed new structures that will be located in 100-year floodplain areas.	Flood	Moderate	County Planning and Zoning	Unknown	Staff time only	2006-2007	2018-2023.	No progress has been made on this since the previous plan.
P-11	Update the Subdivision Ordinance by reviewing and incorporating hazard mitigation objectives.	All	Moderate	County Planning and Zoning	Unknown	Staff time only	2006-2007	2018-2023.	No progress has been made on this since the previous plan.
P-12	Review and revise the Planning Ordinance to allow for clustering of residential lots.	Flood	Moderate	County Planning and Zoning	Unknown	Staff time only	2005-2006	2018-2023.	No progress has been made on this since the previous plan.
Property Protection									
PP-1	Explore funding sources and encourage conservation groups to work with landowners to dedicate environmentally sensitive areas for open space.	All	High	County Planning and Zoning	Unknown	Local	January 2011-June 2014	2018-2023.	No progress has been made on this since the previous plan.
PP-2	Create and maintain a list of repetitive flood loss properties.	Flood	Moderate	County Planning and Zoning	Unknown	Staff time only	2006-2007	2007-2023.	The list will continue to be monitored.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
PP-3	Seek grant funding for mitigation opportunities eligible under the most current version of the UHMA Guidance and Public Assistance 406 mitigation Guidance at the time of application. Projects could include but are not limited to: acquisition, elevation, mitigation reconstruction, and wet/dry flood proofing to commercial and/or residential structures as applicable; redundant power to critical facilities, wind retrofits to critical facilities, storm shelters and other activities that reduce to the loss of life and property.	All	High	Emergency Management, Engineering and/or Planning Departments of each jurisdiction	Project Cost, Staff Hours, and applicable cost share	Federal and State Grants, Local Operating Budget	2018- 2023	2018-2023	New Action.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
Emergency Services									
ES-1	Ensure adequate warning in case of major hazard events.	All	High	County Emergency Services	Unknown	Local; State; Federal	January 2011-December 2013	Completed 2013.	We now have multiple ways to warn public
ES-2	Improve shelter capacities with alternate power/heat sources.	Winter Storm	High	County Emergency Services	Unknown	Local; State; Federal	January 2011-December 2013	Completed 2013.	Generator and switch gear put at shelter location
ES-3	Establish program to maintain continuity of government operations.	All	High	County Emergency Services	Unknown	Local; State; Federal	January 2011-December 2013	2018-2023.	Working on COOP plan
ES-4	Identify alternate Emergency Operations Center locations.	All	High	County Emergency Services	Unknown	Local; State; Federal	January 2011-December 2013	2018-2023.	Will be in COOP Plan
ES-5	Identify alternate routes from major arteries in the County.	All	High	County Emergency Services	Unknown	Local; State; Federal	January 2011-December 2013	2018-2023.	Working with DOT to find alternate routes
Public Education and Awareness									
PEA-1	Maintain and display a zoning map demonstrating zoning, overlay districts, and high hazard areas.	All	High	County Planning and Zoning; County GIS	Unknown	Local	January 2011-December 2011	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
PEA-2	Work with the Brown Creek Soil Representative who has received training on erosion and sedimentation control methods and on floodplain surveying certification. On an annual basis, this person visit sites to assist property owners and developers with problems associated with drainage, erosion, and flooding.	Flood	High	Brown Creek Soil	Unknown	Local; State	2011-2023	2011- 2023.	Brown Creek Soil has representatives with the proper training and experience to visit on an annual basis for evaluations.
PEA-3	Coordinate with the County to make information about mitigation available to the public via the County website and social networking outlets.	All	Moderate	County Emergency Management, Town of Ansonville	Unknown	Local	2013-2017	2018-2023.	Plan will be posted to web site

Town of Polkton Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
Prevention									
P-1	Update the zoning district and permitted uses section of the zoning ordinance to identify appropriate districts and uses. Restrict inappropriate districts and uses in environmentally sensitive areas.	Flood	High	County Planning and Zoning	Unknown	Local	January 2011-July 2011	2018-2023.	No progress has been made in the last five years. Continue to await county zoning.
P-2	Create an Environmental Protection Overlay District that permits floating overlay zones and identifies specific areas in need of special protection for flood hazard areas, watershed protection areas, federal and state freshwater wetlands.	Flood	Moderate	County Planning and Zoning	Unknown	Local	January 2011-December 2011	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-3	Investigate developing effective watershed protection, stormwater, soil erosion, and sediment control plans for commercial developments and major residential housing development projects.	All	Moderate	County Planning and Zoning	Unknown	Local; State	January 2011-June 2013	2018-2023.	No progress has been made on this since the previous plan.
P-4	Create regulations that protect existing forested areas especially in areas buffering and maintaining the integrity of seasonal, intermittent, and perennial waterways located throughout the county.	All	Moderate	County Planning and Zoning	Unknown	Local; State	January 2011-December 2013	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-5	Investigate the feasibility of developing a "Future Open Space & Parks" Map and Ordinance that supports the dedication of floodplains and other environmentally significant areas.	All	Low	County Planning and Zoning	Unknown	Local; State	January 2011-December 2013	2018-2023.	No progress has been made on this since the previous plan.
P-6	Develop highway corridor plans for Highways US 74, US 52, NC 109, and NC 218 to regulate development and provide emergency evacuation routes.	All	Moderate	County Planning and Zoning	Unknown	State; Federal	January 2011-June 2014	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-7	Building Inspections for NFIP enforcement. The Anson County Building Inspection Department will administer the 2008 Flood Prevention Ordinance for Anson County and the Towns of Ansonville, Lilesville, McFarlan, Morven, Peachland, and Wadesboro. This will deter future property losses from natural hazards.	Flood	High	County Building Inspections	Unknown	Local; State; Federal	2011-2023	2011-2023	Floodplain development permits are issued and inspections are performed by the Anson County Building Inspections and Permitting Department. This was performed on a routine basis as needed over the past five year period.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-8	Building Inspections for Flood Damaged Structures. Any and all portions of buildings that have been submerged for any length of time will be inspected for flood related damage as well as other conditions that may be dangerous to life, health or other property. Plan for Damaged Structures: 1. Overall damage assessment/data collection (visual inspection from roadways). 2. Data compiled and geographical areas assigned to teams. 3. Second detailed assessment by area teams. 4. Portions of walls, floors, ceilings, etc. that have been exposed to water will be opened for evaluation.	All	High	County Building Inspections	Unknown	Local; State; Federal	2011-2023	2011- 2023.	The county will continue to inspect houses that have been flooded.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
	5. All construction that is repaired, replaced, dried, or sealed will be inspected before covered. 6. Structure inspected for certificate of compliance. Policy and procedures related to storm damage and disconnected utility services: 1) inform public via television, radio and newspaper of the necessary steps to have utilities restored; 2) restrict travel as necessary while collecting damage assessment data; 3) conduct inspections on first come, first serve basis; 4) work overtime to expedite utility reconnections.								
P-9	Investigate "green" buildings and design options.	Drought; Heat	Low	County Planning and Zoning; County Building Inspections	Unknown	Local; State	January 2011-December 2013	2018-2023.	The County is looking into ways to improve the design of future buildings

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-10	Develop a policy to minimize public services to proposed new structures that will be located in 100-year floodplain areas.	Flood	Moderate	County Planning and Zoning	Unknown	Staff time only	2006-2007	2018-2023.	No progress has been made on this since the previous plan.
P-11	Update the Subdivision Ordinance by reviewing and incorporating hazard mitigation objectives.	All	Moderate	County Planning and Zoning	Unknown	Staff time only	2006-2007	2018-2023.	No progress has been made on this since the previous plan.
P-12	Review and revise the Planning Ordinance to allow for clustering of residential lots.	Flood	Moderate	County Planning and Zoning	Unknown	Staff time only	2005-2006	2018-2023.	No progress has been made on this since the previous plan.
Property Protection									
PP-1	Explore funding sources and encourage conservation groups to work with landowners to dedicate environmentally sensitive areas for open space.	All	High	County Planning and Zoning	Unknown	Local	January 2011-June 2014	2018-2023.	No progress has been made on this since the previous plan.
PP-2	Create and maintain a list of repetitive flood loss properties.	Flood	Moderate	County Planning and Zoning	Unknown	Staff time only	2006-2007	2007-2023.	The list will continue to be monitored.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
PP-3	Seek grant funding for mitigation opportunities eligible under the most current version of the UHMA Guidance and Public Assistance 406 mitigation Guidance at the time of application. Projects could include but are not limited to: acquisition, elevation, mitigation reconstruction, and wet/dry flood proofing to commercial and/or residential structures as applicable; redundant power to critical facilities, wind retrofits to critical facilities, storm shelters and other activities that reduce to the loss of life and property.	All	High	Emergency Management, Engineering and/or Planning Departments of each jurisdiction	Project Cost, Staff Hours, and applicable cost share	Federal and State Grants, Local Operating Budget	2018- 2023	2018-2023	New Action.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
Emergency Services									
ES-1	Ensure adequate warning in case of major hazard events.	All	High	County Emergency Services	Unknown	Local; State; Federal	January 2011-December 2013	Completed 2013.	We now have multiple ways to warn public
ES-2	Improve shelter capacities with alternate power/heat sources.	Winter Storm	High	County Emergency Services	Unknown	Local; State; Federal	January 2011-December 2013	Completed 2013.	Generator and switch gear put at shelter location
ES-3	Establish program to maintain continuity of government operations.	All	High	County Emergency Services	Unknown	Local; State; Federal	January 2011-December 2013	2018-2023.	Working on COOP plan
ES-4	Identify alternate Emergency Operations Center locations.	All	High	County Emergency Services	Unknown	Local; State; Federal	January 2011-December 2013	2018-2023.	Will be in COOP Plan
ES-5	Identify alternate routes from major arteries in the County.	All	High	County Emergency Services	Unknown	Local; State; Federal	January 2011-December 2013	2018-2023.	Working with DOT to find alternate routes
Public Education and Awareness									
PEA-1	Maintain and display a zoning map demonstrating zoning, overlay districts, and high hazard areas.	All	High	County Planning and Zoning; County GIS	Unknown	Local	January 2011-December 2011	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
PEA-2	Work with the Brown Creek Soil Representative who has received training on erosion and sedimentation control methods and on floodplain surveying certification. On an annual basis, this person visit sites to assist property owners and developers with problems associated with drainage, erosion, and flooding.	Flood	High	Brown Creek Soil	Unknown	Local; State	2011-2023	2011- 2023.	Brown Creek Soil has representatives with the proper training and experience to visit on an annual basis for evaluations.
PEA-3	Coordinate with the County to make information about mitigation available to the public via the County website and social networking outlets.	All	Moderate	County Emergency Management, Town of Ansonville	Unknown	Local	2013-2017	2018-2023.	Plan will be posted to web site

Town of Wadesboro Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
Prevention									
P-1	Update the zoning district and permitted uses section of the zoning ordinance to identify appropriate districts and uses. Restrict inappropriate districts and uses in environmentally sensitive areas.	Flood	High	County Planning and Zoning	Unknown	Local	January 2011-July 2011	2018-2023.	No progress has been made in the last five years. Continue to await county zoning.
P-2	Create an Environmental Protection Overlay District that permits floating overlay zones and identifies specific areas in need of special protection for flood hazard areas, watershed protection areas, federal and state freshwater wetlands.	Flood	Moderate	County Planning and Zoning	Unknown	Local	January 2011-December 2011	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-3	Investigate developing effective watershed protection, stormwater, soil erosion, and sediment control plans for commercial developments and major residential housing development projects.	All	Moderate	County Planning and Zoning	Unknown	Local; State	January 2011-June 2013	2018-2023.	No progress has been made on this since the previous plan.
P-4	Create regulations that protect existing forested areas especially in areas buffering and maintaining the integrity of seasonal, intermittent, and perennial waterways located throughout the county.	All	Moderate	County Planning and Zoning	Unknown	Local; State	January 2011-December 2013	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-5	Investigate the feasibility of developing a "Future Open Space & Parks" Map and Ordinance that supports the dedication of floodplains and other environmentally significant areas.	All	Low	County Planning and Zoning	Unknown	Local; State	January 2011-December 2013	2018-2023.	No progress has been made on this since the previous plan.
P-6	Develop highway corridor plans for Highways US 74, US 52, NC 109, and NC 218 to regulate development and provide emergency evacuation routes.	All	Moderate	County Planning and Zoning	Unknown	State; Federal	January 2011-June 2014	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-7	Building Inspections for NFIP enforcement. The Anson County Building Inspection Department will administer the 2008 Flood Prevention Ordinance for Anson County and the Towns of Ansonville, Lilesville, McFarlan, Morven, Peachland, and Wadesboro. This will deter future property losses from natural hazards.	Flood	High	County Building Inspections	Unknown	Local; State; Federal	2011-2023	2011-2023	Floodplain development permits are issued and inspections are performed by the Anson County Building Inspections and Permitting Department. This was performed on a routine basis as needed over the past five year period.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-8	Building Inspections for Flood Damaged Structures. Any and all portions of buildings that have been submerged for any length of time will be inspected for flood related damage as well as other conditions that may be dangerous to life, health or other property. Plan for Damaged Structures: 1. Overall damage assessment/data collection (visual inspection from roadways). 2. Data compiled and geographical areas assigned to teams. 3. Second detailed assessment by area teams. 4. Portions of walls, floors, ceilings, etc. that have been exposed to water will be opened for evaluation.	All	High	County Building Inspections	Unknown	Local; State; Federal	2011-2023	2011- 2023.	The county will continue to inspect houses that have been flooded.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
	5. All construction that is repaired, replaced, dried, or sealed will be inspected before covered. 6. Structure inspected for certificate of compliance. Policy and procedures related to storm damage and disconnected utility services: 1) inform public via television, radio and newspaper of the necessary steps to have utilities restored; 2) restrict travel as necessary while collecting damage assessment data; 3) conduct inspections on first come, first serve basis; 4) work overtime to expedite utility reconnections.								
P-9	Investigate "green" buildings and design options.	Drought; Heat	Low	County Planning and Zoning; County Building Inspections	Unknown	Local; State	January 2011-December 2013	2018-2023.	The County is looking into ways to improve the design of future buildings

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-10	Develop a policy to minimize public services to proposed new structures that will be located in 100-year floodplain areas.	Flood	Moderate	County Planning and Zoning	Unknown	Staff time only	2006-2007	2018-2023.	No progress has been made on this since the previous plan.
P-11	Update the Subdivision Ordinance by reviewing and incorporating hazard mitigation objectives.	All	Moderate	County Planning and Zoning	Unknown	Staff time only	2006-2007	2018-2023.	No progress has been made on this since the previous plan.
P-12	Review and revise the Planning Ordinance to allow for clustering of residential lots.	Flood	Moderate	County Planning and Zoning	Unknown	Staff time only	2005-2006	2018-2023.	No progress has been made on this since the previous plan.
Property Protection									
PP-1	Explore funding sources and encourage conservation groups to work with landowners to dedicate environmentally sensitive areas for open space.	All	High	County Planning and Zoning	Unknown	Local	January 2011-June 2014	2018-2023.	No progress has been made on this since the previous plan.
PP-2	Create and maintain a list of repetitive flood loss properties.	Flood	Moderate	County Planning and Zoning	Unknown	Staff time only	2006-2007	2007-2023.	The list will continue to be monitored.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
PP-3	Seek grant funding for mitigation opportunities eligible under the most current version of the UHMA Guidance and Public Assistance 406 mitigation Guidance at the time of application. Projects could include but are not limited to: acquisition, elevation, mitigation reconstruction, and wet/dry flood proofing to commercial and/or residential structures as applicable; redundant power to critical facilities, wind retrofits to critical facilities, storm shelters and other activities that reduce to the loss of life and property.	All	High	Emergency Management, Engineering and/or Planning Departments of each jurisdiction	Project Cost, Staff Hours, and applicable cost share	Federal and State Grants, Local Operating Budget	2018- 2023	2018-2023	New Action.
Emergency Services									
ES-1	Ensure adequate warning in case of major hazard events.	All	High	County Emergency Services	Unknown	Local; State; Federal	January 2011-December 2013	Completed 2013.	We now have multiple ways to warn public

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
ES-2	Improve shelter capacities with alternate power/heat sources.	Winter Storm	High	County Emergency Services	Unknown	Local; State; Federal	January 2011-December 2013	Completed 2013.	Generator and switch gear put at shelter location
ES-3	Establish program to maintain continuity of government operations.	All	High	County Emergency Services	Unknown	Local; State; Federal	January 2011-December 2013	2018-2023.	Working on COOP plan
ES-4	Identify alternate Emergency Operations Center locations.	All	High	County Emergency Services	Unknown	Local; State; Federal	January 2011-December 2013	2018-2023.	Will be in COOP Plan
ES-5	Identify alternate routes from major arteries in the County.	All	High	County Emergency Services	Unknown	Local; State; Federal	January 2011-December 2013	2018-2023.	Working with DOT to find alternate routes
Public Education and Awareness									
PEA-1	Maintain and display a zoning map demonstrating zoning, overlay districts, and high hazard areas.	All	High	County Planning and Zoning; County GIS	Unknown	Local	January 2011-December 2011	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
PEA-2	Work with the Brown Creek Soil Representative who has received training on erosion and sedimentation control methods and on floodplain surveying certification. On an annual basis, this person visit sites to assist property owners and developers with problems associated with drainage, erosion, and flooding.	Flood	High	Brown Creek Soil	Unknown	Local; State	2011-2023	2011- 2023.	Brown Creek Soil has representatives with the proper training and experience to visit on an annual basis for evaluations.
PEA-3	Coordinate with the County to make information about mitigation available to the public via the County website and social networking outlets.	All	Moderate	County Emergency Management, Town of Ansonville	Unknown	Local	2013-2017	2018-2023.	Plan will be posted to web site

Montgomery County Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
Prevention									
P-1	Hire a County Planner.	All	Moderate	County Manager	Unknown	Local	2012-2014	Complete.	Hired a County Planner in 11/1/2012
P-2	Create a County planning department.	All	Moderate	County Manager; County Planner	Unknown	Local	2015-2017	Complete.	Created 11/1/2012 and is staffed by one person.
P-3	Develop mapping ability.	All	Moderate	County Manager; County Planner	Unknown	Local	2012-2014	Completed 2012.	GIS Mapping is now available in 911 addressing and the County Tax Office.
P-4	**DESCRIPTION REVISED 2018.** Update the flood damage prevention ordinance to the latest model ordinance.	Flood	Moderate	County Manager	Unknown	Local	2012-2014	Deferred to 2018-2023 plan update.	Meeting is being held next month to try to update to latest model.
P-5	Partner with municipalities to consolidate planning services.	All	Moderate	County Manager; County Planner	Unknown	Local	2015-2017	Delete	Deleted due to lack of funding
P-6	Develop a countywide growth management/land use plan.	All	Moderate	County Planner	Unknown	Outside funding	2015-2017	Complete.	Completed and adopted in 2010.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-7	Develop procedure for recording damage assessment information such as type of hazard, location of hazard occurrence, when it occurred, death or injury, property damaged, for use in hazard mitigation and land use planning.	All	Moderate	County 911 Director	Unknown	Local	2012-2014	2018-2023	Deferred to 2018-2023 plan update due to funding sources
P-8	Through local water supply plan, develop a voluntary and mandatory water conservation program for drought conditions.	Drought	Moderate	County Manager	Unknown	Local	2012-2014	Completed 2012.	Have in draft form waiting to be adopted.
P-9	Review and evaluate snow and ice removal plans for each city/county. Evaluate and determine priority routes.	Winter Storm	Moderate	County Public Works	Unknown	Local	2012-2014	Deferred to 2018-2023 plan update.	DOT takes care of all state maintained roads and highways with the towns taking care of all town streets.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-10	Through existing subdivision regulations, encourage that power, cable and telephone lines be buried.	All	Moderate	County Manager; County Planner	Unknown	Local	2012-2014	Complete.	Completed 2014 by adopting county ordinance for burying lines, and cables in subdivisions.
P-11	Strengthen floodplain regulation to current standards. (New model regulation).	Flood	Moderate	County Manager	Unknown	Local	2012-2014	Delete.	Duplicative to action P-4.
Property Protection									
PP-1	Develop recommendations for protection of command center and identify alternate command center.	All	Moderate	County Manager; County EMS Director	Unknown	Local	2012-2014	Completed 2012.	Have primary and back-up 911 and Command Centers in place.
PP-2	Evaluate current capacity of critical services to deal with power outages.	All	Moderate	County EMS Director; County Manager; County Fire Chief	Unknown	Local	2012-2014	2018-2023	Deferred to 2018-2023 plan update due to funding sources
PP-3	Look into funding for transfer switches.	All	Moderate	County Manager; County Fire Chief	Unknown	Federal funding; Homeland Security	2012-2014	Deferred to 2018-2023 plan update.	Have transfer switches, waiting to get them installed.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
PP-4	Seek grant funding for mitigation opportunities eligible under the most current version of the UHMA Guidance and Public Assistance 406 mitigation Guidance at the time of application. Projects could include but are not limited to: acquisition, elevation, mitigation reconstruction, and wet/dry flood proofing to commercial and/or residential structures as applicable; redundant power to critical facilities, wind retrofits to critical facilities, storm shelters and other activities that reduce to the loss of life and property.	All	High	Emergency Management, Engineering and/or Planning Departments of each jurisdiction	Project Cost, Staff Hours, and applicable cost share	Federal and State Grants, Local Operating Budget	2018- 2023	2018-2023	New Action.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
Emergency Services									
ES-1	Hire an emergency manager.	All	Moderate	County Manager	Unknown	Local	2012-2014	Complete.	Current in place since 12/1/2016.
ES-2	Create a Division for Emergency Management.	All	Moderate	County Manager; County Emergency Manager	Unknown	Local	2015-2017	Complete.	Established 2012
ES-3	Develop an emergency operations plan for the County.	All	Moderate	County Manager; County Emergency Manager	Unknown	Local	2012-2014	Complete.	Completed in 2012 and reviewed yearly by NCEM.
ES-4	Develop emergency water supply capability.	All	Moderate	County and Town Managers	Unknown	Local; Possible Federal	2015-2017	Delete	Deleted due to lack of funding
ES-5	As part of annual budgeting process, procure generators: 1 generator for Page Street shelter; look for funding for 4 additional generators for shelters and fire departments.	Winter Storm; Wind	Moderate	County Finance Director; County Manager; County EMS Director	Unknown	Local; Outside source	2012-2017	2018-2023	Have generator for Page St. and West Mont. High. Still looking for funding for East Mont. High.
ES-6	Identify, upgrade, map emergency shelters throughout county and municipalities.	All	Moderate	County Manager; County EMS Director	Unknown	Local	2012-2014	Complete.	Completed 2014 when GIS mapping was established.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
ES-7	Identify and designate at least one emergency shelter in each municipality.	All	Moderate	County and Town Managers; County EMS Director	Unknown	Local	2012-2014	2018-2023.	Still trying to find appropriate facility to house shelters.
ES-8	Put in place a countywide 911 reverse call system for location specific warning to public of impending disaster.	All	Moderate	County 911 Director	Unknown	Federal funding; Homeland Security funds	2015-2017	Complete.	Completed 2017 by using Everbridge.
Public Education and Awareness									
PEA-1	Educate and inform local government and elected officials (decision makers) of the need to consider hazard mitigation in policy and budgetary planning and decision making processes.	All	Moderate	County Manager; County 911 Director; County EMS Director	Unknown	Local	2012-2014	2018-2023.	No progress has been made on this since the previous plan.
PEA-2	Make information about mitigation available to the public via the County website and social networking outlets.	All	Moderate	County Emergency Management	Unknown	Local	2013-2017	2018.	This will be put on county website once completed.

Town of Biscoe Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
Prevention									
P-1	Adopt a flood prevention ordinance to latest model ordinance.	Flood	Moderate	Town Manager	Unknown	Local	2012-2014	2018-2023.	No progress has been made on this since the previous plan.
P-2	Consider partnering with municipalities to consolidate planning services.	All	Moderate	Town Manager	Unknown	Local; County funding	2015-2017	2018-2023.	No progress has been made on this since the previous plan.
P-3	Become an NFIP member.	Flood	Moderate	Town Manager	Unknown	Local	2012-2017	2018-2023.	No progress has been made on this since the previous plan.
P-4	Review and evaluate snow and ice removal plans for each city/county. Evaluate and determine priority routes.	Winter Storm	Moderate	Town Public Works	Unknown	Local	2012-2014	2018-2023.	No progress has been made on this since the previous plan.
P-5	Develop program to clear debris from culverts and storm drains in urbanized areas.	Flood	Moderate	Town Public Works	Unknown	Local	2012-2014	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-6	Develop a water conservation voluntary and mandatory program for drought conditions.	Drought	Moderate	Town Public Works Director	Unknown	Local	2012-2014	2018-2023.	No progress has been made on this since the previous plan.
P-7	Through subdivision regulations, encourage that power, cable and telephone lines be buried.	All	Moderate	Town Manager	Unknown	Local	2012-2014	2018-2023.	No progress has been made on this since the previous plan.
Property Protection									
PP-1	Evaluate current capacity of critical services to deal with power outages.	Winter Storm; Wind	Moderate	County EMS Director; County Manager; Town Fire Chief	Unknown	Local	2012-2014	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
PP-2	Seek grant funding for mitigation opportunities eligible under the most current version of the UHMA Guidance and Public Assistance 406 mitigation Guidance at the time of application. Projects could include but are not limited to: acquisition, elevation, mitigation reconstruction, and wet/dry flood proofing to commercial and/or residential structures as applicable; redundant power to critical facilities, wind retrofits to critical facilities, storm shelters and other activities that reduce to the loss of life and property.	All	High	Emergency Management, Engineering and/or Planning Departments of each jurisdiction	Project Cost, Staff Hours, and applicable cost share	Federal and State Grants, Local Operating Budget	2018- 2023		New Action

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
Emergency Services									
ES-1	Identify and designate at least one emergency shelter in Biscoe.	All	Moderate	Town Manager	Unknown	Local	2012-2014	2018-2023.	No progress has been made on this since the previous plan.
ES-2	Put in place a countywide 911 reverse call system for location specific warning to public of impending disaster.	All	Moderate	County 911 Director	Unknown	Federal funding; Homeland Security funds	2015-2017	2018-2023.	No progress has been made on this since the previous plan.
ES-3	Develop emergency water supply capability.	All	Moderate	Town Public Works Director; County Manager	Unknown	Local	2015-2017	2018-2023.	No progress has been made on this since the previous plan.
Public Education and Awareness									
PEA-1	Educate and inform local government and elected officials (decision makers) of the need to consider hazard mitigation in policy and budgetary planning and decision making processes.	All	Moderate	Town Manager	Unknown	Local	2012-2014	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
PEA-2	Coordinate with the County to make information about mitigation available to the public via the County website and social networking outlets.	All	Moderate	County Emergency Management, Town of Biscoe	Unknown	Local	2013-2017	2018-2023.	No progress has been made on this since the previous plan.

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Town of Candor Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
Prevention									
P-1	Adopt a flood prevention ordinance to latest model ordinance.	Flood	Moderate	Town Clerk	Unknown	Local	2012-2014	2018-2023.	No progress has been made on this since the previous plan.
P-2	Consider partnering with municipalities to consolidate planning services.	All	Moderate	Town Council	Unknown	Local; County funding	2015-2017	2018-2023.	No progress has been made on this since the previous plan.
P-3	Become an NFIP member.	Flood	Moderate	Town Clerk	Unknown	Local	2012-2017	2018-2023.	No progress has been made on this since the previous plan.
P-4	Review and evaluate snow and ice removal plans for each city/county. Evaluate and determine priority routes.	Winter Storm	Moderate	Town Public Works	Unknown	Local	2012-2014	2018-2023.	No progress has been made on this since the previous plan.
P-5	Develop program to clear debris from culverts and storm drains in urbanized areas.	Flood	Moderate	Town Public Works	Unknown	Local	2012-2014	2018-2023.	No progress has been made on this since the previous plan.
P-6	Develop a water conservation voluntary and mandatory program for drought conditions.	Drought	Moderate	Town Public Works Director	Unknown	Local	2012-2014	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-7	Through subdivision regulations, encourage that power, cable and telephone lines be buried.	All	Moderate	Town Clerk	Unknown	Local	2012-2014	2018-2023.	No progress has been made on this since the previous plan.
Property Protection									
PP-1	Evaluate current capacity of critical services to deal with power outages.	Winter Storm; Wind	Moderate	County EMS Director; County Manager; Town Fire Chief	Unknown	Local	2012-2014	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
PP-2	Seek grant funding for mitigation opportunities eligible under the most current version of the UHMA Guidance and Public Assistance 406 mitigation Guidance at the time of application. Projects could include but are not limited to: acquisition, elevation, mitigation reconstruction, and wet/dry flood proofing to commercial and/or residential structures as applicable; redundant power to critical facilities, wind retrofits to critical facilities, storm shelters and other activities that reduce to the loss of life and property.	All	High	Emergency Management, Engineering and/or Planning Departments of each jurisdiction	Project Cost, Staff Hours, and applicable cost share	Federal and State Grants, Local Operating Budget	2018- 2023	2018-2023	New Action.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
Emergency Services									
ES-1	Identify and designate at least one emergency shelter in Candor.	All	Moderate	Town Clerk	Unknown	Local	2012-2014	2018-2023.	No progress has been made on this since the previous plan.
ES-2	Put in place a countywide 911 reverse call system for location specific warning to public of impending disaster.	All	Moderate	County 911 Director	Unknown	Federal funding; Homeland Security funds	2015-2017	2018-2023.	No progress has been made on this since the previous plan.
ES-3	Develop emergency water supply capability.	All	Moderate	Town Public Works Director; County Manager	Unknown	Local	2015-2017	2018-2023.	No progress has been made on this since the previous plan.
Public Education and Awareness									
PEA-1	Coordinate with the County to make information about mitigation available to the public via the County website and social networking outlets.	All	Moderate	County Emergency Management, Town of Candor	Unknown	Local	2013-2017	2018-2023.	No progress has been made on this since the previous plan.

Town of Mount Gilead Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
Prevention									
P-1	Annually review the existing emergency response plan for the Town.	All	Moderate	Town Administrator	Unknown	Local	2015-2017	2018-2023.	No progress has been made on this since the previous plan.
P-2	Adopt a flood prevention ordinance to latest model ordinance.	Flood	Moderate	Town Administrator	Unknown	Local	2012-2014	2018-2023.	No progress has been made on this since the previous plan.
P-3	Consider partnering with municipalities to consolidate planning services.	All	Moderate	Town Administrator	Unknown	Local; County funding	2015-2017	2018-2023.	No progress has been made on this since the previous plan.
P-4	Become an NFIP member.	Flood	Moderate	Town Administrator	Unknown	Local	2012-2014	2018-2023.	No progress has been made on this since the previous plan.
P-5	As part of the emergency response plan, review and evaluate snow and ice removal plans for each city/county. Evaluate and determine priority routes.	Winter Storm	Moderate	Town Public Works	Unknown	Local	2012-2014	2018-2023.	No progress has been made on this since the previous plan.
P-6	Develop program to clear debris from culverts and storm drains in urbanized areas.	Flood	Moderate	Town Public Works	Unknown	Local	2012-2014	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-7	Develop a water conservation voluntary and mandatory program for drought conditions.	Drought	Moderate	Town Public Works Director	Unknown	Local	2012-2014	2018-2023.	No progress has been made on this since the previous plan.
P-8	Through subdivision regulations, encourage that power, cable and telephone lines be buried.	All	Moderate	Town Administrator	Unknown	Local	2012-2014	2018-2023.	No progress has been made on this since the previous plan.
Property Protection									
PP-1	Evaluate current capacity of critical services to deal with power outages.	Winter Storm; Wind	Moderate	County EMS Director; County Manager; Town Fire Chief	Unknown	Local	2012-2017	2018-2023.	No progress has been made on this since the previous plan.
PP-2	As part of annual budget process, procure generators. Priority need for generator at wastewater treatment plant.	Winter Storm; Wind	Moderate	Town Administrator; Town Wastewater Treatment Plant Supervisor	Unknown	Local	2012-2017	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
PP-3	Seek grant funding for mitigation opportunities eligible under the most current version of the UHMA Guidance and Public Assistance 406 mitigation Guidance at the time of application. Projects could include but are not limited to: acquisition, elevation, mitigation reconstruction, and wet/dry flood proofing to commercial and/or residential structures as applicable; redundant power to critical facilities, wind retrofits to critical facilities, storm shelters and other activities that reduce to the loss of life and property.	All	High	Emergency Management, Engineering and/or Planning Departments of each jurisdiction	Project Cost, Staff Hours, and applicable cost share	Federal and State Grants, Local Operating Budget	2018- 2023	2018-2023	New Action.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
Emergency Services									
ES-1	Identify and designate at least one emergency shelter in Mt. Gilead.	All	Moderate	Town Administrator	Unknown	Local	2012-2017	2018-2023.	No progress has been made on this since the previous plan.
ES-2	Put in place a countywide 911 reverse call system for location specific warning to public of impending disaster.	All	Moderate	Town Administrator	Unknown	Local	2015-2017	2018-2023.	No progress has been made on this since the previous plan.
ES-3	Develop emergency water supply capability.	All	Moderate	Town Public Works Director; County Manager	Unknown	Local; Possible Federal	2015-2017	2018-2023.	No progress has been made on this since the previous plan.
Public Education and Awareness									
PEA-1	Educate and inform local government and elected officials (decision makers) of the need to consider hazard mitigation in policy and budgetary planning and decision making processes.	All	Moderate	Town Administrator	Unknown	Local	2012-2014	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
PEA-2	Coordinate with the County to make information about mitigation available to the public via the County website and social networking outlets.	All	Moderate	County Emergency Management, Town of Mount Gilead	Unknown	Local	2013-2017	2018-2023.	No progress has been made on this since the previous plan.

