Smoky Mountain Regional Hazard Mitigation Plan

2022 Plan Update



FINAL - September 2022

U.S. Department of Homeland Security
Region 4
3005 Chamblee Tucker Road
Atlanta, GA 30341

FEMA

September 13, 2022

Mr. Steve McGugan
State Hazard Mitigation Officer
Assistant Director / Mitigation Section Chief
Division of Emergency Management, NC Department of Public Safety
200 Park Offices Drive
Durham, NC 27713

Reference: Smoky Mountain Regional 2022 Hazard Mitigation Plan

Dear Mr. McGugan:

We are pleased to inform you the Smoky Mountain Regional 2022 Hazard Mitigation Plan update complies with the Federal hazard mitigation planning requirements resulting from the Disaster Mitigation Act of 2000, as contained in 44 CFR §201.6. Effective September 13, 2022, the plan is approved for a period of five (5) years to September 12, 2027.

Enclosed is the status of all participating jurisdictions. Approved jurisdictions are eligible applicants through the State for the following mitigation grant programs administered by the Federal Emergency Management Agency (FEMA):

- Hazard Mitigation Grant Program (HMGP)
- Flood Mitigation Assistance (FMA)
- Building Resilient Infrastructure and Communities (BRIC)

Please note that all funding requests will be evaluated individually according to the program's specific eligibility requirements.

The State and all plan participants should be commended for their close coordination and communications with our office in the review and subsequent approval of the plan. If you or any plan participant need assistance, please do not hesitate to contact Edwardine Marrone, of my staff, at (404) 433-3968.

Sincerely,

Kristen M. Martinenza

Kristen M. Martinenza, P.E., CFM
Branch Chief, Risk Analysis Branch
FEMA Region 4

Enclosure

Enclosure: Plan Participant Status List

Attached is the list of participating jurisdictions in the referenced hazard mitigation plan.

	Community Name	Jurisdiction Status	Date Approved by FEMA
1)	Andrews town	APA	
2)	Bryson City town	Approved	9/13/22
3)	Canton town	APA	
4)	Cherokee County	APA	
5)	Clyde town	Approved	9/13/22
6)	Dillsboro town	APA	
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20)	Webster town	APA	

U.S. Department of Homeland Security
Region 4
3005 Chamblee Tucker Road
Atlanta, GA 30341

FEMA

November 8, 2022

Mr. Steve McGugan
State Hazard Mitigation Officer
Assistant Director / Mitigation Section Chief
Division of Emergency Management, NC Department of Public Safety
200 Park Offices Drive
Durham, NC 27713

Reference: Smoky Mountain Regional Hazard Mitigation Plan

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U.S. Department of Homeland Security
Region 4
3005 Chamblee Tucker Road
Atlanta, GA 30341

FEMA

January 9, 2023

Mr. Steve McGugan
State Hazard Mitigation Officer
Assistant Director / Mitigation Section Chief
Division of Emergency Management, NC Department of Public Safety
200 Park Offices Drive
Durham, NC 27713

Reference: Smoky Mountain Regional Hazard Mitigation Plan

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U.S. Department of Homeland Security
Region 4
3005 Chamblee Tucker Road
Atlanta, GA 30341

FEMA

February 27, 2023

Mr. Steve McGugan
State Hazard Mitigation Officer
Assistant Director / Mitigation Section Chief
Division of Emergency Management, NC Department of Public Safety
200 Park Offices Drive
Durham, NC 27713

Reference: Smoky Mountain Regional Hazard Mitigation Plan

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Sincerely,

Kristen M. Martinenza

Kristen M. Martinenza, P.E., CFM
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FEMA Region 4

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U.S. Department of Homeland Security
Region 4
3005 Chamblee Tucker Road
Atlanta, GA 30341

FEMA

February 28, 2023

Mr. Steve McGugan
State Hazard Mitigation Officer
Assistant Director / Mitigation Section Chief
Division of Emergency Management, NC Department of Public Safety
200 Park Offices Drive
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SECTION 1
INTRODUCTION

This section provides a general introduction to the Smoky Mountain 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 winter storms, 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 Smoky Mountain Region is located in the western part of North Carolina and includes Cherokee, Graham, Haywood, Jackson, and Swain Counties, including the municipal governments within those counties, and the Eastern Band of Cherokee Indians (EBCI). This area is vulnerable to a wide range of natural hazards, most notably severe winter weather, tornadoes/thunderstorms and flooding. It is also vulnerable to human-caused hazards, including nuclear accidents and hazardous substances. These hazards threaten the life and safety of residents in the Smoky Mountain 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 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 communities 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. 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 five counties and the Eastern Band of Cherokee Indians first joined together in 2012 to develop the initial version of this regional plan. Prior to that, each County and the Tribe were operating under individual County and Tribal-level hazard mitigation plans. The plan development process for the 2022 update of the plan is detailed in Section 2: Planning Process.

This regional plan draws from each of the County plans and the Tribe's plan to document 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 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 Acts

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), the Building Resilient Infrastructure and Communities (BRIC) program, and the Flood Mitigation Assistance (FMA) program, all of which are administered by the Federal Emergency Management Agency (FEMA) under the Department of Homeland Security. Communities with an adopted and federally-approved hazard mitigation plan thereby become pre-positioned and more apt to receive available mitigation funds before and after the next disaster strikes.

Major federal flood insurance legislation was passed in 2012 under the Biggert-Waters Flood Insurance Reform Act (P.L. 112-141) and the subsequent Homeowner Flood Insurance Affordability Act (HFIAA) in 2014 which revised Biggert-Waters. HFIAA established the requirement that a FEMA-approved Hazard Mitigation Plan is now required if communities wish to be eligible for any of the FEMA mitigation

programs. These acts made several changes to the way the National Flood Insurance Program is to be run, including raises in rates to reflect true flood risk and changes in how Flood Insurance Rate Map (FIRM) updates impact policyholders. These acts further emphasize Congress' focus on mitigating vulnerable structures.

The Smoky Mountain Regional Hazard Mitigation Plan has been prepared in coordination with FEMA Region IV and North Carolina Emergency Management (NCEM) 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 Smoky Mountain Regional Hazard Mitigation Plan is to:

- Completely update the existing Smoky Mountain Regional Hazard Mitigation Plan to demonstrate progress and reflect current conditions;
- Increase public awareness and education;
- Maintain grant eligibility for participating jurisdictions;
- Update the plan in accordance with Community Rating System (CRS) requirements; and
- Maintain compliance with state and federal legislative requirements for local hazard mitigation plans.

1.3 SCOPE

The focus of the Smoky Mountain Regional Hazard Mitigation Plan is on those hazards determined to be "high" or "moderate" risks to the Smoky Mountain 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 counties and municipalities and the Tribe 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 the Smoky Mountain region as well as their incorporated jurisdictions and the Eastern Band of Cherokee Indians. **Table 1.1** indicates the participating jurisdictions.

TABLE 1.1: PARTICIPATING AREAS IN THE SMOKEY MOUNTAIN REGIONAL HAZARD MITIGATION PLAN

Cherokee County	
Town of Andrews	Town of Murphy
Graham County	
Town of Fontana Dam	Town of Robbinsville
Town of Lake Santeetlah	
Swain County	
Town of Bryson City	
Haywood County	
Town of Canton	Town of Maggie Valley
Town of Clyde	Town of Waynesville
Jackson County	
Town of Dillsboro	Town of Sylva
Village of Forest Hills	Town of Webster
Eastern Band of Cherokee Indians	

1.4 AUTHORITY

The Smoky Mountain Regional Hazard Mitigation Plan has been developed in accordance with current state and federal rules and regulations governing local 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 (201.6 for local mitigation planning requirements and 201.7 for Tribal mitigation planning requirements);
- Flood Insurance Reform Act of 2004 (P.L. 108-264) and Biggert-Waters Flood Insurance Reform Act of 2012 (P.L. 112-141) and the Homeowner Flood Insurance Affordability Act of 2014.

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 Smoky Mountain 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 Smoky Mountain Region. The risk assessment also attempts to define any hazard risks that may uniquely or exclusively affect specific areas of the Smoky Mountain Region.

The Risk Assessment begins by identifying hazards that threaten the Smoky Mountain Country 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, NCEM's Risk Management Tool (RMT) 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 as the Smoky Mountain Region seeks to determine the most appropriate mitigation actions to pursue and implement—enabling it 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 Smoky Mountain Region's capacity to implement meaningful mitigation strategies 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 Smoky Mountain 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 jurisdictions participating in the Smoky Mountain Regional Hazard Mitigation Plan 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 and municipal 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 Smoky Mountain 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 the jurisdictions participating in the Smoky Mountain Regional plan 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.

SECTION 2
PLANNING PROCESS

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.

This section describes the planning process undertaken to develop the 2022 update of the Smoky Mountain Regional Hazard Mitigation Plan. Information about the planning process used to develop previous versions of this plan can be found in those plans which are available from NCEM's Hazard Mitigation Planning Section and the participating County and Tribal Emergency Management Offices.

This section consists of the following eight subsections:

- 2.1 Overview of Hazard Mitigation Planning
- 2.2 History of Hazard Mitigation Planning in the Smoky Mountain Region
- 2.3 Preparing the Plan in 2022
- 2.4 The Smoky Mountain Hazard Mitigation Planning Committee
- 2.5 Community Meetings and Workshops
- 2.6 Involving the Public
- 2.7 Involving the Stakeholders
- 2.8 Documentation of Plan Progress

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 protecting property,
- saving money,
- speeding 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, communities that participate in mitigation planning are 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 SMOKY MOUNTAIN REGION

Prior to the development of the initial *Smoky Mountain Regional Hazard Mitigation Plan* in 2012, each of the five counties participating in this Plan and the Eastern Band of Cherokee Indians had previously adopted county/Tribal-level hazard mitigation plans. The FEMA approval dates for each of these plans, along with a list of the participating municipalities for each plan, are listed below:

- *Cherokee County Disaster Mitigation Plan* (February 2006)
  - Town of Andrews
  - Town of Murphy
- *Graham County Multi-Jurisdictional Mitigation Plan* (May 2011)
  - Town of Lake Santeetlah
  - Town of Robbinsville
- *Haywood County Hazard Mitigation Plan* (September 2006)
  - Town of Canton
  - Town of Clyde
  - Town of Maggie Valley
  - Town of Waynesville
- *Jackson County Hazard Mitigation Plan* (August 2011)
  - Town of Dillsboro
  - Village of Forest Hills
  - Town of Sylva

- Town of Webster
- *Swain County & Town of Bryson City Hazard Mitigation Plan* (July 2011)
  - Town of Bryson City
- *Eastern Band of Cherokee Indians Multi-Hazard Mitigation Plan* (March 2011)

Each of the county-levels plans was developed using the multi-jurisdictional planning process recommended by the Federal Emergency Management Agency (FEMA). The EBCI plan was developed to meet Tribal planning requirements.

2.3 UPDATING THE PLAN IN 2022

FEMA requires that hazard mitigation plans be updated every five years to remain eligible for federal mitigation and public assistance funding. To prepare the 2022 update to the *Smoky Mountain Regional Hazard Mitigation Plan*, ESP Associates, Inc. was hired by North Carolina Emergency Management to provide professional mitigation planning services. Per the contractual scope of work, the consultant team followed the mitigation planning process recommended by FEMA (Publication Series 386 and Local Mitigation Plan Review Guide) and recommendations provided by North Carolina Emergency Management (NCEM) mitigation planning staff[1]. Additionally, for the 2020 update, FEMA Community Rating System (CRS) and Community Wildfire Protection Plan (CWPP) requirements were integrated into the plan update.

Tables 2.1 and 2.2 below provide an overview of how the Community Rating System and Community Wildfire Protection Plan requirements were integrated into this plan update.

TABLE 2.1 FEMA HAZARD MITIGATION PLANNING REQUIREMENTS AND THE CRS 10-STEP PLANNING PROCESS REFERENCE TABLE

FEMA Disaster Mitigation Act Requirement	CRS Activity 510 Planning Requirement
Phase I – Planning Process	
§201.6(c)(1)	Step 1: Organize to Prepare the Plan
§201.6(b)(1)	Step 2: Involve the Public
§201.6(b)(2) & (3)	Step 3: Coordinate
Phase II – Risk Assessment	
§201.6(c)(2)(i)	Step 4: Assess the Hazard
§201.6(c)(2)(ii) & (iii)	Step 5: Assess the Problem
Phase III – Mitigation Strategy	
§201.6(c)(3)(i)	Step 6: Set Goals
§201.6(c)(3)(ii)	Step 7: Review Possible Activities
§201.6(c)(3)(iii)	Step 8: Draft an Action Plan
Phase IV – Plan Maintenance	
§201.6(c)(5)	Step 9: Adopt the Plan
§201.6(c)(4)	Step 10: Implement, Evaluate and Revise the Plan

[1] A copy of the negotiated contractual scope of work between NCEM and ESP is available through NCEM upon request.

TABLE 2.2 COMMUNITY WILDFIRE PROTECTION PLAN PROCESS INTEGRATION REFERENCE TABLE

CWPP Process	Hazard Mitigation Plan Integration Reference
Step 1: Convene Decisionmakers	Section 2: Planning Process
Step 2: Involve Federal Agencies	Section 2: Planning Process
Step 3: Engage Interested Parties	Section 2: Planning Process
Step 4: Establish a Community Base Map	Section 3: Community Profile
Step 5: Develop a Community Risk Assessment	Sections 4, 5 and 6: Hazard Identification, Hazard Profiles and Vulnerability Assessment Section 7: Capability Assessment
Step 6: Establish Community Hazard Reduction Priorities and Recommendations to Reduce Structural Ignitability	Section 8: Mitigation Strategy
Step 7: Develop an Action Plan and Assessment Strategy	Section 9: Mitigation Action Plans Section 10: Plan Maintenance
Step 8: Finalize the CWPP	Appendix A: Plan Adoption

Source: Preparing a Community Wildfire Protection Plan – A Handbook for Wildland-Urban Interface Communities

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 (October 2011) for reference as they completed the Plan. To address Tribal mitigation planning requirements (CFR 201.7), the project team relied heavily on FEMA's Tribal Multi-Hazard Mitigation Planning Guidance.

For the development of the 2022 plan, all the aforementioned jurisdictions that participated in the development of the 2018 plan participated in this plan's development.

The process used to prepare this Plan included twelve major steps that were completed over the course of approximately nine months beginning in October 2021. 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*.

FIGURE 2.1: MITIGATION PLANNING PROCESS FOR THE SMOKY MOUNTAIN REGION



2.4 THE SMOKY MOUNTAIN REGIONAL HAZARD MITIGATION PLANNING COMMITTEE

In order to guide the development of this Plan, the Smoky Mountain jurisdictions created the Smoky Mountain Regional Hazard Mitigation Planning Committee. The Regional Hazard Mitigation Planning Committee represents a community-based planning team made up of representatives from various county and municipal departments, and other key stakeholders identified to serve as critical partners in the planning process.

Beginning in October 2021, 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

- help review the local Capability Assessment information and provide copies of any mitigation or hazard-related documents for review and incorporation into the Plan
- support the development and update of the Mitigation Strategy, including the design and adoption of regional 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 2022 *Smoky Mountain Regional Hazard Mitigation Plan*

Table 2.3 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 2.3: MEMBERS OF THE SMOKY MOUNTAIN REGIONAL HAZARD MITIGATION PLANNING COMMITTEE

NAME	POSITION	DEPARTMENT / AGENCY
Cherokee County		
Caldwell, Robin	Emergency Services Director	Cherokee County
Davis, Sam	Emergency Management Coordinator	Cherokee County
Hass, Maria	County Manager	Cherokee County
Graham County		
Stevens, Brian	Emergency Services Interim Director	Graham County
Haywood County		
Donaldson, Travis	Emergency Services Director	Haywood County
Dove, Ira	Health and Human Services Director	Haywood County
Grasty, Cody	Emergency Management Specialist	Haywood County
Harris, Jeannine	Preparedness Coordinator	Haywood County
Haynes, Jeff	Chief Deputy	Haywood County Sheriff's Office
Koonce, Zack	Emergency Management	Haywood County
Ferguson, Jodie	Development Services Coordinator	Haywood County
Sheuer, Nick	Town Manager	Town of Canton
Stinnett, Lisa	Assistant Town Manager	Town of Canton
Garland, Joy	Town Administrator	Town of Clyde
Jackson County		
Dillard, Todd	Emergency Management Director	Jackson County
Poston, Mike	Planning Director	Jackson County
Swain County		
Breedlove, David	Emergency Management Director	Swain County

NAME	POSITION	DEPARTMENT / AGENCY
Tabor, Misty	911 Addressing	Swain County
		Bryson City
Eastern Band of Cherokee Indians		
Panther, Robert	Emergency Management Coordinator	Eastern Band of Cherokee Indians
Grant, Mollie	Emergency Management Program Manager	Eastern Band of Cherokee Indians
Turner, Joshua	Emergency Management Specialist	Eastern Band of Cherokee Indians
Stakeholders		
Feinberg, Lara	Office Adminstrator	Junaluska Sanitary District
Crew, Chris	Hazard Mitigation Plans Chief	NCEM
Baker, Carl	Hazard Mitigation Planner	NCEM
Mello, John	Hazard Mitigation Planner	NCEM

Table 2.4 lists points of contact for several of the jurisdictions who elected to designate their respective county officials to represent their jurisdiction on the planning team, generally because they did not have the time or staff to be able to attend meetings on their own. Although these members designated county officials to represent them at in-person meetings, each was still contacted throughout the planning process and participated by providing suggestions and comments on the Plan, updates to mitigation actions and the Capability Assessment via email and phone conversations. These members are listed below by municipality.

TABLE 2.4: MEMBERS DESIGNATING REPRESENTATIVES TO THE SMOKY MOUNTAIN REGIONAL HAZARD MITIGATION PLANNING COMMITTEE

NAME	JURISDICTION/TITLE
Cherokee County	
Ricks, David	Andrews, Planning Administrator
Simons, Chad	Murphy, Town Manager
Graham County	
Hardy, Robert	Fontana Village, Mayor
Matheson, Kim	Lake Santeetlah, Town Administrator
Adams, Shaun	Robbinsville, Mayor
Haywood County	
Clark, Nathan	Maggie Valley, Town Manager
Hites, Rob	Waynesville, Town Manager
Jackson County	
Jones, David	Dillsboro, Mayor
Buchanan, Jayne	Forest Hills, Planning Board Clerk
Dowling, Paige Roberson	Sylva, Town Manager
Rodes, Tracy	Webster, Mayor

Additional participation and input from other identified stakeholders and the general public was sought by the participating counties and the Tribe during the planning process through phone calls and the

distribution of emails, advertisements and public notices aimed at informing people on the status of the Hazard Mitigation Plan (public and stakeholder involvement is further discussed later in this section).

2.4.1 Multi-Jurisdictional Participation

The *Smoky Mountain Regional Multi-Jurisdictional Hazard Mitigation Plan* includes five counties, fourteen incorporated municipalities, and one Native American tribal nation. 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/new mitigation projects, if applicable and identify any new mitigation actions to be included in the plan;
- Review the draft plan; 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. This provides the means for jurisdictions to monitor and update their Plan on a regular basis.

2.5 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[2]. 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.

2.5.1 Meeting Minutes

Meeting Minutes from Kickoff Microsoft Teams Meeting
October 27, 2021
Phone Call/Microsoft Teams Meeting

Following issuance of a notice to proceed from NCEM on August 29, 2018 ESP Associates reached out by email to County Emergency Management and Planning Department leads from Cherokee, Graham, Swain, Haywood, Jackson, the Eastern Band of Cherokee Indians, and the Western Branch Manager to introduce themselves, explain the plan update process in general and schedule a time to hold an informal internal kickoff conference call/Microsoft Teams meeting. All meetings for the update of the plan in 2022 were conducted online because of the ongoing COVID-19 pandemic.

[2] Copies of agendas, sign-in sheets, minutes, and handout materials for all meetings and workshops can be found in Appendix D.

On October 27, 2021, Nathan Slaughter, Hazard Mitigation Department Manager from ESP Associates, Inc. and Project Manager for the update of the Smoky Mountain Regional Hazard Mitigation Plan conducted a Microsoft Teams meeting with the Hazard Mitigation Planning Committee. Mr. Slaughter led the meeting of the Regional Hazard Mitigation Planning Committee and began by having attendees introduce themselves. The 12 attendees included representatives from various departments and local jurisdictions within each of the five counties participating in the plan update and the Eastern Band of Cherokee Indians. Mr. Slaughter then provided an overview of the items to be discussed at the meeting and briefly reviewed the agenda. He then defined mitigation and gave a review of the Disaster Mitigation Act of 2000 and NC Senate Bill 300.

To continue, Mr. Slaughter provided detailed information about the project. He mentioned that the project is funded by a FEMA HMGP grant, and that NCEM was managing the planning effort and had assigned ESP Associates, Inc. to manage the update, thus ensuring that Mr. Slaughter would remain the Project Manager, as he was for the first two versions of the regional plan. For this update, there was no local funding required.

Mr. Slaughter then explained some of the basic concepts of mitigation. He explained how we should think about mitigation: we want to mitigate hazard impacts of existing development in the community (houses, businesses, critical facilities, etc.), and ensure that future development is conducted in a way that doesn't increase vulnerability. This can be achieved by having good plans, policies, and procedures in place.

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

- Coordinate between the five participating counties and the EBCI to update the regional plan
- Update the plan to demonstrate progress and reflect current conditions
- Complete the update before the existing plan expires on May 20, 2023
- Increase public awareness and education
- Maintain grant eligibility for participating jurisdictions
- Update the plan in accordance with Community Rating System (CRS) requirements where applicable, and
- Maintain compliance with State and Federal requirements

Next, he explained new elements to this update, which include integrating with NCEM's RMT, Activity 510 compliance for CRS communities, Risk MAP, Community Wildfire Protection Plans, the NC Resilience Assessment, and EMAP compliance.

Mr. Slaughter reviewed the list of participating jurisdictions with the group, which all agreed to participate again. He also explained the planning process and specific tasks to be accomplished for the project, which include the planning process, risk assessment, capability assessment, mitigation strategy, mitigation action plan, and plain maintenance procedures. For the risk assessment portion of the process, Mr. Slaughter asked each county to designate a point of contact to coordinate the gathering of GIS data required for the analysis. He also reviewed the list of identified hazards and the committee agreed to maintain the previous list of hazards for the four counties.

The project schedule was presented and Mr. Slaughter noted that the schedule provided ample time to produce a quality plan and meet state and federal deadlines.

Mr. Slaughter discussed what data would need to be collected to complete the project. This includes GIS Data, Capability Assessment Revisions, a Public Participation Survey, and updates to existing Mitigation Actions.

Mr. Slaughter then reviewed the roles and responsibilities of ESP Associates, Inc, the County leads, EBCI representatives and the participating municipal 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. The next HMPC meeting was scheduled for some time in March 2022 to discuss the findings of the risk and capability assessments and to begin updating existing mitigation actions and identify new goals.

March 24, 2022 – Mitigation Strategy Presentation
Microsoft Teams Meeting

Nathan Slaughter, Project Manager from ESP Associates, began the meeting by welcoming the attendees and reviewing the meeting agenda. Mr. Slaughter asked meeting attendees to introduce themselves and gave a refresher on mitigation, why we plan, and the key objectives of the project. He reviewed the participating jurisdictions, project tasks and project schedule. He stated that a draft of the updated Regional Hazard Mitigation Plan would be presented by the end of December 2021.

Mr. Slaughter then presented the findings of the risk assessment. He shared the list of all hazards that are addressed in the regional plan, and reviewed the list of hazards addressed in the North Carolina State Hazard Mitigation Plan. He discussed a couple of caveats for the risk assessment and indicated that best available data was used. While that information is helpful, events are often under-reported, so it is important to keep the end goal in sight. The purpose of the risk assessment was shared: to compare hazards and determine which should be the focus of the mitigation actions. Finally, he mentioned to the stakeholders that it ultimately is their risk assessment, so their recommendations for adjustment are welcomed and encouraged.

Mr. Slaughter stated that since the last plan was updated, there have been three Presidential disaster declarations that have impacted the region, which helped emphasize the need to continue updating the mitigation plan.

The following Hazard Profiles and summaries of each hazard were then shared:

- DROUGHT: There have been eighteen years (out of the past nineteen, 2000-2019) where drought conditions have been reported as severe, extreme or exceptional in the Smoky Mountain Region and future occurrences are likely.
- HURRICANES AND TROPICAL STORMS. NOAA data shows that 29 storm tracks have come within 75 miles of the Smoky Mountain Region since 1850. Nine of these events were tropical storms and nineteen were tropical depressions. Future occurrences are likely.
- HAILSTORM: There have been 221 recorded events since 1977. Future occurrences are likely.
- LIGHTNING. There have been 23 recorded lightning events since 1997, causing one injury and approximately $2.8 million in reported property damages. Future occurrences are highly likely.
- SEVERE THUNDERSTORM: There have been 565 severe thunderstorm events reported since 1959 with $4.5 million in reported property damages. Future occurrences are highly likely.

- TORNADOES: There have been 20 recorded tornado events reported in the region since 1973. $28.2 million in property damages, six deaths, and thirty-eight injuries have been reported. Future occurrences are possible.
- SEVERE WINTER WEATHER: There have been 747 recorded winter events in the Smoky Mountain Region since 1993, resulting in over $34.2 million in damages. Future occurrences are highly likely.
- EARTHQUAKES. There have been 82 recorded earthquake events in the Smoky Mountain Region since 1913. The strongest had a recorded magnitude of VII MMI. Future occurrences are possible.
- LANDSLIDE. There have been 227 recorded landslide events in the Smoky Mountain Region. Future occurrences are possible.
- DAM AND LEVEE FAILURE. There are 71 high hazard dams in the Smoky Mountain Region. There have been two reported failures in the region however future occurrences are unlikely.
- EROSION. Erosion was included in the previous EBCI plan and the Haywood, Jackson and Swain County plans. Future occurrences are possible.
- FLOOD. There have been 127 flood events recorded in the Smoky Mountain Region since 1993, resulting in $232.2 million in property damage. There have been 294 NFIP losses since 1970 and approximately $9.3 million in claims. There are 29 repetitive loss properties in the region and future occurrences are highly likely.
- WILDFIRE. Much of the region is located in a high-risk wildland urban interface area. Future occurrences are likely.
- HAZARDOUS MATERIALS INCIDENTS: 58 serious HAZMAT events have been reported through the PHMSA. There are 8 TRI Facilities in the region. Future occurrences are possible.
- NUCLEAR EMERGENCY: There are two nuclear facilities within 50 miles of the region. No major historical occurrences were found, and future occurrences are unlikely.
- INFECTIOUS DISEASE: The ongoing COVID-19 pandemic demonstrates the need to include infectious disease in the plan. Future occurrences are possible.
- TERROR THREAT: The region does not contain any high potential target areas for terrorism and there have been no reported events. Future occurrences are unlikely, although not impossible.
- CYBER: There have been cyber attacks reported in the region and future occurrences are likely.
- ELECTROMAGNETIC PULSE: identified as a hazard in the NC State Hazard Mitigation Plan so included in the Smoky Mountain Regional Hazard Mitigation Plan. Future occurrences are unlikely, although not impossible.

In concluding the review of Hazard Profiles, Mr. Slaughter stated if anyone had additional information for the hazard profiles, or disagreed with any of the data presented, they should call or email him 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 Severe Winter Weather, followed by Flooding, Tornadoes/Severe Thunderstorms.

Mr. Slaughter then displayed maps that presented each county's social vulnerability, as documented by the Center for Disease Control. The maps present how socially vulnerable areas in each county are as

compared to the rest of North Carolina. Many indicators were used to determine the social vulnerability, and the factors were grouped into four themes that were based on census-tract levels.

After a brief break, Mr. Slaughter then presented the Capability Assessment Findings. ESP Associates used 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, and Community Rating System (CRS) participation.

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 moderate to high range for Planning and Regulatory Capability and in the moderate 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, it was determined that most of the participating jurisdictions have moderate or high capabilities to implement hazard mitigation programs and activities.

Mr. Slaughter then transitioned to the Mitigation Strategy portion of the presentation. Mr. Slaughter gave an overview of the process for updating the Mitigation Strategy and presented the existing mitigation goals for the regional plan. He asked the Hazard Mitigation Planning Committee to review the goals to determine whether or not they still reflect current vulnerabilities and current mitigation priorities. The committee members agreed that the goals should be modified to mention human-caused hazards but otherwise felt that they were still relevant hazard mitigation goals for the region.

Mr. Slaughter then discussed the results of the hazard mitigation public survey that was posted on several of the participating counties' and jurisdictions' and the Tribe's websites. As of the meeting date, 63 responses had been received. Based on the preliminary results, respondents felt that wildfire posed the greatest threats to their neighborhood followed by severe thunderstorms/high winds. Most did not live in a floodplain or have flood insurance, but 66.7% of all respondents did not know who to contact regarding reducing their risks to hazards.

Mr. Slaughter then indicated that each participating jurisdiction would need to provide a status update for their existing mitigation actions (completed, deleted, or deferred) by April 29, 2022. Mr. Slaughter also discussed the Mitigation Action Worksheets to be completed for any new mitigation actions and requested that all worksheets be returned by April 29, 2022. Mr. Slaughter then presented sample mitigation actions for the committee members to consider to include in their plan update.

Finally, Mr. Slaughter discussed the next steps in the planning process. These included returning mitigation action updates and delivery of a draft plan in late May 2022. He thanked the group for taking the time to attend and the meeting was adjourned.

2.6 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 involved 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 presents in their community and take the steps necessary to reduce their impact. Public[3] 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 *Smoky Mountain Regional Hazard Mitigation Plan* was sought using two methods: (1) public survey instruments were made available; and (2) copies of draft Plan deliverables were made available for public review on county, municipal and Tribal websites and at government offices. The Public was provided two opportunities to be involved in the actual plan development 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. A hazard mitigation public survey (discussed in greater detail in Section 2.6.1) was made available during the planning process at various locations throughout the Smoky Mountain region and on each county's and the Tribe's website and/or social media sites.

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.

2.6.1 Hazard Mitigation Public Survey

The Regional Hazard Mitigation Planning Committee was successful in getting citizens to provide input to the mitigation planning process through the use of the *Hazard Mitigation Public Survey*. The *Public Survey* was designed to capture data and information from residents of the Smoky Mountain Region that might not be able to attend public meetings or participate through other means in the mitigation planning process.

Copies of the *Public 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 and the Tribe's websites. A total of 80 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 61 percent of survey respondents had been impacted by a disaster, mainly flooding, hurricanes (Frances-2004, and Ivan-2004), winter storms (blizzard of 1993), and tornadoes (1974 and 2012).

[3] For the purposes of this planning effort, the EBCI defined the "public" as tribal members, tribal employees, neighboring jurisdictions, and all other interested parties.

- Respondents ranked Severe Thunderstorm/High Wind as the highest threat to their neighborhood (24 percent) followed by Wildfires (22 percent), Flood (11 percent), and Tornado (11 percent)
- Approximately 62 percent of respondents have taken actions to make their homes more resistant to hazards and 74 percent are interested in making their homes more resistant to hazards.
- 70 percent of respondents do not know what office to contact regarding reducing their risks to hazards.
- Emergency Services, Natural Resource Protection and Prevention were ranked as the most important activities for communities to pursue in reducing risks.

Full results from the public survey can be found by contacting North Carolina Emergency Management's Hazard Mitigation Planning section. A copy of the survey is provided in Appendix B and a detailed summary of the survey results are provided in Appendix D.

2.7 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 mazzard 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.

At the beginning of the planning process for the development of this plan, the project consultant worked with each of the County Emergency Management leads and the Tribal Emergency Management staff to initiate outreach to stakeholders to be involved in the planning process. The project consultant sent out a list of recommended stakeholders provided from FEMA Publication 386-1 titled **Getting Started: Building Support for Mitigation Planning**. The list of recommended stakeholders is found in Appendix C of that publication (Worksheet #1: Build the Planning Team) and has been included in **Appendix D** of this plan to demonstrate the wide range of stakeholders that were considered to participate in the development of this plan. Each of the County Emergency Management and Tribal Emergency Management leads used that list for reference as they invited stakeholders from their counties to participate in the planning process.

In addition to the efforts described above, the regional Hazard Mitigation Planning Team encouraged more open and widespread participation in the mitigation planning process by designing and distributing the *Hazard Mitigation Public Survey*. These opportunities were provided for local officials, residents, businesses, academia, and other private interests in the Smoky Mountains Region to be involved and offer input throughout the local mitigation planning process.

2.8 DOCUMENTATION OF PLAN PROGRESS

Progress in hazard mitigation planning for the participating jurisdictions in the Smoky Mountain 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 Smoky Mountain 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 are 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 developing the Regional Hazard Mitigation Planning Committee to update the 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 Smoky Mountain 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 Smoky Mountain Region is located in the southern portion of the Western North Carolina Blue Ridge Mountains. For the purposes of this plan, the Smoky Mountain Region Includes Cherokee, Graham, Haywood, Jackson, and Swain Counties, as well as the Tribal lands of the Eastern Band of Cherokee Indians. An orientation map is provided as Figure **3.1**.

The Smoky Mountain Region is best known as being home of the most-visited national park in the United States, the Great Smoky Mountains National Park. Each year, over 9 million people visit the park to see the diverse wildlife and waterfalls, hike, bike, fish, picnic, and camp. The Smoky Mountains are among the tallest in the Appalachian chain with elevations that range from 875 to 6.643 feet. In the park, there are 16 peaks reaching over 5,000 feet.

The Smoky Mountain Region is also a popular tourist destination for other activities such as golfing, tubing, horseback riding, and skiing. The Qualla Boundary, home of the Eastern Band of Cherokee Indians, also attracts many vacationers who come to enjoy Cherokee cultural festivals and outdoor activities, visit the Museum of the Cherokee Indian, or take a tour of the Oconaluftee Indian Village.

The total land area of each of the participating counties and the Eastern Band of Cherokee Indians is presented in **Table 3.1**.

TABLE 3.1: TOTAL AREAS OF PARTICIPATING COUNTIES AND TRIBE

County	Total Land Area
Cherokee County	455 square miles
Graham County	292 square miles
Haywood County	554 square miles
Jackson County	491 square miles
Swain County	528 square miles
Eastern Band of Cherokee Indians	213 square miles[1]

Source: US Census Bureau

The Smoky Mountain Region enjoys a moderate climate that is characterized by mild winters and hot, humid summers; however, variation in elevation and topography can drastically affect local weather. In general, the spring months are marked by unpredictable weather and changes can occur rapidly with sunny skies yielding to snow in just a few hours. From March through May, temperatures in the lower elevations have an average high of 61°F and an average low of 42°F. Typically, the weather is milder by mid-April and warm in May.

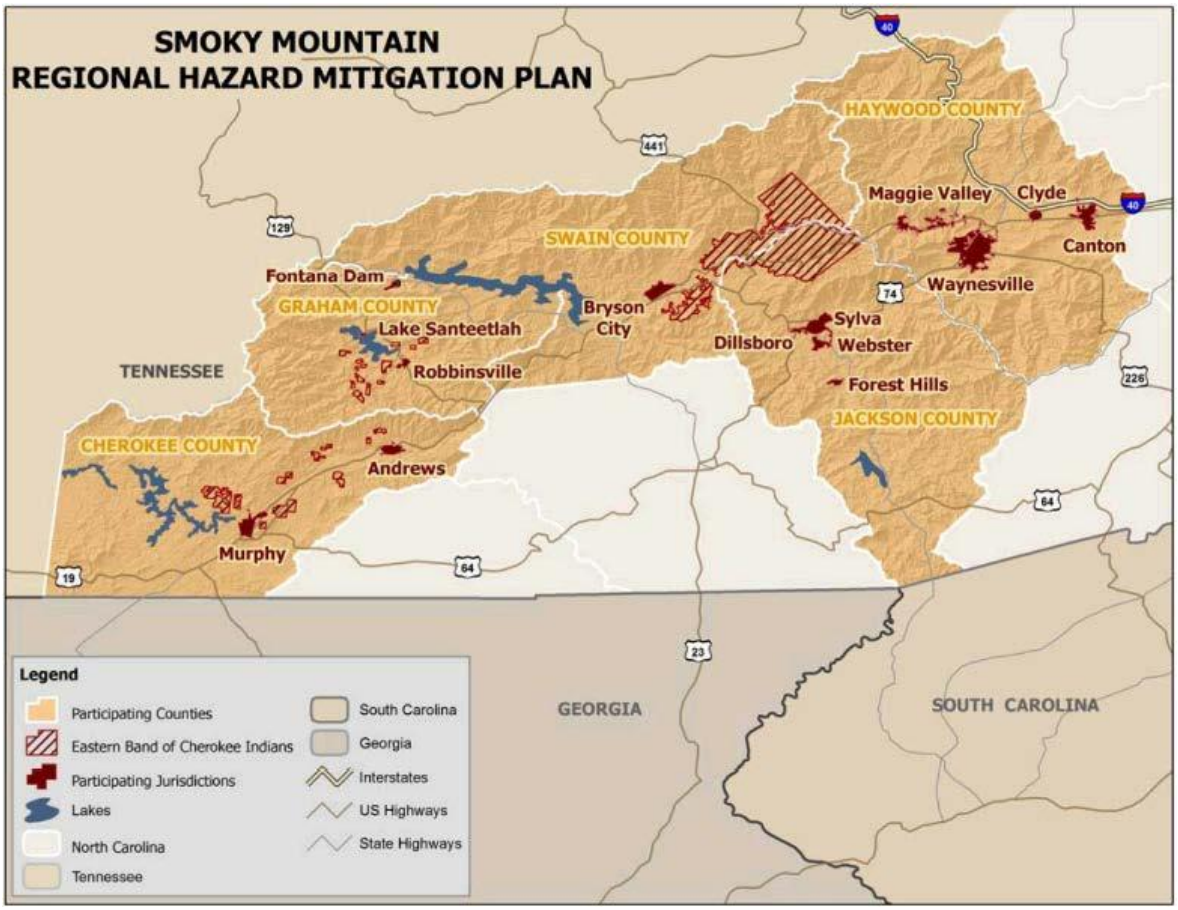
In the summer, afternoon showers and thunderstorms are common and average temperatures increase with afternoon highs reaching the 90s in July and August. At high elevations, weather is much more pleasant during the summer.

September through mid-November is typified by clear skies and cooler weather that alternates between warm days and cool nights. Daytime highs are usually in the 70s and 80s during September but fall to the 50s and 60s by early November. The first frost often occurs in late September and the lows are near freezing by November. During these autumn months, there are only occasional rain showers, making it the driest period of the year.

Winter in the Smoky Mountain Region is generally moderate but extremes do occur, especially at higher elevations. About half of these days from mid-November through February have high temperatures of 50°F or more and can even reach the 70s. Winter lows are usually at or below freezing but temperatures can drop to -20°F at high elevations. Snow is most common during January and February. At low elevations, snows of one inch or more occur one to five times per year; however, in the higher mountains, snow falls more frequently and up to two feet can fall at one time.

[1] The Reservation is comprised of land located in Swain, Jackson, Cherokee, and Graham Counties.

FIGURE 3.1: SMOKY MOUNTAIN REGION ORIENTATION MAP



3.2 POPULATION AND DEMOGRAPHICS

Haywood County is the largest participating county by area and it also has the largest population. Between 2010 and 2018, the majority of participating jurisdictions experienced population growth; however, two towns did see a decline. Population counts from the US Census Bureau for 1990, 2000, 2010 and 2018 estimates for each of the participating counties and 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	2018 Population Estimate	% Change, 2010-2018
CHEROKEE COUNTY	**20,170**	**24,298**	**27,444**	**28,383**	**3.4%**
Town of Andrews	2,551	1,602	1,781	1,833	2.9%
Town of Murphy	1,575	1,568	1,627	1,654	1.7%
GRAHAM COUNTY	**7,196**	**7,993**	**8,861**	**8,484**	**-4.3%**
Town of Fontana	-	-	-	6	-
Town of Lake Santeetlah	47	67	45	43	-4.4%
Town of Robbinsville	709	747	620	650	4.8%
HAYWOOD COUNTY	**46,942**	**54,033**	**59,036**	**61,971**	**5%**
Town of Canton	3,790	4,029	4,227	4,332	2.5%
Town of Clyde	1,041	1,324	1,223	1,301	6.4%
Town of Maggie Valley	185	607	1,150	1,220	6.1%
Town of Waynesville	6,758	9,232	9,869	10,112	2.5%
JACKSON COUNTY	**26,846**	**33,121**	**40,271**	**43,327**	**7.6%**
Town of Dillsboro	95	205	232	245	5.6%
Village of Forest Hills	-	330	365	383	4.9%
Town of Sylva	1,809	2,435	2,588	2,724	5.3%
Town of Webster	410	486	363	384	5.8%
SWAIN COUNTY	**11,268**	**12,968**	**13,981**	**14,245**	**1.9%**
Town of Bryson City	1,145	1,411	1,424	1,450	1.8%
EASTERN BAND OF CHEROKEE INDIANS	5,968	8,092	9,018		

Source: US Census Bureau

Based on the 2018 Census, the median age of residents of the participating counties ranges from 37 to 51 years and the median age of the Tribe was 32 years. The racial characteristics of the participating counties are presented in **Table 3.3**. Generally, whites make up the majority of the population in the region accounting for over 89 percent of the population in Cherokee, Graham, and Haywood Counties. Conversely, the two counties with smaller populations of white people, Jackson and Swain, had the largest proportion of American Indians. This can be attributed to the fact that the main portion of the Eastern Cherokee Reservation lies in eastern Swain County and northern Jackson County.

TABLE 3.3: DEMOGRAPHICS OF PARTICIPATING COUNTIES

County	White, Percent (2018)	Black or African American, Percent (2018)	American Indian or Alaska Native, Percent (2018)	Asian, Percent (2018)	Native Hawaiian or Other Pacific Islander, Percent (2018)	Persons of Hispanic Origin, Percent (2018) *	Two or More Races, Percent (2018)
Cherokee	93.7%	1.6%	1.5%	0.7%	0.1%	3.2%	2.4%
Graham	89.0%	0.5%	7.7%	0.5%	0.1%	3.5%	2.2%
Haywood	96.2%	1.3%	0.6%	0.5%	N/A	3.9%	1.3%
Jackson	85.2%	2.3%	9.2%	1.0%	N/A	5.8%	2.1%
Swain	63.9%	1.1%	29.7%	0.6%	N/A	5.1%	4.6%

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

Source: US Census Bureau

3.3 HOUSING, INFRASTRUCTURE, AND LAND USE

3.3.1 Housing

According to the US Census Bureau, in 2017 there were 96,530 housing units in the Smoky Mountain Region, most of which are single family homes. Housing information for the four participating counties and Tribe is presented in **Table 3.4**. As shown in the table, Swain County has a very low percentage of seasonal housing units compared to the other counties.

TABLE 3.4: HOUSING CHARACTERISTICS

County	Housing Units (2010)	Housing Units (2018)	Seasonal Units, Percent (2018)	Median Home Value (2013-2017)
Cherokee County	17,515	18,407	3.9	$145,500
Graham County	5,930	6,059	2.7	$124,800
Haywood County	34,954	35,567	2.1	$175,900
Jackson County	25,948	27,432	1.2	$177,200
Swain County	8,723	9,065	.5	$122,300

Source: US Census Bureau

3.3.2 Infrastructure

Transportation

There are several major thoroughfares that cross the Smoky Mountain Region. The Great Smoky Mountains Expressway is a four-lane divided highway that traverses west to east starting at Bryson City in Swain County, through Jackson County, to Clyde in Haywood County. The Waterfall Byway, part of US Route 64, also connects west to east starting in Cherokee County and continuing on through Jackson County. This scenic byway is known for its more than 200 waterfalls that surround the route. US Route 74 is another east-west highway that runs across the state, but it travels roughly southwest to northeast in the region connecting the towns of Murphy, Andrews, Bryson City, Cherokee, Sylva, and Waynesville and linking all 5 counties in the Smoky Mountain Region. US Route 74 has alternating names, but it is

considered the commercial backbone and main truck route of Western North Carolina. This highway briefly runs concurrent with and intersects US Route 441, a north-south highway that runs from the Georgia border, into Jackson County, and through Swain County to the Tennessee border.

The Asheville Regional/Hendersonville Airport is the largest airport in the mountains serving the Smoky Mountain Region and all of Western North Carolina. The airport currently offers non-stop commercial flights on four airlines to six major cities. The major airport located nearest to the region is the Charlotte Douglas International Airport, which offers non-stop commercial flights on nine airlines to numerous destinations across the eastern US and Midwest as well as to several international destinations. This airport is approximately 175 miles from Bryson City, which is roughly located in the center of the region. Other major nearby airports include the Hartsfield-Jackson Atlanta International Airport in Georgia and the Nashville Metropolitan Airport in Tennessee.

Utilities

Electric power in the Smoky Mountain Region is provided by two public utilities and several electricity cooperatives. Duke Energy provides service to Graham County, Jackson County, and Swain County while Progress Energy also serves Jackson County and Haywood County. The electricity cooperatives servicing the region include Haywood Electric Membership Corporation in Haywood County and Tri-State Electric Membership Corporation and Blue Ridge Mountain Electric Membership Corporation in Cherokee County.

Water and sewer service is provided by many of the towns in the Smoky Mountain Region, but generally municipal water systems are extremely limited in the mountains and private or shared wells and septic systems are considered the norm. Cherokee and Jackson Counties; the Towns of Andrews, Murphy, Lake Santeetlah, Robbinsville, Canton, Clyde, Maggie Valley, Waynesville, Dillsboro, Sylva and Webster; and the Eastern Band of Cherokee Indians provide water and sewer service to their residents.

Community Facilities

There are a number of public buildings and community facilities located throughout the Smoky Mountain Region. According to the data collected for the vulnerability assessment (Section 6.4.1), there are 109 fire stations, 29 police stations, and 51 schools located within the study area.

Six hospitals are located in the Smoky Mountain Region. The largest is the Murphy Medical Center, a 191-bed short term acute center located in the Town of Murphy. The Haywood Regional Medical Center in Clyde and Harris Regional Hospital in Sylva are two additional short-term acute centers with 121 beds and 86 beds, respectively. The three smaller hospitals are District Memorial Hospitals in Andrews, PHS Indian Hospital in Cherokee, and Swain County Hospital in Bryson City.

In addition to the Smoky Mountain Region contains numerous local, state, and national parks and recreation areas. These include the Nantahala National Forest, Pisgah National Forest, Joyce Kilmer Memorial Forest, Cherohala Skyway, and Blue Ridge Parkway. These facilities offer recreational opportunities to area residents and millions of visitors each year.

3.3.3 Land Use and Development Trends

Many areas of the Smoky Mountain Region are undeveloped or sparsely developed due to the mountainous terrain and the conservation of land in state and national parks and forests. As shown in

Figure 3.1 above, there are a few small incorporated municipalities located throughout the study area, and these areas are where the region's population is generally concentrated. The incorporated areas are also where many of the businesses, commercial uses, and institutional uses are located. Land uses in the balance of the study area generally consist of rural residential development, agricultural uses, recreational areas, and forestland.

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

3.4 EMPLOYMENT AND INDUSTRY

The early modern economy in the Smoky Mountain Region was built around extractive industries; such as mining, logging, and agriculture; manufacturing; and textiles. Like many other mountain towns in North Carolina, the jurisdictions in the Smoky Mountain Region have focused recent economic development efforts on cultural and natural heritage tourism. Second home development is also being considered as another way to boost the economy and promote revitalization.

According to the North Carolina Department of Commerce Labor and Economic Analysis (NCDCLEA), in 2018, Cherokee County had an average annual employment of 11,256 workers. The top 5 employers in this area were the Cherokee County Board of Education, Murphy Medical Center, Moog INC, Cherokee County, and Wal-Mart. The average unemployment rate was 4 compared to the State rate of 3.7.

Graham County had a labor force of 3,230 workers. The top 5 employers in this area were Graham County Schools, Graham County, Graham County Land Company, Crisp and Crisp INC, and Ingles Markets. The average unemployment rate was 5 compared to the State rate of 3.7.

Haywood County had an average annual employment consisting of 30,425 workers in 2018. According to the NCDCLEA the top 5 employers in Haywood County were Haywood County Consolidated Schools, Blue Ridge Paper Products, DLP Partner Medwest, Ingles Markets, and Consolidated Medco. The average unemployment rate was 3.1 compared to the State rate of 3.7.

Jackson County had a labor force of 19,887 workers for 2018. The top 5 employers in the area were Western Carolina University, DLP Partner Medwest, Jackson County Public Schools, Aramark Food and Support Services, and Vaya Health. The average unemployment rate was 3.8 compared to the State rate of 3.7.

Swain County had a 2018 labor force of 6,843 workers. In 2018, the top 5 employers in this area were EBCI, Cherokee Indian Hospital, The Cherokee Boys Club Swain County Schools, and the Great Smoky Mountains Railroad. The average unemployment rate was 4.1 compared to the State rate of 3.7.

According to a 2010 report released by the Bureau of Indian Affairs, the Eastern Band of Cherokee has a total labor force of approximately 9,533. Of that, approximately 12% were unemployed. 7,137 were employed in private business and 1,246 were employed in public employment.

SECTION 4
HAZARD IDENTIFICATION

This section describes how the planning team identified the hazards to be included this plan. It consists of the following five subsections:

- 4.1 Overview
- 4.2 Disaster Declarations
- 4.3 Summary of Hazard Impacts Since Previous Plan
- 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 Smoky Mountain 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 Smoky Mountain 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 Smoky Mountain Region (Cherokee County, Graham County, Haywood County, Jackson County, Swain County) and the Eastern Band of Cherokee Indians 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 Smoky Mountains Regional Hazard Mitigation Planning Team members, research of past disaster declarations in the participating counties and on Tribal lands[1], and review of the North Carolina State Hazard Mitigation Plan (2018).

To maintain consistency, the Smoky Mountains Regional Hazard Mitigation Planning Team voted to assess the same hazards that were identified in the most recent update of the North Carolina State Hazard Mitigation Plan. Therefore, since the development of the previous version of this plan, the hazard identified and included in the plan have changed. A list of all previous hazards covered in the 2018 Smoky Mountain Regional Hazard Mitigation Plan is viewable in **Table 4.1**, along with a summary

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

of the hazards assessed in this 2022 update. 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: 2022 SMOKY MOUNTAINS HAZARDS UPDATE

2018 Smoky Mountains Identified Hazards		2022 Smoky Mountains Identified Hazards		Sub hazards covered in 2022 Plan and Explanations
Atmospheric Hazards	Drought	Natural Hazards	Drought	Agricultural Drought, Hydrological Drought
	Hailstorm			Assessed under "Tornadoes/Thunderstorms"
	Hurricane and Tropical Storm		Hurricane and Coastal Hazards	Storm Surge associated with Hurricanes and Nor'easters, High Wind associated with Hurricanes and Nor'easters, Torrential Rain, Tornadoes Associates with Hurricanes, Severe Winter Weather associated with Nor'easters
	Lightning			Assessed under "Tornadoes/Thunderstorms"
	Tornado		Tornadoes/Thunderstorms	Hailstorm, Torrential Rain associated with Severe Thunderstorms, Thunderstorm Wind, Lightning, Waterspout, High Wind
	Severe Thunderstorm		Severe Thunderstorm	Assessed under "Tornadoes/Thunderstorms"
	Winter Storm and Freeze		Severe Winter Weather	Freezing Rain, Snowstorms, Blizzards, Wind Chill, Extreme Cold
Hydrologic Hazards	Dam and Levee Failure		Dam Failures	
	Erosion			Assessed under "Geological"
	Flood		Flooding	
Geologic Hazards	Earthquake		Earthquakes	
	Landslide		Geological	Landslides, Sinkholes, Erosion
Other Hazards	Wildfire	Other Hazards	Wildfires	
			Infectious Disease	
Other Hazards	Hazardous Materials Incident	Technological Hazards	Hazardous Substances	Hazardous Materials, Hazardous Chemicals, Oil Spill
			Terrorism	Chemical, Biological, Radiological, Nuclear, Explosive
			Cyber	
			Electromagnetic Pulse	

4.2 DISASTER DECLARATIONS

Disaster declarations provide initial insight into the hazards that may impact the Smoky Mountain Regional planning area. Since 1973, eighteen presidential disaster declarations have been reported in the Smoky Mountain Region, which can be seen in **Table 4.2** below. This includes three storms related to

winter storm events, five storms related to hurricane and tropical storm events, two storms related to severe storms and tornadoes, and eight severe storms and flooding events.

Table 4.2: Smoky Mountain Region Disaster Declarations

Year	Disaster Number	Description	Cherokee	Graham	Haywood	Jackson	Swain	EBCI
1973	394	Severe Storms and Flooding			X	X		
1974	428	Tornadoes	X	X				
1977	542	Severe Storms and Flooding			X			
1995	1073	Severe Storms, Flooding, & High Winds	X	X	X	X	X	
1996	1087	Blizzard of '96	X	X	X	X	X	
1996	1103	Winter Storm	X		X			
1998	1200	Severe Storms & Flooding			X			
2003	1457	Severe Ice Storm						X
2003	1490	Hurricane Isabel						X
2004	1553	Hurricane Ivan		X	X	X	X	
2004	1546	Tropical Storm Frances			X	X		
2010	1871	Severe Winter Storms & Flooding			X	X		X
2013	4103	Severe Storms, Flooding, Landslides, & Mudslides						X
2013	4146	Severe Storms, Flooding, Landslides, & Mudslides				X		X
2020	4487	COVID-19 Pandemic	X	X	X	X	X	X
2020	4543	Severe Storms, Tornadoes, and Flooding	X	X			X	
2021	4617	Tropical Storm Fred		X	X			

Source: FEMA.gov

4.3 SUMMARY OF HAZARD IMPACTS SINCE PREVIOUS PLAN

Since the approval date of the previous Smoky Mountains Regional Hazard Mitigation Plan (5/21/2018), there have been 240 hazard events recorded for the region in the National Centers for Environmental Information Storm Events Database. It is important to take note of those hazard events and consider them in the *Hazard Identification* section to help ensure that the appropriate hazards are being considered in the risk assessment sections and in the Mitigation Strategy. **Table 4.3** documents the hazard events recorded. Details for some of these events are discussed in further detail in the *Hazard Profiles* section.

Table 4.3: Summary of Hazard Events Since Previous Plan[2]

Hazard Type*	Number of Reported Events in Cherokee County	Number of Reported Events in Graham County	Number of Reported Events in Haywood County	Number of Reported Events in Jackson County	Number of Reported Events in Swain County
Cold/Wind Chill	0	4	6	11	6
Flash Flood	0	0	2	4	5
Flood	2	0	0	2	1
Hail	1	1	2	3	3
Heavy Snow	15	1	2	4	3
High Wind	0	0	3	1	1
Lightning	0	0	0	0	1
Strong Wind	0	0	0	0	0
Thunderstorm Wind	25	11	6	0	10
Tornado	1	0	0	0	0
Tropical Storm	0	0	0	0	0
Winter Storm	0	3	2	4	2
Winter Weather	0	14	23	25	19
Total Number of Reported Events	**44**	**34**	**46**	**65**	**51**

Source: NCEI

*The hazard type names that NCEI uses are different than the names of hazards used in this plan; however, one can still get an understanding of the types of hazards that impact the region as the hazard types are similar in name.

Appendix H includes detailed information about all previous historical hazard occurrence events that have occurred in the region as reported to the National Centers for Environmental Information. Some more detailed information about previous historical hazard events can be found in Section 5: Hazard Profiles under each separate hazard profile.

4.4 HAZARD EVALUATION

Table 4.4 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 Team during the plan update process.

[2] It is important to note that NCEI records do not provide previous event information for EBCI lands. However, each hazard profile in Section 5 attempts to document hazard events that have occurred on Tribal lands where feasible.

TABLE 4.4: 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?
NATURAL HAZARDS			
Avalanche	**NO**	• Review of US Forest Service National Avalanche site • Review of the NC State Hazard Mitigation Plan • Review of FEMA's Multi-Hazard Identification and Risk Assessment • Review of the previous Smoky Mountain Regional Hazard Mitigation Plan	• 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 was not included in the previous Smoky Mountain Hazard Mitigation Plan
Drought	**YES**	• Review of FEMA's Multi-Hazard Identification and Risk Assessment • Review of the NC State Hazard Mitigation Plan • Review of the previous Smoky Mountain Regional Hazard Mitigation Plan	• There are reports of drought conditions in 18 of the last 19 years (2000-2019) in the Smoky Mountain Region, according to the North Carolina Drought Monitor. "Exceptional" drought levels were reached in all five of the counties • Droughts are discussed in NC State Hazard Mitigation Plan • Drought is included in the previous Smoky Mountain Regional Hazard Mitigation Plan
Hailstorm	**YES (Assessed under Tornadoes/Thunderstorms)**	• Review of FEMA's Multi-Hazard Identification and Risk Assessment • Review of NC State Hazard Mitigation Plan • Review of previous Smoky Mountain Regional Hazard Mitigation Plan • Review of NOAA	• Hailstorm events are discussed in the state plan as its own hazard • NCEI reports 221 hailstorm events (0.75 to 4.5-inch size hail) for the Smoky Mountains Region between 1969 and 2019. For these events there was almost $1.06 million (2020 dollars) in property damages reported. • Hail was addressed as an

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?
		NCEI Storm Events Database	individual hazard in the previous Smoky Mountain Regional Hazard Mitigation Plan
Excessive Heat	**NO**	• Review of NOAA NCEI Storm Events Database • Review of the North Carolina State Hazard Mitigation Plan • Review of the previous Smoky Mountain Regional Hazard Mitigation Plan	• NCEI reported no excessive heat events in the Smoky Mountains region • The NC State Hazard Mitigation Plan includes Excessive Heat as an identified Hazard for North Carolina • Excessive heat was not included in the previous hazard mitigation plan
Hurricane and Coastal Hazards	**YES**	• Review of NC State Hazard Mitigation Plan • Analysis of NOAA historical tropical cyclone tracks and National Hurricane Center Website • Review of NOAA NCEI Storm Events Database • Review of historical presidential disaster declarations • Review of the previous Smoky Mountain Regional Hazard Mitigation Plan	• Hurricanes and coastal hazard events are discussed in the NC State Hazard Mitigation Plan • Hurricanes and coastal hazards were addressed as hurricanes and tropical storms in the previous Smoky Mountain Regional Hazard Mitigation Plan. • NOAA historical records indicate 29 tropical storms or hurricane events have come within 75 miles of the Smoky Mountains Region since 1850. • NCEI reported 1 hurricane, tropical storm, or tropical depression events in the Smoky Mountain Region
Lightning	**YES (Assessed under Tornadoes/ Thunderstorms)**	• Review of FEMA's Multi-Hazard Identification and Risk Assessment • Review of NC State Hazard Mitigation Plan • Review of previous Smoky Mountain	• Lightning events are discussed in the NC State Hazard Mitigation Plan as part of the Tornadoes/Severe Thunderstorm hazard. • NCEI reports 23 lightning events for the Smoky Mountains Region since 1950. These events have

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?
		Regional Hazard Mitigation Plan • Review of NOAA NCEI Storm Events Database • Review of Vaisala's NLDN Lightning Flash Density Map	resulted in a recorded 1 death and 14 injuries and over $2.8 million (2020 dollars) in property damage. • Lightning is addressed as an individual hazard in the previous Smoky Mountain Regional Hazard Mitigation Plan. To maintain consistency with the NC State Hazard Mitigation Plan, it will be addressed under the Tornadoes/Thunderstorms section.
Nor'easter	**NO**	• Review of the NC State Hazard Mitigation Plan • Review of the NOAA NCEI Storm Events Database • Review of the previous Smoky Mountain Regional Hazard Mitigation Plan	• Nor'easters are discussed in the state plan as a part of the Hurricane hazard. • NCEI does not report any Nor'easter activity for the Smoky Mountain Region. However, Nor'easter activity may have affected the region as severe winter storms. In this case, the activity would be reported under winter storm events. • This hazard was not addressed in the previous plan.
Tornado/Thunderstorm	**YES**	• Review of FEMA's Multi-Hazard Identification and Risk Assessment • Review of NC State Hazard Mitigation Plan • Review of previous Smoky Mountain Regional Hazard Mitigation Plan • Review of NOAA NCEI Storm Events Database	• Tornado events are discussed in the NC State Hazard Mitigation Plan under Tornadoes/Severe Thunderstorm. • Tornado events were addressed in the previous Smoky Mountain Regional Hazard Mitigation Plan as an individual hazard. • NCEI reports 20 tornado events in Smoky Mountain Region counties since 1950. These events have resulted in 6 deaths and 38 injuries and over $28.2

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?
			million (2020 dollars) in property damage with the most severe being an F4.
Severe Thunderstorm	**YES (Assessed under Tornadoes/ Thunderstorms)**	• Review of FEMA's Multi-Hazard Identification and Risk Assessment • Review of NC State Hazard Mitigation Plan • Review of previous Smoky Mountain Regional Hazard Mitigation Plan • Review of NOAA NCEI Storm Events Database	• Severe thunderstorm events are discussed in the NC State Hazard Mitigation Plan • Severe thunderstorm events were addressed as Thunderstorm Wind/High Wind in the previous Smoky Mountain Hazard Mitigation Plan • NCEI reports 565 thunderstorm wind and high wind events in the Smoky Mountains region since 1959. These events have resulted in 6 injuries, 1 death and over $4.5 million (2020 dollars) in property damage.
Severe Winter Weather	**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 NCEI Storm Events Database • Review of the previous Smoky Mountain Regional Hazard Mitigation Plan.	• Severe winter storms, including snow storms and ice storms, are discussed in the NC State Hazard Mitigation Plan. • Severe Winter Weather events were addressed as Winter Storms and Freezes in the previous Smoky Mountains hazard mitigation plan. • NCEI reports that the Smoky Mountains counties have been affected by 701 severe winter weather events since 1993. These events resulted in over $34.2 million in property damage. • Winter storms and ice storms were responsible for four of the nineteen disaster declarations in the Smoky Mountains region.
Earthquake	**YES**		

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?
		• Review of FEMA's Multi-Hazard Identification and Risk Assessment • Review of NC State Hazard Mitigation Plan • Review of previous Smoky Mountain Regional Hazard Mitigation Plan • Review of the National Geophysical Data Center • USGS Earthquake Hazards Program website	• Earthquake events are discussed in the NC State Hazard Mitigation Plan • 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. • The previous Smoky Mountain Regional Hazard Mitigation Plan addresses earthquakes. • 82 events are known to have occurred in the region according to the National Geophysical Data Center. The greatest MMI reported was a VII (very strong). • According to USGS seismic hazard maps, the peak ground acceleration (PGA) with a 10% probability of exceedance in 50 years for the Smoky Mountain Region is approximately 10 to 15%g. FEMA recommends that earthquakes be further evaluated for mitigation purposes in areas with a PGA of 3%g or more.
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 the previous Smoky Mountain Regional Hazard	• Expansive soils are identified in the NC State Hazard Mitigation Plan but they are not included as a top hazard for the Region • The previous Smoky Mountain Regional Hazard Mitigation Plan did not identify expansive soils as a potential hazard. • According to FEMA and USDA sources, the Smoky Mountain Region is located in an area that has a "little to no" clay swelling

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?
		Mitigation Plan	potential.
Geological (Landslides, Sinkholes, Erosion)	**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 the previous Smoky Mountain Regional Hazard Mitigation Plan	• Landslide/debris flow events are discussed in the state plan and ranked as a hazard in the in the Region which includes the Smoky Mountain counties and the EBCI • The previous Smoky Mountain Regional Hazard Mitigation Plan addressed landslides as an individual hazard. • USGS landslide hazard maps indicate "high landslide incidence" is found across the Smoky Mountain Region. All counties and EBCI lands also have areas of high susceptibility across the region. • Data provided by NCGS indicate 227 recorded landslide events in the Smoky Mountain Region. • Riverine erosion is discussed in the previous Smoky Mountain Regional Hazard Mitigation Plan.
Land Subsidence	**NO**	• Review of FEMA's Multi-Hazard Identification and Risk Assessment • Review of NC State Hazard Mitigation Plan • Review of previous Smoky Mountain Regional Hazard Mitigation Plan	• The state plan delineates certain areas that are susceptible to land subsidence hazards in North Carolina; however, the Smoky Mountain counties and EBCI lands have zero vulnerability. • The state plan delineates certain areas that are susceptible to land subsidence hazards in North Carolina; however, none of these areas are located in Smoky Mountain counties or EBCI lands. • The previous Smoky Mountain Regional Hazard Mitigation Plan did not identify 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?
Volcano	**NO**	• Review of FEMA's Multi-Hazard Identification and Risk Assessment • Review of NC State Hazard Mitigation Plan • Review of USGS Volcano Hazards Program website • Review of the previous Smoky Mountain Regional Hazard Mitigation Plan	• 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 Smoky Mountain Region.
Dam Failure	**YES**	• Review of FEMA's Multi-Hazard Identification and Risk Assessment • Review of NC State Hazard Mitigation Plan • Review of the previous Smoky Mountain Regional Hazard Mitigation Plan • Review of North Carolina Dam Safety Program's NC Dam Inventory as of 11/20/19	• Dam failure is identified as a hazard in the NC State Hazard Mitigation Plan. • The previous Smoky Mountain Regional Hazard Mitigation Plan identifies Dam failure hazard as Dam and Levee Failure. • Per the NC Dam Inventory, there are 169 dams in total in the Smoky Mountains region, of those, 72 are high hazard dams in the planning region. (High hazard is defined as "where failure will likely cause loss of life or serious damage to homes, industrial and commercial buildings, important public utilities, primary highways, or major railroads.")
Flooding	**YES**	• Review of FEMA's Multi-Hazard Identification and Risk Assessment • Review of NC State Hazard Mitigation Plan	• Floods occur in all 50 states and in the U.S. territories. • The flood hazard is thoroughly discussed in the NC State Hazard Mitigation Plan. The Smoky Mountain Region was found to

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?
		• Review of previous Smoky Mountain Regional Hazard Mitigation Plan • Review of NOAA NCEI Storm Events Database • Review of historical disaster declarations • Review of FEMA DFIRM data • Review of FEMA's NFIP Community Status Book and Community Rating System (CRS)	have relatively low vulnerability compared to the state. • The previous Smoky Mountain Regional Hazard Mitigation Plan addressed flood hazard. NCEI reports that Smoky Mountain counties have been affected by 127 floods events since 1950. These events caused 3 deaths an estimated $32.2 million (2020 dollars) in property damages • Six of the fifteen Presidential Disaster Declarations were flood-related • 3.5% of the Smoky Mountains Region is located in an identified floodplain (100- or 500-year). • Only one of the municipalities in the Smoky Mountains Region does not participate in the NFIP; however, no jurisdictions currently participate in the CRS.
OTHER HAZARDS			
Wildfires	**YES**	• Review of FEMA's Multi-Hazard Identification and Risk Assessment • Review of NC State Hazard Mitigation Plan • Review of previous Smoky Mountain Regional Hazard Mitigation Plan • Review of Southern Wildfire Risk Assessment (SWRA) Data • Review of the NC Division of Forest Resources website	• Wildfires occur in virtually all parts of the United States. Wildfire hazard risks will increase as low-density development along the urban/wildland interface increases. • Wildfires are identified as a hazard in the state plan. • The previous Smoky Mountain Regional Hazard Mitigation plan addressed wildfire as a hazard. • A review of SWRA data indicates that there are areas of elevated concern in the Smoky Mountain 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?
Hazardous Substances	**YES**	• Review of FEMA's Multi-Hazard Identification and Risk Assessment • Review of previous Smoky Mountain Regional Hazard Mitigation Plan • Review of the NC State Hazard Mitigation Plan	• The previous Smoky Mountain Regional Hazard Mitigation Plan lists the Hazardous Substances hazard as Hazardous Materials Incidents. • Review of Pipeline and Hazardous Materials Safety Administration data indicates 58 HAZMAT incidents occurred in the Smoky Mountain region. • EPA Toxic Release Inventory indicates eight Toxic Release Inventory (TRI) facilities in the Smoky Mountain region.
Infectious Disease	**YES**	• Review of the NC State Hazard Mitigation Plan. • Review of the previous Smoky Mountain Regional Hazard Mitigation Plan	• Infectious Disease is identified as a hazard in the state plan • Although the previous hazard mitigation plan for the region did not include infectious diseases as a hazard, it is assessed in this update to maintain consistency with the NC State Hazard Mitigation Plan. • Infectious Disease has caused one of the fifteen disaster declarations in the Smoky Mountain Region (the on-going COVID-19 Pandemic).
TECHNOLOGICAL HAZARDS			
Terrorism	**YES**	• Review of the NC State Hazard Mitigation Plan • Review of the previous Smoky Mountain Regional Hazard Mitigation Plan • Review of local official knowledge.	• Although the previous hazard mitigation plans for the region did not include terrorism as a hazard, it is assessed in this update to maintain consistency with the NC State Hazard Mitigation Plan • This hazard will assess chemical, biological, nuclear, and explosive terrorism events.

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?
Radiological Emergency – Fixed Nuclear Facilities	**YES**	• Review of the previous Smoky Mountains Regional Hazard Mitigation Plan • Review of IAEA list of fixed nuclear power stations in the United States • Discussion with local officials about location of nuclear power stations	• Radiological Emergency hazard was not included in the previous Smoky Mountains Regional Hazard Mitigation Plan • There are two nuclear facilities within 50 miles of the Smoky Mountain Region. Oconee Nuclear is located closest to the to the Smoky Mountain region near Seneca, South Carolina and could impact the region. Watts Bar Nuclear Plant is located within 50 miles of the Smoky Mountain region near Spring City, Tennessee and could impact the region. • Nuclear events can sometimes be caused by natural hazards and deserve some attention in this plan due to some areas in the 50-mile evacuation zone for the Oconee Nuclear Station and the Watts Bar Nuclear Plant.
Cyber	**YES**	• Review of NC State Hazard Mitigation Plan	• Changing future conditions encourage the assessment of the possibility of a cyber-attack with the increase in global technology
Electromagnetic Pulse	**YES**	• Review of NC State Hazard Mitigation Plan	• Changing future conditions encourage the assessment of the possibility of an electromagnetic pulse with the increase in global technology

4.5 HAZARD IDENTIFICATION RESULTS

Table 4.5 provides a summary of the hazard identification and evaluation process noting that 19 of the 25 initially identified hazards are considered significant enough for further evaluation through this Plan's risk assessment (marked with a "☑")

Table 4.5: Summary Results of the Hazard Identification and Evaluation Process

NATURAL HAZARDS		TECHNOLOGICAL HAZARDS	
☐	Avalanche	☑	Radiological Emergency – Fixed Nuclear Facilities
☑	Drought	☑	Terrorism
☑	Hailstorm**	☑	Cyber
☐	Excessive Heat	☑	Electromagnetic Pulse
☑	Hurricane and Coastal Hazards	**OTHER HAZARDS**	
☑	Flooding	☑	Hazardous Substances
☑	Lightning**	☑	Wildfires
☐	Nor'easter	☑	Infectious Disease
☑	Tornadoes/Thunderstorms		
☑	Severe Winter Weather		
☑	Earthquakes		
☑	Dam Failures		
☑	Geological		
☑	Infectious Disease		
☐	Expansive Soils		
☐	Land Subsidence		
☐	Volcano		
☑	Erosion		

☑ = Hazard considered significant enough for further evaluation in the Smoky Mountain Region hazard risk assessment.

**= Hazard is assessed as a sub hazard under the Tornadoes/Thunderstorms hazard

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 Smoky Mountain Regional Hazard Mitigation Plan. It contains the following subsections:

- 5.1 Overview
- 5.2 Study Area
- 5.3 Drought
- 5.4 Hurricane and Coastal Hazards
- 5.5 Tornadoes/Thunderstorms
- 5.6 Severe Winter Weather
- 5.7 Earthquakes
- 5.8 Geological
- 5.9 Dam Failure
- 5.10 Flooding
- 5.11 Wildfires
- 5.12 Infectious Disease
- 5.13 Hazardous Substances
- 5.14 Radiological Emergency – Fixed Nuclear Facilities
- 5.15 Terrorism
- 5.16 Cyber
- 5.17 Electromagnetic Pulse
- 5.18 Conclusions on Hazard Risk
- 5.19 Final Determinations

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 Smoky Mountain Region 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 Smoky Mountain Regional Hazard Mitigation Planning Team as it relates to unique historical or anecdotal hazard information for the counties in the Smoky Mountain Region, or a participating municipality within them, and the Eastern Band of Cherokee Indians.

After reviewing the list of assessed hazards from the previous update, the Smoky Mountain Regional Planning Team moved to amend the hazards in order to be consistent with the State of North Carolina Hazard Mitigation Plan. This required some of the hazard names to change and additional hazards were included in the assessment.

The following hazards were identified:

- **Natural**
  - Drought
  - Hurricane and Coastal Hazards
  - Tornadoes/Thunderstorms (including hailstorms and lightning)
  - Severe Winter Weather
  - Earthquakes
  - Geological (including landslides, sinkholes, and erosion)
  - Dam Failure
  - Flooding
- **Other**
  - Wildfires
  - Infectious Disease
- **Technological**
  - Hazardous Substances
  - Terrorism
  - Cyber
  - Electromagnetic

5.2 STUDY AREA

Table 5.1 provides a summary of the participating jurisdictions within each of the five counties and one Native American Tribe: Eastern Band of Cherokee Indians. In addition, **Figure 5.1** provides a base map, for reference, of the Smoky Mountain Region.

TABLE 5.1: PARTICIPATING JURISDICTIONS IN THE SMOKY MOUNTAIN REGIONAL HAZARD MITIGATION PLAN

Cherokee County	
Andrews	Murphy
Graham County	
Fontana	Robbinsville
Lake Santeetlah	
Haywood County	
Canton	Maggie Valley
Clyde	Waynesville
Jackson County	
Dillsboro	Sylva
Forest Hills	Webster
Swain County	
Bryson City	
Eastern Band of Cherokee Indians	

FIGURE 5.1: SMOKY MOUNTAIN REGION BASE MAP

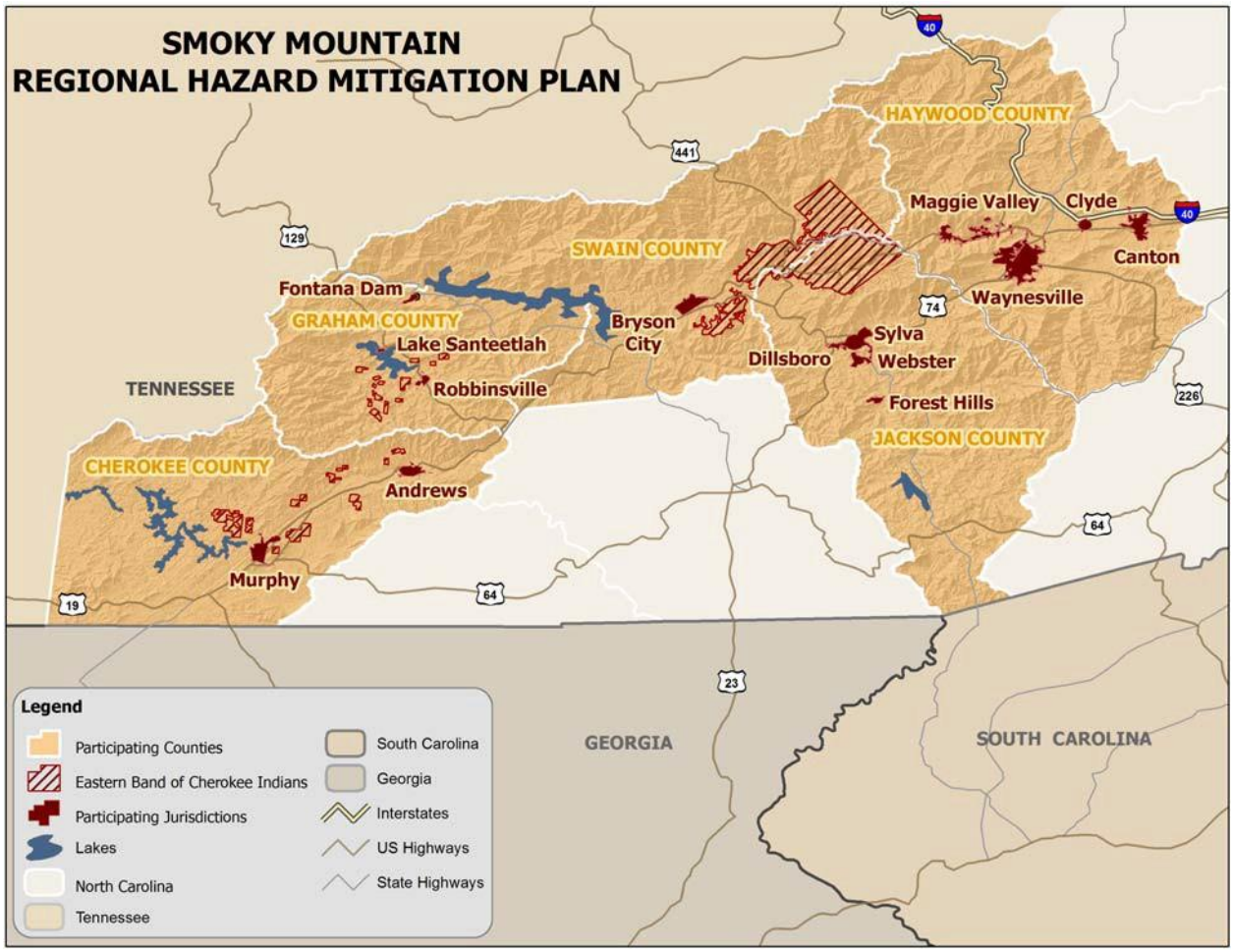


Table 5.2 lists each significant hazard for the Smoky Mountain Region and identifies whether or not it has been determined to be a specific hazard of concern for the fourteen municipal jurisdictions, each of the five county's unincorporated areas, and the Eastern Band of Cherokee Indians. This is the based on the best available data and information from the Smoky Mountain Regional Hazard Mitigation Planning Team. (● = hazard of concern)

TABLE 5.2 SUMMARY OF IDENTIFIED HAZARD EVENTS IN THE SMOKY MOUNTAIN REGION

Jurisdiction	NATURAL									OTHER		TECHNOLOGICAL		
	Drought	Hurricane and Coastal Hazards	Tornadoes/ Thunderstorms	Severe Winter Weather	Earthquakes	Geological	Dam Failure	Flooding	Wildfires	Infectious Disease	Hazardous Substances	Terrorism	Cyber	Electromagnetic Pulse
Cherokee County														
Andrews	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Murphy	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Unincorporated Area	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Graham County														
Fontana	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Lake Santeetlah	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Robbinsville	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Unincorporated Area	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Haywood County														
Canton	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Clyde	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Maggie Valley	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Waynesville	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Unincorporated Area	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Jackson County														
Dillsboro	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Forest Hills	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Sylva	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Webster	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Unincorporated Area	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Swain County														
Bryson City	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Unincorporated Area	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Eastern Band of Cherokee Indians														
Eastern Band of Cherokee Indians	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Natural Hazards

5.3 DROUGHT

5.3.1 Background and Description

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 droughts.