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Town of Star Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
Prevention									
P-1	Adopt a flood prevention ordinance to latest model ordinance.	Flood	Moderate	Town Clerk	Unknown	Local	2012-2014	2018-2023.	No progress has been made on this since the previous plan.
P-2	Consider partnering with municipalities to consolidate planning services.	All	Moderate	Town Council	Unknown	Local; County funding	2015-2017	2018-2023.	No progress has been made on this since the previous plan.
P-3	Become an NFIP member.	Flood	Moderate	Town Clerk	Unknown	Local	2012-2017	2018-2023.	No progress has been made on this since the previous plan.
P-4	Review and evaluate snow and ice removal plans for each city/county. Evaluate and determine priority routes.	Winter Storm	Moderate	Town Public Works	Unknown	Local	2012-2014	2018-2023.	No progress has been made on this since the previous plan.
P-5	Develop program to clear debris from culverts and storm drains in urbanized areas.	Flood	Moderate	Town Public Works	Unknown	Local	2012-2014	2018-2023.	No progress has been made on this since the previous plan.
P-6	Develop a water conservation voluntary and mandatory program for drought conditions.	Drought	Moderate	Town Public Works Director	Unknown	Local	2012-2014	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-7	Through subdivision regulations, encourage that power, cable and telephone lines be buried.	All	Moderate	Town Clerk	Unknown	Local	2012-2014	2018-2023.	No progress has been made on this since the previous plan.
Property Protection									
PP-1	Evaluate current capacity of critical services to deal with power outages.	Winter Storm; Wind	Moderate	County EMS Director; County Manager; Town Fire Chief	Unknown	Local	2012-2014	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
PP-2	Seek grant funding for mitigation opportunities eligible under the most current version of the UHMA Guidance and Public Assistance 406 mitigation Guidance at the time of application. Projects could include but are not limited to: acquisition, elevation, mitigation reconstruction, and wet/dry flood proofing to commercial and/or residential structures as applicable; redundant power to critical facilities, wind retrofits to critical facilities, storm shelters and other activities that reduce to the loss of life and property.	All	High	Emergency Management, Engineering and/or Planning Departments of each jurisdiction	Project Cost, Staff Hours, and applicable cost share	Federal and State Grants, Local Operating Budget	2018- 2023	2018-2023	New Action.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
Emergency Services									
ES-1	Identify and designate at least one emergency shelter in Star.	All	Moderate	Town Clerk	Unknown	Local	2012-2014	2018-2023.	No progress has been made on this since the previous plan.
ES-2	Put in place a countywide 911 reverse call system for location specific warning to public of impending disaster.	All	Moderate	County 911 Director	Unknown	Federal funding; Homeland Security funds	2015-2017	2018-2023.	No progress has been made on this since the previous plan.
ES-3	Develop emergency water supply capability.	All	Moderate	Town Public Works Director; County Manager	Unknown	Local; Possible Federal	2015-2017	2018-2023.	No progress has been made on this since the previous plan.
Public Education and Awareness									
PEA-1	Coordinate with the County to make information about mitigation available to the public via the County website and social networking outlets.	All	Moderate	County Emergency Management, Town of Star	Unknown	Local	2013-2017	2018-2023.	No progress has been made on this since the previous plan.

Town of Troy Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
Prevention									
P-1	Annually review the emergency response plan for the Town.	All	Moderate	Town Manager	Unknown	Local	2012-2014	2018-2023.	No progress has been made on this since the previous plan.
P-2	Adopt a flood prevention ordinance to latest model ordinance.	Flood	Moderate	Town Manager	Unknown	Local	2012-2014	2018-2023.	No progress has been made on this since the previous plan.
P-3	Become an NFIP member.	Flood	Moderate	Town Manager	Unknown	Local	2012-2014	2018-2023.	No progress has been made on this since the previous plan.
P-4	Develop a comprehensive land use plan.	All	Moderate	Town Planning Department	Unknown	Local	2015-2017	2018-2023.	No progress has been made on this since the previous plan.
P-5	Look into upgrading mapping system to GIS capability.	All	Moderate	Town Planner; Town Finance Officer	Unknown	Local	2015-2017	2018-2023.	No progress has been made on this since the previous plan.
P-6	Review and evaluate snow and ice removal plans for each city/county. Evaluate and determine priority routes.	Winter Storm	Moderate	Town Public Works	Unknown	Local	2012-2014	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-7	Develop program to clear debris from culverts and storm drains in urbanized areas.	Flood	Moderate	Town Public Works	Unknown	Local	2012-2014	2018-2023.	No progress has been made on this since the previous plan.
P-8	Develop a water conservation voluntary and mandatory program for drought conditions.	Drought	Moderate	Town Public Works Director	Unknown	Local	2012-2014	2018-2023.	No progress has been made on this since the previous plan.
P-9	Through subdivision regulations, encourage that power, cable and telephone lines be buried.	All	Moderate	Town Planning Department	Unknown	Local	2015-2017	2018-2023.	No progress has been made on this since the previous plan.
P-10	Designate preferred growth areas and develop areas plans for target locations.	All	Moderate	Town Planning Department	Unknown	Local	2015-2017	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-11	Through subdivision regulations, require street interconnectivity in all new subdivision to all multiple access points for emergency vehicles.	All	Moderate	Town Planning Department	Unknown	Local	2015-2017	2018-2023.	No progress has been made on this since the previous plan.
P-12	Through subdivision regulations, consider additional vegetative buffer for large developments with extensive impervious surfaces.	All	Moderate	Town Planning Department	Unknown	Local	2015-2017	2018-2023.	No progress has been made on this since the previous plan.
P-13	Consider amending subdivision ordinance to allow clustering to maximize density while preserving high hazard areas.	All	Moderate	Town Planning Department	Unknown	Local	2015-2017	2018-2023.	No progress has been made on this since the previous plan.
Property Protection									
PP-1	Evaluate current capacity of critical services to deal with power outages.	Winter Storm; Wind	Moderate	Town Manager	Unknown	Local	2012-2014	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
PP-2	Seek grant funding for mitigation opportunities eligible under the most current version of the UHMA Guidance and Public Assistance 406 mitigation Guidance at the time of application. Projects could include but are not limited to: acquisition, elevation, mitigation reconstruction, and wet/dry flood proofing to commercial and/or residential structures as applicable; redundant power to critical facilities, wind retrofits to critical facilities, storm shelters and other activities that reduce to the loss of life and property.	All	High	Emergency Management, Engineering and/or Planning Departments of each jurisdiction	Project Cost, Staff Hours, and applicable cost share	Federal and State Grants, Local Operating Budget	2018- 2023	2018-2023	New Action.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
Natural Resource Protection									
NRP-1	Through subdivision regulations, wherever possible preserve natural wetlands and designate conservation corridors.	All	Moderate	Town Planning Department	Unknown	Local	2015-2017	2018-2023.	No progress has been made on this since the previous plan.
Emergency Services									
ES-1	Identify and designate at least one emergency shelter in Troy.	All	Moderate	Town Manager	Unknown	Local	2012-2014	2018-2023.	No progress has been made on this since the previous plan.
ES-2	Put in place a countywide 911 reverse call system for location specific warning to public of impending disaster.	All	Moderate	County 911 Director	Unknown	Federal funding; Homeland Security funds	2015-2017	2018-2023.	No progress has been made on this since the previous plan.
ES-3	Develop emergency water supply capability.	All	Moderate	County Public Works Director; Town Manager; County Manager	Unknown	Local; Possible Federal	2015-2017	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
Public Education and Awareness									
PEA-1	Educate and inform local government and elected officials (decision makers) of the need to consider hazard mitigation in policy and budgetary planning and decision making processes.	All	Moderate	Town Manager; Town Planning Department	Unknown	Local	2012-2017	2018-2023.	No progress has been made on this since the previous plan.
PEA-2	Coordinate with the County to make information about mitigation available to the public via the County website and social networking outlets.	All	Moderate	County Emergency Management, Town of Troy	Unknown	Local	2013-2017	2018-2023.	No progress has been made on this since the previous plan.

Richmond County Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	2017 Status & Narrative Explanation
Prevention									
P-1	Develop plan for alternate water storage and transportation methods for areas severely affected. Work with existing resources (i.e., fire departments, water departments, etc.) to develop "creative" water distribution.	Drought; Extreme Heat	Low	County Public Works Director	Unknown	State and Federal Programs	2013-2017	2018-2023.	Leasing / Renting of Bulk Storage (tankers) will be utilized should the need arise to supply water to severely affected areas. Coordination and participation shall be performed with local fire departments to provide and address the needs of the citizens
P-2	Reduce potential fuel loads. Evaluate and enforce building and zoning ordinances.	Wildfire	High	County Planning Director	Unknown	Local	2012-2013	2018-2023.	No progress has been made on this since the previous plan.
P-3	Expand and improve existing water distribution systems. Identify conservation methods and establish Public Service Announcements accordingly.	Drought; Extreme Heat	Moderate	County Cooperative Extension Service Director	Unknown	Local; State; Federal; Possible private	2013-2015	2012- 2023.	Partner with Richmond Soil and Water and NRCS to promote conservation methods.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	2017 Status & Narrative Explanation
P-4	Review plans for water conservation and distribution. Compare plans with changing needs of given locations.	Drought; Extreme Heat	Moderate	County Public Works Director	Unknown	Local	2013-2015	2018-2023.	We continue to look for ways to improve on water conservation and improve our distribution system.
P-5	Clear and maintain utility rights of way. Survey and clear right of ways of debris and growth.	Winter Storm	High	County Public Works Director	Unknown	Local; State; Federal; Utilities	2013-2017	2018-2023.	Our water lines are almost completely located on the NCDOT ROW where there is minimal if any clearing to be done. Richmond County is prepared should the need arise to perform clearing for access to its utilities.
P-6	Clear and maintain ditches, canals, and streams. Wherever practical, encourage landowners to expand and maintain drain ways for maximum effect.	Severe Thunderstorm	High	County Public Works Director	Unknown	Local; State; Federal; Utilities	2014-2016	2018-2023.	Richmond County maintains no roadways so most of this work is completed by state forces. Should there be a need for assistance, Richmond County will provide services as they are available
P-7	Reduce potential fuel loads. Remove debris.	Wildfire	High	County Fire Department	Unknown	Local; State	2014-2017	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	2017 Status & Narrative Explanation
P-8	Clear and maintain utility rights of ways. Whenever possible, encourage underground installation of utility lines.	Winter Storms	High	County Public Works Director	Unknown	Local; Utilities	2014-2017	2018-2023.	Clearing of ROW's shall be responsibility of Utility owner. Richmond County shall maintain access to all water and sewer lines operated by the County
P-9	Expand and improve existing water distribution systems. Establish funding for waterline expansion or well construction.	Drought; Extreme Heat	Moderate	Count Community resources Director	Unknown	Local; Federal	2015-2022	2018-2023.	No progress has been made on this since the previous plan.
Property Protection									
PP-1	Reduce the amount of sub-standard structures. Have sub-standard structures removed.	Tornado	High	County Building Inspector	Unknown	Local; Federal	2014-2015	2018-2023.	No progress has been made on this since the previous plan.
PP-2	Reduce potential fuel loads. Demolish and remove structures.	Wildfire	High	County Fire Marshal	Unknown	Local; State; Federal; Private	2015-2017	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	2017 Status & Narrative Explanation
PP-3	Seek grant funding for mitigation opportunities eligible under the most current version of the UHMA Guidance and Public Assistance 406 mitigation Guidance at the time of application. Projects could include but are not limited to: acquisition, elevation, mitigation reconstruction, and wet/dry flood proofing to commercial and/or residential structures as applicable; redundant power to critical facilities, wind retrofits to critical facilities, storm shelters and other activities that reduce to the loss of life and property.	All	High	Emergency Management, Engineering and/or Planning Departments of each jurisdiction	Project Cost, Staff Hours, and applicable cost share	Federal and State Grants, Local Operating Budget	2018- 2023	2018-2023	New Action.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	2017 Status & Narrative Explanation
Emergency Services									
ES-1	Increase the number of water points available for fire suppression. Install dry hydrants.	Wildfire	High	County Emergency Management Coordinator	Unknown	Local; State; Federal; Possibly private	2013-2015	2018-2023.	No progress has been made on this since the previous plan.
ES-2	Increase the amount of relief available to the needy during times of extended high heat. Advertise to the public both need for funds and the resource.	Drought; Extreme Heat	High	County Social Services	$200,000	Business; Local; State; Federal; Private; Utilities	2013-2015	2012- 2023.	CIP Services thru DSS along with partnerships with Aging Service Senior Centers has met population needs.
ES-3	Minimize delay in fire/rescue and emergency services ability to respond during severe ice conditions. Secure and maintain supplemental equipment necessary for operations during severe ice conditions.	Winter Storm	High	County Fire/Rescue/ EMS	Unknown	Local; State; Federal	2013-2015	2012- 2023.	As new trucks are ordered, they are equipped with devices to assist.
ES-4	Pre-supply emergency shelters. Pre-place supplies in secure containers.	Tornado	Low	County Red Cross Director	Unknown	Local; State; Federal; Private	2013-2015	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	2017 Status & Narrative Explanation
ES-5	Upgrade utility fleets to include 4-wheel drive vehicles. Replace key vehicles with ones with 4-wheel drive as existing vehicles age out of fleet service.	Winter Storm	High	County Public Works Director	Unknown	Local; Private; Utilities	2014-2017	2012- 2023.	Water Maintenance fleet continues to replace 2 wheel drive with 4 wheel drive vehicles on an as needed basis
ES-6	Relocate County Ranger Office and equipment to a more central location in the County. Procure land and funding.	Wildfire	Moderate	County Forestry Ranger	Unknown	Local; State	2014-2017	2018-2023.	Working with Senators and Richmond County Government to establish plan
ES-7	Pre-supply emergency shelters. Secure supply funding.	Tornado	Low	County Red Cross Director	Unknown	Local; State; Federal; Non-profit	2015-2017	2018-2023.	No progress has been made on this since the previous plan.
Structural Projects									
S-1	Clear and maintain ditches, canals, and streams. Design alternate means of drainage when necessary.	Severe Thunderstorm	High	County Public Works Director	Unknown	Local; State; Federal; Utilities	2014-2016	2018-2023.	Richmond County shall assist as necessary. However, most of these items shall be performed by state forces

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	2017 Status & Narrative Explanation
Public Education and Awareness									
PEA-1	Provide public education to the hazards of drought/extreme heat. Publicize via: distribution of flyers an articles, articles in the local newspaper, and make handouts available at public libraries.	Drought; Extreme Heat	Moderate	County Cooperative Extension	Unknown	Local and Federal funds	2012-2013	2012- 2023.	Extension staff writes weekly articles for the Daily Journal and also publish on the Extension website and Facebook pages.
PEA-2	Reduce potential fuel loads. Publicize via: distribution of flyers and articles, articles in the local newspaper, and make handouts available at libraries.	Wildfire	High	County Forestry Ranger	Unknown	State; Possibly Federal	2012-2013	2018-2023.	This action is 50% complete.
PEA-3	Expand the public water system to vulnerable areas of the County. Educate the public.	Drought; Extreme Heat	Low	County Public Works Director	Unknown	Local; State; Federal; Possibly private	2013-2015	2018-2023.	Richmond County will continue to monitor water system expansion on an as needed basis. Public Education outreach is performed via Richmond County web page, monthly billing inserts, PSA's, etc.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	2017 Status & Narrative Explanation
PEA-4	Reduce contamination from storm runoff. Promote responsible farming practices	Flood	Moderate	County Cooperative Extension Service Director	Unknown	Federal	2013-2017	2018-2023.	Partner with Richmond Soil and Water and NRCS to promote conservation methods.
PEA-5	Emphasize conservation of electricity. Publicize via: distribution of flyers and articles, articles in the local newspaper, and make handouts available to public libraries.	Drought; Extreme Heat	Moderate	County Cooperative Extension	Unknown	Local; State; Non-profit; Utilities	2014-2017	2018-2023 as needed.	Partner with USDA Rural Development in providing REAP applications to farms. (Rural Energy for America Program.) Promote energy efficiency and renewable energy to farms and businesses.
PEA-6	Make information about mitigation available to the public via the County website and social networking outlets.	All	Moderate	County Emergency Management	Unknown	Local	2013-2017	2018-2023.	No progress has been made on this since the previous plan.

Town of Dobbins Heights Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
Prevention									
P-1	Provide cell phones to key Town personnel.	All	Moderate	Town Mayor	Unknown	Local, State, Federal	2012-2017	2018-2023.	No progress has been made on this since the previous plan.
P-2	Provide two way radios to key Town personnel.	All	Moderate	Town Mayor	Unknown	Local, State, Federal	2012-2017	2018-2023.	No progress has been made on this since the previous plan.
P-3	Take the necessary steps to begin participation in the National Flood Insurance Program to ensure the availability of flood insurance for property owners.	Flood	Moderate	Town Mayor	Unknown	Staff Time Only	2012-2017	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
Property Protection									
PP-1	Continue to consider the relationship between proposed infrastructure locations and hazard prone areas in the capital improvement planning process. If reasonable and possible, public infrastructure will be placed outside of hazard prone areas.	Flood	Moderate	Town Mayor	Unknown	Staff Time Only	2012-2023	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
PP-2	Seek grant funding for mitigation opportunities eligible under the most current version of the UHMA Guidance and Public Assistance 406 mitigation Guidance at the time of application. Projects could include but are not limited to: acquisition, elevation, mitigation reconstruction, and wet/dry flood proofing to commercial and/or residential structures as applicable; redundant power to critical facilities, wind retrofits to critical facilities, storm shelters and other activities that reduce to the loss of life and property.	All	High	Emergency Management, Engineering and/or Planning Departments of each jurisdiction	Project Cost, Staff Hours, and applicable cost share	Federal and State Grants, Local Operating Budget	2018- 2023	2018-2023	New Action.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
Emergency Services									
ES-1	Monitor the Town's emergency infrastructure including but not limited to backup generators, communications equipment, and vehicles by maintaining a routine maintenance and testing schedule. This action will ensure equipment is functioning properly if needed during or in the aftermath of a disaster.	All	Moderate	Town Mayor	Unknown	Staff Time Only	2012-2023	2018-2023.	No progress has been made on this since the previous plan.
Public Education and Awareness									
PEA-1	Have brochures about different natural hazards available for the public at Town Hall and other public locations deemed possible.	All	Moderate	Town Mayor	Unknown	Hazard brochures are available from NCEM and from other agencies. Usually free of charge.	2012-2023.	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
PEA-2	Use the local cable access channel to disseminate information about advanced preparation which residents and businesses can perform that will assist in minimizing the effects and inconveniences associated with natural hazards.	All	Moderate	Town Mayor	Unknown	Local funds	2012-2023	2018-2023.	No progress has been made on this since the previous plan.
PEA-3	Educate citizens about appropriate actions if they find themselves in the path of a tornado, preparing for a possible hurricane, or in a thunderstorm.	Tornado; Hurricane; Severe Thunderstorm	Moderate	Town Mayor	Unknown	Staff Time Only	2012-2023	2018-2023.	No progress has been made on this since the previous plan.
PEA-4	Coordinate with County EM to make information about mitigation available to the public via the County website, Town website and/or social networking outlets.	All	Moderate	County Emergency Management, Town of Dobbins Heights	Unknown	Local	2013-2017	2018-2023.	No progress has been made on this since the previous plan.

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Town of Ellerbe Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
Prevention									
P-1	Provide cell phones to key Town personnel.	All	Moderate	Town Mayor	Unknown	Local, State, Federal	2012-2017	2018-2023.	No progress has been made on this since the previous plan.
P-2	Provide two way radios to key Town personnel.	All	Moderate	Town Mayor	Unknown	Local, State, Federal	2012-2017	2018-2023.	No progress has been made on this since the previous plan.
P-3	Continue to enforce floodplain management regulations which limit and sets standards for developments in flood hazard zones.	Flood	Moderate	Town Mayor	Unknown	Staff Time Only	2012-2023	2018-2023.	No progress has been made on this since the previous plan.
P-4	Provide proper maintenance and upkeep of public drainage systems. The periodic removal of sediment and debris from ditches, catch basins, and storm drains will assist in preventing localized flooding during natural hazards.	Flood	Moderate	Town Mayor	Unknown	Staff Time Only	2012-2023	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-5	Take necessary steps to begin participation in the National Flood Insurance Program to ensure the availability of flood insurance for property owners.	Flood	Moderate	Town Mayor	Unknown	Staff Time Only	2012-2017	2018-2023.	No progress has been made on this since the previous plan.
P-6	Develop a water conservation plan that will establish Town policies for conserving water during periods of drought. Such plan must be established prior to the onset of a drought in order to expedite its implementation during a drought. Once the plan is developed, it can be implemented on an as-needed basis.	Drought	Moderate	Town Mayor	Unknown	Local, State, Federal	2012-2017	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
Property Protection									
PP-1	Continue to consider the relationship between proposed infrastructure locations and hazard prone areas in the capital improvement planning process. If reasonable and possible, public infrastructure will be placed outside of hazard prone areas.	All	Moderate	Town Mayor	Unknown	Staff time only	2012-2023	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
PP-2	Seek grant funding for mitigation opportunities eligible under the most current version of the UHMA Guidance and Public Assistance 406 mitigation Guidance at the time of application. Projects could include but are not limited to: acquisition, elevation, mitigation reconstruction, and wet/dry flood proofing to commercial and/or residential structures as applicable; redundant power to critical facilities, wind retrofits to critical facilities, storm shelters and other activities that reduce to the loss of life and property.	All	High	Emergency Management, Engineering and/or Planning Departments of each jurisdiction	Project Cost, Staff Hours, and applicable cost share	Federal and State Grants, Local Operating Budget	2018- 2023	2018-2023	New Action.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
Emergency Services									
ES-1	Monitor the status of the Town's emergency infrastructure including but not limited to backup generators, communications equipment, and vehicles by maintaining a routine maintenance and testing schedule. This action will ensure equipment is functioning properly if needed during or in the aftermath of a disaster.	All	Moderate	Town Mayor	Unknown	Staff time only	2012-2023	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
ES-2	Develop a comprehensive assessment of each department's emergency infrastructure and determine if current and future needs for emergency response in the aftermath of a disaster are met. Outdated and antiquated equipment will be repaired or replaced as funding allows, and additional equipment that is needed will be purchases as funding allows.	All	Moderate	Town Mayor	Unknown	Staff time only	2012-2023	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
Structural Projects									
S-1	Continue to improve the existing stormwater management system to ensure new development and increased impervious surface areas do not overburden the existing system. Such improvements may include cleaning and piping open ditches, upsizing existing drainage system components, and installing curb and gutter to properly channel water into the drainage system.	Flood	Moderate	Town Mayor	Unknown	Staff time only	2012-2023	2018-2023.	No progress has been made on this since the previous plan.
Public Education and Awareness									
PEA-1	Have brochures about different natural hazards available for the public at Town Hall and other public locations deemed possible.	All	Moderate	Town Mayor	Unknown	Hazard brochures are available from NCEM and from other agencies. Usually free of charge.	2012-2023.	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
PEA-2	Use the local cable access channel to disseminate information about advanced preparation which residents and businesses can perform that will assist in minimizing the effects and inconveniences associated with natural hazards.	All	Moderate	Town Mayor	Unknown	Local funds	2012-2023	2018-2023.	No progress has been made on this since the previous plan.
PEA-3	Educate citizens about appropriate actions if they find themselves in the path of a tornado, preparing for a possible hurricane, or in a thunderstorm.	Tornado; Hurricane; Severe Thunderstorm	Moderate	Town Mayor	Unknown	Staff time only	2012-2023	2018-2023.	No progress has been made on this since the previous plan.
PEA-4	Coordinate with County EM to make information about mitigation available to the public via the County website, Town website and/or social networking outlets.	All	Moderate	County Emergency Management, Town of Ellerbe	Unknown	Local	2013-2017	2018-2023.	No progress has been made on this since the previous plan.

City of Hamlet Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
Prevention									
P-1	Provide cell phones to key City personnel.	All	Moderate	City Mayor	Unknown	Local, State, Federal	2012-2017	Completed 2017.	All department heads have city cell phones.
P-2	Provide two way radios to key City personnel.	All	Moderate	City Mayor	Unknown	Local, State, Federal	2012-2017	Completed 2017.	Both fire and police personnel have two-way radios.
P-3	Continue to enforced flood management which limits and sets standards for developments in flood hazard zones.	Flood	Moderate	City Mayor	Unknown	Staff time only	2012-2023	2018-2023.	Preparation made via ordinance implementation.
P-4	Provide proper maintenance and upkeep of public drainage systems. The periodic removal of sediment and debris from ditches, catch basins, and storm drains will assist in preventing localized flooding during natural hazards.	Flood	Moderate	City Mayor	Unknown	Staff time only	2012-2023	2018-2023.	Public Works continues to monitor, drain, and upkeep drainage systems on a regular basis.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-5	Continue to participate in the National Flood Insurance Program to ensure the availability of flood insurance for property owners.	Flood	Moderate	City Mayor	Unknown	Staff time only	2012-2023	2018-2023.	The City continues to do all things necessary to meet all requirements for participating in the NFIP annually. .
P-6	Develop a water conservation plan that will establish City policies for conserving water during periods of drought. Such plan much be established prior to the onset of a drought in order to expedite its implementation during a drought. Once the plan is developed, it can be implemented on an as-needed basis.	Drought	Moderate	City Mayor	Unknown	Local, State, Federal	2012-2017	2018-2023.	Preparation made via ordinance implementation.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
Property Protection									
PP-1	Continue to consider the relationship between proposed infrastructure locations and hazard prone areas in the capital improvement planning process. If reasonable and possible, public infrastructure will be place outside of hazard prone areas.	All	Moderate	City Mayor	Unknown	Staff time only	2012-2023	2018-2023.	Infrastructure and asset management plans have been conducted that will be utilized for future reference in regards to proposed capital improvement plans.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
PP-2	Seek grant funding for mitigation opportunities eligible under the most current version of the UHMA Guidance and Public Assistance 406 mitigation Guidance at the time of application. Projects could include but are not limited to: acquisition, elevation, mitigation reconstruction, and wet/dry flood proofing to commercial and/or residential structures as applicable; redundant power to critical facilities, wind retrofits to critical facilities, storm shelters and other activities that reduce to the loss of life and property.	All	High	Emergency Management, Engineering and/or Planning Departments of each jurisdiction	Project Cost, Staff Hours, and applicable cost share	Federal and State Grants, Local Operating Budget	2018- 2023	2018-2023	New Action.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
Emergency Services									
ES-1	Monitor the status of the City's emergency infrastructure including but not limited to backup generators, communications equipment, and vehicles by maintaining a routine maintenance and testing schedule. This action will ensure equipment is functioning properly if needed during or in the aftermath of a disaster.	All	Moderate	City Mayor	Unknown	Staff time only	2012-2023	2018-2023.	Issue with regular monitoring and upkeep in place.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
ES-2	Develop a comprehensive assessment of each department's emergency infrastructure and determine if current and future anticipated needs for emergency response in the aftermath of a disaster are met. Outdated and antiquated equipment will be repaired and replaced as funding allows, and additional equipment that is needed will be purchased as funding allows.	All	Moderate	City Mayor	Unknown	Staff time only	2012-2023.	2018-2023.	Issue with regular monitoring of current equipment and the availability of funds for newer equipment.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
Structural Projects									
S-1	Continue to improve the existing stormwater management system to ensure new development and increased impervious surface areas do not overburden the existing system. Such improvements may include cleaning and piping open ditches, upsizing existing drainage system components, and installing curb and gutter to properly channel water into the drainage system.	Flood	Moderate	City Mayor	Unknown	Staff time only	2012-2023	2018-2023.	Issue with regular maintenance, cleaning, and upkeep on stormwater drains throughout the City.
Public Education and Awareness									
PEA-1	Have brochures about different natural disaster available for the public at City Hall and other locations deemed possible.	All	Moderate	City Mayor	Unknown	Hazard brochures are available from NCEM and from other agencies. Usually free of charge.	2012-2023.	2018-2023	Future priority. Such a priority will be assessed and evaluated in the future.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
PEA-2	Use the local cable access channel to disseminate information about advanced preparation which residents and businesses can perform that will assist in minimizing the effects and inconveniences associated with natural hazards.	All	Moderate	City Mayor	Unknown	Local funds	2012-2023	2018-2023	Future priority. Such a priority will be assessed and evaluated in the future.
PEA-3	Educate citizens about appropriate actions if they find themselves in the path of a tornado, preparing for a hurricane, or in a thunderstorm.	Tornado; Hurricane; Severe Thunderstorm	Moderate	City Mayor	Unknown	Staff time only	2012-2023	2018-2023	Future priority. Such a priority will be assessed and evaluated in the future.
PEA-4	Coordinate with County EM to make information about mitigation available to the public via the County website, Town website and/or social networking outlets.	All	Moderate	County Emergency Management, City of Hamlet	Unknown	Local	2013-2017	2018-2023	Future priority. Such a priority will be assessed and evaluated in the future.

Town of Hoffman Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
Prevention									
P-1	Provide cell phones to key Town personnel.	All	Moderate	Town Mayor	Unknown	Local, State, Federal	2012-2017	2018-2023.	No progress has been made on this since the previous plan.
P-2	Provide two way radios to key Town personnel.	All	Moderate	Town Mayor	Unknown	Local, State, Federal	2012-2017	2018-2023.	No progress has been made on this since the previous plan.
P-3	Take necessary steps to begin participation in the National Flood Insurance Program to ensure the availability of flood insurance for property owners.	Flood	Moderate	Town Mayor	Unknown	Staff time only	2012-2017	2018-2023.	No progress has been made on this since the previous plan.
Property Protection									
PP-1	Continue to ensure the relationship between proposed infrastructure locations and hazard prone areas in the capital improvement planning process. If reasonable and possible, public infrastructure will be placed outside of the hazard prone areas.	All	Moderate	Town Mayor	Unknown	Staff time only	2012-2023	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
PP-2	Seek grant funding for mitigation opportunities eligible under the most current version of the UHMA Guidance and Public Assistance 406 mitigation Guidance at the time of application. Projects could include but are not limited to: acquisition, elevation, mitigation reconstruction, and wet/dry flood proofing to commercial and/or residential structures as applicable; redundant power to critical facilities, wind retrofits to critical facilities, storm shelters and other activities that reduce to the loss of life and property.	All	High	Emergency Management, Engineering and/or Planning Departments of each jurisdiction	Project Cost, Staff Hours, and applicable cost share	Federal and State Grants, Local Operating Budget	2018- 2023	2018-2023	New Action.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
Emergency Services									
ES-1	Monitor the Town's emergency infrastructure including but not limited to backup generators, communications equipment, and vehicles by maintaining a routine maintenance and testing schedule. This action will ensure equipment is functioning properly if needed during or in the aftermath of a disaster.	All	Moderate	Town Mayor	Unknown	Staff time only	2012-2023	2018-2023.	No progress has been made on this since the previous plan.
Public Education and Awareness									
PEA-1	Have brochures about different natural disasters available for the public at Town Hall and other public locations deemed possible.	All	Moderate	Town Mayor	Unknown	Hazard brochures are available from NCEM and from other agencies. Usually free of charge.	2012-2023.	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
PEA-2	Use the local cable access channel to disseminate information about advanced preparation which residents and businesses can perform that will assist in minimizing the effects and inconveniences associated with natural hazards.	All	Moderate	Town Mayor	Unknown	Local funds	2012-2023	2018-2023.	No progress has been made on this since the previous plan.
PEA-3	Educate citizens about appropriate actions if they find themselves in the path of a tornado, preparing for a possible hurricane, or in a thunderstorm.	Tornado; Hurricane; Severe Thunderstorm	Moderate	Town Mayor	Unknown	Staff time only	2012-2023	2018-2023.	No progress has been made on this since the previous plan.
PEA-4	Coordinate with County EM to make information about mitigation available to the public via the County website, Town website and/or social networking outlets.	All	Moderate	County Emergency Management, Town of Hoffman	Unknown	Local	2013-2017	2018-2023.	No progress has been made on this since the previous plan.

Town of Norman Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
Prevention									
P-1	Provide cell phones to key town personnel.	All	Moderate	Town Mayor	Unknown	Local, State, Federal	2012-2017	2018-2023.	No progress has been made on this since the previous plan.
P-2	Provide two way radios to key town personnel.	All	Moderate	Town Mayor	Unknown	Local, State, Federal	2012-2017	2018-2023.	No progress has been made on this since the previous plan.
P-3	Take the necessary steps to begin participation in the National Flood Insurance Program to ensure the availability of flood insurance for property owners.	Flood	Moderate	Town Mayor	Unknown	Staff time only	2012-2017	2018-2023.	No progress has been made on this since the previous plan.
Property Protection									
PP-1	Continue to consider the relationship between proposed infrastructure locations and hazard prone areas in the capital improvement planning process. If reasonable and possible, public infrastructure will be placed outside of hazard prone areas.	Flood	Moderate	Town Mayor	Unknown	Staff time only	2012-2023	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
PP-2	Seek grant funding for mitigation opportunities eligible under the most current version of the UHMA Guidance and Public Assistance 406 mitigation Guidance at the time of application. Projects could include but are not limited to: acquisition, elevation, mitigation reconstruction, and wet/dry flood proofing to commercial and/or residential structures as applicable; redundant power to critical facilities, wind retrofits to critical facilities, storm shelters and other activities that reduce to the loss of life and property.	All	High	Emergency Management, Engineering and/or Planning Departments of each jurisdiction	Project Cost, Staff Hours, and applicable cost share	Federal and State Grants, Local Operating Budget	2018- 2023	2018-2023	New Action.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
Emergency Services									
ES-1	Monitor the Town's emergency infrastructure including but not limited to backup generators, communications equipment, and vehicles by maintaining a routine maintenance and testing schedule. This action will ensure equipment is functioning properly if needed during or in the aftermath of a disaster.	All	Moderate	Town Mayor	Unknown	Staff time only	2012-2023	2018-2023.	No progress has been made on this since the previous plan.
Public Education and Awareness									
PEA-1	Have brochures about different natural hazards available for the public at Town Hall and other public locations deemed possible.	All	Moderate	Town Mayor	Unknown	Hazard brochures are available from NCEM and from other agencies. Usually free of charge.	2012-2023.	2018-2023.	No progress has been made on this since the previous plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
PEA-2	Use the local cable access channel to disseminate information about advanced preparation which residents and businesses can perform that will assist in minimizing the effects and inconveniences associated with natural hazards.	All	Moderate	Town Mayor	Unknown	Local funds	2012-2023	2018-2023.	No progress has been made on this since the previous plan.
PEA-3	Educated citizens about appropriate actions if they find themselves in the path of a tornado, preparing for a possible hurricane, or in a thunderstorm.	Tornado; Hurricane; Severe Thunderstorm	Moderate	Town Mayor	Unknown	Staff time only	2012-2023	2018-2023.	No progress has been made on this since the previous plan.
PEA-4	Coordinate with County EM to make information about mitigation available to the public via the County website, Town website and/or social networking outlets.	All	Moderate	County Emergency Management, Town of Norman	Unknown	Local	2013-2017	2018-2023.	No progress has been made on this since the previous plan.

City of Rockingham Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
Prevention									
P-1	Continue to strictly enforce the North Carolina State Building Codes to ensure that all structures are constructed to be as resilient as possible to natural hazards.	All	High	City Inspections Department	Unknown	Internal funds	2012-2023	2018-2023.	The City's Inspections Superintendent does this on a daily basis.
P-2	Continue to require the installation of underground utilities in new developments and continue to seek opportunities to bury existing overhead utilities.	All	Low	City Planning Department; City Planning and Zoning Board	Unknown	Internal funds; Various grants	2012-2023	2018-2023.	This is a requirement in the approval process for subdivision and major land developments.
P-3	Continue to provide cellular phones to al key City personnel. Such phones will be crucial for communication in the aftermath of natural disaster if land lines are damaged.	All	High	All City Department Heads	Unknown	Internal funds	2012-2023	2018-2023.	All critical City personnel are issued mobile phones.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-4	Continue to provide two-way radios to all key City personnel. Such radios will be needed for emergency response in the aftermath of a disaster.	All	High	All City Department Heads	Unknown	Internal funds	2012-2023	2018-2023.	All critical City personnel are issued two-way radios.
P-5	Continue to maintain the City's geographic information system (GIS) by providing modern computer hardware and routine updates of digital data sets. Such system is necessary to identify and map hazard areas, critical facilities, and public infrastructure.	All	High	City Planning Department	Unknown	Internal funds	2012-2023	2018-2023.	The city maintains a GIS system with modern hardware and software. The data sets are updated regularly as needed to stay current.
P-6	Place laptop computers in the vehicles of key City personnel to facilitate quicker access to data stored in the City's GIS.	All	Low	All City Department Heads	Unknown	Internal funds; Various grants	July 2007	2012- 2023.	All key personnel have access to laptop computers.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-7	Continue to strictly enforce flood management regulations which limit and set standards for development in flood hazard areas. Revisions to the City's existing flood management regulations will likely be needed in order to comply with new state and federal guidelines and deficiencies identified in the capability assessment.	Flood; Hurricane; Winter Storm; Severe Thunderstorm	High	City Planning Department	Unknown	Internal funds	2012-2023	2018-2023.	All development plans are viewed during the permitting process to ensure compliance with all applicable flood regulations.
P-8	Draft, adopt, and enforce stormwater management regulations to ensure future growth does not overburden existing drainage systems. The services of a professional consultant with expertise in stormwater management will likely be needed to assist City staff in drafting such regulations.	Flood; Hurricane; Winter Storm; Severe Thunderstorm	Low	City Planning Department; City Planning and Zoning Board; City Council	Unknown	Internal funds; Various grants	January 2012	2018-2023.	The political will does not yet exist to impose greater regulation on new developments in a community with a struggling local economy.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-9	Continue to provide for proper maintenance and upkeep of public drainage systems. The periodic removal of sediment and debris from ditches, catch basins, and storm drains will assist in preventing localized flooding during natural hazards.	Flood; Hurricane; Winter Storm; Severe Thunderstorm	Moderate	City Street Department	Unknown	Internal funds	2012-2023	2018-2023.	The City's Street department routinely clears catch basins and clean ditches to minimize local flooding.
P-10	Continue to participate in the National Flood Insurance Program to ensure the availability of flood insurance for property owners.	Flood; Hurricane; Winter Storm; Severe Thunderstorm	Moderate	City Planning Department	Unknown	Internal funds	2012-2023	2018-2023.	The City meets all requirements for participating in the NFIP annually.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-11	Continue to encourage the use of cluster style development techniques and planned residential developments in and around hazard prone areas where residential development is proposed. The reservation of open space that is required as part of such development techniques can be employed to maintain permissible densities while minimizing hazard exposure.	Flood; Hurricane; Winter Storm; Severe Thunderstorm	Moderate	City Planning Department; City Planning and Zoning Board	Unknown	Internal funds	2012-2023	2018-2023.	Since development has been relatively slow in Rockingham over the last 20 years, the pressure to develop hazard prone areas is not as great as it might be in other communities. The City has seen very few requests for development that involves hazard prone areas.
P-12	Remove beaver dams and other stream impediments along Hitchcock Creek and the north prongs of Falling Creek. The removal of such impediments will improve stream flow and reduce water backup which causes flooding.	Flood; Hurricane; Winter Storm; Severe Thunderstorm	Low	City Administration	Unknown	Internal funds; Various grants	July 2007	2018-2023.	The City continuously removes trees and log jams from these waterways.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-13	Develop and maintain a water conservation plan that will establish City policies for conserving water during periods of drought. Such plan must be established prior to the onset of a drought in order to expedite its implementation during a drought. Once the plan is developed, it can be implemented on an as needed basis.	Drought; Extreme Heat	Moderate	City Administration; City Water Treatment Department	Unknown	Internal funds	July 2005	2005- 2023.	The City water conservation plan is adopted and on file in City Hall. It can and will be implemented on an as needed basis.
P-14	Establish a City urban forestry program. The development of such program will facilitate tree planting that will increase the natural tree canopy and thereby provide a cooling effect during periods of extreme heat.	Drought; Extreme Heat	Low	City Planning Department; Planning and Zoning Board	Unknown	Internal funds	July 2013	2018-2023.	While no official urban forestry program has been established, the City has undertaken several projects to plant new street trees around the City.
P-15	Continue to maintain an agreement with Richmond County to purchase additional water as needed.	Drought; Extreme Heat	Moderate	City Council; City Manager	Unknown	Internal Funds	2012-2023	2018-2023.	The agreement is in place and in full effect.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
Property Protection									
PP-1	Continue to consider the relationship between proposed infrastructure locations and hazard prone areas in the capital improvement planning process. If reasonable and possible, public infrastructure will be placed outside of hazard prone areas.	All	High	City Manager; City Planning Director; City Public Works Director	Unknown	Internal funds	March 2005	2005- 2023.	The City did complete the relocation of the Pee Dee Pump Station as well as the School Pump Station out of the floodplain. The City is not planning to relocate the Hollybrook and Roberdel Pump Stations out of the floodplain.
PP-2	Pursue acquisition of properties located in hazard prone areas that are best suited for use as passive recreation areas as funding permits, which are consistent with the City's plans for the development of greenways and walking trails.	Flood; Hurricane; Winter Storm; Severe Thunderstorm	Moderate	City Administration; City Council	Unknown	Internal funds; Various grants	2012-2023	2018-2023.	No funds were available in the last five-year period to purchase hazard prone properties.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
PP-3	Seek grant funding for mitigation opportunities eligible under the most current version of the UHMA Guidance and Public Assistance 406 mitigation Guidance at the time of application. Projects could include but are not limited to: acquisition, elevation, mitigation reconstruction, and wet/dry flood proofing to commercial and/or residential structures as applicable; redundant power to critical facilities, wind retrofits to critical facilities, storm shelters and other activities that reduce to the loss of life and property.	All	High	Emergency Management, Engineering and/or Planning Departments of each jurisdiction	Project Cost, Staff Hours, and applicable cost share	Federal and State Grants, Local Operating Budget	2018- 2023	2018-2023	New Action.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
Natural Resource Protection									
NRP-1	Continue to utilize the Open Space zoning district in areas that are especially susceptible to natural hazards. Revisions to the boundaries of the Open Space zoning district along Hitchcock Creek, the north prong of Falling Creek, and the south prong of Falling Creek may be needed once state efforts to remap floodway and floodplain boundaries are completed.	Flood; Hurricane; Winter Storm; Severe Thunderstorm	Moderate	City Planning Department; City Planning and Zoning Board	Unknown	Internal funds	2012-2023	2018-2023.	The City continues to utilize the Open Space zoning district as a means to significantly limit development in flood hazard areas.
NRP-2	Establish conservation buffers along the banks of Hitchcock Creek and the north and south prongs of Falling Creek. The use of conservation buffers around such creeks will limit development in flood hazard areas.	Flood; Hurricane; Winter Storm; Severe Thunderstorm	Low	City Planning Department; City Planning and Zoning Board	Unknown	Internal funds	July 2011	2018-2023.	No funds were available to purchase additional conservation buffers in the last five-year period.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
NRP-3	Continue to require the use of proper erosion and sedimentation control devices in conjunction with all land disturbing activities. Such requirements reduce the amount of sediment in the storm drainage system which in turn reduces flood potential.	Flood; Hurricane; Winter Storm; Severe Thunderstorm	Moderate	City Planning and Inspections Department	Unknown	Internal funds	2012-2023	2018-2023.	The City's Code Enforcement Officer routinely reviews sedimentation and erosion control measure on his visits to construction job sites.
NRP-4	Draft, adopt, and enforce tree preservation regulations. The development of such regulations will assist in preserving the natural tree canopy and thereby provide a cooling effect during periods of extreme heat.	Drought; Extreme Heat	Low	City Planning Department; City Planning and Zoning Board; City Council	Unknown	Internal funds	July 2012	2018-2023.	The political will does not yet exist to impose greater regulation in a community with a struggling local economy.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
Emergency Services									
ES-1	Monitor the status of the City's emergency infrastructure including but not limited to backup generators, communications equipment, and vehicles by maintaining a routine maintenance and testing schedule. This action will ensure equipment is functioning properly if needed during or in the aftermath of a natural disaster.	All	High	All City Departments	Unknown	Internal funds	2012-2023	2012- 2023.	The City appropriates funds annually to replace critical equipment that would be needed during an emergency.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
ES-2	Perform a comprehensive assessment of each department's emergency infrastructure and determine if current and future anticipated needs for emergency response in the aftermath of a disaster are met. Outdated and antiquated equipment will be repaired or replaced as funding allows, and additional equipment that is needed will be purchased as funding allows.	All	High	All City Departments	Unknown	Internal funds; Various grants	2012- 2023	2012- 2023.	Each City Department Head is tasked with conducting an inventory of the department's equipment; reviewing anticipated needs; and requesting new and/or replacement equipment during the City's annual budgeting process. The City Council budgets funds annually to replace and update equipment.
ES-3	Implement early warning systems (i.e. stream gauges) on Hitchcock Creek to provide advance notice of flood events.	Flood	Moderate	All City Departments	Unknown	HMA Grant Program	2012-2017	2018-2023.	No funding yet allocated for this project

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
Structural Projects									
S-1	Continue to improve the existing stormwater management system to ensure new development and increase impervious surface areas do not overburden the existing system. Such improvements may include cleaning and piping open ditches, upsizing existing drainage system components, and installing curb and gutter to property channel water into the drainage system.	Flood; Hurricane; Winter Storm; Severe Thunderstorm	Moderate	City Street Department	Unknown	Internal funds	2012-2023	2018-2023.	This type work by the City has been somewhat limited because of limited funding. City staff does routinely work to clean ditches and culverts in efforts to minimize flooding potential.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
Public Education and Awareness									
PEA-1	Continue to require the delineation of floodplain and floodway boundaries on all final subdivision plats with a reference notation regarding limitation for future development potential. Such notation will make potential buyer, developers, and realtors aware of the potential flood hazard for such property.	Flood	Low	City Planning Department	Unknown	Internal funds	2012-2023	2018-2023.	This is a requirement in the approval process for all subdivision plats.
PEA-2	Include information on the City's website about potential hazards, hazard areas, mitigation measures in which citizens can engage, and the mitigation measure in which the City is engaged.	All	High	City Planning Department	Unknown	Internal funds	July 2005	2018-2023.	City staff periodically sends information via social media and the City website regarding upcoming hazard weather conditions.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
PEA-3	Use the local cable access channel to disseminate information about advanced preparations, which residents and businesses can perform that will assist in minimizing the effects and inconveniences associated with natural hazards.	All	Low	City Planning Department	Unknown	Internal funds	July 2005	2018-2023.	The Rockingham Fire Department periodically includes information on the local cable access channel regarding advanced storm preparation measures citizens and businesses.
PEA-4	Educate citizens about appropriate actions if they find themselves in the path of a tornado.	Tornado		City Planning Department	Unknown	Internal funds	2012-2023	2018-2023.	City staff periodically sends information via social media and the City website regarding upcoming hazard weather conditions
PEA-5	Make information about mitigation available to the public via the City's website and/or social networking outlets.	All	Moderate	City Planning Department	Unknown	Local	2013-2017	2018-2023.	City staff periodically sends information via social media and the City website regarding upcoming hazard weather conditions

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Scotland County Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
Prevention									
P-1	At next Land Use Plan Update, review and include hazard mitigation objectives.	All	Moderate	County Planning and Zoning	Unknown	Local	2012-2023.	2018-2023.	Need to have new or revised objectives in place first. in 2018 the new revised Hazard Mitigation plan will be reviewed
P-2	Develop a policy to minimize public services to proposed new structures that will be located in 100-year floodplain areas.	Flood	Moderate	County Planning and Zoning	Unknown	Local	2012-2023.	2018-2023.	Services located in Floodplain areas are restricted from connection by the fact that building permits are not issued for those areas
P-3	Update the Floodplain Ordinance to raise the minimum flood protection level.	Flood	Moderate	County Planning and Zoning	Unknown	Local	2012-2023.	2012- 2023.	Ordinance prohibits this type construction now in 100 year flood plain
P-4	Update the Subdivision Ordinance by reviewing and incorporating hazard mitigation objectives.	All	Moderate	County Planning and Zoning	Unknown	Local	2012-2023.	2018-2023.	Will be addressed with completion of revised hazard Mitigation plan objectives
P-5	Review and revise the Planning Ordinance to allow for clustering of residential lots.	Flood	Moderate	County Planning and Zoning	Unknown	Local	2012-2023.	2018-2023.	Not needed in rural areas at this time

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-6	Building inspections for flood damaged structures. Any and all portions of buildings that have been submerged for any length of time will be inspected for flood related damage as well as other conditions that may be dangerous to life, health, or other property. Plan for damaged structures: 1. Overall damage assessment/data collection (visual inspection from roadways). 2. Data compiled and geographical areas assigned to teams. 3. Second detailed assessment by area teams. 4. Portions of walls, floors, ceilings, etc. that have been exposed to water will be opened for evaluation. 5. All construction that is repaired, replaced, dried, or sealed will be inspected for certificate of compliance. 6. Structures inspected for certificate of compliance.	Flood	High	County Building Inspections	Unknown	Local	2012-2023.	2018-2023.	No structures submerged for any length of time in any recent flood event. Procedures are in place but have not been implemented due to lack of demand from any recent event.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-7	Policy procedures related to storm damage and disconnected utility service: 1) inform public via television, radio, and newspaper of the necessary steps to have utilities restored; 2) restrict travel as necessary while collecting damage assessment data; 3) conduct inspections on first come, first serve basis; 4) work overtime to expedite utility reconnections.	All	High	County Building Inspections	Unknown	Local	2012-2023.	Completed.	These procedures were practiced in the wake of Hurricane Matthew in 2016
P-8	Create a zoning map (digital) that can be easily reproduced /updated for staff and public use.	All	High	County Planning and Zoning	Unknown	Local	2012-2017	2018-2023.	Limited reproduction capability exist now…maps will be reproduced relevant to specific area affected by specific event
Property Protection									
PP-1	Create and maintain a list of repetitive flood loss properties.	Flood	Moderate	County Planning and Zoning	Unknown	Local	2012-2023.	Completed 2016.	Data derived from Hurricane Mathew

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
PP-2	Seek grant funding for mitigation opportunities eligible under the most current version of the UHMA Guidance and Public Assistance 406 mitigation Guidance at the time of application. Projects could include but are not limited to: acquisition, elevation, mitigation reconstruction, and wet/dry flood proofing to commercial and/or residential structures as applicable; redundant power to critical facilities, wind retrofits to critical facilities, storm shelters and other activities that reduce to the loss of life and property.	All	High	Emergency Management, Engineering and/or Planning Departments of each jurisdiction	Project Cost, Staff Hours, and applicable cost share	Federal and State Grants, Local Operating Budget	2018- 2023	2018-2023	New Action.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
Emergency Services									
ES-1	Ensure adequate evacuation warning in case of major hazard event.	All	High	County Building Inspections; County Emergency Services	Unknown	Local	2012-2017	2018-2023.	Flood warning is predictable, wind loss is much less predictable and affects wider areas. . County and City both have "Everbridge" (Reverse 911) in place for widespread use. Need time and staffing to set up system.
ES-2	Improve shelter capacities with alternate power/heat sources.	Winter Storm	High	County Building Inspections; County Emergency Services	Unknown	Local	2012-2017	2018-2023.	Shelter usage is historically very limited. Funding is directed to areas of greater need
ES-3	Establish program to maintain continuity of government operations.	All	High	County Building Inspections; County Emergency Services	Unknown	Local	2012-2017	2018-2023.	Elected officials depend on paid staff to maintain operations in major event…that proved to be adequate in Hurricane Matthew. Process has been presented to LEPC
ES-4	Identify alternate Emergency Operations Center locations.	All	High	County Building Inspections; County Emergency Services	Unknown	Local	2012-2017	Completed.	New EOC designed to withstand most events. Secondary EOC location is in EOP Plan at SMH in Dulin Center. New EOC / 911 Center opened in 2014--- Operational in Hurricane Matthew

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
ES-5	Identify alternate detour routes from major arteries in the County.	All	High	County Building Inspections; County Emergency Services; NCDOT	Unknown	Local	2012-2023.	Completed 2016.	NC DOT Re-Routed I- 95 through Scotland County in Hurricane Matthew. County was never advised of plan. Hard to plan locally when higher power takes over infrastructure with no notice.
Public Education and Awareness									
PEA-1	Place flood protection and other hazard education materials in all branches of the Scotland County public library system.	All	High	County Planning and Zoning	Unknown	Local	2012-2017	2012- 2023.	Also available at Red Cross and EM offices

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
PEA-2	The Scotland County Environmental Health has received training on erosion and sedimentation control methods and on floodplain surveying certification. On an annual basis, this person makes numerous site visits to assist property owners and developers with problems and potential problems associated with drainage, erosion, and flooding. Site visits are made at the request of the property owner or developer and are usually handled through the Planning and Zoning Department.	Flood	High	County Environmental Health Director	Unknown	Local	2012-2023.	2018-2023	Regular part of the normal duties of this departmental position. Though more intense in a disaster situation, this process is an ongoing part of this job responsibilities and will be occurring on a regular basis regardless of disaster status in the county.
PEA-3	Provide hazard mitigation information to citizens via County website	All	Moderate	County Emergency Services	Unknown	Local	2012-2017	2012- 2023.	This was on the county's previous website---new site needs to be updated to reflect new Hazard Mitigation Plan when completed.

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Town of East Laurinburg Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
Prevention									
P-1	At next Land Use Plan Update, review and include hazard mitigation objectives.	All	Moderate	County Planning and Zoning; East Laurinburg	Unknown	Local	2012-2023.	2018-2023	No progress has been made in the last five years. Will continue efforts as additional resources become available.
P-2	Develop a policy to minimize public services to proposed new structures that will be located in 100-year floodplain areas.	Flood	Moderate	County Planning and Zoning; East Laurinburg	Unknown	Local	2012-2023.	2018-2023	No progress has been made in the last five years. Will continue efforts as additional resources become available.
P-3	Update the Floodplain Ordinance to raise the minimum flood protection level.	Flood	Moderate	County Planning and Zoning; East Laurinburg	Unknown	Local	2012-2023.	2018-2023	No progress has been made in the last five years. Will continue efforts as additional resources become available.
P-4	Update the Subdivision Ordinance by reviewing and incorporating hazard mitigation objectives.	All	Moderate	County Planning and Zoning; East Laurinburg	Unknown	Local	2012-2023.	2018-2023	No progress has been made in the last five years. Will continue efforts as additional resources become available.
P-5	Review and revise the Planning Ordinance to allow for clustering of residential lots.	Flood	Moderate	County Planning and Zoning; East Laurinburg	Unknown	Local	2012-2023.	2018-2023	No progress has been made in the last five years. Will continue efforts as additional resources become available.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-6	Revise and update the regulatory floodplain maps.	Flood	High	County Planning and Zoning; East Laurinburg	Unknown	Federal; State	2012-2017	2018-2023	No progress has been made in the last five years. Will continue efforts as additional resources become available.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-7	Building inspections for flood damaged structures. Any and all portions of buildings that have been submerged for any length of time will be inspected for flood related damage as well as other conditions that may be dangerous to life, health, or other property. Plan for damaged structures: 1. Overall damage assessment/data collection (visual inspection from roadways). 2. Data compiled and geographical areas assigned to teams. 3. Second detailed assessment by area teams. 4. Portions of walls, floors, ceilings, etc. that have been exposed to water will be opened for evaluation. 5. All construction that is repaired, replaced, dried, or sealed will be inspected for certificate of compliance. 6. Structure inspected for certificate of compliance.	Flood	High	County Building Inspections; East Laurinburg	Unknown	Local	2012-2023.	2018-2023	No progress has been made in the last five years. Will continue efforts as additional resources become available.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-8	Policy procedures related to storm damage and disconnected utility service: 1) inform public via television, radio, and newspaper of the necessary steps to have utilities restored; 2) restrict travel as necessary while collecting damage assessment data; 3) conduct inspections on first come, first serve basis; 4) work overtime to expedite utility reconnections.	All	High	County Building Inspections; East Laurinburg	Unknown	Local	2012-2023.	2018-2023	No progress has been made in the last five years. Will continue efforts as additional resources become available.
P-9	Create a zoning map (digital) that can be easily reproduced /updated for staff and public use.	All	High	County Planning and Zoning; East Laurinburg	Unknown	Local	2012-2017	2018-2023	No progress has been made in the last five years. Will continue efforts as additional resources become available.
Property Protection									
PP-1	Create and maintain a list of repetitive flood loss properties.	Flood	Moderate	County Planning and Zoning; East Laurinburg	Unknown	Local	2012-2023.	2018-2023	No progress has been made in the last five years. Will continue efforts as additional resources become available.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
PP-2	Seek grant funding for mitigation opportunities eligible under the most current version of the UHMA Guidance and Public Assistance 406 mitigation Guidance at the time of application. Projects could include but are not limited to: acquisition, elevation, mitigation reconstruction, and wet/dry flood proofing to commercial and/or residential structures as applicable; redundant power to critical facilities, wind retrofits to critical facilities, storm shelters and other activities that reduce to the loss of life and property.	All	High	Emergency Management, Engineering and/or Planning Departments of each jurisdiction	Project Cost, Staff Hours, and applicable cost share	Federal and State Grants, Local Operating Budget	2018- 2023	2018-2023	New Action.
Emergency Services									
ES-1	Ensure adequate evacuation warning in case of major hazard event.	All	High	County Building Inspections; County Emergency Services; East Laurinburg	Unknown	Local	2012-2017	2018-2023	No progress has been made in the last five years. Will continue efforts as additional resources become available.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
ES-2	Improve shelter capacities with alternate power/heat sources.	Winter Storm	High	County Building Inspections; County Emergency Services; East Laurinburg	Unknown	Local	2012-2017	2018-2023	
ES-3	Establish program to maintain continuity of government operations.	All	High	County Building Inspections; County Emergency Services; East Laurinburg	Unknown	Local	2012-2017	2018-2023	No progress has been made in the last five years. Will continue efforts as additional resources become available.
ES-4	Identify alternate Emergency Operations Center locations.	All	High	County Building Inspections; County Emergency Services; East Laurinburg	Unknown	Local	2012-2017	2018-2023	Work with the County due to the fact that this is a county responsibility.
ES-5	Identify alternate detour routes from major arteries in the County.	All	High	County Building Inspections; County Emergency Services; East Laurinburg; NCDOT	Unknown	Local	2012-2023.	2018-2023	No progress has been made in the last five years. Will continue efforts as additional resources become available.
Public Education and Awareness									
PEA-1	Place flood protection and other hazard education material in all branches of the Scotland County public library system.	All	High	County Planning and Zoning; East Laurinburg	Unknown	Local	2012-2017	2018-2023	No progress has been made in the last five years. Will continue efforts as additional resources become available.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
PEA-2	The Scotland County Environmental Health has received training on erosion and sedimentation control methods and on floodplain surveying certification. On an annual basis, this person makes numerous site visits to assist property owners and developers with problems and potential problems associated with drainage, erosion, and flooding. Site visits are made at the request of the property owner or developer and are usually handled through the Planning and Zoning Department.	Flood	High	County Environmental Health Director; East Laurinburg	Unknown	Local	2012-2023.	2018-2023	No progress has been made in the last five years. Will continue efforts as additional resources become available.
PEA-3	Coordinate with County Emergency Services to provide hazard mitigation information to citizens via website	All	Moderate	East Laurinburg; County Emergency Services	Unknown	Local	2012-2017	2018-2023	No progress has been made in the last five years. Will continue efforts as additional resources become available.

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Town of Gibson Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
Prevention									
P-1	At next Land Use Plan Update, review and include hazard mitigation objectives.	All	Moderate	County Planning and Zoning; East Laurinburg	Unknown	Local	2012-2023.	2018-2023	No progress has been made in the last five years. Will continue efforts as additional resources become available.
P-2	Develop a policy to minimize public services to proposed new structures that will be located in 100-year floodplain areas.	Flood	Moderate	County Planning and Zoning; East Laurinburg	Unknown	Local	2012-2023.	2018-2023	No progress has been made in the last five years. Will continue efforts as additional resources become available.
P-3	Update the Floodplain Ordinance to raise the minimum flood protection level.	Flood	Moderate	County Planning and Zoning; East Laurinburg	Unknown	Local	2012-2023.	2018-2023	No progress has been made in the last five years. Will continue efforts as additional resources become available.
P-4	Update the Subdivision Ordinance by reviewing and incorporating hazard mitigation objectives.	All	Moderate	County Planning and Zoning; East Laurinburg	Unknown	Local	2012-2023.	2018-2023	No progress has been made in the last five years. Will continue efforts as additional resources become available.
P-5	Review and revise the Planning Ordinance to allow for clustering of residential lots.	Flood	Moderate	County Planning and Zoning; East Laurinburg	Unknown	Local	2012-2023.	2018-2023	No progress has been made in the last five years. Will continue efforts as additional resources become available.
P-6	Revise and update the regulatory floodplain maps.	Flood	High	County Planning and Zoning; East Laurinburg	Unknown	Federal; State	2012-2017	2018-2023	This will be completed by County GIS.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-7	Building inspections for flood damaged structures. Any and all portions of buildings that have been submerged for any length of time will be inspected for flood related damage as well as other conditions that may be dangerous to life, health, or other property. Plan for damaged structures: 1. Overall damage assessment/data collection (visual inspection from roadways). 2. Data compiled and geographical areas assigned to teams. 3. Second detailed assessment by area teams. 4. Portions of walls, floors, ceilings, etc. that have been exposed to water will be opened for evaluation. 5. All construction that is repaired, replaced, dried, or sealed will be inspected for certificate of compliance. 6. Structure inspected for certificate of compliance.	Flood	High	County Building Inspections; East Laurinburg	Unknown	Local	2012-2023.	2018-2023	No progress has been made in the last five years. Will continue efforts as additional resources become available.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-8	Policy procedures related to storm damage and disconnected utility service: 1) inform public via television, radio, and newspaper of the necessary steps to have utilities restored; 2) restrict travel as necessary while collecting damage assessment data; 3) conduct inspections on first come, first serve basis; 4) work overtime to expedite utility reconnections.	All	High	County Building Inspections; East Laurinburg	Unknown	Local	2012-2023.	2018-2023	No progress has been made in the last five years. Will continue efforts as additional resources become available.
P-9	Create a zoning map (digital) that can be easily reproduced /updated for staff and public use.	All	High	County Planning and Zoning; East Laurinburg	Unknown	Local	2012-2017	2018-2023	No progress has been made in the last five years. Will continue efforts as additional resources become available.
Property Protection									
PP-1	Create and maintain a list of repetitive flood loss properties.	Flood	Moderate	County Planning and Zoning; East Laurinburg	Unknown	Local	2012-2023.	2018-2023	No progress has been made in the last five years. Will continue efforts as additional resources become available.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
PP-2	Seek grant funding for mitigation opportunities eligible under the most current version of the UHMA Guidance and Public Assistance 406 mitigation Guidance at the time of application. Projects could include but are not limited to: acquisition, elevation, mitigation reconstruction, and wet/dry flood proofing to commercial and/or residential structures as applicable; redundant power to critical facilities, wind retrofits to critical facilities, storm shelters and other activities that reduce to the loss of life and property.	All	High	Emergency Management, Engineering and/or Planning Departments of each jurisdiction	Project Cost, Staff Hours, and applicable cost share	Federal and State Grants, Local Operating Budget	2018- 2023	2018-2023	New Action.
Emergency Services									
ES-1	Ensure adequate evacuation warning in case of major hazard event.	All	High	County Building Inspections; County Emergency Services; East Laurinburg	Unknown	Local	2012-2017	2018-2023	No progress has been made in the last five years. Will continue efforts as additional resources become available.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
ES-2	Improve shelter capacities with alternate power/heat sources.	Winter Storm	High	County Building Inspections; County Emergency Services; East Laurinburg	Unknown	Local	2012-2017	2018-2023	No progress has been made in the last five years. Will continue efforts as additional resources become available.
ES-3	Establish program to maintain continuity of government operations.	All	High	County Building Inspections; County Emergency Services; East Laurinburg	Unknown	Local	2012-2017	2018-2023	No progress has been made in the last five years. Will continue efforts as additional resources become available.
ES-4	Identify alternate Emergency Operations Center locations.	All	High	County Building Inspections; County Emergency Services; East Laurinburg	Unknown	Local	2012-2017	2018-2023	No progress has been made in the last five years. Will continue efforts as additional resources become available.
ES-5	Identify alternate detour routes from major arteries in the County.	All	High	County Building Inspections; County Emergency Services; East Laurinburg; NCDOT	Unknown	Local	2012-2023.	2018-2023	No progress has been made in the last five years. Will continue efforts as additional resources become available.
Public Education and Awareness									
PEA-1	Place flood protection and other hazard education material in all branches of the Scotland County public library system.	All	High	County Planning and Zoning; East Laurinburg	Unknown	Local	2012-2017	2018-2023	No progress has been made in the last five years. Will continue efforts as additional resources become available.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
PEA-2	The Scotland County Environmental Health has received training on erosion and sedimentation control methods and on floodplain surveying certification. On an annual basis, this person makes numerous site visits to assist property owners and developers with problems and potential problems associated with drainage, erosion, and flooding. Site visits are made at the request of the property owner or developer and are usually handled through the Planning and Zoning Department.	Flood	High	County Environmental Health Director; East Laurinburg	Unknown	Local	2012-2023.	2018-2023	No progress has been made in the last five years. Will continue efforts as additional resources become available.
PEA-3	Coordinate with County Emergency Services to provide hazard mitigation information to citizens via website	All	Moderate	East Laurinburg; County Emergency Services	Unknown	Local	2012-2017	2018-2023	No progress has been made in the last five years. Will continue efforts as additional resources become available.