TABLE 5.3 DROUGHT CLASSIFICATION DEFINITIONS

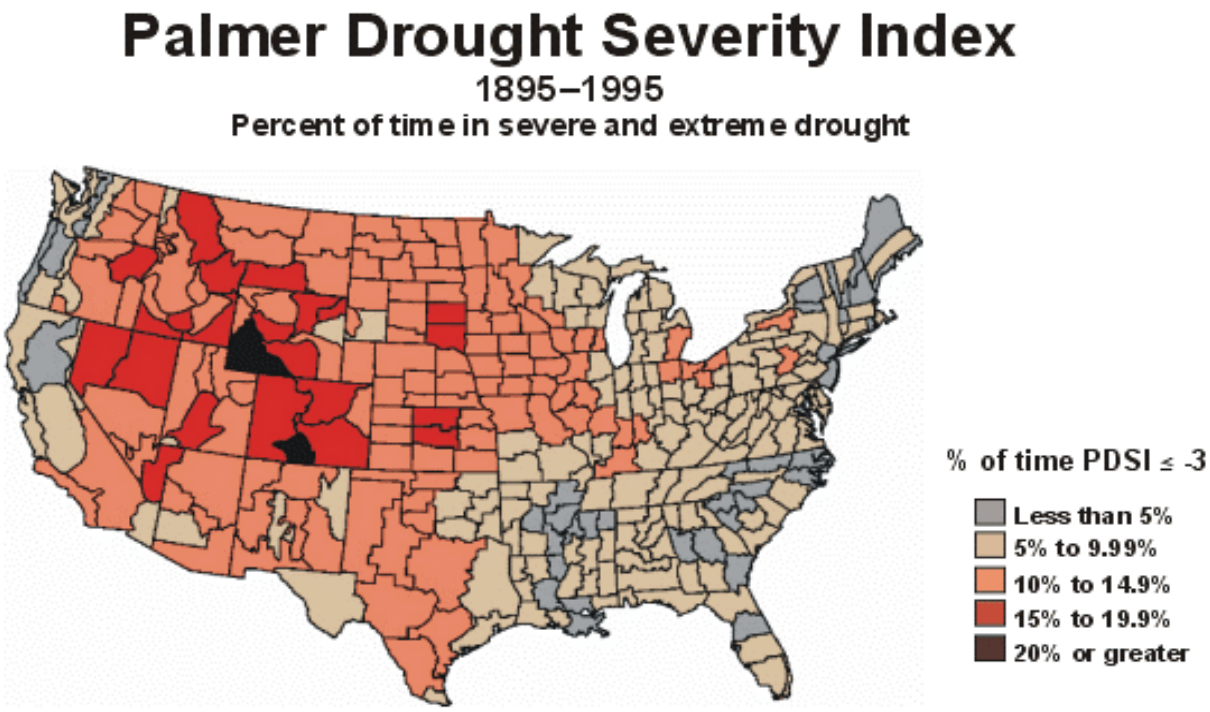
Meteorological Drought	The degree of dryness or departure of actual precipitation from an expected average or normal amount based on monthly, seasonal, or annual time scales.
Hydrologic Drought	The effects of precipitation shortfalls on stream flows and reservoir, lake, and groundwater levels.
Agricultural 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.

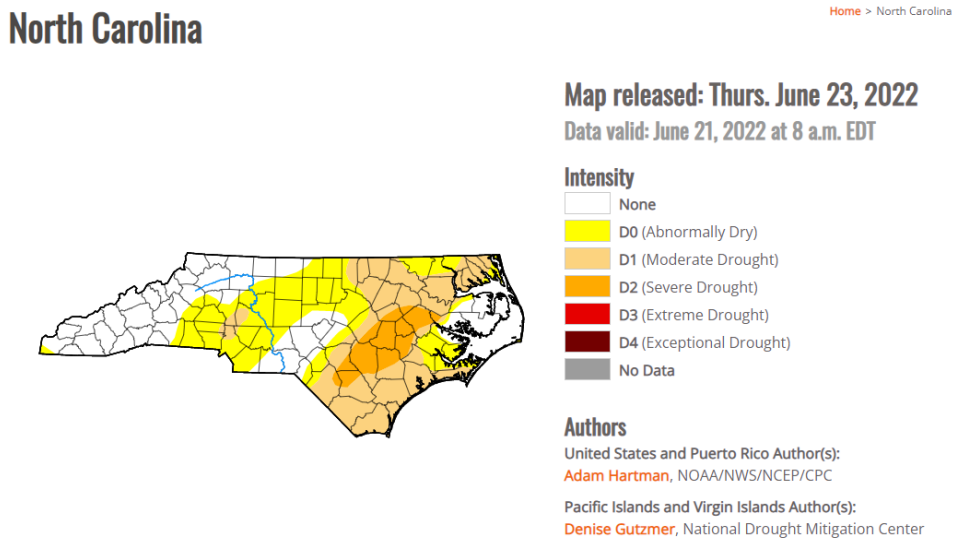
FIGURE 5.2: PALMER DROUGHT SEVERITY INDEX SUMMARY MAP FOR THE UNITED STATES



Source: National Drought Mitigation Center

The figure above is the most updated version of the Palmer Drought Severity Index; however, the US Drought Monitor is updated on a weekly basis. An archived drought map for North Carolina from the Summer of 2022 can be seen below in **Figure 5.3** to reflect more current drought conditions in the U.S.

FIGURE 5.3: US DROUGHT MONITOR



Source: US Drought Monitor

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**), Western 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 Smoky Mountain Region would be 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

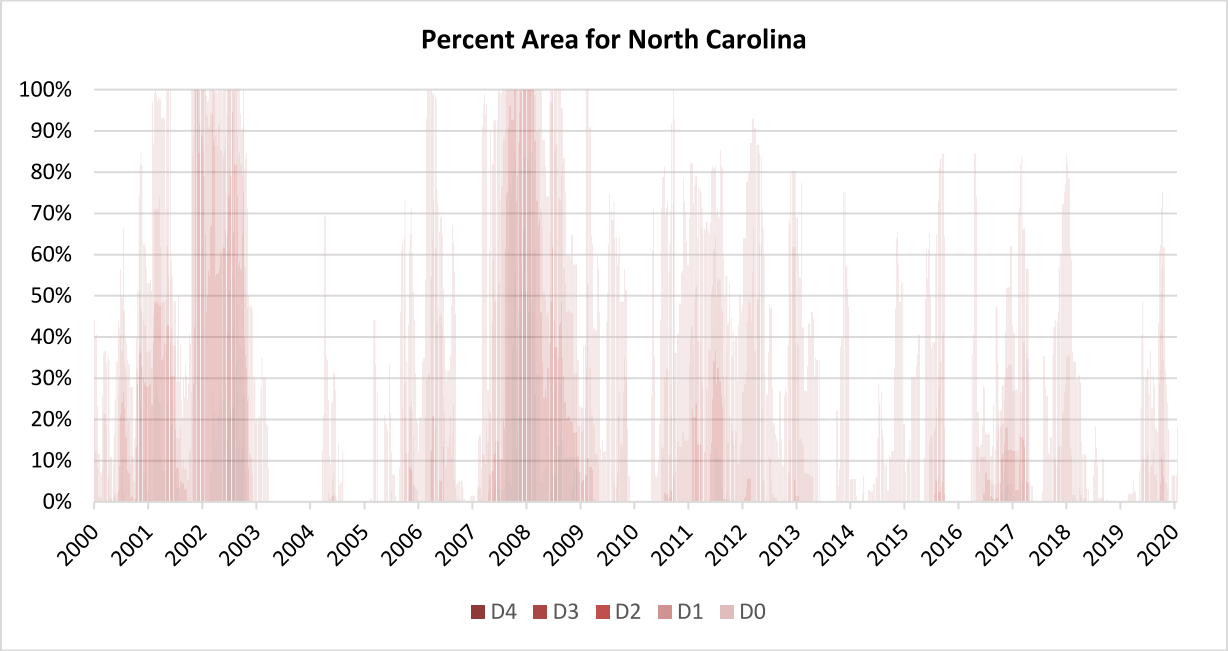
The North Carolina Drought Management Advisory Council reports data on North Carolina drought conditions from 2000 to 2019 through the North Carolina Drought Monitor. It classifies drought conditions using the scale set by the US Drought Monitor, which classifies conditions on a scale of D0 to D4. Each class is further explained in **Table 5.4**.

TABLE 5.4: USDM DROUGHT CLASSIFICATIONS

Scale	Description	Impacts
D0	Abnormally Dry	- Short-term dryness slowing planting, growth of crops - Some lingering water deficits - Pastures or crops not fully recovered
D1	Moderate Drought	- Some damage to crops, pastures - Some water shortages developing - Voluntary water-use restrictions requested
D2	Severe Drought	- Crop or pasture loss likely - Water shortages common - Water restrictions imposed
D3	Extreme Drought	- Major crop/pasture losses - Widespread water shortages or restrictions
D4	Exceptional Drought	- Exceptional and widespread crop/pasture losses - Shortages of water creating water emergencies

Data from the North Carolina Drought Management Advisory Council and the National Centers for Environmental Information (NCEI) were used to ascertain historical drought events in the Smoky Mountain Region. Since 2000, the longest duration of drought (D1-D4) in North Carolina lasted 155 weeks beginning on January 4, 2000 and ending on December 17, 2002. The most intense period of drought occurred the week of December 11, 2007 where D4 affected 66.2% of North Carolina land. **Figure 5.4** shows the percent area of North Carolina that has experienced drought conditions from 2000 to 2018.

FIGURE 5.4: NORTH CAROLINA DROUGHT CONDITIONS (2000-2018)



According to the North Carolina Drought Monitor, every county in the Smoky Mountain Region has had drought occurrences in eighteen of the last nineteen years (2000-2019) (**Table 5.5**). It should be noted that the North Carolina Drought Monitor also estimates what percentage of the county is in each classification of drought severity. For example, the most severe classification reported may be exceptional, but a majority of the county may actually be in a less severe condition.

TABLE 5.5: SUMMARY OF DROUGHT OCCURRENCES IN THE SMOKY MOUNTAIN REGION

Year	Cherokee County	Graham County	Haywood County	Jackson County	Swain County
2000	Extreme Drought	Extreme Drought	Exceptional Drought	Exceptional Drought	Exceptional Drought
2001	Extreme Drought	Extreme Drought	Extreme Drought	Extreme Drought	Extreme Drought
2002	Extreme Drought	Extreme Drought	Extreme Drought	Exceptional Drought	Extreme Drought
2003	None	None	None	None	None
2004	Abnormally Dry	Abnormally Dry	Abnormally Dry	Abnormally Dry	Abnormally Dry
2005	Abnormally Dry	Abnormally Dry	Abnormally Dry	Abnormally Dry	Abnormally Dry
2006	Moderate Drought	Moderate Drought	Severe Drought	Severe Drought	Severe Drought
2007	Exceptional Drought	Exceptional Drought	Exceptional Drought	Exceptional Drought	Exceptional Drought
2008	Exceptional Drought	Exceptional Drought	Exceptional Drought	Exceptional Drought	Exceptional Drought
2009	Severe Drought	Severe Drought	Severe Drought	Extreme Drought	Severe Drought
2010	Moderate Drought	Moderate Drought	Moderate Drought	Moderate Drought	Moderate Drought
2011	Moderate Drought	Moderate Drought	Abnormally Dry	Severe Drought	Moderate Drought
2012	Severe Drought	Abnormally Dry	Moderate Drought	Moderate Drought	Abnormally Dry
2013	None	Abnormally Dry	Abnormally Dry	Abnormally Dry	Abnormally Dry
2014	Abnormally Dry	Abnormally Dry	Abnormally Dry	Abnormally Dry	Abnormally Dry

2015	Abnormally Dry	Abnormally Dry	Severe Drought	Severe Drought	Moderate Drought
2016	Exceptional Drought	Exceptional Drought	Extreme Drought	Exceptional Drought	Exceptional Drought
2017	Extreme Drought	Extreme Drought	Extreme Drought	Extreme Drought	Extreme Drought
2018	Moderate Drought	Moderate Drought	Abnormally Dry	Abnormally Dry	Abnormally Dry
2019	Severe Drought	Severe Drought	Severe Drought	Severe Drought	Moderate Drought

*EBCI has land in each of the participating counties with a majority in Jackson and Swain Counties.
Source: North Carolina Drought Monitor

Eastern Band of Cherokee Indians
Drought plagued the region from 1998 to 2002. This period saw rainfall levels well below normal and caused communities to institute water restrictions. Furthermore, the EBCI "Environmental Health Profile and Priority Projection" dated April 16, 2001 notes a serious drought in the 1930's and conditions of drought in 1985 and 1986. While the U.S. Drought Monitor does not report conditions specific to the tribal areas, the Tribe does have reservation lands in all Smoky Mountain region counties except Haywood. The majority of tribal land is in Swain and Jackson Counties. Thus, the U.S. Drought monitor results can be used to deduce previous drought conditions in tribal areas.

5.3.4 Probability of Future Occurrences
Based on historical occurrence information, it is assumed that all of the Smoky Mountain Region has a probability level of likely (10-100 percent annual probability) for future drought events. This hazard may vary slightly by location but each area has an equal probability of experiencing a drought. However, historical information also indicates that there is a much lower probability for extreme, long-lasting drought conditions.

5.4 HURRICANE AND COASTAL HAZARDS
5.4.1 Background and Description
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 5.6**), which rates hurricane intensity on a scale of 1 to 5, with 5 being the most intense.

TABLE 5.6: 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	111-129	964-945
4	130-156	944-920
5	157 +	Less than 920

Source: National Hurricane Center (2018)

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. Damage during hurricanes may also result from spawned tornadoes, storm surge, and inland flooding associated with heavy rainfall that usually accompanies these storms.

5.4.2 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 Smoky Mountain Region. All areas in the Smoky Mountain Region are equally susceptible to hurricane and tropical storms.

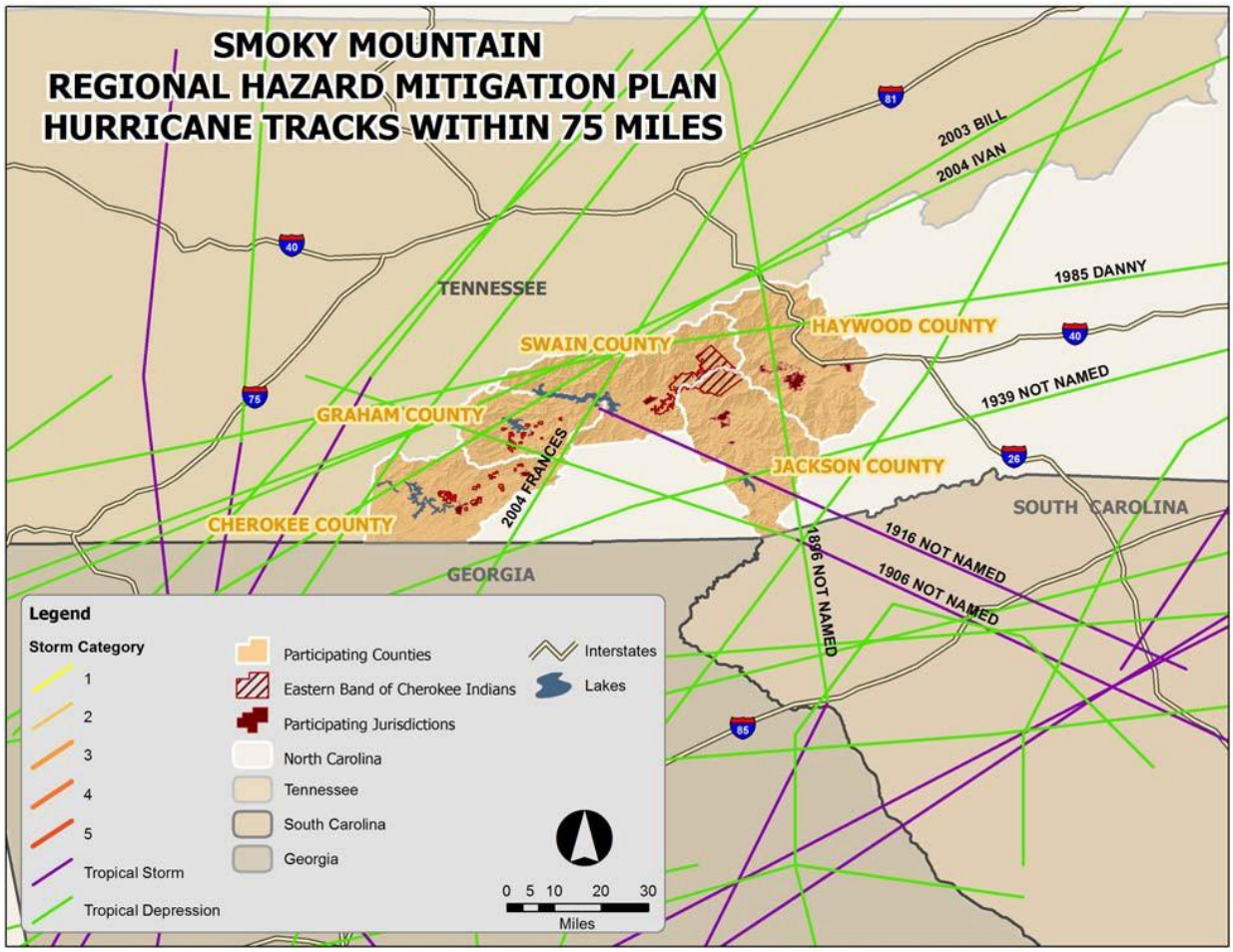
5.4.3 Historical Occurrences

According to the National Hurricane Center's historical storm track records, 29 hurricane or tropical storm tracks have passed within 75 miles of the Smoky Mountain Region since 1850[1]. This includes nine tropical storms and nineteen tropical depressions.

Of the recorded storm events, one tropical storm traversed directly through the Smoky Mountain Region as shown in **Figure 5.5**. **Table 5.7** provides for each event the date of occurrence, name (if applicable), maximum wind speed (as recorded within 75 miles of the Smoky Mountain Region) and Category of the storm based on the Saffir-Simpson Scale.

[1] 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 5.5: HISTORICAL HURRICANE STORM TRACKS WITHIN 75 MILES OF THE SMOKY MOUNTAIN REGION



Source: National Oceanic and Atmospheric Administration; National Hurricane Center

TABLE 5.7: HISTORICAL STORM TRACKS WITHIN 75 MILES OF THE SMOKY MOUNTAIN REGION (1850–2021)

Date of Occurrence	Storm Name	Maximum Wind Speed (miles per hour)	Storm Category
9/11/1882	Not Named	46	Tropical Storm
7/8/1896	Not Named	40	Tropical Storm
9/15/1900	Not Named	29	Tropical Depression
9/16/1903	Not Named	35	Tropical Depression
9/18/1906	Not Named	46	Tropical Storm
8/30/1911	Not Named	35	Tropical Depression
9/4/1913	Not Named	29	Tropical Depression
9/5/1915	Not Named	40	Tropical Storm
7/15/1916	Not Named	52	Tropical Storm
8/15/1928	Not Named	40	Tropical Storm
10/17/1932	Not Named	23	Tropical Depression

Date of Occurrence	Storm Name	Maximum Wind Speed (miles per hour)	Storm Category
5/30/1934	Not Named	35	Tropical Depression
8/18/1939	Not Named	29	Tropical Depression
8/13/1940	Not Named	40	Tropical Storm
8/28/1949	Not Named	46	Tropical Storm
6/8/1968	Abby	29	Tropical Depression
6/9/1968	Abby	29	Tropical Depression
9/18/1971	Edith	29	Tropical Depression
9/23/1975	Eloise	63	Tropical Storm
9/7/1977	Babe	29	Tropical Depression
8/17/1985	Danny	35	Tropical Depression
8/28/1992	Andrew	23	Tropical Depression
8/17/1994	Beryl	23	Tropical Depression
7/23/1997	Danny	23	Tropical Depression
7/2/2003	Bill	23	Tropical Depression
9/8/2004	Frances	29	Tropical Depression
9/17/2004	Ivan	23	Tropical Depression
8/27/2008	Fay	17	Tropical Depression
8/17/2021	Fred	30	Tropical Depression

Source: National Hurricane Center

The National Centers for Environmental Information reported only one event associated with a hurricane or tropical storm in the Smoky Mountain Region between 1950 and 2019. This storm was a tropical depression recorded in Cherokee County on September 16, 2004. The storm resulted in $21,946 (2020 dollars) of property damage and numerous trees and power lines were reported down across the county. However, Federal records also indicate that four disaster declarations for hurricanes/tropical storms for the Smoky Mountain Region were made in 2003 (Hurricane Isabel), 2004 (Tropical Storm Frances), 2004 (Hurricane Ivan), and 2021 (Tropical Storm Fred) [2].

Flooding is generally the greatest hazard of concern with hurricane and tropical storm events in the Smoky Mountain Region. Most events do not carry winds that are above that of the winter storms and straight-line winds received by the Smoky Mountain counties. Some anecdotal information is available for the major storms that have impacted that area as found below:

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. The remnants of Frances produced a swath of 5 to 15 inches of rain across the North Carolina Mountains with reports of 12 to 15 inches of rain along the higher terrain and isolated reports in excess of 18 inches. Wind gusts reached between 40 and 60 mph along the Appalachian Mountains and numerous trees were downed. Frances caused significant crop damages totaling $55 million statewide. North Carolina residents received almost $20.6 million in federal disaster assistance

[2] 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*.

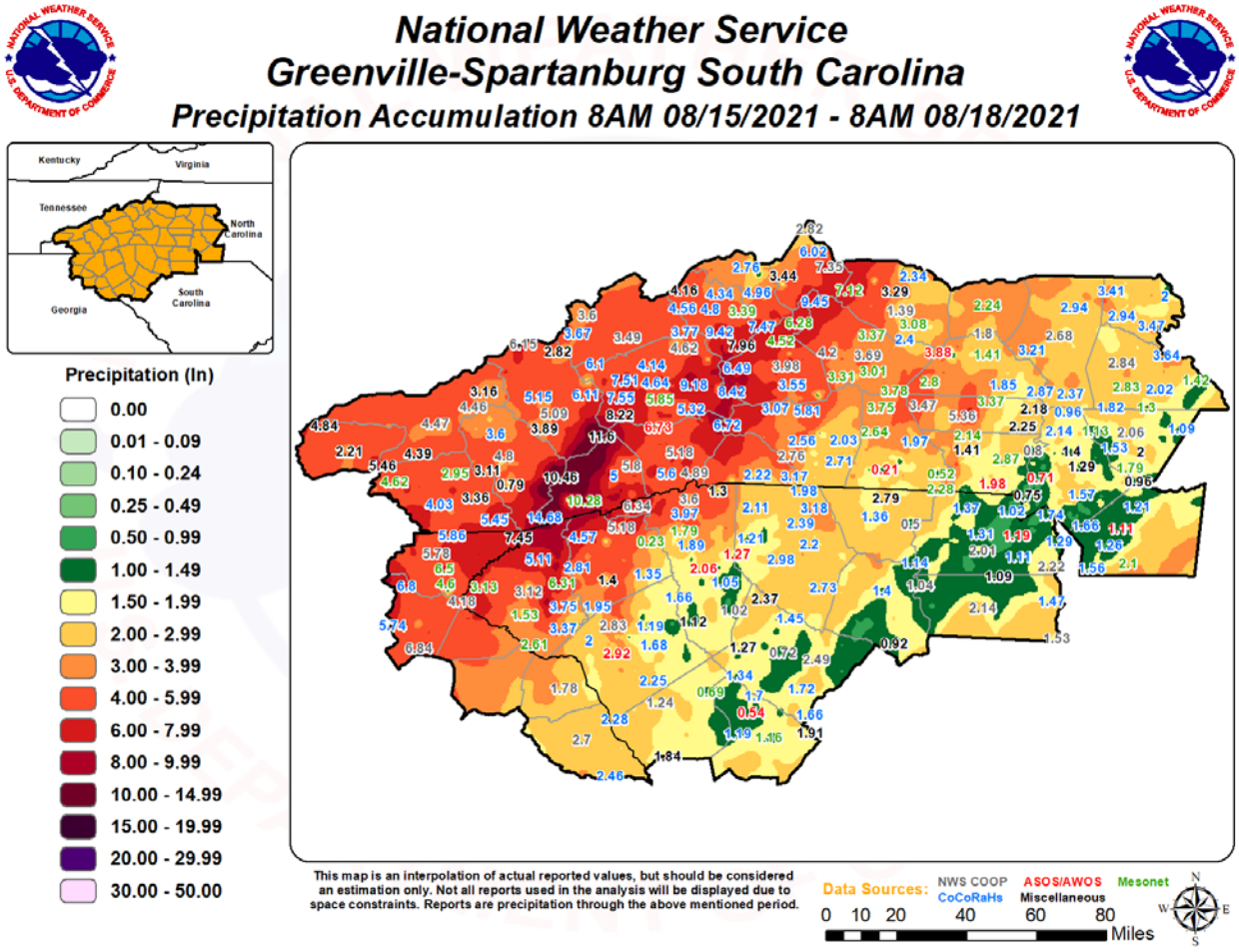
following the storm.

Hurricane Ivan – September 16-17, 2004
Just a week and a half following Tropical Storm Frances, the remnants of Hurricane Ivan hit western North Carolina when many streams and rivers were already well above flood stage. The widespread flooding forced many roads to be closed and landslides were common across the mountain region. Wind gusts reached between 40 and 60 mph across the higher elevations of the Appalachian Mountains resulting in numerous downed trees. More than $13.8 million of federal aid was dispersed across North Carolina following Ivan.

The Hurricane Frances/Ivan combination of events broke the standing flood stage record for the Pigeon River near Canton. It had previous stood since 1940. Hurricane Frances drove the river up to 20.7 feet and Hurricane Ivan raised it further to 22.8 feet.

Tropical Storm Fred (August 17, 2021)
Tropical Storm Fred was reduced to a tropical depression with a maximum wind speed of approximately 30 mph (26 knots). All of the counties in the Smoky Mountain region reported downed trees, numerous power outages, and flooded roads from high winds and rain. Some areas of the region received as much as 10 inches of rain in a 48-hour period. The result of this rainfall was significant to catastrophic flash flooding across portions of the French Broad and Pigeon River basins, including some of the worst flooding to impact these areas in almost 20 years. **Figure 5.6** below displays rainfall totals for Western North Carolina from August 15, 2021 to August 18, 2021.

FIGURE 5.6: RAINFALL TOTALS FOR TROPICAL STORM FRED



Source: National Weather Service

5.4.4 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. The probability of being impacted is less than coastal areas, but still remains a real threat to the Smoky Mountain Region due to induced events like flooding and land sliding. Based on historical evidence, the probability level of future occurrence is likely (annual probability between 10 and 100 percent). Given the regional nature of the hazard, all areas are equally exposed to this hazard. However, when the region is impacted, the damage could be catastrophic, threatening lives and property throughout the planning area.

5.5 TORNADOES/THUNDERSTORMS

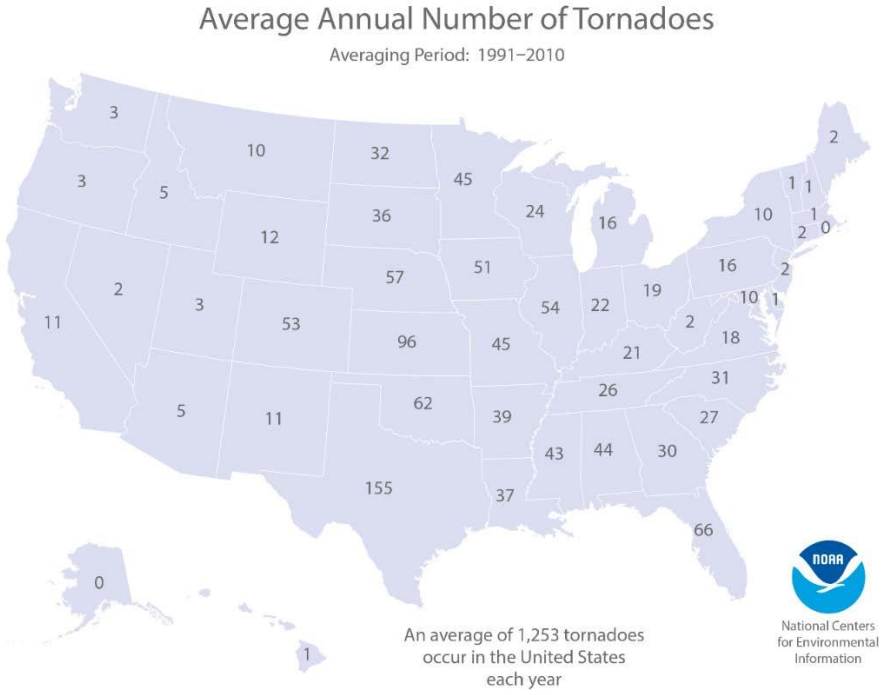
For the purposes of maintaining consistency with the State of North Carolina Hazard Mitigation Plan, this section will assess tornadoes and thunderstorms, which also include high winds, hailstorms, and lightning.

5.5.1 Background and Description

Tornadoes

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[3]. 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 experiences the greatest number of tornadoes per square mile of all U.S. states (SPC, 2002). **Figure 5.7** shows tornado activity in the United States based on the number of recorded tornadoes per 1,000 square miles.

FIGURE 5.7: TORNADO ACTIVITY IN THE UNITED STATES



Source: Federal Emergency Management Agency

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

[3] NOAA, 2009.

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 5.8**. Tornado magnitudes that were determined in 2005 and later were determined using the Enhanced Fujita Scale (**Table 5.9**).

TABLE 5.8: 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 5.9: 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

Thunderstorms

Thunderstorms can produce a variety of accompanying hazards including wind (discussed here), hail, and lightning[4]. Although thunderstorms generally affect a small area, they are very dangerous and 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 severe thunderstorm 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 separate from a thunderstorm event, are common throughout the Smoky Mountain Region. Therefore, high winds are also reported in this section.

High winds can form due to pressure of the Northeast coast that combines with strong pressure moving through the Ohio Valley. This creates a tight pressure gradient across the region, resulting in high winds which increase with elevation. It is common for gusts of 30 to 60 miles per hour during the winter months.

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. 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."

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

Hailstorms

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. **Table 5.10** shows the TORRO Hailstorm Intensity Scale which is a way of measuring hail severity.

TABLE 5.10: TORRO HAILSTORM INTENSITY SCALE

	Intensity Category	Typical Hail Diameter (mm)*	Probable Kinetic Energy, J-m^2	mm to inch conversion (inches)	Typical Damage Impacts
H0	Hard Hail	5	0-20	0 – 0.2	No damage
H1	Potentially Damaging	5-**15**	>20	0.2 – 0.6	Slight general damage to plants, crops
H2	Significant	10-**20**	>100	0.4 – 0.8	Significant damage to fruit, crops, vegetation
H3	Severe	20-**30**	>300	0.8 – 1.2	Severe damage to crops, damage to glass and plastic structures, paint and wood scored
H4	Severe	25-**40**	>500	1.0 – 1.6	Widespread glass damage, vehicle bodywork damage
H5	Destructive	30-**50**	>800	1.2 – 2.0	Wholesale destruction of glass, damage to tiled roofs, significant risk of injuries
H6	Destructive	40-**60**		1.6 – 2.4	Bodywork of grounded aircraft dented; brick walls pitted
H7	Destructive	50-**75**		2.0 – 3.0	Severe roof damage, risk of serious injuries
H8	Destructive	60-**90**		1.6 – 3.5	(Severest recorded in the British Isles) Severe damage to aircraft bodywork
H9	Super Hailstorms	75-**100**		3.0 – 3.9	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open
H10	Super Hailstorms	>100			Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open

Source: http://www.torro.org.uk/site/hscale.php

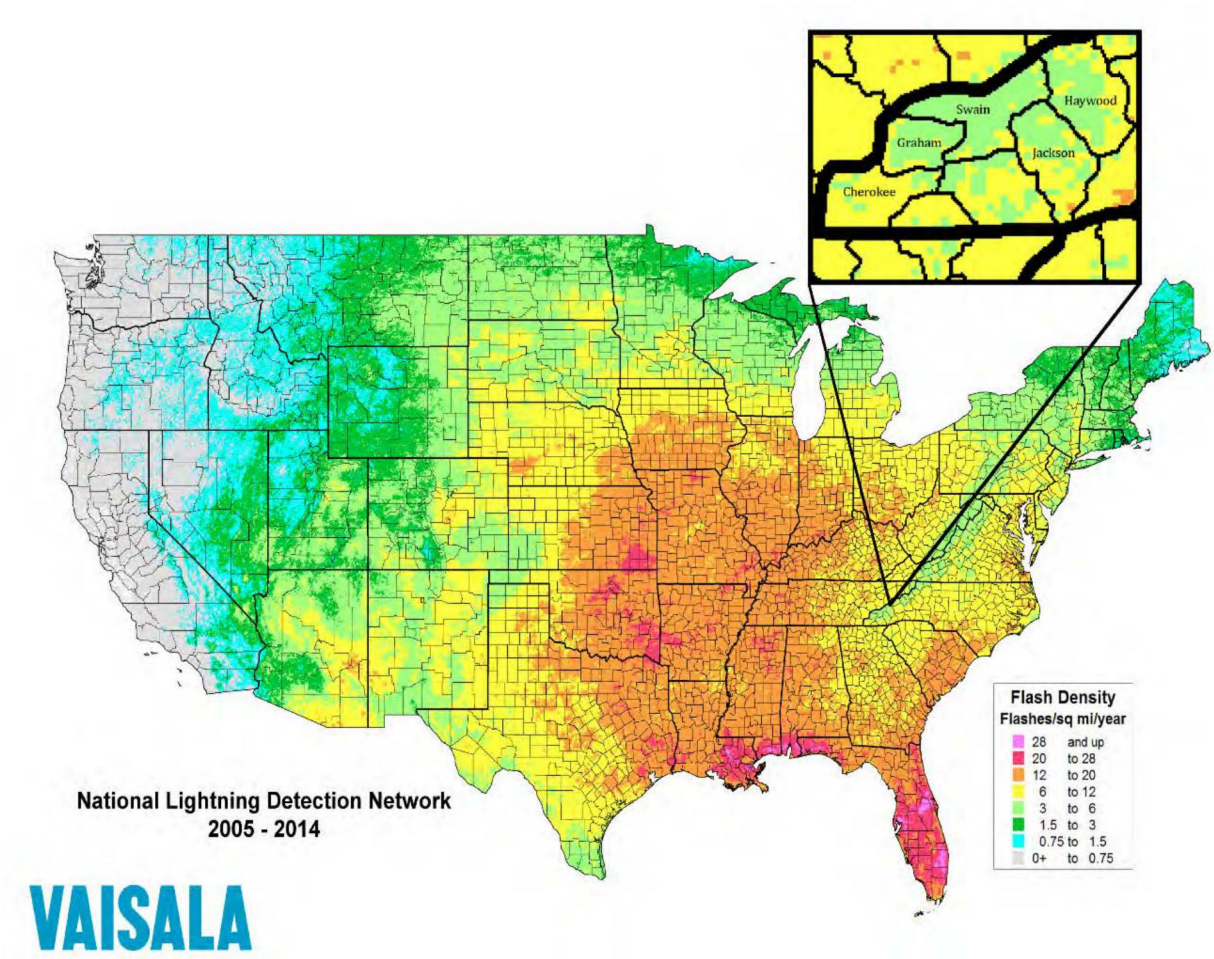
Lightning

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 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 5.8 shows a lightning flash density map for the years 2008-2017 based upon data provided by Vaisala's U.S. National Lightning Detection Network (NLDN®).

FIGURE 5.8: LIGHTNING FLASH DENSITY IN THE UNITED STATES



Source: Vaisala U.S. National Lightning Detection Network

5.5.2 Location and Spatial Extent

Tornadoes

Tornadoes occur throughout the state of North Carolina, and thus in the Smoky Mountain 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 Smoky Mountain Region is uniformly exposed to this hazard.

Thunderstorm

A thunderstorm/wind 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 Smoky Mountain Region typically experiences several straight-line wind events each year. These wind events can and have caused significant damage. It is assumed that the Smoky Mountain Region has uniform exposure to a thunderstorm/wind event and the spatial extent of an impact could be large.

Hailstorms

Hailstorms frequently accompany thunderstorms, so their locations and spatial extents coincide. It is assumed that the Smoky Mountain 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.

Lightning

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

5.5.3 Historical Occurrences

Tornadoes

Tornadoes are a fairly rare occurrence in such a mountainous area. However, they have and do occur in the Smoky Mountain Region. According to the National Centers for Environmental Information, there have been a total of twenty recorded tornado events in the Smoky Mountain Region since 1973 (**Table 5.11**), resulting in over $28.2 million (2012 dollars) in property damages[5]. In addition, 6 deaths and 38 injuries were reported. The magnitude of these tornados' ranges from F0 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 39 years.

[5] These tornado events are only inclusive of those reported by the National Centers for Environmental Information (NCEI). It is likely that additional tornadoes have occurred in the Smoky Mountain Region. As additional local data becomes available, this hazard profile will be amended.

TABLE 5.11: SUMMARY OF TORNADO OCCURRENCES IN THE SMOKY MOUNTAIN REGION

Location	Number of Occurrences	Deaths	Injuries	Property Damage (2020)
Cherokee County	**9**	**4**	**26**	**$27,175,000**
Andrews	0	0	0	$0
Murphy	0	0	0	$0
Unincorporated Area	9	4	26	$27,175,000
Graham County	**1**	**2**	**11**	**$250,000**
Fontana	0	0	0	$0
Lake Santeetlah	0	0	0	$0
Robbinsville	0	0	0	$0
Unincorporated Area	1	2	11	$250,000
Haywood County	**2**	**0**	**1**	**$250,000**
Canton	0	0	0	$0
Clyde	0	0	0	$0
Maggie Valley	0	0	0	$0
Waynesville	0	0	0	$0
Unincorporated Area	2	0	1	$250,000
Jackson County	**3**	**0**	**0**	**$300,250**
Dillsboro	0	0	0	$0
Forest Hills	0	0	0	$0
Sylva	0	0	0	$0
Webster	0	0	0	$0
Unincorporated Area	3	0	0	$300,250
Swain County	**3**	**0**	**0**	**$252,500**
Bryson City	0	0	0	$0
Unincorporated Area	3	0	0	$252,500
Eastern Band of Cherokee Indians	**2**			
SMOKY MOUNTAIN REGION TOTAL	**20**	**6**	**38**	**$28,227,750**

Source: National Centers for Environmental Information

On March 2, 2012, an F2 tornado devastated a corridor across Cherokee County near the Tennessee boarder. The Town of Murphy was hardest hit and damage was reported in 5 additional communities. Cherokee County reported 5 homes and 5 businesses were destroyed, 37 homes and 20 businesses had major damage, and 40 homes and 21 businesses suffered minor damage.

Eastern Band of Cherokee Indians

According to the previous hazard mitigation plan, two tornadoes reportedly touched down on the reservation lands; although there is no indication of where these events occurred or what damage they caused. Local newspaper *Cherokee One Feather* also reported a severe storm and a tornado caused severe damage in Swain and Jackson County in August 2011.

Additionally, the following tornado events were reported by the Tornado History Project to have paths that traveled on lands neighboring EBCI and may have also impacted the reservation:

- April 2, 1974, 12:01 AM: F1, 0 deaths, 1 injury (near Murphy)
- April 3, 1974, 6:05 PM: F2, 3 deaths, 11 injuries (near Robbinsville)
- April 3, 1974, 7:20 PM: F4, 4 deaths, 26 injuries (near Murphy)
- April 4, 1974, 7:00 AM: F0, 0 deaths, 0 injuries (between Murphy and Robbinsville)

Thunderstorms

Severe storms resulted in seven disaster declarations in the Smoky Mountain Region in 1973, 1977, 1995, 1998, two in 2013, and 2020[6]. According to NCEI, there have been 565 reported thunderstorm wind events since 1963 in the Smoky Mountain Region[7]. These events caused over $4.5 million (2020 dollars) in damages. There were reports of six injuries and one fatality. **Table 5.12** summarizes this information[8].

TABLE 5.12: SUMMARY OF THUNDERSTORM WIND OCCURRENCES IN THE SMOKY MOUNTAIN REGION

Location	Number of Occurrences	Deaths	Injuries	Property Damage (2020)
Cherokee County	**155**	**0**	**0**	**$799,000**
Andrews	11	0	0	$110,000
Murphy	60	0	0	$389,000
Unincorporated Area	54	0	0	$300,000
Graham County	**102**	**0**	**3**	**$590,000**
Fontana	8	0	0	$0
Lake Santeetlah	3	0	0	$0
Robbinsville	28	0	3	$44,000
Unincorporated Area	63	0	0	$546,000
Haywood County	**64**	**0**	**0**	**$730,290**
Canton	7	0	0	$6,000
Clyde	3	0	0	$0
Maggie Valley	13	0	0	$50,000
Waynesville	14	0	0	$97,000
Unincorporated Area	27	0	0	$577,290
Jackson County	**154**	**0**	**2**	**$1,796,580**
Dillsboro	1	0	0	$0
Forest Hills	0	0	0	$0
Sylva	23	0	0	$184,000
Webster	3	0	0	$10,000
Unincorporated Area	127	0	2	$1,602,580
Swain County	**90**	**1**	**1**	**$621,000**
Bryson City	25	0	1	$10,000

[6]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 Profiles*.

[7] These thunderstorm events are only inclusive of those reported by the National Centers for Environmental Information (NCEI). It is likely that additional thunderstorm events have occurred in the Smoky Mountain Region. As additional local data becomes available, this hazard profile will be amended.

[8] The dollar amount of damages provided by NCEI is divided by the number of affected counties to reflect a damage estimate for the county.

Unincorporated Area	65	1	0	$611,000
Eastern Band of Cherokee Indians				
SMOKY MOUNTAIN REGION TOTAL	**565**	**1**	**6**	**$4,536,870**

Eastern Band of Cherokee Indians

Several records of wind damage on reservation lands were found in local newspapers, including *Cherokee One Feather* and *Macon County News*. These events included:

- December 8-9, 2009: Heavy rains and high winds on the evening of December 8 and morning of December 9 caused parts of the Oconaluftee River to flood. The storm also caused downed trees and a mudslide in the Big Cove area. A windspeed of 101 mph was recorded at the Cove Mountain Air Quality Station. (*Source: Cherokee One Feather*)
- April 4-5, 2011: A severe weather system caused widespread power outages and significant structural damage in the mountain region. Sixty to seventy mile-per-hour wind gusts and rain uprooted large trees and downed electric poles and power lines. Duke Energy estimated that more than 18,000 customers were without power in the area, mostly in Swain and Jackson Counties. Cherokee on the Qualla Boundary was also left almost entirely without power, after a bulk power line was severed. (*Source: Macon County News*)
- June 15, 2001: Storms with high winds and lightning moved through the area causing massive power outages throughout Jackson and Swain Counties. Duke Energy estimate 18,000 homes were without power. Cracked limbs and branches and a few downed trees were the result of the storm. There were no major injuries or fatalities that EBCI Emergency Management was aware of following the event. (*Source: Cherokee One Feather*)

Hailstorms

According to the National Centers for Environmental Information, 221 recorded hailstorm events have affected the Smoky Mountain Region since 1977[9]. **Table 5.13** is a summary of the hail events in the Smoky Mountain Region. In all, hail occurrences resulted in over $1.06 million (2020 dollars) in property damages, most of which were reported in Jackson County. Hail ranged in diameter from 0.75 inches to 3.0 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 Centers for Environmental Information. Furthermore, high losses in Jackson 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.

TABLE 5.13: SUMMARY OF HAIL OCCURRENCES IN THE SMOKY MOUNTAIN REGION

Location	Number of Occurrences	Deaths	Injuries	Property Damage (2020)
Cherokee County	**52**	**0**	**0**	**$10,000**
Andrews	10	0	0	$0
Murphy	15	0	0	$0
Unincorporated Area	27	0	0	$10,000
Graham County	**33**	**0**	**0**	**$0**
Fontana	1	0	0	$0

[9] These hail events are only inclusive of those reported by the National Centers for Environmental Information (NCEI). It is likely that additional hail events have affected the Smoky Mountain Region. In addition to NCEI, the North Carolina Department of Insurance office was contacted for information. As additional local data becomes available, this hazard profile will be amended.

Lake Santeetlah	0	0	0	$0
Robbinsville	17	0	0	$0
Unincorporated Area	15	0	0	$0
Haywood County	**58**	**0**	**0**	**$50,000**
Canton	10	0	0	$50,000
Clyde	3	0	0	$0
Maggie Valley	3	0	0	$0
Waynesville	19	0	0	$0
Unincorporated Area	23	0	0	$0
Jackson County	**58**	**0**	**0**	**$1,000,000**
Dillsboro	1	0	0	$0
Forest Hills	0	0	0	$0
Sylva	11	0	0	$1,000,000
Webster	2	0	0	$0
Unincorporated Area	44	0	0	$0
Swain County	**20**	**0**	**0**	**$0**
Bryson City	11	0	0	$0
Unincorporated Area	9	0	0	$0
Eastern Band of Cherokee Indians	**--**			**--**
SMOKY MOUNTAIN REGION TOTAL	**221**	**0**	**0**	**$1,060,000**

Source: National Centers for Environmental Information

Eastern Band of Cherokee Indians

The National Centers for Environmental Information reports four (4) historical events on EBCI land, which occurred in either Jackson or Swain County. These events are included in the table above (**Table 5.13**) and are included in the Jackson and Swain County count. These events did not result in losses, injuries, or fatalities. No additional information on historical hail events for EBCI was available in the previous hazard mitigation plan, web sources, or local newspapers.

Lightning

According to the National Centers for Environmental Information, there have been a total of 23 recorded lightning events in the Smoky Mountain Region since 1997[10]. These events resulted in over $2.8 million (2020 dollars) in damages, as listed in summary **Table 5.14**. Furthermore, lightning caused one fatality and fourteen injuries throughout the Smoky Mountain Region. Detailed information on historical lightning events can be found in **Appendix H.**

It is certain that more than 25 events have impacted the Region. Many of the reported events are those that caused damage. Therefore, it should be expected that damages are likely much higher for this hazard than what is reported.

[10] These lightning events are only inclusive of those reported by the National Centers for Environmental Information (NCEI). It is certain that additional lightning events have occurred in the Smoky Mountain 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 5.14: SUMMARY OF LIGHTNING OCCURRENCES IN THE SMOKY MOUNTAIN REGION

Location	Number of Occurrences	Deaths	Injuries	Property Damage (2020)
Cherokee County	**0**	**0**	**0**	**$0**
Andrews	0	0	0	$0
Murphy	0	0	0	$0
Unincorporated Area	0	0	0	$0
Graham County	**1**	**0**	**0**	**$0**
Fontana	0	0	0	$0
Lake Santeetlah	0	0	0	$0
Robbinsville	1	0	0	$0
Unincorporated Area	0	0	0	$0
Haywood County	**5**	**0**	**2**	**$113,000**
Canton	3	0	0	$103,000
Clyde	0	0	0	$0
Maggie Valley	1	0	0	$10,000
Waynesville	0	0	0	$0
Unincorporated Area	1	0	2	$0
Jackson County	**15**	**1**	**10**	**$2,640,000**
Dillsboro	1	0	0	$10,000
Forest Hills	0	0	0	$0
Sylva	2	0	0	$30,000
Webster	0	0	0	$0
Unincorporated Area	12	1	10	$2,600,000
Swain County	**2**	**0**	**2**	**$100,000**
Bryson City	0	0	0	$0
Unincorporated Area	2	0	2	$100,000
Eastern Band of Cherokee Indians	**--**			**--**
SMOKY MOUNTAIN REGION TOTAL	**23**	**1**	**14**	**$2,853,000**

Source: National Centers for Environmental Information

Eastern Band of Cherokee Indians

Information on historical lightning occurrences was found in the EBCI Fire Management Plan and the local newspaper, *Cherokee One Feather*. According to the 2001 EBCI Fire Management Plan, 5 lightning strikes occurred over a 10-year period from 1986 to 1997, causing fires that burned 33.5 acres. The *Cherokee One Feather* also reported that storms with high winds and lightning caused massive power outages on June 15, 2011.

5.5.4 Probability of Future Occurrences

Tornadoes

According to historical information, tornado events are not an annual occurrence for the region. Furthermore, the mountainous terrain of the region makes tornadoes a rare occurrence. 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 Smoky Mountain Region experience a direct tornado strike. The probability of future tornado occurrences affecting the Smoky Mountain Region is possible (1 – 10 percent annual probability).

Thunderstorms

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

Hailstorms

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 (coinciding with thunderstorms), it is assumed that the entire Smoky Mountain Region has equal exposure to this hazard. It can be expected that future hail events will continue to cause minor damage to property and vehicles throughout the region.

Lightning

Although there were not a high number of historical lightning events reported throughout the Smoky Mountain Region via NCEI 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 Smoky Mountain Region is located in an area of the country that experienced an average of 2 to 4 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.

5.6 SEVERE WINTER WEATHER

5.6.1 Background and Description

Severe winter weather 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 severe winter weather 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, etcetera – 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.

5.6.2 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. The Smoky Mountain Region is accustomed to severe winter weather conditions and frequently receives winter weather during the winter months. Given the atmospheric nature of the hazard, the entire region has uniform exposure to a winter storm.

5.6.3 Historical Occurrences

Winter weather has resulted in four disaster declarations in the Smoky Mountain Region. This includes the Blizzard of 1996, one subsequent 1996 winter storm, and an ice storm in 2003, and a severe winter storm in 2010[11]. According to the National Centers for Environmental Information, there have been a total of 747 recorded winter storm events in the Smoky Mountain Region since 1993 (**Table 5.15**)[12]. These events resulted in over $34.2 million (2020 dollars) in damages[13].

TABLE 5.15: SUMMARY OF WINTER STORM EVENTS IN THE SMOKY MOUNTAIN REGION

Location	Number of Occurrences	Deaths	Injuries	Property Damage (2022)
Cherokee County	11	0	0	$849,826
Graham County	140	0	0	$994,449
Haywood County	181	0	0	$6,198,575

[11] 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 Profiles*.

[12] These ice and winter storm events are only inclusive of those reported by the National Centers for Environmental Information (NCEI). It is likely that additional winter storm conditions have affected the Smoky Mountain Region. In addition, the 701 are reported by county, so many of these storms likely affected all of the counties.

[13] The dollar amount of damages provided by NCEI is divided by the number of affected counties to reflect a damage estimate for the county.

Location	Number of Occurrences	Deaths	Injuries	Property Damage (2022)
Jackson County	245	0	0	$20,001,310
Swain County	160	0	0	$6,205,187
Eastern Band of Cherokee Indians*	10	0	0	--
SMOKY MOUNTAIN REGION TOTAL	**747**	**0**	**0**	**$34,249,347**

*EBCI has land in each of the participating counties with a majority being in Jackson and Swain Counties; reported number is not all inclusive.

Source: National Centers for Environmental Information

There are several notable winter storm events in the region. Winter storms may be long lived with gradual snow or ice accumulation or quick with intense snow fall. There have been three disaster declarations in the Smoky Mountain region for the consequential disruption of the area.

"The Storm of the Century" (March 13-17, 1993)

A storm that was called "The 1993 Superstorm" and the "The Storm of the Century" produced up to 50 inches of snow on Mount Mitchell from March 12 through 14. Much of western North Carolina had over a foot of snow during the storm. The National Weather Service reported between 18-24 inches of snow across the Smoky Mountain Region.

Blizzard of 1996 (January 6, 1996)

Snow began early in the morning and by mid-day had reached heavy criteria over part of the mountains with accumulations exceeding 6 inches in some areas. Remaining mountain locations picked up heavy snow accumulations a bit later in the afternoon. At the start of the storm the snow was very wet and accumulations caused power outages in some places. The heavy snow continued through the night and into the next day. Accumulations in the mountains ranged from 4 to 12 inches over the central and southern mountains with 18 to 30 inches in the northern mountains.

Brutally cold conditions followed the snow with very windy conditions reported. Blizzard conditions may have been reached in some areas. Extreme cold followed the storm in much of the mountains with wind chills of 20 to 30 below zero.

Winter Storm (February 1, 1996)

The second snowstorm within a week caused more excitement in North Carolina. Up to a foot of snow was reported in some of the mountains with most mountain and foothill locations receiving 3 to 6 inches. In the piedmont, there was more of a mixture of ice with minimal ice storm conditions reported in and around the Charlotte area. There were some power outages and numerous traffic accidents. Cherokee and Haywood counties reported ice accumulation on power lines and roads throughout the county.

Winter storms throughout the planning area have several negative externalities including hypothermia, cost of snow and debris cleanup, business and government service interruption, traffic accidents, and power outages. Furthermore, citizens may resort to using inappropriate heating devices that could lead to fire or an accumulation of toxic fumes.

There have been several severe winter weather events in the Smoky Mountains region. **Appendix G** includes descriptions of recent winter storm events.

Eastern Band of Cherokee Indians
Ten winter storm events were reported in the previous tribal mitigation plan. However, given the numbers of the surrounding counties, many more events have impacted the reservation lands. The most memorable storms in recent history have been the ice storms of 1994, 1996, and 2003.

Cherokee One Feather reported three additional winter storm events for EBCI:

- January 30, 2010: A severe winter storm brought snow and ice to the area, downed trees, and left thousands without power.
- January 7-12, 2011: More than a foot of snow fell in the Cherokee area causing the closure of Cherokee Central Schools and the EBCI.
- January 20-22, 2016: Winter Storm Jonas resulted in several inches of snow to over one foot of snowfall in the area, causing EBCI government programs to close. Duke Energy reported 4,500 outages in Swain and Jackson Counties.

5.6.4 Probability of Future Occurrences
Winter storm events will remain a regular occurrence in the Smoky Mountain Region due to location and elevation. According to historical information, the Smoky Mountain Region experiences an average of six winter storm events each year. Therefore, the annual probability is highly likely (100 percent).

5.7 EARTHQUAKES
5.7.1 Background and Description
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.

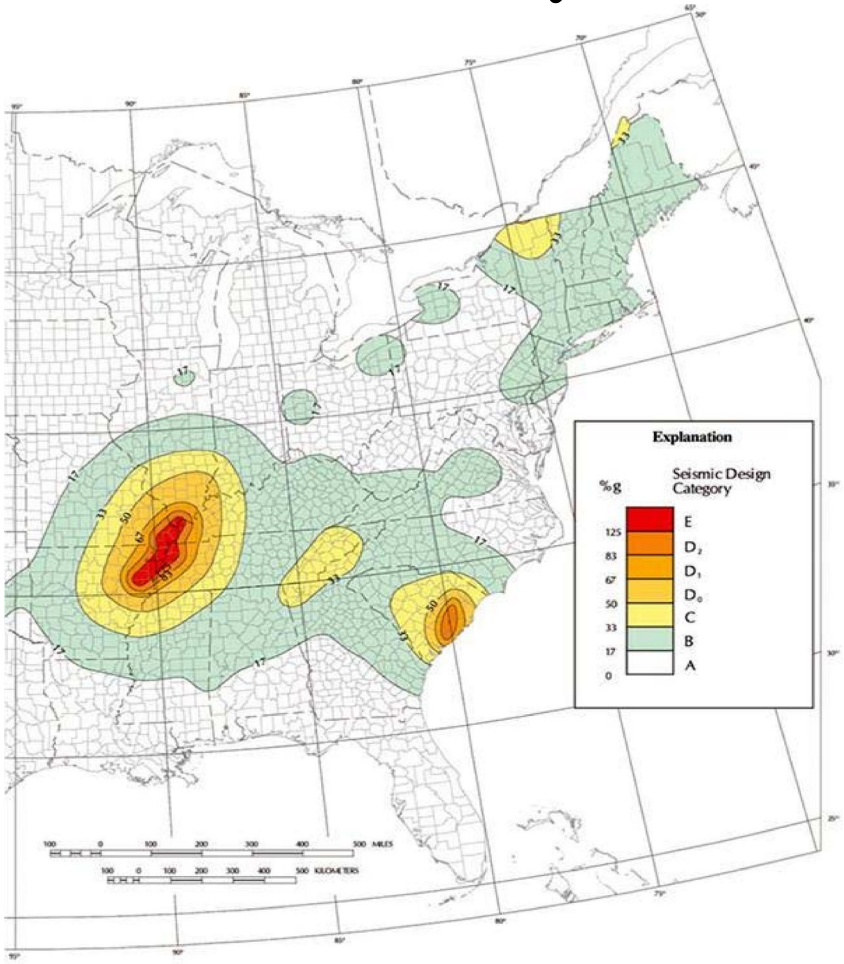
Most property damage and earthquake-related deaths are caused by the failure and collapse of structures due to ground shaking. The level of damage depends upon the amplitude and duration of the shaking, which are directly related to the earthquake size, distance from the fault, site, and regional geology. 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 5.9** shows relative seismic risk for the United States.

FIGURE 5.9: UNITED STATES EARTHQUAKE HAZARD MAP



Source: United States Geological Survey

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 5.16**). 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 5.17**.

TABLE 5.16: RICHTER SCALE

Richter Magnitudes	Earthquakes 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 5.17: MODIFIED MERCALLI INTENSITY SCALE FOR EARTHQUAKES

Scale	Intensity	Description of Effects	Corresponding Richter Scale Magnitude
I	Not felt	Not felt except by a very few under especially favorable conditions.	
II	Weak	Felt only by a few persons at rest, especially on upper floors of buildings.	< 4.2
III	Weak	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration	
IV	Light	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.	
V	Moderate	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.	< 4.8
VI	Strong	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.	< 5.4
VII	Very strong	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.	< 6.1
VIII	Severe	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.	
IX	Violent	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.	< 6.9
X	Extreme	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.	< 7.3

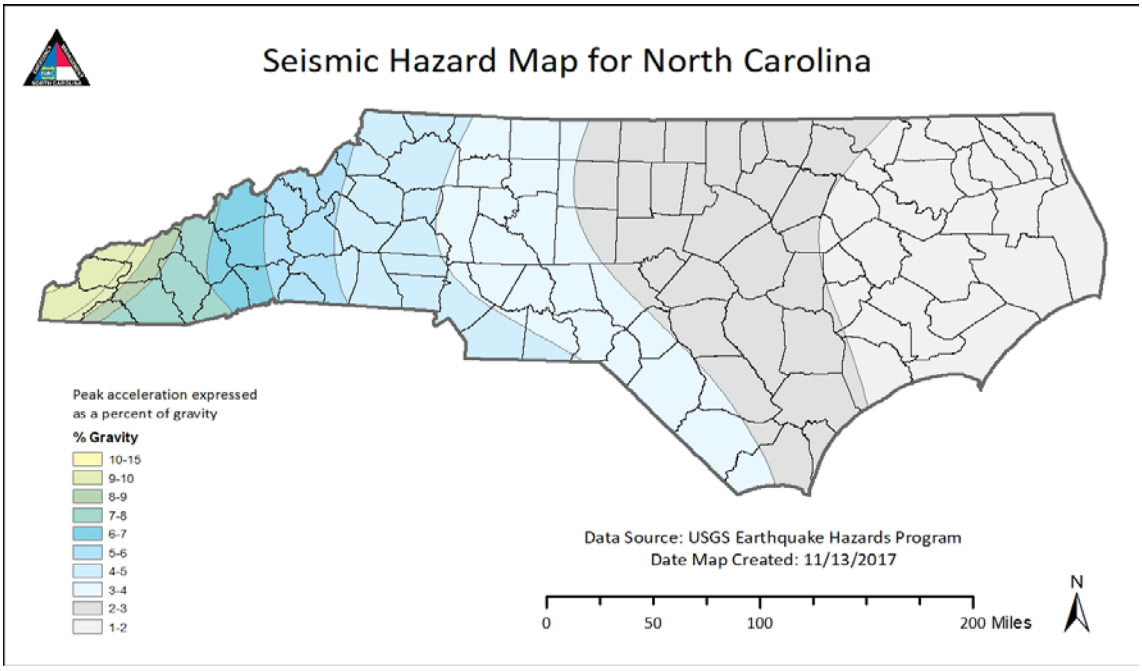
Source: Federal Emergency Management Agency

5.7.2 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 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 5.10** is a map showing geological and seismic information for North Carolina.

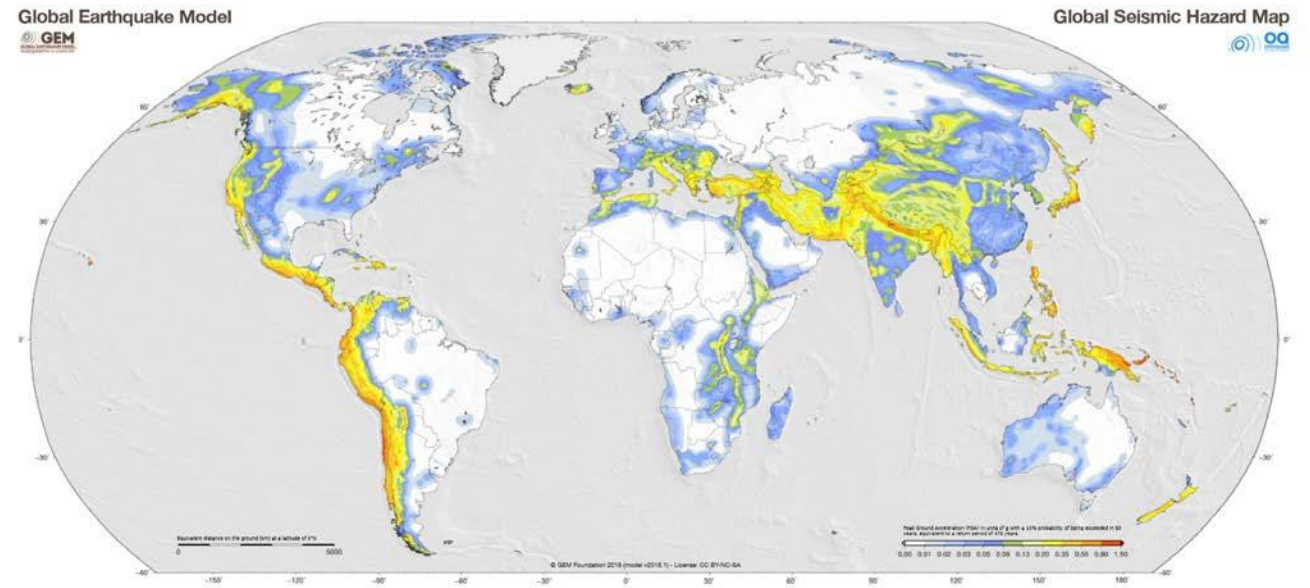
FIGURE 5.10: GEOLOGICAL AND SEISMIC INFORMATION FOR NORTH CAROLINA



Source: North Carolina Geological Survey

Figure 5.11 shows the intensity level associated with the Smoky Mountain 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 Smoky Mountain Region lies within an approximate zone of level "10" to "15" ground acceleration. This indicates that the region as a whole exists within an area of moderate seismic risk.

FIGURE 5.11: PEAK ACCELERATION WITH 10 PERCENT PROBABILITY OF EXCEEDANCE IN 50 YEARS



Source: Global Earthquake Model, 2018

5.7.3 Historical Occurrences

At least 82 earthquakes are known to have affected the Smoky Mountain Region since 1874. The strongest of these measured a VII on the Modified Mercalli Intensity (MMI) scale. **Table 5.18** provides a summary of earthquake events reported by the National Geophysical Data Center between 1638 and 1985[14].

TABLE 5.18: SUMMARY OF SEISMIC ACTIVITY IN THE SMOKY MOUNTAIN REGION

Location	Number of Occurrences	Greatest MMI Reported	Richter Scale Equivalent
Cherokee County	**24**	**V (slightly strong)**	**< 4.8**
Andrews	8	IV	
Murphy	16	V	
Graham County	**18**	**V (slightly strong)**	**< 4.8**
Fontana	6	V	
Lake Santeetlah	-	-	
Robbinsville	12	V	
Haywood County	**19**	**VII (very strong)**	**< 6.1**
Canton	5	V	
Clyde	3	V	

[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.

Location	Number of Occurrences	Greatest MMI Reported	Richter Scale Equivalent
Maggie Valley	-	-	
Waynesville	11	VII	
Jackson County	**14**	**V (slightly strong)**	**< 4.8**
Dillsboro	3	V	
Forest Hills	-	-	
Sylva	8	V	
Webster	3	V	
Swain County	**7**	**V (slightly strong)**	**< 4.8**
Bryson City	7	V	
Eastern Band of Cherokee Indians*	**-**	**-**	**-**
SMOKY MOUNTAIN REGION TOTAL	**82**	**VII**	**< 6.1**

* Although no earthquakes are reported for tribal lands, many of the reported earthquakes for counties in the Smoky Mountain Region would also be felt on reservation lands.
Source: National Geophysical Data Center

In addition to those earthquakes specifically affecting the Smoky Mountain Region, a list of earthquakes that have caused damage throughout North Carolina is presented below in **Table 5.19.**

TABLE 5.19: 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

08/09/2020	Sparta, NC	5.1	VII	VII

*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).

5.7.4 Probability of Future Occurrences

The probability of significant, damaging earthquake events affecting the Smoky Mountain Region 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).

5.8 GEOLOGICAL

5.8.1 Background and Description

For the purposes of maintaining consistency with the State of North Carolina Hazard Mitigation Plan, this section will assess geological hazards which include landslides, sinkholes, and erosion.

Landslide

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.

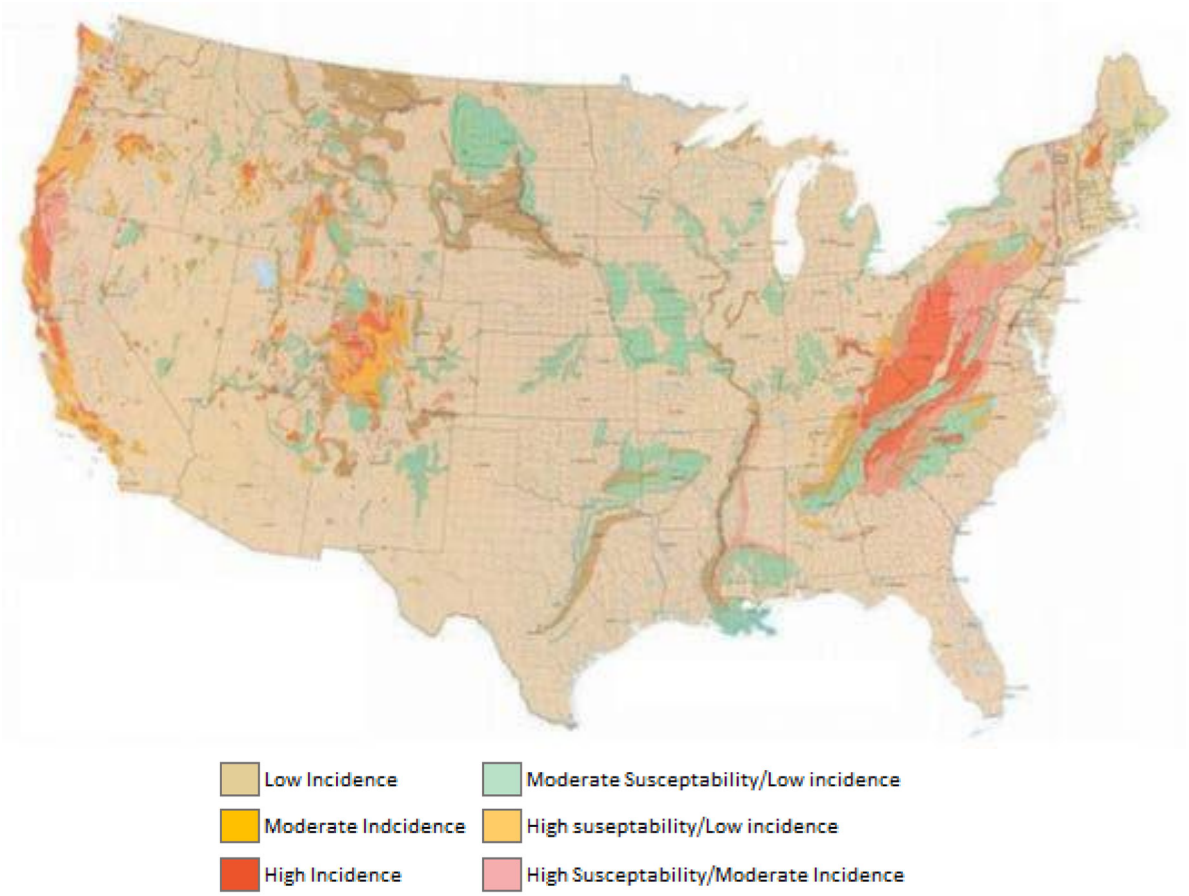
Among the most destructive types of debris flows are those that accompany volcanic eruptions. A spectacular example in the United States was a massive debris flow resulting from the 1980 eruptions of Mount St. Helens, Washington. Areas near the bases of many volcanoes in the Cascade Mountain Range of 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 5.12** delineates areas where large numbers of landslides have occurred and areas that are susceptible to land sliding in the conterminous United States[16].

FIGURE 5.12: LANDSLIDE OVERVIEW MAP OF THE CONTERMINOUS UNITED STATES[17]



Source: USGS

Sinkhole

According to the United States Geological Survey, a sinkhole is an area of ground that has no natural external surface drainage--when it rains, all of the water stays inside the sinkhole and typically drains into the subsurface. Sinkholes can vary from a few feet to hundreds of acres and from less than 1 to more than 100 feet deep. Some are shaped like shallow bowls or saucers whereas others have vertical walls.

Sinkholes are common where the rock below the land surface is limestone, carbonate rock, salt beds, or

[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.
[17] Susceptibility not indicated where same or lower than incidence. Susceptibility to land sliding was defined as the probable degree of response of [the areal] rocks and soils to natural or artificial cutting or loading of slopes, or to anomalously high precipitation. High, moderate, and low susceptibility are delimited by the same percentages used in classifying the incidence of land sliding. Some generalization was necessary at this scale, and several small areas of high incidence and susceptibility were slightly exaggerated.

rocks that can naturally be dissolved by groundwater circulating through them. As the rock dissolves, spaces and caverns develop underground. Sinkholes are dramatic because the land usually stays intact for a while until the underground spaces just 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. These collapses can be small, or, as **Figure 5.13** below shows, they can be huge and can occur where a house or road is on top[18].

FIGURE 5.13: SINKHOLE IN NORTH CAROLINA



Source: NCEM

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.

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 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

[18] *Sinkholes. United States Geological Survey. Retrieved on December 14, 2017 from: https://water.usgs.gov/edu/sinkholes.html*

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.

5.8.2 Location and Spatial Extent

Landslides

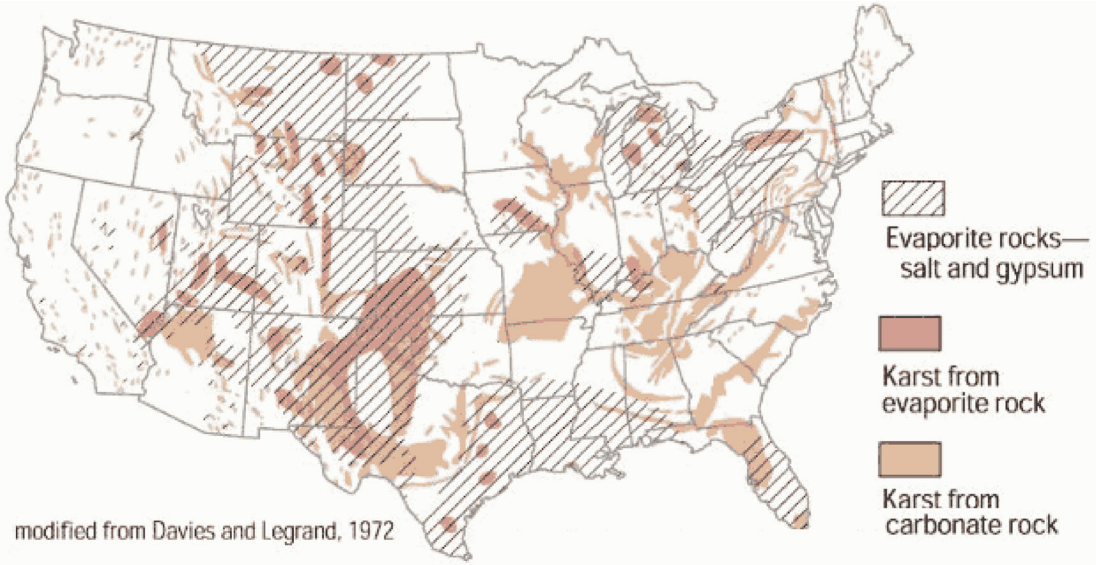
Landslides occur along steep slopes when the pull of gravity can no longer be resisted (often due to heavy rain throughout the Appalachian Mountain region). Human development can also exacerbate risk by building on previously undevelopable steep slopes and constructing roads by cutting through mountains.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

According to **Figure 5.15** below, the majority of the region, across all five counties, have high landslide activity. The remaining portion of the region, mainly in Cherokee and smaller parts of Graham, Jackson, and Haywood Counties, has a moderate incidence occurrence rate. There is high susceptibility throughout the region.

Sinkholes

Figure 5.14 below shows areas of the United States where certain rock types that are susceptible to dissolution in water occur. In these areas, the formation of underground cavities can form and catastrophic sinkholes can happen. These rock types are evaporites (salt, gypsum, and anhydrite) and carbonates (limestone and dolomite). Evaporite rocks underlie about 35 to 40 percent of the United States, though in many areas they are buried at great depths. In some cases, sinkholes in North Carolina have been measured at up to 20 to 25 feet in depth, with similar widths.

FIGURE 5.14: UNITED STATES GEOLOGICAL SURVEY OF KARST MODIFIED FROM DAVIES AND LEGRAND, 1972



Erosion

Erosion in the Smoky Mountain Region is typically caused by flash flooding events. Unlike coastal areas, where the soil is mainly composed of fine-grained particles such as sand, Smoky Mountain region soils have much greater organic matter content. Furthermore, vegetation also helps to prevent erosion in the area. Erosion occurs in the Smoky Mountain Region, particularly along the banks of rivers and streams, but it is not an extreme threat to any of the participating counties and jurisdictions. No areas of concern were reported by the planning committee.

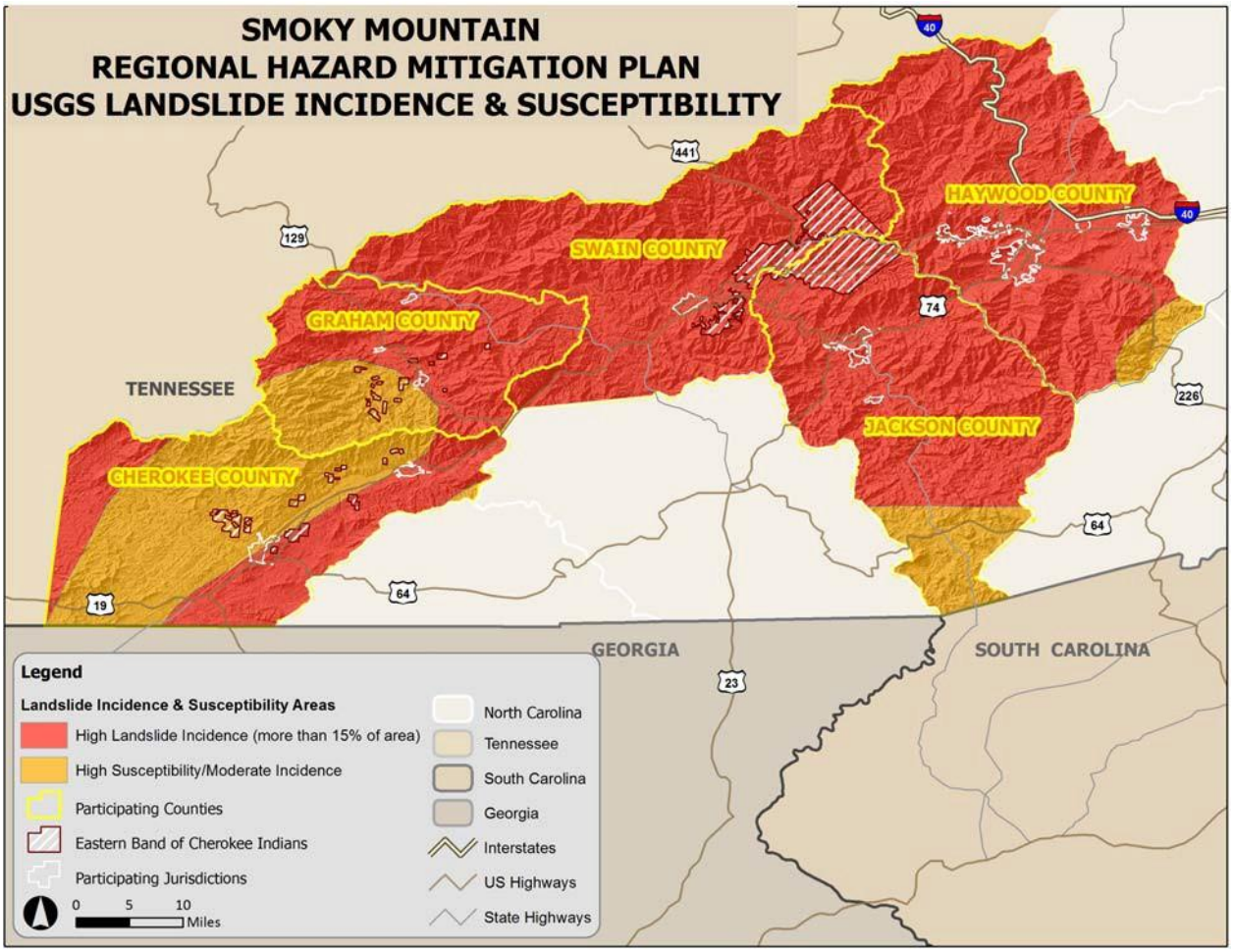
5.8.3 Historical Occurrences

Landslide

Steep topography throughout the Smoky Mountain Region makes the planning area susceptible to landslides. Most landslides are caused by heavy rainfall in the area. Building on steep slopes that was not previously possible also contributes to risk. **Table 5.20** presents a summary of the landslide occurrence events as provided by the North Carolina Geological Survey[19]. The locations of the landslide events presented in the aforementioned tables are presented in **Figure 5.16**. Some incidence mapping has also been completed throughout the western portion of North Carolina though it is not complete. Therefore, it should be noted that many more incidents than what is reported are likely to have occurred in Cherokee and Graham Counties.

[19] It should be noted that the North Carolina Geological Survey (NCGS) emphasized the dataset provided was incomplete. Therefore, there may be additional historical landslide occurrences. Furthermore, dates were not included for every event. The earliest date reported was 1940. No damage information was provided by NCGS.

TABLE 5.15: LANDSLIDE SUSCEPTIBILITY AND INCIDENCE MAP OF THE SMOKY MOUNTAIN REGION



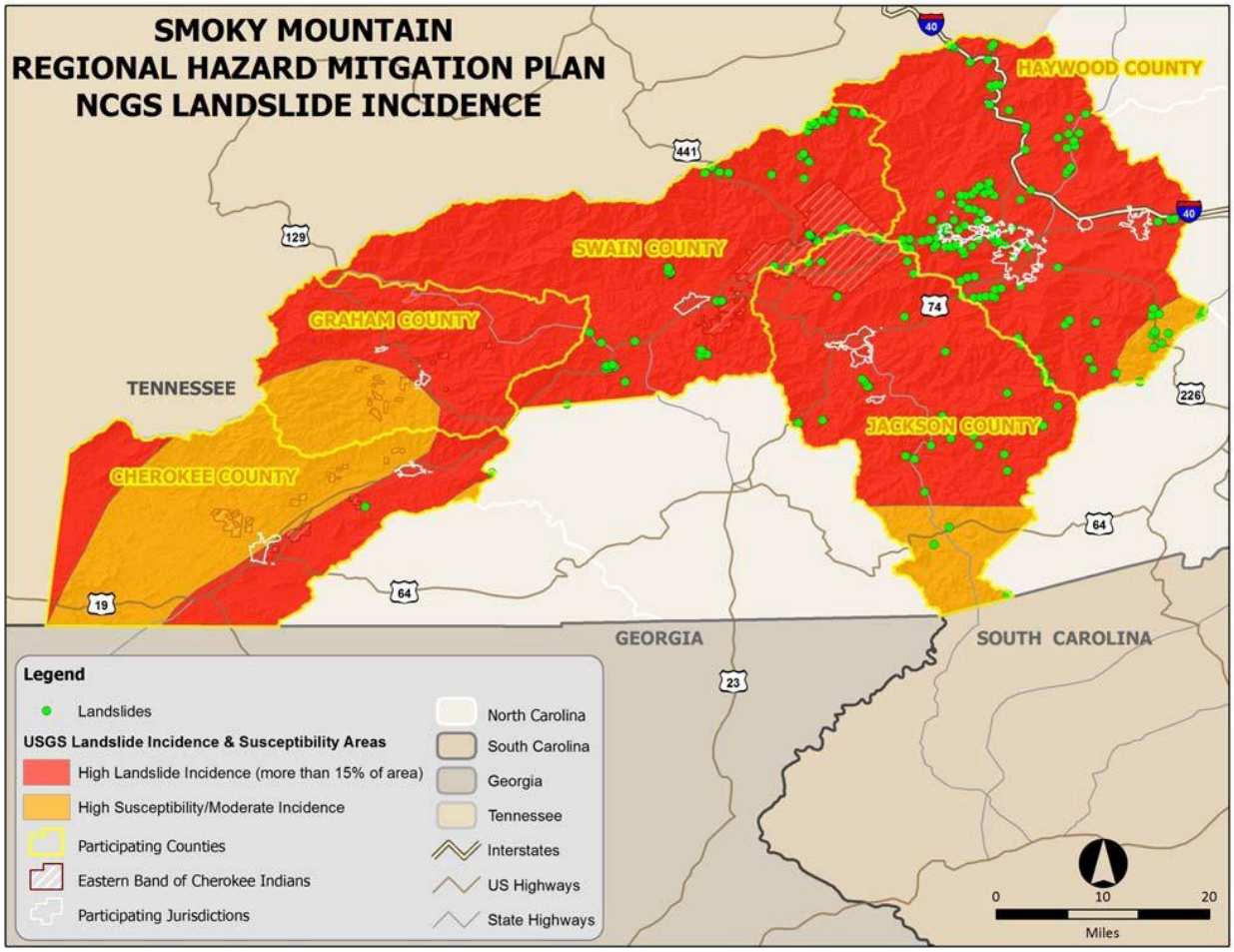
Source: USGS

TABLE 5.20: SUMMARY OF LANDSLIDE ACTIVITY IN THE SMOKY MOUNTAIN REGION

Location	Number of Occurrences
Cherokee County	**9**
Andrews	-
Murphy	4
Unincorporated Area	5
Graham County	**1**
Fontana	-
Lake Santeetlah	-
Robbinsville	-
Unincorporated Area	1
Haywood County	**120**
Canton	4
Clyde	-
Maggie Valley	-
Waynesville	4
Unincorporated Area	112
Jackson County	**29**
Dillsboro	-
Forest Hills	-
Sylva	6
Webster	-
Unincorporated Area	23
Swain County	**63**
Bryson City	5
Unincorporated Area	58
Eastern Band of Cherokee Indians	**5**
SMOKY MOUNTAIN REGION TOTAL	**227**

Source: North Carolina Geological Survey

FIGURE 5.16: LOCATION OF PREVIOUS LANDSLIDE OCCURRENCES IN THE SMOKY MOUNTAIN REGION



Source: North Carolina Geological Survey

The information below identifies additional historical information reported in the previous hazard mitigation plans.

Cherokee County

These incidents are reported above, but the following list shows an exact location and date of historic landslides in Cherokee County and its municipalities:

- 3/01 US64 - 1.6 miles east of Murphy
- 3/94 SR 1331 - Hanging dog Rd 6.0 miles north of Murphy
- 4/92 US64 - 0.5 miles east of Murphy
- 4/94 US74 - Bypass Murphy (near Bulldog Dr)
- 1/77 19/129 North (Red Marble Rd)
- 1/77 SR 1314 (near Violet)
- 4/75 SR 1375 Bluff Rd
- 5/72 SR 1314 Between Hiwassee Dam and Violet

- 10/74 SR 1331 Blackwell Gap

Eastern Band of Cherokee Indians

- The Eastern Band of Cherokee Indians reported damages of $1.2 million in May 2003 due to landslides. One single event caused over $500,000 in damages. (*Taken from previous plan*) In May 2013, a Disaster Declaration was declared for the Eastern Band of Cherokee Indians for severe flooding, landslides and mudslides. This was the first Disaster Declaration to be issued to a tribal nation. Public assistance grants for the declaration reach almost $3.4 million. Another Disaster Declaration, involving Jackson County and EBCI, was made in fall of 2013 for landslides and mudslides associated with severe storms and flooding.

Graham County

- Landslides reported due to the 1994 floods that caused damages to roads and one structure. The 2004 heavy rains also caused landslides. NCDEM classification suggests that a landslide having minor effect on the county is highly likely to occur. The County reports an average of 2 landslides every 10 years.

Haywood County

- Landslides are listed as one of the top three threats to the county. Landslides are reported with hurricane and flooding events. (*Taken from previous plan*) The North Carolina Geological Survey's landslide database describes a landslide event form December 11, 2003 that destroyed a house and killed one person.

Jackson County

- There is no serious history of landslides in Jackson County though some incidents have been reported including the landslides as a result of the May 2003 heavy rains. Jackson County has also established an Erosion Department which is managed by a professional engineer. Public information is also provided via the County website. NCDEM classification suggests that the probability of a landslide event having a minor effect on the county is highly likely to occur.

Swain County

- There is no serious history of landslides in Swain County though some incidents have been reported. NCDEM classification suggests that the probability of a landslide event having a minor effect on the county is highly likely to occur.

(*Taken from previous plan*) Additionally, event narratives of landslides in Swain County though some incidents have been reported. NCDEM classification suggest that the probability of a landslide event having a minor effect on the county is highly likely to occur.

Sinkholes

In North Carolina, most sinkholes occur in the southern coastal plain due to the high concentration of limestone; however, they are also common in the western part of the state and in the Smoky Mountain region. According to a search of local media outlets across the state, the western area has experienced more than 40 sinkholes over the past 20 years. There are no historical occurrences of sinkholes in the region.

Erosion
Several sources were vetted to identify areas of erosion in the Smoky Mountain Region. This includes searching local newspapers, interviewing local officials, and reviewing previous hazard mitigation plans. Little information could be found beyond the hazard mitigation plans.

Erosion was not addressed in the previous Cherokee County and Graham County hazard mitigation plans. The Eastern Band of Cherokee Indians identified erosion as a significant hazard. They completed an erosion control project in 1995 to address road washout. Haywood County, Jackson County, and Swain County recognized erosion as a hazard and include mitigation actions to address the hazard.

5.8.4 Probability of Future Occurrences

Landslide
Based on historical information and the USGS susceptibility index, the probability of future landslide events is highly likely (100 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 Smoky Mountain Region have greater risk than others given factors such as steepness on slope and modification of slopes.

Sinkholes
Sinkholes have also affected parts of North Carolina in recent history, but most of those impacts have been in the southeastern region of the state, not the Smoky Mountains region. While many sinkholes have been relatively small, it is still unlikely (between 1 and 33.3 percent annual probability) that this region will continue to be affected in the future.

Erosion
Erosion remains a natural, dynamic, and continuous process for the Smoky Mountain 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, data, and threat to life or property, no further analysis will be done in Section 6: *Vulnerability Assessment*.

5.9 DAM FAILURE

5.9.1 Background and Description

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.

5.9.2 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 5.21** explains these classifications.

TABLE 5.21: NORTH CAROLINA DAM HAZARD CLASSIFICATIONS

Hazard Classification	Description	Quantitative Guidelines
Low	Interruption of road service, low volume roads Less than 25 vehicles per day	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

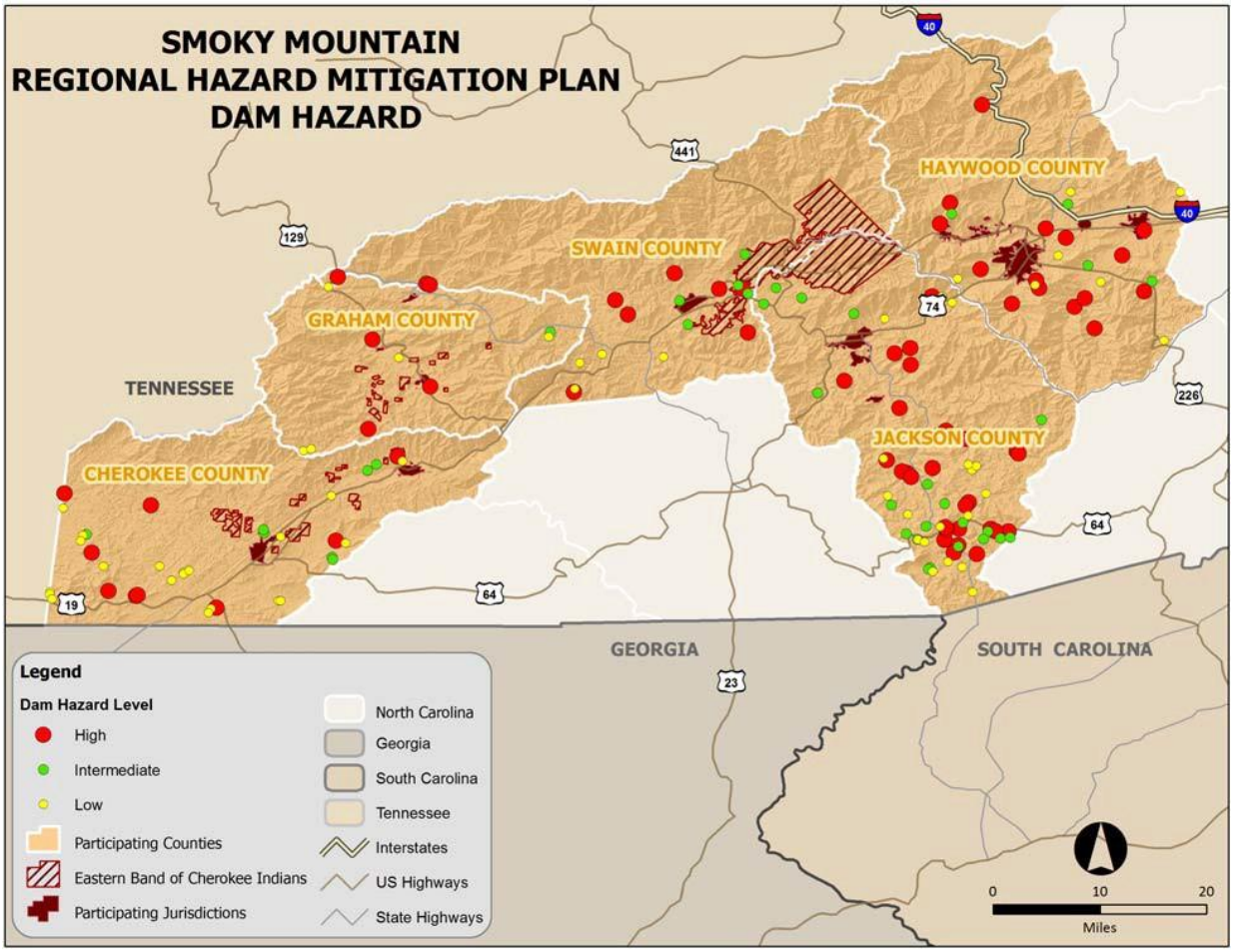
According to the North Carolina Division of Energy, Mineral, and Land Resources, there are 169 dams in the Smoky Mountain Region[20]. **Figure 5.17** shows the dam location and the corresponding hazard ranking for each. Of these dams, 72 are classified as high hazard potential. These high hazard dams are summarized by county in **Table 5.22** and listed in **Table 5.23**.

TABLE 5.22: SUMMARY OF HIGH HAZARD DAM LOCATION

Location	Number High Hazard Dams
Cherokee County	11
Graham County	7
Haywood County	17
Jackson County	28
Swain County	9
EBCI	None reported
Smoky Mountain Region Total	**72**

[20] The February 8, 2012 list of high hazard dams obtained from the North Carolina Division of Energy, Mineral, and Land Resources (http://portal.ncdenr.org/web/lr/dams) was reviewed and amended by local officials to the best of their knowledge.

FIGURE 5.17: SMOKY MOUNTAIN REGION DAM LOCATION AND HAZARD RANKING



Source: North Carolina Division of Land Resources, 2012

TABLE 5.23: SMOKY MOUNTAIN REGION HIGH HAZARD DAMS

Dam Name	Hazard Potential	Surface Area (acres)	Max Capacity (Ac-ft)	Owner Type
Cherokee County				
Appalachia Lake Dam	High	--	69360	Federal
Skomp Dam	High	4.0	44	Private
Hideaway Mountain Lake Dam	High	0.5	5	Private
Hiawassee Lake Dam	High	--	434000	Federal
Pied Piper Dam Lower	High	4.0	65	Private
Pied Piper Dam Upper	High	2.0	18	Private
Tanglewood Forest Dam Lower	High	8.0	100	Private
Upper Tanglewood Dam	High	2.0	25	Private
Andrews Water Supply Dam	High	40.0	1500	Local Gov
Greenbriar Development LLC Dam	High	0.0	0	
Senecal Dam	High	0.1	1	Private
Graham County				
Fontana Lake Dam	High	--	587328	Federal
Tobacco Branch Dam	High	5.0	48	Private
Phillips Dam	High	2.4	22	Private
Santeetlah Dam	High	2800.0	271320	Utility
Robert Mosely Dam	High	1.8	29	Private
Mission Ready Dam	High	--	250	Private
Fontana/Emergency Spillway Dam	High	0.0	587328	Federal
Haywood County				
Lake Junaluska Dam	High	195.0	7720	Private
Camp Daniel Boone Lake Dam	High	4.0	87	Private
Lake Logan Dam	High	90.0	2400	Private
Waynesville Water Supply Dam	High	76.4	3660	Local Gov
Walters Dam	High	--	30000	Utility
Broyhill Baptist Children's Home Pond Dam	High	2.0	36	Private
Hardin Dam	High	1.2	7	Private
Cataloochee Ski Slope Dam	High	0.7	15	Private
Boland Pond Dam	High	0.2	1	Private
Cataloochee Ranch Dam	High	0.5	5	Private
Lake Jane Dam	High	3.0	22	Private
Barrett Pond Dam	High	0.7	7	Private
Lipham Dam	High	2.5	0	Private
Cameron Dam	High	0.3	3	Private
Harvey Dam	High	0.4	3	Private
Smoky Mountain Sanctuary POA Dam	High	0.4	16	Private
Fishers Lake Dam	High	1.0	6	Private
Jackson County				
Cashiers Lake Dam	High	24.8	379	Private
Hampton Lake Dam	High	14.7	280	Private
Hogback Dam	High	23.0	391	Private

Dam Name	Hazard Potential	Surface Area (acres)	Max Capacity (Ac-ft)	Owner Type
Trout Lake Dam	High	7.5	82	Private
Tuckasegee Lake Dam	High	--	183	Utility
Wolf Creek Lake Dam	High	--	14361	Utility
East Fork Dam	High	--	906	Utility
Bear Creek Dam	High	--	34711	Utility
Cedar Cliff Dam	High	--	7000	Utility
Thorpe Lake Dam #1	High	--	70800	Utility
Thorpe Lake Dam #2	High	--	70800	Utility
Frady Cove Estates	High	2.3	31	Private
Hodge Dam	High	0.6	5	Private
Sapphire Valley Golf Course Dam	High	1.7	15	Private
Laurel Lake Dam	High	3.5	50	Private
Wolf Lake	High	3.0	37	Private
Mcguire Lake Dam	High	2.6	45	Private
Hefner Dam	High	--	0	Private
Lancewood Dam	High	2.5	20	Private
Fairfield Lake Dam	High	183.0	3015	Private
Connelly Dam	High	--	0	Private
Hanks Dam	High	15.0	125	Private
Stigler Dam	High	1.2	0	Private
Silver Springs Dam	High	7.4	65	Private
Breedlove Dam	High	1.0	8	Private
Pine Creek Dam	High	1.0	8	Private
Moody Bridge Partners Dam	High	--	--	Private
Town of Sylva Water Supply	High	1.5	17	Local Gov
Swain County				
Bryson Dam	High	43.0	530	Utility
Schmehl Dam	High	--	14	Private
Bryson City Water Supply Dam	High	2.0	78	Local Gov
Widenhouse Dam	High	0.5	7	Private
Cheoah Valley Dam	High	5.0	96	Private
Whitney Dam	High	0.7	10	Private
Lott Dam	High	0.3	3	Private
Frischholz Dam	High	0.7	5	Private
Crimmins Dam	High	0.0	1	Private
Eastern Band of Cherokee Indians				
NONE REPORTED				

Source: North Carolina Division of Land Resources, 2018

The most significant dam in Graham County is the Fontana Dam. At 480 feet in height, it is the highest concrete dam east of the Rocky Mountains. Built in three years' time at a cost of $74.7 million, the Fontana dam became operational as a hydro-electric dam starting in January 1945. The Fontana Dam has three electrical generating units with a peak capacity of 250,000 kilowatts. The dam

is 2,365 feet in length and 376 feet thick at its base. Lake Fontana is 11,685 acres in size and has 240 miles of shoreline. The Lake Fontana reservoir has a flood-storage capacity of 513,965 acre-feet. The dam is a Tennessee Valley Authority dam and is monitored and maintained for safety. Other significant dams in Graham County include the Tapoco (Cheoah) Dam and the Lake Santeetlah Dam.

There are three river basins within Swain County. Swain County has one Tennessee Valley Authority reservoir. If this dam were to fail, the economic impact to Swain County would be substantial and could affect the entire far western section of Swain County. There are eight Duke Power reservoirs located in Jackson and Macon County. If seven of these dams were to fail, the economic impact to Swain County would also be substantial and would severely impact Bryson City. The remaining dam located in Macon County would have a severe impact on the Nantahala Gorge. This dam failure would result in the most impact of life and property within Swain County. Based on historical information as well as dam failure inundation maps, we estimate that flood waters from a dam failure would never exceed 30 feet above the 500-year floodplain.

It should also be noted that dam regulations for classifying dams was recently changed. As a result, generally more dams are classified as high hazard.

5.9.3 Historical Occurrences

Two dam breaches were reported in Jackson County, though no additional information was available. In addition, several breach scenarios in the area could be catastrophic.

5.9.4 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, as has been demonstrated in the past, regular monitoring is necessary to prevent these events. 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) have been completed for dams of concern in the region.

5.10 FLOODING

5.10.1 Background and Description

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.

5.10.2 Location and Spatial Extent

There are areas in the Smoky Mountain Region that are susceptible to flood events. Special flood hazard areas in the Smoky Mountain Region were mapped using Geographic Information System (GIS) and FEMA Digital Flood Insurance Rate Maps (DFIRM)[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 2,357 square miles that make up the Smoky Mountain Region (including the area of Cherokee County, Graham County, Haywood County, Jackson County, Swain County, and Eastern Band of Cherokee Indian reservation lands), there are 80 square miles of land in zones A and AE (1-percent annual chance floodplain/100-year floodplain) and 4.5 square miles of land in zone X500 (0.2-percent annual chance floodplain/500-year floodplain). The county totals are presented below in **Table 5.24**.

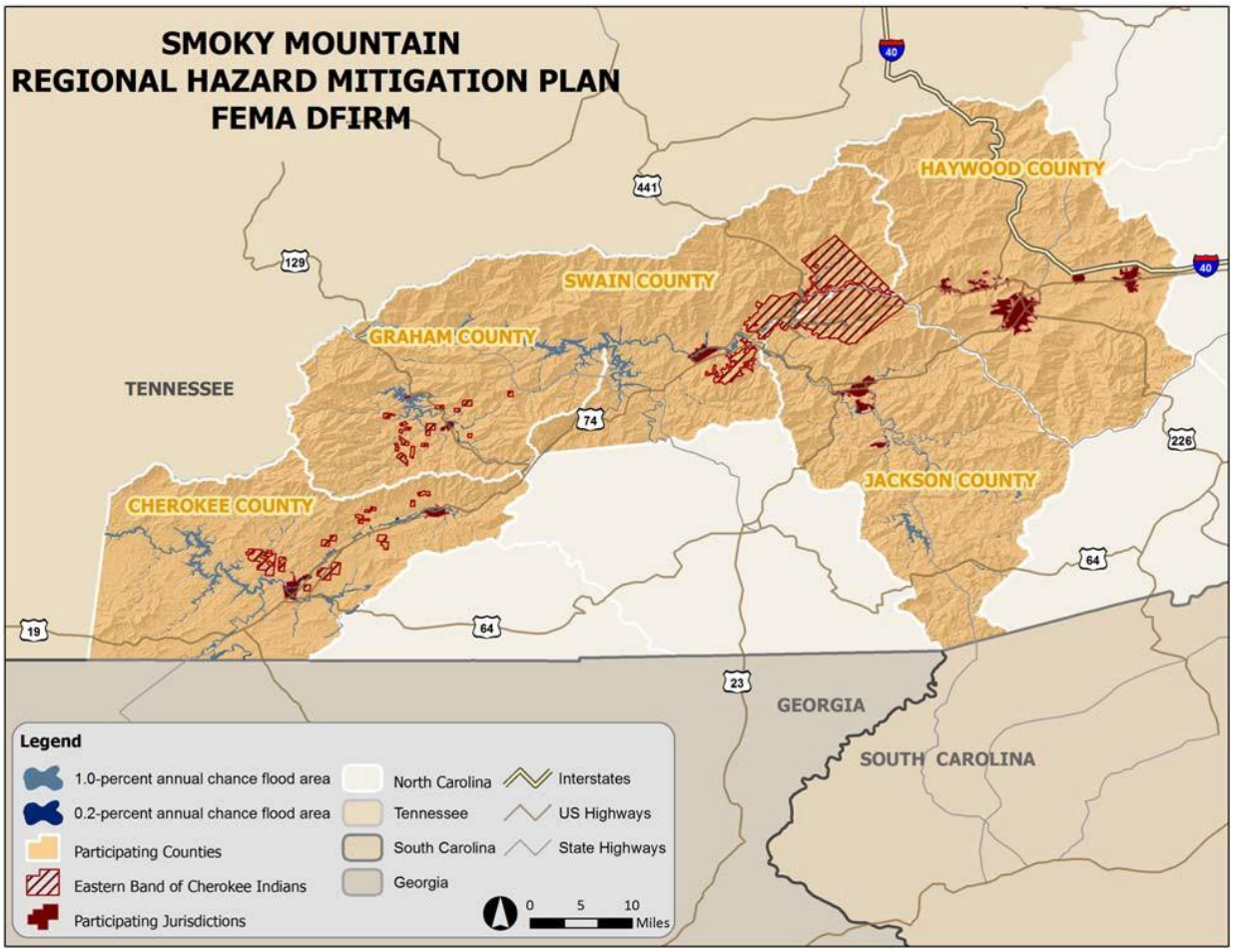
TABLE 5.24: SUMMARY OF FLOODPLAIN AREAS IN THE SMOKY MOUNTAIN REGION

Location	100-year area (square miles)	500-year area (square miles)
Cherokee County	21.17	0.86
Graham County	15.43	0.20
Haywood County	11.41	1.36
Jackson County	11.97	1.01
Swain County	17.47	0.65
Eastern Band of Cherokee Indians	2.63	0.47
SMOKY MOUNTAIN REGION TOTAL	**80.08**	**4.55**

These flood zone values account for 2.6 percent of the total land area in the Smoky Mountain Region. 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 5.18** illustrates the location and extent of currently mapped special flood hazard areas for the Smoky Mountain Region based on best available FEMA DFIRM data. **Appendix F** includes flood maps for all counties and municipalities in the region.

[21] The county-level DFIRM data used for the Smoky Mountain Region were updated in 2010 for each of the counties. EBCI data is preliminary 2008 data as provided by the EBCI.

FIGURE 5.18: SPECIAL FLOOD HAZARD AREAS IN THE SMOKY MOUNTAIN REGION



Source: Federal Emergency Management Agency

Additional, more detailed county-level and jurisdiction-level maps can be found in the annexes.

5.10.3 Historical Occurrences

Information from the National Centers for Environmental Information was used to ascertain historical flood events. The National Centers for Environmental Information reported a total of 105 events throughout the Smoky Mountain Region since 1993[22]. A summary of these events is presented in **Table 5.25**. These events accounted for over $22.2 million (2012 dollars) in property damage 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 **Appendix H.**

[22] These events are only inclusive of those reported by NCEI. 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 5.25: SUMMARY OF FLOOD OCCURRENCES IN THE SMOKY MOUNTAIN REGION

Location	Number of Occurrences	Deaths	Injuries	Property Damage (2020)
Cherokee County	**15**	**0**	**0**	**$1,720,000**
Andrews	1	0	0	$0
Murphy	6	0	0	$14,000
Unincorporated Area	8	0	0	$1,706,000
Graham County	**11**	**0**	**0**	**$370,000**
Fontana	1	0	0	$0
Lake Santeetlah	0	0	0	$0
Robbinsville	0	0	0	$0
Unincorporated Area	10	0	0	$370,000
Haywood County	**30**	**3**	**0**	**$24,526,500**
Canton	1	0	0	
Clyde	1	0	0	
Maggie Valley	3	0	0	$20,000
Waynesville	7	0	0	$555,000
Unincorporated Area	18	3	0	$23,951,500
Jackson County	**42**	**0**	**0**	**$1,184,000**
Dillsboro	1	0	0	
Forest Hills	0	0	0	
Sylva	8	0	0	$156,000
Webster	0	0	0	
Unincorporated Area	33	0	0	$1,028,000
Swain County	**29**	**0**	**0**	**$4,496,500**
Bryson City	11	0	0	$295,000
Unincorporated Area	18	0	0	$4,201,500
Eastern Band of Cherokee Indians				
SMOKY MOUNTAIN REGION TOTAL	**127**	**3**	**0**	**$32,297,000**

Source: National Centers for Environmental Information

Eastern Band of Cherokee Indians

According to the previous hazard mitigation plan, records of historical flood events on the EBCI Reservation are sparse; however, numerous floods on the Oconaluftee River, Rave Fork, and Soco Creek have been documented. There have been approximately 16 recorded flood events since 1840 that have crested above flood stage (10 feet) on the Oconaluftee River and many other events have exceeded 9 feet. The two largest recorded floods occurred in November 1906 and March 1913 with the river cresting at approximately 13 feet at Cherokee. Little information is available regarding damages due to these events. Limited records also indicate a flood occurred in December 1969 that was nearly equal to those in 1906 and 1913 in which several buildings were inundated with floodwaters, roadways were blocked, and the site of a new community center was flooded.

More recently, in 1993, a flooding event of similar magnitude occurred. Anecdotal accounts in local newspapers describe a wall of water through the EBCI Reservation and significant damage to buildings

and road infrastructure. Another recent flood event occurred between May 5 and May 7, 2003. Heavy rains moved through the area causing flooding along all the major waterways in the area. Extensive roadway damage occurred throughout the reservation and 6 businesses and 8 residences were reportedly damaged with 4 structures being completely destroyed. Preliminary estimates calculated the total damage from this event to be approximately $1.8 million.

Several more records of recent flood events were found in the local newspaper, *Cherokee One Feather*. These events included:

- December 8, 2009: High rains caused parts of the Oconaluftee River to flood. The rains also caused downed trees and a mudslide in the Big Cove area.
- July 14-15, 2011: A flash flood occurred along Straight Fork Creek in the Qualla Boundary. No injuries or deaths were reported, but there was considerable damage at the Cherokee Tribal Fish Hatchery. Hatchery officials said a wall of water 8 to 10 feet high raced through the complex and damage estimates ranged from $30,000 to $50,000.

5.10.4 Historical Summary of Insured Flood Losses

According to FEMA flood insurance policy records as of August 2019, there have been 294 flood losses reported in the Smoky Mountain Region through the National Flood Insurance Program (NFIP) since 1970, totaling nearly $9.4 million in claims payments. A summary of these figures for each Smoky Mountain County is provided in **Table 5.26**. 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 Smoky Mountain Region were either uninsured, denied claims payment, or not reported.

TABLE 5.26: SUMMARY OF INSURED FLOOD LOSSES IN THE SMOKY MOUNTAIN REGION

Location	Flood Losses	Claims Payments
Cherokee County	**46**	**$538,071**
Andrews	5	$192,489
Murphy	4	$24,946
Unincorporated Area	37	$320,636
Graham County	**4**	**$10,847**
Fontana*	*	*
Lake Santeetlah*	0	$0
Robbinsville	0	$0
Unincorporated Area	4	$10,847
Haywood County	**236**	**$7,972,928**
Canton	59	$3,045,873
Clyde	149	$3,874,583
Maggie Valley	4	$6,552
Waynesville	11	$82,430
Unincorporated Area	45	$963,490
Jackson County	**20**	**$546,227**
Dillsboro	4	$307,079
Forest Hills	0	$0

Sylva	3	$116,847
Webster	0	$0
Unincorporated Area	13	$122,301
Swain County	**9**	**$264,204**
Bryson City	5	$237,853
Unincorporated Area	4	$26,351
Eastern Band of Cherokee Indians	**3**	**$236,298**
SMOKY MOUNTAIN REGION TOTAL	**294**	**$9,387,718**

*Fontana Dam is covered by Graham County. They do not participate separately but activities are covered by the County.
Source: FEMA, NFIP

5.10.5 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 140,000 repetitive loss properties nationwide.

Currently (as of February 2017), there are 29 non-mitigated repetitive loss properties located in the Smoky Mountain Region, which accounted for 75 losses and more than $2.7 million in claims payments under the NFIP. The average claim amount for these properties is $36,685. Twenty-one of the twenty-nine properties are single family residential and the remaining eight are other residential, commercial, or government- owned buildings. Without mitigation these properties will likely continue to experience flood loses. **Table 5.27** presents detailed information on repetitive loss properties and NFIP claims and policies for the Smoky Mountain.

TABLE 5.27: SUMMARY OF REPETITIVE LOSS PROPERTIES IN THE SMOKY MOUNTAIN REGION

Location	Number of Properties	Types of Properties	Number of Losses	Building Payments	Content Payments	Total Payments	Average Payment
Cherokee County	**8**		**12**	**$83,285**	**$57,858**	**$131,655**	**$10,971**
Andrews	2	1 single family, 1 commercial	4	$8.134	$48.370	$56.504	$14.126
Murphy	1	single family	2	$3,566	$0	$3,566	$1,783
Unincorporated Area	5	5 single family	6	$71,584	$9,488	$71,584	$11,931
Graham County	**0**		**0**	**$0**	**$0**	**$0**	**$0**
Fontana	0	-	0	$0	$0	$0	$0
Lake Santeetlah	0	-	0	$0	$0	$0	$0
Robbinsville	0	-	0	$0	$0	$0	$0
Unincorporated Area	0	-	0	$0	$0	$0	$0
Haywood County	**17**		**28**	**$1,422,178**	**$71,053**	**$1,493,231**	**$53,330**
Canton	0	-	0	$0	$0	$0	$0
Clyde	14	10 single family, 2 Other residential, 1 government, 1 senior housing	26	$1,383,718	$71,053	$1,454,771	$55,953
Maggie Valley	0	-	0	$0	$0	$0	$0
Waynesville	2	commercial	2	$38,460	$0	$38,460	$19,230
Unincorporated Area	1		0	$0	$0	$0	$0
Jackson County	**2**		**4**	**$66,433**	**$0**	**$66,433**	**$16,608**
Dillsboro	0	-	0	$0	$0	$0	$0
Forest Hills	0	-	0	$0	$0	$0	$0
Sylva	0	-	0	$0	$0	$0	$0
Webster	0	-	0	$0	$0	$0	$0
Unincorporated Area	2	2 single famil	4	$66,433	$0	$66,433	$16,608
Swain County	**1**		**5**	**$206,985**	**$39,579**	**$246,564**	**$49,313**
Bryson City	1	commercial	5	$206,985	$39,579	$246,564	$49,313
Unincorporated Area	0	-	0	$0	$0	$0	$0
Eastern Band of Cherokee Indians	**1**	**commercial**	**3**	**$0**	**$236,298**	**$236,298**	**$78,766**
SMOKY MOUNTAIN REGION TOTAL	**23**		**52**	**$1,778,881**	**$395,300**	**$2,174,181**	**$41,811**

Source: National Flood Insurance Program

5.10.6 Probability of Future Occurrences

Flood events will remain a threat in the Smoky Mountain Region, and the probability of future occurrences will remain likely (between 10 and 100 percent annual probability). The probability of future flood events based on magnitude and according to the best available data is illustrated in the figures above, which indicates those areas susceptible to the 1-percent annual chance flood (100-year floodplain) and the 0.2-percent annual chance flood (500-year floodplain).

Other Hazards

5.11 WILDFIRE

5.11.1 Background and Description

A wildfire is any outdoor fire (i.e. grassland, forest, brush land) that is not under control, supervised, or prescribed[24]. 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.

5.11.2 Location and Spatial Extent

The entire region is at risk to a wildfire occurrence. However, several factors such as drought conditions or

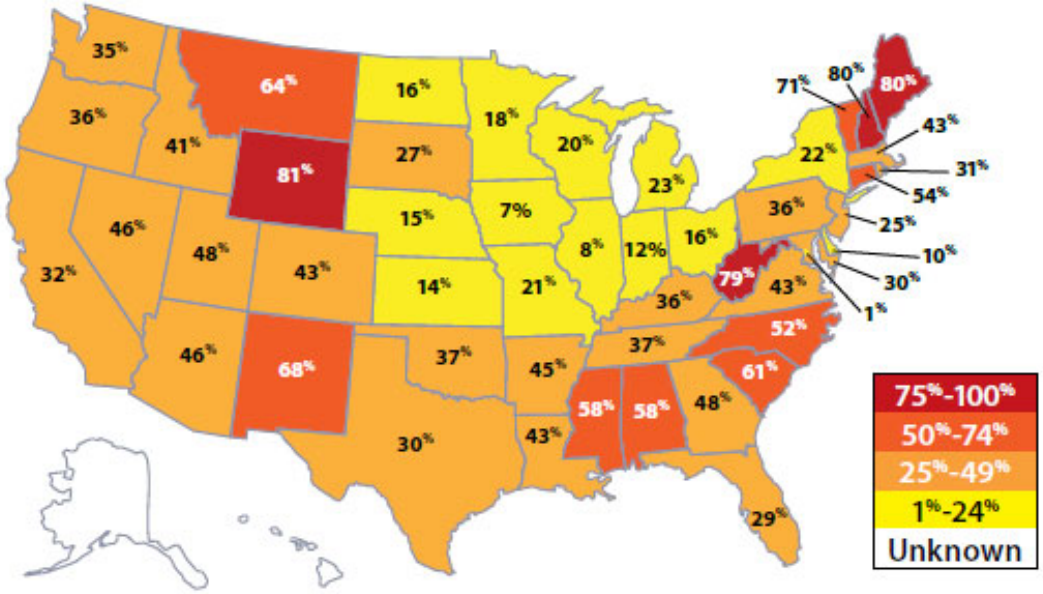
[24] Prescription burning, or "controlled burn," undertaken by land management agencies is the process of igniting fires under selected conditions, in accordance with strict parameters.

high levels of fuel on the forest floor, may make a wildfire more likely. Furthermore, areas in the urban-wildland interface are particularly susceptible to fire hazard as populations abut formerly undeveloped areas.

Maps in **Appendix G** show the Wildfire Ignition Density for each county in the Smoky Mountains Region based on data from the Southern Wildfire Risk Assessment. This data represents the likelihood of wildfire igniting in the area, which is derived from historical wildfire occurrences to create an average ignition rate map.

Every state also has a Wildland Urban Interface (WUI), which is the rating of potential impact of wildfires on people and their homes. The WUI is not a fixed geographical location, but rather a combination of human development and vegetation where wildfires have the greatest potential to result in negative impacts. Nationally, one-third of all homes lie in the WUI, which is growing danger. Below, **Figure 5.19** shows a map of each state's WUI. Based on the data from the US Department of Agriculture, 52% of homes in North Carolina lie within the WUI.

FIGURE 5.19: PERCENT OF TOTAL HOMES IN THE WILDLAND URBAN INTERFACE



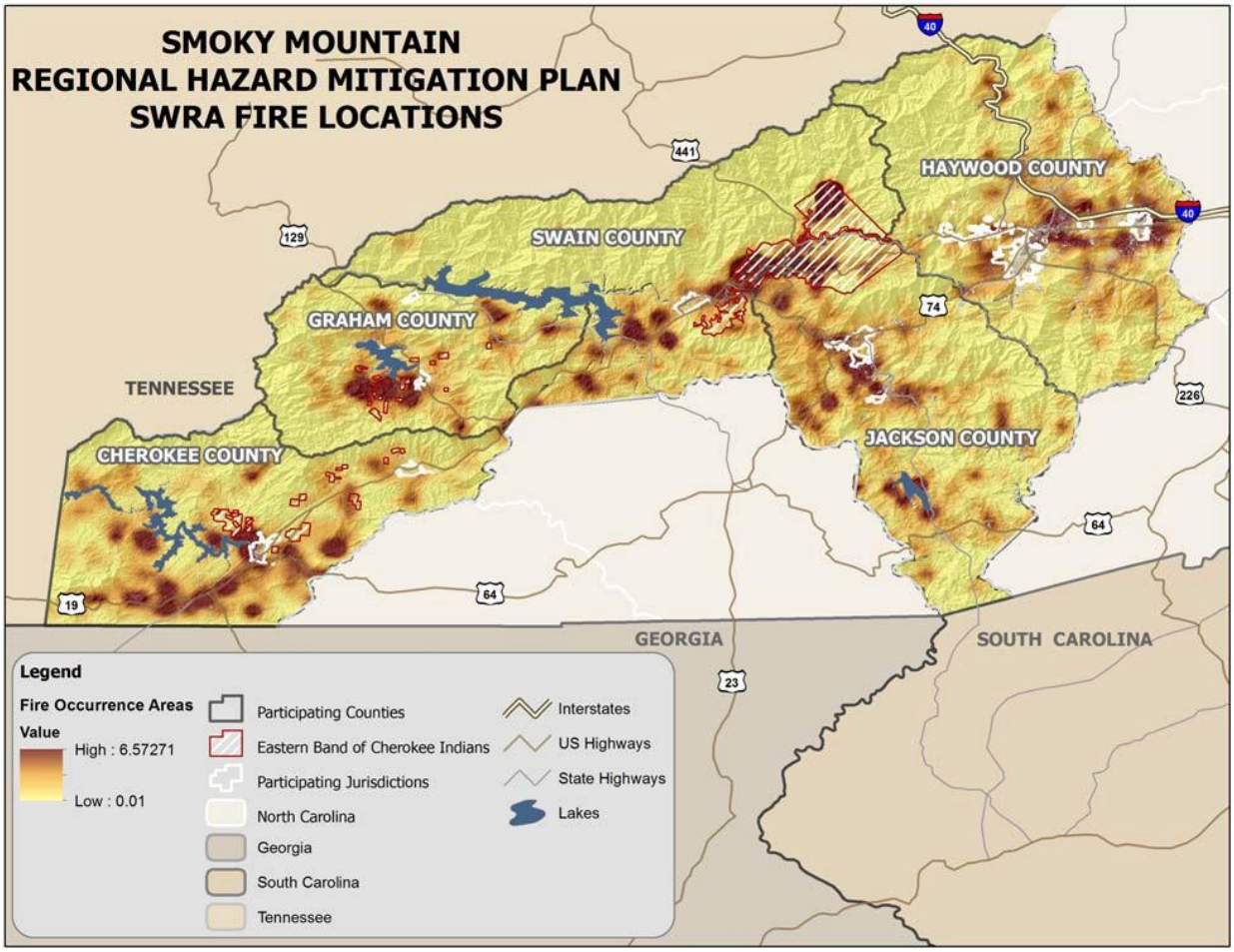
Source: US Department of Agriculture

Appendix G displays the WUI Risk Index for the counties and municipalities in the Smoky Mountain Region.

5.11.3 Historical Occurrences

Figure 5.20 shows the Fire Occurrence Areas (FOA) in the Smoky Mountain 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 5.20: HISTORIC WILDFIRE EVENTS IN THE SMOKY MOUNTAIN REGION



Source: Southern Wildfire Risk Assessment

Information from the National Association of State Foresters was used to ascertain historical wildfire events. The National Association of State Foresters reported that a total of 2,145 events that burned a total of 46,980.8 acres that impacted an area greater than 1 acre have occurred throughout the Smoky Mountain Region since 2002[25]. Data indicates that most of these fires are small, averaging four acres per fire. A summary of these events is presented in **Table 5.28**. Table **5.29** lists the number of reported wildfire occurrences in the participating counties between the years 2002 and 2018.

It should be noted that 2016 saw a spike in the number of acres burned by wildfires, particularly in Graham, Swain, and Jackson Counties. More information on the 2016 wildfires is located at the end of this section

[25] These events are only inclusive of those reported by NASFI. It is likely that additional occurrences have occurred and have gone unreported.

TABLE 5.28: SUMMARY OF WILDFIRE INCIDENTS (2002-2018)

Location	Number of Wildfires	Total Acres Burned
Cherokee County	663	2209.0
Graham County	162	18948.5
Haywood County	548	2634.6
Jackson County	522	3700.2
Swain County	250	19488.5
Eastern Band of Cherokee Indians	--	--
Smoky Mountains Region Total	**2145**	**46980.8**

Source: NASF

TABLE 5.29: HISTORICAL WILDFIRE OCCURRENCES IN THE SMOKY MOUNTAIN REGION

	Cherokee County		Graham County		Haywood County		Jackson County		Swain County	
Year	Number of Fires	Number of Acres	Number of Fires	Number of Acres	Number of Fires	Number of Acres	Number of Fires	Number of Acres	Number of Fires	Number of Acres
2002	33	109.1	12	163.6	59	325.7	41	156.9	19	23.6
2003	23	86	1	3	23	22.6	27	40.7	10	29.1
2004	51	109	20	175.6	63	220.1	60	128.1	22	152.9
2005	45	118.6	7	6.2	41	216	33	185	24	149.2
2006	95	224.7	16	26.5	71	278.2	57	540.1	24	163.1
2007	84	313.3	19	125.8	55	260.9	75	365.6	23	405.2
2008	68	366.9	9	117.5	44	553.6	53	95.2	28	265.6
2009	50	66.1	8	17	54	59.7	44	76	13	104.1
2010	43	44.6	17	33.3	24	25.9	30	147.1	24	284.5
2011	46	140.7	2	9	25	42.9	20	45.5	18	50.2
2012	20	43	8	189	2	3	11	76	6	50
2013	13	65	1	2	10	63	5	11	4	19
2014	30	115	2	19	2	17	10	127	5	29
2015	12	102	6	69	13	155	5	25	0	0
2016	30	236	29	17873	42	223	36	1595	21	17687
2017	11	41	2	52	12	106	10	42	6	73
2018	9	28	3	67	8	62	5	44	3	3

Source: North Carolina Division of Forest Resources

2016 Wildfires

In the late October through November of 2016, western North Carolina suffered from what are considered to be wildfires of historic extent. In November alone, western North Carolina experienced an outbreak of wildfires that burned over 55,000 acres in the wake of an extreme drought.[26] Graham County and Swain County were particularly hard hit. In Graham County, two fires burned over 8,000 acres near Lake Santeetlah. One of which, the Maple Springs Fire, burned over 7,500 acres before being contained.[27]

[26] http://www.charlotteobserver.com/news/local/article114911183.html
[27] http://wlos.com/news/local/boteler-fire-and-nantahala-branch-fires-update

Another fire in Graham County required evacuations. In Swain County, residents of six streets were forced to evacuate after a fire burned over 6,800 acres.[28]

The Tellico Fire, which burned on the Swain County-Macon County border, burned over 13,600 acres before being contained. Homes in the Tellico and Queen Creek communities were only several hundred feet from the fire, and faced a voluntary evacuation. This prompted a state of emergency to be declared for the county.[29]

Jackson County also experienced an increase in acres burned, with 1,064 acres burned in 2016 compared to 203 acres burned per year on average. In addition, dozens of fires were reported on the Qualla Boundary, totaling over 480 acres burned.[30]

Firefighting and rescue crews from all over the state traveled to western North Carolina to aid in relief efforts. According to the USDA's Joint Information Center Western NC Wildfires, by November 25, 2016, nine incident management teams and over 6,000 state and federal personnel from all over the country were deployed to assist the Southeast with fire suppression, in addition to hundreds of state volunteer firefighters and emergency personnel. At the time, North Carolina alone was in use of seven airplanes, eight single engine air tankers (SEATs), six type 1 (large) helicopters, five type 2 (medium) helicopters, and three type 3 (large helicopters) to aid in fire suppression.[32] The USDA estimates that suppression costs from October through December in western North Carolina totaled $36.8 million.[31]

In addition to the impacts to human and environmental health and safety, the fires had a significant impact on the region's economy, which relies heavily on tourism during the fall and winter months.[32]

Eastern Band of Cherokee Indians

(*Taken from the 2011 EBCI plan*) According to the 2001 Fire Management Plan, there were a total of 174 fires reported on the EBCI Reservation between 1986 and 1997, burning a total of 906.9 acres. Of these fires 71% have been caused by debris burning, although other causes include smoking, children, as well as miscellaneous causes.

In addition to the detail provided above, two events were reported in local newspapers for the EBCI Reservation lands, one in 2001 and one in 2009. No additional information about the size, severity, extent, or damages was provided.

- March 26, 2001: A forest fire on Qualla Boundary burned about 110 acres but did not threaten any structures. (*Source: Star News*).
- April 27, 2009: A downed power line in the Big Cove community of the Qualla Boundary sparked dry vegetation. In total, 2,200 acres were burned with a small number of those being within Great Smoky Mountains Park. Most of the fire was in the Big Cove community and at one point the fire approached several homes but did not continue into that area. The fire circled the mountain and zigzagged upward along the peak and down the other side. This fire is known as the Stony Ridge Fire. (*Source: National Park*

[28] http://wlos.com/news/local/mandatory-evacuations-issued-in-swain-county-because-of-wildfires
[29] https://inciweb.nwcg.gov/incident/photograph/5084/19/61188/
[30] http://wlos.com/news/local/fire-updates-dires-greater-than-6000-acres-burn-in-swain-and-graham-counties
[31] UDA Forest Services Joint Information Center Western NC Wildfires. Evening Summary (2016, November 25). Retrieved from https://www.fs.usda.gov/detail/nfsnc/alerts-notices/?cid=fseprd525902
[32] http://www.citizen-times.com/story/news/local/2017/03/31/wnc-wildfires-yield-hefty-price-tag/99736410/

Service).

5.11.4 Probability of Future Occurrences

Wildfire events will be an ongoing occurrence in the Smoky Mountain 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. Dry, windy conditions with an accumulation of forest floor fuel (potentially due to ice storms or lack of fire) could create conditions for a large fire that spreads quickly. It should also be noted that some areas do vary somewhat in risk. For example, highly developed areas are less susceptible unless they are located near the urban-wildland boundary. The risk will also vary due to assets. Areas in the urban-wildland interface will have much more property at risk, resulting in increased vulnerability and need to mitigate compared to rural, mainly forested areas. The probability assigned to the Smoky Mountain Region for future wildfire events is likely (a 10 and 100 percent annual probability).

5.12 INFECTIOUS DISEASE

5.12.1 Background and Description

For the purposes of this plan, this section will assess infectious diseases and vector-borne diseases within the Smoky Mountains region.

Infectious Disease

Communicable, or infectious, diseases are conditions that result in clinically evident illness which are transmissible directly from one person to another or indirectly through vectors such as insects, air, water, blood, or other objects. The impact of communicable disease can range from the mild effects of the common cold to the extreme lethality of pneumonic plague or anthrax. The public health system in the United States was developed in large part as a response to the often urgent need to respond to or prevent outbreaks of communicable diseases. Through public health methods of disease reporting, vaccinations, vector control, and effective treatments, most communicable diseases are well controlled in the United States and across the Smoky Mountain region. However, control systems can fail and when people come together from locations outside of the state, outbreaks can occur, even in the most modern of communities. In this section, some of the more significant potential communicable disease concerns are described.

The threats discussed in this section usually do not occur on a regular basis, though some are more frequent. The diseases described herein do not originate from intentional exposure (such as through terrorist actions) but do present significant issues and concerns for the public health community. There are numerous infectious diseases that rarely, if ever, occur in the State of North Carolina, such as botulism or bubonic plague. Some highly dangerous diseases which could potentially be used as biological weapons, such as anthrax, pneumonic plague, and smallpox, are safely housed and controlled in laboratory settings such as at the Center for Disease Control and Prevention (CDC). Other diseases have not (yet) mutated into a form that can infect humans, or otherwise lie dormant in nature.

There have been several significant viral outbreaks from emerging diseases in recent years of both national and international importance. The Zika virus and West Nile virus are viruses that are typically passed to humans or animals by mosquitoes and made major news as emergent disease threats. Meanwhile, diseases that are spread directly between human beings such as Severe Acute Respiratory Syndrome (SARS) and Ebola have also been identified as serious threats. While each of these conditions caused a great deal of public health concern when they were first identified, SARS has virtually disappeared, West Nile virus

occurs with low frequency and causes serious disease in only a very small percentage of cases, Ebola has been more or less contained and a vaccine is in development, and many people infected with Zika will not experience symptoms from the disease.

Other communicable diseases pose a much more frequent threat to the citizens of in the region. Some of the infectious diseases of greatest concern include influenza, particularly in a pandemic form, as well as norovirus, and multiple antibiotic-resistant tuberculosis. Even in one of its normal year-to-year variants, influenza (commonly referred to as “flu”) can result in serious illness and even death in young children, the elderly and immune-compromised persons.

The Covid-19 pandemic, which was first found in the region in the Spring of 2020 and is further discussed below, proves that there is always the potential risk of the emergence of influenza in one of the pandemics H1N1 forms. Other examples of this include the “Spanish Flu” outbreak of 1918-19, which killed over 50 million people worldwide. Every year, North Carolina sees hundreds of cases of influenza, leading to hundreds of hours of lost productivity in businesses due to sick employees. Of note, a vaccine for influenza is produced every year and, according to the CDC, is highly effective in preventing the disease.

Norovirus is recognized as the leading cause of foodborne-disease outbreaks in the United States. The virus can cause diarrhea, vomiting, and stomach pain, and is easily spread from person to person through contaminated food or water and by surface to surface contact. Especially vulnerable populations to this virus include those living or staying in nursing homes and assisted living facilities and other healthcare facilities such as hospitals. Norovirus could also be a threat in the event of large public gatherings such as sporting events, concerts, festivals, and so forth. North Carolina often experiences norovirus outbreaks on an annual basis. No vaccine or treatment exists for the Norovirus, making it especially dangerous for the public in the event of an outbreak.

Public health threats can occur at any time and can have varying impacts. Discussions between public health professionals, planning officials, and first response agencies are essential in order to facilitate safe, effective, and collaborative efforts toward outbreaks.

Vector-Borne Diseases

Bacterial, viral and parasitic diseases that are transmitted by mosquitoes, ticks and fleas are collectively called "vector-borne diseases" (the insects and arthropods are the "vectors" that carry the diseases). Although the term "vector" can also apply to other carriers of disease — such as mammals that can transmit rabies or rodents that can transmit hantavirus — those diseases are generally called zoonotic (animal-borne) diseases.

The most common vector-borne diseases found in North Carolina and the Smoky Mountains region are carried by ticks and mosquitoes. The tick-borne illnesses most often seen in the state are Rocky Mountain Spotted Fever, ehrlichiosis, Lyme disease and Southern Tick-Associated Rash Illness (STARI). The most frequent mosquito-borne illnesses, or "arboviruses," in North Carolina include La Crosse encephalitis, West Nile virus and Eastern equine encephalitis. An outbreak of the West Nile Virus began showing up in the United States in 1999, with North Carolina reporting 63 cases from that time through the end of 2016.

5.12.2 Location and Spatial Extent

Extent is difficult to measure for an infectious disease event as the extent is largely dependent on the type of disease and on the effect that it has on the population (discussed above). Extent can be somewhat defined by the number of people impacted, which depending on the type of disease could number in the

tens of thousands within the state.

5.12.3 Historical Occurrences

Infectious Disease

Information from the North Carolina Department of Health and Human services was used to monitor and track cases of the infectious disease COVID-19. A COVID-19 Pandemic disaster declaration was declared for North Carolina on March 24, 2020. **Table 5.30** provides a summary of confirmed cases of COVID–19 in the Smoky Mountains Region as of June 26, 2022.

TABLE 5.30: SUMMARY OF CONFIRMED COVID-19 CASES IN THE SMOKY MOUNTAINS REGION

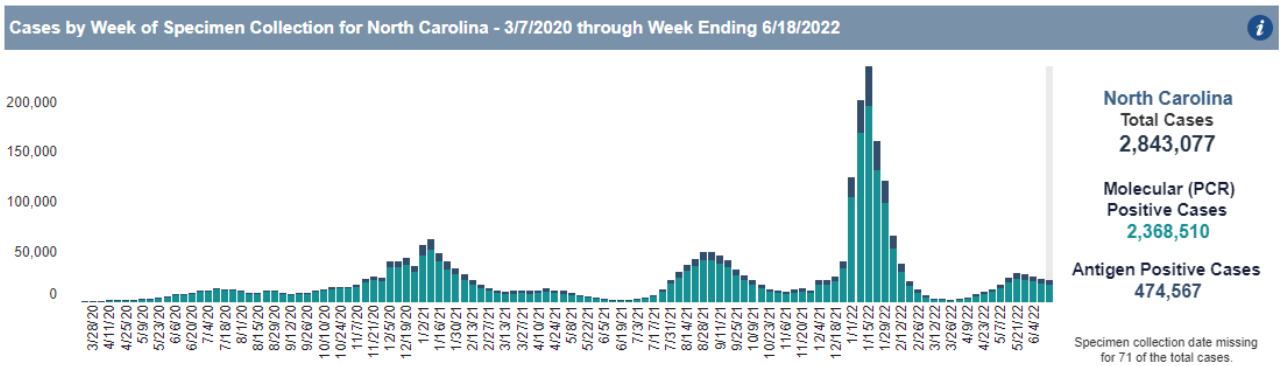
Location	Number of Cases	Number of Deaths*
Cherokee County	7,309	125
Graham County	2,332	31
Haywood County	13,895	223
Jackson County	10,199	99
Swain County	3,873	42
Eastern Band of Cherokee Indians[33]	3,721	32
Smoky Mountains Region Total	**41,329**	**552**

Source: North Carolina Department of Health and Human Services
**Deaths reflect deaths in persons with laboratory-confirmed COVID-19 reported by local health departments to the NC Department of Health and Human Services*

As of June 26, 2022, NC DHHS reported there were 2,843,077 cases of COVID-19 in North Carolina[34]. These cases reflect cases that were tested and returned positive, including the NC State Laboratory of Public Health and reporting hospital and commercial labs. **Figure 5.21** below provides overview of the total number of COVID-19 cases by date of specimen collection for North Carolina.

[33] https://ebci.com/wp-content/uploads/2020/08/EBCI-COVID-19-Dashboard-6-15-22.pdf
[34] https://www.ncdhhs.gov/covid-19-case-count-nc#by-counties

FIGURE 5.21: CUMULATIVE TOTAL NUMBER OF COVID-19 CASES BY DATE OF SPECIMEN COLLECTION*



Source: North Carolina Department of Health and Human Services
**All data are preliminary and might change as cases are investigated. Numbers may not sum to 100% due to rounding*

Vector-Borne Diseases
In 2016, North Carolina state health officials encouraged citizens to take preventative measures against mosquito bites to avoid contracting the Zika virus. $477,500 dollars was allocated from the Governor's yearly budget to develop an infrastructure to detect, prevent, control, and respond to the Zika virus and other vector-borne illnesses[35].

5.12.4 Probability of Future Occurrences
It is difficult to predict the future probability of infectious diseases due to the difficulty with obtaining information on this type of hazard. The most common and probable disease in the state has shown to be influenza; however, based on historical data, it is relatively unlikely (between 1 and 33.3 percent annual probability) that the Buncombe-Madison region will experience an outbreak of infectious diseases in the future.

Technological Hazards

5.13 Hazardous Substances

5.13.1 Background and Description
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

[35] https://www.ncdhhs.gov/news/press-releases/nc-prepared-zika-virus-risk-local-virus-carrying-mosquitoes-low

266 are due to other causes[36]. 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.

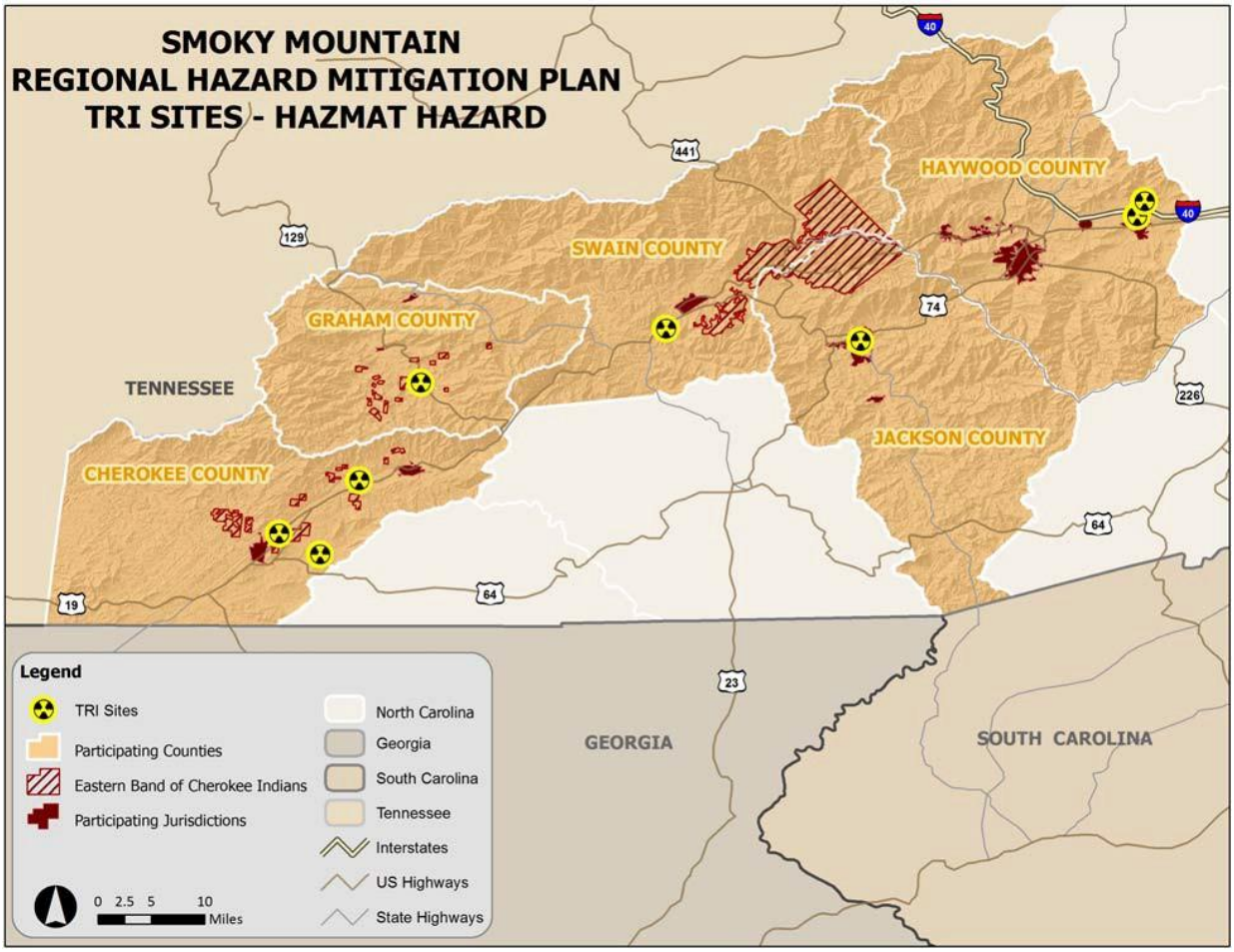
Hazardous material incidents can include the spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment of a hazardous material, but exclude: (1) any release which results in exposure to poisons solely within the workplace 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.

5.13.2 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 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 Smoky Mountain Region has eight TRI sites. These sites are shown in **Figure 5.22.**

[36] FEMA, 1997.

FIGURE 5.22: TOXIC RELEASE INVENTORY (TRI) SITES IN THE SMOKY MOUNTAIN REGION



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.

5.13.3 Historical Occurrences

The U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA) lists historical occurrences throughout the nation. A "serious incident" 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 material "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 5.31 presents detailed information on historic HAZMAT incidents reported in the Smoky Mountain Region.

TABLE 5.31: SUMMARY OF HAZMAT INCIDENTS IN THE SMOKY MOUNTAIN REGION

Location	Number of Occurrences	Deaths	Injuries	Property Damage (2020)
Cherokee County	**3**	**0**	**0**	**$0**
Andrews	0	0	0	$0
Murphy	3	0	0	$0
Unincorporated Area	0	0	0	$0
Graham County	**1**	**0**	**0**	**$0**
Fontana*	0	0	0	$0
Lake Santeetlah	0	0	0	$0
Robbinsville	1	0	0	$0
Unincorporated Area	0	0	0	$0
Haywood County	**32**	**0**	**0**	**$168,961**
Canton	12	0	0	$10,579
Clyde	5	0	0	$84,950
Maggie Valley	1	0	0	$4,000
Waynesville	14	0	0	$69,792
Unincorporated Area	0	0	0	$0
Jackson County	**9**	**0**	**0**	**$2,115**
Dillsboro	0	0	0	$0
Forest Hills	0	0	0	$0

Sylva	7	0	0	$0
Webster	0	0	0	$0
Unincorporated Area	2	0	0	$2,115
Swain County	**13**	**0**	**0**	**$2,115**
Bryson City	11	0	0	$0
Unincorporated Area	2	0	0	$2,115
Eastern Band of Cherokee Indians				
SMOKY MOUNTAIN REGION TOTAL	**58**	**0**	**0**	**$173,191**

Source: US Department of Transportation Pipeline and Hazardous Materials Safety Administration

5.13.4 Probability of Future Occurrence

Given the location of eight toxic release inventory sites in the Smoky Mountain Region and several serious roadway incidents, it is possible that a hazardous material incident may occur in the region, though it is unlikely (less than one percent annual probability). County, municipal and Tribal officials are mindful of this possibility and take precautions to prevent such an event from occurring. Furthermore, there are detailed plans in place to respond to an occurrence.

5.14 Radiological Emergency – Fixed Nuclear Facilities

5.14.1 Background and Description

Although not referenced in the previous Smoky Mountain Hazard Mitigation Plan, radiological emergencies will be assessed in this update.

A nuclear and radiation accident is defined by the International Atomic Energy Agency as "an event that has led to significant consequences to people, the environment or the facility. Often, this type of incident results from damage to the reactor core of a nuclear power plant which can release radioactivity into the environment. The degree of exposure from nuclear accidents has varied from serious to catastrophic. While radiological emergencies generally are a rare occurrence, many incidents are extremely well known due to their large-scale impact and serious effects on people
and the environment.

The Oconee Nuclear Station, which is the plant located closest to the Smoky Mountain Region, is located on Lake Keowee near Seneca, South Carolina, and has an energy output capacity of over 2,500 megawatts. The plant operates with a very high level of security.

The Watts Bar Nuclear Plant, which is located close to Cherokee County in the Smoky Mountain region, is located in Rhea County, Tennessee, near Spring City. It has two Westinghouse pressurized water reactor units, which produce from their two reactors: 1,167 megawatts and 1,165 megawatts[37].

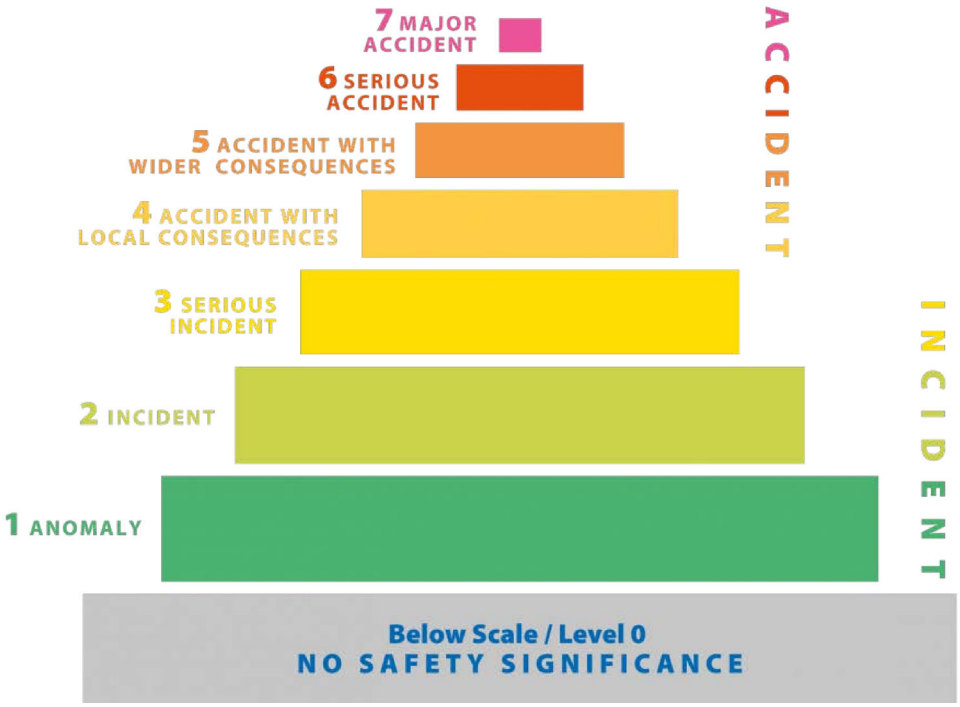
5.14.2 Location and Spatial Extent

Only Cherokee, Haywood and Jackson County are susceptible to a nuclear emergency. The International Atomic Energy Association has developed a scale called the International Nuclear and Radiological Event Scale (INES) which provides a quantitative means of assessing the extent of a nuclear event. This scale, like

[37] https://www.tva.com/energy/our-power-system/nuclear/watts-bar-nuclear-plant

the MMI used for earthquakes, is logarithmic which means that each increasing level on the scale represents an event 10 times more severe than the previous level (**Figure 5.23**).

FIGURE 5.23: INTERNATIONAL NUCLEAR EVENT SCALE

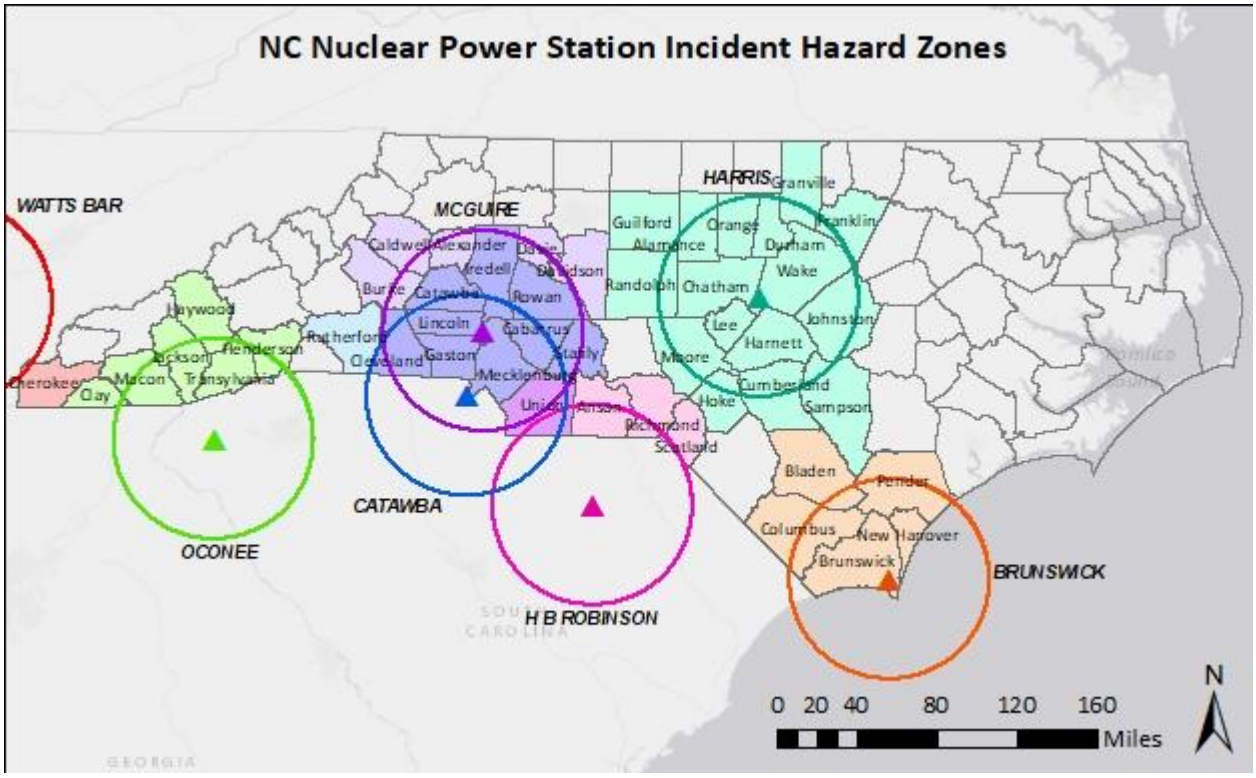


Source: International Atomic Energy Agency

The Nuclear Regulatory Commission defines two emergency planning zones around nuclear plants. Areas located within 10 miles of the station are considered to be within the zone of highest risk to a nuclear incident and this radius is the designated evacuation radius recommended by the Nuclear Regulatory Commission. Within the 10-mile zone, the primary concern is exposure to and inhalation of radioactive contamination. The most concerning effects in the secondary 50-mile zone are related to ingestion of food and liquids that may have been contaminated. All areas of the counties that are not located within the 10-mile radius are located within this 50-mile radius that is still considered to be at risk from a nuclear incident.

Cherokee County is located within 50 miles of the Watts Bar Nuclear Plant, and Jackson and Haywood are within 50 miles of the Oconee Nuclear Station. Particularly, the southern part of Haywood County is susceptible to a nuclear emergency. Also, Watts Bar Nuclear Plant only touches a small swath of land on the western edge of Cherokee County in the Smoky Mountain region, as seen in **Figure 5.24** below.

FIGURE 5.24: NORTH CAROLINA NUCLEAR POWER STATIONS AND INCIDENT HAZARD ZONES



Source: International Atomic Energy Agency

5.14.3 Historical Occurrences

Although there have been no major nuclear events at the Oconee Nuclear Station or the Watts Bar Nuclear Plant, there is some possibility that one could occur as there have been incidents in the past in the United States at other facilities and at facilities around the world.

5.14.4 Probability of Future Occurrences

A nuclear event is a very rare occurrence in the United States due to the intense regulation of the industry. There have been incidents in the past, but it is considered unlikely (less than 1 percent annual probability).

5.15 Terrorism

5.15.1 Background and Description

Terrorism was not referenced in the previous Smoky Mountain Regional Hazard Mitigation Plan, but is addressed in this update. For the purpose of this report, terrorism encompasses explosive, chemical biological, nuclear, and other threats.

Terrorism is defined in the United States by the Code of Federal Regulations is “the unlawful use of force or violence against persons or property to intimidate or coerce a government, civilian population, or any segment thereof, in furtherance of political or social objectives.” Terrorist acts may include assassinations, kidnappings, hijackings, bombings, small arms attacks, vehicle ramming attacks, edged weapon attacks, incendiary attacks, cyber-attacks (computer based), and the use of chemical, biological, nuclear and radiological weapons. For the purposes of this plan, cyber-attacks are included as a separate hazard.

Historically the main categories of weapons of mass destruction (WMDs) used in terror attacks are Chemical, Biological, Radiological, Nuclear, and Explosive (collectively referred to as CBRNE). As we rank these categories, considering immediate danger posed, impact, probability, technical feasibility, frequency, and historical success, they are typically ranked in the following way.

Explosive
Explosive attacks lead all others due to their immediate danger to life and health, immediate and measurable impact, high probability, low cost/easy degree of technical feasibility, and a long history of successful attacks.

Chemical
Chemical attacks can pose immediate danger to life and health depending upon the materials used. Chemicals are easy to access, low cost, and easy to deploy. Chemical terrorism can have high and persistent impacts to people and places. These types of attacks are probable and have enjoyed historical success.

Radiological
Radiological attacks can pose significant threats to life and health depending upon the specific materials used. Radiological materials while restricted and regulated are accessible to people with some knowledge in this discipline. While radiological incidents have occurred, they occur less frequently than explosive and chemical attacks.

Biological
Biological attacks can pose significant threats to life and health. They are typically deployed as diseases and bio-toxins. They require some degree of technical expertise in order to be deployed successfully. While biological incidents have occurred, they occur less frequently than explosive and chemical attacks.

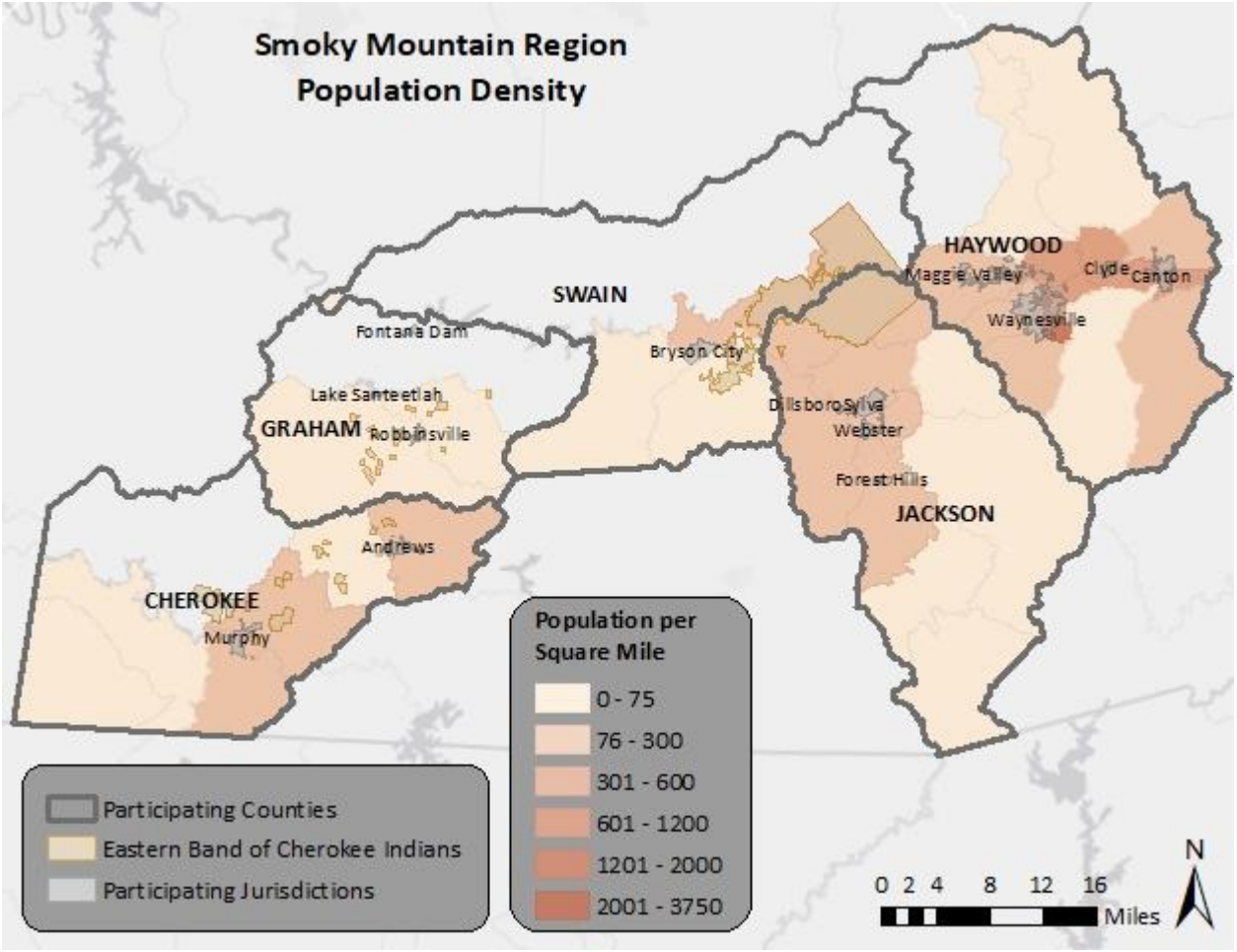
Nuclear
While yielding a very high impact, the nuclear attack is extremely rare due to the fact that it is cost prohibitive and very technically difficult to achieve. This type of attack, however, could be state sponsored which makes it viable.

OTHER
Terrorism Hazard Assessment must also account for modern trends and changes. An additional “OTHER” category should be considered that includes small arms attacks, vehicle ramming attacks, edged weapon attacks, and incendiary attacks.

5.15.2 Location and Spatial Extent

All parts of North Carolina are vulnerable to a terror event; however, terrorism tends to target more densely populated areas. The map in **Figure 5.25** displays the population density in each county in the Smoky Mountain Region using census tract levels.

FIGURE 5.25: POPULATION DENSITY IN SMOKY MOUNTAINS REGION



Source: US Census Bureau

Furthermore, the most recent population counts of each participating county and jurisdictions can be seen in **Table 5.32** below.

TABLE 5.32: 2018 POPULATION ESTIMATES

Location	2018 Population Estimate
Cherokee County	**28,383**
Andrews	1,781
Murphy	1,627
Unincorporated Area	24,975
Graham County	**8,484**
Fontana	7
Lake Santeetlah	42
Robbinsville	620
Unincorporated Area	7,815
Haywood County	**61,971**
Canton	4,227
Clyde	1,223

Maggie Valley	1,150
Waynesville	9,869
Unincorporated Area	45,502
Jackson County	**43,327**
Dillsboro	232
Forest Hills	365
Sylva	2,558
Webster	363
Unincorporated Area	39,809
Swain County	**14,245**
Bryson City	1,424
Unincorporated Area	12,821
Eastern Band of Cherokee Indians	
SMOKY MOUNTAIN REGION TOTAL	**156,410**

Source: US Census Bureau, NC Office of Budget and Management

5.15.3 Historical Occurrences

No extreme cases of terror attacks have previously affected the Smoky Mountains region. However, as the population in the area continues to increase, so does the chance of an attack.

5.15.4 Probability of Future Occurrences

The Smoky Mountains region has experienced no major terrorist attacks, but the area's population is continuing to rise. The probability of future occurrences of a terrorist attack, while unlikely (between 1 and 10 percent annual probability) is a real possibility that the area must be prepared for.