City of Laurinburg Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
Prevention									
P-1	At next Land Use Plan Update, review and include hazard mitigation objectives.	All	Moderate	Laurinburg Planning and Zoning	Unknown	Local	2012-2023.	2012- 2023.	City of Laurinburg updates their Unified Development Ordinance periodically. Was last updated in 2014.
P-2	Develop a policy to minimize public services to proposed new structures that will be located in 100-year floodplain areas.	Flood	Moderate	Laurinburg Planning and Zoning	Unknown	Local	2012-2023.	2012- 2023.	City of Laurinburg updates their Unified Development Ordinance periodically. Was last updated in 2014.
P-3	Update the Floodplain Ordinance to raise the minimum flood protection level.	Flood	Moderate	Laurinburg Planning and Zoning	Unknown	Local	2012-2023.	2012- 2023.	City of Laurinburg updates their Unified Development Ordinance periodically. Was last updated in 2014.
P-4	Update the Subdivision Ordinance by reviewing and incorporating hazard mitigation objectives.	All	Moderate	Laurinburg Planning and Zoning	Unknown	Local	2012-2023.	2012- 2023.	City of Laurinburg updates their Unified Development Ordinance periodically. Was last updated in 2014.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-5	Review and revise the Planning Ordinance to allow for clustering of residential lots.	Flood	Moderate	Laurinburg Planning and Zoning	Unknown	Local	2012-2023.	Delete	Not a practice addressed in UDO update. Not seen as a necessary requirement at this time based on lack of local development
P-6	Revise and update the regulatory floodplain maps.	Flood	High	Laurinburg Planning and Zoning	Unknown	Local	2012-2017	2012- 2023.	Done by City GIS Department

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-7	Building inspections for flood damaged structures. Any and all portions of buildings that have been submerged for any length of time will be inspected for flood related damage as well as other conditions that may be dangerous to life, health, or other property. Plan for damage structures: 1. Overall damage assessment/data collection (visual inspection from roadways). 2. Data compiled and geographical areas assigned to teams. 3. Second detailed assessment by area teams. 4. Portions of walls, floors, ceilings, etc. that have been exposed to water will be opened for evaluation. 5. All construction that is repaired, replaced, dried, or sealed will be inspected for certificate of compliance. 6. Structure inspected for certificate of compliance.	Flood	High	County Building Inspections; Laurinburg	Unknown	Local	2012-2023.	Completed 2016.	All Building inspection done by County Building Inspection Dept. No flood damage situations required in this event. Large number of electrical reconnects were required in this event and were each inspected by County Inspection Dept.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-8	Policy procedures related to storm damage and disconnected utility service: 1) inform public via television, radio, and newspaper of the necessary steps to have utilities restored; 2) restrict travel as necessary while collecting damage assessment data; 3) conduct inspections on first come, first serve basis; 4) work overtime to expedite utility reconnections.	All	High	County Building Inspections; Laurinburg	Unknown	Local	2012-2023.	Completed 2016.	City of Laurinburg is an "Electria City" receiving electricity from Duke Power. All reconnects within the City of Laurinburg are the responsibility of the City of Laurinburg Electric Crews. Reconnect inspection were performed by County Building inspectors. Process in place and working.
P-9	Create a zoning map (digital) that can be easily reproduced/updated for staff and public use.	All	High	County Planning and Zoning; Laurinburg	Unknown	Local	2012-2017	Completed 2016	Completed by City GIS Dept. Done by City GIS Department as needed.
Property Protection									
PP-1	Create and maintain a list of repetitive flood loss properties.	Flood	Moderate	County Planning and Zoning; Laurinburg	Unknown	Local	2012-2023.	2018-2023	Work with the County due to the fact that the County EM has records of properties.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
PP-2	Seek grant funding for mitigation opportunities eligible under the most current version of the UHMA Guidance and Public Assistance 406 mitigation Guidance at the time of application. Projects could include but are not limited to: acquisition, elevation, mitigation reconstruction, and wet/dry flood proofing to commercial and/or residential structures as applicable; redundant power to critical facilities, wind retrofits to critical facilities, storm shelters and other activities that reduce to the loss of life and property.	All	High	Emergency Management, Engineering and/or Planning Departments of each jurisdiction	Project Cost, Staff Hours, and applicable cost share	Federal and State Grants, Local Operating Budget	2018- 2023	2018-2023	New Action.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
Emergency Services									
ES-1	Ensure adequate evacuation warning in case of major hazard event.	All	High	County Building Inspections; County Emergency Services; Laurinburg	Unknown	Local	2012-2017	2018-2023.	County and City share use of a contracted system from "EverBridge". System still needs data input to become operational. Will be a process of continues data entry to be fully operational. Use of Reverse 911 system. Still needs time and personnel to complete data entry task.
ES-2	Improve shelter capacities with alternate power/heat sources.	Winter Storm	High	County Building Inspections; County Emergency Services; Laurinburg	Unknown	Local	2012-2017	2018-2023.	City of Laurinburg has one single substation for the entire city. When it goes down, the entire city is powerless. A second electrical sub-station is needed. Funding is being
ES-3	Establish program o maintain continuity of government operations.	All	High	County Building Inspections; County Emergency Services; Laurinburg	Unknown	Local	2012-2017	2018-2023.	Governing body depending on paid staff to manage incidents. Process working in recent event…Hurricane Matthew

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
ES-4	Identify alternate Emergency Operations Center locations.	All	High	County Building Inspections; County Emergency Services; Laurinburg	Unknown	Local, State & Federal	2012-2017	Completed.	Secondary EOC location established in 2006. New EOC should not need back up location. Alternate location for EOC is the Dulin Center at SMH.
ES-5	Identify alternate detour routes from major arteries in the County.	All	High	County Building Inspections; County Emergency Services; Laurinburg; NCDOT	Unknown	Local	2012-2023.	2018-2023	Based on the nature and location of the event requiring detoured routes. The nature and location of each specific event will determine the need for detoured routes and which jurisdiction would be responsible for establishing the detour routes.
Public Education and Awareness									
PEA-1	Place flood protection and other hazard education materials in all branches of the Scotland County public library system.	All	High	Laurinburg Planning and Zoning	Unknown	Local	2012-2017	2018-2023	Work with the County because all library facilities are operated by Scotland County

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
PEA-2	The Scotland County Environmental Health has received training on erosion and sedimentation control methods and on floodplain surveying certification. On an annual basis, this person makes numerous site visits to assist property owners and potential problems associated with drainage, erosion, and flooding. Site visits are made at the request of the property owner or developer and are usually handled through the Planning and Zoning Department.	Flood	High	County Environmental Health Director; Laurinburg	Unknown	Local	2012-2023.	2018-2023	Done as a Scotland County Function. Scotland County provides all public health services for the City of Laurinburg
PEA-3	Coordinate with County Emergency Services to provide hazard mitigation information to citizens via website	All	Moderate	Laurinburg; County Emergency Services	Unknown	Local	2012-2017	Completed 2016.	County EM had previous Hazard Mitigation plan on Public Safety web site. County has new web site and new revised Hazard Mitigation plan will be added to the new site.

Wagram Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
Prevention									
P-1	At next Land Use Plan Update, review and include hazard mitigation objectives.	All	Moderate	County Planning and Zoning; East Laurinburg	Unknown	Local	2012-2023.	2018-2023	No progress has been made in the last five years. Will continue efforts as additional resources become available.
P-2	Develop a policy to minimize public services to proposed new structures that will be located in 100-year floodplain areas.	Flood	Moderate	County Planning and Zoning; East Laurinburg	Unknown	Local	2012-2023.	2018-2023	No progress has been made in the last five years. Will continue efforts as additional resources become available.
P-3	Update the Floodplain Ordinance to raise the minimum flood protection level.	Flood	Moderate	County Planning and Zoning; East Laurinburg	Unknown	Local	2012-2023.	2018-2023	No progress has been made in the last five years. Will continue efforts as additional resources become available.
P-4	Update the Subdivision Ordinance by reviewing and incorporating hazard mitigation objectives.	All	Moderate	County Planning and Zoning; East Laurinburg	Unknown	Local	2012-2023.	2018-2023	No progress has been made in the last five years. Will continue efforts as additional resources become available.
P-5	Review and revise the Planning Ordinance to allow for clustering of residential lots.	Flood	Moderate	County Planning and Zoning; East Laurinburg	Unknown	Local	2012-2023.	2018-2023	No progress has been made in the last five years. Will continue efforts as additional resources become available.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-6	Revise and update the regulatory floodplain maps.	Flood	High	County Planning and Zoning; East Laurinburg	Unknown	Federal; State	2012-2017	2018-2023	No progress has been made in the last five years. Will continue efforts as additional resources become available.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-7	Building inspections for flood damaged structures. Any and all portions of buildings that have been submerged for any length of time will be inspected for flood related damage as well as other conditions that may be dangerous to life, health, or other property. Plan for damaged structures: 1. Overall damage assessment/data collection (visual inspection from roadways). 2. Data compiled and geographical areas assigned to teams. 3. Second detailed assessment by area teams. 4. Portions of walls, floors, ceilings, etc. that have been exposed to water will be opened for evaluation. 5. All construction that is repaired, replaced, dried, or sealed will be inspected for certificate of compliance. 6. Structure inspected for certificate of compliance.	Flood	High	County Building Inspections; East Laurinburg	Unknown	Local	2012-2023.	2018-2023	No progress has been made in the last five years. Will continue efforts as additional resources become available.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
P-8	Policy procedures related to storm damage and disconnected utility service: 1) inform public via television, radio, and newspaper of the necessary steps to have utilities restored; 2) restrict travel as necessary while collecting damage assessment data; 3) conduct inspections on first come, first serve basis; 4) work overtime to expedite utility reconnections.	All	High	County Building Inspections; East Laurinburg	Unknown	Local	2012-2023.	2018-2023	No progress has been made in the last five years. Will continue efforts as additional resources become available.
P-9	Create a zoning map (digital) that can be easily reproduced /updated for staff and public use.	All	High	County Planning and Zoning; East Laurinburg	Unknown	Local	2012-2017	2018-2023	No progress has been made in the last five years. Will continue efforts as additional resources become available.
Property Protection									
PP-1	Create and maintain a list of repetitive flood loss properties.	Flood	Moderate	County Planning and Zoning; East Laurinburg	Unknown	Local	2012-2023.	2018-2023	No progress has been made in the last five years. Will continue efforts as additional resources become available.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
PP-2	Seek grant funding for mitigation opportunities eligible under the most current version of the UHMA Guidance and Public Assistance 406 mitigation Guidance at the time of application. Projects could include but are not limited to: acquisition, elevation, mitigation reconstruction, and wet/dry flood proofing to commercial and/or residential structures as applicable; redundant power to critical facilities, wind retrofits to critical facilities, storm shelters and other activities that reduce to the loss of life and property.	All	High	Emergency Management, Engineering and/or Planning Departments of each jurisdiction	Project Cost, Staff Hours, and applicable cost share	Federal and State Grants, Local Operating Budget	2018- 2023	2018-2023	New Action.
Emergency Services									
ES-1	Ensure adequate evacuation warning in case of major hazard event.	All	High	County Building Inspections; County Emergency Services; East Laurinburg	Unknown	Local	2012-2017	2018-2023	No progress has been made in the last five years. Will continue efforts as additional resources become available.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
ES-2	Improve shelter capacities with alternate power/heat sources.	Winter Storm	High	County Building Inspections; County Emergency Services; East Laurinburg	Unknown	Local	2012-2017	2018-2023	No progress has been made in the last five years. Will continue efforts as additional resources become available.
ES-3	Establish program to maintain continuity of government operations.	All	High	County Building Inspections; County Emergency Services; East Laurinburg	Unknown	Local	2012-2017	2018-2023	No progress has been made in the last five years. Will continue efforts as additional resources become available.
ES-4	Identify alternate Emergency Operations Center locations.	All	High	County Building Inspections; County Emergency Services; East Laurinburg	Unknown	Local	2012-2017	2018-2023	No progress has been made in the last five years. Will continue efforts as additional resources become available.
ES-5	Identify alternate detour routes from major arteries in the County.	All	High	County Building Inspections; County Emergency Services; East Laurinburg; NCDOT	Unknown	Local	2012-2023.	2018-2023	No progress has been made in the last five years. Will continue efforts as additional resources become available.
Public Education and Awareness									
PEA-1	Place flood protection and other hazard education material in all branches of the Scotland County public library system.	All	High	County Planning and Zoning; East Laurinburg	Unknown	Local	2012-2017	2018-2023	No progress has been made in the last five years. Will continue efforts as additional resources become available.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Original Action Date	Implementation Schedule	Narrative Explanation
PEA-2	The Scotland County Environmental Health has received training on erosion and sedimentation control methods and on floodplain surveying certification. On an annual basis, this person makes numerous site visits to assist property owners and developers with problems and potential problems associated with drainage, erosion, and flooding. Site visits are made at the request of the property owner or developer and are usually handled through the Planning and Zoning Department.	Flood	High	County Environmental Health Director; East Laurinburg	Unknown	Local	2012-2023.	2018-2023	No progress has been made in the last five years. Will continue efforts as additional resources become available.
PEA-3	Coordinate with County Emergency Services to provide hazard mitigation information to citizens via website	All	Moderate	East Laurinburg; County Emergency Services	Unknown	Local	2012-2017	2018-2023	No progress has been made in the last five years. Will continue efforts as additional resources become available.

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SECTION 10
PLAN MAINTENANCE

This section discusses how the Pee Dee Lumber Region Mitigation Strategy and Mitigation Action Plan will be implemented and how the Regional Hazard Mitigation Plan will be evaluated and enhanced over time. This section also discusses how the public will continue to be involved in a sustained hazard mitigation planning process. It consists of the following three subsections:

- 10.1 Implementation and Integration
- 10.2 Monitoring, Evaluation, and Enhancement
- 10.3 Continued Public Involvement

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44 CFR Requirement
44 CFR Part201.6(c)(4)(i): The plan shall include a plan maintenance process that includes a section describing the method and schedule of monitoring, evaluating and updating the mitigation plan within a five-year cycle. ***44 CFR Part 201.6(c)(4)(ii):*** The plan maintenance process shall include a process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate

10.1 IMPLEMENTATION AND INTEGRATION

Each agency, department, or other partner participating under the Pee Dee Lumber Regional Hazard Mitigation Plan is responsible for implementing specific mitigation actions as prescribed in the Mitigation Action Plan. Every proposed action listed in the Mitigation Action Plan is assigned to a specific "lead" agency or department in order to assign responsibility and accountability and increase the likelihood of subsequent implementation.

In addition to the assignment of a local lead department or agency, an implementation time period or a specific implementation date has been assigned in order to assess whether actions are being implemented in a timely fashion. The counties in the Pee Dee Lumber Region 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.

The participating jurisdictions will integrate this Hazard Mitigation Plan into relevant city and county government decision-making processes or mechanisms, where feasible. This includes integrating the requirements of the Regional Hazard Mitigation Plan into other local planning documents, processes, or mechanisms, such as comprehensive or capital improvement plans, when appropriate. The members of the Pee Dee Lumber Regional Hazard Mitigation Planning Committee will remain charged with ensuring that the goals and mitigation actions of new and updated local planning documents for their agencies or departments are consistent, or do not conflict with, the goals and actions of the Regional Hazard Mitigation Plan, and will not contribute to increased hazard vulnerability in the Pee Dee Lumber Region.

Since the previous four plans were adopted (Anson County, Richmond County, and Scotland County in 2005 and Montgomery County in 2004), each County and participating jurisdiction have worked to integrate the hazard mitigation plan into other planning mechanisms where applicable/feasible. Examples of how this integration has occurred have been documented in the Implementation Status discussion provided for each of the mitigation actions found in Section 9. Specific examples of how integration has occurred include:

- Integrating the mitigation plan into reviews and updates of floodplain management ordinances;
- Integrating the mitigation plan into reviews and updates of County emergency operations plans;
- Integrating the mitigation plan into review and updates of building codes; and
- Integrating the mitigation plan into the capital improvements plan through identification of mitigation actions that require local funding

Opportunities to further integrate the requirements of this Plan into other local planning mechanisms shall continue to be identified through future meetings of the Regional Hazard Mitigation Planning Committee, individual county meetings, and the annual 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 Regional Hazard Mitigation Plan is deemed by the Pee Dee Lumber Regional Hazard Mitigation Planning Committee to be the most effective and appropriate method to implement local hazard mitigation actions at this time.

10.2 MONITORING, EVALUATION, AND ENHANCEMENT

Periodic revisions and updates of the Regional Hazard Mitigation Plan are required to ensure that the goals of the Plan are kept current, taking into account potential changes in hazard vulnerability and mitigation priorities. In addition, revisions may be necessary to ensure that the Plan is in full compliance with applicable federal and state regulations. Periodic evaluation of the Plan will also ensure that specific mitigation actions are being reviewed and carried out according to the Mitigation Action Plan.

When determined necessary, the Pee Dee Lumber Regional Hazard Mitigation Planning Committee shall meet in March of every year to evaluate the progress attained and to revise, where needed, the activities set forth in the Plan. The findings and recommendations of the Regional Hazard Mitigation Planning Committee shall be documented in the form of a report that can be shared with interested City and County Council members. The Regional Hazard Mitigation Planning Committee will also meet following any disaster events warranting a reexamination of the mitigation actions being implemented or proposed for future implementation. This will ensure that the Plan is continuously updated to reflect changing conditions and needs within the Pee Dee Lumber Region which includes the counties of Anson, Montgomery, Richmond, and Scotland. The Richmond County Emergency Management Coordinator will be responsible for reconvening the Regional Hazard Mitigation Planning Committee for these reviews.

Five (5) Year Plan Review

The Plan will be thoroughly reviewed by the Regional Hazard Mitigation Planning Committee every five years to determine whether there have been any significant changes in the Pee Dee Lumber Region that may, in turn, necessitate changes in the types of mitigation actions proposed. New development in

identified hazard areas, an increased exposure to hazards, an increase or decrease in capability to address hazards, and changes to federal or state legislation are examples of factors that may affect the necessary content of the Plan.

The plan review provides Pee Dee Lumber county and municipal officials with an opportunity to evaluate those actions that have been successful and to explore the possibility of documenting potential losses avoided due to the implementation of specific mitigation measures. The plan review also provides the opportunity to address mitigation actions that may not have been successfully implemented as assigned. The Richmond County Emergency Management Coordinator will be responsible for reconvening the Regional Hazard Mitigation Planning Committee and conducting the five-year review.

During the five-year plan review process, the following questions will be considered as criteria for assessing the effectiveness and appropriateness of the Plan:

- Do the goals address current and expected conditions?
- Has the nature or magnitude of risks changed?
- Are the current resources appropriate for implementing the Plan?
- Are there implementation problems, such as technical, political, legal or coordination issues with other agencies?
- Have the outcomes occurred as expected?
- Did County departments participate in the plan implementation process as assigned?

Following the five-year review, any revisions deemed necessary will be summarized and implemented according to the reporting procedures and plan amendment process outlined herein. Upon completion of the review and update/amendment process, the Pee Dee Lumber Region Hazard Mitigation Plan will be submitted to the State Hazard Mitigation Officer at the North Carolina Division of Emergency Management (NCDEM) for final review and approval in coordination with the Federal Emergency Management Agency (FEMA).

Because the plan update process can take several months to complete, and because Federal funding may be needed to update the plan, it is recommended that the five-year review process begin at the beginning of the third year after the plan was last approved. This will allow the participants in the Pee Dee Lumber Regional Hazard Mitigation Plan to organize in order to seek Federal funding if necessary and complete required plan update documentation before the plan expires at the end of the fifth year.

Disaster Declaration

Following a disaster declaration, the Pee Dee Lumber Regional Hazard Mitigation 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 Richmond County Emergency Management Coordinator to reconvene the Regional Hazard Mitigation Planning Committee and ensure the appropriate stakeholders are invited to participate in the plan revision and update process following declared disaster events.

Reporting Procedures

The results of the five-year review will be summarized by the Regional Hazard Mitigation Planning Committee in a report that will include an evaluation of the effectiveness of the Plan and any required

or recommended changes or amendments. The report will also include an evaluation of implementation progress for each of the proposed mitigation actions, identifying reasons for delays or obstacles to their completion along with recommended strategies to overcome them.

Plan Amendment Process

Upon the initiation of the amendment process, the Pee Dee Lumber counties and municipalities will forward information on the proposed change(s) to all interested parties including, but not limited to, all directly affected County and municipal departments, residents, and businesses. Information will also be forwarded to the North Carolina Division of Emergency Management. This information will be disseminated in order to seek input on the proposed amendment(s) for no less than a 45-day review and comment period.

At the end of the 45-day review and comment period, the proposed amendment(s) and all comments will be forwarded to the Regional Hazard Mitigation Planning Committee for final consideration. The Planning Committee will review the proposed amendment along with the comments received from other parties, and if acceptable, the committee will submit a recommendation for the approval and adoption of changes to the Plan.

In determining whether to recommend approval or denial of a Plan amendment request, the following factors will be considered by the Regional Hazard Mitigation Planning Committee:

- There are errors, inaccuracies, or omissions made in the identification of issues or needs in the Plan.
- New issues or needs have been identified which are not adequately addressed in the Plan.
- There has been a change in information, data, or assumptions from those on which the Plan is based.

Upon receiving the recommendation from the Regional Hazard Mitigation Planning Committee, and prior to adoption of the Plan, the participating jurisdictions will hold a public hearing, if deemed necessary. The governing bodies of each participating jurisdiction will review the recommendation from the Regional Hazard Mitigation Planning Committee (including the factors listed above) and any oral or written comments received at the public hearing. Following that review, the governing bodies will take one of the following actions:

- Adopt the proposed amendments as presented;
- Adopt the proposed amendments with modifications;
- Refer the amendments request back to the Regional Hazard Mitigation Planning Committee for further revision; or
- Defer the amendment request back to the Regional Hazard Mitigation Planning Committee for further consideration and/or additional hearings.

10.3 CONTINUED PUBLIC INVOLVEMENT

44 CFR Requirement
44 CFR Part 201.6(c)(4)(iii): The plan maintenance process shall include a discussion on how the community will continue public participation in the plan maintenance process

Public participation is an integral component to the mitigation planning process and will continue to be essential as this Plan evolves over time. As described above, significant changes or amendments to the Plan shall require a public hearing prior to any adoption procedures.

Other efforts to involve the public in the maintenance, evaluation, and revision process will be made as necessary. These efforts may include:

- Advertising meetings of the Regional Hazard Mitigation Planning Committee in local newspapers, public bulletin boards and/or County office buildings;
- Designating willing and voluntary citizens and private sector representatives as official members of the Regional Hazard Mitigation Planning Committee;
- Utilizing local media to update the public on any maintenance and/or periodic review activities taking place;
- Utilizing the Pee Dee Lumber county and municipal websites to advertise any maintenance and/or periodic review activities taking place; and
- Keeping copies of the Plan in public libraries.

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Appendix A: Plan Adoption

This appendix to the Pee Dee Lumber Regional Hazard Mitigation Plan includes copies of the local resolutions passed by each participating jurisdiction requesting approval of the Plan. The jurisdictions are listed below in the order that the plan adoption resolutions are included in this appendix.

- **Anson County**
- Town of Ansonville
- Town of Lilesville
- Town of McFarlan
- Town of Morven
- Town of Peachland
- Town of Polkton
- Town of Wadesboro

- **Montgomery County**
- Town of Biscoe
- Town of Candor
- Town of Mount Gilead
- Town of Star
- Town of Troy

- **Richmond County**
- Town of Dobbins Heights
- Town of Ellerbe
- City of Hamlet
- Town of Hoffman
- Town of Norman
- City of Rockingham

- **Scotland County**
- Town of East Laurinburg
- Town of Gibson
- City of Laurinburg
- Town of Wagram

Appendix B: Regulation Checklist

This appendix to the Pee Dee Lumber Regional Hazard Mitigation Plan contains a copy of a completed Regulation Checklist from FEMA's *Local Mitigation Plan Review Tool*. This checklist provides page numbers indicating where in the Plan each element required by FEMA is met. This serves as a final internal review to confirm that the Plan meets Federal requirements.

LOCAL MITIGATION PLAN REVIEW TOOL

The *Local Mitigation Plan Review Tool* 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 community.

- The Regulation Checklist provides a summary of FEMA's evaluation of whether the Plan has addressed all requirements.
- The Plan Assessment identifies the plan's strengths as well as documents areas for future improvement.
- The Multi-jurisdiction Summary Sheet is an optional worksheet that can be used to document how each jurisdiction met the requirements of the each Element of the Plan (Planning Process; Hazard Identification and Risk Assessment; Mitigation Strategy; Plan Review, Evaluation, and Implementation; and Plan Adoption).

The FEMA Mitigation Planner must reference this *Local Mitigation Plan Review Guide* when completing the *Local Mitigation Plan Review Tool*.

Jurisdictions: Anson, Montgomery, Richmond and Scotland Counties and all incorporated municipalities	**Title of Plan: Pee Dee Lumber Regional Hazard Mitigation Plan**	**Date of Plan: August 2017**
Local Point of Contact: Donna Wright	**Address: 1401 Fayetteville Rd. Rockingham, NC 28380**	
Title: Director of Emergency Services		
Agency: Richmond County Emergency Management		
Phone Number: (910)-997-8238	**E-Mail: Donna.Wright@richmondnc.com**	

State Reviewer:	**Title:**	**Date:**

FEMA Reviewer:	**Title:**	**Date:**
Date Received in FEMA Region ***(insert #)***		
Plan Not Approved		
Plan Approvable Pending Adoption		
Plan Approved		

SECTION 1:
REGULATION CHECKLIST

INSTRUCTIONS: The Regulation Checklist must be completed by FEMA. 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.' The 'Required Revisions' summary at the bottom of each Element must be completed by FEMA to provide a clear explanation of the revisions that are required for plan approval. Required revisions must be explained for each plan sub-element that is 'Not Met.' Sub-elements should be referenced in each summary by using the appropriate numbers (A1, B3, etc.), where applicable. Requirements for each Element and sub-element are described in detail in this *Plan Review Guide* in Section 4, Regulation Checklist.

1. REGULATION CHECKLIST **Regulation** (44 CFR 201.6 Local Mitigation Plans)	**Location in Plan (section and/or page number)**	**Met**	**Not Met**
ELEMENT A. PLANNING PROCESS			
A1. Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement §201.6(c)(1))	Section 2: Planning Process		
A2. Does the Plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process? (Requirement §201.6(b)(2))	Section 2 : Planning Process		
A3. Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))	Section 2.4.3		
A4. Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement §201.6(b)(3))	Sections 2.2 and 2.4		
A5. Is there discussion of how the community(ies) will continue public participation in the plan maintenance process? (Requirement §201.6(c)(4)(iii))	Section 10.3		
A6. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle)? (Requirement §201.6(c)(4)(i))	Section 10: Plan Maintenance Procedures		

1. REGULATION CHECKLIST **Regulation** (44 CFR 201.6 Local Mitigation Plans)	Location in Plan (section and/or page number)	Met	Not Met
ELEMENT A: REQUIRED REVISIONS			
ELEMENT B. HAZARD IDENTIFICATION AND RISK ASSESSMENT			
B1. Does the Plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction(s)? (Requirement §201.6(c)(2)(i))	Section 5:Hazard Profiles		
B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))	Section 5		
B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))	Sections 5 and 6		
B4. Does the Plan address NFIP insured structures within the jurisdiction that have been repetitively damaged by floods? (Requirement §201.6(c)(2)(ii))	Section 5.15.5		
ELEMENT B: REQUIRED REVISIONS			
ELEMENT C. MITIGATION STRATEGY			
C1. Does the plan document each jurisdiction's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs? (Requirement §201.6(c)(3))	Section 7: Capability Assessment		
C2. Does the Plan address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate? (Requirement §201.6(c)(3)(ii))	Section 7, specifically Section 7.3.4		
C3. Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement §201.6(c)(3)(i))	Section 8: Mitigation Strategy		
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 §201.6(c)(3)(ii))	Section 9: Mitigation Action Plans		
C5. Does the Plan contain an action plan that describes how the actions identified will be prioritized (including cost benefit review), implemented, and administered by each jurisdiction? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))	Section 9: Mitigation Action Plans		

1. REGULATION CHECKLIST **Regulation** (44 CFR 201.6 Local Mitigation Plans)	Location in Plan (section and/or page number)	Met	Not Met
C6. Does the Plan describe a process by which local governments will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate? (Requirement §201.6(c)(4)(ii))	Section 10.1		
ELEMENT C: REQUIRED REVISIONS			
ELEMENT D. PLAN REVIEW, EVALUATION, AND IMPLEMENTATION (applicable to plan updates only)			
D1. Was the plan revised to reflect changes in development? (Requirement §201.6(d)(3))	Section 6: Vulnerability Assessment (as described in Section 6, specifically in Section 6.2.2 and 6.2.3, the latest GIS data available was used to determine vulnerabilities to existing development beyond what was addressed in previous plan)		
D2. Was the plan revised to reflect progress in local mitigation efforts? (Requirement §201.6(d)(3))	Section 9 (the Mitigation Action Plan for each jurisdiction includes an update on previously adopted actions)		
D3. Was the plan revised to reflect changes in priorities? (Requirement §201.6(d)(3))	Section 9 (the Mitigation Action Plan for each jurisdiction includes an update on previously adopted actions, including changes in priorities)		
ELEMENT D: REQUIRED REVISIONS			
ELEMENT E. PLAN ADOPTION			
E1. Does the Plan include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval? (Requirement §201.6(c)(5))	This will be included in Appendix A		

1. REGULATION CHECKLIST **Regulation** (44 CFR 201.6 Local Mitigation Plans)	Location in Plan (section and/or page number)	Met	Not Met
E2. For multi-jurisdictional plans, has each jurisdiction requesting approval of the plan documented formal plan adoption? (Requirement §201.6(c)(5))	This will be included in Appendix A		
ELEMENT E: REQUIRED REVISIONS			
ELEMENT F. ADDITIONAL STATE REQUIREMENTS (OPTIONAL FOR STATE REVIEWERS ONLY; NOT TO BE COMPLETED BY FEMA)			
F1.			
F2.			
ELEMENT F: REQUIRED REVISIONS			

SECTION 2:
PLAN ASSESSMENT

INSTRUCTIONS: The purpose of the Plan Assessment is to offer the local community more comprehensive feedback to the community on the quality and utility of the plan in a narrative format. The audience for the Plan Assessment is not only the plan developer/local community planner, but also elected officials, local departments and agencies, and others involved in implementing the Local Mitigation Plan. The Plan Assessment must be completed by FEMA. The Assessment is an opportunity for FEMA to provide feedback and information to the community on: 1) suggested improvements to the Plan; 2) specific sections in the Plan where the community has gone above and beyond minimum requirements; 3) recommendations for plan implementation; and 4) ongoing partnership(s) and information on other FEMA programs, specifically RiskMAP and Hazard Mitigation Assistance programs. The Plan Assessment is divided into two sections:

1. Plan Strengths and Opportunities for Improvement
2. Resources for Implementing Your Approved Plan

Plan Strengths and Opportunities for Improvement is organized according to the plan Elements listed in the Regulation Checklist. Each Element includes a series of italicized bulleted items that are suggested topics for consideration while evaluating plans, but it is not intended to be a comprehensive list. FEMA Mitigation Planners are not required to answer each bullet item, and should use them as a guide to paraphrase their own written assessment (2-3 sentences) of each Element.

The Plan Assessment must not reiterate the required revisions from the Regulation Checklist or be regulatory in nature, and should be open-ended and to provide the community with suggestions for improvements or recommended revisions. The recommended revisions are suggestions for improvement and are not required to be made for the Plan to meet Federal regulatory requirements. The italicized text should be deleted once FEMA has added comments regarding strengths of the plan and potential improvements for future plan revisions. It is recommended that the Plan Assessment be a short synopsis of the overall strengths and weaknesses of the Plan (no longer than two pages), rather than a complete recap section by section.

Resources for Implementing Your Approved Plan provides a place for FEMA to offer information, data sources and general suggestions on the overall plan implementation and maintenance process. Information on other possible sources of assistance including, but not limited to, existing publications, grant funding or training opportunities, can be provided. States may add state and local resources, if available.

A. Plan Strengths and Opportunities for Improvement

This section provides a discussion of the strengths of the plan document and identifies areas where these could be improved beyond minimum requirements.