5.16 Cyber

5.16.1 Background and Description

Cyberattacks are deliberate attacks on information technology systems in an attempt to gain illegal access to a computer, or purposely cause damage. As the world and the Smoky Mountains region become more technologically advanced and dependent upon computer systems, the threat of cyberattacks is becoming increasingly prevalent. Also known as computer network attacks, cyberattacks are difficult to recognize and typically use malicious code to alter computer data or steal information.

Mitigating and preparing for cyberattacks is challenging because of how diverse and complex attacks can be. The FBI is the lead federal agency for investigating cyberattacks by criminals, overseas adversaries, and terrorists. In North Carolina, the Department of Information Technology is the lead agency that maintains Cybersecurity and Risk Management resources.

Cyberattacks can happen in both the public and private sector. They may be carried out by a specific individual, or by groups from afar. Many attacks attempt to steal money or to disturb normal operations. According to the 2017 Verizon Report of Data Breaching, 93% of all data breaches had a financial or espionage motive, and espionage cases are rising.

There are many types of cyberattack incident patterns, which include:

- Web App Attacks: Incidents in which web applications were attacked, which can include exploiting code-level vulnerabilities in the application.

- Point-of-Sale Intrusions: Remote attacks against environments where card-present retail transactions are conducted.
- Insider and Privilege Misuse: Unapproved or malicious use of organizational resources.
- Miscellaneous Errors: Incidents in which unintentional actions directly compromise an attribute of a security asset.
- Physical Theft and Loss: Incidents where an information asset went missing.
- Crimeware: Instances involving malware that do not fit into a more specific pattern.
- Payment Card Skimmers: Incidents involving skimming devices physically implanted on an asset that reads magnetic stripe data from payment cards.
- Cyber-espionage: Unauthorized network or system access linked to state-affiliated actors.
- Denial-of-Service Attacks: Any attack intended to compromise the availability of networks and systems that are designed to overwhelm systems, resulting in performance degradation or interruption of service.

Figure 5.26 below displays nationwide cyberattack incident patterns from the 2018 Verizon Data Breach Investigations Report.

FIGURE 5.26: PERCENTAGE AND COUNTS OF INCIDENTS PER PATTERN

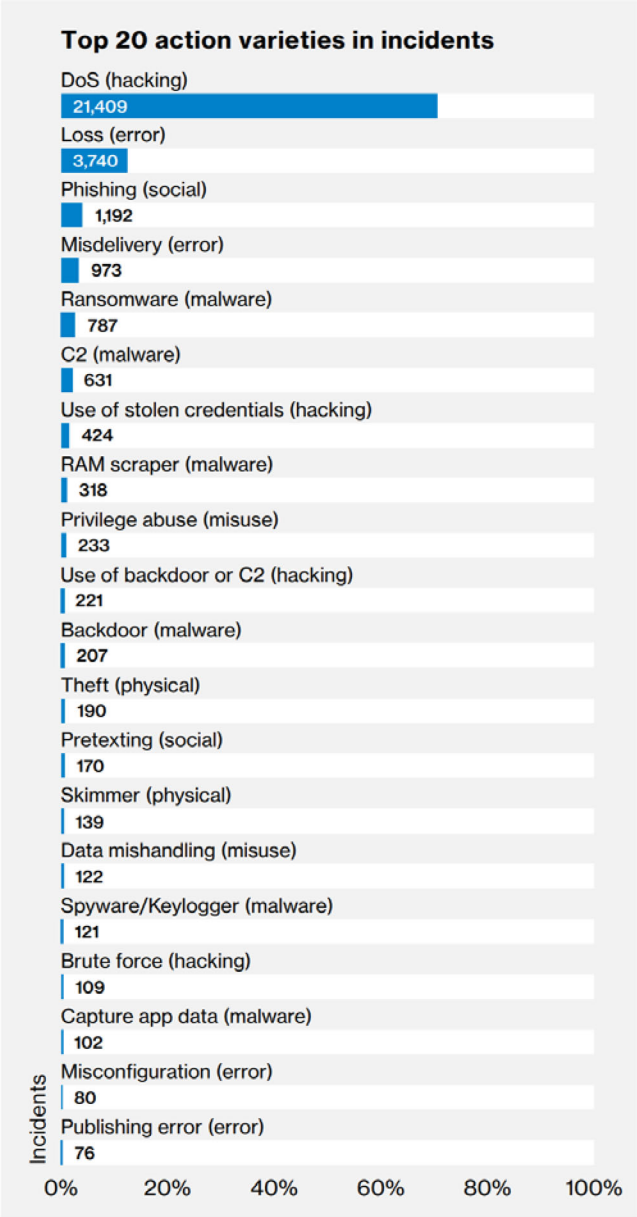


Figure 4. Top 20 threat action varieties (incidents) (n=30,362)

Source: 2018 Verizon Data Breach Investigations Report

5.16.2 Location and Spatial Extent

Cyberattacks happen all over the world and are not restricted to a certain locational boundary. They tend to affect the public industry rather than private industries.

5.16.3 Historical Occurrences

In North Carolina and the Smoky Mountains region, the Department of Information Technology specializes in cybersecurity and risk management. Within the department, the NC Information Sharing and Analysis Center gathers information on cyber threats within the State raise cybersecurity.

In 2016, North Carolina reported the highest number of cybercrimes in the "non-payment/non-delivery" sector, which can be seen in **Table 5.32** below.

TABLE 5.32: NORTH CAROLINA CYBERCRIMES AND VICTIM COUNTS IN 2016

Crime Type by Victim Count			
Crime Type	*Victim Count*	*Crime Type*	*Victim Count*
419/Overpayment	614	Health Care Related	10
Advanced Fee	384	IPR/Copyright and Counterfeit	58
Auction	442	Identity Theft	345
BEC/EAC	254	Investment	28
Charity	10	Lottery/Sweepstakes	119
Civil Matter	28	Malware/Scareware	62
Confidence Fraud/Romance	326	Misrepresentation	102
Corporate Data Breach	74	No Lead Value	121
Credit Card Fraud	274	Non-payment/Non-Delivery	1,844
Crimes Against Children	19	Other	218
Criminal Forums	0	Personal Data Breach	569
Denial of Service	28	Phishing/Vishing/Smishing/Pharming	399
Employment	467	Ransomware	67
Extortion	468	Re-shipping	25
Gambling	1	Real Estate/Rental	280
Government Impersonation	319	Tech Support	298
Hacktivist	2	Terrorism	6
Harassment/Threats of Violence	364	Virus	29
Descriptors*			
Social Media	455	Virtual Currency	38

Source: FBI Internet Crime Complaint Center, 2016

5.16.4 Probability of Future Occurrences

As the world's dependency on technology grows, the possibility of experiencing cyberattacks rises as well. There have not been severe past occurrences in the region, and it is considered unlikely (less than 1 percent annual probability) to experience one in the near future.

5.17 Electromagnetic Pulse

5.17.1 Background and Description

The United States Department of Energy defines electromagnetic pulses (EMPs) as "intense pulses of electromagnetic energy resulting from solar-caused effects or man-made nuclear and pulse power devices." EMPs can be naturally occurring or human-caused hazards. Examples of natural EMP events include:

- Lightning electromagnetic pulse
- Electrostatic discharge
- Meteoric electromagnetic pulse, and
- Coronal mass ejection, also known as a solar electromagnetic pulse.

A human-caused EMP (such as a nuclear EMP) is a technological hazard that can cause severe damage to electrical components attached to power lines or communication systems. One of the most complex aspects of EMPs is the fact they are invisible, unpredictable, and rapid. They can also overload electronic devices that people heavily rely on every day. EMPs are harmless to people biologically; however, an EMP attack could damage electronic systems such as planes or cars. This could cause destruction of property and life and potentially generate disease or societal collapse.

In 2015, Congress amended the Homeland Security Act of 2002 by passing the Critical Infrastructure Protection Act (CIPA), which protects Americans from an EMP. It also required reporting of EMP threats, research and development, and a campaign to educate planners and emergency responders about EMP events.

5.17.2 Location and Spatial Extent

An EMP can happen in any location, and they are relatively unpredictable. Due to advancing technologies, densely populated may be more prone to damages from an EMP. Therefore, bigger cities in the Smoky Mountains region may be more susceptible.

5.17.3 Historical Occurrences

There have been no reports of EMP occurrences in the Smoky Mountains region.

5.17.4 Probability of Future Occurrences

The probability of an EMP is unlikely (less than 1 percent annual probability), but an occurrence could have catastrophic impacts.

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.

5.18.1 Hazard Extent

Table 5.33 describes the extent of each natural hazard identified for the Smokey Mountain Region. The extent of a hazard is defined as its severity or magnitude, as it relates to the planning area.

TABLE 5.33 EXTENT OF SMOKY MOUNTAIN REGION HAZARDS

Natural 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 (**Table 5.4**). According to the North Carolina Drought Monitor Classifications, the most severe drought condition is Exceptional. The Smoky Mountains region experienced drought conditions for 18 of the last 19 years (2000 - 2019).
Hurricane and Tropical Storm Hazards	Hurricane extent is defined by the Saffir-Simpson Scale which classifies hurricanes into Category 1 through Category 5 (**Table 5.6**). No hurricanes have reportedly traversed directly through the region. But, 7 tropical depressions and one tropical storm have traversed directly through the region. The greatest classification to directly impact the region was Tropical Storm in 1975 which reached a maximum wind speed of ~54 knots.

Tornadoes / Thunderstorms	Tornadoes: Tornado hazard extent is measured by tornado occurrences in the US provided by FEMA (**Figure 5.7**) as well as the Fujita/Enhanced Scale (**Tables 5.9**). The greatest magnitude reported as an F1, which occurred on several occasions in the region. *Cherokee County*: F4 *Graham County*: F2 *Haywood County*: F1 *Jackson County*: F2 *Swain County*: F2 *Eastern Band of Cherokee Indians*: F4 Thunderstorms: Thunderstorm extent is defined by the number of thunder events and wind speed reported. According to a 63-year history from the National Centers for Environmental Information, the strongest recorded wind speed event in the Smoky Mountains region was reported on November 18, 2003 at 70 knots (approximately 80 mph). It should be noted that future events may exceed these historical occurrences. *Cherokee County*: 70 knots *Graham County*: 65 knots *Haywood County*: 60 knots *Jackson County*: 70 knots *Swain County*: 60 knots *Eastern Band of Cherokee Indians*: 50 knots Lightning: According to the Vaisala flash density map (**Figure 5.8**), a majority of the Smoky Mountains region is located in an area that experiences 3 to 6 per square mile per year. It should be noted that future lightning occurrences may exceed these figures. Hailstorms: Hail extent can be defined by the size of the hail stone. The largest hail stone reported in the Smoky Mountains region was 3.00 inches (reported on April 3, 1974). It should be noted that future hailstorm occurrences may exceed these figures. *Cherokee County*: 1.75 inches *Graham County*: 3.00 inches *Haywood County*: 1.75 inches *Jackson County*: 1.75 inches *Swain County*: 1.25 inches *Eastern Band of Cherokee Indians*: 0.75 inches

Severe Winter Weather	The extent of winter storms can be measured by the amount of snowfall received (in inches). The greatest 24-hour snowfall reported in the region was 21 inches on March 13, 1993. Due to extreme variations in elevation throughout the region, extent totals will vary for each participating jurisdiction and reliable data on snowfall totals is not available. *Cherokee County*: 18 inches *Graham County*: 12 inches *Haywood County*: 21 inches *Jackson County*: 17 inches *Swain County*: 16 inches *Eastern Band of Cherokee Indians*: Between 12 – 26 inches
Earthquakes	Earthquake extent can be measured by the Richter Scale (**Table 5.16**) and the Modified Mercalli Intensity (MMI) Scale (**Table 5.17**) and the distance of the epicenter from the Smoky Mountains region. According to data provided by the National Geophysical Data Center, the greatest MMI to impact the region was reported on August 31, 1861 with an MMI of VII (Very Strong), but there was no correlating Richter Scale measurement reported by the National Geophysical Data Center. Greatest MMI Reported: *Cherokee County*: V (slightly strong) *Graham County*: V (slightly strong) *Haywood County*: VII (very strong) *Jackson County*: V (slightly strong) *Swain County*: V (slightly strong) *Eastern Band of Cherokee Indians*: I
Geological	Landslide: As noted above in the landslide profile, the landslide data provided by the North Carolina Geological Survey is incomplete. This provides a challenge when trying to determine an accurate extent for the landslide hazard. However, when using the USGS landslide susceptibility index, extent can be measured with incidence, which is high for a majority of the Smoky Mountain region. There is also a high susceptibility throughout the region. Number of Landslides Reported in Smoky Mountain Region: *Cherokee County*: 9 *Graham County*: 1 *Haywood County*: 120 *Jackson County*: 29 *Swain County*: 63 *Eastern Band of Cherokee Indians*: 5 Sinkhole: The Smoky Mountains region has a relatively low risk for sinkholes. The region has no historical information related to sinkholes. Even though there is no historical information from the North Carolina Geological Survey or the National

<table>
<tr><td></td><td>Centers for Environmental Information, there is a possibility of unreported occurrences.

<u>Erosion</u>: The extent of erosion can be defined by the measurable rate of erosion that occurs. There are no erosion rate records available for the Smoky Mountains region.</td></tr>
<tr><td>Dam Failure</td><td>Dam failure extent is defined using the North Carolina Division of Energy, Mineral, and Land Resources criteria (Table 5.21). Of the 115 dams in the Smoky Mountains region, 33 dams are considered High Hazard.
<u>Number of High Hazard Dams:</u>
Cherokee County: 11
Graham County: 7
Haywood County: 17
Jackson County: 28
Swain County: 9
Eastern Band of Cherokee Indians: None Reported</td></tr>
<tr><td>Flooding</td><td>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 3.5 percent of the total land area in the Smoky Mountains region.

Flood depth and velocity are recorded via the United States Geological Survey stream gauges throughout the region. While a gauge does not exist for each of the participating jurisdiction, there is one at or near many areas. The greatest peak discharge recorded for the region at Fontana Dam on August 30, 1940. Water reached a discharge of 71,200 cubic feet per second. Additional peak discharge readings and gauge heights are in the table below.

<table>
<tr><th>Location/Jurisdiction</th><th>Date</th><th>Peak Discharge (cfs)</th><th>Gage Height (ft)</th></tr>
<tr><td colspan="4">Cherokee County</td></tr>
<tr><td>Hiwassee River above Town of Murphy</td><td>8/17/1961</td><td>23,100</td><td>--</td></tr>
<tr><td colspan="4">Graham County</td></tr>
<tr><td>Little Tennessee River at Fontana Dam</td><td>8/30/1940</td><td>71,200</td><td>--</td></tr>
<tr><td>Snowbird Creek near Town of Robbinsville</td><td>3/29/1951</td><td>7,430</td><td>9</td></tr>
<tr><td colspan="4">Haywood County</td></tr>
<tr><td>Pigeon River at Town of Canton</td><td>8/30/1940</td><td>31,600</td><td>20.8</td></tr>
</table>
</td></tr>
</table>

	West Fork Pigeon River near Town of Waynesville	5/15/1976	11,100	10.5
	Jackson County			
	Tuckasegee River at Town of Dillsboro	8/30/1940	52,600	22
	Scott Creek at Town of Sylva	8/30/1940	3,360	8.6
	Swain County			
	Tuckasegee River at Bryson City, NC	5/1/1840	--	22
	Little Tennessee River at Needmore, NC	10/5/1964	22,100	13.06

Other Hazards	
Wildfires	Wildfire data was provided by the North Carolina Division of Forest Resources and is reported annually by county. Analyzing the data by count indicates the following wildfire hazard extent for each county. ***Cherokee County*** The greatest number of fires to occur in any year was 94 in 2006. The greatest number of acres burned in any single year occurred in 2008 when 366.9 acres burned. ***Graham County*** The greatest number of fires to occur in any year was 29 in 2016. The greatest number of acres burned in any single year occurred in 2016 when 17,873 acres burned. ***Haywood County*** The greatest number of fires to occur in any year was 59 in 2002. The greatest number of acres burned in any single year occurred in 2008 when 553.6 acres burned. ***Jackson County*** The greatest number of fires to occur in any year was 75 in 2007. The greatest number of acres burned in any single year occurred in 2016 when 1,595 acres burned. ***Swain County*** The greatest number of fires to occur in any year was 28 in 2008. The greatest number of acres burned in any single year occurred in 2016 when 17.687 acres burned. ***Eastern Band of Cherokee Indians County*** The greatest number of fires to occur in any year was one, though limited information was available (given the close proximity to the counties, it is assumed many more fires may have occurred). Although this data lists the extent that has occurred, larger and more frequent wildfires are possible throughout the region.

Infectious Disease	Extent of infectious disease events can be measured by the number of lives lost due to a particular event. As of the time of this report, the COVID-19 pandemic is still taking place, but the number of deaths associated with that event for the Smoky Mountain Region is 552 (as of 6/26/2022).
Technological Hazard	
Hazardous Materials Incident	According to the USDOT PHMSA, the largest hazardous materials incident reported in the region was 6,250 LGA on August 12, 1982 in Clyde, NC. It should be noted that larger events are possible.
Terrorism	Although no severe terrorism attacks have been reported in Smoky Mountains region, the entire area is still at risk to a future event. Densely populated areas, such as cities, are considered more susceptible. Terror events have the potential to affect the human population, buildings and infrastructure, and the economy in the region.
Cyber	No cyber-attacks have been historically reported in the Smoky Mountains region. Technology usage, however, is increasing. A cyber-attack could potentially devastate the region's economy and could have lasting negative impacts.
Electromagnetic Pulse	Electromagnetic Pulse (EMP) occurrences have not taken place in the Smoky Mountains region, but the risk still exists. If an EMP were to occur, the effects would negatively impact first responders and communication efforts and may cause panic within the area.

5.18.2 Priority Risk Index

In order to draw some meaningful planning conclusions on hazard risk for the Smoky Mountain 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 Smoky Mountain 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 jurisdictions in the Smoky Mountain Region to consider as part of their proposed mitigation strategy.

The prioritization and categorization of identified hazards for the Smoky Mountain 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 Smoky Mountain Regional Hazard Mitigation Planning Team in gaining consensus on the determination of those hazards that pose the most significant threat to the Smoky Mountain 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 Smoky Mountain 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[38], as summarized in **Table 5.34**. 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 Smoky Mountain 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 Team.

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

TABLE 5.34: PRIORITY RISK INDEX FOR THE SMOKY MOUNTAIN 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 5.35 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 Team. The results were then used in calculating PRI values and making final determinations for the risk assessment.

TABLE 5.35: SUMMARY OF PRI RESULTS FOR THE SMOKY MOUNTAIN REGION

Hazard	Sub hazard(s) Assessed	Category/Degree of Risk					
		Probability	Impact	Spatial Extent	Warning Time	Duration	PRI Score
Natural Hazards							
Drought		Likely	Minor	Large	More than 24 hours	More than 1 week	2.5
Hurricane and Coastal Hazards		Likely	Limited	Large	More than 24 hours	Less than 24 hours	2.6
Tornadoes/ Thunderstorms	Hailstorm, Lightning	Highly Likely	Limited	Moderate	6 to 12 hours	Less than 6 hours	2.8
Severe Winter Weather		Likely	Critical	Large	More than 24 hours	Less than 1 week	3.3
Earthquakes		Likely	Minor	Moderate	Less than 6 hours	Less than 6 hours	2.3
Geological	Landslide, Sinkholes, Erosion	Highly Likely	Limited	Small	Less than 6 hours	Less than 6 hours	2.1
Dam Failure		Unlikely	Critical	Moderate	Less than 6 hours	Less than 24 hours	2.3
Flooding		Highly Likely	Critical	Small	6 to 12 hours	Less than 1 week	3.1
Other Hazards							
Wildfires		Likely	Minor	Small	Less than 6 hours	Less than 1 week	2.4
Infectious Disease		Unlikely	Limited	Moderate	More than 24 hours	More than 1 week	2.0
Technological Hazards							
Hazardous Substances		Possible	Limited	Small	Less than 6 hours	Less than 24 hours	2.2
Radiological Emergency	Fixed Nuclear Facilities	Unlikely	Critical	Moderate	6 to 12 hours	Less than 1 week	2.4
Terrorism		Unlikely	Critical	Moderate	Less than 6 hours	More than 1 week	2.6
Cyber		Likely	Minor	Moderate	Less than 6 hours	Less than 1 week	2.6
Electromagnetic Pulse		Unlikely	Limited	Large	Less than 6 hours	More than 1 week	2.5

5.19 FINAL DETERMINATIONS

The conclusions drawn from the hazard profiling process for the Smoky Mountain Region, including the PRI results and input from the Regional Hazard Mitigation Planning Team, resulted in the classification of risk for each identified hazard according to three categories: High Risk, Moderate Risk, and Low Risk (**Table 5.36**). 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 Smoky Mountain 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 5.36: CONCLUSIONS ON HAZARD RISK FOR THE SMOKY MOUNTAIN REGION

HIGH RISK	Severe Winter Weather Flood Tornadoes/Severe Thunderstorm Hurricane and Coastal Hazards
MODERATE RISK	Drought Wildfire Cyber Infectious Disease Earthquake Dam Failure Hazardous Substances Geological
LOW RISK	Radiological Emergency Terrorism EMP

SECTION 6

VULNERABILITY ASSESSMENT

This section identifies and quantifies the vulnerability of the jurisdictions within the Smoky Mountain 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

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 Smoky Mountain Region. Additionally, an assessment is conducted for each identified hazard, including the potential impact and expected amount of damages it may cause. The primary objective of the vulnerability assessment is to quantify exposure and the potential loss estimates for each hazard. In doing so, each county, their participating jurisdictions and the EBCI 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 jurisdictions in the Smoky Mountain Region. The remainder of this section focuses on the results of the assessment conducted.

6.2 METHODOLOGY

This vulnerability assessment was conducted using two distinct methodologies: (1) a geographic information system (GIS)-based analysis; and (2) a risk modeling software analysis. Each approach

provides estimates for the potential impact of hazards by using a common, systematic framework for evaluation. A brief description of the two different approaches is provided on the following pages.

6.2.1 GIS-Based Analysis

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

- Flooding
- Hazardous Substances
- Geological (Landslide)
- Wildfires

The objective of the GIS-based analysis was to determine the estimated vulnerability of assets, critical facilities and populations for the identified hazards in the Smoky Mountain 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 georeferenced point locations for identified assets (critical facilities and infrastructure, special populations, etc.) when available. ESRI® ArcGIS™ 10.6.1 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 and was supplemented with current population estimates from the US Census Bureau. 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 as population by census block becomes available for all areas in the region. The results of the analysis provided an estimate of the number of people and critical facilities, as well as the assessed value of parcels and improvements, determined to be potentially at risk to those hazards with delineable geographic hazard boundaries.

6.2.2 Risk Management Tool

The Risk Management Tool (RMT) was developed by NCEM-Risk Management (RM) as a tool to simplify hazard mitigation plan development into a single, automated, tool-based format to include geospatially based risk assessment data, also developed by NCEM-RM. The RMT is a twofold system used to create and/or update a local and state hazard mitigation plan. The two parts of the RMT are a step-by-step system that will prompt a user to input information and narrative as well as upload pictures, documents and other information as needed. The second part of the system is the Risk Tool. The Risk Tool will run a risk assessment at the building level for certain hazards selected based on predetermined calculations for each hazard. Some hazards will have a single return period and others have multi-return periods. The availability of multi-returns periods is based on the availability of datasets for each hazard and the degree of detail in each dataset.

The Risk Assessment produced by the Risk Tool will also identify high-risk structures in the planning area and estimate cost by types of mitigation projects (wind retrofits, elevation, acquisition, mitigation reconstruction) and benefit-cost estimates by type of mitigation. The mitigation tool is only meant to begin the process of thinking about problem areas where mitigation may be of interest to the jurisdiction and property owners. It is also designed to drive mitigation actions that are specific, measurable, attainable, realistic and timely.

Finally, the Risk Management Tool also assesses vulnerable populations, such as children and elderly persons. Data used to assess these populations is from the US 2010 Census. According to the US Census Bureau, those defined as "elderly," are 65 years old or older, while those defined as "children" are 5 years old or younger. It is important to note that the numbers assessed are from the most recent Census in 2010.

Once all of the information was input into the system, a hazard mitigation plan can then be exported into multiple document formats. The system will also store the plan so that when it is time to update the plan, the information is already in the system.

The RMT was originally developed as part of the Integrated Hazard Risk Management (IHRM) pilot project which included Durham, Edgecombe, Macon and New Hanover counties. The pilot was successful and it was determined that there is a need and interest in a system designed to be used statewide and potentially nationwide in the future. The RMT used in this update was the second version created by NCEM.

A list of the hazards assessed by the RMT follows:

- Hurricane and Coastal Hazards
- Tornadoes/Thunderstorms
- Earthquakes
- Flooding
- Wildfires

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

Hazard Prioritization

When it comes to evaluating hazards and determining which hazards a jurisdiction should spend the most time and effort addressing, a number of factors affect the prioritization. As discussed in *Section 5: Hazard Profiles,* the risk (magnitude, probability, location) of a hazard is one of the primary driving forces that helps determine the relative importance of addressing the potential impacts of a hazard. However, the assessment of a hazard's risk is generally focused on the hazard itself and how severe or likely it could be within geographic scope of the study area. This assessment does not necessarily analyze the potential effects of that hazard on humans and the built environment. This is a critical component of planning for hazards since a hazard that does not impact human life, safety, or welfare is typically not considered as important to address through mitigation. The analysis that follows attempts to bring this consideration into the planning process by estimating the impacts on humans and the built environment and prioritizing hazards accordingly.

6.3 EXPLANATION OF DATA SOURCES

Hurricane and Coastal Hazards

NCEM's Risk Management Tool assessed vulnerable areas to the Hurricane and Coastal Hazards. For this assessment, vulnerable buildings and populations were analyzed against damages caused by hurricane winds.

Tornadoes/Thunderstorms

NCEM's Risk Management Tool analyzed the vulnerable buildings and populations to the Tornadoes/Thunderstorms hazard. Sub hazards assessed under the thunderstorms hazard include hail and lightning; however, for the purposes of this assessment, thunderstorm winds were the only risk analyzed.

Earthquakes

NCEM's Risk Management Tool assessed vulnerable areas to the earthquake hazard. This assessment included susceptible buildings by the type of structure, and the potential dollar losses associated with the buildings. It also analyzed susceptible populations, such as children and elderly.

Geological (Landslide)

Data from the U.S. Geological Survey was used to first determine what areas are considered high, moderate, or low susceptibility areas to the landslide hazard. Data was downloaded in an ArcGIS compatible format. This allowed the parcel data received by local governments to be layered on top of the landslide regions to assess vulnerability to landslide occurrences.

Flooding

FEMA Digital Flood Insurance Rate Maps (DFIRMs) were used to determine flood vulnerability. DFIRM 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 DFIRM 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, local parcel data and critical facilities were overlaid on the 100-year floodplain areas and 500-year floodplain areas. This data was also supplemented with the NCEM RMT data, which assessed structure type and vulnerable populations within the floodplain areas. It should be noted that such an analysis does account for building elevation.

Wildfires

The data used to determine vulnerability to wildfires in the Smoky Mountain 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 the "Wildland Urban Interface" (WUI) was used to determine vulnerability of people and property. This layer uses the key input of housing density to define potential wildfire impacts to people and homes. The WUI Risk Index is then derived from a scale of -1 to -9, with the least negative impact being a -1, and uses flame length to measure fire intensity. The primary purpose of this data is to highlight areas of concern that may be conducive to mitigation actions. Many assumptions are made, making it not a true probability; however, it does provide a comparison of risk throughout the region. Data was also supplemented with the data from NCEM's RMT, which assessed vulnerable buildings, potential dollar losses of those buildings, and susceptible populations.

Hazardous Substances

Hazardous materials incidents can occur in both fixed facilities and through mobile transportation. For the fixed incident analysis, Toxic Release Inventory (TRI) data was used. The Toxic Release Inventory is a publicly available database from the federal Environmental Protection Agency (EPA) that contains information on toxic chemicals, 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 was further expanded by the Pollution Prevention Act of 1990. Facilities that meet certain activity thresholds must annually report their releases and other waste management activities for listed toxic chemicals to the EPA and to their state or tribal entity. A facility must report if it meets the following 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.

6.4 ASSET INVENTORY

An inventory of geo-referenced assets within Cherokee, Graham, Haywood, Jackson, Swain Counties, the municipalities within the Counties and the EBCI was compiled in order to identify and characterize those properties potentially at risk to the identified hazards[1]. 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. **Improved Property**: Includes all improved properties in the Smoky Mountain Region according to local parcel data provided by the counties. The information has been expressed in terms of the number of parcels and total assessed value of improvements (buildings) that may be exposed to the identified hazards.
2. **Critical Facilities**: Critical facilities vary by jurisdiction. Each county provided data from their respective critical facilities that were used in this section. Identified critical facilities are fire stations, police stations, medical care facilities, schools, government facilities, emergency

[1] While potentially not all-inclusive for the jurisdictions in the Smoky Mountain 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.

operation centers, or other important buildings. 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.

The following tables provide a detailed listing of the geo-referenced assets that have been identified for inclusion in the vulnerability assessment for the Smoky Mountain Region.

Table 6.1 lists the number of parcels, total value of parcels, total number of parcels with improvements, and the total assessed value of improvements for participating areas of the Smoky Mountain Region (study area of vulnerability assessment)[2].

TABLE 6.1: IMPROVED PROPERTY IN THE SMOKY MOUNTAIN REGION

Location[3]	Number of Parcels	Total Assessed Value of Parcels	Estimated Number of Buildings	Total Assessed Value of Improvements
Cherokee County	**33,518**	**$4,399,077,400**	**19,167**	**$2,550,285,420**
Andrews	842	$29,171,560	707	$97,957,370
Murphy	1,145	$318,929,370	919	$176,948,740
Unincorporated Area	31,531	$4,050,976,470	17,541	$2,275,379,310
Graham County	**9,960**	**$608,669,480**	**4,841**	**$485,390,345**
Fontana	2	$100,000	2	$96,260
Lake Santeetlah	256	$27,580,700	162	$36,593,735
Robbinsville	286	$10,469,060	215	$30,680,000
Unincorporated Area	9,416	$570,519,720	4,462	$418,020,350
Haywood County	**48,122**	**$1,387,400**	**22**	**$6,818,100**
Canton	2,294	$0	0	$0
Clyde	687	$39,000	0	$0
Maggie Valley	1,886	$37,500	2	$295,800
Waynesville	5,581	$184,800	4	$496,600
Unincorporated Area	37,674	$1,126,100	16	$6,025,700
Jackson County	**41,385**	**$7,548,532,060**	**23,062**	**$8,910,051,618**
Dillsboro	179	$20,406,470	124	$28,381,170
Forest Hills	182	$5,930,130	109	$17,386,060
Sylva	1,489	$173,347,130	1,132	$268,122,860
Webster	213	$24,672,470	153	$56,417,310
Unincorporated Area	39,322	$7,324,175,860	21,544	$8,539,744,218
Swain County	12,397	$982,729,430	6,813	$933,847,196
Bryson City	945	$51,345,280	729	$145,488,914
Unincorporated Area	11,452	$931,384,150	6,084	$788,358,282
Eastern Band of Cherokee Indians	**147**	**$7,295,440**	**72**	**$9,626,580**
Smoky Mountain Regional Total	**145,529**	**$13,547,691,210**	**53,977**	**$12,896,019,259**

Source: Local governments

[2] Total assessed values for improvements 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. It should also be noted that, due to record keeping, some duplication is possible thus potentially resulting in an inflated value exposure for an area.

[3] Number of buildings for each county is based on the number of parcels with an improved building value greater than zero.

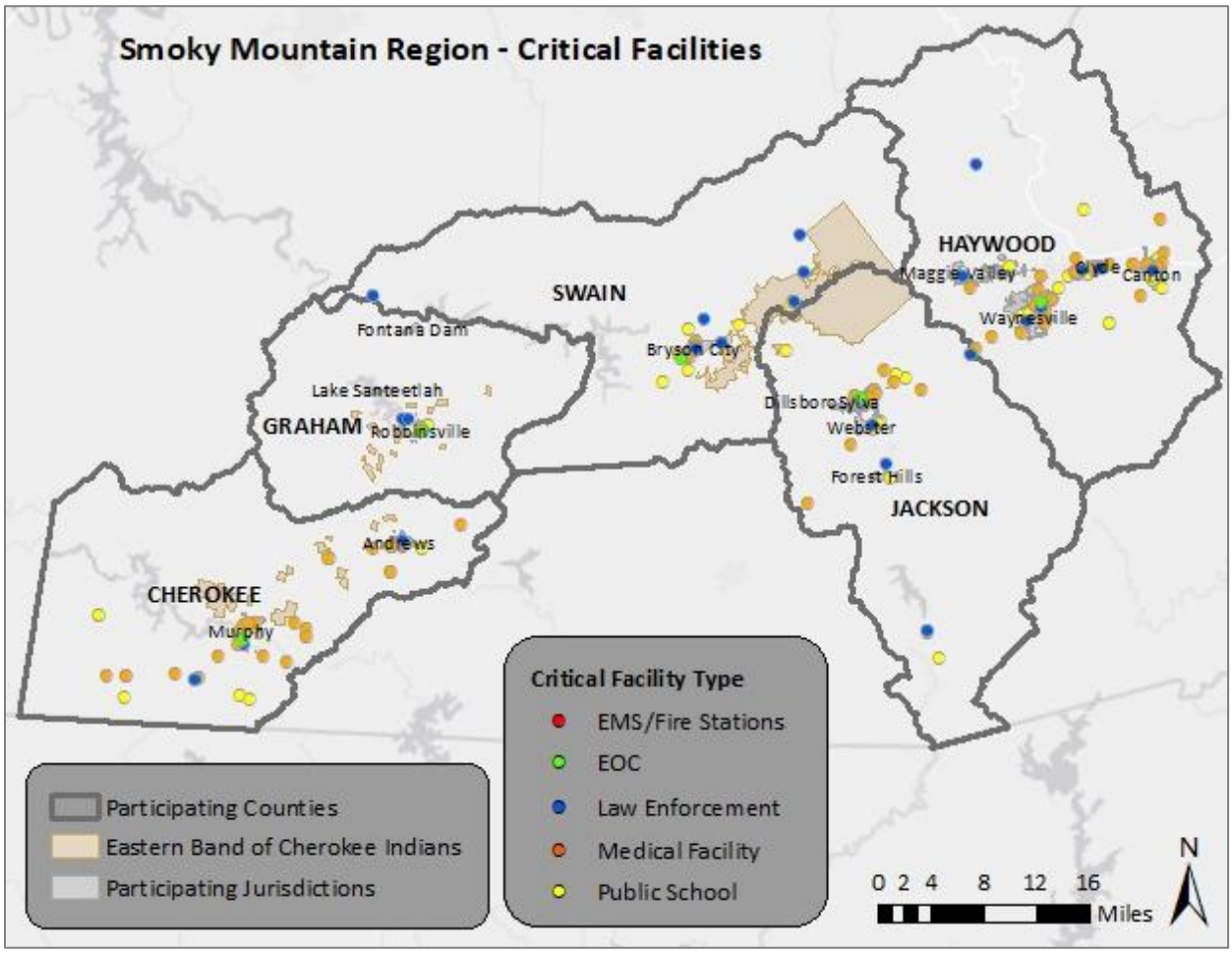
The following table lists the fire stations, police stations, emergency operations centers (EOCs), medical care facilities, schools, and other critical facilities located in the Smoky Mountain Region. Local governments at the county level provided a majority of the data for this analysis. In addition, **Figure 6.1** shows the locations of essential facilities in the Smoky Mountain Region. **Table 6.24**, at the end of this section, shows a complete list of the critical facilities by name, as well as the hazards that affect each facility. As noted previously, this list is not all inclusive and only includes information provided by the counties.

TABLE 6.2: CRITICAL FACILITY INVENTORY

Location	Fire/EMS Stations	Law Enforcement	Medical Facilities	Public Schools	Other
Cherokee County	**39**	**5**	**18**	**14**	**1**
Andrews	5	1	6	3	0
Murphy	0	0	0	0	0
Unincorporated Area	34	4	12	11	1
Graham County	**11**	**3**	**1**	**3**	**1**
Fontana	0	0	0	0	0
Lake Santeetlah	0	0	0	0	0
Robbinsville	2	1	1	1	1
Unincorporated Area	9	2	0	2	0
Haywood County	**31**	**7**	**8**	**15**	**1**
Canton	5	1	1	4	0
Clyde	3	1	0	2	0
Maggie Valley	3	1	0	0	0
Waynesville	4	3	0	1	1
Unincorporated Area	16	1	7	8	0
Jackson County	**19**	**6**	**13**	**10**	**0**
Dillsboro	0	0	0	0	0
Forest Hills	0	0	0	0	0
Sylva	0	0	0	0	0
Webster	0	0	0	0	0
Unincorporated Area	19	6	13	10	0
Swain County	**5**	**7**	**2**	**6**	**1**
Bryson City	3	2	1	2	0
Unincorporated Area	2	5	1	4	1
Eastern Band of Cherokee Indians	**4**	**1**	**0**	**3**	**0**
Smoky Mountain Regional Total	**109**	**29**	**42**	**51**	**4**

Source: Local governments

FIGURE 6.1: CRITICAL FACILITIES



Source: Local governments

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 Smoky Mountain Region that are potentially at risk to these hazards.

Table 6.3 lists the population by county according to U.S. Census 2018 population estimates. The population estimates are updated using the most recent vintage tables dated July 1, 2018. The total population in the Smoky Mountain Region according to Census data is 156,410.

TABLE 6.3: TOTAL POPULATION IN THE SMOKY MOUNTAIN REGION

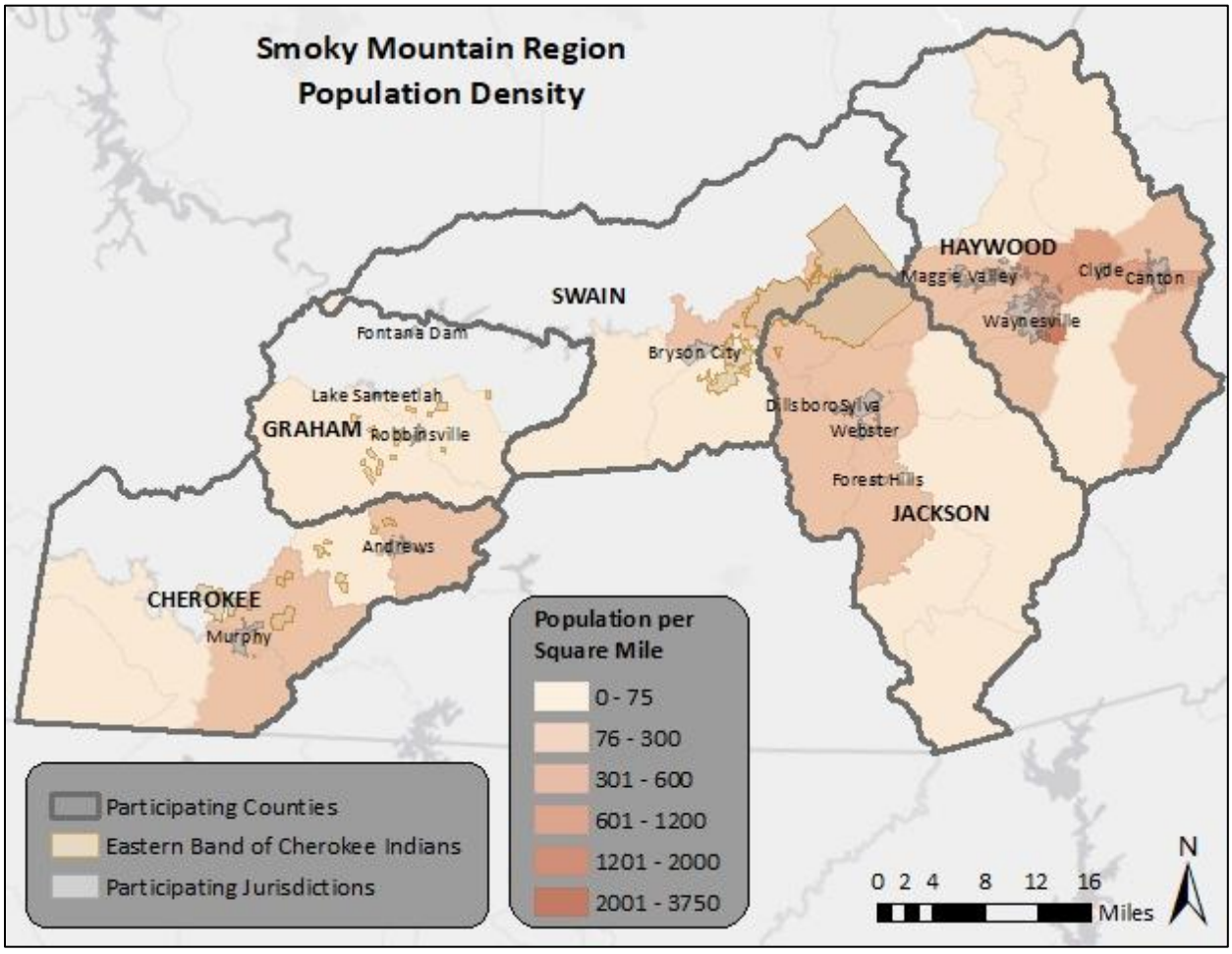
Location	2018 Population Estimates
Cherokee County	28,383
Graham County	8,484
Haywood County	61,971
Jackson County	43,327
Swain County	14,245
Smoky Mountain Regional Total	**156,410**

Source: US Census Bureau

Additional population estimates are presented in Section 3: *Community Profile*.

In addition, **Figure 6.2** illustrates the population density by census tract as it was reported by the US Census Bureau in 2010 and updated with 2017 population estimates.

FIGURE 6.2: POPULATION DENSITY IN THE SMOKY MOUNTAIN REGION



6.4.3. Development Trends and Changes in Vulnerability

Since the previous regional hazard mitigation plan was approved (in 2018), portions of the Smoky Mountain Region have experienced relatively strong growth and development. **Table 6.4** shows the number of building units constructed since 2010 according to the US Census American Community Survey.

TABLE 6.4: BUILDING COUNTS FOR THE SMOKY MOUNTAIN REGION

Location	Total Housing Units (2017)	Units Built 2010 or Later	% Building Stock Built Post-2010
Cherokee County	**17,961**	**17,071**	**5.0%**
Andrews	1,004	1,073	-6.9%
Murphy	958	1,089	-13.7%
Unincorporated Area	15,999	14,909	6.8%
Graham County	**6,001**	**5,827**	**2.9%**
Fontana	107	80	25.2%
Lake Santeetlah	201	179	10.9%
Robbinsville	440	493	-12.0%
Unincorporated Area	5,253	5,075	3.4%
Haywood County	**35,295**	**34,075**	**3.5%**
Canton	2,062	2,163	-4.9%
Clyde	574	562	2.1%
Maggie Valley	1,597	1,191	25.4%
Waynesville	5,677	5,457	3.9%
Unincorporated Area	25,385	24,702	2.7%
Jackson County	**26,847**	**25,128**	**6.4%**
Dillsboro	146	146	0.0%
Forest Hills	181	287	-58.6%
Sylva	1,212	1,240	-2.3%
Webster	228	242	-6.1%
Unincorporated Area	25,080	23,213	7.4%
Swain County	**8,913**	**8,529**	**4.3%**
Bryson City	868	848	2.3%
Unincorporated Area	8,045	7,681	4.5%
Smoky Mountain Regional Total	**95,017**	**90,630**	**4.6%**

Source: US Census Bureau

Table 6.5 shows population growth estimates for the region from 2010 to 2018 based on the US Census Annual Estimates of Resident Population and 2018 population estimates.

TABLE 6.5: POPULATION GROWTH FOR THE SMOKY MOUNTAIN REGION

Location	2010	2015	2016	2017	% Change 2010-2017
Cherokee County	**27,317**	**27,092**	**27,226**	**27,463**	**0.5%**
Andrews	2,117	2,050	2,082	1,971	-7.4%
Murphy	2,181	2,095	1,898	1,954	-11.6%
Unincorporated Area	23,019	22,947	23,246	23,538	2.2%
Graham County	**8,702**	**8,700**	**8,651**	**8,607**	**-1.1%**
Fontana	0	0	0	9	100.0%
Lake Santeetlah	72	36	39	52	-38.5%
Robbinsville	997	575	636	514	-94.0%
Unincorporated Area	7,633	8,089	7,976	8,032	5.0%
Haywood County	**58,597**	**59,170**	**59,577**	**59,854**	**2.1%**
Canton	4,243	4,156	4,182	4,191	-1.2%
Clyde	1,001	1,311	1,226	1,295	22.7%
Maggie Valley	1,069	1,533	1,767	1,541	30.6%
Waynesville	9,934	9,748	9,788	9,804	-1.3%
Unincorporated Area	42,350	42,422	42,614	43,023	1.6%
Jackson County	**39,144**	**40,812**	**41,227**	**41,725**	**6.2%**
Dillsboro	133	295	232	258	48.4%
Forest Hills	538	405	364	341	-57.8%
Sylva	2,571	2,597	2,599	2,612	1.6%
Webster	551	409	438	442	-24.7%
Unincorporated Area	35,351	37,106	37,594	38,072	7.1%
Swain County	**13,861**	**14,163**	**14,234**	**14,208**	**2.4%**
Bryson City	1,542	1,748	1,665	1,519	-1.5%
Unincorporated Area	12,319	12,415	12,569	12,689	2.9%
Smoky Mountain Regional Total	**147,621**	**149,937**	**150,915**	**151,857**	**10.1%**

Source: US Census Bureau

Based on the above data, the rate of residential development and population growth in the region since 2010 has increased, most dramatically in Jackson County. Cherokee, Haywood and Swain Counties also experienced growth and Graham had a slight loss in population. Changes in development do impact the region's vulnerability since the last update. The greater the population, the greater the risk is that persons are impacted by hazards and the greater number of assets potentially at risk. It should be noted that if future development occurs in vulnerable areas, populations and infrastructure will be exposed to potential hazards.

6.5 VULNERABILITY ASSESSMENT RESULTS

As noted earlier, only hazards with a specific geographic boundary, modeling tool, or sufficient historical data allow for further analysis. Those results are presented here. All other hazards are assumed to impact the entire planning region (drought, excessive heat, hailstorm, lightning, and severe winter weather) or, due to lack of data, analysis would not lead to credible results (sinkholes, erosion, dam failure, infectious disease, terrorism, cyber, EMP). The total region exposure for critical facilities is presented in **Table 6.24**.

The hazards presented in this subsection include: hurricane and coastal hazards, tornadoes/ thunderstorms, earthquakes, landslides, flooding, wildfires, and hazardous substances.

6.5.1. Hurricane and Coastal Hazards

Historical evidence indicates that the Smoky Mountain Region is at risk to the hurricane and tropical storm hazard, mostly due to the location of the state of North Carolina as a coastal state. Additionally, remnants from hurricanes and tropical storms that make landfall in the Gulf Coast area of the United States often make their way into the Smoky Mountain Region and cause problems. Most recently, remnants from Tropical Storm Fred resulted in a Presidential disaster declaration in the region. Many more storm tracks have come near or traversed through the region, as shown and discussed in Section 5: *Hazard Profiles.*

Numerous secondary hazards, such as erosion, flooding, tornadoes, and high winds, tend to be a result of hurricanes or tropical storms. These cumulative effects often make potential loss estimates difficult to calculate and track.

NCEM's Risk Management Tool analyzes hurricane winds and no other hazards often associated with hurricanes; therefore, only hurricane winds are analyzed in this section. Building and population vulnerabilities to hurricane winds in a 100-year frequency event (return period) are reported in the following **Table 6.6** and **Table 6.7**.

It is assumed that all existing and future buildings and populations are at risk to the hurricane and tropical storm hazard.

TABLE 6.6: BUILDING VULNERABILITIES TO HURRICANE WINDS

Location	Pre-Firm Buildings at Risk	Residential Buildings at Risk		Commercial Buildings at Risk		Public Buildings at Risk		Total Buildings at Risk	
		Number	Damages	Number	Damages	Number	Damages	Number	Damages
Cherokee County	**20,703**	**18,730**	**$4,870,623**	**1,546**	**$1,301,428**	**417**	**$494,936**	**20,693**	**$6,666,987**
Andrews	1,050	833	$202,749	164	$46,911	52	$18,729	1,049	$268,389
Murphy	1,012	729	$293,334	236	$218,535	45	$26,979	1,010	$538,848
Unincorporated Area	18,641	17,168	$4,374,540	1,146	$1,035,982	320	$449,228	18,634	$5,859,750
Graham County	**5,269**	**5,169**	**$1,476,213**	**422**	**$347,944**	**111**	**$124,966**	**5,702**	**$1,949,123**
Fontana	0	0	$0	0	$0	0	$0	0	$0
Lake Santeetlah	152	143	$85,044	8	$4,655	1	$443	152	$90,142
Robbinsville	418	312	$66,670	78	$108,537	26	$9,591	416	$184,798
Unincorporated Area	4,699	4,714	$1,324,499	336	$234,752	84	$114,932	5,134	$1,674,183
Haywood County	**25,752**	**32,646**	**$10,658,941**	**4,069**	**$1,752,084**	**469**	**$1,222,624**	**37,184**	**$13,633,651**
Canton	2,080	2,027	$741,076	358	$151,920	49	$82,162	2,434	$975,158
Clyde	1,431	1,671	$592,489	166	$40,692	58	$56,724	1,895	$689,905
Maggie Valley	1,172	1,462	$399,324	564	$154,289	23	$290,594	2,049	$844,208
Waynesville	5,848	5,913	$1,871,406	988	$509,386	108	$133,960	7,009	$2,514,752
Unincorporated Area	15,221	21,573	$7,054,646	1,993	$895,797	231	$659,184	23,797	$8,609,628
Jackson County	**21,969**	**19,071**	**$6,752,935**	**2,002**	**$1,625,876**	**897**	**$621,013**	**21,970**	**$8,999,825**
Dillsboro	138	87	$57,839	51	$5,306	0	$0	138	$63,146
Forest Hills	129	114	$38,549	3	$1,216	12	$2,917	129	$42,682
Sylva	1,350	857	$243,256	405	$244,057	88	$55,790	1,350	$543,104
Webster	223	177	$71,422	31	$7,116	15	$14,888	223	$93,425
Unincorporated Area	20,129	17,836	$6,341,869	1,512	$1,368,181	782	$547,418	20,130	$8,257,468
Swain County	**7,316**	**6,247**	**$1,678,417**	**851**	**$363,096**	**216**	**$126,778**	**7,314**	**$2,168,289**
Bryson City	866	508	$108,362	274	$54,918	84	$36,365	866	$199,644
Unincorporated Area	6,450	5,739	$1,570,055	577	$308,178	132	$90,413	6,448	$1,968,645
Eastern Band of Cherokee Indians	**3,991**	**3,438**	**$596,835**	**461**	**$661,605**	**89**	**$162,674**	**3,988**	**$1,421,115**
Smoky Mountain Regional Total	**85,000**	**85,301**	**$26,033,964**	**9,351**	**$6,052,033**	**2,199**	**$2,752,991**	**96,851**	**$34,838,990**

Source: NCEM Risk Management Tool

TABLE 6.7: POPULATION VULNERABILITIES TO HURRICANE WINDS

Location	Elderly at Risk	Children at Risk	Total at Risk
Cherokee County	**6,282**	**1,376**	**27,080**
Andrews	413	90	1,779
Murphy	379	83	1,635
Unincorporated Area	5,490	1,203	23,666
Graham County	**1,742**	**509**	**8,347**
Fontana	0	0	0
Lake Santeetlah	9	3	44
Robbinsville	133	39	635
Unincorporated Area	1,600	467	7,668
Haywood County	**12,416**	**2,905**	**59,038**
Canton	1,049	245	4,987
Clyde	765	179	3,638
Maggie Valley	328	77	1,560
Waynesville	2,565	600	12,195
Unincorporated Area	7,709	1,804	36,658
Jackson County	**6083**	**2034**	**36607**
Dillsboro	33	11	198
Forest Hills	60	20	362
Sylva	407	136	2,448
Webster	64	21	385
Unincorporated Area	5,519	1,846	33,214
Swain County	**2321**	**879**	**9431**
Bryson City	339	128	1,376
Unincorporated Area	1,982	751	8,055
Eastern Band of Cherokee	**0**	**0**	**9,071**
Smoky Mountain Regional Total	**28,844**	**7,703**	**149,574**

Source: NCEM Risk Management Tool

SOCIAL VULNERABILITY

Given the equal susceptibility across the entire Smoky Mountain Region, it can be assumed that the entire population is at risk to the hurricane and tropical storm hazard.

CRITICAL FACILITIES

Given equal vulnerability across the Smoky Mountain Region, all critical facilities are considered to be at risk. Although some buildings may perform better than others in the face of such an event due to construction, age, and other factors, determining individual building response is beyond the scope of this plan. However, this plan will consider mitigation actions for vulnerable structures, including critical facilities, to reduce the impacts of the hurricane wind hazard. A list of specific critical facilities and their associated risk can be found in **Table 6.24** at the end of this section.

In conclusion, a hurricane event has the potential to impact many existing and future buildings, critical facilities, and populations in the Smoky Mountain Region. Hurricane events can cause substantial damage in their wake including fatalities, extensive debris clean-up, and extended power outages.

6.5.2 Tornadoes/Thunderstorms

Tornadoes

A probabilistic scenario was created to estimate building and population vulnerabilities in the Smoky Mountain region for the tornado hazard. For this scenario, a tornado ranked F2 on the Fujita scale was analyzed. The Risk Management Tool analyzed this information which has been reported in **Table 6.8** and **Table 6.9**.

TABLE 6.8: BUILDING VULNERABILITY TO THE TORNADOES HAZARD

Location	Pre-Firm Buildings at Risk	Residential Buildings at Risk		Commercial Buildings at Risk		Public Buildings at Risk		Total Buildings at Risk	
		Number	Damages	Number	Damages	Number	Damages	Number	Damages
Cherokee County	**20,708**	**18,735**	**$2,212,143,603**	**1,546**	**$991,840,997**	**417**	**$301,349,995**	**20,698**	**$3,505,334,595**
Andrews	1,050	833	$72,730,650	164	$88,611,378	52	$29,280,011	1,049	$190,622,039
Murphy	1,012	729	$106,484,928	236	$184,863,097	45	$32,077,774	1,010	$323,425,799
Unincorporated Area	18,646	17,173	$2,032,928,025	1,146	$718,366,522	320	$239,992,210	18,639	$2,991,286,757
Graham County	**5269**	**5169**	**$658,054,844**	**422**	**$193,588,028**	**111**	**$90,022,333**	**5702**	**$941,665,204**
Fontana	0	0	$0	0	$0	0	$ 0	0	$ 0
Lake Santeetlah	152	143	$27,663,697	8	$3,314,100	1	$770,016	152	$31,747,813
Robbinsville	418	312	$30,519,842	78	$90,370,924	26	$20,090,705	416	$140,981,470
Unincorporated Area	4,699	4,714	$599,871,305	336	$99,903,004	84	$69,161,612	5,134	$768,935,921
Haywood County	**25,752**	**32,646**	**$4,122,892,714**	**4,069**	**$1,299,886,201**	**469**	**$467,159,823**	**37,184**	**$5,889,938,739**
Canton	2,080	2,027	$226,447,741	358	$215,567,344	49	$62,245,715	2,434	$504,260,800
Clyde	1,431	1,671	$189,115,930	166	$31,009,659	58	$60,029,055	1,895	$280,154,644
Maggie Valley	1,172	1,462	$191,381,500	564	$144,070,361	23	$29,924,373	2,049	$365,376,234
Waynesville	5,848	5,913	$763,516,140	988	$427,193,212	108	$129,211,931	7,009	$1,319,921,284
Unincorporated Area	15,221	21,573	$2,752,431,403	1,993	$482,045,625	231	$185,748,749	23,797	$3,420,225,777
Jackson County	**21969**	**19071**	**$3,430,706,564**	**2002**	**$1,191,280,962**	**897**	**$563,708,692**	**21970**	**$5,160,333,682**
Dillsboro	138	87	$17,789,488	51	$10,410,985	0	$0	138	$28,200,474
Forest Hills	129	114	$19,635,774	3	$1,976,406	12	$3,750,356	129	$25,362,53
Sylva	1,350	857	$99,770,723	405	$256,608,655	88	$54,915,920	1,350	$411,295,297
Webster	223	177	$31,457,580	31	$15,276,237	15	$15,952,297	223	$62,686,114
Unincorporated Area	20,129	17,836	$3,262,052,999	1,512	$907,008,679	782	$489,090,119	20,130	$4,658,151,797
Swain County	**7316**	**6247**	**$710,237,559**	**851**	**$334,616,692**	**216**	**$109,988,580**	**7314**	**$1,154,842,832**
Bryson City	866	508	$45,403,721	274	$103,662,821	84	$39,391,464	866	$188,458,006
Unincorporated Area	6,450	5,739	$664,833,838	577	$230,953,871	132	$70,597,116	6,448	$966,384,826
Eastern Band of Cherokee Indians	**3,991**	**3,438**	**$596,835**	**461**	**$661,605**	**89**	**$162,674**	**3,988**	**$1,421,115**
Smoky Mountain Regional Total	**85,005**	**85,306**	**$11,134,632,119**	**9,351**	**$4,011,874,485**	**2,199**	**$1,532,392,097**	**96,856**	**$16,653,536,167**

Source: NCEM Risk Management Tool

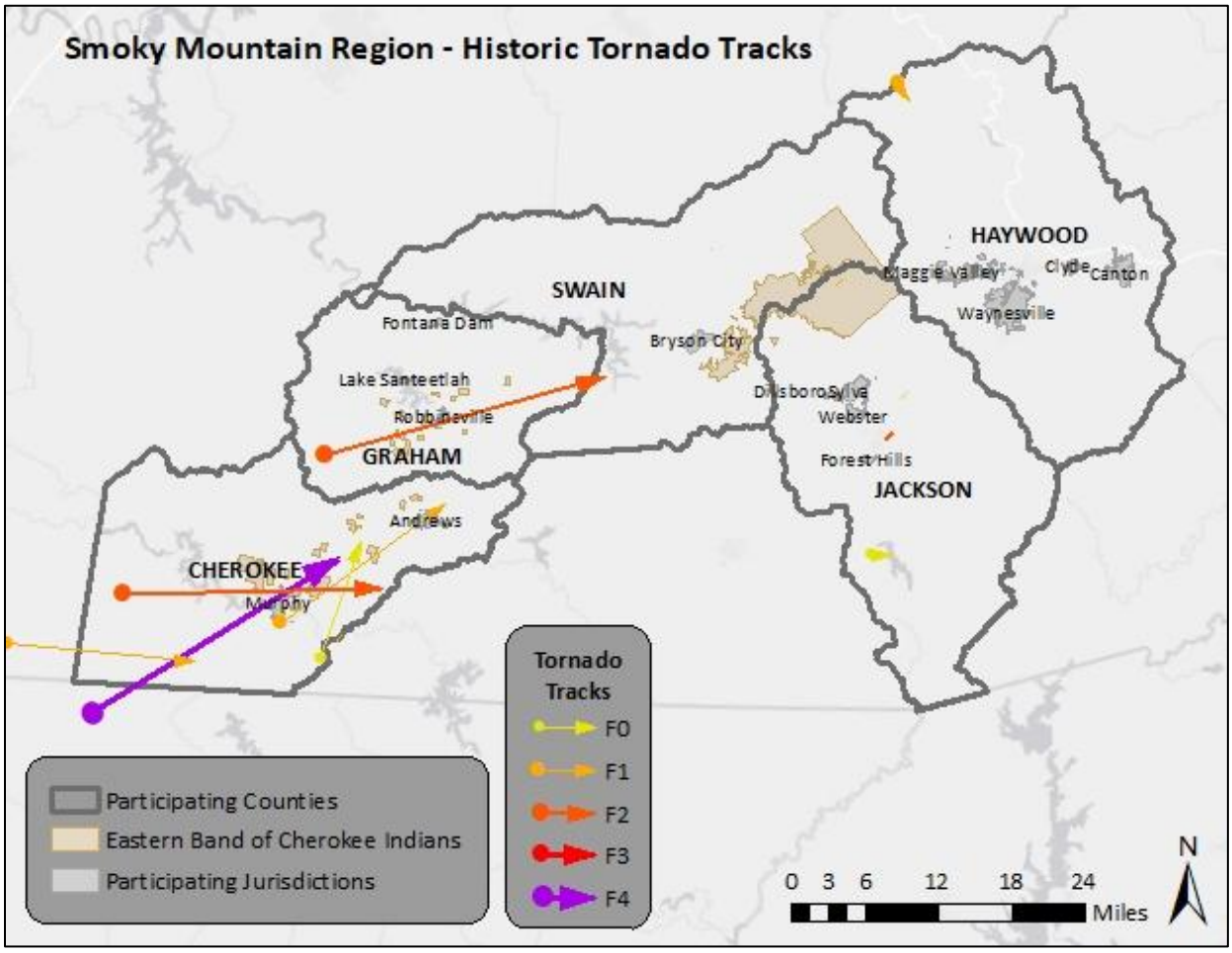
TABLE 6.9: POPULATION VULNERABILITY TO THE TORNADO HAZARD

Location	Elderly at Risk	Children at Risk	Total at Risk
Cherokee County	**6,284**	**1,376**	**27,087**
Andrews	413	90	1,779
Murphy	379	83	1,635
Unincorporated Area	5,492	1,203	23,673
Graham County	**1,742**	**509**	**8,347**
Fontana	0	0	0
Lake Santeetlah	9	3	44
Robbinsville	133	39	635
Unincorporated Area	1,600	467	7,668
Haywood County	**12,416**	**2,905**	**59,038**
Canton	1,049	245	4,987
Clyde	765	179	3,638
Maggie Valley	328	77	1,560
Waynesville	2,565	600	12,195
Unincorporated Area	7,709	1,804	36,658
Jackson County	**6,083**	**2,034**	**36,607**
Dillsboro	33	11	198
Forest Hills	60	20	362
Sylva	407	136	2,448
Webster	64	21	385
Unincorporated Area	5,519	1,846	33,214
Swain County	**2,321**	**879**	**9,431**
Bryson City	339	128	1,376
Unincorporated Area	1,982	751	8,055
Eastern Band of Cherokee Indians	**0**	**0**	**9,071**
Smoky Mountain Regional Total	**28,846**	**7,703**	**149,581**

Source: NCEM Risk Management Tool

A map of historical tornado points of origin and paths can be seen below in **Figure 6.3.**

FIGURE 6.3: HISTORICAL TORNADO TRACKS



Source: NOAA

Thunderstorms

A probabilistic scenario was created to estimate building and population vulnerabilities in the Smoky Mountain region for the thunderstorm hazard. For this scenario, damages due to thunderstorm winds on a 50-year frequency event (return period) were analyzed. It is important to note that this data does not include damages caused by other potential impacts from thunderstorms, such as lightning or hail. The Risk Management Tool analyzed this information which has been reported below in **Table 6.10** and **Table 6.11**.

TABLE 6.10: BUILDING VULNERABILITY TO THUNDERSTORM WINDS

Location	Pre-Firm Buildings at Risk	Residential Buildings at Risk		Commercial Buildings at Risk		Public Buildings at Risk		Total Buildings at Risk	
		Number	Damages	Number	Damages	Number	Damages	Number	Damages
Cherokee County	**20,703**	**18,730**	**$4,870,623**	**1,546**	**$1,301,428**	**417**	**$494,936**	**20,693**	**$6,666,987**
Andrews	1,050	833	$202,749	164	$46,911	52	$18,729	1,049	$268,389
Murphy	1,012	729	$293,334	236	$218,535	45	$26,979	1,010	$538,848
Unincorporated Area	18,641	17,168	$4,374,540	1,146	$1,035,982	320	$449,228	18,634	$5,859,750
Graham County	**5,269**	**5,169**	**$1,476,213**	**422**	**$347,944**	**111**	**$124,966**	**5,702**	**$1,949,123**
Fontana	0	0	$0	0	$0	0	$0	0	$0
Lake Santeetlah	152	143	$85,044	8	$4,655	1	$443	152	$90,142
Robbinsville	418	312	$66,670	78	$108,537	26	$9,591	416	$184,798
Unincorporated Area	4,699	4,714	$1,324,499	336	$234,752	84	$114,932	5,134	$1,674,183
Haywood County	**25,752**	**32,646**	**$10,658,941**	**4,069**	**$1,752,084**	**469**	**$1,222,624**	**37,184**	**$13,633,651**
Canton	2,080	2,027	$741,076	358	$151,920	49	$82,162	2,434	$975,158
Clyde	1,431	1,671	$592,489	166	$40,692	58	$56,724	1,895	$689,905
Maggie Valley	1,172	1,462	$399,324	564	$154,289	23	$290,594	2,049	$844,208
Waynesville	5,848	5,913	$1,871,406	988	$509,386	108	$133,960	7,009	$2,514,752
Unincorporated Area	15,221	21,573	$7,054,646	1,993	$895,797	231	$659,184	23,797	$8,609,628
Jackson County	**21,969**	**19,071**	**$6,752,935**	**2,002**	**$1,625,876**	**897**	**$621,013**	**21,970**	**$8,999,825**
Dillsboro	138	87	$57,839	51	$5,306	0	$0	138	$63,146
Forest Hills	129	114	$38,549	3	$1,216	12	$2,917	129	$42,682
Sylva	1,350	857	$243,256	405	$244,057	88	$55,790	1,350	$543,104
Webster	223	177	$71,422	31	$7,116	15	$14,888	223	$93,425
Unincorporated Area	20,129	17,836	$6,341,869	1,512	$1,368,181	782	$547,418	20,130	$8,257,468
Swain County	**7,316**	**6,247**	**$1,678,417**	**851**	**$363,096**	**216**	**$126,778**	**7,314**	**$2,168,289**
Bryson City	866	508	$108,362	274	$54,918	84	$36,365	866	$199,644
Unincorporated Area	6,450	5,739	$1,570,055	577	$308,178	132	$90,413	6,448	$1,968,645
Eastern Band of Cherokee Indians	**3,991**	**3,438**	**$596,835**	**461**	**$661,605**	**89**	**$162,674**	**3,988**	**$1,421,115**
Smoky Mountain Regional Total	**85,000**	**85,301**	**$26,033,964**	**9,351**	**$6,052,033**	**2,199**	**$2,752,991**	**96,851**	**$34,838,990**

Source: NCEM Risk Management Tool

TABLE 6.11: POPULATION VULNERABILITY TO THUNDERSTORM WINDS

Location	Elderly at Risk	Children at Risk	Total at Risk
Cherokee County	**6,282**	**1,376**	**27,080**
Andrews	413	90	1,779
Murphy	379	83	1,635
Unincorporated Area	5,490	1,203	23,666
Graham County	**1,742**	**509**	**8,347**
Fontana	0	0	0
Lake Santeetlah	9	3	44
Robbinsville	133	39	635
Unincorporated Area	1,600	467	7,668
Haywood County	**12,416**	**2,905**	**59,038**
Canton	1,049	245	4,987
Clyde	765	179	3,638
Maggie Valley	328	77	1,560
Waynesville	2,565	600	12,195
Unincorporated Area	7,709	1,804	36,658
Jackson County	**6,083**	**2,034**	**36,607**
Dillsboro	33	11	198
Forest Hills	60	20	362
Sylva	407	136	2,448
Webster	64	21	385
Unincorporated Area	5,519	1,846	33,214
Swain County	**2,321**	**879**	**9,431**
Bryson City	339	128	1,376
Unincorporated Area	1,982	751	8,055
Eastern Band of Cherokee Indians	**0**	**0**	**9,071**
Smoky Mountain Regional Total	**28,844**	**7,703**	**149,574**

Source: NCEM Risk Management Tool

SOCIAL VULNERABILITY

It is assumed that all existing populations and future populations are at risk to the tornadoes/ thunderstorms hazard.

CRITICAL FACILITIES

All critical facilities should still be considered at-risk to damage should an event occur. A list of all individual critical facilities in the region can be found in **Table 6.26**.

6.5.3. Earthquakes

A probabilistic scenario was created to estimate building and population vulnerabilities in the Smoky Mountain region for the earthquake hazard with a 500-year frequency (return period). The Risk Management Tool analyzed this information which has been reported below in **Table 6.12** and **Table 6.13**.

TABLE 6.12: BUILDING VULNERABILITY TO THE EARTHQUAKE HAZARD

Location	Pre-Firm Buildings at Risk	Residential Buildings at Risk		Commercial Buildings at Risk		Public Buildings at Risk		Total Buildings at Risk	
		Number	Damages	Number	Damages	Number	Damages	Number	Damages
Cherokee County	**20,708**	**18,735**	**$7,282,245**	**1,546**	**$6,383,200**	**417**	**$2,052,889**	**20,698**	**$15,718,334**
Andrews	1,050	833	$354,822	164	$635,362	52	$220,477	1,049	$1,210,660
Murphy	1,012	729	$401,844	236	$1,385,717	45	$228,490	1,010	$2,016,052
Unincorporated Area	18,646	17,173	$6,525,579	1,146	$4,362,121	320	$1,603,922	18,639	$12,491,622
Graham County	**5269**	**5169**	**$2,234,989**	**422**	**$1,337,393**	**111**	**$587,804**	**5702**	**$4,160,187**
Fontana	0	0	$0	0	$0	0	$0	0	$0
Lake Santeetlah	152	143	$92,520	8	$22,005	1	$6,837	152	$121,362
Robbinsville	418	312	$172,987	78	$755,927	26	$161,600	416	$1,090,514
Unincorporated Area	4,699	4,714	$1,969,482	336	$559,461	84	$419,367	5,134	$2,948,311
Haywood County	**25,752**	**32,646**	**$11,172,910**	**4,069**	**$7,603,464**	**469**	**$2,974,814**	**37,184**	**$21,751,189**
Canton	2,080	2,027	$611,606	358	$1,258,641	49	$400,799	2,434	$2,271,046
Clyde	1,431	1,671	$535,940	166	$193,773	58	$410,027	1,895	$1,139,740
Maggie Valley	1,172	1,462	$551,917	564	$765,273	23	$156,878	2,049	$1,474,067
Waynesville	5,848	5,913	$2,150,842	988	$2,579,188	108	$968,572	7,009	$5,698,603
Unincorporated Area	15,221	21,573	$7,322,605	1,993	$2,806,589	231	$1,038,538	23,797	$11,167,733
Jackson County	**21969**	**19071**	**$9,748,523**	**2002**	**$6,596,153**	**897**	**$3,196,450**	**21970**	**$19,541,124**
Dillsboro	138	87	$54,353	51	$64,333	0	$0	138	$118,685
Forest Hills	129	114	$70,144	3	$10,596	12	$18,744	129	$99,484
Sylva	1,350	857	$326,909	405	$1,645,325	88	$348,316	1,350	$2,320,550
Webster	223	177	$125,540	31	$110,108	15	$91,150	223	$326,797
Unincorporated Area	20,129	17,836	$9,171,577	1,512	$4,765,791	782	$2,738,240	20,130	$16,675,608
Swain County	**7316**	**6247**	**$2,144,184**	**851**	**$2,008,285**	**216**	**$742,745**	**7314**	**$4,895,213**
Bryson City	866	508	$158,191	274	$697,245	84	$283,480	866	$1,138,916
Unincorporated Area	6,450	5,739	$1,985,993	577	$1,311,040	132	$459,265	6,448	$3,756,297
Eastern Band of Cherokee Indians	**3,991**	**3,438**	**$596,835**	**461**	**$661,605**	**89**	**$162,674**	**3,988**	**$1,421,115**
Smoky Mountain Regional Total	**85,005**	**85,306**	**$33,179,686**	**9,351**	**$24,590,100**	**2,199**	**$9,717,376**	**96,856**	**$67,487,162**

Source: NCEM Risk Management Tool

TABLE 6.13: POPULATION VULNERABILITY TO EARTHQUAKES

Location	Elderly at Risk	Children at Risk	Total at Risk
Cherokee County	**6,284**	**1,376**	**27,087**
Andrews	413	90	1,779
Murphy	379	83	1,635
Unincorporated Area	5,492	1,203	23,673
Graham County	**1,742**	**509**	**8347**
Fontana	0	0	0
Lake Santeetlah	9	3	44
Robbinsville	133	39	635
Unincorporated Area	1,600	467	7,668
Haywood County	**12,416**	**2,905**	**59,038**
Canton	1,049	245	4,987
Clyde	765	179	3,638
Maggie Valley	328	77	1,560
Waynesville	2,565	600	12,195
Unincorporated Area	7,709	1,804	36,658
Jackson County	**6,083**	**2,034**	**36,607**
Dillsboro	33	11	198
Forest Hills	60	20	362
Sylva	407	136	2,448
Webster	64	21	385
Unincorporated Area	5,519	1,846	33,214
Swain County	**2321**	**879**	**9,431**
Bryson City	339	128	1,376
Unincorporated Area	1,982	751	8,055
Eastern Band of Cherokee Indians	**0**	**0**	**9,071**
Smoky Mountain Regional Total	**28,846**	**7,703**	**149,581**

Source: NCEM Risk Management Tool

SOCIAL VULNERABILITY

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

CRITICAL FACILITIES

All critical facilities should still be considered at-risk to minor damage should an event occur. A list of all individual critical facilities in the region can be found in **Table 6.24**.

In conclusion, an earthquake could potentially impact all existing and future buildings, facilities, and populations in the Smoky Mountain region. Though minor earthquakes are often recorded but not felt, they may rattle breakables and cause minimal damage. Furthermore, major earthquakes have potential to damage structures. Severe impacts of earthquakes may result in debris clean-up, service disruption, building collapse, and fatalities. Specific vulnerabilities for 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 if data becomes available. Furthermore, mitigation actions to address earthquake vulnerability will be considered.

6.5.4. Geological (Landslide)

GIS analysis was used to complete the vulnerability assessment for landslides in the Smoky Mountain Region. The potential dollar value of exposed land and property total can be determined using the USGS Landslide Susceptibility Index (detailed in Section 5: *Hazard Profiles*), county level tax parcel data, and GIS analysis. **Table 6.14** presents the potential at-risk property where available. All areas of the Smoky Mountain Region are identified as moderate or high incidence areas by the USGS landslide data. The incidence levels (high and moderate) were used to identify different areas of concern for the analysis below.

TABLE 6.14: TOTAL POTENTIAL AT-RISK PARCELS FOR THE GEOLOGICAL (LANDSLIDE) HAZARD

Location	Number of Parcels at Risk		Number of Improvements at Risk		Total Value of Improvements at Risk ($)	
Incidence Level	**Moderate**	**High**	**Moderate**	**High**	**Moderate**	**High**
Cherokee County	**19,877**	**14,572**	**12,379**	**7,317**	**$1,800,124,980**	**$948,749,890**
Andrews	877	0	730	0	$109,087,040	$0
Murphy	0	0	0	0	$0	$0
Unincorporated Area	19,000	14,572	11,649	7,317	$1,691,037,940	$948,749,890
Graham County	**8,731**	**1,584**	**4,392**	**629**	**$473,280,655**	**$51,857,090**
Fontana	0	0	0	0	$0	$0
Lake Santeetlah	299	0	208	0	$48,574,595	$0
Robbinsville	373	0	284	0	$51,042,030	$0
Unincorporated Area	8,059	1,584	3,900	629	$373,664,030	$51,857,090
Haywood County	**49,496**	**860**	**21**	**1**	**$6,801,800**	**$16,300**
Canton	2,773	4	0	0	$0	$0
Clyde	817	0	0	0	$0	$0
Maggie Valley	2,886	0	2	0	$295,800	$0
Waynesville	6,402	7	4	0	$496,600	$0
Unincorporated Area	36,618	849	15	1	$6,009,400	$16,300
Jackson County	**32,063**	**10,349**	**17,703**	**5,885**	**6,391,094,707**	**2,777,764,881**
Dillsboro	206	0	142	0	$33,237,480	$0
Forest Hills	0	0	0	0	$0	$0
Sylva	0	0	0	0	$0	$0
Webster	0	0	0	0	$0	$0
Unincorporated Area	31,857	10,349	17,561	5,885	$6,357,857,227	$2,777,764,881
Swain County	**12,774**	**0**	**6,998**	**0**	**$962,191,389**	**$0**
Bryson City	1,064	0	812	0	$162,174,027	$0
Unincorporated Area	11,710	0	6,186	0	$800,017,362	$0
Eastern Band of Cherokee Indians	**93**	**135**	**42**	**50**	**$7,523,510**	**$6,049,850**
Smoky Mountain Regional Total	**123,034**	**17,151**	**23,832**	**7,997**	**$3,249,922,334**	**$1,006,673,130**

Source: United States Geological Survey, Local governments

SOCIAL VULNERABILITY

Given moderate to high susceptibility across the entire Smoky Mountain Region, it is assumed that a moderate amount of population is at risk.

CRITICAL FACILITIES

There are 33 critical facilities located in a high susceptibility area, including the following: 4 Medical facilities, 21 fire/EMS stations, 1 police station, and 7 public schools. The remaining critical facilities are located in moderate-to-low incidence areas. A list of specific critical facilities and their associated risk can be found in **Table 6.24** at the end of this section.

In conclusion, a landslide has the potential to impact many existing and future buildings, facilities, and populations in the Smoky Mountain Region, though some areas are at a higher risk than others due to a variety of factors. For example, steep slopes and modified slopes bear a greater risk than flat areas. Specific vulnerabilities for Smoky Mountain 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 if data becomes available.

6.5.5 Flooding

Historical evidence indicates that the Smoky Mountain Region is susceptible to flood events. A total of 87 flood events have been reported by the National Centers for Environmental Information since 1993, resulting in over $1.69 million (2019 dollars) in damages.

In order to assess flood risk, a GIS-based analysis was used to estimate exposure to flood events using Digital Flood Insurance Rate Map (DFIRM) data in combination with local tax assessor records for each of the Smoky Mountain 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 6.15** presents the potential at-risk property. Both the number of parcels and the approximate value are presented.

TABLE 6.15: ESTIMATED EXPOSURE OF PARCELS TO THE FLOODING HAZARD

Location	1% Annual Chance of Flooding (100-year)			0.2% Annual Chance of Flooding (500-year)		
	Approx. Number of Parcels	Approx. Number of Improved Buildings	Approx. Improved Value of Buildings	Approx. Number of Parcels	Approx. Number of Improved Buildings	Approx. Improved Value of Buildings
Cherokee County	**2,552**	**1,530**	**$340,223,570**	**2,687**	**1,624**	**$359,427,140**
Andrews	82	60	$24,779,050	95	71	$26,360,580
Murphy	0	0	$0	0	0	$0
Unincorporated Area	2,470	1,470	$315,444,520	2,592	1,553	$333,066,560
Graham County	**2,257**	**1,198**	**$166,130,055**	**2,322**	**1,236**	**$170,538,495**
Fontana	0	0	$0	0	0	$0
Lake Santeetlah	86	73	$22,993,195	81	69	$22,200,455
Robbinsville	80	56	$23,971,890	89	64	$24,795,070
Unincorporated Area	2,091	1,069	$119,164,970	2,152	1,103	$123,542,970
Haywood County	**5,226**	**6**	**$662,700**	**5,733**	**6**	**$662,700**
Canton	340	0	$0	371	0	$0
Clyde	273	0	$0	303	0	$0
Maggie Valley	410	1	$104,400	473	1	$104,400
Waynesville	1,429	3	$354,300	1,533	3	$354,300
Unincorporated Area	2,774	2	$204,000	3,053	2	$204,000
Jackson County	**4,351**	**2,704**	**$2,261,466,170**	**4,626**	**2,883**	**$2,315,517,620**
Dillsboro	77	48	$12,232,410	101	66	$21,702,170
Forest Hills	0	0	$0	0	0	$0
Sylva	0	0	$0	0	0	$0
Webster	0	0	$0	0	0	$0
Unincorporated Area	4,274	2,656	$2,249,233,760	4,525	2,817	$2,293,815,450
Swain County	**1,372**	**883**	**$144,653,052**	**1,536**	**999**	**$170,538,802**
Bryson City	290	226	$42,404,770	365	283	$52,965,130
Unincorporated Area	1,082	657	$102,248,282	1,171	716	$117,573,672
Eastern Band of Cherokee Indians	**38**	**8**	**$3,581,440**	**39**	**8**	**$3,581,440**
Smoky Mountain Regional Total	**15,796**	**6,329**	**$2,916,716,987**	**16,943**	**6,756**	**$3,020,266,197**

Source: FEMA DFIRM

To assess flood risk, the NCEM Risk Management Tool (RMT) analyzed buildings located in the 1 percent chance of annual floodplains. The buildings are assessed by the type of building (commercial, residential, or public) and also assesses Pre-Firm buildings, or structures built before flood code regulations were installed. This data is shown by jurisdiction in **Table 6.16**.

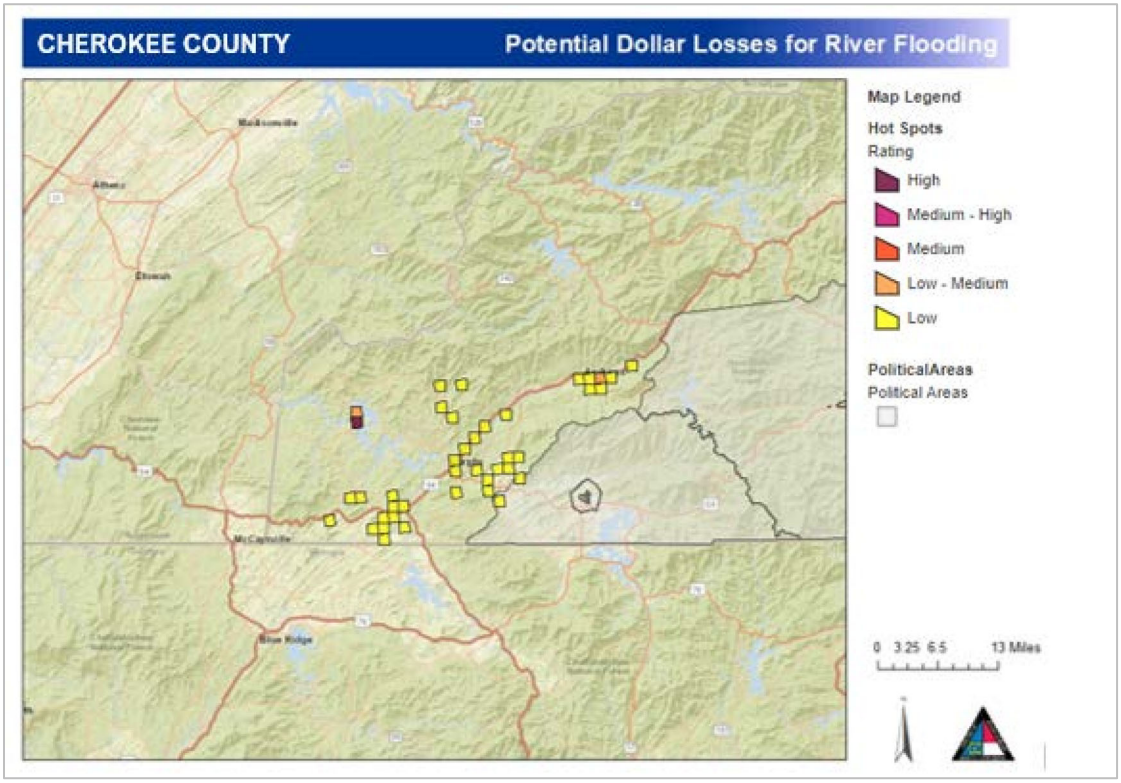
TABLE 6.16: BUILDING VULNERABILITY FOR THE 100-YEAR FLOODPLAINS

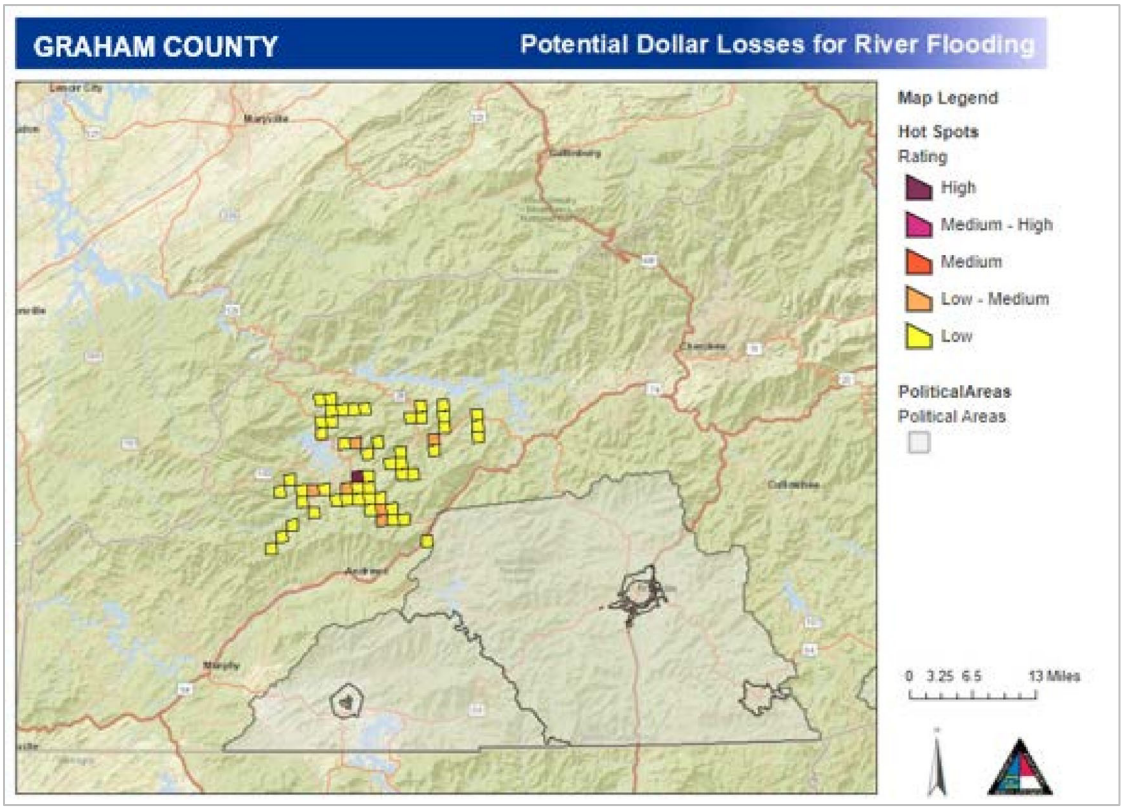
Location	Pre-Firm Buildings at Risk	Residential Buildings at Risk		Commercial Buildings at Risk		Public Buildings at Risk		Total Buildings at Risk	
		Number	Damages	Number	Damages	Number	Damages	Number	Damages
Cherokee County	**421**	**380**	**$7,115,054**	**30**	**$1,395,126**	**11**	**$458,420**	**421**	**$8,968,601**
Andrews	63	50	$183,246	13	$932,510	0	$0	63	$1,115,756
Murphy	17	6	$21,606	3	$108,867	8	$125,253	17	$255,726
Unincorporated Area	341	324	$6,910,202	14	$353,749	3	$333,167	341	$7,597,119
Graham County	**334**	**356**	**$2,687,867**	**23**	**$385,394**	**5**	**$79,518**	**384**	**$3,152,779**
Fontana	0	0	$ 0	0	$ 0	0	$ 0	0	$0
Lake Santeetlah	0	0	$0	0	$0	0	$0	0	$0
Robbinsville	29	28	$435,305	1	$1,895	0	$0	29	$437,200
Unincorporated Area	305	328	$2,252,562	22	$383,499	5	$79,518	355	$2,715,579
Haywood County	**2,417**	**2,411**	**$40,656,800**	**512**	**$33,082,312**	**39**	**$5,486,259**	**2,962**	**$79,225,372**
Canton	129	54	$1,829,462	87	$11,081,335	7	$1,407,397	148	$14,318,193
Clyde	226	213	$9,392,601	34	$2,200,209	9	$1,386,834	256	$12,979,645
Maggie Valley	205	192	$2,205,569	64	$3,952,194	5	$241,163	261	$6,398,926
Waynesville	1,261	1,152	$15,512,444	182	$13,982,069	8	$1,866,967	1,342	$31,361,481
Unincorporated Area	596	800	$11,716,724	145	$1,866,505	10	$583,898	955	$14,167,127
Jackson County	**1279**	**1106**	**$11,826,845**	**151**	**$7,839,330**	**22**	**$2,124,471**	**1279**	**$21,790,645**
Dillsboro	23	6	$47,875	17	$215,543	0	$0	23	$263,417
Forest Hills	7	7	$67,485	0	$0	0	$0	7	$67,485
Sylva	112	73	$1,186,336	37	$3,655,543	2	$114,132	112	$4,956,011
Webster	16	14	$343,624	2	$56,013	0	$0	16	$399,637
Unincorporated Area	1,121	1,006	$10,181,525	95	$3,912,231	20	$2,010,339	1,121	$16,104,095
Swain County	**688**	**521**	**$6,489,171**	**155**	**$9,783,825**	**11**	**$270,595**	**687**	**$16,543,591**
Bryson City	203	104	$1,950,945	97	$7,057,206	2	$89,747	203	$9,097,898
Unincorporated Area	485	417	$4,538,226	58	$2,726,619	9	$180,848	484	$7,445,693
Eastern Band of Cherokee Indians	**3,991**	**3,438**	**$596,835**	**461**	**$661,605**	**89**	**$162,674**	**3,988**	**$1,421,115**
Smoky Mountain Regional Total	**9,130**	**8,212**	**$69,372,572**	**1,332**	**$53,147,592**	**177**	**$8,581,937**	**9,721**	**$131,102,103**

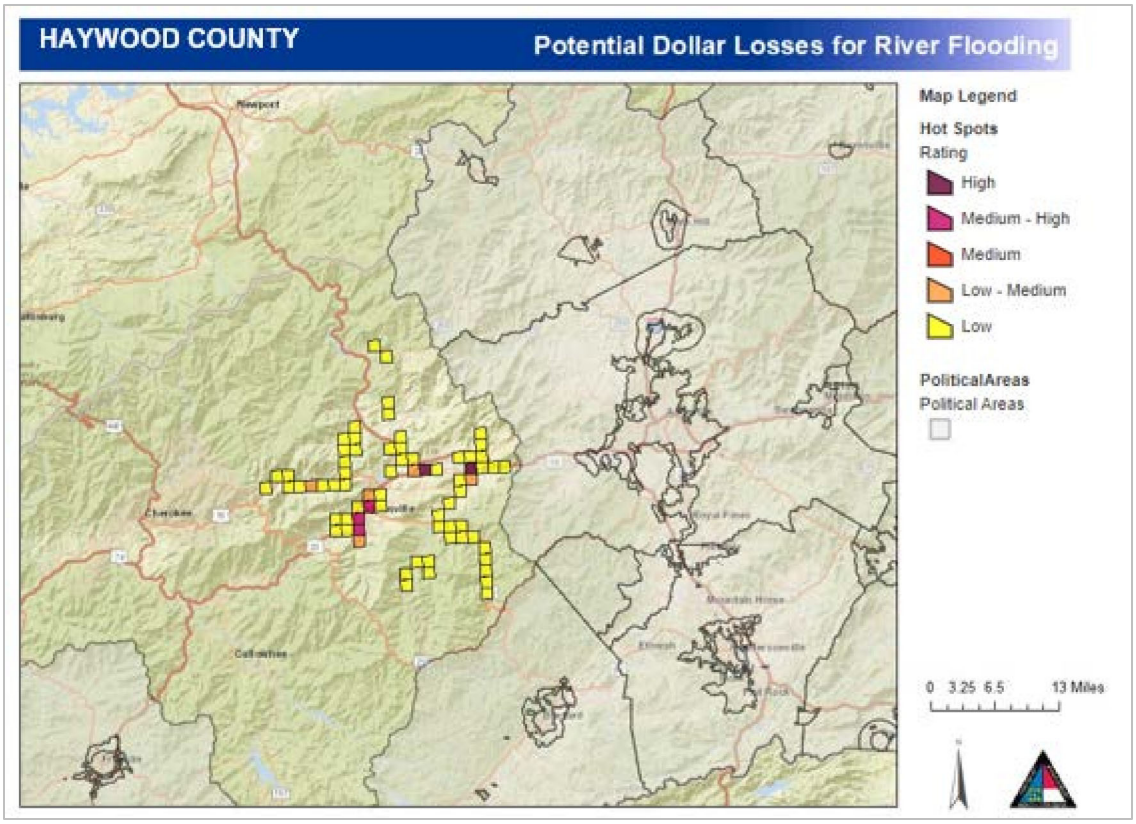
Source: NCEM Risk Management Tool

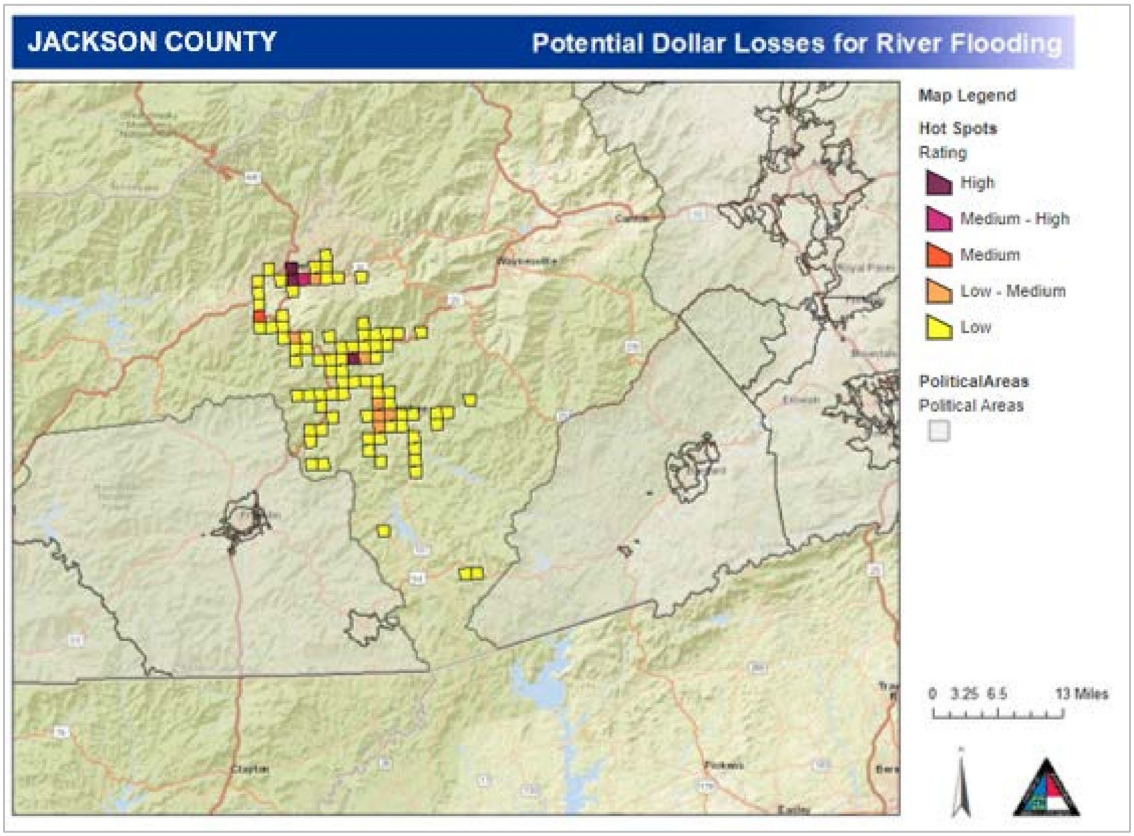
Figure 6.4 below displays visual hotspots of potential dollar losses for the flood hazard by county. Based on the figures, most hot spots are in an area with low vulnerability.

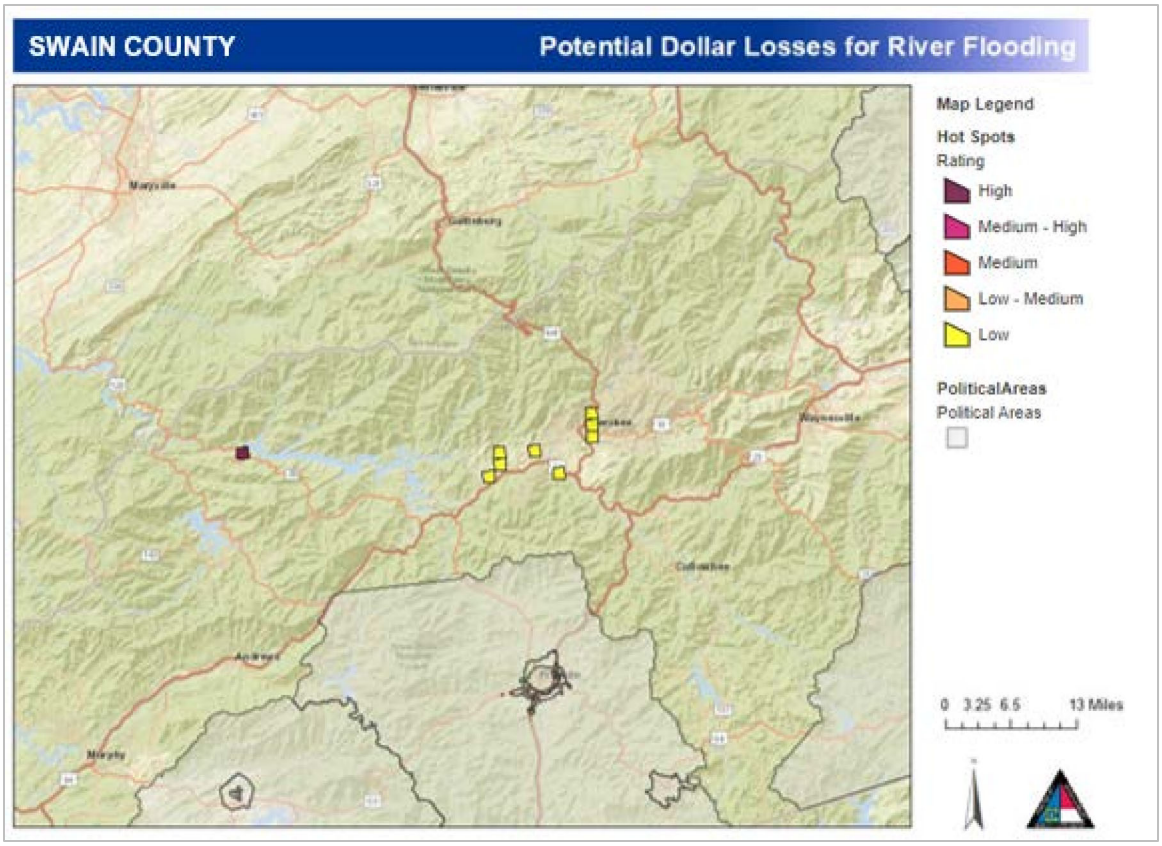
FIGURE 6.4: POTENTIAL DOLLAR LOSSES FROM FLOODING






HAYWOOD COUNTY
Potential Dollar Losses for River Flooding
Map Legend
Hot Spots
Rating
High
Medium - High
Medium
Low - Medium
Low
PoliticalAreas
Political Areas
0 3.25 6.5 13 Miles


JACKSON COUNTY
Potential Dollar Losses for River Flooding
Map Legend
Hot Spots
Rating
High
Medium - High
Medium
Low - Medium
Low
PoliticalAreas
Political Areas
0 3.25 6.5 13 Miles



Source: NCEM Risk Management Tool

Table 6.17 assesses the vulnerability of the region's population. This data is also from the RMT and analyzes the populations of elderly and children living at risk to the 1 percent annual flooding.

TABLE 6.17: POPULATION VULNERABILITY FOR 100-YEAR FLOODPLAINS

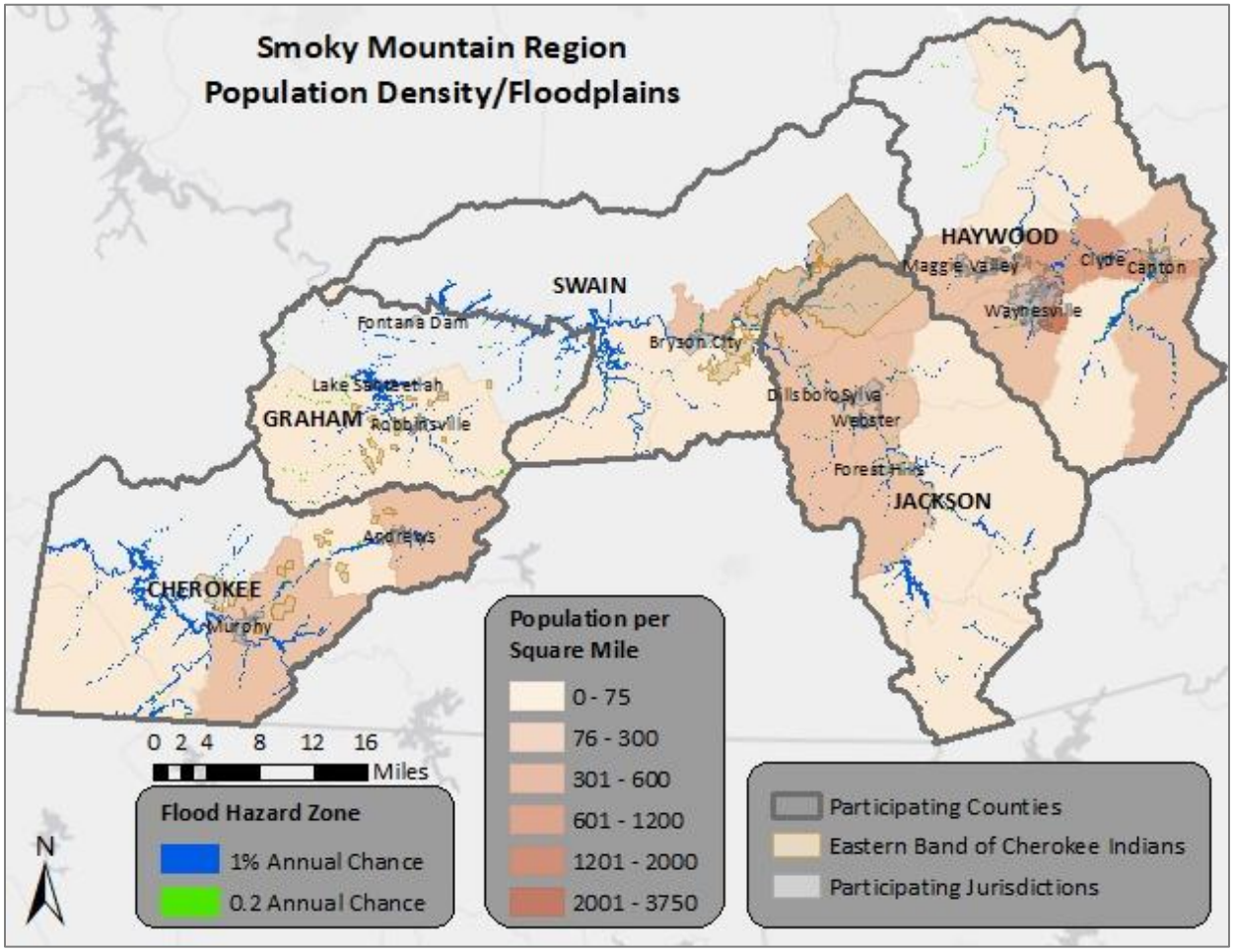
Incidence Level	Elderly at Risk	Children at Risk	Total at Risk
Cherokee County	**131**	**29**	**567**
Andrews	25	5	108
Murphy	3	1	13
Unincorporated Area	103	23	446
Graham County	**123**	**35**	**588**
Fontana	0	0	0
Lake Santeetlah	0	0	0
Robbinsville	12	3	56
Unincorporated Area	111	32	532
Haywood County	**952**	**224**	**4,529**
Canton	28	7	132
Clyde	97	23	463
Maggie Valley	44	10	209
Waynesville	498	117	2,369
Unincorporated Area	285	67	1,356
Jackson County	**357**	**119**	**2148**
Dillsboro	2	1	13
Forest Hills	4	1	22
Sylva	34	11	206
Webster	5	2	31
Unincorporated Area	312	104	1,876
Swain County	**211**	**80**	**858**
Bryson City	66	25	267
Unincorporated Area	145	55	591
Eastern Band of Cherokee Indians	**0**	**0**	**9,071**
Smoky Mountain Regional Total	**1,774**	**487**	**17,761**

Source: NCEM Risk Management Tool

SOCIAL VULNERABILITY

Population estimates from the US Census Bureau as of July 1, 2017 are available at a jurisdictional level. This data was analyzed to present at-risk populations to the flooding hazard in the Smoky Mountain region and can be seen below in **Figure 6.5**.

FIGURE 6.5: POPULATION DENSITY NEAR FLOODPLAINS



Source: FEMA DFIRM, US Census Bureau

CRITICAL FACILITIES

The critical facility analysis revealed that there are 19 critical facilities located in the Smoky Mountain Region's 1.0-percent and 2.0-percent annual chance floodplain based on FEMA DFIRM boundaries and GIS analysis. (As previously noted, this analysis does not consider building elevation, which may negate risk.) These facilities include 1 Public School, 10 Medical Facilities, and 8 Fire/EMS Stations. A list of specific critical facilities and their associated risk can be found in **Table 6.24** at the end of this section.

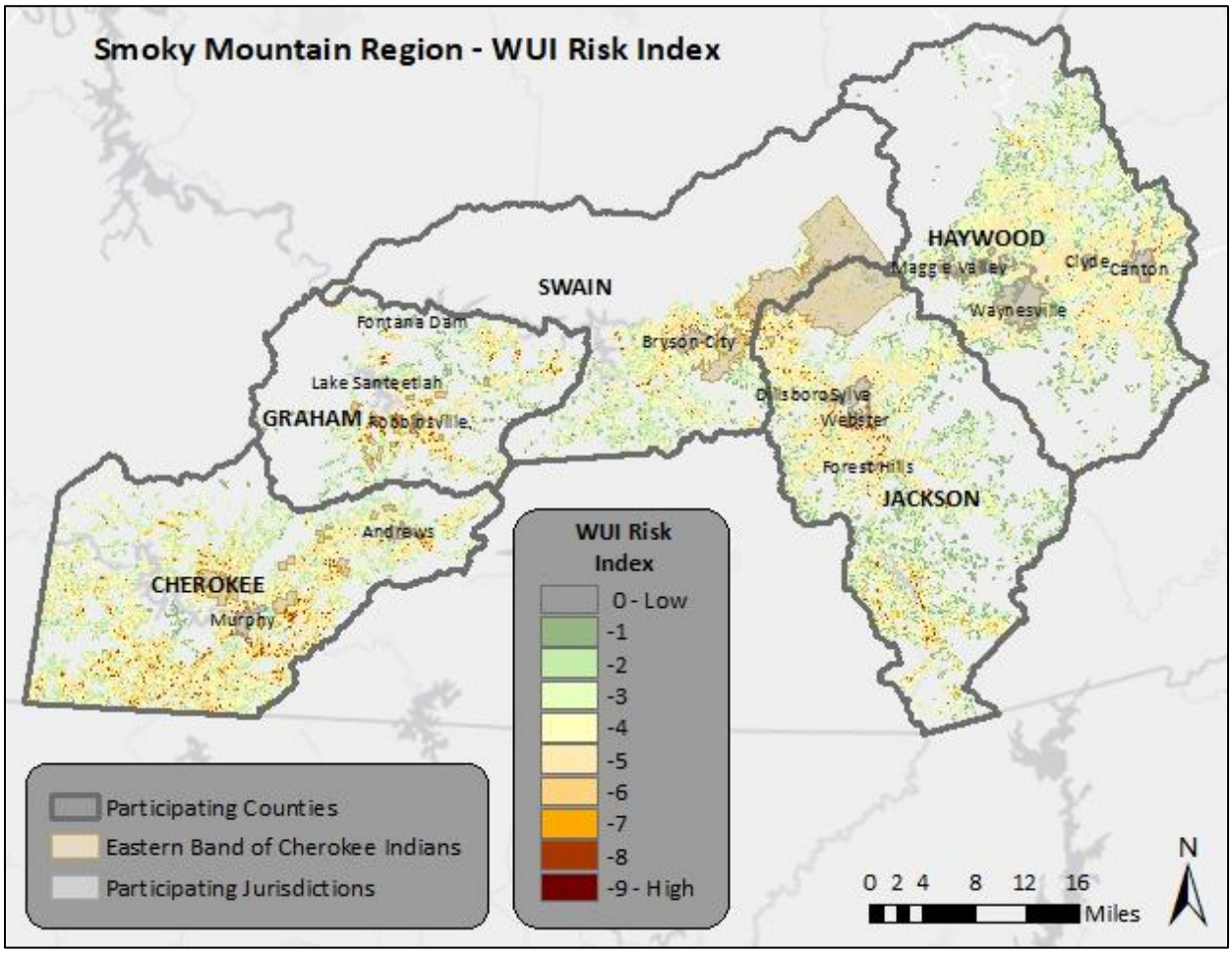
In conclusion, a flood has the potential to impact many existing and future buildings, facilities, and populations in the Smoky Mountain Region, though some areas are at a higher risk than others. All types of structures in a floodplain are at-risk, though elevated structures will have a reduced risk. As noted, the floodplains used in this analysis include the 100-year and 500-year FEMA regulated floodplain boundaries. It is certainly possible that more severe events could occur beyond these boundaries or urban (flash) flooding could impact additional structures. Such site-specific vulnerability determinations should be considered during future plan updates. Furthermore, areas subject to repetitive flooding should be analyzed for potential mitigation actions.

6.5.6 Wildfires

As described in the *Hazard Profiles*, the Smoky Mountain Region is susceptible to wildfire events. It should also be that a single event could result in significant damages throughout the region.

To estimate exposure to wildfire, the Wildland Urban Interface (WUI) Risk Index for the region was obtained through the Southern Wildfire Risk Assessment. The WUI uses a Response Function modeling approach and rates the potential impact of a wildfire on people and their homes. The index ranges from -1 to -9, with -9 being the most negative impact. For example, an area with high housing density and high flame lengths are rated -9, while an area with low housing density and low flame lengths are rated -1. At-risk areas fall within the range of -7 to -9. This index was layered with parcel data using GIS analysis. **Figure 6.6** shows the WUI Risk Index for the region below.

FIGURE 6.6: WILDLAND URBAN INTERFACE RISK INDEX



Source: Southern Wildfire Risk Assessment

The entire region contains lands that fall into the higher risk value. Overall, there is a high-to-medium wildfire ignition density risk index in the region which is somewhat higher than other areas in North Carolina.

SOCIAL VULNERABILITY

Even though not all areas have equal vulnerability, there is some susceptibility across the entire Smoky Mountain Region. It is assumed that the total population is at risk to the wildfire hazard. Determining the exact number of people in certain wildfire zones is difficult with existing data and could be misleading.

CRITICAL FACILITIES

Counts for critical facilities in the Smoky Mountain Region that fall within the high wildfire risk area (-7 or higher) are shown in **Table 6.18.**

TABLE 6.18: CRITICAL FACILITIES IN THE AT-RISK WUI RISK INDEX AREA

Location	Number of At-Risk Critical Facilities
Cherokee County	7
Graham County	3
Haywood County	2
Jackson County	2
Swain County	0
Eastern Band of Cherokee Indians	0
Smoky Mountain Regional Total	14

Source: Southern Wildfire Risk Assessment, Local governments

Additional information was provided through the NCEM Risk Management Tool (RMT). This data can be seen in below in **Table 6.19** and **Table 6.20**.

TABLE 6.19: BUILDING VULNERABILITY TO WILDFIRE HAZARDS

Location	Pre-Firm Buildings at Risk	Residential Buildings at Risk		Commercial Buildings at Risk		Public Buildings at Risk		Total Buildings at Risk	
		#	Damages	#	Damages	#	Damages	#	Damages
Cherokee County	**16,384**	**14,886**	**$2,140,170,914**	**1,162**	**$1,112,385,632**	**326**	**$391,829,075**	**16,374**	**$3,644,385,622**
Andrews	760	625	$75,065,438	94	$93,466,167	40	$35,476,984	759	$204,008,589
Murphy	730	570	$107,277,575	131	$221,899,686	27	$23,751,052	728	$352,928,314
Unincorporated Area	14,894	13,691	$1,957,827,901	937	$797,019,779	259	$332,601,039	14,887	$3,087,448,719
Graham County	**3945**	**3931**	**$597,533,820**	**336**	**$225,711,541**	**87**	**$131,098,906**	**4354**	**$954,344,266**
Fontana	0	0	$0	0	$0	0	$0	0	$0
Lake Santeetlah	64	61	$17,512,401	3	$2,253,746	0	$0	64	$19,766,147
Robbinsville	304	233	$32,317,943	49	$118,102,393	20	$26,985,172	302	$177,405,508
Unincorporated Area	3,577	3,637	$547,703,476	284	$105,355,402	67	$104,113,734	3,988	$757,172,611
Haywood County	**22,073**	**28,687**	**$4,263,123,300**	**3,108**	**$1,473,778,037**	**376**	**$661,126,932**	**32,171**	**$6,398,028,269**
Canton	1,667	1,742	$233,535,401	224	$211,361,809	38	$92,559,232	2,004	$537,456,442
Clyde	1,287	1,564	$213,821,388	120	$34,961,262	45	$90,010,341	1,729	$338,792,991
Maggie Valley	1,081	1,375	$217,456,130	510	$191,741,799	20	$49,786,802	1,905	$458,984,731
Waynesville	4,187	4,581	$741,562,283	482	$383,059,434	68	$141,232,803	5,131	$1,265,854,521
Unincorporated Area	13,851	19,425	$2,856,748,098	1,772	$652,653,733	205	$287,537,754	21,402	$3,796,939,584
Jackson County	**18083**	**15679**	**$3,161,518,561**	**1634**	**$1,305,083,750**	**770**	**$826,333,396**	**18083**	**$5,292,935,707**
Dillsboro	121	83	$21,902,445	38	$12,102,172	0	$0	121	$34,004,616
Forest Hills	128	113	$25,477,458	3	$3,008,404	12	$6,237,899	128	$34,723,761
Sylva	1,156	784	$114,931,046	311	$294,069,674	61	$70,771,208	1,156	$479,771,928
Webster	218	172	$42,181,493	31	$20,908,029	15	$26,284,458	218	$89,373,980
Unincorporated Area	16,460	14,527	$2,957,026,119	1,251	$974,995,471	682	$723,039,831	16,460	$4,655,061,422
Swain County	**6587**	**5728**	**$756,411,197**	**663**	**$356,529,804**	**195**	**$166,221,325**	**6586**	**$1,279,162,326**
Bryson City	657	441	$48,895,342	143	$75,016,612	73	$52,919,555	657	$176,831,509
Unincorporated Area	5,930	5,287	$707,515,855	520	$281,513,192	122	$113,301,770	5,929	$1,102,330,817
Eastern Band of Cherokee Indians	**3,823**	**3,304**	**$423,151,432**	**434**	**$515,765,769**	**82**	**$134,284,754**	**3,820**	**$1,073,201,955**
Smoky Mountain Regional Total	**70,895**	**72,215**	**$11,341,909,224**	**7,337**	**$4,989,254,533**	**1,836**	**$2,310,894,388**	**81,388**	**$18,642,058,145**

Source: NCEM Risk Management Tool

TABLE 6.20: POPULATION VULNERABILITY TO WILDFIRE HAZARD

Incidence Level	Elderly at Risk	Children at Risk	Total at Risk
Cherokee County	**4,985**	**1,092**	**21,489**
Andrews	310	68	1,335
Murphy	295	65	1,273
Unincorporated Area	4,380	959	18,881
Graham County	**1,336**	**390**	**6,403**
Fontana	0	0	0
Lake Santeetlah	4	1	19
Robbinsville	98	29	470
Unincorporated Area	1,234	360	5,914
Haywood County	**10,852**	**2,539**	**51,604**
Canton	901	210	4,284
Clyde	716	168	3,405
Maggie Valley	307	72	1,461
Waynesville	1,988	465	9,452
Unincorporated Area	6,940	1,624	33,002
Jackson County	**5,026**	**1,680**	**30,251**
Dillsboro	31	10	187
Forest Hills	59	20	359
Sylva	371	124	2,229
Webster	62	20	375
Unincorporated Area	4,503	1,506	27,101
Swain County	**2,122**	**804**	**8,626**
Bryson City	294	111	1,195
Unincorporated Area	1,828	693	7,431
Eastern Band of Cherokee Indians	**0**	**0**	**8,711**
Smoky Mountain Regional Total	**4,985**	**1,092**	**21,489**

Source: NCEM Risk Management Tool

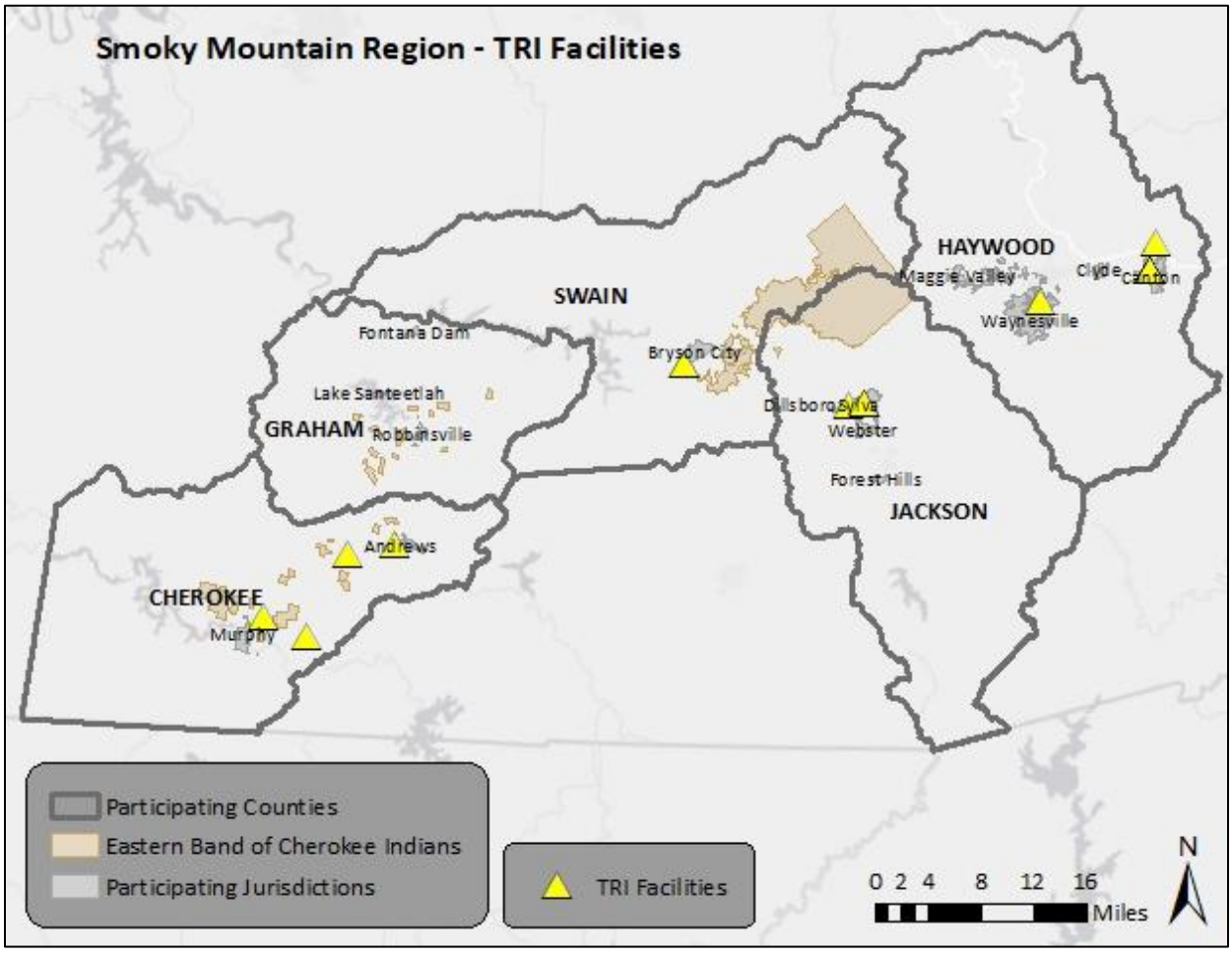
6.5.7 Hazardous Substances

As described in the *Hazard Profiles*, the Smoky Mountain Region is susceptible to hazardous substance events. It should also be that a single event could result in significant impacts throughout the region.

Most hazardous substance 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 substance 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 intersection analysis was used for fixed and mobile areas and parcels[4]. In both scenarios, two sizes of buffers—0.5 mile and 1 mile—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 Smoky Mountain Region, along with buffers, were used for analysis as shown in **Figure 6.7.** 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. **Figure 6.8** shows the areas used for mobile toxic release buffer analysis. The results indicate the approximate number of parcels, improved value, as shown in **Table 6.21** (fixed sites), **Table 6.22** (mobile road sites) and **Table 6.23** (mobile railroad sites)[5].

FIGURE 6.7: TOXIC RELEASE INVENTORY (TRI) FACILITIES



Source: EPA

[4] This type of analysis will likely yield inflated results (generally higher than what is actually reported after an actual event).

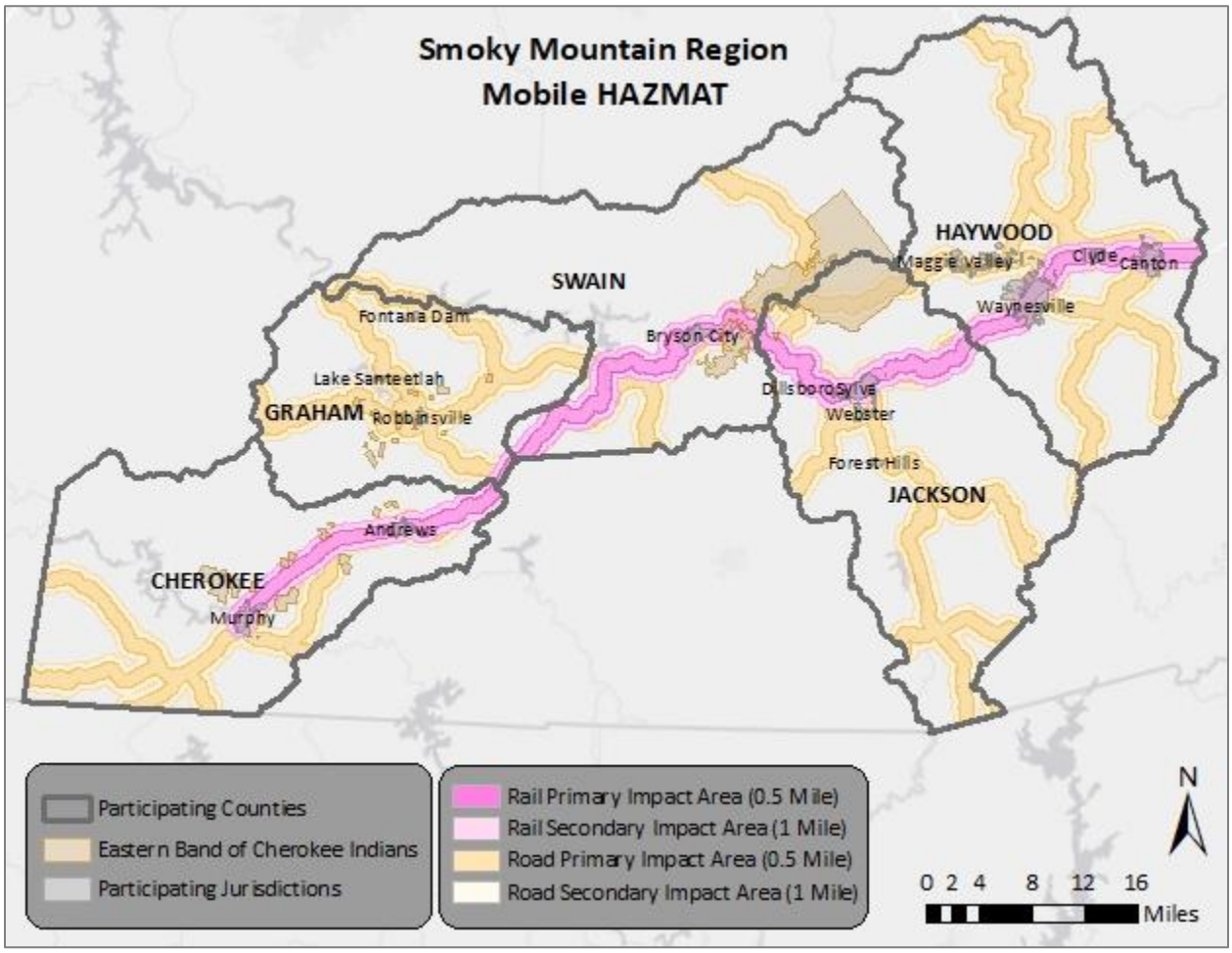
[5] Note that parcels included in the 1-mile analysis are also included in the 0.5-mile analysis.

TABLE 6.21: EXPOSURE OF IMPROVED PROPERTY TO HAZARDOUS SUBSTANCES (FIXED SITES)

Location	0.5 Mile Buffer			1.0 Mile Buffer		
	Approx. Number of Parcels	Approx. Number Improved	Approx. Improved Value	Approx. Number of Parcels	Approx. Number Improved	Approx. Improved Value
Cherokee County	**741**	**581**	**$97,509,870**	**2,375**	**1,753**	**$241,528,550**
Andrews	365	309	$37,344,310	783	659	$91,995,320
Murphy	0	0	$0	0	0	$0
Unincorporated Area	376	272	$60,165,560	1,592	1,094	$149,533,230
Graham County	**0**	**0**	**$0**	**0**	**0**	**$0**
Fontana	0	0	$0	0	0	$0
Lake Santeetlah	0	0	$0	0	0	$0
Robbinsville	0	0	$0	0	0	$0
Unincorporated Area	0	0	$0	0	0	$0
Haywood County	**1,815**	**1**	**$84,000**	**5,639**	**6**	**$700,600**
Canton	621	0	$0	2,143	0	$0
Clyde	1	0	$0	1	0	$0
Maggie Valley	6	0	$0	14	0	$0
Waynesville	876	1	$84,000	2,363	4	$496,600
Unincorporated Area	311	0	$0	1,118	2	$204,000
Jackson County	**991**	**745**	**$144,818,100**	**2,200**	**1,615**	**$330,765,560**
Dillsboro	17	9	$1,931,490	173	120	$18,021,120
Forest Hills	0	0	$0	0	0	$0
Sylva	0	0	$0	0	0	$0
Webster	0	0	$0	0	0	$0
Unincorporated Area	974	736	$142,886,610	2,027	1,495	$312,744,440
Swain County	**191**	**118**	**$32,063,280**	**778**	**512**	**$89,929,854**
Bryson City	110	85	$16,247,930	379	298	$55,664,224
Unincorporated Area	81	33	$15,815,350	399	214	$34,265,630
Eastern Band of Cherokee Indians	**0**	**0**	**$0**	**2**	**0**	**$0**
Smoky Mountain Regional Total	**3,738**	**1,445**	**$274,475,250**	**10,994**	**3,886**	**$662,924,564**

Source: EPA, Local governments

FIGURE 6.8: MOBILE HAZMAT IMPACT ZONES



Source: NC Department of Transportation

TABLE 6.22: EXPOSURE OF IMPROVED PROPERTY TO HAZARDOUS SUBSTANCES (MOBILE ANALYSIS – ROAD)

Location	0.5 Mile Buffer			1.0 Mile Buffer		
	Approx. Number of Parcels	Approx. Number Improved	Approx. Improved Value	Approx. Number of Parcels	Approx. Number Improved	Approx. Improved Value
Cherokee County	**13,262**	**8,571**	**$1,257,844,500**	**20,752**	**12,793**	**$1,765,880,160**
Andrews	829	694	$105,383,630	877	730	$109,087,040
Murphy	0	0	$0	0	0	$0
Unincorporated Area	12,433	7,877	$1,152,460,870	19,875	12,063	$1,656,793,120
Graham County	**5,693**	**2,974**	**$339,906,345**	**7,955**	**3,987**	**$432,986,075**
Fontana	0	0	$0	0	0	$0
Lake Santeetlah	248	167	$37,153,715	299	208	$48,574,595
Robbinsville	373	284	$51,042,030	373	284	$51,042,030
Unincorporated Area	5,072	2,523	$251,710,600	7,283	3,495	$333,369,450
Haywood County	**28,015**	**12**	**$1,477,800**	**38,120**	**13**	**$1,695,100**
Canton	2,282	0	$0	2,758	0	$0
Clyde	795	0	$0	806	0	$0
Maggie Valley	2,309	2	$295,800	2,784	2	$295,800
Waynesville	5,023	4	$496,600	5,950	4	$496,600
Unincorporated Area	17,606	6	$685,400	25,822	7	$902,700
Jackson County	**19,656**	**11,931**	**$5,931,420,407**	**29,142**	**17,187**	**$7,758,704,997**
Dillsboro	206	142	$33,237,480	206	142	$33,237,480
Forest Hills	0	0	$0	0	0	$0
Sylva	0	0	$0	0	0	$0
Webster	0	0	$0	0	0	$0
Unincorporated Area	19,450	11,789	$5,898,182,927	28,936	17,045	$7,725,467,517
Swain County	**4,775**	**2,874**	**$439,324,147**	**7,022**	**4,094**	**$599,910,868**
Bryson City	1,048	802	$160,419,297	1,064	812	$162,174,027
Unincorporated Area	3,676	2,056	$272,978,680	5,874	3,251	$430,494,071
Eastern Band of Cherokee Indians	**51**	**16**	**$5,926,170**	**84**	**31**	**$7,242,770**
Smoky Mountain Regional Total	**71,452**	**26,378**	**$7,975,899,369**	**103,075**	**38,105**	**$10,566,419,970**

Source: NC Department of Transportation, Local Governments

TABLE 6.23: EXPOSURE OF IMPROVED PROPERTY TO HAZARDOUS SUBSTANCES (MOBILE ANALYSIS – RAILROAD)

Location	0.5 Mile Buffer			1.0 Mile Buffer		
	Approx. Number of Parcels	Approx. Number Improved	Approx. Improved Value	Approx. Number of Parcels	Approx. Number Improved	Approx. Improved Value
Cherokee County	**4,369**	**3,228**	**$529,286,430**	**6,922**	**4,823**	**$723,071,640**
Andrews	854	714	$107,718,050	877	730	$109,087,040
Murphy	0	0	$0	0	0	$0
Unincorporated Area	3,515	2,514	$421,568,380	6,045	4,093	$613,984,600
Graham County	**121**	**38**	**$2,820,200**	**161**	**54**	**$3,685,410**
Fontana	0	0	$0	0	0	$0
Lake Santeetlah	0	0	$0	0	0	$0
Robbinsville	0	0	$0	0	0	$0
Unincorporated Area	121	38	$2,820,200	161	54	$3,685,410
Haywood County	**10,444**	**8**	**$1,106,300**	**16,850**	**9**	**$1,323,600**
Canton	1,616	0	$0	2,554	0	$0
Clyde	765	0	$0	796	0	$0
Maggie Valley	26	0	$0	36	0	$0
Waynesville	3,340	4	$496,600	5,042	4	$496,600
Unincorporated Area	4,697	4	$609,700	8,422	5	$827,000
Jackson County	**5,691**	**3,759**	**$622,351,060**	**8,985**	**5,747**	**$892,692,610**
Dillsboro	206	142	$33,237,480	206	142	$33,237,480
Forest Hills	0	0	$0	0	0	$0
Sylva	0	0	$0	0	0	$0
Webster	0	0	$0	0	0	$0
Unincorporated Area	5,485	3,617	$589,113,580	8,779	5,605	$859,455,130
Swain County	**3,751**	**2,320**	**$404,315,577**	**6,334**	**3,823**	**$575,953,487**
Bryson City	967	743	$152,611,337	1,064	812	$162,174,027
Unincorporated Area	2,784	1,577	$251,704,240	5,270	3,011	$413,779,460
Eastern Band of Cherokee Indians	**19**	**8**	**$3,410,510**	**29**	**10**	**$3,482,160**
Smoky Mountain Regional Total	**24,395**	**9,361**	**$1,563,290,077**	**39,281**	**14,466**	**$2,200,208,907**

Source: NC Department of Transportation, Local Governments

SOCIAL VULNERABILITY

Given high susceptibility across the entire Smoky Mountain Region, it is assumed that the total population is at risk to hazardous materials incidents. It should be noted that areas of population concentration 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 are 14 facilities located in a HAZMAT risk zone. The primary impact zone (0.5-mile buffer) includes 1 facility in the region, while the remaining facilities are in the secondary, 1-mile zone. A list of specific critical facilities and their associated risk can be found in **Table 6.24** at the end of this section.

Mobile Analysis:
The critical facility analysis for road and railroad transportation corridors revealed that there are 72 critical facilities located in the primary (0.5 mile) mobile HAZMAT buffer areas for roads and railroads throughout the region. Although this is a worst-case scenario model, it indicates that most of the critical facilities in the Smoky Mountain region are vulnerable to a potential mobile HAZMAT incident. Additionally, there are 75 critical facilities located in the secondary (1 mile) buffer area of both roads and railroads, accounting for approximately 79 percent of the total number of critical facilities in the region. This may be the result of many critical facilities being located near major roadways for ease of access, but it is nonetheless important to recognize what a large percentage of critical facilities in the region are located in the smaller buffer area. A list of specific critical facilities and their associated risk can be found in **Table 6.24** at the end of this section.

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

6.6 CONCLUSIONS ON HAZARD VULNERABILITY

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

- Improving our understanding of the risk associated with the natural hazards in the Smoky Mountain 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 Smoky Mountain 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 natural 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 natural hazards that are present in the Smoky Mountain 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 Cherokee, Graham, Haywood, Jackson, Swain, counties and the Eastern band of Cherokee Indians.

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).

As noted previously, all existing and future buildings and populations (including critical facilities) are vulnerable to natural hazards including drought, hurricane and coastal hazards, tornadoes/ thunderstorms, and severe winter weather. Some buildings may be more vulnerable to these hazards based on locations, construction, and building type. **Table 6.24** shows the critical facilities vulnerable to additional hazards analyzed in this section. The table lists those assets that are determined to be exposed to each of the identified hazards (marked with an "**X**")

Table 6.24: Critical Facility Vulnerability in the Smoky Mountain Region

Facility Name	Facility Type	Natural								Geological		Other						
		Drought	Excessive Heat	Hurricane & Coastal Hazards	Tornadoes/Thunderstorms	Severe Winter Weather	Earthquakes	Flood 100-year	Flood 500-year	Landslide - High Incidence	Landslide - Mod. Incidence	Wildfires	Fixed HAZMAT 0.5 Mile	Fixed HAZMAT 1 Mile	Mobile HAZMAT 0.5 Mile (Road)	Mobile HAZMAT 1 Mile (Road)	Mobile HAZMAT 0.5 Mile (Rail)	Mobile HAZMAT 1 Mile (Rail)
Cherokee County																		
Junaluska Community Volunteer Fire	Fire/EMS	X	X	X	X	X	X				X				X	X	X	X
Junaluska Elementary	Public School	X	X	X	X	X	X			X					X	X		
Leitz Home	Medical Facility	X	X	X	X	X	X				X				X	X	X	X
Lifespan Cardiac Rehabilitation	Medical Facility	X	X	X	X	X	X				X				X	X	X	X
Lifespan Enrichment Services of Murphy	Medical Facility	X	X	X	X	X	X				X				X	X	X	X
Maggie Valley Police Dept. - Headquarters	Law Enforcement	X	X	X	X	X	X				X				X	X	X	X
Maggie Valley Volunteer Fire Dept.	Fire/EMS	X	X	X	X	X	X				X				X	X	X	X
Maggie Valley Volunteer Fire Dept.	Fire/EMS	X	X	X	X	X	X			X								
Marble Elementary	Public School	X	X	X	X	X	X				X				X	X		
Martins Creek Elementary/Mid	Public School	X	X	X	X	X	X				X				X	X		
Meadowbrook Elementary	Public School	X	X	X	X	X	X				X				X	X	X	X
Mountain Discovery Charter	Public School	X	X	X	X	X	X				X				X	X	X	X
Mountain Hearts Cardiac Rehab	Medical Facility	X	X	X	X	X	X				X				X	X	X	X
Mountain Hearts Cardiac Rehabilitation	Medical Facility	X	X	X	X	X	X				X				X	X	X	X
Mountain Hearts Cardiac Rehabilitation	Medical Facility	X	X	X	X	X	X				X					X		
Mountain Manor Rest Home	Medical Facility	X	X	X	X	X	X				X		X	X	X	X	X	X
Mountain View Manor Nursing Center	Medical Facility	X	X	X	X	X	X				X			X	X	X	X	X
Mountain Youth School	Public School	X	X	X	X	X	X				X			X	X	X	X	X
Murphy Elementary	Public School	X	X	X	X	X	X				X			X	X	X	X	X
Murphy Fire Dept. - Substation	Fire/EMS	X	X	X	X	X	X			X					X	X	X	X

Facility Name	Facility Type	Natural								Geological		Other						
		Drought	Excessive Heat	Hurricane & Coastal Hazards	Tornadoes/Thunderstorms	Severe Winter Weather	Earthquakes	Flood 100-year	Flood 500-year	Landslide - High Incidence	Landslide - Mod. Incidence	Wildfires	Fixed HAZMAT 0.5 Mile	Fixed HAZMAT 1 Mile	Mobile HAZMAT 0.5 Mile (Road)	Mobile HAZMAT 1 Mile (Road)	Mobile HAZMAT 0.5 Mile (Rail)	Mobile HAZMAT 1 Mile (Rail)
Murphy Fire Dept. - Substation	Fire/EMS	X	X	X	X	X	X				X				X	X	X	X
Murphy Fire Dept. Station 1	Fire/EMS	X	X	X	X	X	X				X				X	X	X	X
Murphy Fire Dept. Station 1	Fire/EMS	X	X	X	X	X	X				X							
Murphy High	Public School	X	X	X	X	X	X				X				X	X		
Murphy Medical Center, Inc.	Medical Facility	X	X	X	X	X	X				X				X	X		
Murphy Middle	Public School	X	X	X	X	X	X			X					X	X		
NC Division of Forest Resources District 9 - Graham County	Fire/EMS	X	X	X	X	X	X			X								
NC Forestry Service	Law Enforcement	X	X	X	X	X	X			X								
NC State Highway Patrol Troop G District 6	Law Enforcement	X	X	X	X	X	X				X				X	X	X	X
NC State Highway Patrol Troop G District V	Law Enforcement	X	X	X	X	X	X				X							
NCDNR - Division of Forest Resources - District 9	Law Enforcement	X	X	X	X	X	X				X		X	X	X	X		
New Beginnings	Medical Facility	X	X	X	X	X	X				X		X	X	X	X		
New Beginnings	Medical Facility	X	X	X	X	X	X				X			X	X	X	X	X
North Canton Elementary	Public School	X	X	X	X	X	X				X				X	X	X	X
North Canton United Fire Dept.	Fire/EMS	X	X	X	X	X	X				X		X	X	X	X	X	X
NPS - Blue Ridge Parkway Balsam Gap Ranger Station	Law Enforcement	X	X	X	X	X	X			X								
Oak Hill Care Center	Medical Facility	X	X	X	X	X	X				X			X	X	X	X	X
Oak Park Guest Home	Medical Facility	X	X	X	X	X	X				X		X	X	X	X	X	X
Oak Park Guest Home #2	Medical Facility	X	X	X	X	X	X				X			X	X	X	X	X
Opportunity House	Medical Facility	X	X	X	X	X	X				X		X	X	X	X	X	X
Park Vista Group Home	Medical Facility	X	X	X	X	X	X				X				X	X	X	X
Parrish Home	Medical Facility	X	X	X	X	X	X	X	X		X				X	X		X

Facility Name	Facility Type	Natural								Geological		Other						
		Drought	Excessive Heat	Hurricane & Coastal Hazards	Tornadoes/Thunderstorms	Severe Winter Weather	Earthquakes	Flood 100-year	Flood 500-year	Landslide - High Incidence	Landslide - Mod. Incidence	Wildfires	Fixed HAZMAT 0.5 Mile	Fixed HAZMAT 1 Mile	Mobile HAZMAT 0.5 Mile (Road)	Mobile HAZMAT 1 Mile (Road)	Mobile HAZMAT 0.5 Mile (Rail)	Mobile HAZMAT 1 Mile (Rail)
Peachtree Elementary	Public School	X	X	X	X	X	X	X	X		X				X	X		X
Peachtree Guest House	Medical Facility	X	X	X	X	X	X				X				X	X	X	X
Peachtree Volunteer Fire Dept.	Fire/EMS	X	X	X	X	X	X			X					X	X	X	X
Peachtree Volunteer Fire Dept.	Fire/EMS	X	X	X	X	X	X			X					X	X	X	X
Pisgah High	Public School	X	X	X	X	X	X			X					X	X	X	X
Pleasant Hill Group Home	Medical Facility	X	X	X	X	X	X				X			X	X	X	X	X
Pleasant Valley Group Home	Medical Facility	X	X	X	X	X	X				X				X	X		X
Prn Nursing Services	Medical Facility	X	X	X	X	X	X	X	X		X				X	X		
Qualla Volunteer Fire Dept. Station 1	Fire/EMS	X	X	X	X	X	X	X	X		X				X	X		
Qualla Volunteer Fire Dept. Station 2	Fire/EMS	X	X	X	X	X	X			X					X	X		
Queen Retirement Home	Medical Facility	X	X	X	X	X	X			X					X	X		
Ranger Elementary/Middle	Public School	X	X	X	X	X	X				X		X	X	X	X	X	X
Ranger Volunteer Fire Dept.	Fire/EMS	X	X	X	X	X	X				X		X	X	X	X	X	X
Ranger Volunteer Fire Dept.	Fire/EMS	X	X	X	X	X	X				X				X	X	X	X
Richland Rest Home #1	Medical Facility	X	X	X	X	X	X			X					X	X		
Richland Rest Home #2	Medical Facility	X	X	X	X	X	X			X					X	X		
Rising Sun	Medical Facility	X	X	X	X	X	X				X				X	X		
Riverbend Elementary	Public School	X	X	X	X	X	X				X							
Robbinsville Elementary	Public School	X	X	X	X	X	X				X				X	X		X
Robbinsville High	Public School	X	X	X	X	X	X			X								
Robbinsville Middle	Public School	X	X	X	X	X	X			X								
Saunook Volunteer Fire Dept.	Fire/EMS	X	X	X	X	X	X			X					X	X		
Savannah Volunteer Fire Dept. Station 1	Fire/EMS	X	X	X	X	X	X			X								
Savannah Volunteer Fire Dept. Station 2	Fire/EMS	X	X	X	X	X	X			X								

Facility Name	Facility Type	Natural								Geological		Other						
		Drought	Excessive Heat	Hurricane & Coastal Hazards	Tornadoes/Thunderstorms	Severe Winter Weather	Earthquakes	Flood 100-year	Flood 500-year	Landslide - High Incidence	Landslide - Mod. Incidence	Wildfires	Fixed HAZMAT 0.5 Mile	Fixed HAZMAT 1 Mile	Mobile HAZMAT 0.5 Mile (Road)	Mobile HAZMAT 1 Mile (Road)	Mobile HAZMAT 0.5 Mile (Rail)	Mobile HAZMAT 1 Mile (Rail)
Scotts Creek Elementary	Public School	X	X	X	X	X	X				X			X	X	X	X	X
Skill Creations, Inc.-Pisgah	Medical Facility	X	X	X	X	X	X	X	X		X							
Skyland Care Center, Inc.	Medical Facility	X	X	X	X	X	X				X				X	X	X	X
Turning Point Services, Inc./Ledford Home	Medical Facility	X	X	X	X	X	X				X		X	X	X	X	X	X
Tuscola High	Public School	X	X	X	X	X	X				X				X	X		
TVA Police - Appalachian Sector	Law Enforcement	X	X	X	X	X	X				X		X	X	X	X		
Unaka Volunteer Fire Dept.	Fire/EMS	X	X	X	X	X	X				X		X	X	X	X	X	X
Unaka Volunteer Fire Dept.	Fire/EMS	X	X	X	X	X	X				X		X	X	X	X	X	X
Unique Care Incorporated III	Medical Facility	X	X	X	X	X	X	X	X		X			X	X	X	X	X
US Forest Service - Cheoah Ranger District	Law Enforcement	X	X	X	X	X	X				X				X	X		
US Forest Service - Nantahala NF Tusquitee Ranger District	Law Enforcement	X	X	X	X	X	X				X							
US Forest Service - Tusquitee Ranger District	Fire/EMS	X	X	X	X	X	X				X							
Valley View Care and Rehabilitation Center	Medical Facility	X	X	X	X	X	X				X		X	X	X	X	X	X
Valleytown Rural Fire Dept. Station 1 - Headquarters	Fire/EMS	X	X	X	X	X	X				X				X	X		
Valleytown Rural Fire Dept. Station 1 - Headquarters	Fire/EMS	X	X	X	X	X	X				X				X	X	X	X
Valleytown Rural Fire Dept. Station 2	Fire/EMS	X	X	X	X	X	X				X				X	X		
Valleytown Rural Fire Dept. Station 2	Fire/EMS	X	X	X	X	X	X				X				X	X	X	X
Valleytown Rural Fire Dept. Station 3	Fire/EMS	X	X	X	X	X	X				X		X	X	X	X		
Westcare EMS Station 2	Fire/EMS	X	X	X	X	X	X				X	X			X	X		
Westcare EMS Station 3	Fire/EMS	X	X	X	X	X	X				X	X			X	X		
Westcare Home Health and Hospice Services	Medical Facility	X	X	X	X	X	X			X		X						

Facility Name	Facility Type	Natural								Geological		Other						
		Drought	Excessive Heat	Hurricane & Coastal Hazards	Tornadoes/Thunderstorms	Severe Winter Weather	Earthquakes	Flood 100-year	Flood 500-year	Landslide - High Incidence	Landslide - Mod. Incidence	Wildfires	Fixed HAZMAT 0.5 Mile	Fixed HAZMAT 1 Mile	Mobile HAZMAT 0.5 Mile (Road)	Mobile HAZMAT 1 Mile (Road)	Mobile HAZMAT 0.5 Mile (Rail)	Mobile HAZMAT 1 Mile (Rail)
Western Carolina EMS	Fire/EMS	X	X	X	X	X	X			X		X						
Western Carolina University Police	Law Enforcement	X	X	X	X	X	X				X	X	X	X	X	X		
Wilson Residential Home	Medical Facility	X	X	X	X	X	X			X		X			X	X		
Wolfcreek Fire Dept.	Fire/EMS	X	X	X	X	X	X				X	X			X	X		
Graham County																		
Hiwassee Dam Volunteer Fire Dept. - HQ	Fire/EMS	X	X	X	X	X	X				X				X	X		
Jackson County Early College	Public School	X	X	X	X	X	X				X				X	X		
Jackson County Emergency Management	Other	X	X	X	X	X	X				X				X	X		
Jackson County Rescue Squad	Fire/EMS	X	X	X	X	X	X				X				X	X		
Jackson County School of Alternatives	Public School	X	X	X	X	X	X				X				X	X		
Jackson County Sheriff's Office - Cashiers Station	Law Enforcement	X	X	X	X	X	X				X				X	X		
Jackson County Sheriff's Office/Jackson County Jail	Law Enforcement	X	X	X	X	X	X				X				X	X		
Jonathan Creek Volunteer Fire Dept.	Fire/EMS	X	X	X	X	X	X				X				X	X		
Jonathan Valley Elementary	Public School	X	X	X	X	X	X				X				X	X		
Kelley's Home Health Services	Medical Facility	X	X	X	X	X	X				X				X	X		
Kelley's Home Health Services	Medical Facility	X	X	X	X	X	X				X				X	X		
Kelley's Home Health Services	Medical Facility	X	X	X	X	X	X				X				X	X		
Lake Logan-Cecil Volunteer Fire Dept.	Fire/EMS	X	X	X	X	X	X				X				X	X		
McCracken Rest Home	Medical Facility	X	X	X	X	X	X				X				X	X		
Valleytown Rural Fire Dept. Station 3	Fire/EMS	X	X	X	X	X	X				X				X	X		
Valleytown Rural Fire Dept. Station 4	Fire/EMS	X	X	X	X	X	X				X				X	X		
Webster Children's Group Home	Medical Facility	X	X	X	X	X	X				X	X			X	X		
West Care Cardiac Rehabilitation Program	Medical Facility	X	X	X	X	X	X				X	X			X	X		
West Swain Fire Dept.	Fire/EMS	X	X	X	X	X	X				X	X			X	X		

Facility Name	Facility Type	Natural								Geological		Other						
		Drought	Excessive Heat	Hurricane & Coastal Hazards	Tornadoes/Thunderstorms	Severe Winter Weather	Earthquakes	Flood 100-year	Flood 500-year	Landslide - High Incidence	Landslide - Mod. Incidence	Wildfires	Fixed HAZMAT 0.5 Mile	Fixed HAZMAT 1 Mile	Mobile HAZMAT 0.5 Mile (Road)	Mobile HAZMAT 1 Mile (Road)	Mobile HAZMAT 0.5 Mile (Rail)	Mobile HAZMAT 1 Mile (Rail)
Haywood County																		
Culberson Volunteer Fire Dept.	Fire/EMS	X	X	X	X	X	X		X		X							
Cullowhee Valley School	Public School	X	X	X	X	X	X				X		X	X	X	X	X	X
Cullowhee Volunteer Fire Dept. Station 1	Fire/EMS	X	X	X	X	X	X				X			X	X	X	X	X
Cullowhee Volunteer Fire Dept. Station 2	Fire/EMS	X	X	X	X	X	X				X				X	X		
Cullowhee Volunteer Fire Dept. Station 3	Fire/EMS	X	X	X	X	X	X	X	X		X				X	X	X	X
District Medical Center, Inc.	Medical Facility	X	X	X	X	X	X				X					X		X
Dogwood Acres	Medical Facility	X	X	X	X	X	X				X				X	X	X	X
Fairview Elementary	Public School	X	X	X	X	X	X				X				X	X	X	X
Fines Creek Volunteer Fire Dept.	Fire/EMS	X	X	X	X	X	X				X			X	X	X	X	X
Fines Creek Volunteer Fire Dept.	Fire/EMS	X	X	X	X	X	X				X				X	X	X	X
Fontana Public Safety	Fire/EMS	X	X	X	X	X	X				X				X	X	X	X
Gateway	Medical Facility	X	X	X	X	X	X				X				X	X	X	X
Glenville Cashiers Rescue Squad	Fire/EMS	X	X	X	X	X	X				X				X	X	X	X
Golden Years of Murphy	Medical Facility	X	X	X	X	X	X				X				X	X	X	X
Good Shepherd Home Health and Hospice Agency	Medical Facility	X	X	X	X	X	X	X	X		X				X	X	X	X
Good Shepherd Home Health and Hospice Agency	Medical Facility	X	X	X	X	X	X				X				X	X	X	X
Graham County Emergency Management	Other	X	X	X	X	X	X				X				X	X		
Graham County EMS	Fire/EMS	X	X	X	X	X	X				X				X	X		
Graham County EMS	Fire/EMS	X	X	X	X	X	X				X				X	X	X	X
Graham County Rescue Squad	Fire/EMS	X	X	X	X	X	X				X				X	X	X	X
Graham County Sheriffs Dept.	Law Enforcement	X	X	X	X	X	X				X				X	X	X	X
Graham County Volunteer Fire Dept. - Santopia Station	Fire/EMS	X	X	X	X	X	X				X				X	X	X	X

Facility Name	Facility Type	Natural								Geological		Other						
		Drought	Excessive Heat	Hurricane & Coastal Hazards	Tornadoes/Thunderstorms	Severe Winter Weather	Earthquakes	Flood 100-year	Flood 500-year	Landslide - High Incidence	Landslide - Mod. Incidence	Wildfires	Fixed HAZMAT 0.5 Mile	Fixed HAZMAT 1 Mile	Mobile HAZMAT 0.5 Mile (Road)	Mobile HAZMAT 1 Mile (Road)	Mobile HAZMAT 0.5 Mile (Rail)	Mobile HAZMAT 1 Mile (Rail)
Graham County Volunteer Fire Dept. - Fort Hill Station	Fire/EMS	X	X	X	X	X	X				X				X	X	X	X
Graham Home	Medical Facility	X	X	X	X	X	X				X			X		X		X
Grandview Assisted Living Services	Medical Facility	X	X	X	X	X	X		X		X		X	X	X	X	X	X
Grandview Assisted Living Services	Medical Facility	X	X	X	X	X	X	X	X		X		X	X	X	X	X	X
Grape Creek Volunteer Fire Dept	Fire/EMS	X	X	X	X	X	X	X	X		X		X	X	X	X	X	X
Great Smokey Mountain Nation Park - Deep Creek Ranger Station	Law Enforcement	X	X	X	X	X	X				X		X	X	X	X	X	X
Great Smokey Mountain National Park - 20 Mile Ranger Station	Law Enforcement	X	X	X	X	X	X				X		X	X	X	X	X	X
Great Smokey Mountain National Park - NC Ranger Operations	Law Enforcement	X	X	X	X	X	X				X					X		
Great Smokey Mountain National Park - Oconaluftee Ranger Station	Law Enforcement	X	X	X	X	X	X				X					X		
Great Smokey Mountains National Park - Cataloochee Ranger Station	Law Enforcement	X	X	X	X	X	X		X		X			X	X	X	X	X
Hanging Dog Volunteer Fire Dept.	Fire/EMS	X	X	X	X	X	X				X				X	X		
Hanging Dog Volunteer Fire Dept.	Fire/EMS	X	X	X	X	X	X				X			X	X	X		X
Harris Regional Hospital, Inc.	Medical Facility	X	X	X	X	X	X	X	X		X				X	X	X	X
Haywood County Emergency Management	Other	X	X	X	X	X	X				X				X	X		
Haywood County EMS - Maggie Valley	Fire/EMS	X	X	X	X	X	X				X				X	X		
Haywood County EMS - Medic 1 And Medic 5	Fire/EMS	X	X	X	X	X	X				X				X	X		
Haywood County EMS - Medic 3	Fire/EMS	X	X	X	X	X	X				X					X		
Haywood County EMS - Medic 4	Fire/EMS	X	X	X	X	X	X				X					X		

Facility Name	Facility Type	Natural								Geological		Other						
		Drought	Excessive Heat	Hurricane & Coastal Hazards	Tornadoes/Thunderstorms	Severe Winter Weather	Earthquakes	Flood 100-year	Flood 500-year	Landslide - High Incidence	Landslide - Mod. Incidence	Wildfires	Fixed HAZMAT 0.5 Mile	Fixed HAZMAT 1 Mile	Mobile HAZMAT 0.5 Mile (Road)	Mobile HAZMAT 1 Mile (Road)	Mobile HAZMAT 0.5 Mile (Rail)	Mobile HAZMAT 1 Mile (Rail)
Haywood County EMS - Medic 6	Fire/EMS	X	X	X	X	X	X	X	X		X		X	X	X	X	X	X
Haywood County Group Home #1	Medical Facility	X	X	X	X	X	X	X	X		X		X	X	X	X	X	X
Haywood County Group Home #3	Medical Facility	X	X	X	X	X	X				X		X	X	X	X	X	X
Haywood County Group Home #4	Medical Facility	X	X	X	X	X	X		X		X				X	X	X	X
Haywood County Rescue Squad	Fire/EMS	X	X	X	X	X	X		X		X				X	X	X	X
Haywood County Rescue Squad	Fire/EMS	X	X	X	X	X	X		X		X				X	X	X	X
Haywood County Sheriffs Dept. / Detention Center	Law Enforcement	X	X	X	X	X	X		X		X				X	X	X	X
Haywood Early College	Public School	X	X	X	X	X	X		X		X				X	X	X	X
Haywood Lodge and Retirement Center	Medical Facility	X	X	X	X	X	X				X			X	X	X		
Haywood Regional Medical Center	Medical Facility	X	X	X	X	X	X				X				X	X	X	X
Hazelwood Elementary	Public School	X	X	X	X	X	X				X				X	X		
HealthPros Inc.	Medical Facility	X	X	X	X	X	X				X				X	X		
Helping Hands	Medical Facility	X	X	X	X	X	X				X				X	X		
Hiwassee Dam Elementary/Middle	Public School	X	X	X	X	X	X				X				X	X		
Hiwassee Dam Fire Dept. - Substation	Fire/EMS	X	X	X	X	X	X				X							
Hiwassee Dam High	Public School	X	X	X	X	X	X				X				X	X		
Hiwassee Dam Volunteer Fire Dept. - HQ	Fire/EMS	X	X	X	X	X	X				X					X		
Holloway Home	Medical Facility	X	X	X	X	X	X			X					X	X		
Home Care Services of Haywood Regional Medical Center	Medical Facility	X	X	X	X	X	X			X					X	X		
Infinity House	Medical Facility	X	X	X	X	X	X				X				X	X		
Smokey Mountain Elementary	Public School	X	X	X	X	X	X	X	X		X				X	X	X	X
Smoky Mountain Learning Center	Medical Facility	X	X	X	X	X	X				X				X	X		
Snowbird Fire and Rescue	Fire/EMS	X	X	X	X	X	X				X			X	X	X	X	X