Element A: Planning Process

How does the Plan go above and beyond minimum requirements to document the planning process with respect to:

- *Involvement of stakeholders (elected officials/decision makers, plan implementers, business owners, academic institutions, utility companies, water/sanitation districts, etc.);*
- *Involvement of Planning, Emergency Management, Public Works Departments or other planning agencies (i.e., regional planning councils);*
- *Diverse methods of participation (meetings, surveys, online, etc.); and*
- *Reflective of an open and inclusive public involvement process.*

Element B: Hazard Identification and Risk Assessment

In addition to the requirements listed in the Regulation Checklist, 44 CFR 201.6 Local Mitigation Plans identifies additional elements that should be included as part of a plan's risk assessment. The plan should describe vulnerability in terms of:

1) *A general description of land uses and future development trends within the community so that mitigation options can be considered in future land use decisions;*
2) *The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas; and*
3) *A description of potential dollar losses to vulnerable structures, and a description of the methodology used to prepare the estimate.*

How does the Plan go above and beyond minimum requirements to document the Hazard Identification and Risk Assessment with respect to:

- *Use of best available data (flood maps, HAZUS, flood studies) to describe significant hazards;*
- *Communication of risk on people, property, and infrastructure to the public (through tables, charts, maps, photos, etc.);*
- *Incorporation of techniques and methodologies to estimate dollar losses to vulnerable structures;*
- *Incorporation of Risk MAP products (i.e., depth grids, Flood Risk Report, Changes Since Last FIRM, Areas of Mitigation Interest, etc.); and*
- *Identification of any data gaps that can be filled as new data became available.*

Element C: Mitigation Strategy

How does the Plan go above and beyond minimum requirements to document the Mitigation Strategy with respect to:

- *Key problems identified in, and linkages to, the vulnerability assessment;*
- *Serving as a blueprint for reducing potential losses identified in the Hazard Identification and Risk Assessment;*
- *Plan content flow from the risk assessment (problem identification) to goal setting to mitigation action development;*
- *An understanding of mitigation principles (diversity of actions that include structural projects, preventative measures, outreach activities, property protection measures, post-disaster actions, etc);*
- *Specific mitigation actions for each participating jurisdictions that reflects their unique risks and capabilities;*
- *Integration of mitigation actions with existing local authorities, policies, programs, and resources; and*
- *Discussion of existing programs (including the NFIP), plans, and policies that could be used to implement mitigation, as well as document past projects.*

Element D: Plan Update, Evaluation, and Implementation (*Plan Updates Only*)

How does the Plan go above and beyond minimum requirements to document the 5-year Evaluation and Implementation measures with respect to:

- *Status of previously recommended mitigation actions;*
- *Identification of barriers or obstacles to successful implementation or completion of mitigation actions, along with possible solutions for overcoming risk;*
- *Documentation of annual reviews and committee involvement;*
- *Identification of a lead person to take ownership of, and champion the Plan;*
- *Reducing risks from natural hazards and serving as a guide for decisions makers as they commit resources to reducing the effects of natural hazards;*
- *An approach to evaluating future conditions (i.e. socio-economic, environmental, demographic, change in built environment etc.);*
- *Discussion of how changing conditions and opportunities could impact community resilience in the long term; and*
- *Discussion of how the mitigation goals and actions support the long-term community vision for increased resilience.*

B. Resources for Implementing Your Approved Plan

Ideas may be offered on moving the mitigation plan forward and continuing the relationship with key mitigation stakeholders such as the following:

- *What FEMA assistance (funding) programs are available (for example, Hazard Mitigation Assistance (HMA)) to the jurisdiction(s) to assist with implementing the mitigation actions?*
- *What other Federal programs (National Flood Insurance Program (NFIP), Community Rating System (CRS), Risk MAP, etc.) may provide assistance for mitigation activities?*
- *What publications, technical guidance or other resources are available to the jurisdiction(s) relevant to the identified mitigation actions?*
- *Are there upcoming trainings/workshops (Benefit-Cost Analysis (BCA), HMA, etc.) to assist the jurisdictions(s)?*
- *What mitigation actions can be funded by other Federal agencies (for example, U.S. Forest Service, National Oceanic and Atmospheric Administration (NOAA), Environmental Protection Agency (EPA) Smart Growth, Housing and Urban Development (HUD) Sustainable Communities, etc.) and/or state and local agencies?*

SECTION 3:
MULTI-JURISDICTION SUMMARY SHEET (OPTIONAL)

INSTRUCTIONS: For multi-jurisdictional plans, a Multi-jurisdiction Summary Spreadsheet may be completed by listing each participating jurisdiction, which required Elements for each jurisdiction were 'Met' or 'Not Met,' and when the adoption resolutions were received. This Summary Sheet does not imply that a mini-plan be developed for each jurisdiction; it should be used as an optional worksheet to ensure that each jurisdiction participating in the Plan has been documented and has met the requirements for those Elements (A through E).

MULTI-JURISDICTION SUMMARY SHEET												
							Requirements Met (Y/N)					
#	Jurisdiction Name	Jurisdiction Type (city/borough/ township/ village, etc.)	Plan POC	Mailing Address	Email	Phone	A. Planning Process	B. Hazard Identification & Risk Assessment	C. Mitigation Strategy	D. Plan Review, Evaluation & Implementation	E. Plan Adoption	F. State Requirements
1	Anson	County	Rodney Diggs	2230 Country Club Rd Wadesboro, NC 28170	rdiggs@co.anson.nc.us	704-994-3272	Y	Y	Y	Y	Y	Y
2	Ansonville	Town	Diane McLaughlin	8778 Highway 52 North Ansonville, NC 28007	N/A	704-826-8404	Y	Y	Y	Y	Y	Y
3	Lilesville	Town	Lynn Whitlock	Po Box 451 114 East Wall St Lilesville, NC 28091	lilesvilletown@windstream.net	704-848-4711	Y	Y	Y	Y	Y	Y
4	McFarlan	Town	Diane Timmons	119 N. Washington Street, Wadesboro, North Carolina 28170	N/A	704-851-3269	Y	Y	Y	Y	Y	Y
5	Morven	Town	Kelly Tarlton	301 Main St, Morven, NC 28119	N/A	704-851-9321	Y	Y	Y	Y	Y	Y

MULTI-JURISDICTION SUMMARY SHEET													
#	Jurisdiction Name	Jurisdiction Type (city/borough/ township/ village, etc.)	Plan POC	Mailing Address	Email	Phone	Requirements Met (Y/N)					
							A. Planning Process	B. Hazard Identification & Risk Assessment	C. Mitigation Strategy	D. Plan Review, Evaluation & Implementation	E. Plan Adoption	F. State Requirements
6	Peachland	Town	Lynn Griffin	P.O. Box 120 32 West Passaic Street Peachland, NC 28133	townofpeachland@windstream.net	704-272-7781	Y	Y	Y	Y	Y	Y
7	Polkton	Town	Minnie Staton	PO Box 99 35 West Polk Street Polkton, NC 28135	townofpolkton@windstream.net	704-272-7463	Y	Y	Y	Y	Y	Y
8	Wadesboro	Town	Alex Sewell	P.O. Box 697 Wadesboro, NC 28170	wadesboromanager@windstream.net	704-694-5171	Y	Y	Y	Y	Y	Y
9	Montgomery	County	Robbie Smith	199 South Liberty St. Troy, NC 27371	robbie.smith@montgomerycountync.com	910-572-1347	Y	Y	Y	Y	Y	Y
10	Biscoe	Town	Brandon Holland	110 West Main Street, Biscoe, N.C. 27209	manager@townofbiscoe.com	910-428-4112	Y	Y	Y	Y	Y	Y
11	Candor	Town	Tammy Kellis	214 S. Main Street PO Box 220 Candor, NC 27229	TownofCandor@Embarqmail.com	910-974-4221	Y	Y	Y	Y	Y	Y
12	Mount Gilead	Town	Matthew Christian	110 West Allenton Street PO Box 325, Mt. Gilead, NC 27306	mchristian@mtgileadnc.com	910-439-5111	Y	Y	Y	Y	Y	Y
13	Star	Town	Wesley Brown	Star Fire Department 454 S Main Star, NC 27356	N/A	910-428-4623	Y	Y	Y	Y	Y	Y

MULTI-JURISDICTION SUMMARY SHEET												
#	Jurisdiction Name	Jurisdiction Type (city/borough/ township/ village, etc.)	Plan POC	Mailing Address	Email	Phone	Requirements Met (Y/N)					
							A. Planning Process	B. Hazard Identification & Risk Assessment	C. Mitigation Strategy	D. Plan Review, Evaluation & Implementation	E. Plan Adoption	F. State Requirements
14	Troy	Town	Greg Zephyr	315 N Main Street Troy, NC 27371	manager@troy.nc.us	910-572-3661	Y	Y	Y	Y	Y	Y
15	Richmond	County	Donna Wright	1401 Fayetteville Rd. Rockingham, NC 28380	donna.wright@richmondnc.com	910-997-8238	Y	Y	Y	Y	Y	Y
16	Dobbins Heights	Town	Antonio Blue	172 Earle Franklin Dr Dobbins Heights, NC	'dobbinsheights@bellsouth.net'	910-582-6002	Y	Y	Y	Y	Y	Y
17	Ellerbe	Town	Lee Berry	P.O. Box 297 Ellerbe, NC 28338	N/A	910-417-0972	Y	Y	Y	Y	Y	Y
18	Hamlet	City	Bill Bayless	201 W. Main Street Hamlet, NC 28346	N/A	910-582-2651	Y	Y	Y	Y	Y	Y
19	Hoffman	Town	Tommy Hart	2176 Caddell Road P.O. Box 145 Hoffman, NC 28347	laymenhart@yahoo.com	910-281-3606	Y	Y	Y	Y	Y	Y
20	Norman	Town	Kenneth Broadway	104 Town Hall Rd. Norman, NC 28367	N/A	910-652-3620	Y	Y	Y	Y	Y	Y
21	Rockingham	City	John Massey	514 Rockingham Road Rockingham, N.C. 28379	john@gorockingham.com	910-997-5546	Y	Y	Y	Y	Y	Y
22	Scotland	County	Roylin Hammond	507 West Covington Street Laurinburg, NC 28352	rhammond@scotlandcounty.org	910-277-2406	Y	Y	Y	Y	Y	Y

MULTI-JURISDICTION SUMMARY SHEET												
#	Jurisdiction Name	Jurisdiction Type (city/borough/ township/ village, etc.)	Plan POC	Mailing Address	Email	Phone	Requirements Met (Y/N)					
							A. Planning Process	B. Hazard Identification & Risk Assessment	C. Mitigation Strategy	D. Plan Review, Evaluation & Implementation	E. Plan Adoption	F. State Requirements
23	East Laurinburg	Town	Donald Wayne Caulder	11 3rd St, Laurinburg, NC 28352	N/A	910-276-2746	Y	Y	Y	Y	Y	Y
24	Gibson	Town	Ronnie Hudson	4681 Main, Gibson, NC 28343	N/A	910-268-4291	Y	Y	Y	Y	Y	Y
25	Laurinburg	City	Mac McInnis	305 West Church Street, Laurinburg, NC 28352	mmcinnis@laurinburg.org	910-276-8257	Y	Y	Y	Y	Y	Y
26	Wagram	Town	Milton Farmer	24421 Marlboro Street, Wagram, North Carolina, 28396	townofwagram@windstream.net,	910-369-2776	Y	Y	Y	Y	Y	Y

Appendix C: Public Outreach Strategy

This appendix to the Pee Dee Lumber Regional Hazard Mitigation Plan contains a copy of the Public Outreach Strategy to guide the public outreach element of the mitigation planning process.

Public Outreach Strategy
October 27, 2016

Project Summary

The counties of Anson, Montgomery, Richmond and Scotland, in coordination with their participating municipal jurisdictions, are updating their regional hazard mitigation plan that covers the four-county Pee Dee Lumber area. The Pee Dee Lumber Regional Hazard Mitigation Plan will identify local policies and actions for reducing risk and future losses from natural hazards such as floods, severe storms, wildfires, and winter weather.

The plan will also serve to meet key federal planning regulations which require local governments to develop a hazard mitigation plan as a condition for receiving certain types of non-emergency disaster assistance, including funding for hazard mitigation projects. These mitigation planning requirements stem from the Disaster Mitigation Act of 2000, which was passed by the U.S. Congress in October of 2000. This Act amended federal law to require that all states and local governments must have hazard mitigation plans in place in order to be eligible to apply for funding under such programs as the Hazard Mitigation Grant Program (HMGP) and the Pre-Disaster Mitigation (PDM) program.

Public Outreach

A key element in the mitigation planning process is the discussion it promotes among community members about creating a safer, more disaster-resilient community. A plan that accurately reflects the community's values and priorities is likely to have greater legitimacy and "buy-in" and greater success in implementing mitigation actions and projects to reduce risk.[1] Therefore, the purpose of the Pee Dee Lumber Regional Hazard Mitigation Plan Public Outreach Strategy is to:

- Generate public interest;
- Solicit citizen input; and
- Engage additional partners in the planning process.

The following specific public outreach opportunities and methods have been identified for citizens and targeted stakeholders to participate at various points in the mitigation planning process, and are presented in more detail on the following pages:

1. In-person public meetings (3)
2. Public information website (including social media integration)
3. Project information fact sheet
4. Planning resources
5. Public participation survey
6. Emergency Preparedness Fair

[1] FEMA, *Local Mitigation Planning Handbook*, March 2013.

OUTREACH METHOD 1
In-Person Public Meetings (3)
AVAILABILITY
October 27, 2016, June 15, 2017 and September 2017.
BRIEF DESCRIPTION
Three public meetings will be scheduled at key points in the project timeline, one following the kick-off meeting with the Pee Dee Lumber Regional Hazard Mitigation Planning Committee, one following completion of the draft risk and capability assessments and one following completion of the draft plan (and prior to the plan's local adoption). These meetings will be coordinated and arranged by Richmond County with facilitation support from AECOM.
DETAILS
For all public meetings: • The purpose will be to inform the public on the process and current status of the regional planning process, as well as gain input to the process during the drafting stage and prior to plan completion and approval • AECOM will prepare presentation and handout materials as needed to help facilitate two-way communication with public meeting attendees
LEAD AGENCY
Richmond County/AECOM

OUTREACH METHOD 2
Public Information Website (including Social Media Integration)
AVAILABILITY
April 5, 2017
BRIEF DESCRIPTION
A project information website will be hosted by Richmond County Emergency Management and will be available to the general public and to members of the Hazard Mitigation Planning Committee for the duration of the project at the following web address: http://www.richmondnc.com/163/Emergency-Services. The primary purpose of this site will be to share information relevant to the 2017 Pee Dee Lumber Regional Hazard Mitigation Plan planning process.
DETAILS
Specific resources to be included on this site include: • Project information fact sheet • Drafts of Pee Dee Lumber Regional Hazard Mitigation Plan sections • List of Pee Dee Lumber Local Jurisdiction Leads • List of project tasks and subtasks with schedule • PowerPoint files from Hazard Mitigation Planning Committee meetings • PDFs of existing county-level hazard mitigation plans for reference during the plan update process • Links to planning resources, including recently published FEMA hazard mitigation planning guidance • Social media integration including, but not limited to, Facebook, Twitter, Tumblr, and Pinterest
LEAD AGENCY
Richmond County

OUTREACH METHOD 3

Project Information Fact Sheet

AVAILABILITY

April 5, 2017

BRIEF DESCRIPTION

A 1-page (double-sided) project information fact sheet will be available online in PDF format for the duration of the project. The primary purpose of this document will be to provide information on the regional planning process and to provide project contact information and links for interested parties to engage in the planning effort. This resource will be available on the project information website described above in Outreach Method 2. Printed copies may be made available on an as-needed basis.

DETAILS

Specific information to be provided in this fact sheet includes:

- Project overview
- Overview of the regional hazard mitigation planning process, including:
  - Public outreach
  - Risk assessment
  - Capability assessment
  - Mitigation strategy development
  - Plan maintenance
  - Plan adoption
- Explanation of project leadership
- Project schedule
- Contact information and links to project information website
- Project graphics/illustrations

LEAD AGENCY

Richmond County/AECOM

OUTREACH METHOD 4

Planning Resources

AVAILABILITY

September 27, 2016

BRIEF DESCRIPTION

Mitigation planning resources will be made available for Hazard Mitigation Planning Committee members and other interested parties in order to promote education and participation in the mitigation planning process.

DETAILS

Specific planning resources will include:

- FEMA mitigation planning guidance
  - *Local Mitigation Planning Handbook*
  - *Mitigation Ideas*
  - *Integrating Hazard Mitigation Into Local Planning*
- Other appropriate planning resources as identified throughout the duration of the planning process

LEAD AGENCY

Richmond County/AECOM

OUTREACH METHOD 5

Public Participation Survey

AVAILABILITY

March 9 to July 21, 2017

BRIEF DESCRIPTION

An online public participation survey will be hosted by AECOM using the SurveyMonkey web hosting service and will be open to the public for a duration of approximately three months. The primary purpose of this survey will be to solicit input from any interested parties in the planning area and will be used so that individuals throughout the planning area have the opportunity to provide valuable information and feedback to the project team. The online survey will give individuals that are unable to attend the in-person meetings the opportunity to participate in the plan update process. Information from the online survey will allow the project team to better understand the types of hazards that most concern the public and the mitigation actions that are of particular interest. The survey will be made accessible through hyperlinks posted on the project information website and can be circulated via email, Facebook, etc. Additionally, hard copies of the survey will be distributed at the in-person public meetings. The feedback received will be evaluated and incorporated into the Hazard Mitigation Planning Committee's decision making process and the final plan.

DETAILS

Types of specific questions to be asked as part of this survey may include:

- Personal history with natural hazards
- Natural hazard concerns
- Perception of vulnerable community assets
- Importance of community assets
- Priorities concerning natural hazard preparedness
- Steps local government can take to reduce natural hazard risk
- Types of mitigation activities deemed important
- Personal interest in natural hazard mitigation
- Effective ways to communicate with residents
- Location in the floodplain
- Questions regarding flood insurance
- Personal actions to mitigate property
- Mitigation activities planned for the respondent's household
- Location within the planning area
- Age (optional)*
- Gender (optional)
- Highest level of education (optional)
- Length of time living in the planning area
- Ownership of property versus rental status
- Type of dwelling
- Open comments**

** All information will be kept strictly confidential*

*** Information will be processed and summarized by AECOM in order to produce summary statistics and summary responses*

LEAD AGENCY

Richmond County/AECOM

OUTREACH METHOD 6
Emergency Preparedness Fair
AVAILABILITY
April 3, 2017
BRIEF DESCRIPTION
Tables will be set up at the County Health Fair in order to provide information about emergency preparedness and about the Pee Dee Lumber Hazard Mitigation Plan and also to promote public involvement in the planning process.
DETAILS
An AECOM representative was at the Health Fair to answer any questions the public had as well as tables that were set up for the public to view the following: • Aerial maps of each county and different colored markers for the public to mark any areas they find to be hazardous. • Public Participation Survey link and a hard-copy for them to complete there. • Public Information Fact Sheet handouts.
LEAD AGENCY
Richmond County/AECOM

Appendix D: Public Participation Survey

This appendix to the Pee Dee Lumber Regional Hazard Mitigation Plan contains a summary of the results obtained through the public participation survey offered from March 9 to July 21, 2017. The survey was conducted online through SurveyMonkey, an online survey software provider, and was also made available in print form at public meetings and at other locations throughout the planning area. These written responses were added to the online database and are reflected in the summary report provided in this appendix.

There were a total of 169 surveys completed by the public. Of those 169 surveys, here are some key facts:

- 70% of residents have experienced or been impacted by a disaster.
    - Hurricane and Winter Weather were the two most common at 66% with Erosion and Landslide at the least common at only 1%

- 57% of the residents stated they were very concerned about their community being impacted by Thunderstorm/High Wind and 78% stated they were not concerned about Landslide.

- 52% of the residents ranked *People: Loss of life and/or injuries* as the most vulnerable to being susceptible to natural hazards and 59% ranked *Cultural/Historic: Damage or loss of libraries, museums, historic properties, etc.* as the least vulnerable.

- When asked which assets are most important 90% said *Fire, Police and EMS stations*, and *Hospitals and Medical Facilities.*

- 94% stated that *protecting critical facilities (hospitals, police stations, fire stations, etc.)* is most important for planning against natural hazards.

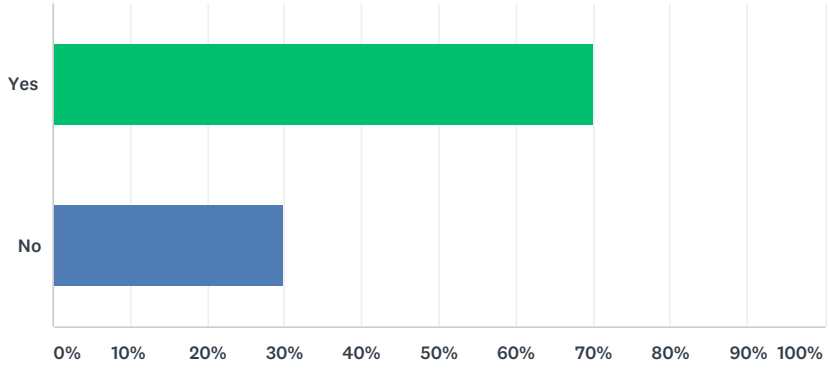
- 63% of the residents stated that the *internet (social media)* is the best way for them to receive information about natural hazards. 52-58% also stated *internet (web pages), mobile messages/alerts, mail and newspaper* were the best ways.

- Only 5% of the residents live in a floodplain.

- 73% of the residents have lived in the Pee Dee Lumber area for 20 years or more.

Q1 Have you ever experienced or been impacted by a disaster?

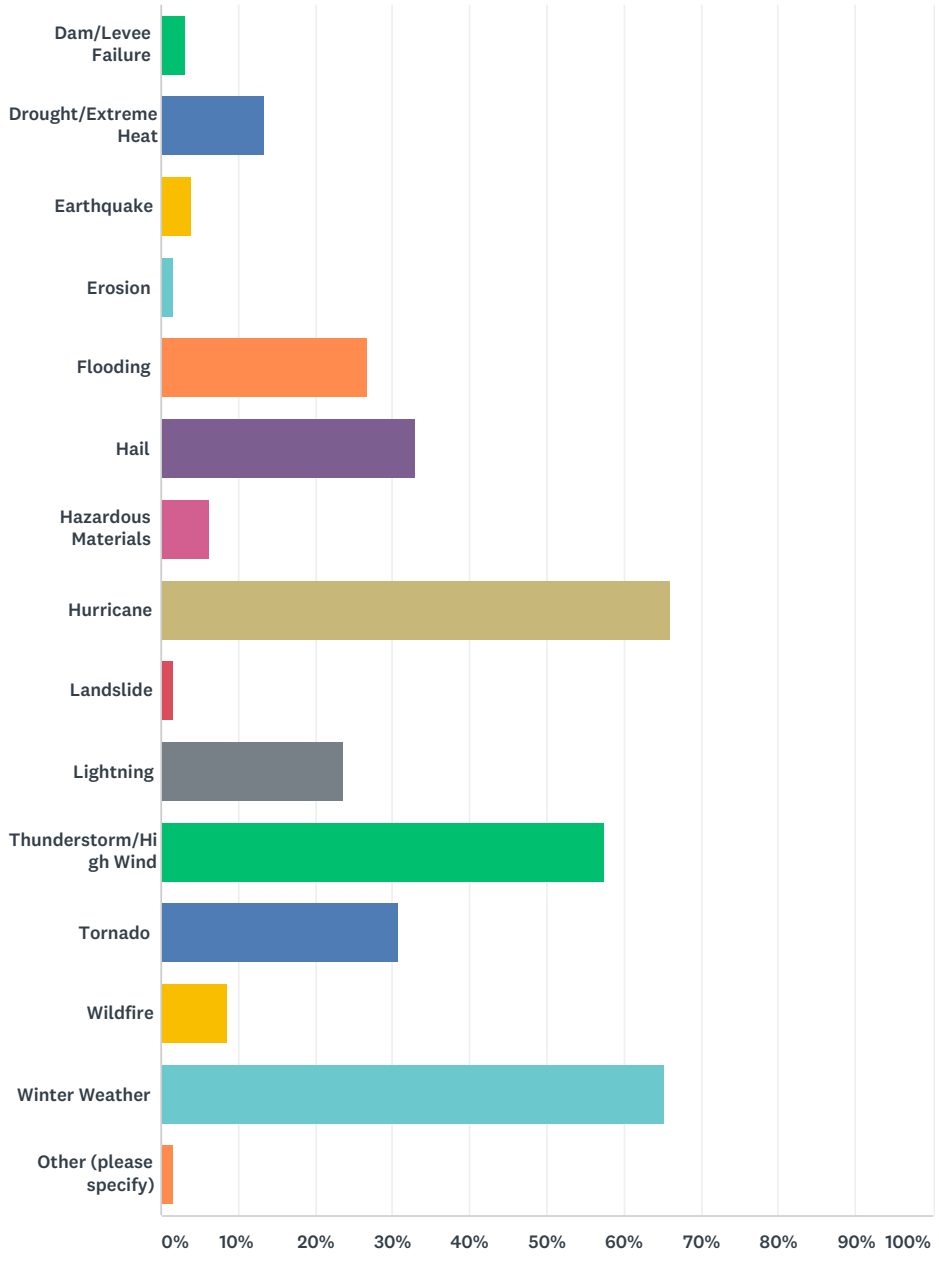
Answered: 167 Skipped: 2



ANSWER CHOICES	RESPONSES	
Yes	70.06%	117
No	29.94%	50
TOTAL		167

Q2 If yes, which of these natural hazards have you experienced or been impacted by? (Check all that apply.)

Answered: 127 Skipped: 42



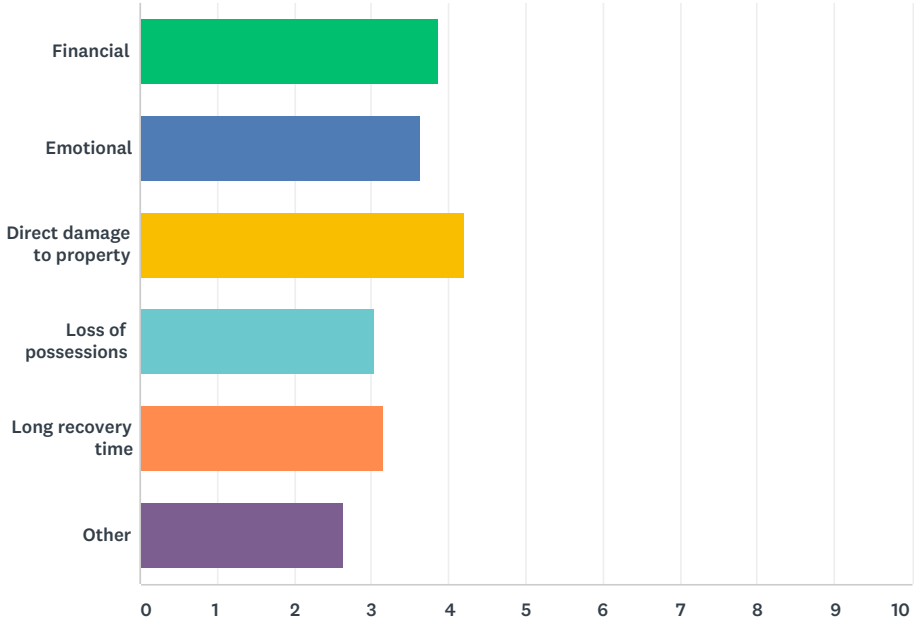
ANSWER CHOICES	RESPONSES	
Dam/Levee Failure	3.15%	4
Drought/Extreme Heat	13.39%	17
Earthquake	3.94%	5
Erosion	1.57%	2
Flooding	26.77%	34
Hail	33.07%	42

Hazardous Materials	6.30%	8
Hurricane	66.14%	84
Landslide	1.57%	2
Lightning	23.62%	30
Thunderstorm/High Wind	57.48%	73
Tornado	30.71%	39
Wildfire	8.66%	11
Winter Weather	65.35%	83
Other (please specify)	1.57%	2
Total Respondents: 127		

#	OTHER (PLEASE SPECIFY)	DATE
1	rain	6/17/2017 9:16 PM
2	Ice Storm	6/12/2017 12:46 PM

Q3 What was the most difficult part for you in recovering from past disasters that you have experienced? (1 being most difficult and 6 being least difficult.)

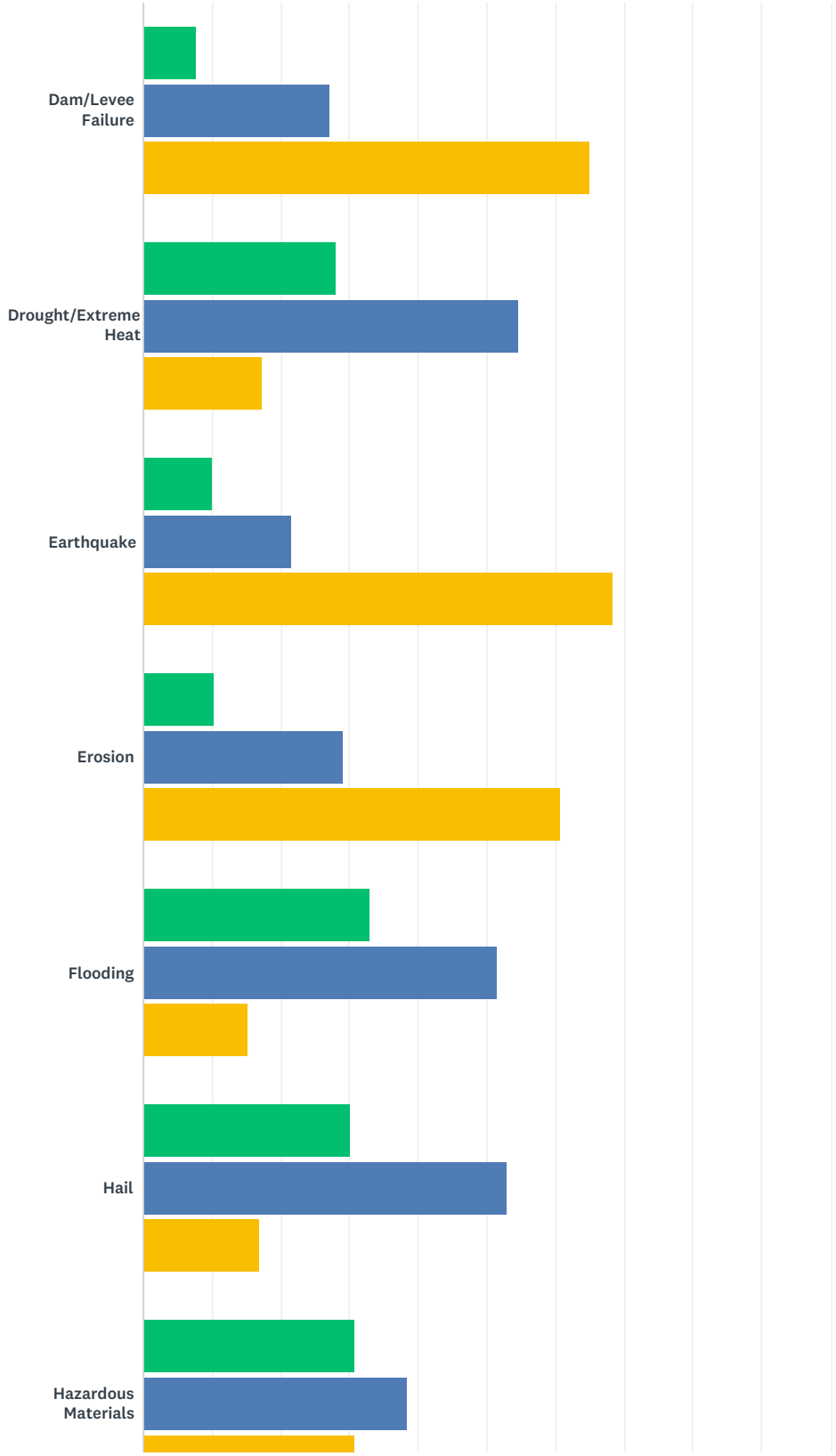
Answered: 123 Skipped: 46

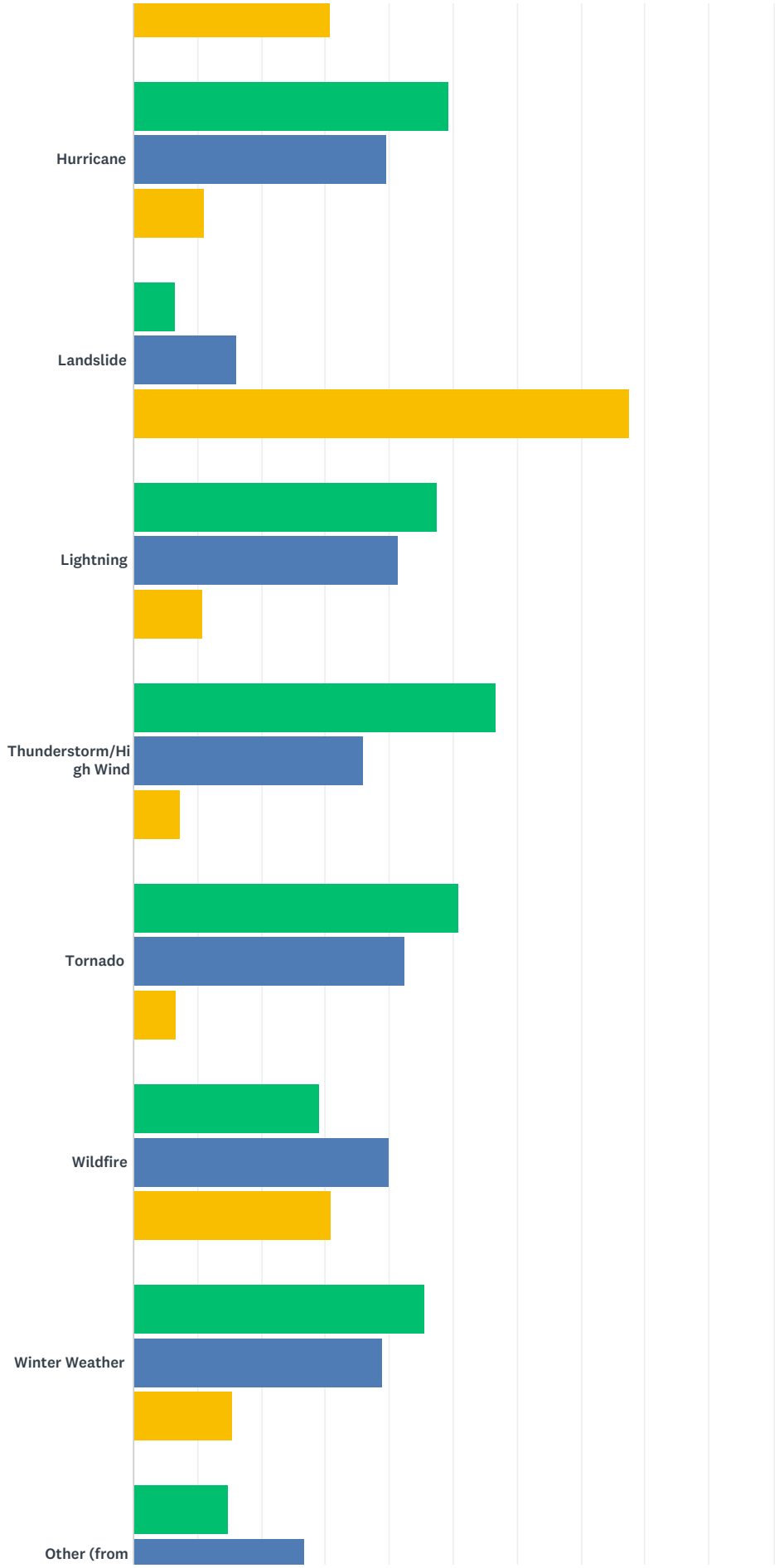


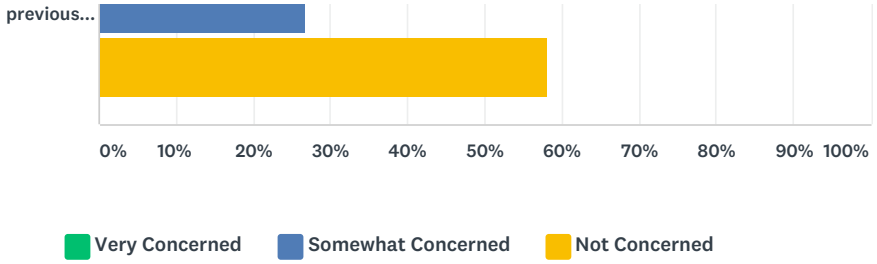
	1	2	3	4	5	6	TOTAL	SCORE
Financial	21.13% 15	23.94% 17	16.90% 12	14.08% 10	7.04% 5	16.90% 12	71	3.87
Emotional	11.39% 9	21.52% 17	22.78% 18	15.19% 12	21.52% 17	7.59% 6	79	3.63
Direct damage to property	28.57% 24	15.48% 13	26.19% 22	10.71% 9	15.48% 13	3.57% 3	84	4.20
Loss of possessions	10.84% 9	7.23% 6	16.87% 14	26.51% 22	16.87% 14	21.69% 18	83	3.04
Long recovery time	8.25% 8	16.49% 16	16.49% 16	18.56% 18	22.68% 22	17.53% 17	97	3.16
Other	17.50% 7	5.00% 2	7.50% 3	10.00% 4	12.50% 5	47.50% 19	40	2.63

Q4 How concerned are you about the possibility of your community being impacted by each of these natural hazards? (Check the corresponding circle for each natural hazard.)