Facility Name	Facility Type	Natural								Geological		Other						
		Drought	Excessive Heat	Hurricane & Coastal Hazards	Tornadoes/Thunderstorms	Severe Winter Weather	Earthquakes	Flood 100-year	Flood 500-year	Landslide - High Incidence	Landslide - Mod. Incidence	Wildfires	Fixed HAZMAT 0.5 Mile	Fixed HAZMAT 1 Mile	Mobile HAZMAT 0.5 Mile (Road)	Mobile HAZMAT 1 Mile (Road)	Mobile HAZMAT 0.5 Mile (Rail)	Mobile HAZMAT 1 Mile (Rail)
Snowbird Fire and Rescue	Fire/EMS	X	X	X	X	X	X				X				X	X	X	X
Snyder Home	Medical Facility	X	X	X	X	X	X				X				X	X	X	X
Stecoah Rescue Squad and Fire Dept.	Fire/EMS	X	X	X	X	X	X				X		X	X	X	X	X	X
Stecoah Rescue Squad and Fire Dept.	Fire/EMS	X	X	X	X	X	X		X		X		X	X	X	X	X	X
Stockton Home	Medical Facility	X	X	X	X	X	X				X				X	X		
Summit Charter	Public School	X	X	X	X	X	X				X			X	X	X		X
Swain Co East Elementary	Public School	X	X	X	X	X	X				X			X	X	X		X
Swain Co West Elementary	Public School	X	X	X	X	X	X				X			X		X	X	X
Swain County Emergency Operations Center	Other	X	X	X	X	X	X				X			X	X	X	X	X
Swain County EMS	EMS	X	X	X	X	X	X				X			X	X	X	X	X
Swain County Health Dept.	Medical Facility	X	X	X	X	X	X				X				X	X	X	X
Swain County High	Public School	X	X	X	X	X	X				X				X	X	X	X
Swain County Hospital	Medical Facility	X	X	X	X	X	X	X	X		X				X	X	X	X
Swain County Middle	Public School	X	X	X	X	X	X				X			X	X	X		X
Swain County Rescue Squad Incorporated	Fire/EMS	X	X	X	X	X	X				X		X	X	X	X	X	X
Swain County Sheriffs Dept. / Swain County Jail	Law Enforcement	X	X	X	X	X	X				X					X		
Sylva Police Dept.	Law Enforcement	X	X	X	X	X	X		X		X				X	X	X	X
Sylva Volunteer Fire Dept.	Fire/EMS	X	X	X	X	X	X				X			X	X	X		X
Temporary Nursing Solutions	Medical Facility	X	X	X	X	X	X				X				X	X		
The Brooks at Balsam	Medical Facility	X	X	X	X	X	X				X			X	X	X		X
The Learning Center	Public School	X	X	X	X	X	X				X		X	X	X	X	X	X
The Nursing Network	Medical Facility	X	X	X	X	X	X				X			X	X	X	X	X
The Potts House	Medical Facility	X	X	X	X	X	X				X				X	X	X	X
The Risin	Medical Facility	X	X	X	X	X	X				X		X	X	X	X	X	X

Facility Name	Facility Type	Natural								Geological		Other						
		Drought	Excessive Heat	Hurricane & Coastal Hazards	Tornadoes/Thunderstorms	Severe Winter Weather	Earthquakes	Flood 100-year	Flood 500-year	Landslide - High Incidence	Landslide - Mod. Incidence	Wildfires	Fixed HAZMAT 0.5 Mile	Fixed HAZMAT 1 Mile	Mobile HAZMAT 0.5 Mile (Road)	Mobile HAZMAT 1 Mile (Road)	Mobile HAZMAT 0.5 Mile (Rail)	Mobile HAZMAT 1 Mile (Rail)
The River House	Medical Facility	X	X	X	X	X	X				X				X	X	X	X
Town of Murphy Police Dept.	Law Enforcement	X	X	X	X	X	X				X		X	X	X	X	X	X
Tri-County Early College High	Public School	X	X	X	X	X	X				X		X	X	X	X	X	X
Waynesville Middle	Public School	X	X	X	X	X	X				X	X		X	X	X	X	X
Waynesville Police Dept.	Law Enforcement	X	X	X	X	X	X				X	X			X	X		
Jackson County																		
Beal Home	Medical Facility	X	X	X	X	X	X				X				X	X		X
Bellview Volunteer Fire Dept.	Fire/EMS	X	X	X	X	X	X				X							X
Canada Volunteer Fire Dept.	Fire/EMS	X	X	X	X	X	X	X	X		X				X	X	X	X
Canton Fire Dept.	Fire/EMS	X	X	X	X	X	X	X	X		X				X	X	X	X
Canton Fire Dept.	Fire/EMS	X	X	X	X	X	X				X				X	X	X	X
Canton Health Care Center	Medical Facility	X	X	X	X	X	X				X		X	X	X	X	X	X
Canton Middle	Public School	X	X	X	X	X	X				X		X	X	X	X	X	X
Canton Police Dept.	Law Enforcement	X	X	X	X	X	X				X			X	X	X	X	X
Carolina Care Home #1	Medical Facility	X	X	X	X	X	X		X		X		X	X	X	X	X	X
Carolina Care Home #2	Medical Facility	X	X	X	X	X	X				X		X	X	X	X	X	X
Cashiers-Glenville Fire Dept. Station 1	Fire/EMS	X	X	X	X	X	X	X	X		X		X	X	X	X	X	X
Cashiers-Glenville Fire Dept. Station 2	Fire/EMS	X	X	X	X	X	X				X		X	X	X	X	X	X
Cashiers-Glenville Fire Dept. Station 3	Fire/EMS	X	X	X	X	X	X				X		X	X	X	X	X	X
Center Pigeon Fire Dept.	Fire/EMS	X	X	X	X	X	X				X		X	X	X	X	X	X
Center Pigeon Fire Dept.	Fire/EMS	X	X	X	X	X	X				X						X	X
Central Elementary	Public School	X	X	X	X	X	X				X					X	X	X
Central Haywood High	Public School	X	X	X	X	X	X				X				X	X	X	X
Cherokee County Emergency Management	Other	X	X	X	X	X	X				X				X	X	X	X

Facility Name	Facility Type	Natural								Geological		Other						
		Drought	Excessive Heat	Hurricane & Coastal Hazards	Tornadoes/Thunderstorms	Severe Winter Weather	Earthquakes	Flood 100-year	Flood 500-year	Landslide - High Incidence	Landslide - Mod. Incidence	Wildfires	Fixed HAZMAT 0.5 Mile	Fixed HAZMAT 1 Mile	Mobile HAZMAT 0.5 Mile (Road)	Mobile HAZMAT 1 Mile (Road)	Mobile HAZMAT 0.5 Mile (Rail)	Mobile HAZMAT 1 Mile (Rail)
Cherokee County EMS Station 1	Fire/EMS	X	X	X	X	X	X				X				X	X	X	X
Cherokee County EMS Station 2	Fire/EMS	X	X	X	X	X	X				X				X	X		
Cherokee County EMS Station 3	Fire/EMS	X	X	X	X	X	X				X				X	X		
Cherokee County Rescue Squad Incorporated	Fire/EMS	X	X	X	X	X	X				X					X		
Cherokee County Sheriffs Dept.	Law Enforcement	X	X	X	X	X	X				X					X		
Cherokee Elementary	Public School	X	X	X	X	X	X				X					X		
Cherokee Extension School	Public School	X	X	X	X	X	X				X				X	X		
Cherokee Fire Dept. - Emergency Medical First Response	Fire/EMS	X	X	X	X	X	X		X		X				X	X		
Cherokee Fire Dept. - Emergency Medical First Response	Fire/EMS	X	X	X	X	X	X	X	X		X							
Cherokee Fire Dept. Station 2	Fire/EMS	X	X	X	X	X	X				X				X	X		
Cherokee Fire Dept. Station 3	Fire/EMS	X	X	X	X	X	X				X				X	X		
Cherokee High	Public School	X	X	X	X	X	X			X					X	X		
Cherokee Indian Police Dept.	Law Enforcement	X	X	X	X	X	X			X					X	X		
Cherokee Middle	Public School	X	X	X	X	X	X			X					X	X		
Cherokee Tribal EMS	Fire/EMS	X	X	X	X	X	X	X	X		X				X	X		
City of Bryson City Police Dept.	Law Enforcement	X	X	X	X	X	X			X					X	X		
Clyde Elementary	Public School	X	X	X	X	X	X			X					X	X		
Clyde Police Dept.	Law Enforcement	X	X	X	X	X	X				X				X	X	X	X
Clyde Road Home	Medical Facility	X	X	X	X	X	X				X				X	X		X
Clyde Volunteer Fire Dept. Incorporated	Fire/EMS	X	X	X	X	X	X			X					X	X		
Clyde Volunteer Fire Dept. Incorporated	Fire/EMS	X	X	X	X	X	X				X					X		
Continuum Home Care of Clyde	Medical Facility	X	X	X	X	X	X				X							

Facility Name	Facility Type	Natural								Geological		Other						
		Drought	Excessive Heat	Hurricane & Coastal Hazards	Tornadoes/Thunderstorms	Severe Winter Weather	Earthquakes	Flood 100-year	Flood 500-year	Landslide - High Incidence	Landslide - Mod. Incidence	Wildfires	Fixed HAZMAT 0.5 Mile	Fixed HAZMAT 1 Mile	Mobile HAZMAT 0.5 Mile (Road)	Mobile HAZMAT 1 Mile (Road)	Mobile HAZMAT 0.5 Mile (Rail)	Mobile HAZMAT 1 Mile (Rail)
Covenant Family Care	Medical Facility	X	X	X	X	X	X				X				X	X		
Crabtree-Iron Duff Volunteer Fire Dept.	Fire/EMS	X	X	X	X	X	X				X				X	X		
Crabtree-Iron Duff Volunteer Fire Dept.	Fire/EMS	X	X	X	X	X	X			X						X		
Cruso Volunteer Fire Dept.	Fire/EMS	X	X	X	X	X	X				X				X	X	X	X
Cruso Volunteer Fire Dept.	Fire/EMS	X	X	X	X	X	X				X			X	X	X		X
Culberson Volunteer Fire Dept.	Fire/EMS	X	X	X	X	X	X				X				X	X		
Smoky Mountain Counseling Center	Medical Facility	X	X	X	X	X	X				X			X	X	X	X	X
Smoky Mountain High	Public School	X	X	X	X	X	X				X				X	X	X	X
Smoky Mountain House	Medical Facility	X	X	X	X	X	X				X		X	X	X	X	X	X
Visiting Health Professionals	Medical Facility	X	X	X	X	X	X				X		X	X	X	X	X	X
Waynesville Fire Dept. Station 1 - Headquarters	Fire/EMS	X	X	X	X	X	X				X	X			X	X		
Waynesville Fire Dept. Station 2	Fire/EMS	X	X	X	X	X	X				X	X			X	X		
Swain County																		
Advanced Home Care	Medical Facility	X	X	X	X	X	X		X		X				X	X	X	X
Alarka Volunteer Fire Dept.	Fire/EMS	X	X	X	X	X	X				X				X	X	X	X
Andrews Elementary	Public School	X	X	X	X	X	X				X				X	X	X	X
Andrews Fire Dept.	Fire/EMS	X	X	X	X	X	X				X			X	X	X		X
Andrews High	Public School	X	X	X	X	X	X				X				X	X	X	X
Andrews Home - Cherokee County	Medical Facility	X	X	X	X	X	X				X							
Andrews Middle	Public School	X	X	X	X	X	X				X			X	X	X	X	X
Andrews Police Dept.	Law Enforcement	X	X	X	X	X	X	X	X		X				X	X	X	X
Andrews Rescue Squad Incorporated	Fire/EMS	X	X	X	X	X	X		X		X				X	X	X	X
Angel Home Health and Hospice	Medical Facility	X	X	X	X	X	X				X				X	X	X	X
Ann Davis Rest Home	Medical Facility	X	X	X	X	X	X				X				X	X	X	X

Facility Name	Facility Type	Natural								Geological		Other						
		Drought	Excessive Heat	Hurricane & Coastal Hazards	Tornadoes/Thunderstorms	Severe Winter Weather	Earthquakes	Flood 100-year	Flood 500-year	Landslide - High Incidence	Landslide - Mod. Incidence	Wildfires	Fixed HAZMAT 0.5 Mile	Fixed HAZMAT 1 Mile	Mobile HAZMAT 0.5 Mile (Road)	Mobile HAZMAT 1 Mile (Road)	Mobile HAZMAT 0.5 Mile (Rail)	Mobile HAZMAT 1 Mile (Rail)
Autumn Care of Waynesville	Medical Facility	X	X	X	X	X	X				X				X	X	X	X
Autumn Wind of Bryson City	Medical Facility	X	X	X	X	X	X				X							
Balsam Road Home	Medical Facility	X	X	X	X	X	X				X		X	X	X	X	X	X
Balsam-Willets-Ochre Hill Volunteer Fire Dept. #1	Fire/EMS	X	X	X	X	X	X				X			X	X	X	X	X
Balsam-Willets-Ochre Hill Volunteer Fire Dept. #2	Fire/EMS	X	X	X	X	X	X	X	X		X				X	X	X	X
Bellview Volunteer Fire Dept.	Fire/EMS	X	X	X	X	X	X				X				X	X		X
Bethel Elementary	Public School	X	X	X	X	X	X	X	X		X				X	X		
Bethel Middle	Public School	X	X	X	X	X	X				X				X	X		
Blue Ridge Early College	Public School	X	X	X	X	X	X				X							
Blue Ridge Paper Products Emergency Response	Fire/EMS	X	X	X	X	X	X				X				X	X		
Smoky Mountain Center for MH/DD/SAS	Medical Facility	X	X	X	X	X	X				X			X	X	X	X	X
Smoky Mountain Center-Cherokee	Medical Facility	X	X	X	X	X	X				X			X	X	X	X	X
Smoky Mountain Counseling Center	Medical Facility	X	X	X	X	X	X				X				X	X	X	X
Smoky Mountain Counseling Center	Medical Facility	X	X	X	X	X	X				X				X	X	X	X
Smoky Mountain Counseling Center	Medical Facility	X	X	X	X	X	X				X				X	X	X	X
Eastern Band of Cherokee Indians																		
Blue Ridge Paper Products Emergency Response - Waynesville Facility	Fire/EMS	X	X	X	X	X	X				X				X	X		
Blue Ridge Paper Products Emergency Response - Waynesville Facility	Fire/EMS	X	X	X	X	X	X		X		X				X	X		
Blue Ridge School	Public School	X	X	X	X	X	X				X				X	X		
Brian Center Health & Rehabilitation/Waynesville	Medical Facility	X	X	X	X	X	X				X				X	X		
Britthaven of Clyde	Medical Facility	X	X	X	X	X	X	X	X		X							
Bryson City Fire Dept.	Fire/EMS	X	X	X	X	X	X				X				X	X		

Facility Name	Facility Type	Natural								Geological		Other						
		Drought	Excessive Heat	Hurricane & Coastal Hazards	Tornadoes/Thunderstorms	Severe Winter Weather	Earthquakes	Flood 100-year	Flood 500-year	Landslide - High Incidence	Landslide - Mod. Incidence	Wildfires	Fixed HAZMAT 0.5 Mile	Fixed HAZMAT 1 Mile	Mobile HAZMAT 0.5 Mile (Road)	Mobile HAZMAT 1 Mile (Road)	Mobile HAZMAT 0.5 Mile (Rail)	Mobile HAZMAT 1 Mile (Rail)
Bryson City Home	Medical Facility	X	X	X	X	X	X				X				X	X		
Cagle Home	Medical Facility	X	X	X	X	X	X		X		X				X	X		
Martins Creek Volunteer Fire Dept. Incorporated	Fire/EMS	X	X	X	X	X	X			X								
Mauney Cove Family Care Home	Medical Facility	X	X	X	X	X	X			X								
Valleytown Rural Fire Dept. Station 4	Fire/EMS	X	X	X	X	X	X				X				X	X		

SECTION 7
CAPABILITY ASSESSMENT

This section of the Plan discusses the capability of the communities in the Smoky Mountain 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, number 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 Smoky Mountain 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 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

During the first iteration of this regional plan in 2012, a detailed survey of existing plans and policies was undertaken. This information was then used to score each jurisdiction's capability. The result was a numerical score of capability, similar to a grade. In this version of the plan, however, capabilities were reviewed similar to previous efforts but a numerical score on capability was not provided. There were numerous reasons for this revised approach, but it was primarily driven by receipt of conflicting information. Thus, rather than focusing on a number for which capability could be graded, actual gaps or achievements in capability were tracked based on received and researched information.

For this version of the plan, a Capability Assessment Review Form 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 was distributed to each participating jurisdiction. Other indicators included information related to the region's fiscal, administrative, and technical capabilities, such as access to local budgetary and personnel resources for mitigation purposes was evaluated by each point of contact. The current political climate, an important consideration for any local planning or decision making process, was also evaluated with respect to hazard mitigation. Capability information for the region was also updated based on information found in plans and local government websites.

At a minimum, the results of this assessment 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 information 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[2] 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 jurisdictions in the Smoky Mountain 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 Smoky Mountain Regional Hazard Mitigation Planning Committee.

[2] The scoring methodology used to quantify and rank the region's capability can be found in Appendix B.

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 jurisdictions in the Smoky Mountain 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 jurisdictions in the Smoky Mountain Region. A checkmark (✓) indicates that the given item is currently in place and being implemented. An asterisk (*) indicates that the given item is currently being developed for future implementation. Each of these local plans, ordinances, and programs should be considered available mechanisms for incorporating the requirements of the Smoky Mountain Regional Hazard Mitigation Plan.

TABLE 7.1: RELEVANT PLANS, ORDINANCES, AND PROGRAMS

Planning / Regulatory Tool	CHEROKEE COUNTY	Andrews	Murphy	GRAHAM COUNTY	Fontana Dam	Lake Santeetlah	Robbinsville	HAYWOOD COUNTY	Canton	Clyde	Maggie Valley	Waynesville	JACKSON COUNTY	Dillsboro	Forest Hills	Sylva	Webster	SWAIN COUNTY	Bryson City	EASTERN BAND of CHEROKEE
Hazard Mitigation Plan	✓	✓	✓	✓	*	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Comprehensive Land Use Plan	✓			✓							✓	✓	✓	✓	✓	✓	✓	*	✓	
Floodplain Management Plan														✓	✓		✓			
Open Space Management Plan (Parks & Rec/Greenway Plan)																		*		
Stormwater Management Plan/Ordinance	✓									✓			✓	✓	✓	✓	✓			
Natural Resource Protection Plan																				✓
Flood Response Plan																				
Emergency Operations Plan	✓			✓		✓	✓	✓					✓	✓	✓	✓	✓	✓	✓	✓
Continuity of Operations Plan													✓							
Evacuation Plan																				

Planning / Regulatory Tool	CHEROKEE COUNTY	Andrews	Murphy	GRAHAM COUNTY	Fontana Dam	Lake Santeetlah	Robbinsville	HAYWOOD COUNTY	Canton	Clyde	Maggie Valley	Waynesville	JACKSON COUNTY	Dillsboro	Forest Hills	Sylva	Webster	SWAIN COUNTY	Bryson City	EASTERN BAND of CHEROKEE
Disaster Recovery Plan																				
Capital Improvements Plan								✓					✓		✓		✓			
Economic Development Plan													✓							✓
Historic Preservation Plan													✓							
Flood Damage Prevention Ordinance	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Zoning Ordinance		✓	✓						✓	✓	✓		✓	✓	✓	✓	✓			✓
Subdivision Ordinance	*		✓					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Unified Development Ordinance																				
Post-Disaster Redevelopment Ordinance																				
Building Code	✓			✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Fire Code	✓			✓				✓	✓	✓	✓	✓	✓					✓	✓	✓
National Flood Insurance Program (NFIP)	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NFIP Community Rating System	✓																			

A more detailed discussion on the region's planning and regulatory capability follows, along with the incorporation of additional information based on the narrative comments provided by local officials in response to the survey questionnaire.

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 Smoky Mountain 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.

- Each of the five counties and Tribe participating in this multi-jurisdictional plan has previously adopted hazard mitigation plans.

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.

- None of the counties or Tribe participating in this multi-jurisdictional plan have adopted a disaster recovery plan. They should consider developing a plan to guide the recovery and reconstruction process following a disaster.

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

- Cherokee County, Graham County, Haywood County, Jackson County, Swain County, and the Eastern Band of Cherokee Indians each maintain emergency operations plans through their respective Emergency Management Departments.
- The Towns of Lake Santeetlah and Robbinsville are covered by Graham County's emergency operations plan.

- Haywood County's emergency operation plan is designed to address plans of action for multiple hazards that may threaten a jurisdiction with the County, including the Towns of Canton, Clyde, Maggie Valley, and Waynesville.
- Jackson County maintains a countywide emergency operations plan that covers all of its municipalities (Dillsboro, Forest Hills, Sylva, and Webster).
- Bryson City is covered by the Swain County 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.

- Only Jackson County has adopted 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 Smoky Mountain 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.

- Cherokee County has adopted a county growth management plan.
- Graham County has adopted a county land use plan.
- Although Haywood County does not have a comprehensive land use plan in place, Maggie Valley has adopted a town land use plan and Waynesville has adopted a town land development plan.
- Jackson County and all of its participating jurisdictions have adopted comprehensive land use plans.
- Swain County does not have an official land use plan in place, but the county is currently in the process of updating its land use plan in anticipation of changing conditions in the area. Bryson City adopted its first land development plan in 2008.
- Although the Eastern Band of Cherokee Indians does not have a comprehensive plan in place, as the Tribe continues to grow economically, there are trends toward more comprehensive planning.

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.

- The Haywood County Manager is responsible for development of the County's capital improvement program.
- Jackson County, Forest Hills, and Webster have capital improvement plans in place to guide the schedule of spending on public improvements.

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.

- Jackson County is the only participating jurisdiction that has a historic preservation plan.

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.

- Cherokee County does not have a zoning ordinance. However, the Towns of Andrews and Murphy have adopted zoning ordinances that are overseen by Town Zoning Administrators.
- Zoning ordinances have not been adopted in Graham County or its jurisdictions.
- Haywood County does not have a zoning ordinance in place, but three of the jurisdictions, Canton, Clyde, and Maggie Valley, have adopted zoning ordinances that are administered by the Town Planning Department or Town Administrator.
- Jackson County and all four of its jurisdictions have adopted and enforce zoning ordinances. These ordinances are intended to promote and enhance the unique community atmosphere and preserve the social, economic, cultural, historic, and aesthetic conditions.
- Neither Swain County nor Bryson City has adopted zoning ordinances.
- The Eastern Band of Cherokee Indians has very limited zoning. The Code establishes the Cherokee Business Zone and prohibits certain events and activities within that zone, but no other zones are established or addressed and no specific uses are prohibited or encouraged.

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.

- Cherokee County and Graham County do not have subdivision ordinances in place. However, the Cherokee County Board of Commissioners has reviewed a draft subdivision ordinance that is being considered for adoption.

- Haywood County has a subdivision ordinance that was adopted by the Board of County Commissioners and applies to all areas of unincorporated Haywood County. One of the stated purposes is to ensure that land is subdivided in a manner "that shall be of such character that it can be used safely without danger to health or peril from fire, flood, erosion, air and/or water pollution." All of the participating jurisdictions in Haywood County have also adopted subdivision ordinances.
- Jackson County's Code of Ordinances includes subdivision regulations which address steep slope and flood hazard. All of the participating jurisdictions in Jackson County have also adopted subdivision ordinances.
- Swain County has a subdivision ordinance that was adopted by the County Board of Commissioners and applies to all areas of unincorporated Swain County. The Town of Bryson City has not adopted a subdivision ordinance.
- The Eastern Band of Cherokee Indians does not have any subdivision regulations in place.

Building Codes, Permitting, and Inspections: Building codes regulate construction standards. In many communities, permits, and inspections are required for new construction. Decisions regarding the adoption of building codes (that account for hazard risk), the type of permitting process required both before and after a disaster, and the enforcement of inspection protocols all affect the level of hazard risk faced by a community.

- 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 and jurisdictions have adopted a building code except for the towns in Cherokee and Graham Counties (Andrews, Murphy, Fontana Dam, Lake Santeetlah, and Robbinsville). The building code is enforced by each county's building inspector.
- The Towns of Canton and Waynesville have their own inspections departments that enforce the building code within their town 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).[3] 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.

[3] 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 Smoky Mountain 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
CHEROKEE COUNTY	2/2/89	4/19/10	124	$28,170,800	15	$139,779.16
Andrews	2/1/85	4/19/10	6	$1,795,800	5	$192,489.11
Murphy	7/3/86	4/19/10(M)	6	$1,290,300	4	$24,946.48
GRAHAM COUNTY	7/17/86	4/19/10	43	$6,782,500	2	$10,846.72
Fontana Dam	--	--	--	--	--	--
Lake Santeetlah	9/12/17	4/19/10	--	--	--	--
Robbinsville	12/1/89	4/19/10	1	$147,000	--	--
HAYWOOD COUNTY	7/15/84	4/3/12	229	$47,877,500	45	$963,490.45
Canton	2/2/77	4/3/12	32	$7,846,600	50	$3,045,873.23
Clyde	12/1/83	4/3/12	61	$9,774,300	127	$3,874,582.67
Maggie Valley	4/17/84	4/3/12	34	$8,900,500	3	$6,552.17

Jurisdiction	Date Joined NFIP	Current Effective Map Date	NFIP Policies in Force	Insurance in Force	Closed Claims	Total Payments to Date
Waynesville	1/6/83	4/3/12	278	$37,623,600	11	$82,430.31
JACKSON COUNTY	5/17/89	4/19/10	275	$57,799,300	13	$122,301.08
Dillsboro	5/15/86	4/19/10	10	$3,082,600	4	$307,078.56
Forest Hills	5/10/10	4/19/10	2	$330,000	--	--
Sylva	7/3/86	4/19/10	21	$6,135,200	3	$116,847.48
Webster	4/19/10	4/19/10	3	$193,000	--	--
SWAIN COUNTY	7/17/86	4/19/10	60	$12,256,200	4	$26,351.11
Bryson City	12/4/84	4/19/10	28	$5,423,600	5	$237,853.05
EASTERN BAND OF CHEROKEE	5/17/89	4/19/10	51	$12,400,000	3	$236,297.96

(M) – No Elevation Determined, all Zone A, C and X
(S) – Suspended Community
Source: NFIP claims and policy information as of 2/29/12; NFIP Community Status information as of 4/19/12

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.

- Cherokee County participates in the CRS as a Class 9 community. Participation in the CRS program should be considered as a mitigation action by the counties, municipalities, and Tribe. The program would be most beneficial to the Town of Waynesville, Jackson County, and Haywood County, which have 278, 275, and 229 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 counties and municipalities participating in this hazard mitigation plan, with the exception of the Town of Fontana Dam, also participate in the NFIP and they all have adopted flood damage prevention regulations.

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.

- The Towns of Dillsboro and Webster and the Village of Forest Hills have adopted 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, municipalities, or Tribe have an open space management plan.
- A Greenway Project has been suggested by Swain County as a way to acquire and control parts of the Tuckasegee River floodway.

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.

- Only two of the participating counties, Cherokee and Jackson, have adopted stormwater management plans.
- The Town of Clyde in Haywood County has developed a stormwater master plan and adopted a stormwater management ordinance that is overseen by the Town Administrator.

- The Towns of Dillsboro, Forest Hill, Sylva, and Webster in Jackson County also have stormwater management plans in place.

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 results for the Smoky Mountain Region with regard to relevant staff and personnel resources. A checkmark (✓) indicates the presence of a staff member(s) in that jurisdiction with the specified knowledge or skill.

TABLE 7.4: RELEVANT STAFF / PERSONNEL RESOURCES

Staff / Personnel Resource	CHEROKEE COUNTY	Andrews	Murphy	GRAHAM COUNTY	Fontana Dam	Lake Santeetlah	Robbinsville	HAYWOOD COUNTY	Canton	Clyde	Maggie Valley	Waynesville	JACKSON COUNTY	Dillsboro	Forest Hills	Sylva	Webster	SWAIN COUNTY	Bryson City	EASTERN BAND of CHEROKEE
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				✓				✓	✓		✓	✓	✓					✓		✓
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	✓							✓					✓					✓		✓

Staff / Personnel Resource	CHEROKEE COUNTY	Andrews	Murphy	GRAHAM COUNTY	Fontana Dam	Lake Santeetlah	Robbinsville	HAYWOOD COUNTY	Canton	Clyde	Maggie Valley	Waynesville	JACKSON COUNTY	Dillsboro	Forest Hills	Sylva	Webster	SWAIN COUNTY	Bryson City	EASTERN BAND of CHEROKEE
Resource development staff or grant writers													✓							✓

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 Smoky Mountain Region with regard to relevant fiscal resources. A checkmark (✓) indicates that the given fiscal resource is locally available for hazard mitigation purposes (including match funds for state and federal mitigation grant funds) according to the previous county hazard mitigation plans.

TABLE 7.5: RELEVANT FISCAL RESOURCES

Fiscal Tool / Resource	CHEROKEE COUNTY	Andrews	Murphy	GRAHAM COUNTY	Fontana Dam	Lake Santeetlah	Robbinsville	HAYWOOD COUNTY	Canton	Clyde	Maggie Valley	Waynesville	JACKSON COUNTY	Dillsboro	Forest Hills	Sylva	Webster	SWAIN COUNTY	Bryson City	EASTERN BAND of CHEROKEE
Capital Improvement Programming	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓		✓
Community Development Block Grants (CDBG)	✓	✓	✓					✓	✓	✓	✓	✓	✓							
Special Purpose Taxes (or taxing districts)								✓	✓	✓	✓	✓								

Fiscal Tool / Resource	CHEROKEE COUNTY	Andrews	Murphy	GRAHAM COUNTY	Fontana Dam	Lake Santeetlah	Robbinsville	HAYWOOD COUNTY	Canton	Clyde	Maggie Valley	Waynesville	JACKSON COUNTY	Dillsboro	Forest Hills	Sylva	Webster	SWAIN COUNTY	Bryson City	EASTERN BAND of CHEROKEE
Gas / Electric Utility Fees																				
Water / Sewer Fees																				
Stormwater Utility Fees																				
Development Impact Fees																				
General Obligation, Revenue, and/or Special Tax Bonds																				
Partnering Arrangements or Intergovernmental Agreements	✓	✓	✓										✓	✓	✓	✓	✓	✓	✓	

7.3.8 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 Smoky Mountain 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.
- There is resistance to zoning and comprehensive land use planning in Haywood, Jackson, and Swain Counties and it is possible that citizens will not support the implementation of a hazard mitigation plan. However, the counties feel that public outreach can be used to educate citizens on the necessity of such a plan by using examples of damage from past disaster events.
- Cherokee County, the Town of Andrews, and the Town of Murphy indicated that their residents have a better understanding of hazard vulnerability, as well as the need to mitigate that vulnerability, due to the number of natural and manmade hazards that have occurred and that have been effectively controlled in the past.
- The Eastern Band of Cherokee Indians was the first Native American Nation to participate in the FEMA Project Impact Initiative and is also a Cooperating Technical Partner with an ongoing floodplain mapping initiate. The Tribe is making continuous and costly improvements to its

emergency management program and has demonstrated a serious commitment to hazard mitigation even in the absence of a recent major disaster. Mitigation and hazard reduction principles are indirectly referenced throughout many of the Tribal documents, plans, and policies.

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, further described in Appendix B, attempts to assess the overall level of capability of the Smoky Mountain 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 moderate range. There is more variation in the administrative and technical capability among the jurisdictions with larger jurisdictions generally having greater staff and technical resources. Almost all of jurisdictions are in the limited range for fiscal capability.

Table 7.6 shows the results of the capability assessment using the designed scoring methodology. The capability score is based solely on the information found in existing hazard mitigation plans and readily available on the jurisdictions' government websites. According to the assessment, the average local capability score for all responding jurisdictions is 21.8, which falls into the moderate capability ranking.

TABLE 7.6: CAPABILITY ASSESSMENT RESULTS

Jurisdiction	Overall Capability Score	Overall Capability Rating
CHEROKEE COUNTY	30	Moderate
Andrews	16	Limited
Murphy	16	Limited
GRAHAM COUNTY	25	Moderate
Fontana Dam	1	Limited
Lake Santeetlah	10	Limited
Robbinsville	10	Limited
HAYWOOD COUNTY	31	Moderate
Canton	23	Moderate
Clyde	19	Limited
Maggie Valley	24	Moderate
Waynesville	25	Moderate

Jurisdiction	Overall Capability Score	Overall Capability Rating
JACKSON COUNTY	42	High
Dillsboro	21	Moderate
Forest Hills	23	Moderate
Sylva	20	Moderate
Webster	23	Moderate
SWAIN COUNTY	29	Moderate
Bryson City	16	Limited
EASTERN BAND OF CHEROKEE	32	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 Team 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 Smoky Mountain Region to follow in order to become less vulnerable to its identified hazards. It is based on general consensus of the Smoky Mountain 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 Smoky Mountain Region
- 8.5 Plan Update Requirement
- 8.6 Tribal Funding Sources

8.1 INTRODUCTION

The intent of the Mitigation Strategy is to provide the Smoky Mountain Region communities with the goals that will serve as guiding principles for future mitigation policy and project administration, along with an analysis of mitigation techniques 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 Smoky Mountain 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 Smoky Mountain counties, jurisdictions and the Tribe 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 Smoky Mountain 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

All existing mitigation actions found in the Mitigation Action Plan were previously prioritized by the participating jurisdictions. For the 2022 update of the plan the members of the Regional Hazard Mitigation Planning Committee were asked, as part of the process of providing a status update for each action, to make sure that the assigned priority for each action was still appropriate. Prioritization of the proposed mitigation actions was based on the following strategies:

1. High Priority – Highly cost-effective, administratively feasible and politically feasible strategies that should be implemented in fiscal years 2022/2023 and 2023/2024 and be continued.
2. Medium Priority – Strategies that have at least two of the following characteristics (but not all three) and should be implemented in fiscal years 2023/2024 to 2024/2025:
    a. Highly cost-effective; or
    b. Administratively feasible, given current levels of staffing and resources; or
    c. Are politically popular and supportable given the current environment.
3. Low Priority – Strategies that have at least one of the following characteristics (but not two or three) and should be implemented in the next five (5) years (by the end of 2026/2027):
    d. Highly cost-effective; or
    e. Administratively feasible, given current levels of staffing and resources; or
    f. Are politically popular and supportable given the current environment.

The point of contact for each county and the Tribe 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 Smoky Mountain counties, the participating municipalities and the Tribe have developed six goal statements for local hazard mitigation planning in the region.

As part of the 2022 plan update, the existing regional mitigation goals were presented, reviewed, voted on, and accepted by the Planning Team at the second Regional Hazard Mitigation Planning Team meeting. Each goal, purposefully broad in nature, serves to establish parameters that were used in developing more mitigation actions. The Smoky Mountain Regional Mitigation Goals are presented in **Table 8.1**. Consistent implementation of actions over time will ensure that community goals are achieved.

TABLE 8.1: SMOKY MOUNTAIN REGIONAL MITIGATION GOALS

	Goal
Goal #1	Increase public awareness of hazard mitigation and hazard risk.
Goal #2	Enhance or create new policies that will help reduce the damaging effects of all hazards including natural, man-made and technological hazards.
Goal #3	Increase capabilities to support and implement effective mitigation measures.
Goal #4	Identify and mitigate development and infrastructure in known hazard areas and consider the risks, impacts, and potential mitigation measures to incorporate if proposing to build new structures in known hazard areas.
Goal #5	Encourage conservation of natural environments including forests, surface waters, wet lands, floodplains, and stream corridors.
Goal #6	Improve emergency service capabilities by identifying and seeking funding for necessary equipment as well as fostering regional cooperation for response and recovery.

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 Smoky Mountain 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 Smoky Mountain Regional Hazard Mitigation Planning Team meetings. In general, all activities considered by the Regional Hazard Mitigation Planning Team 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 SMOKY MOUNTAIN REGION

In order to determine the most appropriate mitigation techniques for the communities in the Smoky Mountain Region, the Regional Hazard Mitigation Planning Team 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 Smoky Mountain Regional Hazard Mitigation Plan were evaluated to determine their 2022 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 plans as well as any new mitigation actions proposed through the 2022 planning process.

8.6 POTENTIAL FUNDING SOURCES

Federal, state, tribal, and private funding sources are identified for each of the proposed mitigation actions found in Section 9: *Mitigation Action Plan.*

Additionally, the participating jurisdictions, (including EBCI) intend to pursue Federal grants in the future to implement mitigation activities. **Table 8.3,** below, identifies programs administered by FEMA that provide funding for eligible mitigation activities that reduce disaster losses and protect life and property from future disaster damages.

TABLE 8.3: POTENTIAL GRANT OPPORTUNITIES

Program	Enabling Legislation	Funding Authorization	Hazard Mitigation Plan Required?	
			Grantee Status	Subgrantee Status
Public Assistance (PA) (*Categories A, B: e.g., debris removal, emergency protective measures)*	Stafford Act	Presidential Disaster Declaration	No Plan Required	No Plan Required
Public Assistance *(Categories C-G: e.g., repairs to damaged infrastructure, publicly owned buildings)*	Stafford Act	Presidential Disaster Declaration	✓	No Plan Required
Individual Assistance (IA)	Stafford Act	Presidential Disaster Declaration	No Plan Required	No Plan Required
Fire Management Assistance Grants	Stafford Act	Fire Management Assistance Declaration	✓	No Plan Required
Hazard Mitigation Grant Program (HMGP) Planning Grant	Stafford Act	Presidential Disaster Declaration	✓	No Plan Required
HMGP Project Grant	Stafford Act	Presidential Disaster Declaration	✓	✓
Building Resilient Infrastructure and Communities (BRIC) Planning Grant	Stafford Act	Annual Appropriation	No Plan Required	No Plan Required
Building Resilient Infrastructure and Communities (BRIC) Project Grant	Stafford Act	Annual Appropriation	✓	✓
Flood Mitigation Assistance (FMA)	National Flood Insurance Act	Annual Appropriation	✓	✓

SECTION 9
Mitigation Action Plan

This section provides the mitigation actions that have been identified for the participating jurisdictions. It consists of the following two subsections:

- 9.1 Overview
- 9.2 Mitigation Action Plans

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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 Smoky Mountain 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 Smoky Mountain 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).

Table 9.1 describes the key elements of the Mitigation Action Plan.

TABLE 9.1: KEY ELEMENTS OF THE MITIGATION ACTION PLAN

Jurisdiction Name Mitigation Action Number	**Title of Action (Description of action to be undertaken.)**
Hazard(s) Addressed:	Hazard which the action addresses.
Category:	Category of Mitigation Strategy that is met: Prevention, Property Protection, Natural Resource Protection, Structural Projects, Emergency Services, Public Education and Awareness
Priority (High, Moderate, Low):	In preparing their own individual Mitigation Actions Plans, each jurisdiction considered their overall hazard risk and capability to mitigate natural hazards as recorded through the risk and capability assessment process, in addition to meeting the adopted countywide mitigation goals and the unique needs of the unique needs of their community. Prioritizing mitigation actions for each jurisdiction was based on the following five (5) factors: (1) effect on overall risk to life and property; (2) ease of implementation; (3) political and community support; (4) a general economic cost/benefit review; and (5) funding availability. This process is also described on page 8:2, Section 8: *Mitigation Strategy*.
Lead Agency/Department Responsible:	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.
Implementation Schedule:	Date by which the action the action should be completed. More information is provided when possible.
Implementation Status (2022):	An indication of completion, progress, deferment, or no change with each action since the previous plan. If the action is new, that will be noted here.

9.2 MITIGATION ACTION PLANS

The mitigation actions proposed by each of the participating jurisdictions are listed in 20 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.

TABLE 9.1: INDIVIDUAL MAP LOCATIONS

Location	Page	Number of Mitigation Actions
Cherokee County	**9:5**	**9**
Andrews	9:7	7
Murphy	9:9	7
Graham County	**9:11**	**19**
Fontana Dam	9:15	8
Lake Santeetlah	9:18	7
Robbinsville	9:20	9
Haywood County	**9:23**	**29**
Canton	9:28	19
Clyde	9:32	16
Maggie Valley	9:35	21
Waynesville	9:39	18
Jackson County	**9:42**	**13**
Dillsboro	9:46	6
Forest Hills	9:48	15
Sylva	9:52	14
Webster	9:57	11
Swain County	**9:61**	**10**
Bryson City	9:64	11
Eastern Band of Cherokee Indians	**9:67**	**36**

Cherokee County Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Prevention								
P-11	Monitor and manage the County's Steep Slope initiative to ensure sufficient accessibility of entrances and exits for emergency service vehicles.	All	High	County/Town Administration	N/A	General Fund	Action to be deleted.	Action to be deleted: Politically infeasible to implement at this time.
P-14	Evaluate the need for a drought management plan and protocol to be implemented throughout the county in the event a drought should occur.	Drought	Moderate	County Emergency Management	N/A	General Fund	2027	Action deferred pending funding, technical assistance (if needed) and staff availability for implementation.
Property Protection								
PP-1	Retrofit or relocate residential structures currently located in the 100-year floodplain to a base elevation one foot above the floodplain.	Flooding	Moderate	County Emergency Management; County Planning; NCDEM	Unknown	Local, State, Federal	Action to be deleted.	Action to be deleted: Politically infeasible to implement at this time.
PP-2	Retrofit all critical facilities to reduce collapsing materials such as light fixtures, ceiling tiles, shelves, or other unsecured material.	All	Moderate	County Emergency Management; County Inspections	Unknown	Local, State, Federal	Action to be deleted.	Action to be deleted: Politically infeasible to implement at this time.
PP-3	Identify critical facilities and the need for a second source of power for critical facilities and other public buildings to operate despite the negative effects of hazards on the main power source.	All	High	County Emergency Management	N/A	Unknown	2027	Action to be deleted as it is duplicative of Action PP- 6.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
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 hazards	Moderate	Emergency Management, Engineering and/or Planning Department	Project Cost, Staff Hours, and applicable cost share	Federal and State Grants, Local Operating Budget	2027	Action deferred pending funding, technical assistance (if needed) and staff availability for implementation.
PP-5	Identify structures subject to recurring flooding so that they can be retrofitted.	Flooding	Moderate	Emergency Management/Planning/GIS	Low; staff hours	Local	Action Completed	Action Completed. Structures identified using GIS data.
PP-6	Install generator or generator hook-ups for critical facilities as budget and need arise.	Severe Winter Weather, Hurricane and Coastal Hazards, Tornadoes/ Thunderstorms Flooding, Wildfires, Earthquake	Moderate	Emergency Management	Varies	FEMA HMA funding; local; state	2027	Action deferred pending funding, technical assistance (if needed) and staff availability for implementation.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Public Education and Awareness								
PEA-3	Develop and implement a comprehensive community information program to inform the public of the risk of potential hazards, potential mitigation measures, as well as what actions they can take to protect themselves and their property.	All	Low	County Emergency Management	N/A	General Fund	2027	Action deferred pending funding, technical assistance (if needed) and staff availability for implementation..

Town of Andrews Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Prevention								
P-5	To establish, where feasible, joint (town and county) guidelines for hazard mitigation implementation and to use all available information in the decision making process that is likely to effect within a five year period, based on growth projections, a municipal jurisdiction. This includes planning and zoning authority that is currently exercised by either the municipality or the county.	All	Moderate	County Emergency Management; Hazard Mitigation Task Force/LEPC		Local, State, Federal	Action completed.	Action completed through communication between town and county.
P-6	To establish, where feasible, joint (town and county) mitigation funding sources. To establish joint searches for opportunities to implement hazard mitigation goals, objectives, or recommendations.	All	Moderate	County and municipal executives; County and municipal Grants Management	Unknown	Local, State, Federal	Action completed.	Action completed through communication between town and county.
P-7	Formation of a cooperative hazard mitigation program to integrate hazard mitigation into new developments, commercial districts, land use planning, growth planning, infrastructure, and other initiatives.	All	Moderate	County and municipal executives	Unknown	Local, State, Federal	Action to be deleted.	Action to be deleted: Politically infeasible to implement at this time.
Property Protection								
PP-1	Retrofit or relocate residential structures currently located in the 100-year floodplain to a base elevation one foot above the floodplain.	Flooding	Moderate	County Emergency Management; County Planning; NCDEM	Unknown	Local, State, Federal	Action to be deleted.	Action to be deleted: Politically infeasible to implement at this time.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
PP-2	Retrofit all critical facilities to reduce collapsing materials such as light fixtures, ceiling tiles, shelves, or other unsecured material.	All	Moderate	County Emergency Management; County Inspections	Unknown	Local, State, Federal	Action to be deleted.	Action to be deleted: Politically infeasible to implement at this time.
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	Moderate	Emergency Management, Engineering and/or Planning Department	Project Cost, Staff Hours, and applicable cost share	Federal and State Grants, Local Operating Budget	2027	Action deferred pending funding, technical assistance (if needed) and staff availability for implementation.
PP-4	Install generator or generator hook-ups for critical facilities as budget and need arise.	Severe Winter Weather, Hurricane and Coastal Hazards, Tornadoes/ Thunderstorms Flooding, Wildfires, Earthquake	Moderate	Emergency Management	Varies	FEMA HMA, funding; local; state	2027	Action deferred pending funding, technical assistance (if needed) and staff availability for implementation.

Town of Murphy Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Prevention								
P-5	To establish, where feasible, joint (town and county) guidelines for hazard mitigation implementation and to use all available information in the decision making process that is likely to effect within a five year period, based on growth projections, a municipal jurisdiction. This includes planning and zoning authority that is currently exercised by either the municipality or the county.	All	Moderate	County Emergency Management; Hazard Mitigation Task Force/LEPC	Unknown	Local, State, Federal	Action completed.	Action completed through communication between town and county.
P-6	To establish, where feasible, joint (town and county) mitigation funding sources. To establish joint searches for opportunities to implement hazard mitigation goals, objectives, or recommendations.	All	Moderate	County and municipal executives; County and municipal Grants Management	Unknown	Local, State, Federal	Action completed.	Action completed through communication between town and county.
P-7	Formation of a cooperative hazard mitigation program to integrate hazard mitigation into new developments, commercial districts, land use planning, growth planning, infrastructure, and other initiatives.	All	Moderate	County and municipal executives	Unknown	Local, State, Federal	2027	Action deferred pending funding, technical assistance (if needed) and staff availability for implementation.
Property Protection								
PP-1	Retrofit or relocate residential structures currently located in the 100-year floodplain to a base elevation one foot above the floodplain.	Flooding	Moderate	County Emergency Management; County Planning; NCEM	Unknown	Local, State, Federal	2022-2030	There was no political will to complete this action over the last five years. As funding permits and homeowners volunteer we can focus more on this action.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
PP-2	Retrofit all critical facilities to reduce collapsing materials such as light fixtures, ceiling tiles, shelves, or other unsecured material.	All	Moderate	County Emergency Management; County Planning; NCEM	Unknown	Local, State, Federal	2022-2030	There was no political will to complete this action over the last five years. The town is still committed, will continue as funding becomes available.
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	Moderate	Emergency Management, Engineering and/or Planning Department	Project Cost, Staff Hours, and applicable cost share	Federal and State Grants, Local Operating Budget	2027	Action deferred pending funding, technical assistance (if needed) and staff availability for implementation.
PP-4	Install generator or generator hook-ups for critical facilities as budget and need arise.	Severe Winter Weather, Hurricane and Coastal Hazards, Tornadoes/ Thunderstorms Flooding, Wildfires, Earthquake	Moderate	Emergency Management	Varies	FEMA HMA, funding; local; state	2027	Action deferred pending funding, technical assistance (if needed) and staff availability for implementation.

Graham County Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Prevention								
P-3	Review the Emergency Operations Plan on an annual basis to ensure that it is kept current.	All	High	County Emergency Management Director	Unknown	Self-funded; partial state funding	Annual, 2030	Revisions as determined by need, evaluation and assessment.
P-4	Explore expanding floodplain and tax data to include residential-commercial distinction and occupied-unoccupied distinction.	Flooding	Low	County Tax Assessor	Unknown	Self-funded	2027	County has rejoined NFIP. There was no political will to complete this action over the last five years.
P-5	Develop a fire management plan that includes a clear statement of objectives and that incorporates information on land, threatened structures, degree of fire risk, fire history, and fire management measures.	Wildfires	High	County Fire Marshal; County Forest Ranger	Unknown	Self-funded; Partial state funding	Annually until 2027	Development continues as a result of wildfires and threat assessment.
P-6	Encourage fire-vulnerable subdivisions to become Firewise communities.	Wildfires	Low	County Fire Marshal; NCDNR Forest Ranger	Unknown	Self-funded; Firewise reimbursement	2030	County remains committed to this action, but there was no political will to complete this action over the last five years.
P-7	Create a subdivision ordinance that would specify a width and grade for entrance and exit routes to ensure the accessibility of emergency vehicles.	All	High	County Manager	Unknown	Self-funded	2027	County officials have considered a “Steep Slope Ordinance”, but there was no political will to complete this action over the last five years.
P-8	Expand Land Use Plan to address grade of banks on residential/commercial property.	Geological (Landslide)	Low	County Tax Assessor	Unknown	Self-funded	2030	There was no political will to complete this action over the last five years. County officials have considered a “Steep Slope Ordinance” but have taken no action.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
P-9	Identify potential landslide problem areas in County.	Geological (Landslide)	High	County Emergency Management Director	Unknown	Self-funded	2027	There was no political will to complete this action over the last five years. Assessment is as needed
Property Protection								
PP-1	Evaluate the relocation/elevation/floodproofing needs of all critical public structures or facilities within the floodplain and implement the necessary improvements.	Flooding	High	County Emergency Management Director	Unknown	Self-funded	2027	Assessment and recommendations continue, but there was no political will to complete this action over the last five years.
PP-2	Minimize placing new critical public facilities within the floodplain unless they promote an overriding public benefit, will not worsen hazard risk, will not directly promote development in floodplains, and are designed to withstand flood damage.	Flooding	Low	County Manager	Unknown	Self-funded	2030	There was no political will to complete this action over the last five years.
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	Moderate	Emergency Management, Engineering and/or Planning Department	Project Cost, Staff Hours, and applicable cost share	Federal and State Grants, Local Operating Budget	2027	New Action.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
PP-4	Install generator or generator hook-ups for critical facilities as budget and need arise.	Severe Winter Weather, Hurricane and Coastal Hazards, Tornadoes/ Thunderstorms Flooding, Wildfires, Earthquake	Moderate	Emergency Management	Varies	FEMA HMA, funding; local; state	2030	New Action
Natural Resource Protection								
NRP-1	Improve and maintain streams throughout the community to the fullest extent possible.	Flooding	High	County Manager	Unknown	Self-funded	2022-2030	There was no political will to complete this action over the last five years. Evaluate spills and encroachments as presented.
NRP-2	Whenever possible, preserve natural wetlands, especially along streams, through acquisition or conservation easements.	Flooding	Low	County Manager	Unknown	Self-funded	2030	There was no political will to complete this action over the last five years.
Emergency Services								
ES-1	Explore adding flood monitoring facilities on streams and coupling with a disaster warning system to give early warning of floods.	Flooding; Dam Failure	High	County Emergency Management Director	Unknown	State-funded	2027	Regional hydroelectric producers cooperating with early warning/failure devices and notification but nothing on streams.
ES-2	Coordinate response/recovery efforts with other communities and counties.	All	High	County Emergency Management Director	Unknown	Self-funded	2027	In progress. Continued use of MOA and mutual aid agreements.
ES-4	Procure and maintain up-to-date emergency response vehicles/equipment to ensure emergency response is capable of responding to various hazards.	All	High	County Emergency Management Director	Unknown	Self-funded; Partially state or Federal funding	2022-2030	Continued participation in DPR program to obtain, maintain, and improve response capabilities. Additional equipment or training may be necessary

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Public Education and Awareness								
PEA-1	Provide opportunities through meetings and special programs for contractors and property owners to become more informed as to appropriate building materials, equipment, and techniques to use in order to mitigate the impacts of flooding. Local inspectors can help encourage construction that is more resilient to these hazards.	Flooding	High	County Building Inspector	Unknown	Self-funded	2027	There was no political will to complete this action over the last five years.
PEA-2	Explore the possibility of developing an internet-based emergency information website.	All	Low	County Emergency Management Director	Unknown	Self-funded	2030	County website, social media platforms, and reverse 911 system used for information releases and emergency notifications.
PEA-3	Conduct a series of public classes on how to protect yourself during a hazard event in case you are at home, in a car, at the office, or outside.	All	High	County Emergency Management Director	Unknown	Self-funded	2027	While some education is conducted through the year, there is no formal program. There was no political will to complete this action over the last five years.

Town of Fontana Dam Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Prevention								
P-1	Develop a fire management plan that includes a clear statement of objectives and that incorporates information on land, threatened structures, degree of fire risk, fire history, and fire management measures.	Wildfires	High	Town Government in cooperation with County Government	Unknown	Local	2027	There was no political will to complete this action over the last five years. Continue to identify hazards and assess risk.
P-2	Continued consistency in enforcing the codes as they apply to protection from hazards is essential to maintaining adequate public safety. Constant vigilance regarding construction in flood prone areas is imperative to ensure all construction meets required flood protection measures. Enforcement of all floodplain requirements, including building and other codes, must be coordinated and systematically applied with adequate follow-up to ensure compliance.	Flooding	High	Town Government in cooperation with County Government	Unknown	Local	2022-2030	Maintained NFIP participation and good standing. Ensure compliance with NFIP during issuance of permits and inspections.
Property Protection								

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
PP-1	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	Moderate	Emergency Management, Engineering and/or Planning Department	Project Cost, Staff Hours, and applicable cost share	Federal and State Grants, Local Operating Budget	2022-2030	New Action.
PP-2	Install generator or generator hook-ups for critical facilities as budget and need arise.	Severe Winter Weather, Hurricane and Coastal Hazards, Tornadoes/ Thunderstorms Flooding, Wildfires, Earthquake	Moderate	Emergency Management	Varies	FEMA HMA, funding; local; state	2030	New Action
Emergency Services								
ES-1	Coordinate response/recovery efforts with other communities and counties.	All	High	Town Government in cooperation with County Government	Unknown	Local	2027	New action

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Public Education and Awareness								
PEA-1	Provide opportunities through meetings and special programs for contractors and property owners to become more informed as to appropriate building materials, equipment, and techniques to use in order to mitigate the impacts of flooding. Local inspectors can help encourage construction that is more resilient to these hazards.	Flooding	Low	Town Government	Unknown	Local	2030	There was no political will to complete this action over the last five years.
PEA-2	Coordinate with the County to explore the possibility of developing an internet-based emergency information website.	All	Low	County Emergency Management Director, Town Government	Unknown	Self-funded	2022-2030	Completed. County and municipality websites, social media platforms, and reverse 911 utilized for release of information.
PEA-3	Coordinate with the County to conduct a series of public classes on how to protect yourself during a hazard event in case you are at home, in a car, at the office, or outside.	All	High	County Emergency Management Director, Town Government	Unknown	Self-funded	2027	Informational presentations at the request of interested parties.

Town of Lake Santeetlah Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Prevention								
P-2	Develop a fire management plan that includes a clear statement of objectives and that incorporates information on land, threatened structures, degree of fire risk, fire history, and fire management measures.	Wildfires	High	Town Government in cooperation with County Government	Unknown	Local	2030	Continued revision and reassessment.
Property Protection								
PP-1	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	Moderate	Emergency Management, Engineering and/or Planning Department	Project Cost, Staff Hours, and applicable cost share	Federal and State Grants, Local Operating Budget	2022-2030	New Action.
PP-2	Install generator or generator hook-ups for critical facilities as budget and need arise.	Severe Winter Weather, Hurricane and Coastal Hazards, Tornadoes/ Thunderstorms Flooding, Wildfires, Earthquake	Moderate	Emergency Management	Varies	FEMA HMA, funding; local; state	2030	New Action

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Emergency Services								
ES-1	Coordinate response/recovery efforts with other communities and counties.	All	High	Town Government in cooperation with County Government	Unknown	Local	2030	Continued use of MOA and mutual aid agreements.
Public Education and Awareness								
PEA-1	Provide opportunities through meetings and special programs for contractors and property owners to become more informed as to appropriate building materials, equipment, and techniques to use in order to mitigate the impacts of flooding. Local inspectors can help encourage construction that is more resilient to these hazards.	Flooding	Low	Town Government	Unknown	Local	2027	There was no political will to complete this action over the last five years.
PEA-2	Coordinate with the County to explore the possibility of developing an internet-based emergency information website.	All	Low	County Emergency Management Director, Town Government	Unknown	Self-funded	2030	In progress. County and municipal websites, social media platforms, and reverse 911 system utilized for notifications.
PEA-3	Coordinate with the County to conduct a series of public classes on how to protect yourself during a hazard event in case you are at home, in a car, at the office, or outside.	All	High	County Emergency Management Director, Town Government	Unknown	Self-funded	2027	In progress. Informational presentations are being made at request of interested parties.

Town of Robbinsville Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2012)
Prevention								
P-3	Integrate county/municipality EOP Plan with Hazard Mitigation Plan as a way to mitigate unforeseeable hazard events.	All	High	Town Government	Unknown	Local funds	2027	There was no political will to complete this action over the last five years.
P-5	Create a stormwater runoff plan for the Town.	Flooding	High	Town Government	Unknown	State/FEMA/Local funds	2027	There was no political will to complete this action over the last five years.
Property Protection								
PP-1	Evaluate the relocation/elevation/floodproofing needs of all critical public structures or facilities within the floodplain and implement the necessary improvements.	Flooding	High	Town Government	Unknown	Procure mitigation grants	2027	There was no political will to complete this action over the last five years.
PP-2	Minimize placing new critical public facilities within the floodplain unless they promote an overriding public benefit, will not worsen hazard risk, will not directly promote development in floodplains, and are designed to withstand flood damage.	Flooding	High	Town Government	Unknown	Local government and self-funding	2027	Assessments as needed to ensure compliance.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2012)
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	Moderate	Emergency Management, Engineering and/or Planning Department	Project Cost, Staff Hours, and applicable cost share	Federal and State Grants, Local Operating Budget	2022-2030	New Action.
PP-4	Install generator or generator hook-ups for critical facilities as budget and need arise.	Severe Winter Weather, Hurricane and Coastal Hazards, Tornadoes/ Thunderstorms Flooding, Wildfires, Earthquake	Moderate	Emergency Management	Varies	FEMA HMA, funding; local; state	2030	New Action
Natural Resource Protection								
NRP-1	Improve and maintain streams throughout the community to the fullest extent possible.	Flooding	High	Town Government	Unknown	Local government and self-funding	2027	Continued assessment of encroachments and spills. There was no political will to complete this action over the last five years.
NRP-2	Wherever possible, preserve natural wetlands, especially along streams, through acquisition or conservation easements.	Flooding	Low	Town Government	Unknown	State and FEMA	2030	There was no political will to complete this action over the last five years.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2012)
Emergency Services								
ES-1	Flood monitoring facilities are needed on the other streams and should be coupled with a disaster warning system to give early warning of flood problems.	Dam Failure; Flooding; Hurricane and Coastal Hazards; Severe Winter Weather; Tornadoes/ Thunderstorms	High	Town	Unknown	National Weather Service	2022-2030	Implementation of reverse 911 system in March 2017. However, gages still needed.

Haywood County Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Prevention								
P-1	Development of a comprehensive Water Shortage Response Plan in conjunction with the existing incorporated municipalities.	Drought	High	County Administration	Unknown	Local; State	2022-2030	In progress. State grant funding was secured, and water availability study was completed. Cost estimates on building and operating a plan based on drought. Actively seeking funding to complete project. .
P-2	Development of a comprehensive study of use data to determine patterns of peak and off-peak water usage.	Drought	Moderate	County Administration	Unknown	Local; State	2022-2030	In progress. State grant funding was secured and water availability study was completed. Cost estimates on building and operating a plan based on drought. Actively seeking funding to complete project.
P-3	Review potential new regulations designed to prevent or mitigate wildfires including requiring fire breaks within subdivisions.	Wildfires	Moderate	NC Forest Service	Unknown	Local; State	2022-2030	Pending agency involvement and funding sources
P-4	Development of monitoring program to assess daily wildfire risk.	Wildfires	Low	NC Forest Service	Unknown	Local; State	2022-2030	Pending agency involvement and funding sources
P-6	Review possibility of revising existing Flood Damage Prevention Ordinance policies concerning substantial improvement.	Flooding	Low	County Development Services	Unknown	State	2022-2030	Ongoing. County ordinances were updated in 2018 and County is currently in the middle of a 2022 ordinance update.
P-8	Continue participation in the NFIP.	Flooding	High	County Development Services	Unknown	Local; State	2027	County has maintained participation in NFIP which requires continuous action and funding.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
P-9	Comprehensive review of existing emergency response plans for all natural disasters.	All	High	County Emergency Management	Unknown	Local; State	2027	County continues to actively update Basic EOP addressing natural disasters and created a Hazardous Weather Annex that was adopted and added to the County EOP.
P-10	Continue to review development of winter storm tracking program.	Severe Winter Weather	Moderate	County Emergency Management	Unknown	Local; Federal	2022-2030	Completed. Haywood County consulted with National Weather Service and will rely on their Winter Storm Tracking program.
P-11	County to review the need to require all new residential developments to include common areas, dedicated to the County, for the storage of sand and salt to be used by the County to aid in making roadways safe for vehicular traffic.	Severe Winter Weather	Moderate	County Emergency Management; County Planning	Unknown	Local; State	2022-2030	County will continue to work with all new residential developments and current HOA's to educate roles and responsibilities of private owned roads and private road maintenance.
P-12	Continue to review and revise soil erosion and sedimentation control ordinance.	Erosion; Geological (Landslide)	Moderate	County Development Services	Unknown	Local; State	2022-2030	Ongoing. The county continues to improve permitting and oversite of land disturbing activities. The County is in the process of amending this ordinance.
P-13	Consider the development of a comprehensive stormwater management ordinance.	Erosion; Geological (Landslide)	Moderate	County Development Services	Unknown	Local; State; Federal	2022-2030	The County considered an ordinance, but currently defers stormwater management to NCDEQ as there is a comprehensive regulatory process for MSA. Haywood County relies on State Phase II Stormwater Guidelines for MSA.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Property Protection								
PP-1	Work with local business community to develop plan to protect local infrastructure during an earthquake.	Earthquake	Moderate	County Emergency Management	Unknown	Local; State; Federal	2022-2030	County continues to work with business community to secure redundant infrastructure at identified critical facilities.
PP-2	Continue to review the possibility of purchasing additional property in identified flood areas to convert it to open space.	Flooding	Moderate	County Development Services	Unknown	Local; Federal	2022-2030	County continues to work with State and Federal partners to purchase additional properties identified in flood areas.
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	Moderate	Emergency Management, Engineering and/or Planning Department	Project Cost, Staff Hours, and applicable cost share	Federal and State Grants, Local Operating Budget	2022-2030	New Action.
PP-4	Install generator or generator hook-ups for critical facilities as budget and need arise.	Severe Winter Weather, Hurricane and Coastal Hazards, Tornadoes/ Thunderstorms Flooding, Wildfires, Earthquake	Moderate	Emergency Management	Varies	FEMA HMA, funding; local; state	2022-2030	New Action

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Natural Resource Protection								
NRP-1	Work with the Army Corps of Engineers to conduct a comprehensive hydrological study of existing watersheds and water ways to determine what the recharge rate is to avoid depletion of necessary water.	Drought	Low	County Erosion Control	Unknown	Local; State; Federal	2030	County continues to work with Army Corps of Engineers on conducting aa comprehensive hydrological study.
Emergency Services								
ES-2	Develop public emergency action plans to address flood events including identifying areas where sandbags could be placed to address flood events.	Flooding	High	County Emergency Management; County Planning	Unknown	Local, State, Federal	2022-2030	In progress. The Emergency Management Department is working on a dedicated webpage that includes updated information regarding potential hazards in the County with recommended preparedness activities.
ES-4	Develop and implement projects to increase countywide coverage of rainfall and stream flow gauges and provide public warning when rainfall and streamflow data suggest impending risk.	Flooding, Geological (Landslide), Tornadoes/ Thunderstorms Hurricane and Coastal Hazards	High	Haywood County Emergency Management	Unknown	FEMA, NCEM, local funding, various other funding sources	2022-2030	New Action
Structural Projects								
S-1	Continue coordination of efforts with NCDOT and local municipalities to erect landslide barriers along roadways identified in high-risk landslide areas.	Erosion; Geological (Landslide)		NCDOT	Unknown	Local; NCDOT	2022-2030	The County has coordinated with NCDOT on identified areas that are high-risk of landslides. NCDOT is responsible for implementation. Pending agency involvement and funding resources.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Public Education and Awareness								
PEA-1	Development of educational materials/brochures to educate local residents on earthquake preparedness.	Earthquake	Moderate	County Emergency Management; County Erosion Control	Unknown	Local; State; Federal	2030	In progress. The Emergency Management Department is working on a dedicated webpage that includes updates information regarding potential hazards in the County and recommended preparedness activities.
PEA-2	Development of educational materials/brochures to educate local residents on wildfire prevention.	Wildfires	High	NC Forest Service	Unknown	State	2022	Ongoing. The Emergency Management Department is working on a dedicated webpage that includes updated information regarding potential hazards in the County and recommended preparedness activities. Requires continuous action and funding.
PEA-3	Develop an educational brochure outlining the dangers of hail and outlining what steps, if any, individuals can take to mitigate the effects of a hailstorm.	Tornadoes/ Thunderstorms	Moderate	County Emergency Management	Unknown	Local; NC Fire Service	2030	Ongoing. The Emergency Management Department is working on a dedicated webpage that includes updated information regarding potential hazards in the County and recommended preparedness activities.
PEA-5	Development of educational materials/brochures to educate local residents on preventative steps that can be taken to offset problems created during winter storm events.	Severe Winter Weather	High	County Emergency Management	Unknown	Local; State	2022-2030	Action to be deleted from future updates as it is duplicative of Action PEA-11

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
PEA-6	Review of need to require hazard disclosure for areas in the County that are susceptible to service disruption during a winter storm event.	Severe Winter Weather	Moderate	County Emergency Management; County Planning	Unknown	Local	2027	Action to be deleted from future updates as it is duplicative of Action PEA-11
PEA-7	Development of education materials/brochures to educate local residents on flood hazards produced by thunderstorm events.	Tornadoes/ Thunderstorms	High	County Emergency Management	Unknown	Local	2027	Action to be deleted from future updates as it is duplicative of Action PEA-11
PEA-8	Development of educational materials/brochures to educate local residents on dangers of tornadoes.	Tornadoes/ Thunderstorms	High	County Emergency Management	Unknown	Local; State; Federal	2022-2030	Action to be deleted from future updates as it is duplicative of Action PEA-11
PEA-9	Development of educational materials/brochures to educate the public about landslides.	Erosion; Geological (Landslide)	High	County Emergency Management; County Erosion Control	Unknown	Local; State; Federal	2022-2030	Action to be deleted from future updates as it is duplicative of Action PEA-11
PEA-10	Provide hazard mitigation information to citizens via website and/or social networking sites.	All	Moderate	County Emergency Management	Unknown	Local; State; Federal	2022-2030	New Action
PEA-11	Increase public awareness about the hazards identified in this plan and the mitigation techniques that can be used to reduce the impacts of the hazards.	All	Moderate	County Emergency Management	Unknown	Local; State; Federal	2022-2030	New Action

Town of Canton Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Prevention								
P-1	Development of a comprehensive study of use data to determine patterns of peak and off-peak water usage.	Drought	Moderate	Town; County Administration	Unknown	Local; State; Non-profits	2022-2030	In progress. State grant funding was secured and water availability study was completed. Cost estimates on building and operating a plan based on drought. Actively seeking funding to complete project.
P-2	Comprehensive review of existing emergency response plans to continuously update and revise response plans.	Severe Winter Weather	Moderate	Town; County Emergency Management	Unknown	Local	2022-2030	There was no political will to complete this action over the last five years.
P-3	Continue to review development of winter storm tracking program.	Severe Winter Weather	Moderate	County Emergency Management	Unknown	Local; Federal	2022-2030	Completed. Haywood County consulted with National Weather Service and will rely on their Winter Storm Tracking program.
P-4	Continue to review and revise soil erosion and sedimentation control ordinance.	Erosion; Geological (Landslide)	Low	Town; County Development Services	Unknown	Local; State	2022-2030	Ongoing. The County continues to improve permitting and oversite of land disturbing activities. The County is in the process of amending this ordinance.
Property Protection								
PP-1	Work with local business community to develop plan to protect local infrastructure during an earthquake.	Earthquake	High	Town; County Emergency Management	Unknown	Local; State; Federal	2022-2030	County continues to work with business community to secure redundant infrastructure at identified critical facilities. .

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
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 hazards	Moderate	Emergency Management, Engineering and/or Planning Department	Project Cost, Staff Hours, and applicable cost share	Federal and State Grants, Local Operating Budget	2022-2030	New Action.
PP-3	Install generator or generator hook-ups for critical facilities as budget and need arise.	Severe Winter Weather, Hurricane and Coastal Hazards, Tornadoes/ Thunderstorms Flooding, Wildfires, Earthquake	Moderate	Emergency Management	Varies	FEMA HMA, funding; local; state	2022-2030	New Action
Emergency Services								
ES-2	Develop public emergency action plans to address flood events including identifying areas where sandbags could be placed to address flood events.	Flooding	High	Town; County Emergency Management	Unknown	Local; State; Federal	2022-2030	In progress. The Emergency Management Department is working on a dedicated webpage that includes updated information regarding potential hazards in the County with recommended preparedness activities.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Structural Projects								
S-1	Continue coordination of efforts with NCDOT and local municipalities to erect landslide barriers along roadways identified in high risk landslide areas.	Geological (Landslide)	Moderate	Town; NCDOT	Unknown	Local; NCDOT	2022-2030	The County has coordinated with NCDOT on identified areas that are high-risk of landslides. NCDOT is responsible for implementation. Pending agency involvement and funding resources.
Public Education and Awareness								
PEA-1	Development of educational materials/brochures to educate local residents on earthquake preparedness.	Earthquake	High	Town; County Emergency Management; County Erosion Control	Unknown	Local; State; Federal	2022-2030	In progress. The Emergency Management Department is working on a dedicated webpage that includes updates information regarding potential hazards in the County and recommended preparedness activities.
PEA-2	Development of educational materials/brochures to educate local residents on wildfire prevention.	Wildfires	High	Town; NC Fire Service	Unknown	Local; NC Fire Service	20222030	Ongoing. The Emergency Management Department is working on a dedicated webpage that includes updated information regarding potential hazards in the County and recommended preparedness activities. Requires continuous action and funding.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
PEA-3	County shall develop an educational brochure outlining the dangers of hail and outlining what steps, if any, individuals can take to mitigate the effects of a hailstorm.	Tornadoes/ Thunderstorms	Moderate	Town; County Emergency Management	Unknown	Local	2022-2030	Ongoing. The Emergency Management Department is working on a dedicated webpage that includes updated information regarding potential hazards in the County and recommended preparedness activities. There was no political will to complete this action over the last five years.
PEA-4	Development of educational materials/brochures to educate local residents on preventative steps that can be taken to offset problems created during winter storm events.	Severe Winter Weather	High	Town; County	Unknown	Local	2022	Action to be deleted from future updates as it is duplicative of Action PEA-10.
PEA-5	Review of need to require hazard disclosure for areas in the County that are susceptible to service disruption during a winter storm event.	Severe Winter Weather	Moderate	Town; County Emergency Management	Unknown	Local	2022-2030	Action to be deleted from future updates as it is duplicative of Action PEA-10.
PEA-6	Development of education materials/brochures to educate local residents on flood hazards produced by thunderstorm events.	Tornadoes/ Thunderstorms	High	Town	Unknown	Local	2027	Action to be deleted from future updates as it is duplicative of Action PEA-10
PEA-7	Development of educational materials/brochures to educate local residents on dangers of tornadoes.	Tornadoes/ Thunderstorms	High	Town; County Emergency Management	Unknown	Local	2027	Action to be deleted from future updates as it is duplicative of Action PEA-10
PEA-8	Development of educational materials/brochures to educate local residents on preventative steps that can be taken to prevent landslides.	Erosion; Geological (Landslide)	High	Town; County Emergency Management	Unknown	Local	2027	Action to be deleted from future updates as it is duplicative of Action PEA-10

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
PEA-9	Coordinate with Haywood County to provide hazard mitigation information to citizens via website and/or social networking sites.	All	Moderate	County Emergency Management, Town of Canton	Unknown	Local; State; Federal	2022-2030	New Action
PEA-10	Coordinate with Haywood County to increase public awareness about the hazards identified in this plan and the mitigation techniques that can be used to reduce the impacts of the hazards.	All	Moderate	County Emergency Management, Town of Canton	Unknown	Local; State; Federal	2022-2030	New Action

Town of Clyde Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Prevention								
P-1	Development of a Haywood County Public Water Systems Resiliency Study Report.	Drought	Moderate	Town; County	$49,500	State	2022-2030	In progress. State grant funding was secured and water availability study was completed. Cost estimates on building and operating a plan based on drought. Actively seeking funding to complete project.
P-2	Comprehensive review of existing emergency response plans to continuously update and revise response plans.	Severe Winter Weather	Moderate	Town; County Emergency Management	Unknown	Local	2022-2030	County continues to actively update Basic EOP addressing natural disasters and created a Hazardous Weather Annex that was adopted and added to the County EOP.
P-3	Continue to review development of winter storm tracking program.	Severe Winter Weather	Moderate	Town; County Emergency Management	Unknown	Local; State; Federal	2022-2030	Completed. Haywood County consulted with National Weather Service and will rely on their Winter Storm Tracking program.
P-4	Continue to review and revise soil erosion and sedimentation control ordinance.	Erosion; Geological (Landslide)	Moderate	Town; County Development Services	Unknown	Local	2022-2030	Ongoing. The County continues to improve permitting and oversite of land disturbing activities. The County is in the process of amending this ordinance.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Property Protection								
PP-1	Work with local business community to develop plan to protect local infrastructure during an earthquake.	Earthquake	High	Town; County Emergency Management	Unknown	Local	2022-2030	County continues to work with business community to secure redundant infrastructure at identified critical facilities.
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 hazards	Moderate	Emergency Management, Engineering and/or Planning Department	Project Cost, Staff Hours, and applicable cost share	Federal and State Grants, Local Operating Budget	2022-2030	New Action.
PP-3	Develop and implement projects to protect critical infrastructure including water and sewer hardening, relocating or providing alternate capabilities for service provision.	All	High	Town	Unknow	FEMA, NCEM, local funding, various other funds	2030	New Action.
PP-4	Install generator or generator hook-ups for critical facilities as budget and need arise.	Severe Winter Weather, Hurricane and Coastal Hazards, Tornadoes/ Thunderstorms Flooding, Wildfires, Earthquake	Moderate	Emergency Management	Varies	FEMA HMA, funding; local; state	2022-2030	New Action.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Emergency Services								
ES-2	Develop public emergency action plans to address flood events including identifying areas where sandbags could be placed to address flood events.	Flooding	High	Town; County Emergency Management; County Planning	Unknown	Local	2022-2030	In progress. The Emergency Management Department is working on a dedicated webpage that includes updated information regarding potential hazards in the County with recommended preparedness activities.
Structural Projects								
S-1	Continue coordination of efforts with NCDOT and local municipalities to erect landslide barriers along roadways identified in high risk landslide areas.	Erosion; Geological (Landslide)	High	Town; NCDOT	Unknown	Local; NCDOT	2022-2030	The County has coordinated with NCDOT on identified areas that are high-risk of landslides. NCDOT is responsible for implementation. Pending agency involvement and funding resources.
S-2	Install additional waterline crossing under the Pigeon River (Intersections of Main Street and Broad Street across from the Pigeon River)	Flooding	High	Town	$700,000	State Fiscal Recovery Funds	2022-2025	New Action
Public Education and Awareness								
PEA-1	Development of educational materials/brochures to educate local residents on earthquake preparedness.	Earthquake	High	Town; County	Unknown	Local	2022-2030	In progress. The Emergency Management Department is working on a dedicated webpage that includes updates information regarding potential hazards in the County and recommended preparedness activities.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
PEA-3	County shall develop an educational brochure outlining the dangers of hail and outlining what steps, if any, individuals can take to mitigate the effects of a hailstorm.	Tornadoes/ Thunderstorms	Moderate	Town; County	Unknown	Local	2022-2030	In progress. The Emergency Management Department is working on a dedicated webpage that includes updates information regarding potential hazards in the County and recommended preparedness activities.
PEA-5	Review of need to require hazard disclosure for areas in the County that are susceptible to service disruption during a winter storm event.	Severe Winter Weather	Moderate	Town; County Emergency Management	Unknown	Local	2022-2030	Action to be deleted from future updates as it is duplicative of Action PEA - 10.
PEA-9	Coordinate with Haywood County to provide hazard mitigation information to citizens via website and/or social networking sites.	All	Moderate	County Emergency Management, Town of Clyde	Unknown	Local; State; Federal	2022-2030	New Action
PEA-10	Coordinate with Haywood County to increase public awareness about the hazards identified in this plan and the mitigation techniques that can be used to reduce the impacts of the hazards.	All	Moderate	County Emergency Management, Town of Clyde	Unknown	Local; State; Federal	2022-2030	New Action

Town of Maggie Valley Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Prevention								
P-1	Development of a comprehensive study of use data to determine patterns of peak and off-peak water usage.	Drought	Moderate	Town; County Administration	Unknown	Local; State	2022-2030	In progress. State grant funding was secured and water availability study was completed. Cost estimates on building and operating a plan based on drought. Actively seeking funding to complete project.
P-2	Comprehensive review of existing emergency response plans to continuously update and revise response plans.	Severe Winter Weather	Moderate	County Emergency Management; Town Police Department; Town Public Works	Unknown	Local	2022-2030	County continues to actively update Basic EOP addressing natural disasters and created a Hazardous Weather Annex that was adopted and added to the County EOP.
P-3	Continue to review development of winter storm tracking program.	Severe Winter Weather	Moderate	Town; County Emergency Management;	Unknown	Local; Federal	2022-2030	Completed. Haywood County consulted with National Weather Service and will rely on their Winter Storm Tracking program.
P-4	Continue to review and revise soil erosion and sedimentation control ordinance.	Erosion; Geological (Landslide)		Town Planning; County Development Services	Unknown	Local; State	2027	Ongoing. The County continues to improve permitting and oversite of land disturbing activities. The County is in the process of amending this ordinance. .

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Property Protection								
PP-1	Work with local business community to develop plan to protect local infrastructure during an earthquake.	Earthquake	High	Town; County Emergency Management	Unknown	Local	2027	County continues to work with business community to secure redundant infrastructure at identified critical facilities.
PP-2	Protect water treatment plant from flooding.	Flooding	High	Town Planning; Town Public Works	Unknown	Local	2027	New action. Currently constructing a FEMA approved levee to protect wastewater treatment plant.
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	Moderate	Emergency Management, Engineering and/or Planning Department	Project Cost, Staff Hours, and applicable cost share	Federal and State Grants, Local Operating Budget	2022-2030	New Action.
PP-4	Install generator or generator hook-ups for critical facilities as budget and need arise.	Severe Winter Weather, Hurricane and Coastal Hazards, Tornadoes/ Thunderstorms Flooding, Wildfires, Earthquake	Moderate	Emergency Management	Varies	FEMA HMA, funding; local; state	2022-2030	New Action

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Emergency Services								
ES-1	Develop emergency notification system in coordination with existing natural hazard emergency notification systems.	Earthquake	Moderate	County Emergency Management	Unknown	Local; State; Federal	2022-2030	County and All municipalities have acquired warning and notification system that is utilized for all hazard notifications.
ES-2	Develop public emergency action plans to address flood events including identifying areas where sandbags could be placed to address flood events.	Flooding	High	Town Planning; County Emergency Management; County Planning	Unknown	Local; State; Federal	2027	In progress. The Emergency Management Department is working on a dedicated webpage that includes updated information regarding potential hazards in the County with recommended preparedness activities.
Structural Projects								
S-1	Continue coordination of efforts with NCDOT and local municipalities to erect landslide barriers along roadways identified in high risk landslide areas.	Erosion; Geological (Landslide)		Town; NCDOT	Unknown	Local; NCDOT	2022-2030	The County has coordinated with NCDOT on identified areas that are high-risk of landslides. NCDOT is responsible for implementation. Pending agency involvement and funding resources. .
Public Education and Awareness								
PEA-1	Development of educational materials/brochures to educate local residents on earthquake preparedness.	Earthquake	High	Town; County Emergency Management; County Erosion Control	Unknown	Local	2022-2030	In progress. The Emergency Management Department is working on a dedicated webpage that includes updates information regarding potential hazards in the County and recommended preparedness activities.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
PEA-2	Development of educational materials/brochures to educate local residents on wildfire prevention.	Wildfires	High	Town; NC Forest Service	Unknown	Local; NC Fire Service	2022-2030	In progress. The Emergency Management Department is working on a dedicated webpage that includes updates information regarding potential hazards in the County and recommended preparedness activities.
PEA-3	County shall develop an educational brochure outlining the dangers of hail and outlining what steps, if any, individuals can take to mitigate the effects of a hailstorm.	Tornadoes/ Thunderstorms	Moderate	County Emergency Management	Unknown	Local; State	2027	In progress. The Emergency Management Department is working on a dedicated webpage that includes updates information regarding potential hazards in the County and recommended preparedness activities.
PEA-4	Development of educational materials/brochures to educate local residents on preventative steps that can be taken to offset problems created during winter storm events.	Severe Winter Weather	High	County Emergency Management	Unknown	Local; SHMO	2027	Action to be deleted from future updates as it is duplicative of Action PEA-10.
PEA-5	Review of need to require hazard disclosure for areas in the County that are susceptible to service disruption during a winter storm event.	Severe Winter Weather	Moderate	County Emergency Management; County Planning	Unknown	Local	2022-2030	Action to be deleted from future updates as it is duplicative of Action PEA-10.
PEA-6	Development of education materials/brochures to educate local residents on flood hazards produced by thunderstorm events.	Tornadoes/ Thunderstorms	High	County Emergency Management	Unknown	Local	2027	Action to be deleted from future updates as it is duplicative of Action PEA-10.
PEA-7	Development of educational materials/brochures to educate local residents on dangers of tornadoes.	Tornadoes/ Thunderstorms	High	County Emergency Management	Unknown	Local	2027	Action to be deleted from future updates as it is duplicative of Action PEA-10.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
PEA-8	Development of educational materials/brochures to educate local residents on preventative steps that can be taken to prevent landslides.	Erosion; Geological (Landslide)	High	County Emergency Management	Unknown	Local; SHMO	2027	Action to be deleted from future updates as it is duplicative of Action PEA-10.
PEA-9	Coordinate with Haywood County to provide hazard mitigation information to citizens via website and/or social networking sites.	All	Moderate	County Emergency Management, Town of Maggie Valley	Unknown	Local; State; Federal	2022-2030	New Action
PEA-10	Coordinate with Haywood County to increase public awareness about the hazards identified in this plan and the mitigation techniques that can be used to reduce the impacts of the hazards.	All	Moderate	County Emergency Management, Town of Maggie Valley	Unknown	Local; State; Federal	2022-2030	New Action

Town of Waynesville Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Prevention								
P-1	Development of a comprehensive study of use data to determine patterns of peak and off-peak water usage.	Drought	Moderate	Town Public Works; County Administration	Unknown	Local budget; State	2022-2030	In progress. State grant funding was secured and water availability study was completed. Cost estimates on building and operating a plan based on drought. Actively seeking funding to complete project.
P-2	Comprehensive review of existing emergency response plans to continuously update and revise response plans.	Severe Winter Weather	Moderate	Town Police; Town Fire; Town Public Works	Unknown	Local budget	2022-2030	There was limited political will to advance this action over the last five years.
P-3	Continue to review development of winter storm tracking program.	Severe Winter Weather	Moderate	Town Police; Town Fire; County Emergency Management	Unknown	Local budget; Federal	2022-2030	Completed. Haywood County consulted with National Weather Service and will rely on their Winter Storm Tracking program. .
P-4	Continue to review and revise soil erosion and sedimentation control ordinance.	Erosion; Geological (Landslide)	Moderate	Town Planning	Unknown	Local budget	2022-2030	There was limited political will to advance this action over the last five years.
Property Protection								
PP-1	Work with local business community to develop plan to protect local infrastructure during an earthquake.	Earthquake	High	County Emergency Management; Town Fire	Unknown	Local budget	2027	County continues to work with business community to secure redundant infrastructure at identified critical facilities.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
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 hazards	Moderate	Emergency Management, Engineering and/or Planning Department	Project Cost, Staff Hours, and applicable cost share	Federal and State Grants, Local Operating Budget	2022-2030	New Action.
PP-3	Install generator or generator hook-ups for critical facilities as budget and need arise.	Severe Winter Weather, Hurricane and Coastal Hazards, Tornadoes/ Thunderstorms Flooding, Wildfires, Earthquake	Moderate	Emergency Management	Varies	FEMA HMA, funding; local; state	2022-2030	New Action
Emergency Services								
ES-2	Develop public emergency action plans to address flood events including identifying areas where sandbags could be placed to address flood events.	Flooding	High	Town Public Works; County Emergency Management; County Planning	Unknown	Local budget; State; Federal	2027	County continues to work with Army Corps of Engineers to conduct a a comprehensive hydrological study. .

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Public Education and Awareness								
PEA-1	Development of educational materials/brochures to educate local residents on earthquake preparedness.	Earthquake	High	All Town Departments; County Emergency Management; County Erosion Control	Unknown	Local; State; Federal	2027	In progress. The Emergency Management Department is working on a dedicated webpage that includes updates information regarding potential hazards in the County and recommended preparedness activities.
PEA-2	Development of educational materials/brochures to educate local residents on wildfire prevention.	Wildfires	High	All Town Departments; NC Forest Service	Unknown	Local; NC Fire Service	2027	In progress. The Emergency Management Department is working on a dedicated webpage that includes updates information regarding potential hazards in the County and recommended preparedness activities.
PEA-3	County shall develop an educational brochure outlining the dangers of hail and outlining what steps, if any, individuals can take to mitigate the effects of a hailstorm.	Tornadoes/ Thunderstorms	Moderate	All Town Departments; County Emergency Management	Unknown	Local; State	2022-2030	In progress. The Emergency Management Department is working on a dedicated webpage that includes updates information regarding potential hazards in the County and recommended preparedness activities.
PEA-4	Development of educational materials/brochures to educate local residents on preventative steps that can be taken to offset problems created during winter storm events.	Severe Winter Weather	High	All Town Departments	Unknown	Local; SHMO	2027	Action to be deleted from future updates as it is duplicative of Action PEA-10.
PEA-5	Review of need to require hazard disclosure for areas in the County that are susceptible to service disruption during a winter storm event.	Severe Winter Weather	Moderate	All Town Departments	Unknown	Local	2022-2030	Action to be deleted from future updates as it is duplicative of Action PEA-10.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
PEA-6	Development of education materials/brochures to educate local residents on flood hazards produced by thunderstorm events.	Tornadoes/ Thunderstorms	High	All Town Departments	Unknown	Local	2027	Action to be deleted from future updates as it is duplicative of Action PEA-10.
PEA-7	Development of educational materials/brochures to educate local residents on dangers of tornadoes.	Tornadoes/ Thunderstorms	High	All Town Departments	Unknown	Local	2027	Action to be deleted from future updates as it is duplicative of Action PEA-10.
PEA-8	Development of educational materials/brochures to educate local residents on preventative steps that can be taken to prevent landslides.	Geological (Landslide)	High	All Town Departments	Unknown	Local; SHMO	2027	Action to be deleted from future updates as it is duplicative of Action PEA-10.
PEA-9	Coordinate with Haywood County to provide hazard mitigation information to citizens via website and/or social networking sites.	All	Moderate	County Emergency Management, Town of Waynesville	Unknown	Local; State; Federal	2022-2030	New Action
PEA-10	Coordinate with Haywood County to increase public awareness about the hazards identified in this plan and the mitigation techniques that can be used to reduce the impacts of the hazards.	All	Moderate	County Emergency Management, Town of Waynesville	Unknown	Local; State; Federal	2022-2030	New Action

Jackson County Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Prevention								
P-4	Expand the floodplain and tax data to include residential-commercial distinction and occupied-unoccupied distinction.	Flooding	High	County Erosion Control Officer	Unknown	General revenue	2027	In progress. The County continues to collect and maintain data related to occupancy and use.
P-10	Integrate county/municipality EOP with Hazard Mitigation Plan as a way to mitigate unforeseeable hazard events.	All	High	County Emergency Management	Unknown	General revenue	2027	The County and municipalities continue to integrate their EOPs with the Regional Hazard Mitigation Plan. An updated Regional HMP is currently being undertaken and any amendments necessary to ensure continued integration will be completed.
P-11	Obtain and install a second source of power for critical facilities and other public buildings to operate despite the negative effects of hazards on the main power source.	All	High	County Emergency Management	Unknown	General revenue	2027	Action to be deleted as it is duplicative of Action PP-5.
Property Protection								
PP-3	As additional funding sources become available, the County will apply for acquisition funds to purchase nonresidential properties that were damaged during any previous disaster.	Flooding	Moderate	County Emergency Management	Unknown	Grants for acquisition funds	2027	The County has and will continue to seek funding, as appropriate, to purchase non-residential property that has been damaged during a prior disaster.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
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 hazards	Moderate	Emergency Management, Engineering and/or Planning Department	Project Cost, Staff Hours, and applicable cost share	Federal and State Grants, Local Operating Budget	2022-2030	New Action.
PP-5	Install generator or generator hook-ups for critical facilities as budget and need arise.	Severe Winter Weather, Hurricane and Coastal Hazards, Tornadoes/ Thunderstorms Flooding, Wildfires, Earthquake	Moderate	Emergency Management	Varies	FEMA HMA, funding; local; state	2022-2030	New Action
Natural Resource Protection								
NRP-1	Improve and maintain steam maintenance throughout the community to the fullest extent possible.	Flooding; Dam Failure	High	County Erosion Control Officer	Unknown	General revenue	2022-2030	The County continues to actively improve and maintain stream maintenance through the Erosion and Sedimentation Control Ordinance.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
NRP-2	Preserve natural wetlands, especially along streams, through acquisition or conservation easements.	Flooding	Moderate	County Erosion Control Officer	Unknown	General revenue	2022-2030	The County has and continues to identify conservation opportunities that preserve natural wetlands and other significant natural resources.
Emergency Services								
ES-1	Flood monitoring facilities are needed on the other streams and should be coupled with a disaster warning system to give early warning of flood problems.	Flooding	High	County Emergency Management	Unknown	General revenue	2027	The County continues to evaluate funding opportunities to purchase stream monitoring equipment. There was no political will to complete this action over the last five years.
ES-2	Coordinate response and recovery efforts with other communities and counties.	All	High	County Emergency Management	Unknown	General revenue	2027	The Emergency Management Department is engaged with surrounding communities and counties to coordinate resources during response and recovery events.
Public Education and Awareness								
PEA-1	By providing opportunities through meetings and special programs for contractors and property owners to become more informed as to appropriate building materials, equipment, and techniques to use in order to mitigate the impact of flooding. Local inspectors can help encourage construction that is more resilient to these hazards.	All	High	County Erosion Control Officer	Unknown	General revenue	2022-2030	The County has and continues to educate contractors, developers and homeowners regarding best management practices but no formal program is in place.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
PEA-2	Update the internet-based emergency information website to inform and educate citizens about potential risks from hazards and opportunities to mitigate them.	All	High	County Emergency Management	Unknown	General revenue	2027	The Emergency Management Department has a dedicated webpage that includes updated information regarding potential hazards in the County. The website also includes the ability to participate in the CodeRED notification program. Additional updates may be required.
PEA-3	Conduct a series of public classes on potential risks from hazards and potential ways to mitigate them as well as safety measures to be conducted during a hazard event.	All	High	County Emergency Management	Unknown	General revenue	2022-2030	In progress. The Emergency Management Department is active in the local school system teaching students how to prepare for hazards. They also offer classes to the general public as requested.

Town of Dillsboro Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Prevention								
P-4	Obtain and install a second source of power for critical facilities and other public buildings to operate despite the negative effects of hazards on the main power source.	All	High	County Emergency Management	Unknown	General revenue	2022-2030	Action to be deleted as it is duplicative of Action PP- 2.
P-5	Ensure that manufactured homes are installed and secured properly.	Flooding; Tornadoes/ Thunderstorms ; Geological (Landslide); Earthquake	High	County Building Inspections	Unknown	General revenue	2022-2030	Through inter-local agreement with the Town, the Jackson County Building Inspection Department ensures that all new manufactured homes are installed and secured as required by state building codes.
Property Protection								
PP-1	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	Moderate	Emergency Management, Engineering and/or Planning Department	Project Cost, Staff Hours, and applicable cost share	Federal and State Grants, Local Operating Budget	2022-2030	New Action.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
PP-2	Install generator or generator hook-ups for critical facilities as budget and need arise.	Severe Winter Weather, Hurricane and Coastal Hazards, Tornadoes/ Thunderstorms Flooding, Wildfires, Earthquake	Moderate	Emergency Management	Varies	FEMA HMA, funding; local; state	2022-2030	New Action
Emergency Services								
ES-1	Coordinate all hazardous responses with Jackson County Emergency Management Coordinator.	All	High	Town Mayor	Unknown	General revenue	2022-2030	The Town of Dillsboro continues to coordinate hazardous response with the Jackson County Emergency Management Coordinator.
Public Education and Awareness								
PEA-1	Conduct a series of public classes on potential risks from hazards and potential ways to mitigate them as well as safety measures to be conducted during a hazard event.	All	High	County Emergency Management	Unknown	General revenue	2022-2030	The Town of Dillsboro collaborates with the local emergency response stakeholders to offer opportunities for the public to learn more about hazard mitigation and response. Additional education may be requires

Village of Forest Hills Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Prevention								
P-3	Review the Emergency Operations Plan on an annual basis to ensure that it is kept current.	All	High	County Emergency Management	Unknown	General revenue	2027	The Jackson County Emergency Management Department assists the Village with reviewing the EOP on an annual basis and recommends any necessary amendments to the plan.
P-4	Expand the floodplain and tax data to include residential-commercial distinction and occupied-unoccupied distinction.	Flooding	High	County Tax and GIS	Unknown	General revenue	2022-2030	The County continues to collect and maintain data related to occupancy and use.
P-10	Integrate county/municipality EOP with Hazard Mitigation Plan as a way to mitigate unforeseeable hazard events.	All	High	Village Mayor; County Emergency Management	Unknown	General revenue	2017-2022	The County and municipalities continue to integrate their EOPs with the Regional Hazard Mitigation Plan. An updated Regional HMP is currently being undertaken and any amendments necessary to ensure continued integration will be completed.
P-11	Obtain and install a second source of power for critical facilities and other public buildings to operate despite the negative effects of hazards on the main power source.	All	High	Village of Forest Hills	Unknown	General revenue	2022-2030	Action to be deleted as it is duplicative of Action PP- 5.
Property Protection								
PP-1	Evaluate the relocation, elevation, and floodproofing needs of all critical public structures or facilities within the floodplain and implement the necessary improvements.	Flooding	High	County Building Inspections	Unknown	General revenue	2017-2030	Ongoing. Jackson County continues to perform this evaluation by means of the Inter-Local Jurisdiction Agreement.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
PP-2	Minimize placing new critical public facilities within the floodplain unless they promote an overriding public benefit, will not worsen hazard risk, will not directly promote development in floodplains, and are designed to withstand flood damage.	Flooding	High	County Building Inspections	Unknown	General revenue	2017-2030	Ongoing. Jackson County continues to perform this evaluation by means of the Inter-Local Jurisdiction Agreement.
PP-3	As additional funding sources become available, the County will apply for acquisition funds to purchase nonresidential properties that were damaged during any previous disaster.	Flooding	Moderate	County Planning	Unknown	General revenue	2030	Ongoing. There is still a need for this action of acquisition of nonresidential properties that were damaged by previous disasters.
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 hazards	Moderate	Emergency Management, Engineering and/or Planning Department	Project Cost, Staff Hours, and applicable cost share	Federal and State Grants, Local Operating Budget	2022-2030	New Action.
PP-5	Install generator or generator hook-ups for critical facilities as budget and need arise.	Severe Winter Weather, Hurricane and Coastal Hazards, Tornadoes/ Thunderstorms Flooding, Wildfires, Earthquake	Moderate	Emergency Management	Varies	FEMA HMA, funding; local; state	2022-2030	New Action

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Natural Resource Protection								
NRP-1	Improve and maintain steams throughout the community to the fullest extent possible.	Flooding	High	Village Mayor; County Erosion Control Department	Unknown	General revenue	2022-2030	The Village continues to monitor and maintain streams within its jurisdiction. Limited political will to advance further over the last 5 years.
NRP-2	Preserve natural wetlands, especially along streams, through acquisition or conservation easements.	Flooding	Moderate	County Erosion Control Department	Unknown	General revenue	2022-2030	The Village remains committed to preserve natural wetlands and evaluates opportunities to conserve those areas through conservation easements. Additional actions may be required.
Emergency Services								
ES-1	Flood monitoring facilities are needed on the other streams and should be coupled with a disaster warning system to give early warning of flood problems.	Flooding	High	County Emergency Management	Unknown	General revenue	2022-2030	Jackson County's Emergency Management Department, in coordination with the municipality, continues to seek funding sources to acquire additional monitoring equipment. There was no political will to advance this action further over the last five years.
ES-2	Coordinate response and recovery efforts with other communities and counties.	All	High	Village Mayor; County Emergency Management	Unknown	General revenue	2022-2030	The Village of Forest Hills, through the Jackson County Emergency Management Department, continues to cooperate and coordinate with neighboring jurisdictions during response and recovery efforts.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Public Education and Awareness								
PEA-1	By providing opportunities through meetings and special programs for contractors and property owners to become more informed as to appropriate building materials, equipment, and techniques to use in order to mitigate the impact of flooding. Local inspectors can help encourage construction that is more resilient to these hazards.	All	High	County Building Inspections	Unknown	General revenue	2022-2030	The Village contracts, through an interlocal agreement, with the Jackson County Building Inspections to administer the Floodplain Ordinance. They work with property owners to ensure that any construction within the floodplain meet all ordinance requirements.
PEA-3	Conduct a series of public classes on potential risks from hazards and potential ways to mitigate them as well as safety measures to be conducted during a hazard event.	All	High	Village Fire Department; County Emergency Management	Unknown	General revenue	2027	Completed. The Village collaborates with the local emergency response stakeholders to offer opportunities for the public to learn more about hazard mitigation and response. Additional education may be required.

Town of Sylva Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Prevention								
P-3	Review the Emergency Operations Plan on an annual basis to ensure that it is kept current.	All	High	County Emergency Management	Unknown	General revenue	2027	Jackson County's Emergency Management Department annually reviews the Town's EOP and recommends any necessary amendments.
P-4	Expand the floodplain and tax data to include residential-commercial distinction and occupied-unoccupied distinction.	Flooding	High	County Tax and GIS	Unknown	General revenue	2027	The County continues to collect and maintain data related to occupancy and use but there was limited political to advance this over the last 5 years.
P-13	Obtain and install a second source of power for critical facilities and other public buildings to operate despite the negative effects of hazards on the main power source.	All	High	Town of Sylva	Unknown	General revenue	2022-2030	Action to be deleted as it is duplicative of Action PP- 5.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Property Protection								
PP-1	Evaluate the relocation, elevation, and floodproofing needs of all critical public structures or facilities within the floodplain and implement the necessary improvements.	Flooding	High	Town Mayor; County Building Inspections	Unknown	General revenue	2030	The Town continues to evaluate and implement strategies to floodproof and potentially relocate critical services located within the floodplain. It has developed a plan of action for vehicle parking/storage in flood events and has relocated storage from the Town's Police Department basement to minimize flood damage. There was limited opportunity and political will to advance over the last year years.
PP-2	Minimize placing new critical public facilities within the floodplain unless they promote an overriding public benefit, will not worsen hazard risk, will not directly promote development in floodplains, and are designed to withstand flood damage.	Flooding	High	County Building Inspections	Unknown	General revenue	2030	The Town will minimize the placement of critical facilities within the floodplain.
PP-3	As additional funding sources become available, the County will apply for acquisition funds to purchase nonresidential properties that were damaged during any previous disaster.	Flooding	Moderate	Town Mayor	Unknown	General revenue	2022-2030	The Town continues to work in conjunction with the County to identify sources to acquire nonresidential properties that were damaged during a previous disaster. There was limited opportunity and political will to advance over the last year years.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
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 hazards	Moderate	Emergency Management, Engineering and/or Planning Department	Project Cost, Staff Hours, and applicable cost share	Federal and State Grants, Local Operating Budget	2022-2030	New Action.
PP-5	Install generator or generator hook-ups for critical facilities as budget and need arise.	Severe Winter Weather, Hurricane and Coastal Hazards, Tornadoes/ Thunderstorms Flooding, Wildfires, Earthquake	Moderate	Emergency Management	Varies	FEMA HMA, funding; local; state	2022-2030	New Action
Natural Resource Protection								
NRP-1	Improve and maintain steams throughout the community to the fullest extent possible by surveying for debris on a quarterly basis.	Flooding	High	County Erosion Department	Unknown	General revenue	2027	There has been limited political will to complete this action over the last 5 years. However, the Town continues to monitor and maintain streams within its jurisdiction.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
NRP-2	Wherever possible, preserve natural wetlands, especially along streams, through acquisition or conservation easements.	Flooding	Moderate	Town Mayor	Unknown	General Revenue	2022-2030	The Town remains committed to preserve natural wetlands and evaluates opportunities to conserve those areas through conservation easements.
Emergency Services								
ES-1	Flood monitoring facilities are needed on the other streams and should be coupled with a disaster warning system to give early warning of Flooding problems.	Flooding	High	County Emergency Management	Unknown	General revenue	2027	Jackson County Emergency Management Department, in coordination with the municipality, continues to seek funding resources to acquire additional monitoring equipment. There has been limited political will and opportunity to complete this action over the last 5 years.
ES-2	Coordinate response and recovery efforts with other communities and counties.	All	High	Town Mayor; Town Manager	Unknown	General revenue	2027	The Town of Sylva, through the Jackson County Emergency Management Department, continues to cooperate and coordinate with neighboring jurisdictions during response and recovery efforts.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Structural Projects								
S-1	Improve existing stormwater management systems and construct new system.	Flooding	Moderate	Town Mayor	Unknown	General revenue	2027	There has been limited political will to complete this action over the last 5 years. The Town has previously (2005) conducted a study to improve the stormwater system and continues to seek funding sources to implement the plan.
Public Education and Awareness								
PEA-3	Conduct a series of public classes on potential risks from hazards and potential ways to mitigate them as well as safety measures to be conducted during a hazard event.	All	High	County Emergency Management	Unknown	General revenue	2030	The Town of Sylva collaborates with the local emergency response stakeholders to offer opportunities for the public to learn more about hazard mitigation and response.

Town of Webster Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Prevention								
P-10	Integrate county/municipality EOP with Hazard Mitigation Plan as a way to mitigate unforeseeable hazard events.	All	High	County Emergency Management	Unknown	General revenue	2027	The County and municipalities continue to integrate their EOPs with the Regional Hazard Mitigation Plan. An updated Regional HMP is currently being undertaken and any amendments necessary to ensure continued integration will be completed.
P-11	Obtain and install a second source of power for critical facilities and other public buildings to operate despite the negative effects of hazards on the main power source.	All	High	Town of Webster	Unknown	General revenue	2027	Action to be deleted as it is duplicative of Action PP-5.
Property Protection								
PP-1	Evaluate the relocation, elevation, and floodproofing needs of all critical public structures or facilities within the floodplain and implement the necessary improvements.	Flooding	High	County Building Inspections	Unknown	General revenue	2027	The Town, with assistance from the County, continues to evaluate and implement strategies to floodproof and potentially relocate critical services located with the floodplain. There was no political will to complete this action over the last five years.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
PP-3	As additional funding sources become available, the County will apply for acquisition funds to purchase nonresidential properties that were damaged during any previous disaster.	Flooding	High	County Emergency Management	Unknown	General revenue	2030	The Town continues to work in conjunction with the County to identify sources to acquire nonresidential properties that were damaged during a previous disaster. There has been limited political will to complete this action over the last 5 years.
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 hazards	Moderate	Emergency Management, Engineering and/or Planning Department	Project Cost, Staff Hours, and applicable cost share	Federal and State Grants, Local Operating Budget	2022-2030	New Action.
PP-5	Install generator or generator hook-ups for critical facilities as budget and need arise.	Severe Winter Weather, Hurricane and Coastal Hazards, Tornadoes/ Thunderstorms Flooding, Wildfires, Earthquake	Moderate	Emergency Management	Varies	FEMA HMA, funding; local; state	2022-2030	New Action

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Natural Resource Protection								
NRP-1	Improve and maintain steams throughout the community.	Flooding	High	County Erosion Control Department	Unknown	General revenue	2022-2030	The Town, with assistance from the County, continues to monitor and maintain streams within its jurisdiction. There was limited political will to complete this action over the last five years.
NRP-2	Wherever possible, preserve natural wetlands, especially along streams, through acquisition or conservation easements.	Flooding	Moderate	County Erosion Control Officer	Unknown	General Revenue	2022-2030	The town remains committed to preserve natural wetlands and evaluates opportunities to conserve those areas through conservations easements. There was limited political will to complete this action over the last five years.
Emergency Services								
ES-1	Flood monitoring facilities are needed on the other streams and should be coupled with a disaster warning system to give early warning of flood problems.	Flooding	High	County Emergency Management	Unknown	General revenue	2022-2030	Jackson County Emergency Management Department, in coordination with the four municipalities, continues to seek funding sources to acquire additional monitoring equipment. There was limited political will to complete this action over the last 5 years.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
ES-2	Coordinate response and recovery efforts with other communities and counties.	All	High	Town Mayor	Unknown	General revenue	2022-2030	The Town of Webster, through the Jackson County Emergency Management Department, continues to cooperate and coordinate with neighboring jurisdictions during response and recovery efforts.
Public Education and Awareness								
PEA-3	Conduct a series of public classes on potential risks from hazards and potential ways to mitigate them as well as safety measures to be conducted during a hazard event.	All	High	Town Mayor	Unknown	General revenue	2027	The Town collaborates with the local emergency response stakeholders to offer opportunities for the public to learn more about hazard mitigation and response

Swain County Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Prevention								
P-4	Expand floodplain/tax data to include residential/commercial distinction and occupied/unoccupied distinction.	Flooding	Moderate	County Mapping	Unknown	Local	2027	There was no political will to complete this action over the last five years.
P-5	Develop a fire management plan that includes a clear statement of objectives and that incorporates information on land, threatened structures, degree of fire risk, fire history, and fire management measures.	Wildfires	Moderate	County Fire Marshal; Town Council; NCDFS	Unknown	Local and State	2027	Recent fires have increased awareness of this need. There was limited political will to complete this action over the last five years.
P-6	Create a subdivision ordinance that would specify a width and grade for entrance and exit routes to ensure the accessibility of emergency vehicles.	All	Moderate	County Emergency Management; County Fire Marshal; County Inspections Office; Town Council	Unknown	Local	2027	Not likely to be instituted over the next few years, Local gov't has no interest in the subdivision plan. There was limited political will to complete this action over the last five years.
Property Protection								
PP-1	Evaluate the relocation/elevation/floodproofing of all critical public structures or facilities within the floodplain and implement the necessary improvements.	Flooding	Moderate	County Emergency Management; County Inspections Office; Town Council	Unknown	HMGP	2027	There was limited political will to complete this action over the last five years.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
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 hazards	Moderate	Emergency Management, Engineering and/or Planning Department	Project Cost, Staff Hours, and applicable cost share	Federal and State Grants, Local Operating Budget	2030	New Action.
PP-5	Install generator or generator hook-ups for critical facilities as budget and need arise.	Severe Winter Weather, Hurricane and Coastal Hazards, Tornadoes/ Thunderstorms Flooding, Wildfires, Earthquake	Moderate	Emergency Management	Varies	FEMA HMA, funding; local; state	2030	New Action
Natural Resource Protection								
NRP-1	Improve and maintain streams throughout the community to the fullest extent possible.	Flooding	Moderate	County Government; Town Council	Unknown	US Army Corps of Engineers	2030	There was limited political will to complete this action over the last five years.
Emergency Services								
ES-1	Flood monitoring facilities are needed on the other streams and should be coupled with a disaster warning system to give early warning of food problems.	Flooding/All	Moderate	County Government; Town Council	Unknown	National Weather Service	2030	There was no political will to complete this action over the last five years.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Public Education and Awareness								
PEA-1	Continue providing opportunities through meetings and special programs for contractors and property owners to become more informed as to appropriate building materials, equipment, and techniques to use in order to mitigate the impacts of flooding.	Flooding	Moderate	County Inspections Office; Town Council	Unknown	Local	2030	Completed/ongoing. This action is ongoing as funding and staff time becomes available.
PEA-3	Conduct a series of public classes on how to protect yourself during a hazard event in case you are at home, in a car, or at the office.	All	Moderate	County Emergency Management; Town Council	Unknown	Local	2030	There was no political will to complete this action over the last five years.

Town of Bryson City Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Prevention								
P-4	Develop a fire management plan that includes a clear statement of objectives and that incorporates information on land, threatened structures, degree of fire risk, fire history, and fire management measures.	Wildfires	Moderate	County Fire Marshal; Town Council; NCDFS	Unknown	Local, State, Federal	In progress; 2030	Recent fires have increased the awareness of this need but it was not completed over the last five years given limited political will.
Property Protection								
PP-1	Evaluate the relocation/elevation/floodproofing of all critical public structures or facilities within the floodplain and implement the necessary improvements.	Flooding	Moderate	County Emergency Management; Town Inspections Office	Unknown	HMGP	2030	This action is dependent on political will and receipt of funding.
PP-3	As additional grants become available, the County should apply for acquisition funds to purchase nonresidential properties that were damaged during a previous disaster when practical.	Flooding	Moderate	County Emergency Management, Town Council	Unknown	State, Federal	2030	This action is ongoing until staff time can be dedicated toward grant applications and funding is acquired.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
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 hazards	Moderate	Emergency Management, Engineering and/or Planning Department	Project Cost, Staff Hours, and applicable cost share	Federal and State Grants, Local Operating Budget	2030	Deferred pending staff time and funding to implement action.
PP-5	Install generator or generator hook-ups for critical facilities as budget and need arise.	Severe Winter Weather, Hurricane and Coastal Hazards, Tornadoes/ Thunderstorms Flooding, Wildfires, Earthquake	Moderate	Emergency Management	Varies	FEMA HMA, funding; local; state	2030	New Action
Natural Resource Protection								
NRP-1	Improve and maintain streams throughout the community to the fullest extent possible.	Flooding	Moderate	County Government, Town Council	Unknown	US Army Corps of Engineers	2030	There was limited political will to complete this action over the last five years.
Emergency Services								
ES-1	Flood monitoring facilities are needed on the other streams and should be coupled with a disaster warning system to give early warning of food problems.	Flooding/All	Moderate	County Emergency Management, Town Council	Unknown	National Weather Service	2030	There was limited political will to complete this action over the last five years.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
ES-2	Coordinate response/recovery efforts with other communities and counties.	All	Moderate	County Emergency Management, Town Council	Unknown	Staff time only	Currently in place	Completed/ongoing. This action requires continued action and funding, and is therefore ongoing.
ES-4	Evaluate need for Dam safety plan.	Flooding	Moderate	Emergency Management	Varies/low	State, FEMA, Local Staff hours for administration	Action completed.	Action completed in 2020
Public Education and Awareness								
PEA-1	Continue providing opportunities through meetings and special programs for contractors and property owners to become more informed as to appropriate building materials, equipment, and techniques to use in order to mitigate the impacts of flooding.	Flooding	Moderate	County Inspections Office; Town Council	Unknown	Local	2030	This action requires continued action and funding. There was limited political will to formalize this action over the last five years.
PEA-2	Conduct a series of public classes on how to protect yourself during a hazard event in case you are at home, in a car, or at the office.	All	Moderate	County Emergency Management, Town Council	Unknown	Local	2030	This action is pending funding, political will, and staff time.

Eastern Band of Cherokee Indians Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Prevention								
P-2	Create a fund for mitigation projects identified in this plan and in the future from gaming revenues to ensure the long term sustainability of the Tribe by reducing exposure to disasters.	All	High	EBCI Emergency Management	Unknown	Annual Tribe Budget Request	2027	Emergency Management will budget for two mitigation projects each year but it was not politically feasible over the last 5 years.
P-3	Institutionalize mitigation into housing infrastructure, capital improvement, and housing improvement funds. Develop guidelines for projects designed or completed with these funds established in Section 16 of the Cherokee Code. Guidelines would require that when tribal dollars are dispersed from the fund for projects in identified hazard areas, mitigation measures will be constructed into the design/project. Draft Guidelines and Sample Mitigation Measures for infrastructure and buildings, for each type of hazard. Modify Sections 16-33, 16-35 and 16-38 of the Cherokee Code to include this provision.	All	High	EBCI Emergency Management; EBCI Tribal Council	Unknown	Capital Budget	Within 5 years	Additional education and training is needed in order to develop guidelines for project designs. There was limited political will to advance this action over the last 5 years.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
P-5	Improve the effectiveness of inspections by building and environmental staff in enforcing current local codes to increase the resistance of new development to the effects of natural hazards. While inspection effectiveness has improved significantly in recent years, the rural and private nature of the Reservation still presents challenges of construction without permits.	All	High	EBCI Tribal Construction; EBCI Environmental Planning; EBCI Construction Inspection; EBCI Environmental Inspection; EBCI Building Inspections	Unknown	Capital Budget	2027	Assess the current capacity of all inspectional services on the EBCI Reservation as they relate potential hazards. Ensure adequate resources to existing inspectional services and provide additional hazard related training to inspectional staff to ensure codes are enforced properly. Develop a system of weekly tracking of inspection activities, across disciplines and track with one central organized system. More education and training is needed to justify before presenting to the tribal government. There was no political will to complete this action over the last five years.
P-6	Develop a comprehensive plan for all Tribal trust and fee land holdings, addressing economic development, housing, land use, historic/cultural preservation, transportation and other typical planning elements.	All	Moderate	EBCI Business Committee; EBCI Tribal Planning; EBCI Emergency Management	Unknown	BIA; HUD; Capital Budget; PDM	2030	There was no political will to complete this action over the last five years.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
P-7	The Cherokee Business District Master Plan lists a potential long-term goal of relocating fire, police and other services outside of the downtown area and the Comprehensive Economic Development Plan identifies the need for new police and fire stations. Section 61 of the Cherokee Code, Zoning, should be modified to preclude construction of critical emergency service facilities in hazard prone areas when feasible alternatives are available.	All	Moderate	EBCI Tribal Council; EBCI Business Committee; EBCI Tribal Planning/ Emergency Management/ Police/Fire	Unknown	BIA; HUD; Capital Budget; PDM	2030	Deferred until funding is allocated for the Cherokee Business District Plan to be updated or modified.
P-8	Conduct a risk analysis for Information Technology and Enrollment Records to include Business Continuity Planning, Facilities Management, Security and other Emergency Management Issues.	All	High	EBCI Finance; EBCI Enrollment; EBCI Emergency Management	Unknown	NC EMPG	2030	Deferred until funding is identified to implement the action.
P-9	Develop a Capital Improvement Plan to guide the scheduling of spending on public improvements.	Flooding	High	EBCI Executive; EBCI Tribal Council; EBCI Finance; EBCI Emergency Management	Unknown	NC EMPG	2030	Deferred until funding is identified to implement the action.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
P-10	Continue remapping currently underway on Raven Fork and the Oconaluftee to complete the Oconaluftee River and Soco Creek, and other major tributaries on the Qualla Boundary. Inventory all mapped and unmapped rivers in the Snowbird and Cherokee County Communities and prioritize remapping based on existing and anticipated development.	Flooding	High	EBCI Environmental Planning	Unknown	CTP agreement; NCDEM Mapping Funds	2027	This project has been ongoing for 5 years; however the tribe is waiting for the state to map the Western North Carolina Area. Amend existing FEMA Cooperating Technical Partner agreement and prepare Mapping Activity Statements for prioritized work. If successful in obtaining funds, solicit for contractors to complete mapping, adopt and update Chapter 143, Article II of the Cherokee Code, Flood Damage Prevention, to incorporate the new mapping.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
P-11	Prevent production chemical releases from fish hatchery by studying the problem and identifying solutions. There is frequent flooding of a fish hatchery located on the upstream portion of Raven's Fork. Although the fish hatchery is not shown as in the floodplain, it reportedly floods frequently, perhaps due to water diverted from the Fork for use in the processes at the facility. During significant flood events, the hatchery is flooded and the chemicals used in the breeding process are washed into the main river channel. This contamination has the potential to have significant negative effects on the water quality of the river, impacting the habitat of a number of aquatic species. Negative recreational impacts reportedly occur, as well, due to odor. There is not enough available information to calculate monetary losses in this analysis. Secondary impacts however can be significant. Study the problem and identify solutions.	Flooding	Moderate	EBCI Emergency Management; EBCI Police; EBCI Fire	Unknown	USEPA; USACE	2027	There has been no political will to complete this action over the last 5 years except with the exception of further defining an approach: The Tribe will meet with the owner of the facility to develop a solution to the problem. Determine whether process currently follows environmental standards or whether process can be modified. Determine whether chemicals can be stored in locations above typical flooding levels and not used during times of flooding threat. Seek assistance from the USACE in identifying potential structural solutions if feasible. Identify who should be responsible for associated costs and how to fund them.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
P-12	Increase enforcement of sound construction practices in landslide hazard areas.	Geological (Landslide)	High	EBCI Environmental Planning	Unknown	Capital Budget	2027	Ongoing. Chapter 113 D of the Cherokee Code addresses sedimentation and erosion control for land disturbances exceeding more than one acre and requires permits and preparation of a plan to control erosion. The tribal environmental inspectors will coordinate with other inspectors and department personnel in the field to ensure monitoring and enforcement of the standards is occurring and will examine ways of increasing site inspection frequency during construction. Increased emphasis on enforcement and monitoring should also focus heavily on Cherokee DOT road projects. Completion of the plan will be contingent on budgetary or grant funding.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
P-13	Modify Chapter 113 D, *Soil Erosion and Sedimentation Control*, to require, at minimum, a permit for disturbances not related to agriculture. While it may not be necessary to require a plan for these smaller disturbances, by issuing permits, there will be an opportunity to build in management practices as permit conditions and monitor and enforce those conditions. Gather example regulations and codes from similar jurisdictions, develop code language and submit for consideration to Tribal Council. If approved, develop a permitting program and identify ways to address additional staffing needs for enforcement. Notify the public of the code change.	Geological (Landslide)	High	EBCI Environmental Planning	Unknown	Capital Budget	2027	No change given limited political will to further this action over the last 5 years. More education and awareness is needed to justify this action.
P-14	Develop a monitoring program for landslide activity on selected locations through the EBCI Reservation. Identify areas of historic landslides where the potential loss of life and impact to the community is greatest and develop a simple monitoring program to evaluate slope movement over time in order to identify areas where land slides activity is greatest, and the risk to residents and property is greatest. Use collected data to analyze the need for potential need for structural protective measures, or continuously assess the risk to adjacent property	Geological (Landslide)	Moderate	EBCI Public Works	Unknown	Capital Budget	2027	Limited political will to further this action over the last 5 years. Additional and ongoing education and training is necessary.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
P-16	Implement a requirement for appropriate defensible space for new construction in the Urban Wildland Interface areas.	Wildfires	High	EBCI Fire, EBCI Planning, BIA	Unknown	Capital Budget	2027	In progress - Working with Fire Management to determine appropriate level of defensible space for structures located in the UWI depending on the slope and fuel type present.
P-18	Encourage the use of fire resistant building materials in high risk areas. While issuing permits for new construction in high UWI areas, provide information to builders and home owners on fire resistant roofing and siding materials, fire resistant landscaping materials and defensible space. Consider waiving fees and developing other incentives of owners willing to incorporate these materials/techniques into new construction.	Wildfires	Moderate	EBCI Building Inspections; EBCI Emergency Management; EBCI Fire; BIA	Unknown	Capital Budget	2027	There has been limited political will to further this action over the last 5 years. This project will be ongoing all parties involved need more education and training.
P=19a	Work with vulnerable communities identified by the Tribe to provide shelter and Emergency Disaster Kits	Severe Winter Weather	Moderate	EBCI Emergency Management; EBCI Fire; EBCI Police	Unknown	Capital Budget	2030	New Action
P-20	Develop a program to clear overhanging limbs from utility lines to critical facilities annually. Meet with the responsible departments and other appropriate parties, possibly including the Cherokee Boys Club and identify a systematic approach to annual trimming of overhanging limbs from utility lines annually during the fall.	Severe Winter Weather	High	EBCI Emergency Management; EBCI Public Works; Utility companies	Unknown	Public Works Budget; Private utility companies	2027	Deferred due to cost constraints and limited political will the project has been put on hold.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
P-21	Collect data regarding seismic design of all critical facilities and infrastructure to identify vulnerabilities to damage due to a significant earthquake event. At minimum include schools, government buildings, fire and police facilities and emergency shelters. With input from all local departments develop a list of critical facilities and infrastructure with the potential to cause large scale injury or loss of life if damaged during an earthquake. Perform a structural evaluation on these facilities to determine how they would be expected to perform during different level earthquakes and to make specific structural retrofit recommendations. In addition to structural mitigation measures, also investigate the potential implementation of non-structural measures in facilities with high occupancy rates (similar to the program used for day care centers with FEMA Project Impact grant). Such measures can include securing loose items such as book shelves, overhead fixtures, shatter proof glass, etc. Many such measures can be accomplished with donated labor and minimal materials cost.	Earthquake	Moderate	EBCI Building Department; EBCI Emergency Management	Unknown	Capital Budget; PDM; HMGP; Donated labor; USDOE	Within 1 year: identify structures; Within 2 years: design program to implement minor non-structural measures; Within 5 years; Fund and complete a full structural evaluation	There has been limited political will to further this action over the last 5 years.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
P-22	Develop Drought Management Plan and Protocols Evaluate the need for a drought management plan and protocol to be implemented throughout the Reservation in the event a drought should occur. Review and analysis current regional, and State drought management plans and procedures to determine what potential measures can be under taken at the local level.	Drought	Low	EBCI Emergency Management	Unknown	Capital Budget; BIA; Dept. of Agriculture	2027	In the process of developing a drought management plan.
P-23	Utility Line Maintenance Program: Develop a program to protect key portions of utility systems from damage due to a high wind event. Working with local utility companies, analyze key portions of utility networks and assess the vulnerability to damages due to high winds. Investigate the potential of developing a program to harden identified vulnerabilities including removing overhanging limbs and trees from key utility lines.	Tornadoes/ Thunderstorms	Low	EBCI Emergency Management; EBCI Public Works; Utility companies	Unknown	Capital Budget; Local utility company funds	2027	There has been limited political will to further this action over the last 5 years.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
P-24	Form a working subcommittee of the HMPC along with security personnel from Harrah's Casino to work with the Federal and state government to further evaluate security needs. Some hazard prone sites should not be published in a public document such as this plan. Working with the subcommittee retain the services of a security expert to identify other potential sites that may be at risk and to determine appropriate security measures to protect those sites.	Terrorism	Moderate	EBCI Emergency Management; EBCI Police; Harrah's Casino	Unknown	Capital Budget; Harrah's Casino; DHS grants	2030	Deferred: Potential sites have been determined however due to cost containment the purchase of security systems has been placed on hold.
P-26	Monitor and audit security performance at Harrah's Casino. Evaluate at least annually the Casino's ongoing security efforts and conduct periodic audits to ensure that security continues functioning at high levels.	Terrorism	High	EBCI Office of Principal Chief	Unknown	N/A	2030	Deferred until a funding source is identified.
Property Protection								
PP-1	Perform an all-hazard site specific audit on critical facilities (schools, hospitals, shelters, fire and police facilities, etc.) to assess their specific vulnerability to all natural hazards and develop recommendations for potential mitigation measures.	All	High	EBCI Emergency Management	Unknown	PDM; HMGP; DOE DHS School Safety Funds; Capital Budget	2027	There has been limited political will to further this action over the last 5 years. Due to limited staff and staff turnover has affected the timely completion of this objective. New staff is currently attending training to become more familiar with accessing critical facilities.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
PP-2	Implement technically feasible and cost beneficial retrofit mitigation measures identified through the Critical Facility Audit. Working with departments responsible for each facility, develop an implementation strategy including funding sources, scope of work, project schedule, and project budget.	All	High	EBCI Emergency Management	Unknown	PDM; HMGP; FMA; Capital Budget	2027	There has been limited political will to further this action over the last 5 years. Due to limited staff and staff turnover has affected the timely completion of this objective. New staff is currently attending training to become more familiar with accessing critical facilities
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 hazards	Moderate	Emergency Management; Engineering and/or Planning Department	Project Cost, Staff Hours, and applicable cost share	Federal and State Grants, Local Operating Budget	2030	New Action
PP-5	Install generator or generator hook-ups for critical facilities as budget and need arise.	Severe Winter Weather, Hurricane and Coastal Hazards, Tornadoes/ Thunderstorms, Flooding, Wildfires, Earthquake	Moderate	Emergency Management	Varies	FEMA HMA funding; local; state	2030	New Action

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Natural Resource Protection								
NRP-1	Create a riparian buffer zone along less developed waterways. Stream bank erosion is a serious problem on the EBCI reservation from both a water quality perspective and a property protection perspective. Riparian Buffers serve as natural boundaries between local waterways and existing development and help protect resources by filtering pollutants, providing flood control, alleviating stream bank erosion and providing lateral room for movement of a stream channel. While it may be difficult to create a buffer zone along the developed portions of Raven Fork, the Oconaluftee River and Soco Creek, other watercourses where development pressure may eventually exist will be examined. Identify areas where stream bank erosion has historically caused problems and areas where existing development patterns would allow for a riparian corridor to work. Propose language to modify Chapter 113 D of the Cherokee Code and a program to administer the new restriction. Consider exempting certain agricultural and recreational operations from buffer regulations to promote passive recreational use of these areas as is consistent with other tribal goals.	Geological (Landslide)	Moderate	EBCI Environmental Planning	Unknown	EPA Clean Water Management Trust Fund	2030	There has been limited political will to further this action over the last 5 years. This project will be ongoing as time and funding permits.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Emergency Services								
ES-1	Continue to develop reverse 911 capabilities as part of an Emergency Notification System to contact many homeowners with pre-recorded messages in the event of an emergency.	All	High	EBCI Emergency Management	Unknown	DHS/FEMA; NCDEM; HMGP; PDM	2030	The system has been purchased and installed. Updating the data will be ongoing for future use.
ES-3	Install flood evacuations signs in Yellowhill community (an area of high transient visits) to guide visitors to safety during flooding events and to raise awareness of flooding potential.	Flooding	Moderate	EBCI Emergency Management; EBCI Fire; EBCI Police	Unknown	FEMA; NCDEM; Capital Budget	2027	The signs have been purchased due to construction of sidewalks installation of signs has been put on hold.

ES-4	Develop a flood warning system for Soco Creek and the Oconaluftee River. The system will increase the ability to locally and specifically forecast flood events and flood depths. Focus efforts on areas with high concentrations of residential and recreational properties where risk of injury and loss of life is high. Adding a voluntary building flood audit will provide building occupants with a strategy to employ in conjunction with the warnings to protect themselves. Work with state of North Carolina, NOAA, USGS, and NRCS to identify on-going efforts in the region as well as develop a specific action plan for the development and implementation of a system. There is a stream gauge on the Oconaluftee. Additional gauges will need to be added. The gauges send information through a repeater back to a central computer that would be in the emergency management office. Stream levels during flooding would be monitored and with assistance of the National Weather Service, flood level predictions would be made. The voluntary audit portion of the program will build upon the flood prone building inventory generated for this plan. Voluntary participants will have their homes surveyed for elevation and a simple one or two page audit completed providing instructions on what specific actions to take for certain predicted floods (e.g. move valuables to second story, disconnect electricity, bag furnaces, etc.). When a flood level is predicted, those property owners who participated in the audit would be contacted, possibly via the reverse 911 system and notified to activate their plan.	Flooding	High	EBCI Emergency Management	Unknown	NRCS; USGS; NCDEM; PDM	2027	There has been limited political will to further this action over the last 5 years. March 2008 Water & Earth Technologies, Inc was contracted to develop a Flood Hazard Mitigation and Response plan. During the process of developing the plan a feasibility study was conducted to research for the most appropriate locations for two warning systems.
Structural Projects								

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
S-1	Replacement of culverts to alleviate the potential for flooding of the existing homes.	Flooding	High	EBCI Transportation; EBCI Tribal Construction	Unknown	NCDEM Hazard Mitigation Section	2027	There has been limited political will to further this action over the last 5 years.
Public Education and Awareness								
PEA-1	Develop and implement a comprehensive community education program to inform the public of risk of potential hazards, potential mitigation measures, as well as what actions they can take to protect themselves and their property.	All	High	EBCI Emergency Management	Unknown	Capital Budget	2027	The Emergency Staff along with the Health & Medical Division have been conducting Disaster Preparedness in the Communities. Some Education Materials have been distributed when available. Additional work is needed to further education and formalize the program.
PEA-2	Promote early warning of the onset of natural hazard by encouraging residents to utilize NOAA Weather Warning System Radios. Provide information on the use and function of the system as well as information on purchasing receivers. Place receivers in key public facilities and educate occupants. Advertise information through public education program. Work with vendors to assist residents and business owners to obtain receivers.	All	High	EBCI Emergency Management	Unknown	Resident/business funding; FEMA; Capital Budget	2027	Some progress has been made including Radios have been placed in key public facilities. However, it is not fully completed.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
PEA-3	Expand the purchase of NFIP flood insurance on the EBCI Reservation by education home owners and business owners located in the 100 year floodplain of the benefits of carrying flood insurance. Utilize the educational program. Mail educational materials to homeowners, targeting all structures estimated to be in the 100 flood plain, based on the Hazard Mapping and associated Flood Prone Structures Worksheet. Conduct an evening seminar where interested homeowners can learn of the principles of the NFIP, as well as other floodplain management techniques. Obtain NFIP materials from FEMA and mail to each flood prone property with an offer to meet and explain the details of the program. Use FEMA and NCDEM staff to support/provide the training.	Flooding	High	EBCI Building Inspections; EBCI Emergency Management	Unknown	Capital Budget	2027	There has been limited political will to further this action over the last 5 years. Legislation to be introduced to Tribal Council by resolution.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
PEA-4	Develop an education and mitigation program to remove unsecured propane and oil tanks from the floodplain or to strap down and secure tanks. The primary source of heating on the EBCI Reservation is bottled propane. A majority of the buildings located in flood prone areas have exterior propane tanks, which are many times located in the rear of the property closest to the river, often in the floodway. Most of the tanks are not secured in place to prevent floatation during a flooding event. Using the hazard maps from this plan, inventory all propane tanks in flood prone areas. Identify existing strap down devises on the market and identify a vendor to work with to educate the inventoried building owners on the risks of storing propane and oil in the floodplain in unsecured tanks. Provide guidance on measures to secure these tanks and, when possible, provide incentives for implementing these potential measures. If enough interest is generated in the program, identify funding mechanisms so owners could apply to a pool for matching grants to install the protection.	Flooding	High	EBCI Emergency Management; EBCI Public Works	Unknown	Capital Budget; PDM; FMA	2027	The Emergency Management, Public Safety and Environmental Department have been discussing this issue but it has not been advanced to date.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
PEA-5	Develop a flood assistance program to offer homeowners and business owners located in the floodplain advice on how to identify, implement and fund effective mitigation measures. Assemble a team of experts from within Cherokee government and outside. Send direct mailings to the flood prone properties inventoried through this plan. Specifically look at the community of mobile homes along Grape Creek in Cherokee County that experiences frequent flooding. Encourage these homeowners to obtain flood insurance as a first step. Explain the importance of having flood insurance as it pertains not only to their own financial recovery, but to their chances of being eligible for grant funding to help mitigate the problem. Offer assistance to perform flood audits identifying specific mitigation measures considering the full range of potential options including structural elevation, relocation, acquisition and demolition, flood proofing or minor retrofitting, such as strapping down oil or gas tanks. Once measures have been identified, apply for state and federal assistance to aid homeowners in acquiring assistance with the cost of implementing measures. Give priority to NFIP repetitive loss properties and develop selection criteria based on factors such as historic levels of damages and benefit cost ratio.	Flooding	High	EBCI Emergency Management; EBCI Building Inspections; EBCI Environmental Planning	Unknown	Capital Budget; PDM; FMA; HMGP	2027	Activity has occurred but the action is not fully completed. The EM and Environmental Planning have been attending meeting in the Big Cove Community to conduct education on flood assistance. Big Cove Community was selected due to the high concentration of residential and business located along the Raven Fork and Oconaluftee River.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
PEA-6	Educate property owners located in the UWI on wildfire mitigation techniques. Target owners of structures located in the designated wildfire hazard areas identified by this plan by direct mailing and other outreach techniques to educate them on the potential wildfire risks facing their property as well as the potential mitigation measures including defensible space, fire resistant materials, adequate property access, and additional structural measures. Offer to send experienced professionals to audit properties and offer wildfire damage prevention techniques at low costs. Hold outreach sessions as interest warrants.	Wildfires	High	EBCI Emergency Management; EBCI Fire; BIA Cherokee Agency	Unknown	Local Funding	2027	There has been limited political will to further this action over the last 5 years. In the summer of 2008 students from the Student Conservation Foundations went door to door conducting fire prevention education and a wildfire fire study around the residents. In the fall of 2008 a follow up was conduct with EM, Fire Dept, and Healthy Cherokee to install smoke detectors, remove debris from around the residents and conduct further education.

SECTION 10
PLAN MAINTENANCE PROCEDURES

This section discusses how the Smoky Mountain 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 four subsections:

- 10.1 Implementation and Integration
- 10.2 Monitoring, Evaluation and Enhancement
- 10.3 Continued Public Involvement
- 10.4 Evaluation of Monitoring, Evaluation and Update Process

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 Smoky Mountain 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 Smoky Mountain Region and the EBCI 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, county and Tribal government decision-making processes or mechanisms, where feasible. This includes integrating the requirements of the Hazard Mitigation Plan into other local planning documents, processes or mechanisms, such as comprehensive or capital improvement plans, when appropriate. The members of the Smoky Mountain Regional Hazard Mitigation Planning Team 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 Hazard Mitigation Plan, and will not contribute to increased hazard vulnerability in the Smoky Mountain Region.

Since the communities in the region first adopted hazard mitigation plans, each County and participating jurisdiction has 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 and Tribal emergency operations plans
- Integrating the mitigation plan into review and updates of building codes
- 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 Team, individual county and Tribal 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 Smoky Mountain 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 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 Smoky Mountain Regional Hazard Mitigation Planning Team shall meet in March of every year to evaluate and monitor 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 Team shall be documented in the form of a report that can be shared with interested City, County and Tribal Council members. The Regional Hazard Mitigation Planning Team 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 Smoky Mountain Region which includes the counties of the Smoky Mountain region. For future updates of the plan, North Carolina Emergency

Management's Hazard Mitigation Planning section will help coordinate the reconvening the Regional Hazard Mitigation Planning Committee for these reviews through coordination with each County's and the EBCI Emergency Management Departments. Unless it is determined otherwise, the Emergency Management Directors from Cherokee, Graham, Haywood, Jackson, Swain, and the EBCI will maintain ultimate responsibility for their respective County's plan implementation and monitoring, evaluation and update.

Five (5) Year Plan Review

The Plan will be thoroughly reviewed by the Regional Hazard Mitigation Planning Team every five years to determine whether there have been any significant changes in the Smoky Mountain 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 participating jurisdiction 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. North Carolina Emergency Management's Hazard Mitigation Planning section will help coordinate the reconvening the Regional Hazard Mitigation Planning Team and conducting the five-year review through coordination with each County and the Tribe's Emergency Management Departments.

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 Smoky Mountain Regional Hazard Mitigation Plan will be submitted to the State Hazard Mitigation Officer at the North Carolina Emergency Management (NCEM) for final review and approval in coordination with the Federal Emergency Management Agency (FEMA).

Disaster Declaration

Following a disaster declaration, the Smoky Mountain 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 North Carolina Emergency Management's Hazard Mitigation Planning section to coordinate the reconvening of the Regional Hazard Mitigation Planning Committee, through

coordination with each County and the Tribe's Emergency Management Department, 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 Team 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, representatives from Cherokee, Graham, Haywood, Jackson, Swain counties and the EBCI will forward information on the proposed change(s) to all interested parties including, but not limited to, all directly affected County/Tribal departments, residents, and businesses. Information will also be forwarded to the North Carolina 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 Team for final consideration. The Planning Team 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 Team:

- 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 Team 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 Team (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 Team for further revision, or

- Defer the amendment request back to the Regional Hazard Mitigation Planning Team 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 Team in local newspapers, public bulletin boards and/or County or Tribal office buildings
- Designating willing and voluntary citizens and private sector representatives as official members of the Regional Hazard Mitigation Planning Team
- Utilizing local media to update the public on any maintenance and/or periodic review activities taking place
- Utilizing the Cherokee, Graham, Haywood, Jackson and Swain County and EBCI websites to advertise any maintenance and/or periodic review activities taking place, and
- Keeping copies of the Plan in public libraries.

10.4 EVALUATION OF PREVIOUS MONITORING, EVALUATION AND UPDATE PROCESS

Over the past five years, the participating jurisdictions have been independently implementing, monitoring and evaluating their own mitigation action plans. Progress made in implementing actions has been documented in Section 9: Mitigation Action Plan where each action contains a narrative about the implementation status of the action. That said, the jurisdiction did waiver slightly from the monitoring and evaluation process defined in the original version of the plan, but still made significant process in implementing their mitigation action plans. During the 2020 update of this plan, the Regional Hazard Mitigation Planning Team determined that the procedures for the upcoming five-year monitoring and evaluation process will remain as defined above and will be re-evaluated during the next plan update process.

The five-year comprehensive update process began as early as 2018 when North Carolina Emergency Management made the decision to set aside HMGP funding from Hurricane Matthew to fund the Smoky Mountain Regional Hazard Mitigation Plan. To facilitate this effort, NCEM assigned the plan update to their pre-qualified hazard mitigation planning consultants ESP Associates. Representatives from ESP Associates first reached out to the Smoky Mountain counties representatives in October 2021 to initiate

the plan update process. More details about the plan update process are provided in Section 2, Planning Process.

For the next update of this plan, NCEM's Hazard Mitigation Planning section will continue take the lead on organizing and initiating the 5-year update of the plan.

Tribal Assurances

EBCI will comply with all applicable federal statutes and regulations in effect with respect to the periods for which the Tribe receives grant funding, including 2 CFR parts 200 and 3002. Whenever necessary, EBCI will amend the plan to reflect new or revised Federal regulations or statues, or changes in Tribal law, organization, policy, or tribal agency operation, in compliance with 44 CFR 13.11(d). It is understood that the Tribe will submit those amendments for review and approval in coordination with FEMA Region IV and the State of North Carolina Emergency Management.

Appendix A
Plan Adoption

This Appendix contains the adoption resolutions from all participating jurisdictions.

RESOLUTION TO ADOPT THE
SMOKY MOUNTAIN REGIONAL HAZARD MITIGATION PLAN

WHEREAS, CHEROKEE COUNTY is vulnerable to an array of hazards that can cause loss of life and damages to public and private property; and

WHEREAS, the CHEROKEE COUNTY desires to seek ways to mitigate situations that may aggravate such circumstances; and

WHEREAS, the development and implementation of a hazard mitigation plan can result in actions that reduce the long-term risk to life and property from hazards; and

WHEREAS, it is the intent of the CHEROKEE COUNTY BOARD OF COMMISSIONERS to protect its citizens and property from the effects of hazards by preparing and maintaining a local hazard mitigation plan; it is not the intent of Cherokee County to enforce zoning, property confiscation or relocation of landowners; and

WHEREAS, it is also the intent of the CHEROKEE COUNTY BOARD OF COMMISSIONERS to fulfill its obligation under North Carolina General Statutes, Chapter 166A: North Carolina Emergency Management Act and Section 322: Mitigation Planning, of the Robert T. Stafford Disaster Relief and Emergency Assistance Act to remain eligible to receive state and federal assistance in the event of a declared disaster affecting the CHEROKEE COUNTY; and

WHEREAS, CHEROKEE COUNTY, in coordination with Cherokee, Graham, Jackson and Swain counties, the municipalities within those counties, and the Eastern Band of Cherokee Indians, has prepared a multi-jurisdictional hazard mitigation plan with input from the appropriate local and state officials;

WHEREAS, the North Carolina Emergency Management has reviewed the Smoky Mountain Regional Hazard Mitigation Plan for legislative compliance and has approved the plan pending the completion of local adoption procedures;

NOW, THEREFORE, BE IT RESOLVED that the BOARD OF COMMISSIONERS of CHEROKEE COUNTY hereby:

1. Adopts the Smoky Mountain Regional Hazard Mitigation Plan; and
2. Agrees to take such other official action as may be reasonably necessary to carry out the proposed actions of the Plan.

Adopted on February 20, 2023.

Cal Stiles, Chair
CHEROKEE COUNTY BOARD OF COMMISSIONERS

Attest:

Maria Hass, Clerk
CHEROKEE COUNTY

RESOLUTION TO ADOPT THE SMOKY MOUNTAIN REGIONAL HAZARD MITIGATION PLAN

WHEREAS, Cherokee County is vulnerable to an array of hazards that can cause loss of life and damages to public and private property; and

WHEREAS, the Cherokee County desires to seek ways to mitigate situations that may aggravate such circumstances; and

WHEREAS, the development and implementation of a hazard mitigation plan can result in actions that reduce the long-term risk to life and property from hazards; and

WHEREAS, it is the intent of the Town of Andrews to protect its citizens and property from the effects of hazards by preparing and maintaining a local hazard mitigation plan; and

WHEREAS, it is also the intent of the Town of Andrews to fulfill its obligation under North Carolina General Statutes, Chapter 166A: North Carolina Emergency Management Act and Section 322: Mitigation Planning, of the Robert T. Stafford Disaster Relief and Emergency Assistance Act to remain eligible to receive state and federal assistance in the event of a declared disaster affecting the Cherokee County and

WHEREAS, Cherokee County, in coordination with Cherokee, Graham, Haywood, Jackson and Swain counties, the municipalities within those counties and the Eastern Band of Cherokee Indians has prepared a multi-jurisdictional hazard mitigation plan with input from the appropriate local and state officials;

WHEREAS, the North Carolina Emergency Management has reviewed the Smoky Mountain Regional Hazard Mitigation Plan for legislative compliance and has approved the plan pending the completion of local adoption procedures;

NOW, THEREFORE, BE IT RESOLVED that the Town of Andrews of Cherokee County hereby:

1. Adopts the Smoky Mountain Regional Hazard Mitigation Plan; and
2. Agrees to take such other official action as may be reasonably necessary to carry out the proposed actions of the Plan.

Adopted on February 6th, 2023

James Reid, Mayor

Attest:

N. Whitaker

Natasha Whitaker, Clerk

Certified by: N. Whitaker

Date: February 6th, 2023

(SEAL) Town of Andrews CORPORATE SEAL February 21, 1905 NORTH CAROLINA

Town of Murphy

Commissioners
Frank E. Dickey
Barbara Hughes
Barry R. McClure

Tim Radford, Mayor
P.O. Box 130
Murphy, North Carolina 28906
(828) 837-2510 • Fax (828) 837-9612
manager@townofmurphync.com

Commissioners
Charlene Smith
Gail Stansell Walker
Keisha Dockery

RESOLUTION TO ADOPT THE SMOKY MOUNTAIN REGIONAL HAZARD MITIGATION PLAN

WHEREAS, The Town of Murphy is vulnerable to an array of hazards that can cause loss of life and damages to public and private property; and

WHEREAS, the Town of Murphy desires to seek ways to mitigate situations that may aggravate such circumstances; and

WHEREAS, the development and implementation of a hazard mitigation plan can result in actions that reduce the long-term risk to life and property from hazards; and

WHEREAS, it is the intent of the Town of Murphy to protect its citizens and property from the effects of hazards by preparing and maintaining a local hazard mitigation plan; and

WHEREAS, it is also the intent of the Town of Murphy to fulfill its obligation under North Carolina General Statutes, Chapter 166A: North Carolina Emergency Management Act and Section 322: Mitigation Planning, of the Robert T. Stafford Disaster Relief and Emergency Assistance Act to remain eligible to receive state and federal assistance in the event of a declared disaster affecting the Town of Murphy, and

WHEREAS, Town of Murphy, in coordination with Cherokee, Graham, Haywood, Jackson and Swain counties, the municipalities within those counties and the Eastern Band of Cherokee Indians has prepared a multi-jurisdictional hazard mitigation plan with input from the appropriate local and state officials;

WHEREAS, the North Carolina Emergency Management has reviewed the Smoky Mountain Regional Hazard Mitigation Plan for legislative compliance and has approved the plan pending the completion of local adoption procedures;

NOW, THEREFORE, BE IT RESOLVED that the Board of Commissioners of the Town of Murphy hereby:

1. Adopts the Smoky Mountain Regional Hazard Mitigation Plan; and
2. Agrees to take such other official action as may be reasonably necessary to carry out the proposed actions of the Plan.

Adopted on February 6, 2023.

Tim Radford
Tim Radford
Mayor

Attest:
Chad Simons, Town Clerk

Feb 6, 2023
Date

Certified by: _____ (SEAL)

PASSED

Cherokee Council House
Cherokee, North Carolina

DEC 0 6 2022
DATE

Resolution NO. 458 (2022)

WHEREAS, the Cherokee Tribal Council is the legislative branch of the Eastern Band of Cherokee Indian; and

WHEREAS, the Eastern Band of Cherokee Indians has historically experienced severe damage from natural and human-caused hazards such as flooding, wildfire, earthquake, drought, thunderstorms/high winds, and hazardous materials incidents on many occasions in the past century, resulting in loss of property and life, economic hardship, and threats to public health and safety; and

WHEREAS, the Eastern Band of Cherokee Indians has developed and received conditional approval from the Federal Emergency Management Agency (FEMA) for the Smoky Mountain Regional Hazard Mitigation Plan under the requirements of 44 CFR 201.7; and

WHEREAS, the plan specifically addresses hazard mitigation strategies and plan maintenance procedures for the Eastern Band of Cherokee Indians; and

WHEREAS, the plan recommends several hazard mitigation actions/projects that will provide mitigation for specific natural, and human caused hazards that impact the Eastern Band of Cherokee Indians, with the effect of protecting people and property from loss associated with those hazards; and

WHEREAS, adoption of this plan will make the Eastern Band of Cherokee Indians eligible for funding to alleviate the impacts of future hazards on the Qualla Boundary and trust land; and

NOW THEREFORE BE IT RESOLVED by the Eastern Band of Cherokee Indians in council assembled, at which a quorum is present, that the plan is hereby adopted as an official plan of the Eastern Band of Cherokee Indians (Copy attached).

BE IT FURTHER RESOLVED, the respective officials identified in the mitigation strategy of the plan are hereby directed to pursue implementation of the recommended actions assigned to them. Future revisions and plan maintenance required by 44 CFR 201.7 and FEMA, are hereby adopted as a part of this resolution for a period of five (5) years from the date of this resolution.

BE IT FURTHER RESOLVED The Eastern Band of Cherokee Indians will comply with all applicable Federal statutes and regulations in effect with respect to the periods for which it receives grant funding, in compliance with 44 CFR 13.11 (c); and will amend our plan whenever necessary to reflect applicable changes in Tribe, State or Federal laws and statutes as required in 44 CFR 13.11. (d).

BE IT FINALLY RESOLVED this plan shall become effective upon ratification by the Principal Chief.

Submitted by: Mollie Grant, Director of Public Safety

The attached Resolution/Ordinance No. 458 dated DECEMBER 6, 2022 was:

PASSED (X)

KILLED ( )

and ratified in open Council on DECEMBER 6, 2022 by 82 voting for the act and 0 members voting against it as follows:

VOTE	FOR	AGAINST	ABSTAIN	ABSENT
Richard French	X			
Teresa McCoy	X			
Boyd Owle	X			
Bucky Brown	X			
TW Saunooke	X			
David Wolfe	X			
Adam Wachacha	X			
Bo Crowe	X			
Bill Taylor				X
Albert Rose	X			
Dike Sneed	X			
Tommye Saunooke				X
	82	0	0	18

Richard French
TRIBAL COUNCIL CHAIRMAN

Michelle Thompson
ENGLISH CLERK

PRINCIPAL CHIEF

APPROVED (✓) VETOED ( )

VETO UPHELD ( ) VETO DENIED ( )

DATE: 12/14/22

I hereby certify that the foregoing act of the Council was duly:

PASSED ( )

KILLED ( )

and ratified in open Council after the same has been interpreted by the Official Interpreter and has been fully and freely discussed.

INTERPRETED ( )

OMITTED ( )

RESOLUTION TO ADOPT THE SMOKY MOUNTAIN REGIONAL HAZARD MITIGATION PLAN

WHEREAS, The County of Graham is vulnerable to an array of hazards that can cause loss of life and damages to public and private property; and

WHEREAS, The County of Graham desires to seek ways to mitigate situations that may aggravate such circumstances; and

WHEREAS, the development and implementation of a hazard mitigation plan can result in actions that reduce the long-term risk to life and property from hazards; and

WHEREAS, it is the intent of the Graham County Board of Commissioners to protect its citizens and property from the effects of hazards by preparing and maintaining a local hazard mitigation plan; and

WHEREAS, it is also the intent of the Graham County Board of Commissioners to fulfill its obligation under North Carolina General Statutes, Chapter 166A: North Carolina Emergency Management Act and Section 322: Mitigation Planning, of the Robert T. Stafford Disaster Relief and Emergency Assistance Act to remain eligible to receive state and federal assistance in the event of a declared disaster affecting the County of Graham; and

WHEREAS, Graham County Emergency Management in coordination has prepared a multi-jurisdictional hazard mitigation plan with input from the appropriate local and state officials;

WHEREAS, the North Carolina Emergency Management has reviewed the Smoky Mountain Regional Hazard Mitigation Plan for legislative compliance and has approved the plan pending the completion of local adoption procedures.

NOW, THEREFORE, BE IT RESOLVED that the Graham County Board of Commissioners of The County of Graham hereby:

1. Adopts the Smoky Mountain Regional Hazard Mitigation Plan; and
2. Agrees to take such other official action as may be reasonably necessary to carry out the proposed actions of the Plan.

Adopted on August 16, 2022.

Connie Orr, Chair
Connie Orr, Chair

Keith Eller, Vice-Chairman

Lynn Cody
Lynn Cody, Member

Dale Wiggins Member

Jacob Nelms, Member

ATTEST: Kim Crisp
Kim Crisp, Clerk

Resolution #08012022.1

Town of Fontana Dam

Rob Hardy, Mayor
Lacie McBee
Tiffany Duke
Luis Giraldo
Zelerie Rogers, Town Administrator

PO Box 128
Fontana Dam, NC 28733
828.498.2107

RESOLUTION TO ADOPT THE SMOKY MOUNTAIN REGIONAL HAZARD MITIGATION PLAN

WHEREAS, The Town of Fontana Dam is vulnerable to an array of hazards that can cause loss of life and damages to public and private property; and

WHEREAS, The Town of Fontana Dam desires to seek ways to mitigate situations that may aggravate such circumstances; and

WHEREAS, the development and implementation of a hazard mitigation plan can result in actions that reduce the long-term risk to life and property from hazards; and

WHEREAS, it is the intent of the Fontana Dam Town Council to protect its citizens and property from the effects of hazards by preparing and maintaining a local hazard mitigation plan; and

WHEREAS, it is also the intent of the Fontana Dam Town Council to fulfill its obligation under North Carolina General Statutes, Chapter 166A: North Carolina Emergency Management Act and Section 322: Mitigation Planning, of the Robert T. Stafford Disaster Relief and Emergency Assistance Act to remain eligible to receive state and federal assistance in the event of a declared disaster affecting the County of Graham; and

WHEREAS, Graham County Emergency Management in coordination with Cherokee, Haywood, Jackson, and Swain counties, the municipalities within those counties and the Eastern Band of Cherokee Indians has prepared a multi-jurisdictional hazard mitigation plan with input from the appropriate local and state officials;

WHEREAS, the North Carolina Emergency Management has reviewed the Smoky Mountain Regional Hazard Mitigation Plan for legislative compliance and has approved the plan pending the completion of local adoption procedures;

NOW, THEREFORE, BE IT RESOLVED that the Town Council of The Town of Fontana Dam hereby:

1. Adopts the Smoky Mountain Regional Hazard Mitigation Plan; and
2. Agrees to take such other official action as may be reasonably necessary to carry out the proposed actions of the Plan.

Adopted on August 17, , 2022.

Rob Hardy, Mayor
Town of Fontana Dam

Attest:

Zelerie Rogers, Town Administrator
Town of Fontana Dam

Certified by: Zelerie Rogers (SEAL)

Date: 8/17/2022

TOWN OF INCORPORATED 2011 JUNE 8 FONTANA DAM, NC

Town of Lake Santeetlah

RESOLUTION TO ADOPT THE SMOKY MOUNTAIN REGIONAL HAZARD MITIGATION PLAN

WHEREAS, The Town of Lake Santeetlah is vulnerable to an array of hazards that can cause loss of life and damages to public and private property; and

WHEREAS, The Town of Lake Santeetlah desires to seek ways to mitigate situations that may aggravate such circumstances; and

WHEREAS, the development and implementation of a hazard mitigation plan can result in actions that reduce the long-term risk to life and property from hazards; and

WHEREAS, it is the intent of the Santeetlah Town Council to protect its citizens and property from the effects of hazards by preparing and maintaining a local hazard mitigation plan; and

WHEREAS it is also the intent of the Santeetlah Town Council to fulfill its obligation under North Carolina General Statutes, Chapter 166A: North Carolina Emergency Management Act and Section 322: Mitigation Planning, of the Robert T. Stafford Disaster Relief and Emergency Assistance Act to remain eligible to receive state and federal assistance in the event of a declared disaster affecting The Town of Lake Santeetlah; and

WHEREAS, Graham County Emergency Management in coordination with Cherokee, Haywood, Jackson and Swain counties, the municipalities within those counties and the Eastern Band of Cherokee Indians has prepared a multi-jurisdictional hazard mitigation plan with input from the appropriate local and state officials;

WHEREAS, the North Carolina Emergency Management has reviewed the Smoky Mountain Regional Hazard Mitigation Plan for legislative compliance and has approved the plan pending the completion of local adoption procedures;

NOW, THEREFORE, BE IT RESOLVED that the Town Council of The Town of Lake Santeetlah hereby:

1. Adopts the Smoky Mountain Regional Hazard Mitigation Plan; and
2. Agrees to take such other official action as may be reasonably necessary to carry out the proposed actions of the Plan.

Adopted on August 8, 2022.

Connie Gross, Mayor
Town of Lake Santeetlah

Attest:

Emily Hooper, Clerk
Town of Lake Santeetlah

Certified by: Town of Lake Santeetlah (SEAL)

Date: August 8, 2022

RESOLUTION TO ADOPT THE
SMOKY MOUNTAIN REGIONAL HAZARD MITIGATION PLAN

WHEREAS, the Town of Robbinsville is vulnerable to an array of hazards that can cause loss of life and damages to public and private property; and

WHEREAS, the Town of Robbinsville desires to seek ways to mitigate situations that may aggravate such circumstances; and

WHEREAS, the development and implementation of a hazard mitigation plan can result in actions that reduce the long-term risk to life and property from hazards; and

WHEREAS, it is the intent of the Robbinsville Town Council to protect its citizens and property from the effects of hazards by preparing and maintaining a local hazard mitigation plan; and

WHEREAS, it is also the intent of the Robbinsville Town Council to fulfill its obligation under North Carolina General Statutes, Chapter 166A: North Carolina Emergency Management Act and Section 322: Mitigation Planning, of the Robert T. Stafford Disaster Relief and Emergency Assistance Act to remain eligible to receive state and federal assistance in the event of a declared disaster affecting the Town of Robbinsville; and

WHEREAS, Graham County Emergency Management in coordination with Cherokee, Graham, Haywood, Jackson and Swain counties, the municipalities within those counties and the Eastern Band of Cherokee Indians has prepared a multi-jurisdictional hazard mitigation plan with input from the appropriate local and state officials;

WHEREAS, the North Carolina Emergency Management has reviewed the Smoky Mountain Regional Hazard Mitigation Plan for legislative compliance and has approved the plan pending the completion of local adoption procedures;

NOW, THEREFORE, BE IT RESOLVED that the Town Council of the Town of Robbinsville hereby:

1. Adopts the Smoky Mountain Regional Hazard Mitigation Plan; and
2. Agrees to take such other official action as may be reasonably necessary to carry out the proposed actions of the Plan.

Adopted on August 3, 2022.

Shaun Adams

Shaun Adams, Mayor
Town of Robbinsville

Attest:

Shari Birchfield

Shari Birchfield, Clerk
Town of Robbinsville

Certified by: Shari A. Birchfield (SEAL)

Date: 8-8-2022

SHARI A. BIRCHFIELD NOTARY PUBLIC GRAHAM COUNTY, N.C.

BOARD OF COMMISSIONERS

L. KEVIN ENSLEY, CHAIRMAN
BRANDON C. ROGERS, VICE CHAIRMAN
J. W. "KIRK" KIRKPATRICK, III
TOMMY LONG
JENNIFER M. BEST

COUNTY MANAGER
BRYANT MOREHEAD

COUNTY ATTORNEY
FRANK G. QUEEN

RESOLUTION TO ADOPT THE SMOKY MOUNTAIN REGIONAL HAZARD MITIGATION PLAN

WHEREAS, Haywood County is vulnerable to an array of hazards that can cause loss of life and damages to public and private property; and

WHEREAS, the Haywood County desires to seek ways to mitigate situations that may aggravate such circumstances; and

WHEREAS, the development and implementation of a hazard mitigation plan can result in actions that reduce the long-term risk to life and property from hazards; and

WHEREAS, it is the intent of the Haywood County to protect its citizens and property from the effects of hazards by preparing and maintaining a local hazard mitigation plan; and

WHEREAS, it is also the intent of the Haywood County Commissioners to fulfill its obligation under North Carolina General Statutes, Chapter 166A: North Carolina Emergency Management Act and Section 322: Mitigation Planning, of the Robert T. Stafford Disaster Relief and Emergency Assistance Act to remain eligible to receive state and federal assistance in the event of a declared disaster affecting the Haywood County; and

WHEREAS, Haywood County, in coordination In coordination with Cherokee, Graham, Haywood, Jackson and Swain counties, the municipalities within those counties and the Eastern Band of Cherokee Indians has prepared a multi-jurisdictional hazard mitigation plan with input from the appropriate local and state officials. has prepared a multi-jurisdictional hazard mitigation plan with input from the appropriate local and state officials;

WHEREAS, the North Carolina Emergency Management has reviewed the Smoky Mountain Regional Hazard Mitigation Plan for legislative compliance and has approved the plan pending the completion of local adoption procedures;

NOW, THEREFORE, BE IT RESOLVED that the Board of Commissioners of Haywood County hereby:

1. Adopts the Smoky Mountain Regional Hazard Mitigation Plan; and
2. Agrees to take such other official action as may be reasonably necessary to carry out the proposed actions of the Plan.