Answered: 166 Skipped: 3



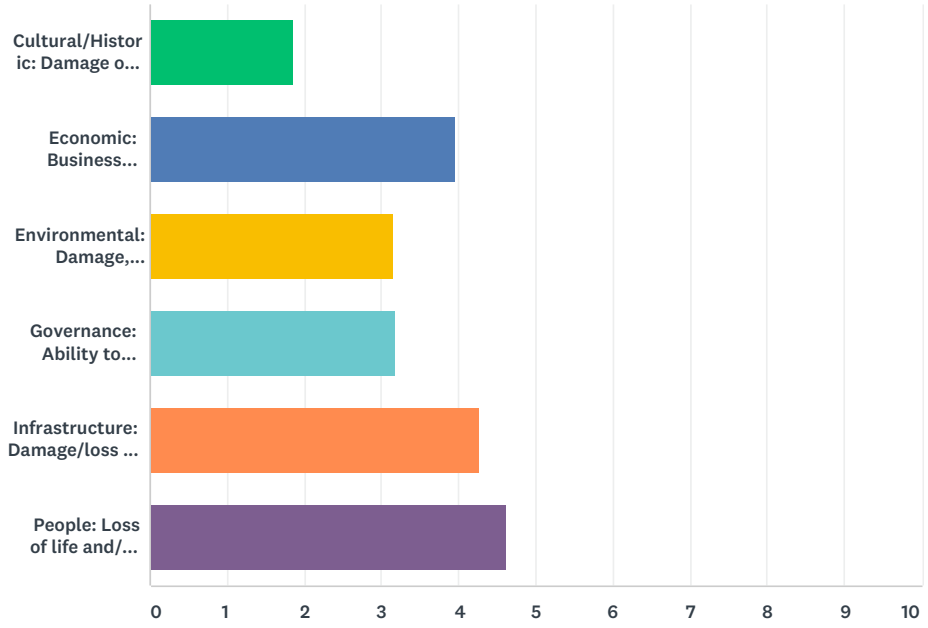

Hurricane
Landslide
Lightning
Thunderstorm/High Wind
Tornado
Wildfire
Winter Weather
Other (from



	VERY CONCERNED	SOMEWHAT CONCERNED	NOT CONCERNED	TOTAL
Dam/Levee Failure	7.74% 12	27.10% 42	65.16% 101	155
Drought/Extreme Heat	27.95% 45	54.66% 88	17.39% 28	161
Earthquake	10.13% 16	21.52% 34	68.35% 108	158
Erosion	10.32% 16	29.03% 45	60.65% 94	155
Flooding	33.13% 54	51.53% 84	15.34% 25	163
Hail	30.19% 48	52.83% 84	16.98% 27	159
Hazardous Materials	30.77% 48	38.46% 60	30.77% 48	156
Hurricane	49.38% 80	39.51% 64	11.11% 18	162
Landslide	6.41% 10	16.03% 25	77.56% 121	156
Lightning	47.56% 78	41.46% 68	10.98% 18	164
Thunderstorm/High Wind	56.71% 93	35.98% 59	7.32% 12	164
Tornado	50.91% 84	42.42% 70	6.67% 11	165
Wildfire	29.11% 46	39.87% 63	31.01% 49	158
Winter Weather	45.68% 74	38.89% 63	15.43% 25	162
Other (from previous question)	14.93% 10	26.87% 18	58.21% 39	67

Q5 In your opinion, which of the following categories are most susceptible to natural hazards in your community? (Rank the community assets in order of vulnerability, 1 being most vulnerable and 6 being least vulnerable.) Please note, the list will automatically re-order itself as you make your selections. You can also drag and drop the items on the list to reorder them.

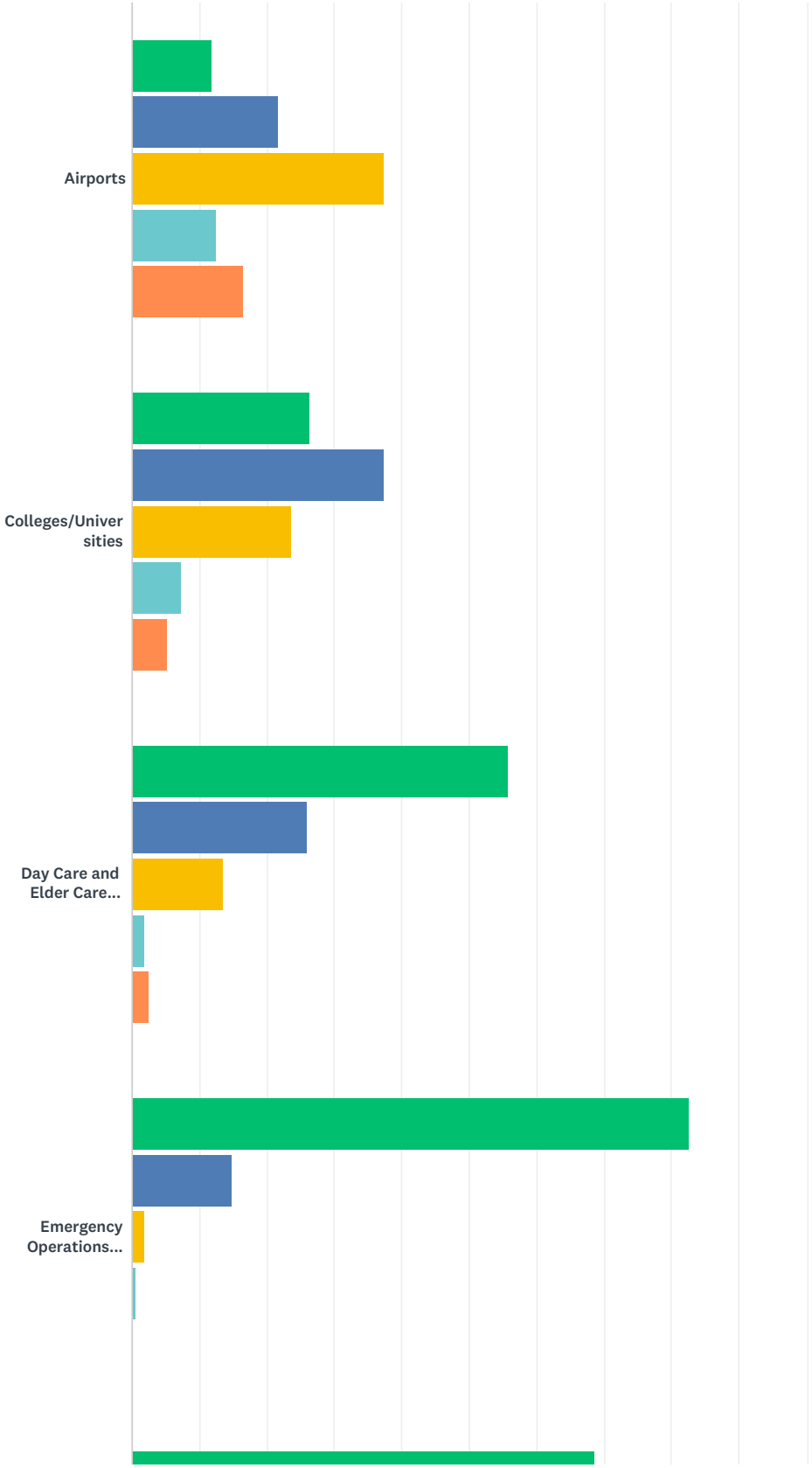
Answered: 147 Skipped: 22

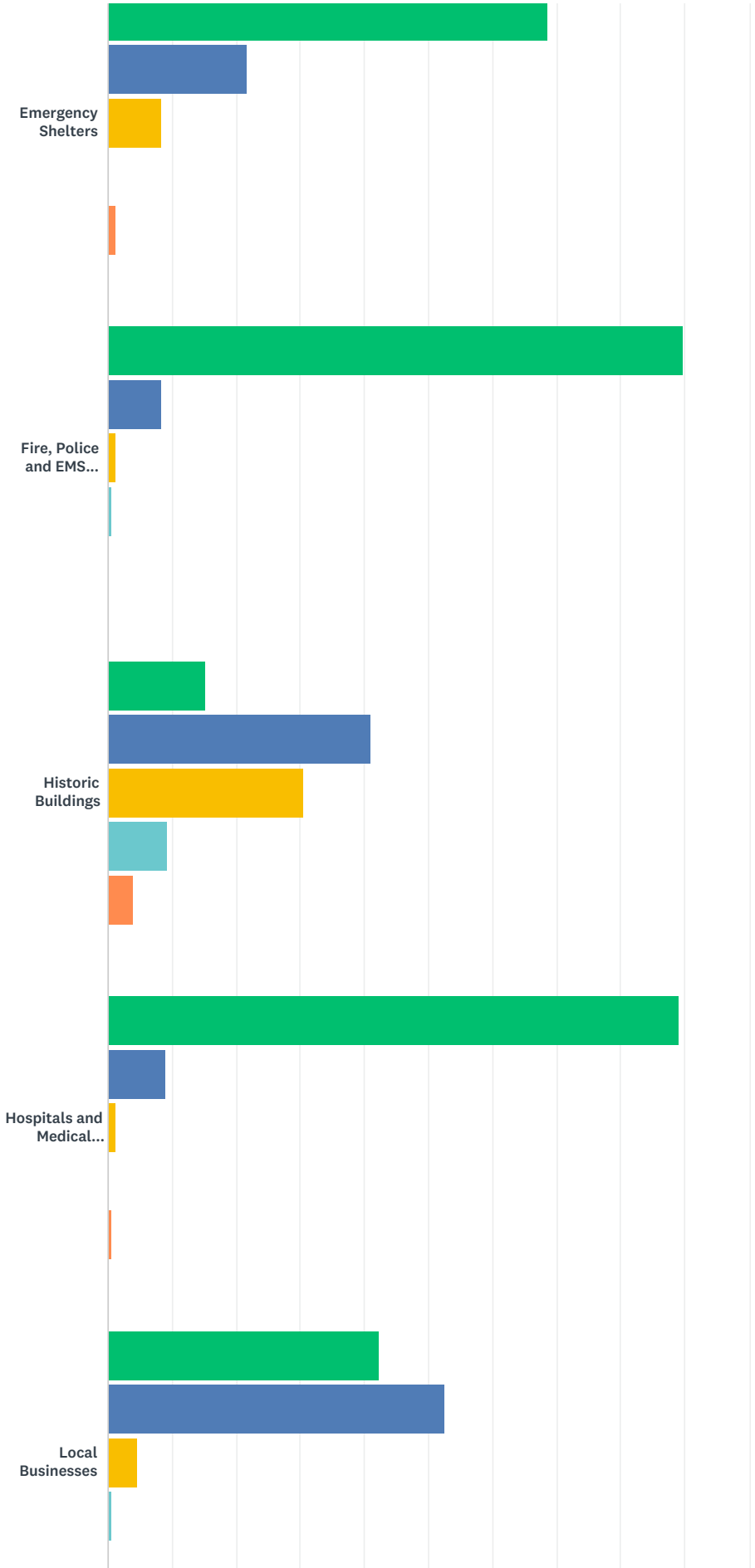


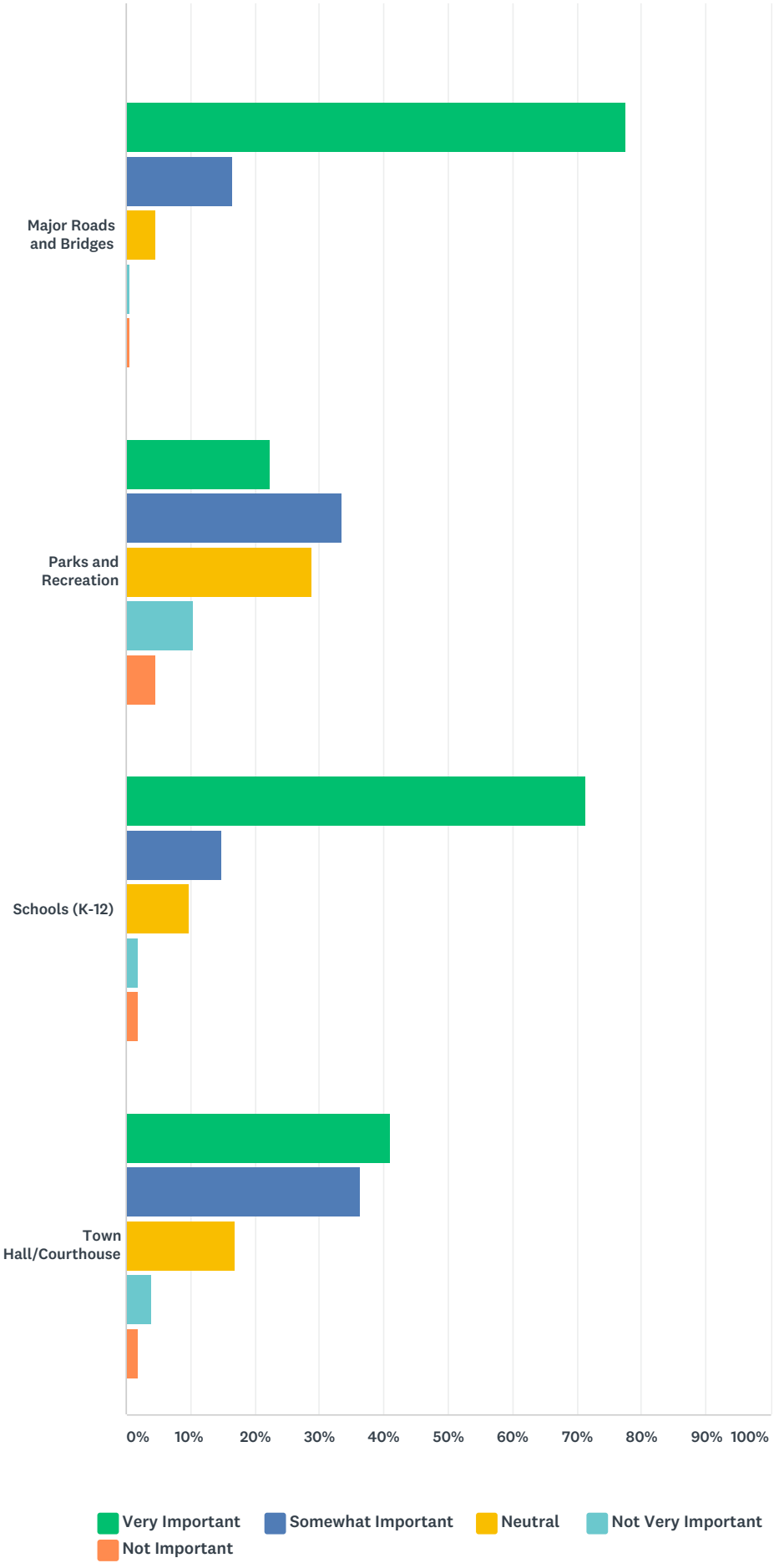
	1	2	3	4	5	6	TOTAL	SCORE
Cultural/Historic: Damage or loss of libraries, museums, historic properties, etc.	5.56% 6	1.85% 2	5.56% 6	5.56% 6	23.15% 25	58.33% 63	108	1.86
Economic: Business interruptions/closures, job losses, etc.	10.31% 10	31.96% 31	18.56% 18	20.62% 20	18.56% 18	0.00% 0	97	3.95
Environmental: Damage, contamination or loss of forests, wetlands, waterways, etc.	7.27% 8	8.18% 9	22.73% 25	27.27% 30	24.55% 27	10.00% 11	110	3.16
Governance: Ability to maintain order and/or provide public amenities and services	6.54% 7	11.21% 12	20.56% 22	32.71% 35	14.02% 15	14.95% 16	107	3.19
Infrastructure: Damage/loss of roads, bridges, utilities, schools, etc.	13.79% 16	39.66% 46	23.28% 27	9.48% 11	10.34% 12	3.45% 4	116	4.27
People: Loss of life and/or injuries	52.11% 74	9.15% 13	15.49% 22	7.04% 10	5.63% 8	10.56% 15	142	4.63

Q6 How important is each of the following specific community assets to you? (Check the appropriate circle for each asset.)

Answered: 156 Skipped: 13




Emergency Shelters
Fire, Police and EMS...
Historic Buildings
Hospitals and Medical...
Local Businesses

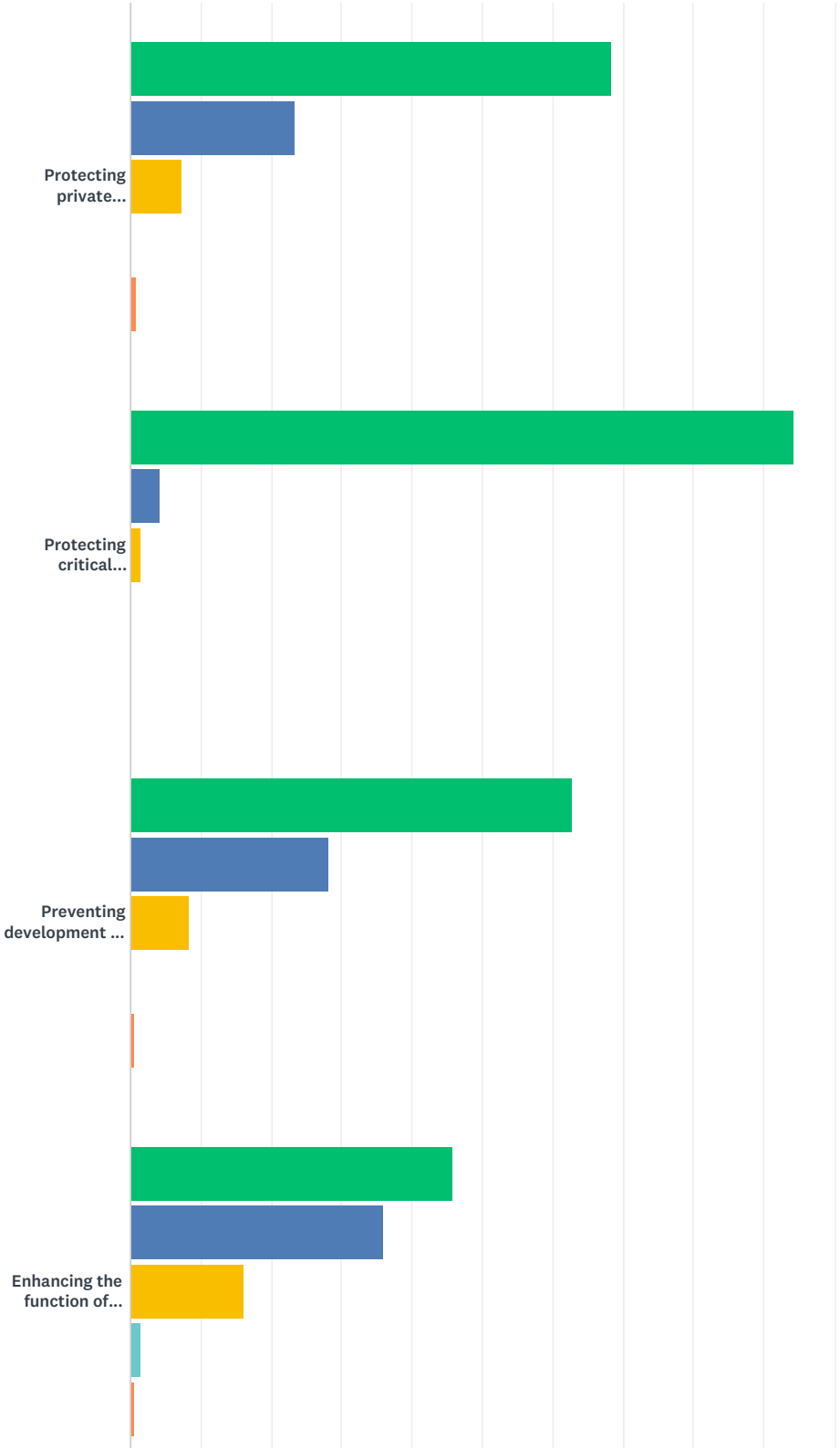

Major Roads and Bridges
Parks and Recreation
Schools (K-12)
Town Hall/Courthouse
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Very Important
Somewhat Important
Neutral
Not Very Important
Not Important

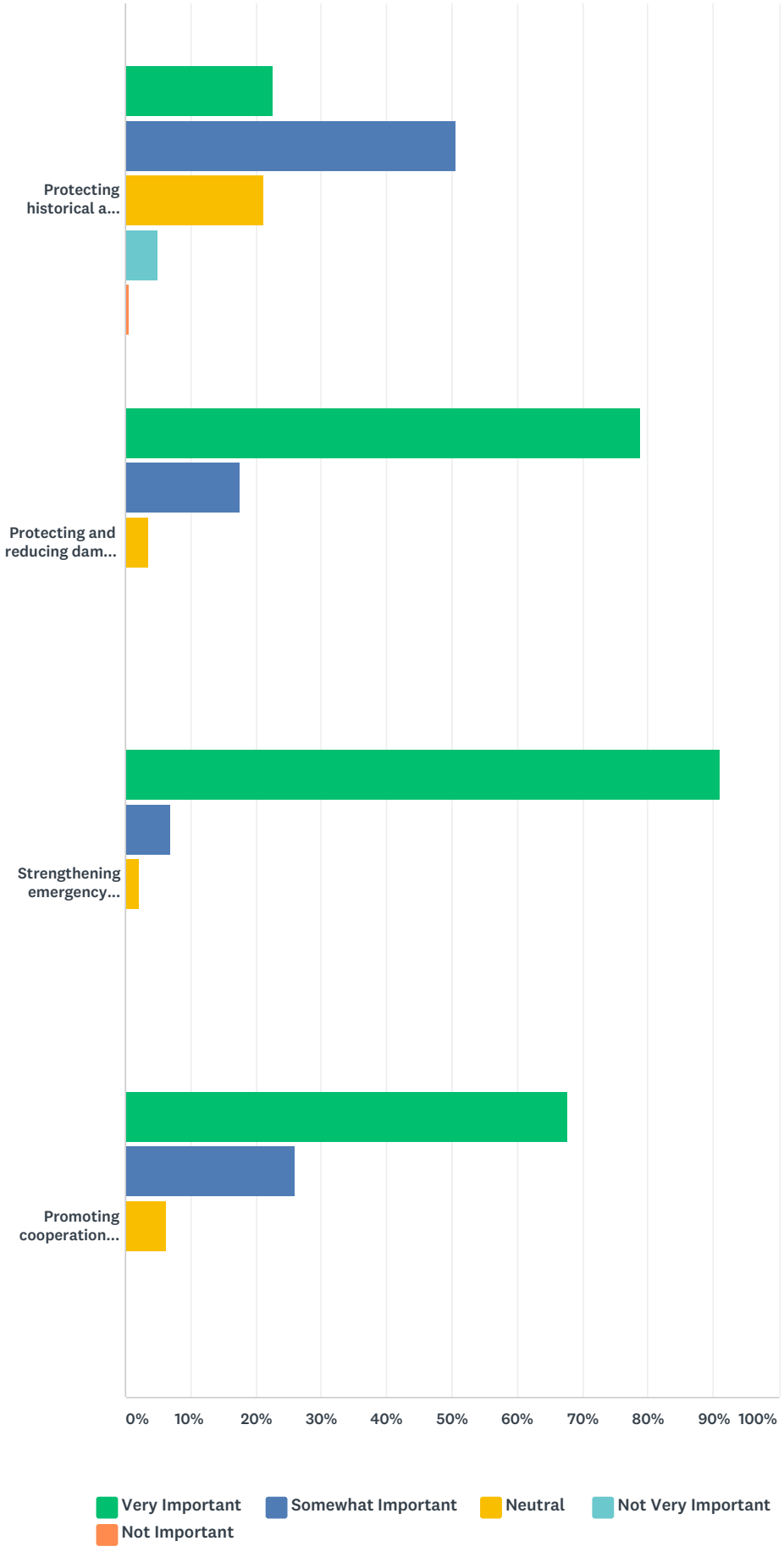
	VERY IMPORTANT	SOMEWHAT IMPORTANT	NEUTRAL	NOT VERY IMPORTANT	NOT IMPORTANT	TOTAL
Airports	11.84% 18	21.71% 33	37.50% 57	12.50% 19	16.45% 25	152
Colleges/Universities	26.32% 40	37.50% 57	23.68% 36	7.24% 11	5.26% 8	152
Day Care and Elder Care Facilities	55.84% 86	25.97% 40	13.64% 21	1.95% 3	2.60% 4	154
Emergency Operations Centers	82.58% 128	14.84% 23	1.94% 3	0.65% 1	0.00% 0	155
Emergency Shelters	68.59% 107	21.79% 34	8.33% 13	0.00% 0	1.28% 2	156
Fire, Police and EMS Stations	89.74% 140	8.33% 13	1.28% 2	0.64% 1	0.00% 0	156
Historic Buildings	15.23% 23	41.06% 62	30.46% 46	9.27% 14	3.97% 6	151
Hospitals and Medical Facilities	89.03% 138	9.03% 14	1.29% 2	0.00% 0	0.65% 1	155
Local Businesses	42.21% 65	52.60% 81	4.55% 7	0.65% 1	0.00% 0	154
Major Roads and Bridges	77.63% 118	16.45% 25	4.61% 7	0.66% 1	0.66% 1	152
Parks and Recreation	22.37% 34	33.55% 51	28.95% 44	10.53% 16	4.61% 7	152
Schools (K-12)	71.43% 110	14.94% 23	9.74% 15	1.95% 3	1.95% 3	154
Town Hall/Courthouse	40.91% 63	36.36% 56	16.88% 26	3.90% 6	1.95% 3	154

#	OTHER (PLEASE SPECIFY)	DATE
1	Homeless shelter for women.YMCA. Mentor programs for underprivledge boys and girlls	6/10/2017 4:32 PM

Q7 Natural hazards can have a significant impact on a community, but planning for these types of events can help lessen the impacts. Please tell us how important each statement is to you by checking the appropriate circle for each.

Answered: 143 Skipped: 26

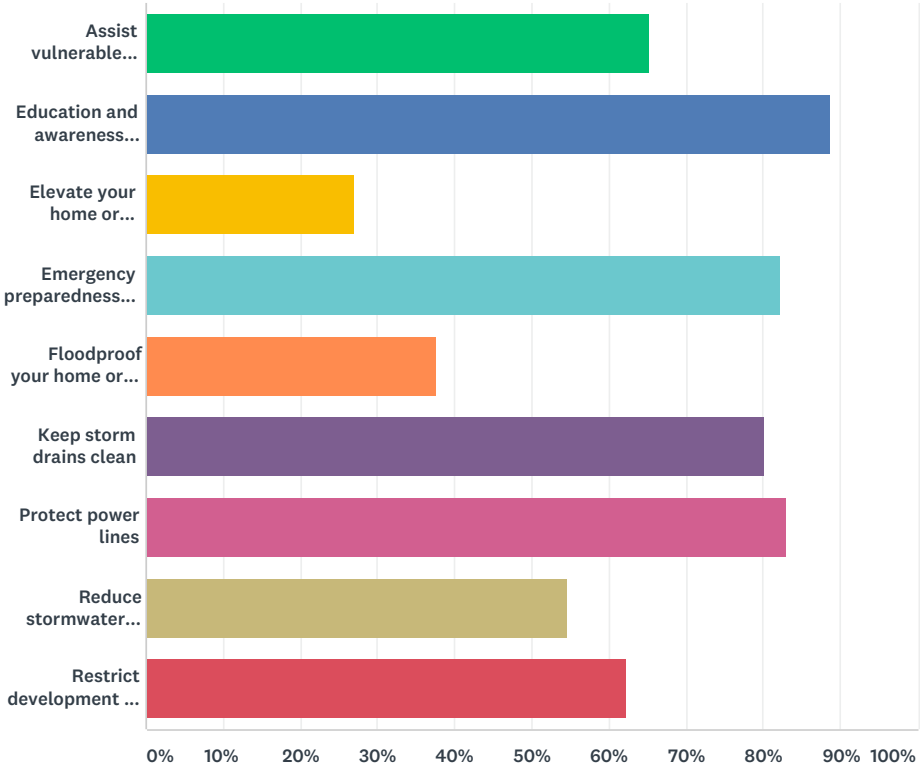



Protecting historical a...
Protecting and reducing dam...
Strengthening emergency...
Promoting cooperation...
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Very Important
Somewhat Important
Neutral
Not Very Important
Not Important

	VERY IMPORTANT	SOMEWHAT IMPORTANT	NEUTRAL	NOT VERY IMPORTANT	NOT IMPORTANT	TOTAL
Protecting private property	68.38% 93	23.53% 32	7.35% 10	0.00% 0	0.74% 1	136
Protecting critical facilities (for example, hospitals, police stations, fire stations, etc.)	94.33% 133	4.26% 6	1.42% 2	0.00% 0	0.00% 0	141
Preventing development in hazard areas	62.68% 89	28.17% 40	8.45% 12	0.00% 0	0.70% 1	142
Enhancing the function of natural features (for example, streams, wetlands, etc.)	45.77% 65	35.92% 51	16.20% 23	1.41% 2	0.70% 1	142
Protecting historical and cultural landmarks	22.54% 32	50.70% 72	21.13% 30	4.93% 7	0.70% 1	142
Protecting and reducing damage to utilities	78.87% 112	17.61% 25	3.52% 5	0.00% 0	0.00% 0	142
Strengthening emergency services (for example, police, fire, ambulance)	90.91% 130	6.99% 10	2.10% 3	0.00% 0	0.00% 0	143
Promoting cooperation among public agencies, citizens, non-profit organizations, and businesses	67.83% 97	25.87% 37	6.29% 9	0.00% 0	0.00% 0	143

Q8 What are some steps that you and/or your local government could take to reduce or eliminate the risk of future natural hazard damages in your neighborhood?

Answered: 141 Skipped: 28

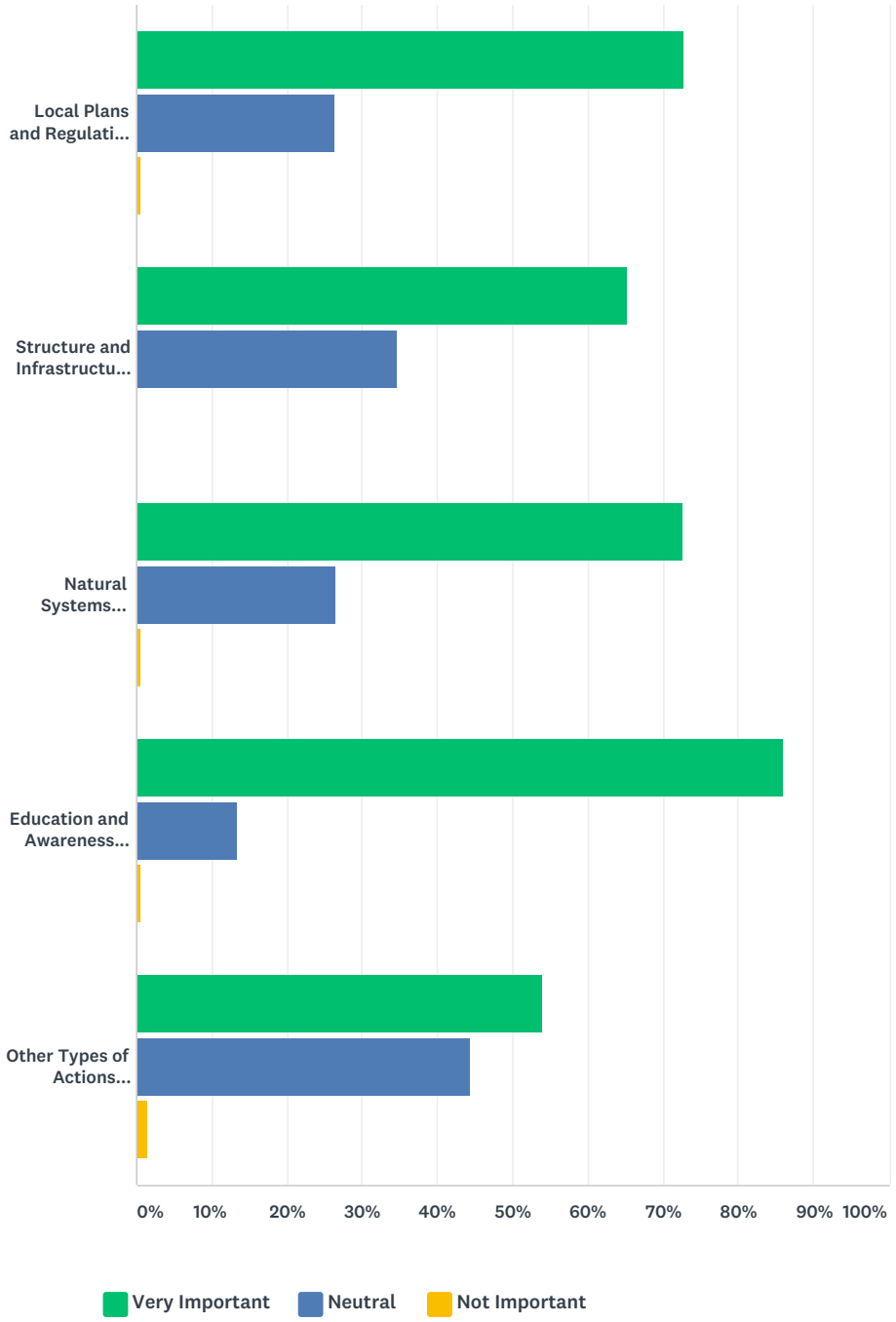


ANSWER CHOICES	RESPONSES	
Assist vulnerable populations	65.25%	92
Education and awareness activities	88.65%	125
Elevate your home or business	26.95%	38
Emergency preparedness kits	82.27%	116
Floodproof your home or business	37.59%	53
Keep storm drains clean	80.14%	113
Protect power lines	82.98%	117
Reduce stormwater runoff	54.61%	77
Restrict development in floodplain areas	62.41%	88
Total Respondents: 141		

#	OTHER (PLEASE SPECIFY)	DATE
	There are no responses.	

Q9 A number of community-wide activities can reduce risk from natural hazards. Please tell us how important you think each one is for your community to consider pursuing.

Answered: 142 Skipped: 27

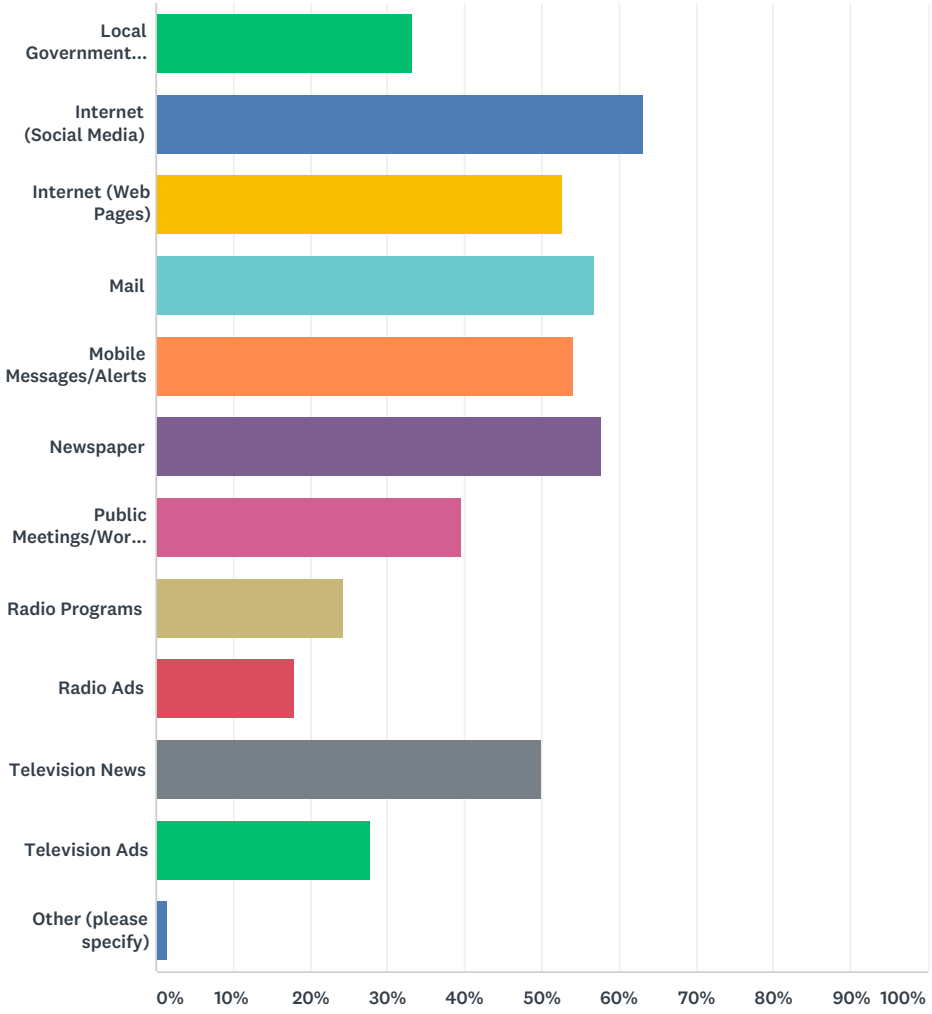


	VERY IMPORTANT	NEUTRAL	NOT IMPORTANT	TOTAL
Local Plans and Regulations (Government policies or codes that influence the way land and buildings are developed and built.)	72.86% 102	26.43% 37	0.71% 1	140
Structure and Infrastructure Projects (Modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area.)	65.25% 92	34.75% 49	0.00% 0	141

Natural Systems Protection (Actions that minimize damage and losses and also preserve or restore the functions of natural systems.)	72.66% 101	26.62% 37	0.72% 1	139
Education and Awareness Programs (Actions that inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them.)	85.92% 122	13.38% 19	0.70% 1	142
Other Types of Actions (Actions that are related to mitigation in ways that make sense to the local government that do not fall into one of the categories above.)	54.07% 73	44.44% 60	1.48% 2	135

Q10 What are the most effective ways for you to receive information about how to make your home and neighborhood more resistant to natural hazards?

Answered: 144 Skipped: 25



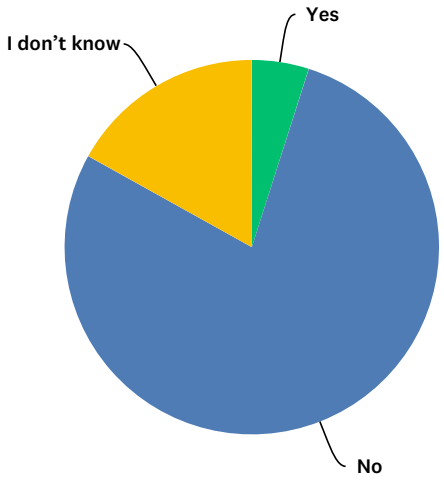
ANSWER CHOICES	RESPONSES	
Local Government Channel	33.33%	48
Internet (Social Media)	63.19%	91
Internet (Web Pages)	52.78%	76
Mail	56.94%	82
Mobile Messages/Alerts	54.17%	78
Newspaper	57.64%	83
Public Meetings/Workshops	39.58%	57
Radio Programs	24.31%	35
Radio Ads	18.06%	26
Television News	50.00%	72

Television Ads	27.78%	40
Other (please specify)	1.39%	2
Total Respondents: 144		

#	OTHER (PLEASE SPECIFY)	DATE
1	PHONE TREE E-COM	6/12/2017 11:27 AM
2	billboards	6/9/2017 4:27 PM

Q11 Is your home located in a floodplain?

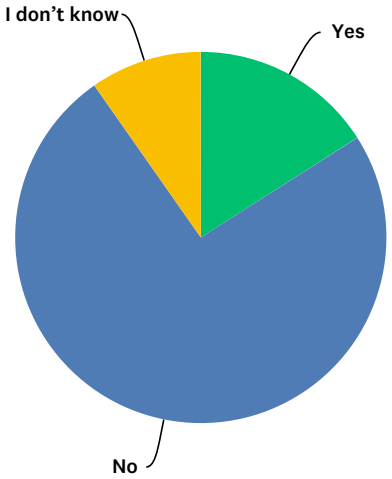
Answered: 142 Skipped: 27



ANSWER CHOICES	RESPONSES	
Yes	4.93%	7
No	78.17%	111
I don't know	16.90%	24
TOTAL		142

Q12 Do you have flood insurance?

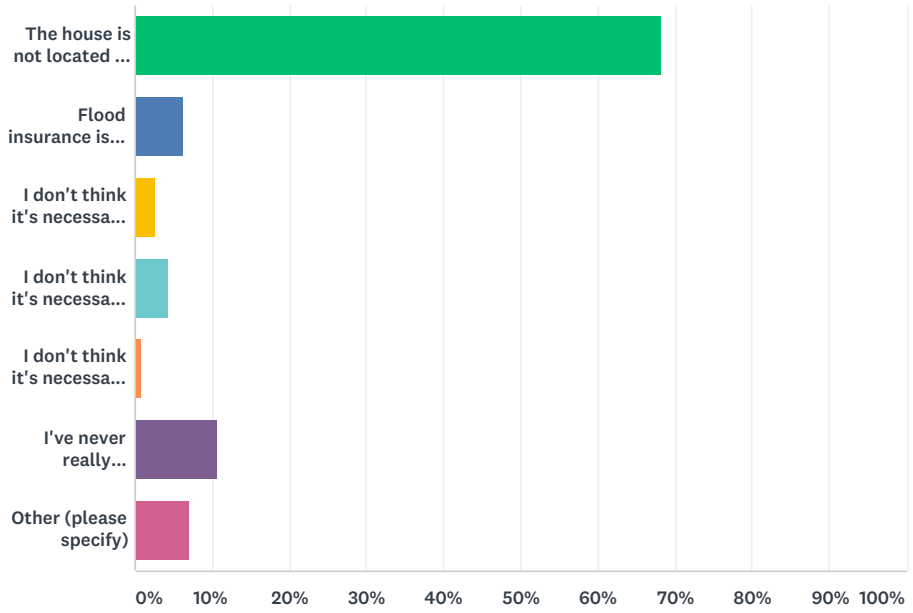
Answered: 144 Skipped: 25



ANSWER CHOICES	RESPONSES	
Yes	15.97%	23
No	74.31%	107
I don't know	9.72%	14
TOTAL		144

Q13 If “No,” why not?

Answered: 113 Skipped: 56

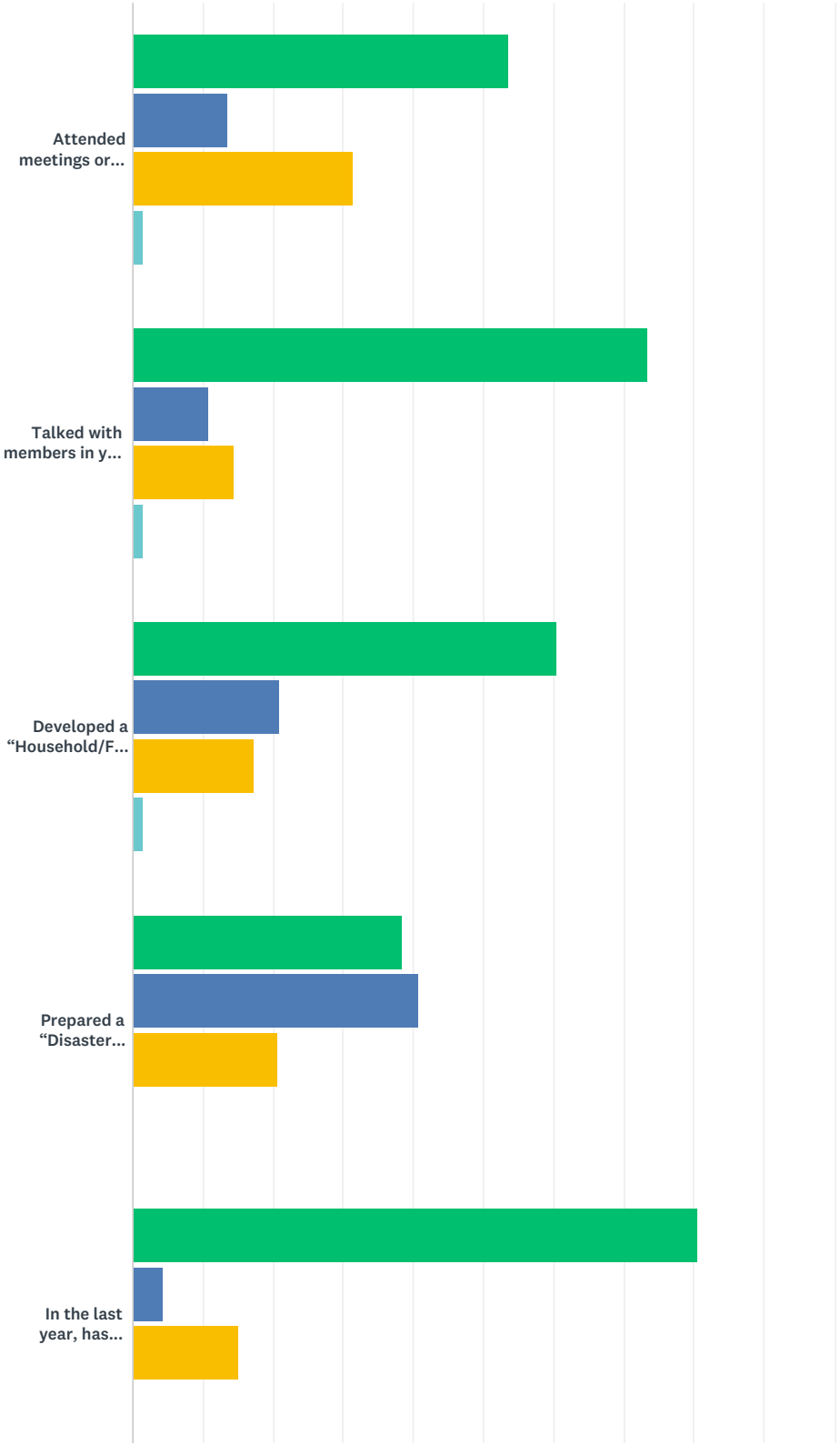


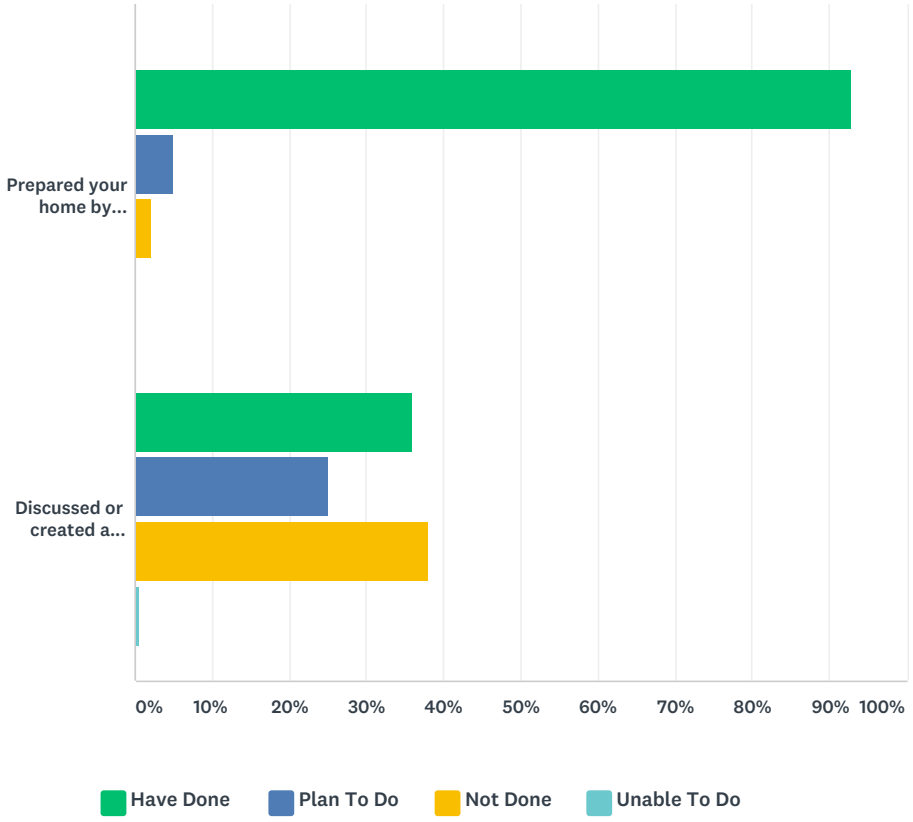
ANSWER CHOICES	RESPONSES	
The house is not located in a floodplain	68.14%	77
Flood insurance is too expensive	6.19%	7
I don't think it's necessary because it never floods	2.65%	3
I don't think it's necessary because I’m elevated or otherwise protected	4.42%	5
I don't think it's necessary because I have homeowners insurance	0.88%	1
I've never really considered it	10.62%	12
Other (please specify)	7.08%	8
TOTAL		113

#	OTHER (PLEASE SPECIFY)	DATE
1	Flood insurance should be covered in a traditional policy if not located in a floodplain. You should not have to buy additional insurance for it. Insurance companies are a joke and if you file more than 1 claim they just drop you. Its ridiculous and Insurance companies should be better regulated on how they treat their paying customers.	6/28/2017 11:15 AM
2	Because rent to own insurance is not available for me	6/12/2017 5:45 PM
3	under my house has flooded after a storm, however they say I do not live in a flood plain and I cannot have flood insurance	6/12/2017 2:28 PM
4	this is a business	6/12/2017 1:42 PM
5	n/a	6/12/2017 10:04 AM
6	I will check with my homeowners insurance.	6/10/2017 4:37 PM
7	not my house	6/9/2017 1:37 PM
8	don't know	6/9/2017 1:17 PM

Q14 In the following list, please check the activities that you have done in your household, plan to do in the near future, have not done, or are unable to do. (Please check one response for each preparedness activity.)

Answered: 140 Skipped: 29



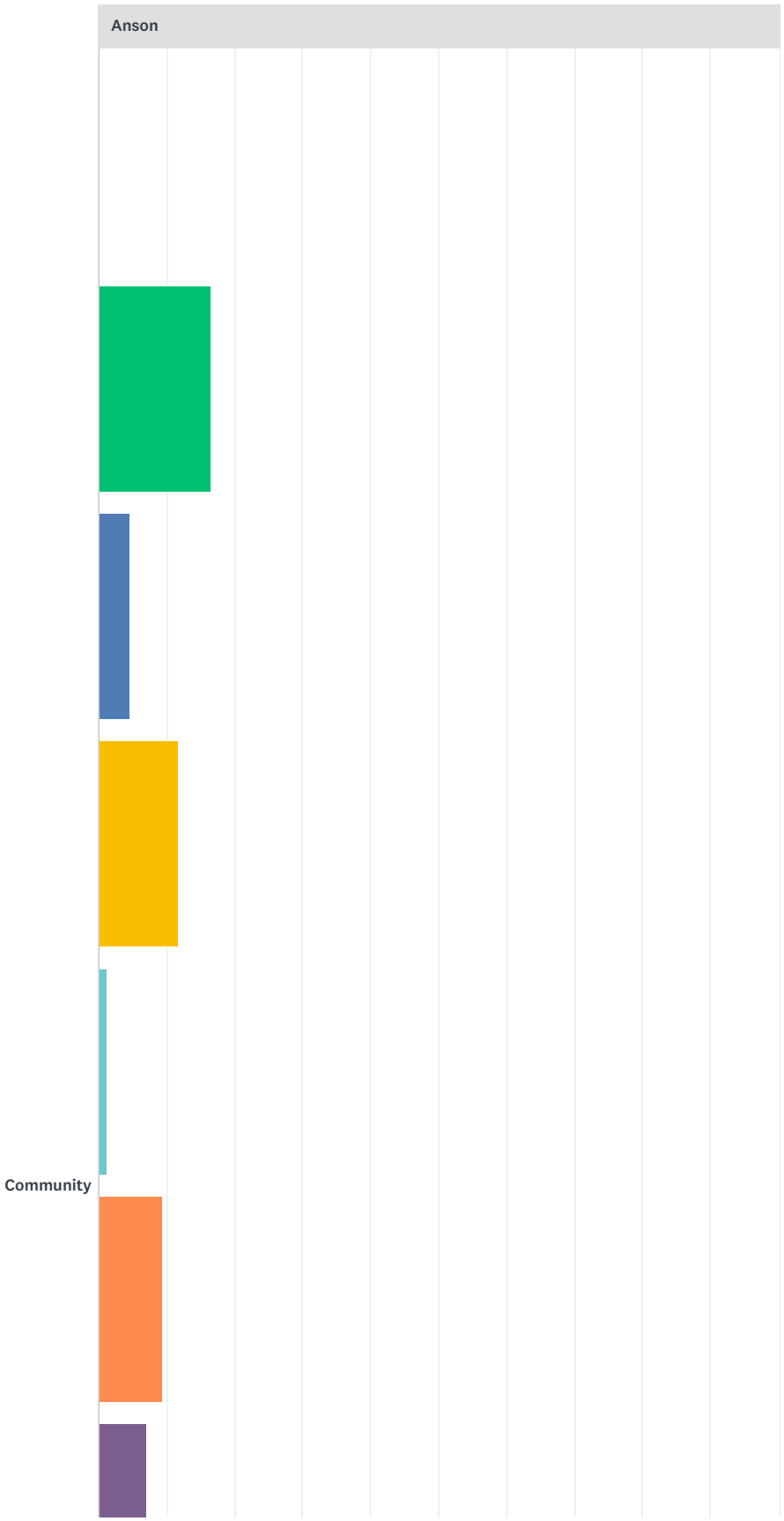


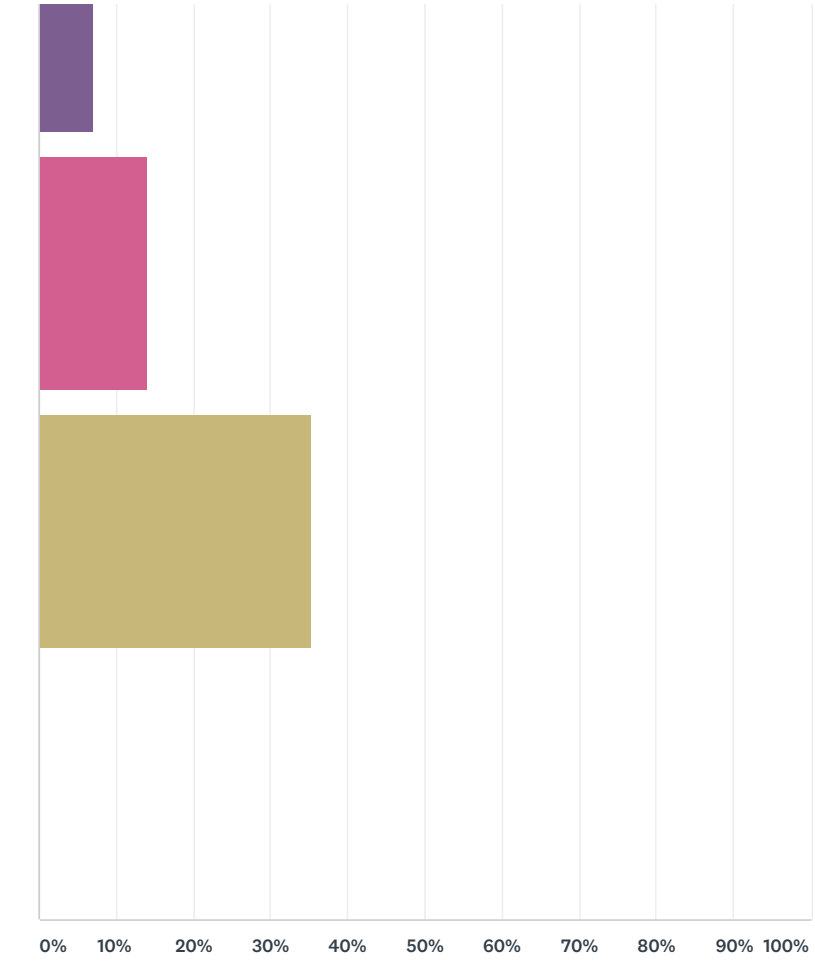
	HAVE DONE	PLAN TO DO	NOT DONE	UNABLE TO DO	TOTAL
Attended meetings or received written information on natural disasters or emergency preparedness?	53.57% 75	13.57% 19	31.43% 44	1.43% 2	140
Talked with members in your household about what to do in case of a natural disaster or emergency?	73.38% 102	10.79% 15	14.39% 20	1.44% 2	139
Developed a “Household/Family Emergency Plan” in order to decide what everyone would do in the event of a disaster?	60.43% 84	20.86% 29	17.27% 24	1.44% 2	139
Prepared a “Disaster Supply Kit” (stored extra food, water, batteries or other emergency supplies)?	38.57% 54	40.71% 57	20.71% 29	0.00% 0	140
In the last year, has anyone in your household been trained in First Aid or Cardio-Pulmonary Resuscitation (CPR)?	80.58% 112	4.32% 6	15.11% 21	0.00% 0	139
Prepared your home by installing smoke detectors on each level of the house?	92.86% 130	5.00% 7	2.14% 3	0.00% 0	140
Discussed or created a utility shutoff procedure in the event of a natural disaster?	35.97% 50	25.18% 35	38.13% 53	0.72% 1	139

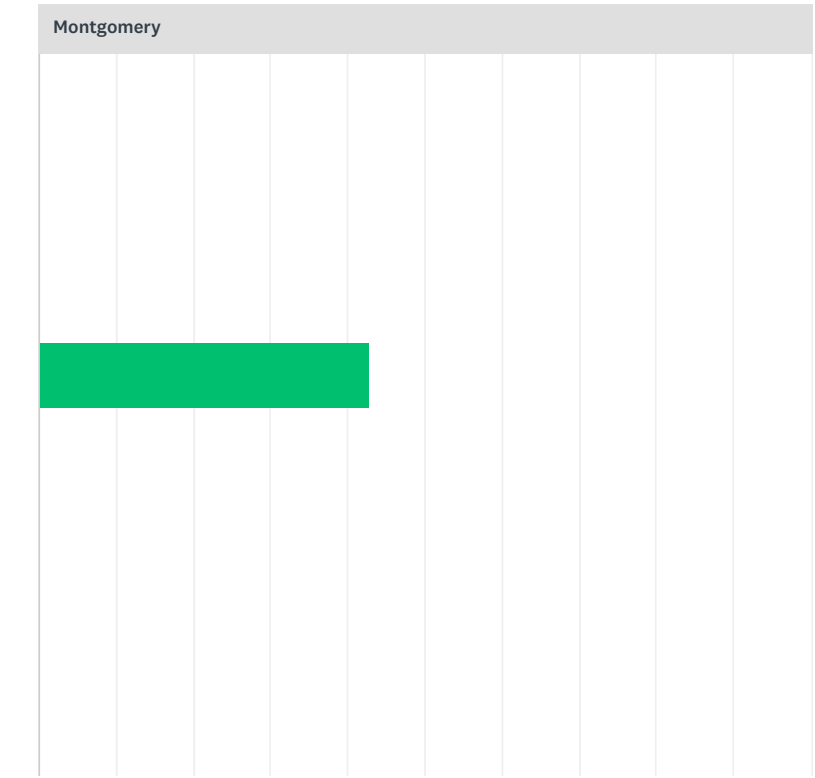
#	OTHER (PLEASE SPECIFY)	DATE
	There are no responses.	

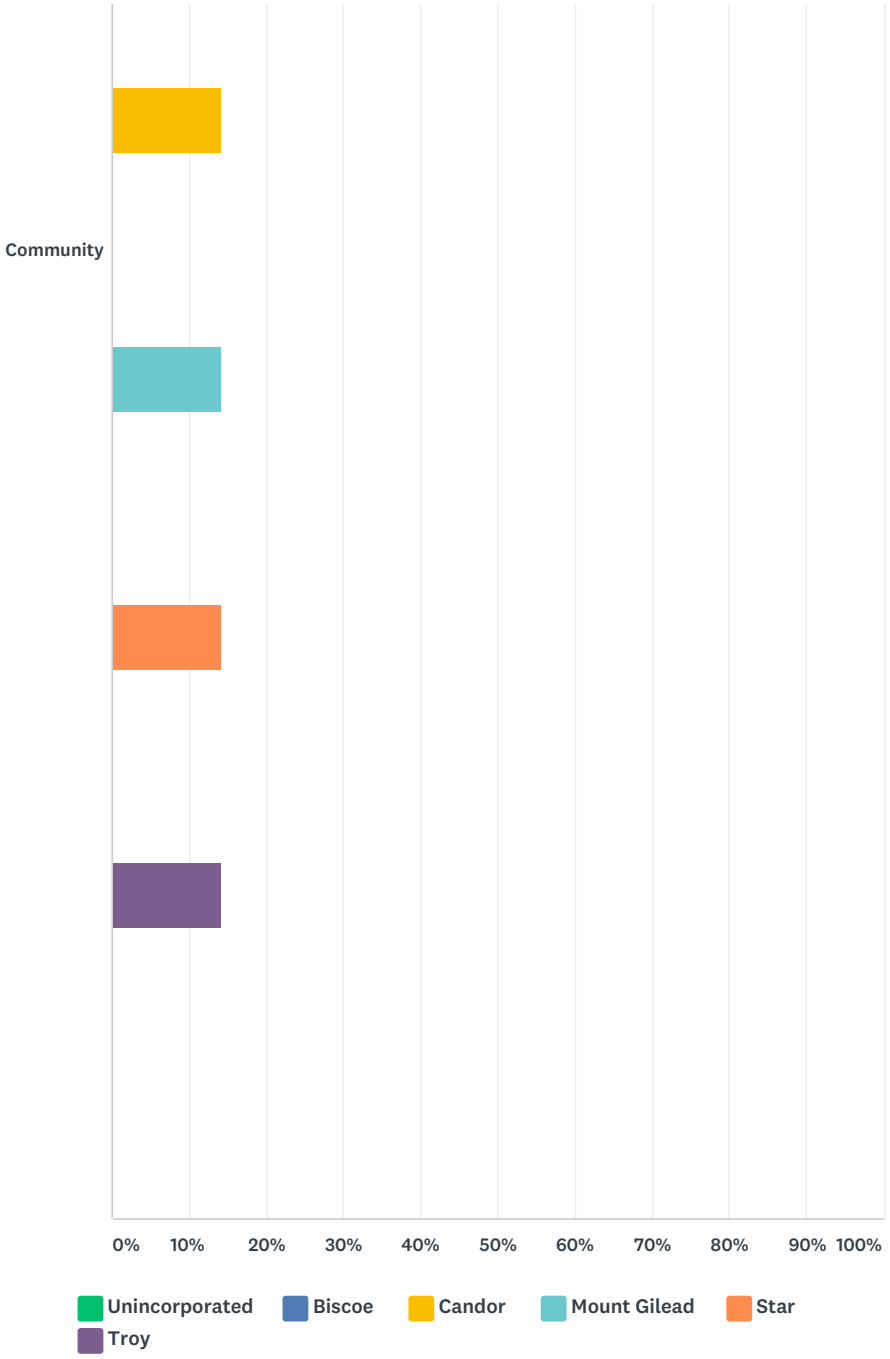
Q15 In which community do you live?

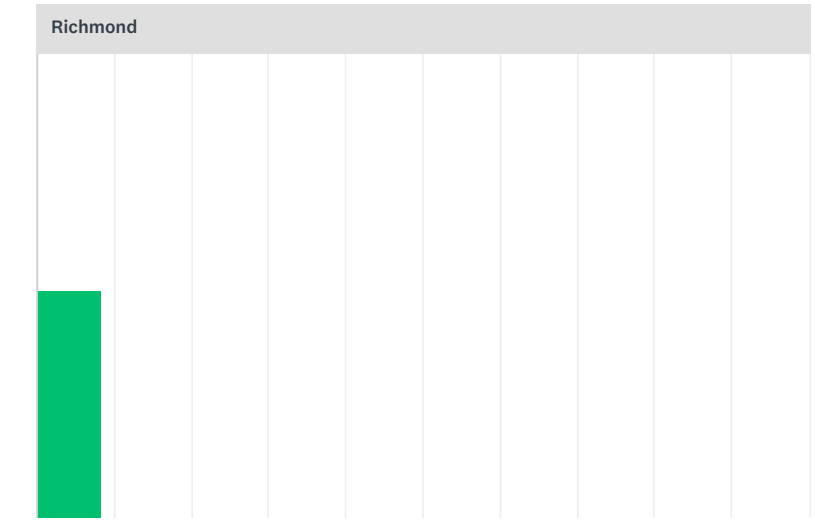
Answered: 124 Skipped: 45

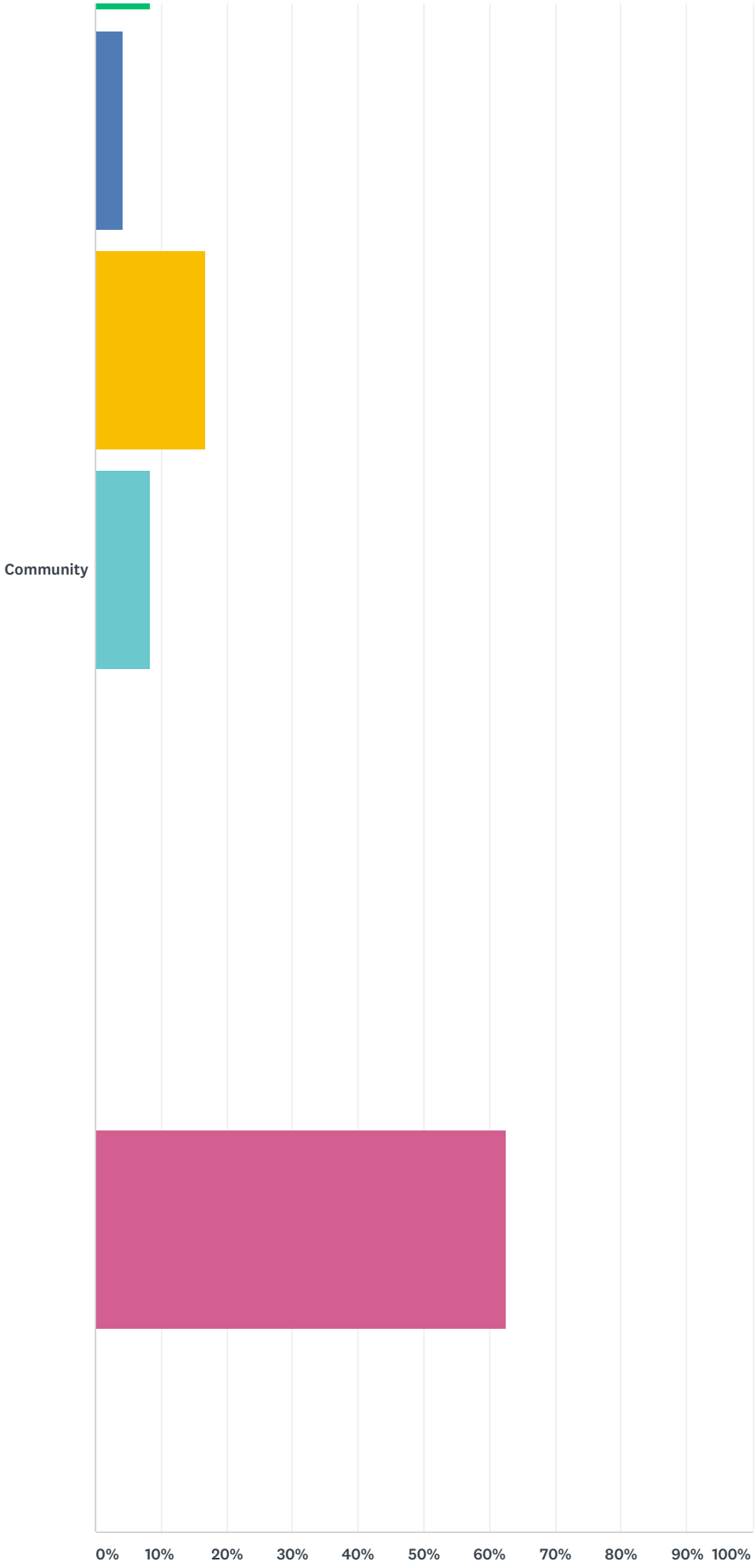



0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Unincorporated
Ansonville
Lilesville
McFarlan
Morven
Peachland
Polkton
Wadesboro

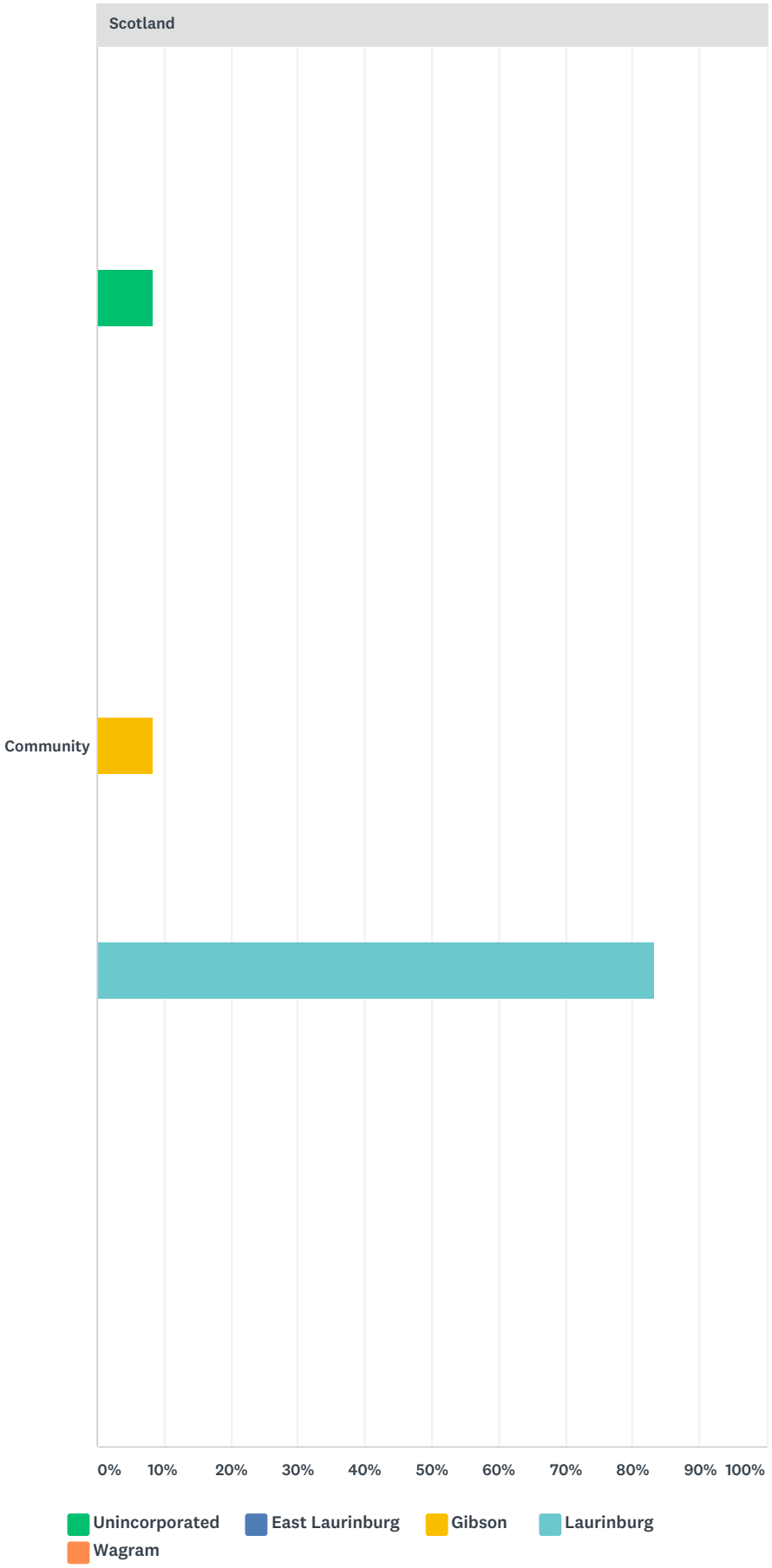

Montgomery


Community
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Unincorporated
Biscoe
Candor
Mount Gilead
Star
Troy


Richmond


Community
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%


Unincorporated
Dobbins Heights
Ellerbe
Hamlet
Hoffman
Norman
Rockingham


Scotland
Community
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Unincorporated
East Laurinburg
Gibson
Laurinburg
Wagram

Anson								
	UNINCORPORATED	ANSONVILLE	LILESVILLE	MCFARLAN	MORVEN	PEACHLAND	POLKTON	WADESBORO
Community	16.47% 14	4.71% 4	11.76% 10	1.18% 1	9.41% 8	7.06% 6	14.12% 12	35.29% 30

Montgomery						
	UNINCORPORATED	BISCOE	CANDOR	MOUNT GILEAD	STAR	TROY	TOTAL
Community	42.86% 3	0.00% 0	14.29% 1	14.29% 1	14.29% 1	14.29% 1	7

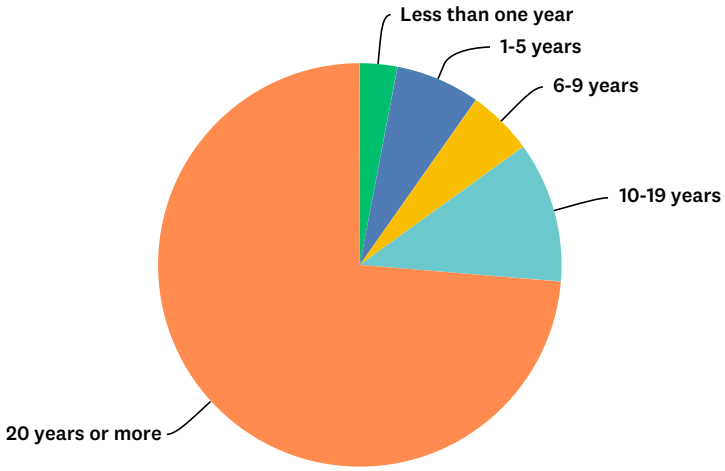
Richmond								
	UNINCORPORATED	DOBBINS HEIGHTS	ELLERBE	HAMLET	HOFFMAN	NORMAN	ROCKINGHAM	TOTAL
Community	8.33% 2	4.17% 1	16.67% 4	8.33% 2	0.00% 0	0.00% 0	62.50% 15	24

Scotland						
	UNINCORPORATED	EAST LAURINBURG	GIBSON	LAURINBURG	WAGRAM	TOTAL
Community	8.33% 1	0.00% 0	8.33% 1	83.33% 10	0.00% 0	12

#	OTHER (PLEASE SPECIFY)	DATE
1	Union- Marshville	6/19/2017 4:24 PM
2	Stanly	6/14/2017 8:50 AM
3	Union	6/14/2017 1:03 AM
4	Robeson county	6/13/2017 4:48 PM
5	chesterfield county	6/13/2017 3:18 PM
6	white store community	6/13/2017 7:43 AM
7	Chesterfield	6/12/2017 11:26 PM
8	Union Conuty- Monroe	6/12/2017 10:21 AM
9	Stanly	6/12/2017 10:03 AM
10	Union, Wingate	6/12/2017 9:58 AM
11	burnsville community	6/12/2017 9:42 AM
12	Randolph	6/12/2017 4:48 AM
13	stanly county (Norwood)	6/11/2017 7:08 PM
14	lancaster county	6/10/2017 9:20 PM
15	Union	6/10/2017 4:01 PM
16	union	6/9/2017 11:39 PM
17	Union	6/9/2017 4:02 PM

Q16 How long have you lived in the Pee Dee Lumber region?

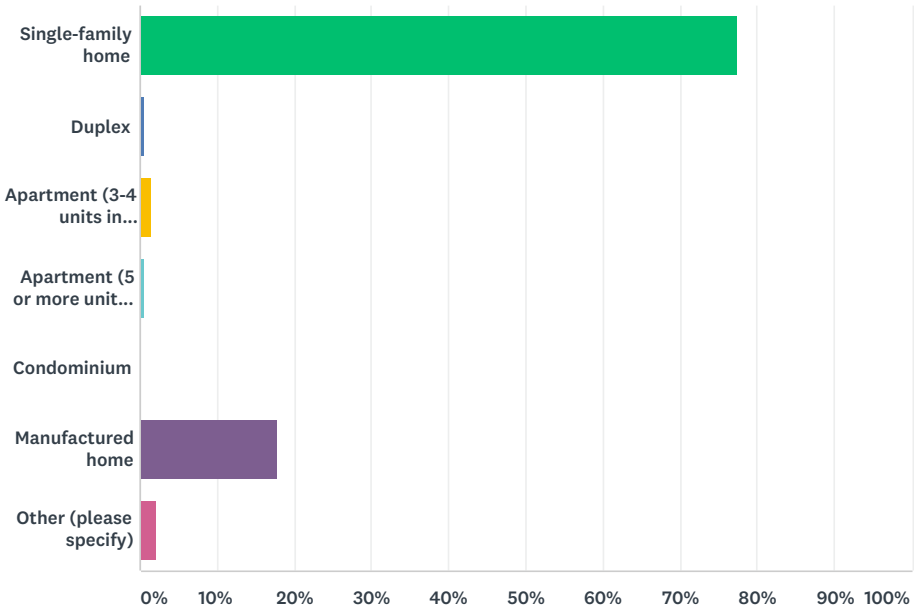
Answered: 133 Skipped: 36



ANSWER CHOICES	RESPONSES	
Less than one year	3.01%	4
1-5 years	6.77%	9
6-9 years	5.26%	7
10-19 years	11.28%	15
20 years or more	73.68%	98
TOTAL		133

Q17 What type of building do you live in?

Answered: 141 Skipped: 28



ANSWER CHOICES	RESPONSES	
Single-family home	77.30%	109
Duplex	0.71%	1
Apartment (3-4 units in structure)	1.42%	2
Apartment (5 or more units in structure)	0.71%	1
Condominium	0.00%	0
Manufactured home	17.73%	25
Other (please specify)	2.13%	3
TOTAL		141

#	OTHER (PLEASE SPECIFY)	DATE
1	own our home in country	6/9/2017 3:05 PM
2	commercial property / government agency	6/9/2017 1:19 PM
3	Mobile Home	6/9/2017 1:00 PM

Q18 Additional Comments

Answered: 8 Skipped: 161

#	RESPONSES	DATE
1	None	6/13/2017 3:37 PM
2	I am a fire chief so I am interested in preparing for disasters	6/12/2017 11:25 AM
3	none	6/12/2017 11:09 AM
4	In this area hurricanes, periods of rain with high winds, and ice storms seem to be the most common problems knocking out utilities for extended periods of time. Development should never be allowed in floodplains and other areas prone to flooding or other natural disasters. Vulnerable ecosystems and natural areas should also be protected from development.	6/10/2017 4:15 PM
5	Thank You for "All" you do	6/9/2017 7:19 PM
6	I think our Anson County Emergency Management does a great job at making the community prepared and aware of resources available. Ongoing training seems to constantly be provided within the local first responding agencies, and the community safety days have been a great opportunity for the public to become disaster ready.	6/9/2017 4:16 PM
7	This is a poor county. We really need more assistance in getting the aid we need in an emergency. More trained staff. More education of the public.	6/9/2017 3:07 PM
8	n/a	6/9/2017 1:19 PM

Appendix E: Safe Growth Surveys

This appendix to the Pee Dee Lumber Regional Hazard Mitigation Plan includes copies of the individual *Safe Growth Surveys* completed by the local officials and representatives of the participating jurisdictions.

Appendix E: Safe Growth Survey

As part of the 2017 plan update process, each jurisdiction was also asked to complete a *Safe Growth Survey*. This unique survey instrument was drawn from a technique recommended by David Godschalk, FAICP and professor emeritus of city and regional planning at the University of North Carolina at Chapel Hill, to help better evaluate the extent to which each local jurisdiction in the Pee Dee Lumber Region is positioned to grow safely relative to its natural hazards. The survey covered 6 distinct topic areas including the following:

- Land Use
- Transportation
- Environmental Management
- Public Safety, Zoning Ordinance
- Subdivision Regulations
- Capital Improvement Program and Infrastructure Policies

The Safe Growth Survey was completed by appropriate planning, zoning and/or community development staff for each of jurisdiction and the results are summarized in **Table E.1**. In completing the survey each respondent was asked to indicate how strongly they agree or disagree with 25 "Safe Growth Statements" as they relate to their own jurisdiction's current plans, policies and programs for guiding future community growth and development, according to the following scale:

1=Strongly Disagree 2=Somewhat Disagree 3=Neutral 4=Somewhat Agree 5=Strongly Agree

Numerical averages were calculated for each jurisdiction to help quantify much each respondent agreed with the indicative Safe Growth Statements. Jurisdiction total averages ranged from 2.8 to 4.2, with a total cumulative average of 3.4 for the entire planning area. These results suggest that the jurisdictions have integrated hazard mitigation principles into their local community planning and development framework to a certain degree, but there are opportunities for enhancement. Of the 6 specific topic areas Public Safety, Zoning Ordinance and Subdivision Regulations received the highest average ratings (3.6 for each) while Capital Improvement Program and Environmental Management received the lowest average rating (3.2).

Safe Growth Statement	Anson County	Ansonville	Lilesville	McFarlan	Morven	Peachland	Polkton	Wadesboro	Montgomery County	Biscoe	Candor	Mount Gilead	Star	Troy	Richmond County	Ellerbe	Hamlet	Hoffman	Norman	Rockingham	Scotland County	East Laurinburg	Gibson	Laurinburg	Wagram
LAND USE																									
The general plan includes a future land use map that clearly identifies natural hazard areas.	3	4	N/A	3	N/A	4	4	3	3	2	2	3	3	3	4	N/A	N/A	N/A	N/A	4	3	N/A	N/A	3	N/A
Current land use policies discourage development and/or redevelopment within natural hazard areas.	3	1	N/A	3	N/A	4	5	3	3	3	2	3	3	5	3	N/A	N/A	N/A	N/A	3	4	N/A	N/A	4	N/A
The general plan provides adequate space for expected future growth in areas located outside of natural hazard areas.	3	4	N/A	3	N/A	5	5	4	3	3	1	4	4	4	5	N/A	N/A	N/A	N/A	5	4	N/A	N/A	4	N/A
TRANSPORTATION																									
The transportation element limits access to natural hazard areas.	3	5	N/A	3	N/A	4	4	3	3	2	1	2	4	4	3	N/A	N/A	N/A	N/A	3	4	N/A	N/A	4	N/A

Transportation policy is used to guide future growth and development to safe locations.	3	5	N/A	3	N/A	5	3	3	3	4	1	2	3	4	4	N/A	N/A	N/A	N/A	3	4	N/A	N/A	4	N/A
Transportation systems are designed to function under disaster conditions (e.g., evacuation, mobility for fire/rescue apparatus, etc.).	3	4	N/A	3	N/A	3	4	3	3	5	4	4	3	3	4	N/A	N/A	N/A	N/A	4	4	N/A	N/A	4	N/A
ENVIRONMENTAL MANAGEMENT																									
Environmental features that serve to protect development from hazards (e.g., wetlands, riparian buffers, etc.) are identified and mapped.	3	4	N/A	3	N/A	4	3	3	3	4	3	3	3	5	5	N/A	N/A	N/A	N/A	4	2	N/A	N/A	2	N/A
Environmental policies encourage the preservation and restoration of protective ecosystems.	3	5	N/A	3	N/A	4	3	3	4	4	3	2	3	5	5	N/A	N/A	N/A	N/A	4	2	N/A	N/A	2	N/A
Environmental policies provide incentives to development that is located outside of protective ecosystems.	3	5	N/A	3	N/A	4	3	3	2	2	3	2	3	3	3	N/A	N/A	N/A	N/A	4	2	N/A	N/A	2	N/A
PUBLIC SAFETY																									

The goals and policies of the general plan are related to and consistent with those in the Multi-jurisdictional Hazard Mitigation Plan.	3	3	N/A	3	N/A	4	5	3	4	4	4	3	4	3	3	N/A	N/A	N/A	N/A	4	3	N/A	N/A	3	N/A
Public safety is explicitly included in the plan's growth and development policies.	3	3	N/A	3	N/A	5	5	3	5	4	4	3	4	3	4	N/A	N/A	N/A	N/A	4	4	N/A	N/A	4	N/A
The monitoring and implementation 'section of the plan covers safe growth objectives.	3	2	N/A	3	N/A	4	5	3	4	4	3	3	3	3	3	N/A	N/A	N/A	N/A	4	4	N/A	N/A	4	N/A
ZONING ORDINANCE																									
The zoning ordinance conforms to the general plan in terms of discouraging development and/or redevelopment within natural hazard areas.	3	5	N/A	3	N/A	5	5	3	3	4	4	3	3	3	3	N/A	N/A	N/A	N/A	4	4	N/A	N/A	4	N/A
The ordinance contains natural hazard overlay zones that set conditions for land use within such zones.	3	2	N/A	3	N/A	4	3	3	3	3	1	3	3	1	4	N/A	N/A	N/A	N/A	4	4	N/A	N/A	4	N/A

Rezoning procedures recognize natural hazard areas as limits on zoning changes that allow greater intensity or density of use.	3	3	N/A	3	N/A	4	5	3	4	4	5	3	3	4	4	N/A	N/A	N/A	N/A	4	4	N/A	N/A	4	N/A
The ordinance prohibits development within, or filling of, wetlands, floodways, and floodplains.	3	3	N/A	3	N/A	5	5	3	3	5	3	5	3	1	4	N/A	N/A	N/A	N/A	2	4	N/A	N/A	4	N/A
SUBDIVISION REGULATIONS																										
The subdivision regulations restrict the subdivision of land within or adjacent to natural hazard areas.	3	1	N/A	3	N/A	5	4	4	4	4	4	4	4	5	5	N/A	N/A	N/A	N/A	4	4	N/A	N/A	4	N/A
The regulations provide for conservation subdivisions or cluster subdivisions in order to conserve environmental resources.	3	1	N/A	3	N/A	5	3	4	4	4	3	3	4	5	5	N/A	N/A	N/A	N/A	5	4	N/A	N/A	4	N/A
The regulations allow density transfers where hazard areas exist.	3	1	N/A	3	N/A	4	3	3	2	3	3	3	3	5	3	N/A	N/A	N/A	N/A	4	4	N/A	N/A	4	N/A
CAPITAL IMPROVEMENT PROGRAM AND INFRASTRUCTURE POLICIES																										

The capital improvement program limits expenditures on projects that would encourage development and/or redevelopment in areas vulnerable to natural hazards.	3	2	N/A	3	N/A	4	3	3	4	4	2	4	3	3	3	N/A	N/A	N/A	N/A	4	5	N/A	N/A	5	N/A
Infrastructure policies limit the extension of existing facilities and services that would encourage development in areas vulnerable to natural hazards.	3	2	N/A	3	N/A	4	3	3	4	4	4	3	3	3	3	N/A	N/A	N/A	N/A	4	5	N/A	N/A	5	N/A
The capital improvements program provides funding for hazard mitigation projects identified in the Multi-jurisdictional Hazard Mitigation Plan.	3	2	N/A	3	N/A	4	3	3	3	3	1	3	3	3	3	N/A	N/A	N/A	N/A	3	2	N/A	N/A	2	N/A
OTHER																									

Small area or corridor plans recognize the need to avoid or mitigate natural hazards.	3	3	N/A	3	N/A	4	3	3	3	2	3	3	3	3	3	N/A	N/A	N/A	N/A	3	4	N/A	N/A	4	N/A
The building code contains provisions to strengthen or elevate new or substantially improved construction to withstand hazard forces.	3	4	N/A	3	N/A	4	5	3	4	3	3	3	3	3	4	N/A	N/A	N/A	N/A	4	4	N/A	N/A	4	N/A
Economic development and/or redevelopment strategies include provisions for mitigating natural hazards or otherwise enhancing social and economic resiliency to hazards.	3	3	N/A	3	N/A	4	3	3	4	4	3	4	3	3	4	N/A	N/A	N/A	N/A	4	4	N/A	N/A	4	N/A
AVERAGE SURVEY RATINGS	**3**	**3.1**	N/A	**3**	N/A	**4.2**	**3.9**	**3.1**	**3.4**	**3.5**	**2.8**	**3.1**	**3.2**	**3.5**	**3.8**	N/A	N/A	N/A	N/A	**3.8**	**3.7**	N/A	N/A	**3.7**	N/A

*Jurisdictions with N/A did not participate in the completion of the safe growth survey.

While somewhat of a subjective exercise, the Safe Growth Survey was used to provide some quantitative measures of how adequately existing planning mechanisms and tools for each jurisdiction were being used to address the notion of safe growth as currently advocated by organizations such as FEMA and the American Planning Association (APA). In addition, the survey instrument was aimed at further integrating the subject of hazard risk management into the dialogue of local planners throughout the Pee Dee Lumber Region and to possibly consider and identify new mitigation actions as it relates to those local planning policies or programs already in place. It is anticipated that the survey will be used again during future plan updates to help measure progress over time and to continue identifying possible mitigation actions as it relates to future growth and community development practices, and how such actions may better be incorporated into local planning mechanisms.

Appendix F: Project Information Fact Sheet

This appendix to the Pee Dee Lumber Regional Hazard Mitigation Plan contains a copy of the project information fact sheet that was developed to communicate information about the project to the general public and stakeholders, and to provide talking points for Hazard Mitigation Planning Committee members.

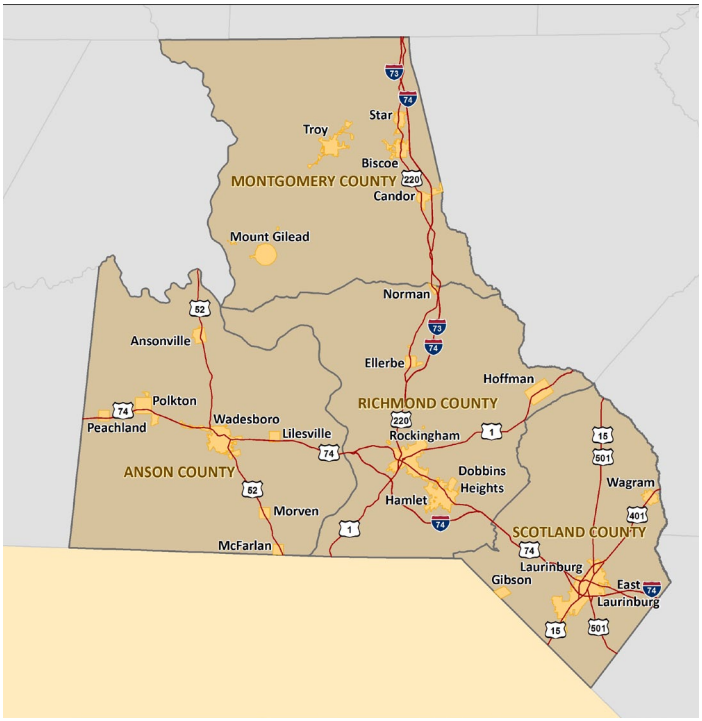
Planning Process Fact Sheet

Pee Dee Lumber Regional Hazard Mitigation Plan

Natural and man-made hazards have the potential to cause property damage, loss of life, economic hardship, and threats to public health and safety. Hazard mitigation measures are the things we do today to be more protected in the future. They are actions taken before a disaster happens to reduce the impact of future hazard events on people and property in the community. Mitigation reduces the risk of loss and creates a more resilient and sustainable community.

PROJECT OVERVIEW

The counties of Anson, Montgomery, Richmond, and Scotland, in coordination with their participating municipal jurisdictions, are updating the regional hazard mitigation plan that covers the four-county Pee Dee Lumber planning area. **The Pee Dee Lumber Regional Hazard Mitigation Plan** will identify local policies and actions for reducing risk and future losses from natural hazards such as floods, severe storms, wildfires, and winter weather. It builds upon previous mitigation planning efforts and seeks to enhance overall community resilience.



The plan will also serve to meet key federal planning regulations which require local governments to develop a hazard mitigation plan as a condition for receiving certain types of non-emergency disaster assistance, including funding for hazard mitigation projects.

These mitigation planning requirements stem from the Disaster Mitigation Act of 2000, which was passed by the U.S. Congress in October of 2000. This Act amended federal law to require that all states and local governments must have hazard mitigation plans in place in order to be eligible to apply for funding under such programs as the Hazard Mitigation Grant Program (HMGP) and the Pre-Disaster Mitigation (PDM) program.

THE PLANNING PROCESS

The planning process for the Pee Dee Lumber Regional Hazard Mitigation Plan will consist of six main phases described in detail in the following sections: **public outreach**, **risk assessment**, **capability assessment**, **mitigation strategy development**, **plan maintenance**, and **plan adoption**. The end result will be an updated regional hazard mitigation plan that continues to meet state and federal planning requirements.

Public Outreach

The goals of the public outreach strategy for this planning effort are to: generate public interest, solicit citizen input, and engage additional partners in the planning process. Public outreach will include three (3) open public meetings, a project information website, a web-based public participation survey, and updates and information shared via social media.

Risk Assessment

The desired outcomes of a risk assessment are an evaluation of each hazard's potential impacts on the people, economy, and built and natural environments in the planning area plus an understanding of each participating jurisdiction's overall vulnerability and most significant risks. These potential impacts and a thorough understanding of the overall vulnerability can be used to create problem statements and identify and prioritize mitigation actions to reduce risk.

Capability Assessment

Each participating jurisdiction has a unique set of capabilities, including authorities, policies, programs, staff, funding, and other resources available to accomplish mitigation and reduce long-term vulnerability. By reviewing the existing capabilities in each jurisdiction, the planning team can identify capabilities that currently reduce disaster losses or could be used to reduce losses in the future.

Mitigation Strategy Development

The primary purpose of mitigation planning is to systematically identify policies, actions, and activities to reduce the impact that future natural hazard occurrences will have on people and property in the planning area. Mitigation strategy development includes long-range mitigation goals common to the planning area and short-term mitigation actions specific to each participating jurisdiction.

Plan Maintenance

Plan maintenance is the process established to track the plan's implementation and to aid in updating the plan every five (5) years. These procedures help to ensure that the mitigation strategy is implemented according to the plan. They also provide the foundation for an ongoing mitigation program, standardize long-term monitoring of hazard-related activities, integrate mitigation principles into local officials' daily job responsibilities, and maintain momentum through continued engagement and accountability in the plan's progress.

Plan Adoption

Each participating jurisdiction seeking plan approval must adopt the plan. Adoption by the local governing body demonstrates the community's commitment to implementing the mitigation strategy and authorizes responsible agencies to execute their actions. The final plan is not approved until the community adopts the plan and FEMA receives documentation of formal adoption by the governing body of the jurisdictions requesting approval.

It is then important for each jurisdiction to work toward *implementing* the mitigation actions identified in the plan and to fulfill the goals outlined in the mitigation strategy.



Flooding can cause serious problems in many parts of North Carolina, but there are opportunities available to mitigate flooding and lessen the severity of future events.

PROJECT LEADERSHIP

This regional planning effort is being led by Richmond County Emergency Services with technical assistance from AECOM. A local Hazard Mitigation Planning Team made up of local officials, representatives, and stakeholders has been established to guide this process. In addition, local points of contact have been established for each of the four counties as well as all of the participating municipal jurisdictions. Planning committee meetings and open public meetings will be scheduled to occur at key points throughout the project timeline.

SCHEDULE

The planning process began in September 2016 and a fully updated plan is expected to be ready for review by North Carolina Emergency Management and the Federal Emergency Management Agency in the Fall of 2017. Draft documents will be available on the project information website at various stages in the planning process. The public and other stakeholders are invited to participate in public meetings and to contribute comments on draft planning products throughout the process.

FOR MORE INFORMATION

To learn more about this project, or to find out how you can be involved, please contact Donna Wright, Richmond County Emergency Services, at (910) 997-8238 or donna.wright@richmondnc.com.

Additional information and regular updates throughout the duration of this project can be found on the Pee Dee Lumber Hazard Mitigation Planning website at http://www.richmondnc.com/163/Emergency-Services.