Adopted on September 6, 2022

L. Kevin Ensley, Chairman
Haywood County Board of Commissioners

Attest:

Amy L. Stevens, Clerk to the Board
Haywood County Board of Commissioners

HAYWOOD COUNTY SEAL NORTH CAROLINA

215 NORTH MAIN STREET • WAYNESVILLE, NORTH CAROLINA 28786
PHONE: 828.452.6625 • FAX: 828.452.6715

RESOLUTION TO ADOPT THE
SMOKY MOUNTAIN REGIONAL HAZARD MITIGATION PLAN

WHEREAS, the Town of Canton is vulnerable to an array of hazards that can cause loss of life and damages to public and private property; and

WHEREAS, the Town of Canton desires to seek ways to mitigate situations that may aggravate such circumstances; and

WHEREAS, the development and implementation of a hazard mitigation plan can result in actions that reduce the long-term risk to life and property from hazards; and

WHEREAS, it is the intent of the Mayor and Board of Aldermen/women to protect its citizens and property from the effects of hazards by preparing and maintaining a local hazard mitigation plan; and

WHEREAS, it is also the intent of the Mayor and Board of Aldermen/women to fulfill its obligation under North Carolina General Statutes, Chapter 166A: North Carolina Emergency Management Act and Section 322: Mitigation Planning, of the Robert T. Stafford Disaster Relief and Emergency Assistance Act to remain eligible to receive state and federal assistance in the event of a declared disaster affecting the town of Canton; and

WHEREAS, the Town of Canton, in coordination with Cherokee, Graham, Haywood, Jackson and Swain counties, the municipalities within those counties and the Eastern Band of Cherokee Indians has prepared a multi-jurisdictional hazard mitigation plan with input from the appropriate local and state officials;

WHEREAS, the North Carolina Emergency Management has reviewed the Smoky Mountain Regional Hazard Mitigation Plan for legislative compliance and has approved the plan pending the completion of local adoption procedures;

NOW, THEREFORE, BE IT RESOLVED that the Mayor and Board of Aldermen/women of the Town of Canton hereby:

1. Adopts the Smoky Mountain Regional Hazard Mitigation Plan; and
2. Agrees to take such other official action as may be reasonably necessary to carry out the proposed actions of the Plan.

Adopted on September 22, 2022.

Gail Mull
Gail Mull, Mayor Pro-Tem
Town of Canton

Attest:

Lisa Stinnett
Lisa Stinnett, Clerk to the Board
Town of Canton

Certified by: Rhonda M. Lyons (SEAL)
Date: October 5, 2022

RESOLUTION TO ADOPT THE
SMOKY MOUNTAIN REGIONAL HAZARD MITIGATION PLAN

WHEREAS, the Town of Clyde is vulnerable to an array of hazards that can cause loss of life and damages to public and private property; and

WHEREAS, the Town of Clyde desires to seek ways to mitigate situations that may aggravate such circumstances; and

WHEREAS, the development and implementation of a hazard mitigation plan can result in actions that reduce the long-term risk to life and property from hazards; and

WHEREAS, it is the intent of the Mayor and Board of Aldermen to protect its citizens and property from the effects of hazards by preparing and maintaining a local hazard mitigation plan; and

WHEREAS, it is also the intent of the Town of Clyde to fulfill its obligation under North Carolina General Statutes, Chapter 166A: North Carolina Emergency Management Act and Section 322: Mitigation Planning, of the Robert T. Stafford Disaster Relief and Emergency Assistance Act to remain eligible to receive state and federal assistance in the event of a declared disaster affecting the Town of Clyde; and

WHEREAS, the Town of Clyde, in coordination with Cherokee, Graham, Haywood, Jackson and Swain counties, the municipalities within those counties and the Eastern Band of Cherokee Indians have prepared a multi-jurisdictional hazard mitigation plan with input from the appropriate local and state officials;

WHEREAS, the North Carolina Emergency Management has reviewed the Smoky Mountain Regional Hazard Mitigation Plan for legislative compliance and has approved the plan pending the completion of local adoption procedures;

NOW, THEREFORE, BE IT RESOLVED that the Mayor and Board of Aldermen of the Town of Clyde hereby:

1. Adopts the Smoky Mountain Regional Hazard Mitigation Plan; and
2. Agrees to take such other official action as may be reasonably necessary to carry out the proposed actions of the Plan.

Adopted on 25th August, 2022.

James Trantham, Mayor
Town of Clyde

TOWN OF CLYDE · SEAL · CLYDE, NORTH CAROLINA

Attest:

Kim Ramsey, Clerk
Town of Clyde

Certified by: _____ (SEAL)
Date: 8-25-2022

Resolution 22-22

RESOLUTION TO ADOPT THE
SMOKY MOUNTAIN REGIONAL HAZARD MITIGATION PLAN

WHEREAS, Maggie Valley is vulnerable to an array of hazards that can cause loss of life and damages to public and private property; and

WHEREAS, the Maggie Valley desires to seek ways to mitigate situations that may aggravate such circumstances; and

WHEREAS, the development and implementation of a hazard mitigation plan can result in actions that reduce the long-term risk to life and property from hazards; and

WHEREAS, it is the intent of the Board of Aldermen to protect its citizens and property from the effects of hazards by preparing and maintaining a local hazard mitigation plan; and

WHEREAS, it is also the intent of the Maggie Valley Board of Aldermen to fulfill its obligation under North Carolina General Statutes, Chapter 166A: North Carolina Emergency Management Act and Section 322: Mitigation Planning, of the Robert T. Stafford Disaster Relief and Emergency Assistance Act to remain eligible to receive state and federal assistance in the event of a declared disaster affecting the Town of Maggie Valley ; and

WHEREAS, Town of Maggie Valley, in coordination with Cherokee, Graham, Haywood, Jackson and Swain counties, the municipalities within those counties and the Eastern Band of Cherokee Indians have prepared a multi-jurisdictional hazard mitigation plan with input from the appropriate local and state officials;

WHEREAS, the North Carolina Emergency Management has reviewed the Smoky Mountain Regional Hazard Mitigation Plan for legislative compliance and has approved the plan pending the completion of local adoption procedures;

NOW, THEREFORE, BE IT RESOLVED that the Board of Aldermen of Town of Maggie Valley hereby:

1. Adopts the Smoky Mountain Regional Hazard Mitigation Plan; and
2. Agrees to take such other official action as may be reasonably necessary to carry out the proposed actions of the Plan.

Adopted on September 13, 2022

Mayor Mike Eveland

Vickie Best, Clerk

Certified by: VEB (SEAL)
Date: 9-14-22

RESOLUTION R-26-22

RESOLUTION ADOPTING THE SMOKY MOUNTAIN REGIONAL HAZARD MITIGATION PLAN

WHEREAS, The Town of Waynesville is vulnerable to an array of hazards that can cause loss of life and damages to public and private property; and

WHEREAS, Waynesville desires to seek ways to mitigate situations that may aggravate such circumstances; and

WHEREAS, the development and implementation of a hazard mitigation plan can result in actions that reduce the long-term risk to life and property from hazards; and

WHEREAS, it is the intent of the Board of Aldermen to protect its citizens and property from the effects of hazards by preparing and maintaining a local hazard mitigation plan; and

WHEREAS, it is also the intent of the Board of Aldermen to fulfill its obligation under North Carolina General Statutes, Chapter 166A: North Carolina Emergency Management Act and Section 322: Mitigation Planning, of the Robert T. Stafford Disaster Relief and Emergency Assistance Act to remain eligible to receive state and federal assistance in the event of a declared disaster affecting the Town of Waynesville; and

WHEREAS, Waynesville, in coordination with Cherokee, Graham, Haywood, Jackson and Swain counties, the municipalities within those counties and the Eastern Band of Cherokee Indians have prepared a multi-jurisdictional hazard mitigation plan with input from the appropriate local and state officials.

WHEREAS, the North Carolina Emergency Management has reviewed the Smoky Mountain Regional Hazard Mitigation Plan for legislative compliance and has approved the plan pending the completion of local adoption procedures.

NOW, THEREFORE, BE IT RESOLVED that the Board of Aldermen of the Town of Waynesville hereby:

1. Adopts the Smoky Mountain Regional Hazard Mitigation Plan; and
2. Agrees to take such other official action as may be reasonably necessary to carry out the proposed actions of the Plan.

Adopted on October 11, 2022.

Gary Caldwell

Gary Caldwell, Mayor

Attest:

Eddie Ward

Eddie Ward, Clerk

WAYNESVILLE
PROGRESS with VISION
FOUNDED 1871

STATE OF NORTH CAROLINA
COUNTY OF JACKSON

R22-20

RESOLUTION TO ADOPT THE SMOKY MOUNTAIN REGIONAL HAZARD MITIGATION PLAN

WHEREAS, Jackson County is vulnerable to an array of hazards that can cause loss of life and damages to public and private property; and

WHEREAS, the Jackson County desires to seek ways to mitigate situations that may aggravate such circumstances; and

WHEREAS, the development and implementation of a hazard mitigation plan can result in actions that reduce the long-term risk to life and property from hazards; and

WHEREAS, it is the intent of the Jackson County to protect its citizens and property from the effects of hazards by preparing and maintaining a local hazard mitigation plan; and

WHEREAS, it is also the intent of the Jackson County to fulfill its obligation under North Carolina General Statutes, Chapter 166A: North Carolina Emergency Management Act and Section 322: Mitigation Planning, of the Robert T. Stafford Disaster Relief and Emergency Assistance Act to remain eligible to receive state and federal assistance in the event of a declared disaster affecting the Jackson County; and

WHEREAS, Jackson County, in coordination with Cherokee, Graham, Haywood and Swain Counties, the municipalities within those counties and the Eastern Band of Cherokee Indians has prepared a multi-jurisdictional hazard mitigation plan with input from the appropriate local and state officials;

WHEREAS, the North Carolina Emergency Management has reviewed the Smoky Mountain Regional Hazard Mitigation Plan for legislative compliance and has approved the plan pending the completion of local adoption procedures;

NOW, THEREFORE, BE IT RESOLVED that the Board of Commissioners of Jackson County hereby:

1. Adopts the Smoky Mountain Regional Hazard Mitigation Plan; and
2. Agrees to take such other official action as may be reasonably necessary to carry out the proposed actions of the Plan.

Adopted on September 20, 2022.

JACKSON COUNTY, NC Seal 1851

Jackson County Board of Commissioners

By: Brian Thomas McMahan

Brian Thomas McMahan, Chairman

Attest: Angela M. Winchester

Angela M. Winchester, Clerk to the Board

APPROVED COUNTY ATTORNEY

NOW, THEREFORE, BE IT RESOLVED that the Board of Commissioners for the Town of Sylva hereby:

1. Adopts the Smoky Mountain Regional Hazard Mitigation Plan; and
2. Agrees to take such other official action as may be reasonably necessary to carry out the proposed actions of the Plan.

Adopted on October 27, 2022

Town of Sylva

By: _____
Lynda Sossamon, Mayor

Attest:

_____
Amanda W. Murajda, Clerk to the Board

NOW, THEREFORE, BE IT RESOLVED that the Board of Alderman for the Town of Dillsboro hereby:

1. Adopts the Smoky Mountain Regional Hazard Mitigation Plan; and
2. Agrees to take such other official action as may be reasonably necessary to carry out the proposed actions of the Plan.

Adopted on November 14 2022

Town of Dillsboro

By: David Jones
David Jones, Mayor

Attest:

Debbie Coffey
Debbie Coffey, Clerk to the Board

NOW, THEREFORE, BE IT RESOLVED that the Board of Commissioners for the Town of Webster hereby:

1. Adopts the Smoky Mountain Regional Hazard Mitigation Plan; and
2. Agrees to take such other official action as may be reasonably necessary to carry out the proposed actions of the Plan.

Adopted on Dec. 7, 2022

Town of Webster

By: Tracy Rodes
Tracy Rodes, Mayor

Attest:

Debbie Coffey
Debbie Coffey, Clerk to the Board

NOW, THEREFORE, BE IT RESOLVED that the Village of Forest Hills Council hereby:

1. Adopts the Smoky Mountain Regional Hazard Mitigation Plan; and
2. Agrees to take such other official action as may be reasonably necessary to carry out the proposed actions of the Plan.

Adopted on 10-6-22

Village of Forest Hills

By: Marcia Almond, Mayor Pro Tem
Jim Wallace, Mayor

Attest:

Stephanie Gibson, Clerk to the Board

STATE OF NORTH CAROLINA
COUNTY OF SWAIN

Resolution # 900-2022-11

RESOLUTION TO ADOPT THE SMOKY MOUNTAIN REGIONAL HAZARD MITIGATION PLAN

WHEREAS, Swain County is vulnerable to an array of hazards that can cause loss of life and damages to public and private property; and

WHEREAS, Swain County desires to seek ways to mitigate situations that may aggravate such circumstances; and

WHEREAS, the development and implementation of a hazard mitigation plan can result in actions that reduce the long-term risk to life and property from hazards; and

WHEREAS, it is the intent of the Swain County Board of Commissioners to protect its citizens and property from the effects of hazards by preparing and maintaining a local hazard mitigation plan; and

WHEREAS, it is also the intent of the Swain County Board of Commissioners to fulfill its obligation under North Carolina General Statutes, Chapter 166A: North Carolina Emergency Management Act and Section 322: Mitigation Planning, of the Robert T. Stafford Disaster Relief and Emergency Assistance Act to remain eligible to receive state and federal assistance in the event of a declared disaster affecting Swain County and

WHEREAS, Swain County, in coordination with Cherokee, Graham, Haywood and Swain Counties, the municipalities within those counties and the Eastern Band of Cherokee Indians and has prepared a multi-jurisdictional hazard mitigation plan with input from the appropriate local and state officials;

WHEREAS, the North Carolina Emergency Management has reviewed the Smoky Mountain Regional Hazard Mitigation Plan for legislative compliance and has approved the plan pending the completion of local adoption procedures;

NOW, THEREFORE, BE IT RESOLVED that the Swain County Board of Commissioners hereby:

1. Adopts the Smoky Mountain Regional Hazard Mitigation Plan; and

2. Agrees to take such other official action as may be reasonably necessary to carry out the proposed actions of the Plan.

Adopted this the 11th day of August, 2022

Ben Bushyhead, Chairman
Swain County Board of Commissioners

Attest:

Cindi C. Woodard, Clerk to the Board
Swain County Board of Commissioners

RESOLUTION TO ADOPT THE
SMOKY MOUNTAIN REGIONAL HAZARD MITIGATION PLAN

WHEREAS, Town of Bryson City is vulnerable to an array of hazards that can cause loss of life and damages to public and private property; and

WHEREAS, the Town of Bryson City desires to seek ways to mitigate situations that may aggravate such circumstances; and

WHEREAS, the development and implementation of a hazard mitigation plan can result in actions that reduce the long-term risk to life and property from hazards; and

WHEREAS, it is the intent of the Town of Bryson City Board of Aldermen to protect its citizens and property from the effects of hazards by preparing and maintaining a local hazard mitigation plan; and

WHEREAS, it is also the intent of the Town of Bryson City Board of Aldermen to fulfill its obligation under North Carolina General Statutes, Chapter 166A: North Carolina Emergency Management Act and Section 322: Mitigation Planning, of the Robert T. Stafford Disaster Relief and Emergency Assistance Act to remain eligible to receive state and federal assistance in the event of a declared disaster affecting the Town of Bryson City; and

WHEREAS, the Town of Bryson City, in coordination with Cherokee, Graham, Haywood, Jackson and Swain counties, the municipalities within those counties and the Eastern Band of Cherokee Indians has prepared a multi-jurisdictional hazard mitigation plan with input from the appropriate local and state officials;

WHEREAS, the North Carolina Emergency Management has reviewed the Smoky Mountain Regional Hazard Mitigation Plan for legislative compliance and has approved the plan pending the completion of local adoption procedures;

NOW, THEREFORE, BE IT RESOLVED that the Board of Aldermen of the Town of Bryson City hereby:

1. Adopts the Smoky Mountain Regional Hazard Mitigation Plan; and
2. Agrees to take such other official action as may be reasonably necessary to carry out the proposed actions of the Plan.

Adopted on August 1, 2022.

Tom Sutton, Mayor
Town of Bryson City Board of Aldermen

Attest:

Lynn Thomas, Town Clerk
Town of Bryson City Board of Aldermen

Certified by: Lynn Thomas (SEAL)

Date: 8/1/2022

TOWN OF BRYSON CITY
CORPORATE
SEAL
NORTH CAROLINA

Appendix B
Planning Tools

This Appendix includes the following:

1. A Blank Hazard Mitigation Public Survey
2. GIS Data Inventory Spreadsheet
3. Scoring Criteria for Capability Assessment
4. A Blank Mitigation Action Worksheet

surveyplanet

Smoky Mountain Regional Hazard Mitigation Plan - Public Survey

Please take my survey - thanks!

1 1\. Where do you live?*

- ◯ Andrews
- ◯ Fontana
- ◯ Robbinsville
- ◯ Canton
- ◯ Maggie Valley
- ◯ Dillsboro
- ◯ Sylva
- ◯ Unincorporated Cherokee County
- ◯ Unincorporated Haywood County
- ◯ Unincorporated Swain County
- ◯ Murphy
- ◯ Lake Santeetlah
- ◯ Bryson City
- ◯ Clyde
- ◯ Waynesville
- ◯ Forest Hills
- ◯ Webster
- ◯ Unincorporated Graham County
- ◯ Unincorporated Jackson County
- ◯ Eastern Band of Cherokee Indians Tribal Reservation Lands

* Choose one.

2 2\. Have you ever experienced or been impacted by a disaster in Cherokee, Graham,

Swain, Haywood, or Jackson County?*

- ◯ Yes
- ◯ No

* Choose one.

3 3\. If “Yes,” please explain.

4 4\. How concerned are you about the possibility of your community being impacted by a disaster?*

- ◯ Extemely concerned
- ◯ Somewhat concerned

- ◯ Not concerned

* Choose one.

5 5\. Please select the **one** hazard you think is the highest threat to your neighborhood:*

- ◯ Cyber Attack
- ◯ Electromagnetic Pulse (EMP)
- ◯ Hazardous Substances
- ◯ Lightning
- ◯ Terrorism
- ◯ Dam Failure
- ◯ Erosion
- ◯ Hurricane and Coasta; Hazards
- ◯ Radiological Emergency
- ◯ Tornadoes
- ◯ Drought
- ◯ Excessive Heat
- ◯ Infectious Disease (like COVID-19)
- ◯ Severe Thunderstorms/High Winds
- ◯ Wildfire
- ◯ Earthquakes
- ◯ Flooding
- ◯ Landslides
- ◯ Severe Winter Weather

* Choose one.

6 6\. Please select the **one** hazard you think is the second highest threat to your neighborhood:*

- ◯ Cyber Attack
- ◯ Electromagnetic Pulse (EMP)
- ◯ Hazardous Substances
- ◯ Drought
- ◯ Excessive Heat
- ◯ Infectious Disease

- ◯ Lightning
- ◯ Terrorism
- ◯ Dam Failure
- ◯ Erosion
- ◯ Hurricane and Coastal Hazards
- ◯ Radiological Emergency
- ◯ Tornado
- ◯ Severe Thunderstorms/High Wind
- ◯ Wildfire
- ◯ Earthquake
- ◯ Flooding
- ◯ Landslides
- ◯ Severe Winter Weather

* Choose one.

7 7\. Are there any other hazards that you feel pose a wide-scale threat to your community? If so, please explain:

8 8\. Is your home located in a floodplain?*

- ◯ Yes
- ◯ No
- ◯ I'm not sure

* Choose one.

9 9\. Do you have flood insurance?*

- ◯ Yes
- ◯ No
- ◯ I'm not sure

* Choose one.

10 10\. If you do not have flood insurance, why not?

- ◯ Not located in floodplain
- ◯ Too expensive
- ◯ Not necessary because it never floods
- ◯ Not necessary because I am elevated or otherwise protected
- ◯ Never really considered it
- ◯ Other

* Choose one.

11 11\. If "Other," please explain:

12 12\. Have you taken any steps to make your home or neighborhood more resistant to hazards?*

- ◯ Yes
- ◯ No

* Choose one.

13 13\. If "Yes," please explain:

14 14\. Are you interested in making your home or neighborhood more resistant to hazards?*

- ◯ Yes
- ◯ No

* Choose one.

15 15\. Do you know what office to contact to find out more information about how to reduce your risks to hazards in your area?*

- ◯ Yes
- ◯ No

* Choose one.

16 16\. What is the most effective way for you to receive information about how to make your home and neighborhood more resistant to hazards?*

- ◯ Newspaper
- ◯ Mail
- ◯ Television
- ◯ Public Wokshops/Meetings
- ◯ Radio
- ◯ School Meetings
- ◯ Internet (including social media)

* Choose one.

17 17\. Are there any other ways you prefer to receive information? If so, please explain:

18 18\. In your opinion, what are some steps your local government could take to reduce or eliminate the risk of future hazard damages in your neighborhood?

19 19\. Are there any other issues regarding the reduction of risk and loss associated with hazards or disasters in the community that you think are important? If so, please explain:

20 A number of community-wide activities can reduce our risk from hazards. In general, these activities fall into one of the following six broad categories. In the next six

questions, please tell us how important you think each one is for your community to consider pursuing.

20\. **Prevention** - Administrative or regulatory actions that influence the way land is developed and buildings are built. Examples include planning and zoning, building codes, open space preservation, and floodplain regulations.*

- ◯ Very important
- ◯ Somewhat important
- ◯ Not important

* Choose one.

21 21\. **Property Protection** - Actions that involve the modification of existing buildings to protect them from a hazard or removal from the hazard area.

(Examples include acquisition, relocation, elevation, structural retrofits, and storm shutters.)*

- ◯ Very important
- ◯ Somewhat important
- ◯ Not important

* Choose one.

22 22\. **Natural Resource Protection** - Actions that, in addition to minimizing hazard losses, also preserve or restore the functions of natural systems. (Examples include: floodplain protection, habitat preservation, slope stabilization, riparian buffers, and forest management.)*

- ◯ Very important
- ◯ Somewhat important
- ◯ Not important

* Choose one.

23 23\. **Structural Projects** - Actions intended to lessen the impact of a hazard by modifying the natural progression of the hazard.

(Examples include dams, levees, detention/retention basins, channel modification, retaining walls and storm sewers.)*

- ◯ Very important
- ◯ Somewhat important
- ◯ Not important

* Choose one.

24 24\. **Emergency Services** - Actions that protect people and property during and immediately after a hazard event.

(Examples include warning systems, evacuation planning, emergency response training, and protection of critical emergency facilities or systems.)*

- ◯ Very important
- ◯ Somewhat important
- ◯ Not important

* Choose one.

25 25\. **Public Education and Awareness** - Actions to inform citizens about hazards and the techniques they can use to protect themselves and their property.

(Examples include outreach projects, school education programs, library materials and demonstration events.)*

- ◯ Very important
- ◯ Somewhat important
- ◯ Not important

* Choose one.

26 This survey may be submitted anonymously; however, if you provide us with your name and contact information below, we will have the ability to follow up with you to learn more about your ideas or concerns. (Optional)

surveyplanet

Thanks for taking this survey!

GIS DATA INVENTORY

DATA DESCRIPTION	AVAILABLE?	RECEIVED?	SOURCE(S)
Administrative / Political Boundaries			
County boundaries			
Municipal boundaries			
Tax parcels *			
* *At a minimum, attribute data for tax parcels should include address, building type, square footage, building value and year built.*			
Population and Demographics			
Census block data *			
* *Anything better than Census 2000 data?*			
Buildings and Facilities			
Building footprints			
Existing building stock, by occupancy class			
Government buildings			
County offices, city/town halls, etc.			
Police stations			
Fire/Rescue stations			
Emergency Operations Centers			
Public works facilities			
Communication facilities			
Hazardous materials facilities			
Hospitals			
Schools			
Shelters			
Senior care facilities			
Day care facilities			
Historic properties			
Power generation facilities / transmission lines			
Water/wastewater facilities / distribution lines			
Pipelines			
Repetitive loss properties (NFIP)			
Topography, Hydrology, Geology			
Contour data (two foot)			
Digital Elevation Model			
Watershed boundaries			
Rivers and streams			
Lakes and ponds			
Ocean / shoreline			
Wetlands			
Geology			
Soils			
Transportation			
Highways and roads (center lines)			
Bridges			
Railways			
Airports			
Ports			
Land Use			
Land Use / Land Cover			
Zoning / Future Land Use			
Parks / Open Space			
Preserved Farmland			
Acquired properties (HMGP buyouts, etc.)			

GIS DATA INVENTORY

DATA DESCRIPTION	AVAILABLE?	RECEIVED?	SOURCE(S)
Aerial Imagery			
High-resolution digital orthophotography			
Hazards			
DROUGHT			
Palmer Drought Severity Index (PDSI)	X	X	National Drought Mitigation Center
FLOOD			
FEMA Digital Flood Data (DFIRMs)			FEMA
Location of dams, levees and any inundation zones			
HURRICANE AND TROPICAL STORM			
Historical storm tracks	X	X	NOAA
THUNDERSTORM			
Thunderstorm frequency	X	X	NOAA
Lightning frequency	X	X	NOAA
Hail frequency	X	X	NOAA
TORNADO			
Historical tornado locations	X	X	NOAA
WILDFIRE			
Wildfire hazard areas, fuel maps, etc.			
Urban/wildland interface communities			
WINTER STORM			
Annual snow/ice precipitation	X	X	NOAA
OTHER			
Any other data on historic events/ damages			

Points System for Capability Ranking

0-24 points = Limited overall capability **25-49 points = Moderate overall capability** **50-80 points = High overall capability**

I. Planning and Regulatory Capability (Up to 43 points)

Yes = 3 points
Under Development = 1 point
No = 0 points

- Hazard Mitigation Plan
- Comprehensive Land Use Plan
- Floodplain Management Plan
- Participate in NFIP
- Participate in CRS Program

Yes = 2 points
Under Development = 1 point
No = 0 points

- Open Space Management / Parks & Rec. Plan
- Stormwater Management Plan
- Natural Resource Protection Plan
- Flood Response Plan
- Emergency Operations Plan
- Continuity of Operations Plan
- Evacuation Plan
- Disaster Recovery Plan
- Flood Damage Prevention Ordinance
- Post-Disaster Redevelopment / Reconstruction Ordinance

Yes = 1 point
No = 0 points

- Capital Improvements Plan
- Economic Development Plan
- Historic Preservation Plan
- Zoning Ordinance
- Subdivision Ordinance
- Unified Development Ordinance
- Building Code
- Fire Code

II. Administrative and Technical Capability
(Up to 15 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

III. Fiscal Capability
(Up to 10 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/ Revenue/ Special Tax Bonds
- Partnering arrangements or intergovernmental agreements
- Other

IV. Self-Assessment of Overall Capability
(Up to 10 points)

High = 2 points
Moderate = 1 points
Low = 0 points

- Technical Capability
- Fiscal Capability
- Administrative Capability
- Political Capability
- Overall Capability

MITIGATION ACTION WORKSHEETS

Mitigation Action Worksheets are used to identify potential hazard mitigation actions that participating jurisdictions in the Smoky Mountain Region will consider to reduce the negative effects of identified hazards. The worksheets provide a simple yet effective method of organizing potential actions in a user-friendly manner that can easily be incorporated into the Region's Hazard Mitigation Plan.

The worksheets are to be used as part of a strategic planning process and are designed to be:

a.) completed electronically (worksheets and instructions will be e-mailed to members of the Hazard Mitigation Planning Team following the Mitigation Strategy Workshop);
b.) reviewed with your department/organization for further consideration; and
c.) returned according to the contact information provided below.

Please return all completed worksheets to:

Nathan Slaughter - ESP Associates, Inc.

Electronic copies may be e-mailed to: nslaughter@espassociates.com

INSTRUCTIONS

Each mitigation action should be considered to be a separate local project, policy or program and each individual action should be entered into a separate worksheet. By identifying the implementation requirements for each action, the worksheets will help lay the framework for engaging in distinct actions that will help reduce the community's overall vulnerability and risk. Detailed explanations on how to complete the worksheet are provided below.

Proposed Action: Identify a specific action that, if accomplished, will reduce vulnerability and risk in the impact area. Actions may be in the form of local policies (i.e., regulatory or incentive-based measures), programs or structural mitigation projects and should be consistent with any pre-identified mitigation goals and objectives.

Site and Location: Provide details with regard to the physical location or geographic extent of the proposed action, such as the location of a specific structure to be mitigated, whether a program will be citywide, countywide or regional, etc.

History of Damages: Provide a brief history of any known damages as it relates to the proposed action and the hazard(s) being addressed. For example, the proposed elevation of a repetitive loss property should include an overview of the number of times the structure has flooded, total dollar amount of damages if available, etc.

Hazard(s) Addressed: List the hazard(s) the proposed action is designed to mitigate against.

Category: Indicate the most appropriate category for the proposed action as discussed during the Mitigation Strategy Workshop (Prevention; Property Protection; Natural Resource Protection; Structural Projects; Emergency Services; Public Education and Awareness).

Priority: Indicate whether the action is a "high" priority, "moderate" priority or "low" priority based generally on the following criteria:

1. Effect on overall risk to life and property
2. Ease of implementation / technical feasibility
3. Project costs versus benefits
4. Political and community support
5. Funding availability

Estimated Cost: If applicable, indicate what the total cost will be to accomplish this action. This amount will be an estimate until actual final dollar amounts can be determined. Some actions (such as ordinance revisions) may only cost "local staff time" and should be noted so.

Potential Funding Sources: If applicable, indicate how the cost to complete the action will be funded. For example, funds may be provided from existing operating budgets or general funds, a previously established contingency fund, a cost-sharing federal or state grant program, etc.

Lead Agency/Department Responsible: Identify the local agency, department or organization that is best suited to implement the proposed action.

Implementation Schedule: Indicate when the action will begin and when the action is expected to be completed. Remember that some actions will require only a minimal amount of time, while others may require a long-term or continuous effort.

Comments: This space is provided for any additional information or details that may not be captured under the previous headings.

MITIGATION ACTION	
Proposed Action:	
BACKGROUND INFORMATION	
Site and Location:	
History of Damages:	

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	
Category:	
Priority (High, Moderate, Low):	
Estimated Cost:	
Potential Funding Sources:	
Lead Agency/Department Responsible:	
Implementation Schedule:	

COMMENTS

Appendix C

Local Mitigation Plan Review Tool

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*.

Jurisdiction: Smoky Mountain Region (see list of participants in Section 3)	**Title of Plan:** Smoky Mountain Regional Hazard Mitigation Plan	**Date of Plan:** DRAFT - June 2022
Local Point of Contact: Nathan Slaughter	**Address:** 2200 Gateway Centre Boulevard Suite 216 Morrisville, NC 27560	
Title: Hazard Mitigation Department Manager		
Agency: ESP Associates		
Phone Number: 919-224-9536	**E-Mail:** nslaughter@espassociates.com	

State Reviewer:	**Title:**	**Date:**
Carl Baker	Hazard Mitigation Planner	July 8, 2022 July 25, 2022

FEMA Reviewer:	**Title:**	**Date:**
Edwardine S. Marrone	NC-FIT-Mitigation Planner	August 17, 2022
Date Received in FEMA Region 4	July 27, 2022	
Plan Not Approved		
Plan Approvable Pending Adoption		
Plan Approved	September 13, 2022	

✓ Denotes FEMA Reviewer concurs with State Reviewers notations.

SECTION 1:
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 ✓ P 1:1, 1:4, 2:2	X	
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, Appendix D ✓ P 2:14	X	
A3. Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))	Section 2.6 ✓ P 2:10-14,	X	
A4. Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement §201.6(b)(3))	Section 7 ✓ P 2:3, 10:2	X	
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 ✓ P 10:5	X	
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 ✓	X	
ELEMENT A: REQUIRED REVISIONS NCEM 1st Review: A1: Neither the meeting narratives in Section 2, nor the attendance listings in Appendix D, list the position and jurisdiction for attendees. The plan must list who attended the meetings for each participating jurisdiction to document involvement in the planning process. Page 2:6, Table 2.3, Jeff Haynes of Haywood County, Chief of what department or service? ESP Response: Added needed detail. Page 2:6, Table 2.3, does not list the positions for Joshua Turner and Lara Feinberg. ESP Response: Added needed detail. A2: No revision required. A3: No revision required. A4: No revision required. A5: No revision required. A6: No revision required. NCEM 2nd Review: No revision required.			
ELEMENT B. HAZARD IDENTIFICATION AND RISK ASSESSMENT			

1. REGULATION CHECKLIST **Regulation** (44 CFR 201.6 Local Mitigation Plans)	Location in Plan (section and/or page number)	Met	Not Met
B1. Does the Plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction(s)? (Requirement §201.6(c)(2)(i))	Sections 4 and 5 Also Appendix F and Appendix G P 3:3, P 4:5-4:15, 5:4, 7-11, 19-30, 33-35, 38, 40, 42, 47-48, 53-63, App G	X	
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 P **3:**30-24, **5:**7-14, 20-30, 32, 34-36-37, 41-46, 51-52, 54-58, 60-64, **6:**6-30, 41-63, App G	X	
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))	Section 5 Section 6 (Vulnerability Assessment) P **3:**30-34, **5:**7, 12-14, 20-30, 32, 45-46, 51, 60-63, 88-89, **6:**6-33, 41-61, App G	X	
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, page 5:57 and 58 ✓	X	

ELEMENT B: REQUIRED REVISIONS

NCEM 1st Review:

B1: Area designated as the Eastern Band of Cherokee Indians (EBCI) on Figure 3.1 is not demonstrated on the wildfire and flood hazard maps in Appendix F and Appendix G.

ESP Response: Maps revised to add EBCI lands.

B2: No revision required.

B3: The following natural hazards were not addressed in Section 6, Vulnerability Assessment: Drought, and Severe Winter Weather. As well the other/technological hazards were not addressed in Section 6. The impact and vulnerability should be addressed for all identified hazards.

ESP Response: Page 6.11 states "All other hazards are assumed to impact the entire planning region (drought, excessive heat, hailstorm, lightning, and severe winter weather) or, due to lack of data, analysis would not lead to credible results (sinkholes, erosion, dam failure, infectious disease, terrorism, cyber, EMP)." Page 6.41 states "As noted previously, all existing and future buildings and populations (including critical facilities) are vulnerable to natural hazards including drought, hurricane and coastal hazards, tornadoes/ thunderstorms, and severe winter weather. Some buildings may be more vulnerable to these hazards based on locations, construction, and building type." Table 6.24 indicates the critical facilities that are vulnerable to Drought and Severe Winter Weather.

B4: No revision required.

NCEM 2nd Review:

No revisions required.

ELEMENT C. MITIGATION STRATEGY

1. REGULATION CHECKLIST **Regulation** (44 CFR 201.6 Local Mitigation Plans)	Location in Plan (section and/or page number)	Met	Not Met
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 ✓ P 10:2	X	
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, page 7:9 and 7:10 ✓	X	
C3. Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement §201.6(c)(3)(i))	Section 8 ✓ P 8:3	X	
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 ✓	X	
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 8 and 9 ✓ P 8:2-3	X	
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 ✓ P 10:2	X	

ELEMENT C: REQUIRED REVISIONS

NCEM 1st Review:

C1: No revision required.

C2: The FEMA Community Status Book lists Graham County and the towns of Lake Santeetlah and Robbinsville as participating in the NFIP. Table 7.1 indicates that none of the jurisdictions in and including Graham County participate in the NFIP. This also conflicts with Table 7.2.

ESP Response: Corrected Table 7.1.

C3: No revision required.

C4: Change Hazard(s) Addressed throughout Section 9 to match identified hazards in Section 5 (e.g. Geological instead of landslide, and flooding versus flood).

ESP Response: Done for all hazards

The category "Emergency Services" can be in the plan but does not count as a mitigation action. Recommend revising the category to "Property Protection (PP)" for the jurisdictions listed below so the action will count as an "All Hazard" action. Action description: "Install generator or generator hook-ups for critical facilities as budget and need arise."

Cherokee County, ES-3, page 9:6; Andrews, ES-3, page 9:8; Murphy, ES-3, page 9:10; Graham County, ES-5, page 9:13; Fontana Dam, ES-2, page 9:16; Lake Santeetlah, ES-2, page 9:19; Robbinsville, ES-2, page 9:21; Haywood County, ES-3, page 9:25; Canton, ES-3, page 9:29; Clyde, ES-3, page 9:33; Maggie Valley, ES-3, page 9:36; Waynesville, ES-3, page 9:40; Jackson County, ES-3, page 9:44; Dillsboro, ES-2, page 9:47; Forest Hills, ES-3, page 9:51; Sylva, ES-3, page 9:55; Webster, ES-3, page 9:59; Swain County, ES-3, page 9:62; Bryson City, ES-3, page 9:65; EBCI, ES-5, page 9:83

ESP Response: Done

The action description "Identify critical facilities and the need for a second source of power for critical facilities and other public buildings to operate despite the negative effects of hazards on the main power source" duplicates the action described above of obtaining and installing a generator as a back-up power source. This action was listed in the following jurisdictions: Cherokee County, PP-3; Jackson County, P-11; Dillsboro, P-4; Forest Hills, P-11; Sylva, P-13; Webster, P-11

ESP Response: Made note on each of these actions to delete as duplicative in future plan updates.

Murphy, Actions P-5 and P-6 are documented as completed. Are these actions slated to be removed?

ESP Response: Actions completed since previous update are noted as completed in current plan update and moved to Appendix E in future updates.

Graham County, P-8 and P-9, Change Hazard Addressed to Geological. Landslide is a subcategory of the Geological hazard.

ESP Response: Done

Haywood County, P-12 and P-13, Change Hazard Addressed to Geological. Landslide and erosion is a subcategory of the Geological hazard.

ESP Response: Done

Haywood County (and towns within the county), PEA-11 discusses all hazard awareness and training that should negate the need for the individual hazard actions PEA 5 through PEA-9.

ESP Response: Made note to delete duplicative PEA actions for Haywood County and Towns in future updates.

EBCI, P-23 lists Wind as the hazard addressed. This is not an identified hazard in Section 5.

ESP Response: Changed to reference Tornadoes/Thunderstorms

EBCI, P-24 and P-26 list Manmade as the hazard addressed. This is not an identified hazard in Section 5. While culturally sensitive information is recognized, suggest changing the hazard(s) addressed.

ESP Response: Changed to reference Terrorism

C5: No revision required.

C6: No revision required.

NCEM 2nd Review:

No revisions required.

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 3.3.3 and 6.4.3 ✓	X	
D2. Was the plan revised to reflect progress in local mitigation efforts? (Requirement §201.6(d)(3))	Section 9, Appendix E ✓	X	
D3. Was the plan revised to reflect changes in priorities? (Requirement §201.6(d)(3))	Section 8.5 Section 8.1 ✓ P 4:5-4:15	X	
ELEMENT D: REQUIRED REVISIONS NCEM 1st Review: D1: No revision required. D2: No revision required. D3: No revision required. NCEM 2nd Review: No revisions required.			
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))	Adoption will take place by all participating jurisdictions after the plan has been deemed by FEMA to be Approvable Pending Adoption.	X	
E2. For multi-jurisdictional plans, has each jurisdiction requesting approval of the plan documented formal plan adoption? (Requirement §201.6(c)(5))	Adoption will take place by all participating jurisdictions after the plan has been deemed by FEMA to be Approvable Pending Adoption.	X	

ELEMENT E: REQUIRED REVISIONS

FEMA REQUIRED REVISIONS:

Adoption documentation has not been provided by all participating jurisdictions.

E2: Each jurisdiction that is included in the plan must have its governing body adopt the plan prior to FEMA approval, even when a regional agency has the authority to prepare such plans. At least one participating jurisdiction must formally adopt the plan within one calendar year of FEMA's designation of the plan as "Approvable Pending Adoption."

FEMA recommends that all participating jurisdictions coordinate the adoption process as soon as the plan has received APA status to ensure that all participants are covered by a plan for the full five years.

FEMA Review of Adoption Documentation:

The Town of Bryson City provided adoption documentation while plan was being reviewed by FEMA.
8-22-22 Graham County and the Towns of Robbinsville, Lake Santeetlah, and Fontana Dam provided adoption documentation.
8-29-22 Town of Clyde provided adoption documentation.
9-12-22 Haywood County provided adoption documentation.
11-08-22 Adoption documentation was provided by Swain County, Towns of Maggie Valley, Canton, and Waynesville.
01-09-23 Adoption documentation was provided by Eastern Band of Cherokee Indians.
02-23-23 Adoption documentation provided by Cherokee County and the Towns of Andrews and Murphy.
02-27-23 Adoption documentation provided by Jackson County; the Towns of Dillsboro, Sylva, and Webster; and the Village of Forest Hills. All jurisdictions have adopted the plan; Element E2 is Met.

For additional information, please see Element E, Plan Adoption, in the "Local Mitigation Plan Review Guide", October 1, 2011, Pages 28-29 and Task 8 of the Local Mitigation Planning Handbook, March 2013.

ELEMENT F. ADDITIONAL STATE REQUIREMENTS (OPTIONAL FOR STATE REVIEWERS ONLY; NOT TO BE COMPLETED BY FEMA)			
F1.			
F2.			

Not applicable.

SECTION 2:
PLAN ASSESSMENT

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

Plan Strengths

- The counties, tribe, and communities worked together to update the regional plan, along with the assistance of a contractor.
- The planning process is the cornerstone for the development of the hazard mitigation plan. Each section, from beginning to end, is built upon to provide a cohesive and substantial plan
- The mitigation plan was integrated into floodplain management ordinances, County and Tribal emergency operations plans, building codes, and capital improvement plans.
- A Plan Amendment Process is documented in the plan.

Opportunities for Improvement

As an effort to include the underserved communities, in the next plan update consider including the/an Outreach Flyer in utility bills to reach the population that may not have access to the internet. Or another channel of communication that does not require electronic devices. EM booth at community events, specific outreach to minority populations through community, social, or houses of worship, is another possibility.

Element B: Hazard Identification and Risk Assessment

Plan Strengths

- The hazards discussed are those that may affect the participating jurisdictions in varying degrees. The manner the plan is written allows the reader to have a full picture of which hazards present a higher risk to the participating jurisdictions therefore these are the hazards that have higher priority mitigations strategies.
- The risk assessment is the groundwork for the development of mitigation measures. The plan draws from each of the community's capabilities to document the community's sustained efforts to incorporate hazard mitigation principles and practices into routine government activities and functions thus establishing a successful and sustainable local hazard mitigation program.
- The plan includes a Priority Risk Index at the end of the Section 5, Final Determinations is provided which indicated the high, medium, and low risk of the identified hazards. The Smoky Mountain regions is at high risk of sever winter weather, flood, tornadoes/severe thunderstorm, hurricane/coastal hazards. Moderate risks are listed as drought, wildfire, earthquake, dam failure, and geological.

Element C: Mitigation Strategy

Plan Strengths

- Having a documented structure for developing new actions and reporting on the status of existing actions will provide the living document a path for continued efforts towards maintaining and building a resilient community.
- The proposed mitigation projects are very specific, actionable, and it is clear that actions, including those carried over from the previous plan, were evaluated and re-prioritized.

Element D: Plan Update, Evaluation, and Implementation (*Plan Updates Only*)

Plan Strengths

The plan contains an entirely updated risk assessment and hazard review, a refreshed and updated set of mitigation strategies, and provides ample detail on existing land use, development trends, and issues of community vulnerability, among other subjects. The planning committee and consultants also paid close attention to updating narratives and descriptions throughout the plan to reference new information and updates.

B. Resources for Implementing Your Approved Plan

Hold the CTRL key as you click on each internet link. Please inform the Region 4 Planning Team if a link is broken, or you have a suggestion to include in this collection of resources.

For questions or assistance, connect with your state planning contact, your State Hazard Mitigation Officer (SHMO), or the FEMA Region 4 Planning Team at: FEMA-r4-mitplanning@fema.dhs.gov

Equity, Whole Community Planning, Capacity Building

- **FEMA Strategic Plan Update 2022-2026** (Goal 1, Instill Equity as a Foundation of Emergency Management) Read more about the first goal from the updated FEMA Strategic Plan, focusing on equity across all elements of FEMA.

https://www.fema.gov/about/strategic-plan/goal-1

- **FEMA National Risk Index:** A baseline relative risk measurement for each United States county and Census tract. Online tools help illustrate the communities most at risk for 18 natural hazards.

https://hazards.fema.gov/nri/

- **NOAA's Digital Coast:** Risk communication tools, hazard data and products, plus training that address coastal issues. The digital coast suite of data and information is helpful for coastal communities.

https://coast.noaa.gov/digitalcoast/

- **EPA's Environmental Justice Screening and Mapping Tool (Version 2.0):** Quickly visualize various environmental, health, socioeconomic, and other equity indices/layers compared to the larger US or state. https://ejscreen.epa.gov/mapper/
- **FEMA Guide to Expanding Mitigation, Making the Connection to the Whole Community:** A graphic rich, easy to understand and share, seven-page summary of mitigation considerations across the community.

https://www.fema.gov/sites/default/files/documents/fema_mitigation-guide_whole-community.pdf

- **FEMA Guide to Supporting Engagement and Resiliency in Rural Communities**: 36-page document focusing on the unique set of challenges rural communities face with lower population density and larger amounts of undeveloped land. Includes engagement activities that are authentic and right sized to make every community more resilient (large file, long download)

https://www.fema.gov/sites/default/files/documents/fema_rural-guide_jan-2021.pdf

- **American Planning Association (APA) Hazard Mitigation Policy Guide:** 29-page guide encourages planners to champion a new approach to hazard mitigation, adaptation, and recovery thinking centered on equity and established research for resiliency standards, man-made disasters, and natural disasters.

https://www.planning.org/publications/document/9203323/

Climate Resilience and Green Infrastructure

- **FEMA Building Community Resilience with Nature Based Solutions, A Guide for Local Communities:** The guide helps communities identify and engage the staff and resources that can be used to implement nature-based solutions to build resilience to natural hazards.

https://www.fema.gov/sites/default/files/documents/fema_riskmap-nature-based-solutions-guide_2021.pdf

- **FEMA Resources for Climate Resilience publication:** A 33-page resource highlighting key grant programs and summarizing information on identifying climate risks, planning, and FEMA's role in community and climate resilience.

https://www.fema.gov/sites/default/files/documents/fema_resources-climate-resilience.pdf

- **National Climate Assessment:** Written to help inform decision-makers, utility and natural resource managers, public health officials, emergency planners, and other stakeholders by providing a thorough examination of the effects of climate change on the United States.

https://nca2018.globalchange.gov/

- **Addressing Future Climate, Population, and Land Use Changes Through Mitigation Planning Training** 1.5 hour YouTube video, part of FEMA training series:

Addressing Future Climate, Population, and Land Use Changes Through Hazard Mitigation Planning - YouTube

- **FEMA/EPA Regional Resilience Toolkit:** Summary of large-scale technical assistance projects from 2013 to 2018 discussing regional-scale disaster resilience, with expanded lessons learned. Part of the larger EPA Smart Growth program.

https://www.epa.gov/smartgrowth/regional-resilience-toolkit

- **National Stormwater Calculator & Climate Assessment:** A software application tool that estimates the annual amount of rainwater and frequency of runoff from a specific site using green infrastructure as low impact development controls. The SWC is designed for use by anyone interested in reducing runoff from a property.

http://www.epa.gov/nrmrl/wswrd/wq/models/swc/

- **Including Watershed Planning and Green Infrastructure into State Hazard Mitigation Plans**: High level watershed planning opportunities during state hazard mitigation plan updates.

https://www.epa.gov/sites/production/files/2019-04/documents/final4_good_reasons_for_shmos_to_inc_gi_into_shmps_-_508.pdf

- **USDA Natural Resources Conservation Service, Landscape Planning:** Main landing site for the NRCS landscape and watershed programs, with notes on recent legislation, program fact sheets, and available assistance.

https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/landscape/

- **FEMA Strategic Plan Update 2022-2026** (Goal 2, Lead Whole of Community in Climate Resilience). Read more about the second goal from the updated FEMA Strategic Plan and how climate resilience is critical for long term mitigation.

https://www.fema.gov/about/strategic-plan/goal-2

- **U.S. Climate Resilience Toolkit:** A website designed to help people find and use tools, information, and subject matter expertise to build climate resilience. The Toolkit offers information from across the U.S. federal government in one easy-to-use location. Includes 200+ digital tools, case studies for building resilience, and climate and expected future conditions data.

https://toolkit.climate.gov/

- **NOAA's Digital Coast:** Sea level rise viewer, green infrastructure information, coastal flooding information, and other data, tools, and training that address coastal issues. The digital coast suite of data and information is invaluable for coastal communities.

https://coast.noaa.gov/digitalcoast/

- **American Planning Association (APA) Climate Change Resources:** Planning works at the intersection of transportation, development, and land use — sectors critical to climate mitigation and adaptation. Site includes resources and news related to energy, green infrastructure, climate change, and mitigation.

https://www.planning.org/resources/climatechange/

Planning, Administrative Plan Management, & General Resources

- **Region IV Planning Toolkit:** This toolkit was produced by FEMA Region 4 planners and Resilience Action Partners, the Community Engagement and Risk Communications Contractor. The document was developed for communities writing/implementing their hazard mitigation plan 'In-house' without the use of a contractor. It offers credible data sources, summarized content, and helpful suggestions related to hazard mitigation plans. It is not available online, but can be requested

through the State Planning Coordinator as well as the FEMA Planning Team via email: FEMA-r4-mitplanning@fema.dhs.gov

- **Local Mitigation Planning Handbook** (Will sunset on April 19, 2023, updated policy effective April 19, 2023, is the next link): This Handbook provides guidance to local governments on developing or updating hazard mitigation plans to meet the requirements under the Code of Federal Regulations (CFR) Title 44 – Emergency Management and Assistance §201.6. Use the Local Plan Guide and Handbook in tandem to understand technical requirements.

https://www.fema.gov/sites/default/files/2020-06/fema-local-mitigation-planning-handbook_03-2013.pdf

- **Updated Local Mitigation Planning Policy Guide** effective April 19, 2023:

https://www.fema.gov/sites/default/files/documents/fema_local-mitigation-planning-policy-guide_042022.pdf

- **State NFIP Coordinators:**

https://www.floods.org/membership-communities/connect/state-floodplain-managers-scs/

- **FEMA Mitigation Planning** (Central Landing Page) – FEMA website includes recent news from the Agency, links to regional resources such as the Region 9 audio series, and key planning information.

https://www.fema.gov/emergency-managers/risk-management/hazard-mitigation-planning

- **Recovery and Resilience Resource Library** – Subpage from the main landing page above - Allows users to find and research federal disaster recovery resources, beneficial in pre-disaster recovery planning or in the wake of a disaster.

https://www.fema.gov/emergency-managers/practitioners/recovery-resilience-resource-library

Plan Integration, Mitigation Actions

- **Implement, Integrate and Maintain Mitigation Planning Activities:** Mitigation is most effective when it is part of other community planning processes, regulations, and policies. The publications included will help communities integrate principles of hazard mitigation with planning efforts.

https://www.fema.gov/emergency-managers/risk-management/hazard-mitigation-planning/implementing

- **Mitigation Assistance Programs:** Currently, FEMA administers three primary programs that provide funding for eligible mitigation projects that reduces disaster losses and protect life and property from future disaster damages. The three programs are the Hazard Mitigation Grant Program (HMGP), the Flood Mitigation Assistance (FMA) Program, and the Building Resilient Infrastructure and Communities (BRIC). More funding resources are on the following page.

https://www.fema.gov/grants/mitigation

- **Integrating Mitigation Strategies with Local Planning**: Provides practical guidance on how to incorporate risk reduction strategies into existing local plans, policies, codes, and programs that guide community development or redevelopment patterns.

https://www.fema.gov/emergency-managers/national-preparedness/frameworks/community-recovery-management-toolkit/recovery-planning/integrating-mitigation/case-studies-tools-community

- **Integrating Mitigation Strategies with Local Planning:** This resource provides practical guidance on how to incorporate risk reduction strategies into existing local plans, policies, codes, and programs that guide community development or redevelopment patterns.

https://www.fema.gov/media-collection/integrating-hazard-mitigation-local-planning-case-studies-and-tools-community

- **Mitigation Ideas:** Communities can use this resource to identify and evaluate a range of potential mitigation actions for reducing risk to natural hazards and disasters.

https://www.fema.gov/sites/default/files/2020-06/fema-mitigation-ideas_02-13-2013.pdf

- **American Planning Association (APA), Post Disaster Recovery Resources:** An APA collection of resources, documents, and briefing papers related to post disaster recovery and public engagement. https://www.planning.org/resources/disaster/

Risk Assessment, Hazard Specific Analyses

- **The Southern Wildfire Risk Assessment Portal (SouthWRAP):** A risk information portal maintained by the Southern Group of State Foresters that provides maps of fire intensity scales that meet extent and location planning requirements. Site also includes Wildland Urban Interface (WUI) maps and other tools to discuss risk at the county level. While this is a commonly used, high-quality resource, local firefighters should verify the data. Request access to the free 'Professional Viewer' to see dedicated fire risk graphics/maps such as WUI interface, burn probability, fire intensity, and more.

www.southernwildfirerisk.com

- **Building Wildfire Resilience: A Land Use Toolbox for County Leaders (National Association of Counties, NACo):** Targeting county leaders, resources provides simplified guidance around wildland fire strategy, examples of local fire mitigation efforts, and extensive integration opportunities with other community documents.

Building Wildfire Resilience: A Land Use Toolbox for County Leaders (naco.org)

- **Profiling Difficult Hazards (Flooding, Drought, Wildfire) + Vulnerability and Multi-Jurisdiction Requirements Job Aids:** Region 4 Planning Team produced job aids with examples, clarifying details, and suggestions for addressing the most missed elements of the current guidance. Hazards of flooding, drought, and wildfire are specifically profiled. These job aids are not online, but can be requested through the State Planning Coordinator as well as the FEMA Planning Team via email: FEMA-r4-mitplanning@fema.dhs.gov

Funding Sources, Guidance

- **Federal Emergency Management Agency:**
  - **Mitigation Planning and Grants Overview:** Main landing page with requirements and information around the primary FEMA grant programs surrounding hazard mitigation planning.

    https://www.fema.gov/emergency-managers/risk-management/hazard-mitigation-planning/requirements
  - **Building Resilient Infrastructure and Communities (BRIC):** Support states, local communities, tribes and/or territories as they undertake hazard mitigation projects, reducing the risks they face from disasters and natural hazards.

    https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities
  - **Pre-Disaster Mitigation Program (PDM):** Provides funds for hazard mitigation planning and the implementation of mitigation projects prior to a disaster event.

    https://www.fema.gov/grants/mitigation/pre-disaster
  - **Flood Mitigation Assistance (FMA):** Provides funds for projects to reduce or eliminate risk of flood damage to buildings that are insured under the National Flood Insurance Program (NFIP) on an annual basis.

    https://www.fema.gov/grants/mitigation/floods

- **Environmental Protection Agency, Department of Agriculture, and Other Federal Sources:**
  - **(EPA) Wetland Program Development Grants:** The EPA makes available funds for water management and wetlands protection programs that help mitigate against future costs associated with hazard damage. Provides funds for projects to reduce or eliminate risk of flood damage to buildings that are insured under the National Flood Insurance Program (NFIP) on an annual basis

    https://www.epa.gov/wetlands/wetland-program-development-grants-and-epa-wetlands-grant-coordinators

- **(EPA) Water Infrastructure and Resiliency Finance Center:** The Water Finance Center provides financing information to help local decision makers make informed decisions for drinking water, wastewater, and stormwater infrastructure to protect human health and the environment https://www.epa.gov/waterfinancecenter
- **National Oceanic and Atmosphere Administration (NOAA) Funding Opportunities:** NOAA offers major source for mitigation funding related to coastal zone management and other coastal protection projects.

https://coast.noaa.gov/funding/

- **Natural Resource Conservation Service (USDA) Financial Assistance:** NRCS offers voluntary programs to eligible landowners and agricultural producers to provide financial and technical assistance to help manage natural resources in a sustainable manner.

https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/

- **U.S. Department of Agriculture (USDA) Forest Service National Fire Plan:** Funding for organizing, training, and equipping fire districts through volunteer, state and rural fire assistance programs. Technical assistance for fire related mitigation.

http://www.forestsandrangelands.gov/

- **Natural Resources Conservation Service Watershed Protection and Flood Prevention (USDA):** Information and funds for landscape planning, soil conservation; flood prevention; conservation, development, utilization and disposal of water; and conservation and proper utilization of land.

http://www.nrcs.usda.gov/programs/watershed/index.html

- **Firewise Communities Program:** Effort to involve homeowners, community leaders, planners, developers, and others in the effort to protect people, property, and natural resources from the risk of wildland fire before a fire starts.

http://www.firewise.org

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												
#	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 Require-ments
1	**Cherokee County**	**County**					Y	Y	Y	Y	Y	
2	Andrews	Town					Y	Y	Y	Y	Y	
3	Murphy	Town					Y	Y	Y	Y	Y	
4	**Graham County**	**County**					Y	Y	Y	Y	Y	
5	Fontana Dam	Town					Y	Y	Y	Y	Y	
6	Lake Santeetlah	Town					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 Require-ments
7	Robbinsville	Town					Y	Y	Y	Y	Y	
8	**Swain County**	**County**					Y	Y	Y	Y	**Y**	
9	Bryson City	Town					Y	Y	Y	Y	**Y**	
10	**Haywood County**	**County**					Y	Y	Y	Y	**Y**	
11	Canton	Town					Y	Y	Y	Y	**Y**	
12	Clyde	Town					Y	Y	Y	Y	**Y**	
13	Maggie Valley	Town					Y	Y	Y	Y	**Y**	
14	Waynesville	Town					Y	Y	Y	Y	**Y**	
15	**Jackson County**	**County**					Y	Y	Y	Y	Y	
16	Dillsboro	Town					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 Require-ments
17	Forest Hills	Village					Y	Y	Y	Y	Y	
18	Sylva	Town					Y	Y	Y	Y	Y	
19	Webster	Town					Y	Y	Y	Y	Y	
20	Eastern Band of Cherokee Indians	Tribe					Y	Y	Y	Y	Y	
21												
22												
23												
24												
25												
26												

TRIBAL MITIGATION PLAN REVIEW TOOL

The *Tribal Mitigation Plan Review Tool* records how the tribal mitigation plan meets the regulations in 44 CFR §§ 201.7 and 201.5 (if applicable) and offers FEMA plan reviewers an opportunity to provide feedback to the tribal government.

- **Section 1**: The Regulation Checklist documents FEMA's evaluation of whether the plan has addressed all requirements. If plan requirements are not met, FEMA uses each Required Revisions section to indicate necessary changes.
- **Section 2**: The Strengths and Opportunities for Improvement summary identifies plan's strengths as well as areas for improvement as part of the next plan update.

The FEMA mitigation planner must reference the *Tribal Mitigation Plan Review Guide* when completing the Tribal Mitigation Plan Review Tool.

<table>
<tr><td>Tribal Jurisdiction:
Eastern Band of Cherokee Indians</td><td colspan="2">Title of Plan:
Smoky Mountain Regional Hazard Mitigation Plan</td><td>Date of Plan:
July 2022</td></tr>
<tr><td colspan="2">Tribal Point of Contact:
Nathan Slaughter</td><td colspan="2" rowspan="3">Address:
2200 Gateway Centre Blvd, Suite 216
Morrisville, NC 27560</td></tr>
<tr><td colspan="2">Title:
Hazard Mitigation Department Manager</td></tr>
<tr><td colspan="2">Agency:
ESP Associates, Inc</td></tr>
<tr><td colspan="2">Phone Number:
919-244-9536</td><td colspan="2">Email:
nslaughter@espassociates.com</td></tr>
</table>

State Reviewer (if applicable):	**Title:**	**Date:**
Carl Baker	Hazard Mitigation Planner	July 8, 2022 July 25, 2022

FEMA Reviewer:	**Title:**	**Date:**
Edwardine S. Marrone	NC-FIT-Mitigation Planner	August 17, 2022
Date Received in FEMA Region 4	July 27, 2022	
Plan Not Approved		
Plan Approvable Pending Adoption		
Plan Approved		

✓ Denotes FEMA Reviewer concurs with State Reviewers notations.

Section 1: REGULATION CHECKLIST

1. **Standard Regulation Checklist** **Regulation** (44 CFR § 201.7 Tribal 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? [44 CFR § 201.7(c)(1)]	Section 2 P 1:1, 1:4, 2:2	X	
A2. Does the plan document an opportunity for public comment during the drafting stage and prior to plan approval, including a description of how the tribal government defined "public"? [44 CFR § 201.7(c)(1)(i)]	Section 2, Appendix D P 2:10-14	X	
A3. Does the plan document, as appropriate, an opportunity for neighboring communities, tribal 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? [44 CFR § 201.7(c)(1)(ii)]	Section 2.7, Appendix D P 2:14	X	
A4. Does the plan describe the review and incorporation of existing plans, studies, and reports? [44 CFR § 201.7(c)(1)(iii)]	Section 7 ✓ P 2:3, Appendix D	X	
A5. Does the plan include a discussion on how the planning process was integrated to the extent possible with other ongoing tribal planning efforts as well as other FEMA programs and initiatives? [44 CFR § 201.7(c)(1)(iv)]	Section 10 ✓ P 10:2	X	
A6. Does the plan include a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within the plan update cycle)? [44 CFR § 201.7(c)(4)(i)]	Section 10 ✓ P 10:3	X	
A7. Does the plan include a discussion of how the tribal government will continue public participation in the plan maintenance process? [44 CFR § 201.7(c)(4)(iv)]	Section 10 ✓ P 10:5	X	

ELEMENT A: REQUIRED REVISIONS

NCEM 1st Review:
A1: Page 2:6, Table 2.3, does not list the position for Joshua Turner.
ESP Response: Added needed detail.
A2: No revision required.
A3: No revision required.
A4: No revision required.
A5: No revision required.
A6: No revision required.
A7: No revision required.

NCEM 2nd Review:
No revisions required.

A2 (missing the "public" definition. Emailed Carl B, he responded will look into & have ESP provide should it be missing.

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 the tribal planning area? [44 CFR § 201.7(c)(2)(i)]	Section 4 and 5 Also Appendix F and Appendix G P 3:3, P 4:5-4:15, 5:4, 7-11, 19-30, 33-35, 38, 40, 42, 47-48, 53-63, App G	X	
B2. Does the plan include information on previous occurrences of hazard events and on the probability of future hazard events for the tribal planning area? [44 CFR § 201.7(c)(2)(i)]	Section 5 P **3:**30-24, **5:**7-14, 20-30, 32, 34-36-37, 41-46, 51-52, 54-58, 60-64, **6:**6-30, 41-63, App G	X	

1. **Standard Regulation Checklist** **Regulation** (44 CFR § 201.7 Tribal Mitigation Plans)	**Location in Plan** (section and/or page number)	**Met**	**Not Met**
B3. Does the plan include a description of each identified hazard's impact as well as an overall summary of the vulnerability of the tribal planning area? [44 CFR § 201.7(c)(2)(ii)]	Section 5 Section 6 (Vulnerability Assessment) ✓ P **3:**30-34, **5:**7, 12-14, 20-30, 32, 45-46, 51, 60-63, 88-89, **6:**6-33, 41-61, App G	X	

ELEMENT B: REQUIRED REVISIONS

NCEM 1st Review:

B1: Area designated as the Eastern Band of Cherokee Indians (EBCI) on Figure 3.1 is not demonstrated on the wildfire and flood hazard maps in Appendix F and Appendix G.

ESP Response: Maps revised to add EBCI lands.

B2: No revision required.

B3: The following natural hazards were not addressed in Section 6, Vulnerability Assessment: Drought, and Severe Winter Weather. As well the other/technological hazards were not addressed in Section 6. The impact and vulnerability should be addressed for all identified hazards.

ESP Response: Page 6.11 states "All other hazards are assumed to impact the entire planning region (drought, excessive heat, hailstorm, lightning, and severe winter weather) or, due to lack of data, analysis would not lead to credible results (sinkholes, erosion, dam failure, infectious disease, terrorism, cyber, EMP)." Page 6.41 states "As noted previously, all existing and future buildings and populations (including critical facilities) are vulnerable to natural hazards including drought, hurricane and coastal hazards, tornadoes/ thunderstorms, and severe winter weather. Some buildings may be more vulnerable to these hazards based on locations, construction, and building type." Table 6.24 indicates the critical facilities that are vulnerable to Drought and Severe Winter Weather.

NCEM 2nd Review:

No revisions required.

ELEMENT C. MITIGATION STRATEGY			
C1. Does the plan include a discussion of the tribal government's pre- and post-disaster hazard management policies, programs, and capabilities to mitigate the hazards in the area, including an evaluation of tribal laws and regulations related to hazard mitigation as well as to development in hazard-prone areas? [44 CFR §§ 201.7(c)(3) and 201.7(c)(3)(iv)]	Section 7 ✓ P 10:2	X	
C2. Does the plan include a discussion of tribal funding sources for hazard mitigation projects and identify current and potential sources of Federal, tribal, or private funding to implement mitigation activities? [44 CFR §§ 201.7(c)(3)(iv) and 201.7(c)(3)(v)]	Section 8 ✓ P 8:6, 9:68-87	X	
C3. Does the Mitigation Strategy include goals to reduce or avoid long-term vulnerabilities to the identified hazards? [44 CFR § 201.7(c)(3)(i)]	Section 8 ✓ P 8:3	X	
C4. Does the plan identify and analyze a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with emphasis on new and existing buildings and infrastructure? [44 CFR § 201.7(c)(3)(ii)]	Section 9 ✓ P 9:68-87	X	

C5. Does the plan contain an action plan that describes how the actions identified will be prioritized, implemented, and administered by the tribal government? [44 CFR § 201.7(c)(3)(iii)]	Section 8 and 9 ✓ P 8:2-3	X	
C6. Does the plan describe a process by which the tribal government will incorporate the requirements of the mitigation plan into other planning mechanisms, when appropriate? [44 CFR § 201.7(c)(4)(iii)]	Section 10 P 10:2	X	
C7. Does the plan describe a system for reviewing progress on achieving goals as well as activities and projects identified in the mitigation strategy, including monitoring implementation of mitigation measures and project closeouts? [44 CFR §§ 201.7(c)(4)(ii) and 201.7(c)(4)(v)]	Section 10 P 10:1-2	X	

1. Standard Regulation Checklist **Regulation** (44 CFR § 201.7 Tribal Mitigation Plans)	Location in Plan (section and/or page number)	Met	Not Met
ELEMENT C: REQUIRED REVISIONS NCEM 1st Review: C1: No revision required. C2: The FEMA Community Status Book lists Graham County and the towns of Lake Santeetlah and Robbinsville as participating in the NFIP. Table 7.1 indicates that none of the jurisdictions in and including Graham County participate in the NFIP. This also conflicts with Table 7.2. ESP Response: Corrected Table 7.1. C3: No revision required. C4: Change Hazard(s) Addressed throughout Section 9 to match identified hazards in Section 5 (e.g. Geological instead of landslide, and flooding versus flood). ESP Response: Done for all hazards EBCI, ES-5, page 9:83 The category "Emergency Services" can be in the plan but does not count as a mitigation action. Recommend revising the category to "Property Protection (PP)" so the action will count as an "All Hazard" action. Action description: "Install generator or generator hook-ups for critical facilities as budget and need arise." ESP Response: Done EBCI, P-23 lists Wind as the hazard addressed. This is not an identified hazard in Section 5. ESP Response: Corrected EBCI, P-24 and P-26 list Manmade as the hazard addressed. This is not an identified hazard in Section 5. While culturally sensitive information is recognized, suggest changing the hazard(s) addressed. ESP Response: Corrected C5: No revision required. C6: No revision required. C7: No revision required. NCEM 2nd Review: No revisions required.			
ELEMENT D. PLAN UPDATES			
D1. Was the plan revised to reflect changes in development? [44 CFR § 201.7(d)(3)]	Section 3.3.3 and 6.4.3 ✓	X	
D2. Was the plan revised to reflect progress in tribal mitigation efforts? [44 CFR §§ 201.7(d)(3) and 201.7(c)(4)(iii)]	Section 9, Appendix E ✓	X	
D3. Was the plan revised to reflect changes in priorities? [44 CFR § 201.7(d)(3)]	Section 8.5 ✓ Section 8.1, P 4:5-15	X	
ELEMENT D: REQUIRED REVISIONS NCEM 1st Review: D1: No revision required. D2: No revision required. D3: No revision required. NCEM 2nd Review: No revisions required.			

ELEMENT E. ASSURANCES AND PLAN ADOPTION			
E1. Does the plan include assurances that the tribal government will comply with all applicable Federal statutes and regulations in effect with respect to the periods for which it receives grant funding, including 2 CFR Parts 200 and 3002, and will amend its plan whenever necessary to reflect changes in tribal or Federal laws and statutes? [44 CFR § 201.7(c)(6)]	Section 10		X
E2. Does the plan include documentation that it has been formally adopted by the governing body of the tribal government requesting approval? [44 CFR § 201.7(c)(5)]	Pending		X

ELEMENT E: REQUIRED REVISIONS

NCEM 1st Review:
E1: No revision required.
E2: No revision required.

NCEM 2nd Review:
No revisions required.

FEMA REQUIRED REVISIONS:

Adoption documentation has not been provided by EBCI. See Smoky Mountain RHMP NC PRT 08-17-22 ESM for additional notations.

E2: Each jurisdiction that is included in the plan must have its governing body adopt the plan prior to FEMA approval, even when a regional agency has the authority to prepare such plans. At least one participating jurisdiction must formally adopt the plan within one calendar year of FEMA's designation of the plan as "Approvable Pending Adoption."

FEMA recommends that all participating jurisdictions coordinate the adoption process as soon as the plan has received APA status to ensure that all participants are covered by a plan for the full five years.

For additional information, please see Element E, Plan Adoption, in the "Local Mitigation Plan Review Guide", October 1, 2011, Pages 28-29 and Task 8 of the Local Mitigation Planning Handbook, March 2013.

2. Enhanced Regulation Checklist **Regulation** (44 CFR § 201.5 Enhanced Tribal Mitigation Plans)	**Location in Plan (section and/or page number)**	**Met**	**Not Met**
ENHANCED ELEMENT F. STANDARD PLAN REQUIREMENTS			
F1. Does the enhanced plan include all elements of the standard tribal mitigation plan? [44 CFR §§ 201.3(e)(3), 201.5(b), and 201.7]			
ENHANCED ELEMENT F: REQUIRED REVISIONS			
ENHANCED ELEMENT G. INTEGRATED PLANNING			
G1. Does the enhanced plan demonstrate integration to the extent practicable with other tribal and/or regional planning initiatives and FEMA mitigation programs and initiatives? [44 CFR §§ 201.3(e)(3) and 201.5(b)(1)]			
ENHANCED ELEMENT G: REQUIRED REVISIONS			
ENHANCED ELEMENT H. TRIBAL MITIGATION CAPABILITIES			
H1. Does the tribal government demonstrate commitment to a comprehensive mitigation program? [44 CFR §§ 201.3(e)(3) and 201.5(b)(4)]			
H2. Does the enhanced plan document capability to implement mitigation actions? [44 CFR §§ 201.3(e)(3), 201.5(b)(2)(i), 201.5(b)(2)(ii), and 201.5(b)(2)(iv)]			
H3. Is the tribal government using existing mitigation programs to achieve mitigation goals? [44 CFR §§ 201.3(e)(3), 201.5(a) and 201.5(b)(3)]			
ENHANCED ELEMENT H: REQUIRED REVISIONS			

2. Enhanced Regulation Checklist **Regulation** (44 CFR § 201.5 Enhanced Tribal Mitigation Plans)	**Location in Plan (section and/or page number)**	**Met**	**Not Met**
ENHANCED ELEMENT I. HMA GRANTS MANAGEMENT PERFORMANCE			
I1. With regard to HMA, is the tribal government maintaining the capability to meet application timeframes and submitting complete project applications? [44 CFR §§ 201.3(e)(3), 201.5(b)(2)(iii)(A)]			
I2. With regard to HMA, is the tribal government maintaining the capability to prepare and submit accurate environmental reviews and benefit-cost analyses? [44 CFR §§ 201.3(e)(3) and 201.5(b)(2)(iii)(B)]			
I3. With regard to HMA, is the tribal government maintaining the capability to submit complete and accurate quarterly progress and financial reports on time? [44 CFR §§ 201.3(e)(3) and 201.5(b)(2)(iii)(C)]			
I4. With regard to HMA, is the tribal government maintaining the capability to complete HMA projects within established performance periods, including financial reconciliation? [44 CFR §§ 201.3(e)(3) and 201.5(b)(2)(iii)(D)]			
ENHANCED ELEMENT I: REQUIRED REVISIONS			

Section 2: STRENGTHS AND OPPORTUNITIES FOR IMPROVEMENT

INSTRUCTIONS: The purpose of the ***Strengths and Opportunities for Improvement*** section is for FEMA to provide more comprehensive feedback on the tribal mitigation plan to help the tribal government advance mitigation planning. The intended audience is the tribal staff responsible for the mitigation plan update. FEMA will address the following topics:

1. Plan strengths, including specific sections in the plan that are above and beyond the minimum requirements; and
2. Suggestions for future improvements.

FEMA will provide feedback and include examples of best practices, when possible, as part of the *Tribal Mitigation Plan Review Tool,* or, if necessary, as a separate document. The tribal mitigation plan elements are included below in italics for reference. FEMA is not required to provide feedback for each element.

Required revisions from the **Regulation Checklist** are not documented in the **Strengths and Opportunities for Improvement** section. Results from the **Strengths and Opportunities for Improvement** section are not required for Plan Approval.

Describe the mitigation plan strengths areas for future improvements, including areas that may exceed minimum requirements.

- Planning process
- *Hazard identification and risk assessment*
- *Mitigation strategy (including Mitigation Capabilities)*
- *Plan updates*
- *Adoption and assurances*
- *Enhanced Plan - Integrated planning*
- *Enhanced Plan - Tribal government mitigation capabilities (commitment to a comprehensive mitigation program)*
- *Enhanced Plan - HMA grants management performance*

It is important to note that NCEI records do not provide previous event information for EBCI lands. However, each hazard profile in Section 5 attempts to document hazard events that have occurred on Tribal lands where feasible.

Appendix D

Planning Process Documentation

1. Meeting Presentations
2. Meeting Attendance Logs
3. Public Survey Summary Results
4. Notification of Neighboring Jurisdictions

SMOKY MOUNTAINS REGIONAL HAZARD MITIGATION PLAN KICKOFF MEETING



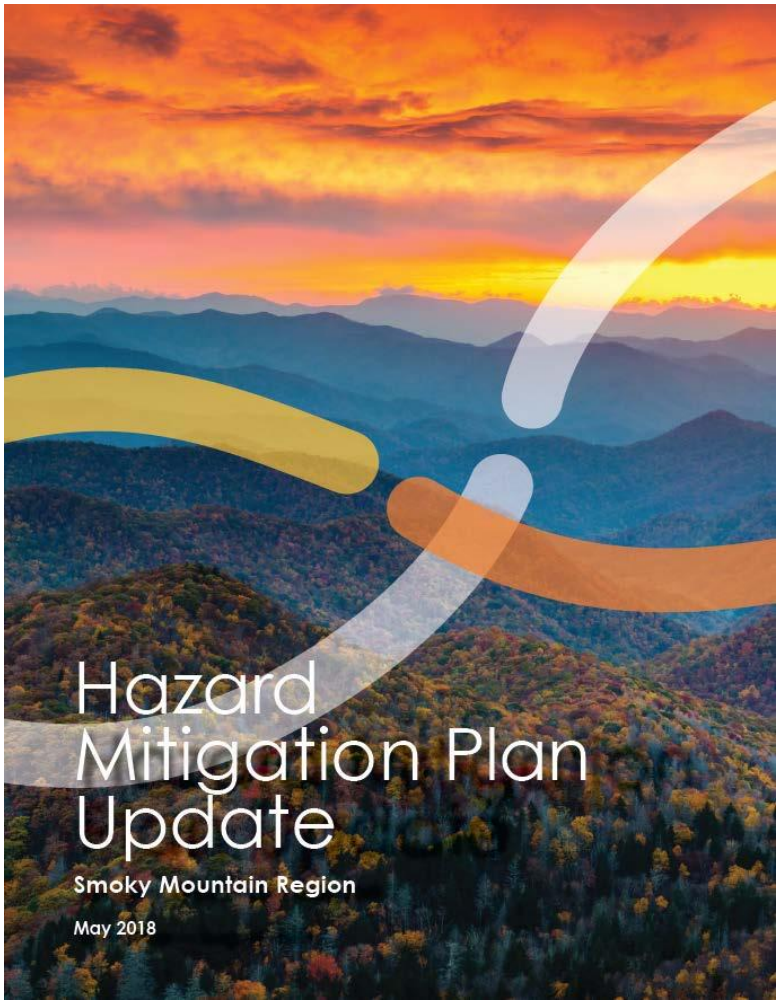






AGENDA

- Introductions
- Mitigation Refresher
- Project Overview
  - Key Objectives
  - Project Tasks
  - Project Schedule
  - Project Staffing
- Roles & Responsibilities
- Next Steps
- Questions, Issues or Concerns



INTRODUCTIONS

- ESP Associates
  - Nathan Slaughter, AICP, CFM – Project Manager
  - Andrew Olive – Lead Planner
- County/EBCI Leads
- Municipalities
- Stakeholders
- NCEM

PROJECT INFORMATION

- Funded with a Federal HMGP Grant (Hurricane Matthew)
- NCEM is managing the grant – providing contractor support
- No local match requirement (State is covering)

WHAT IS MITIGATION?



"mit-i-gate"

1: to cause to become less harsh or hostile.

2: to make less severe or painful.

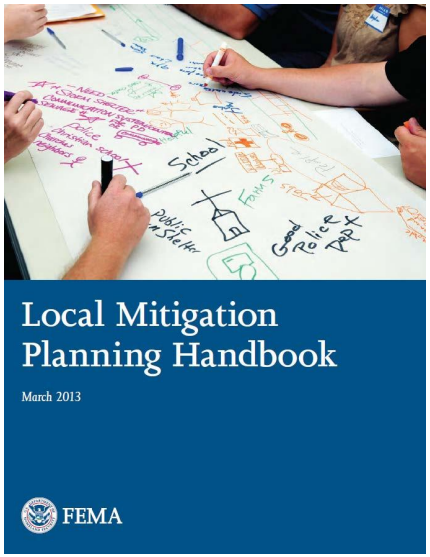


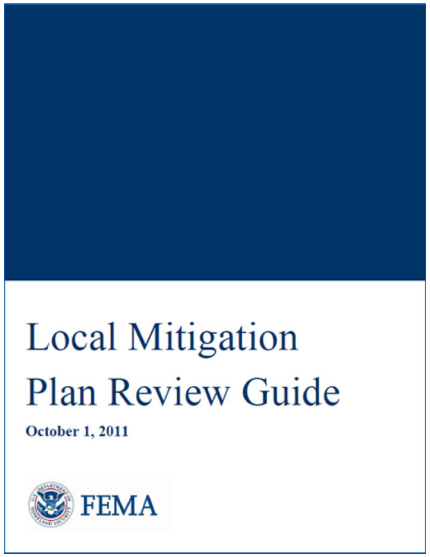
Hazard Mitigation

Any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards.

DISASTER MITIGATION ACT OF 2000

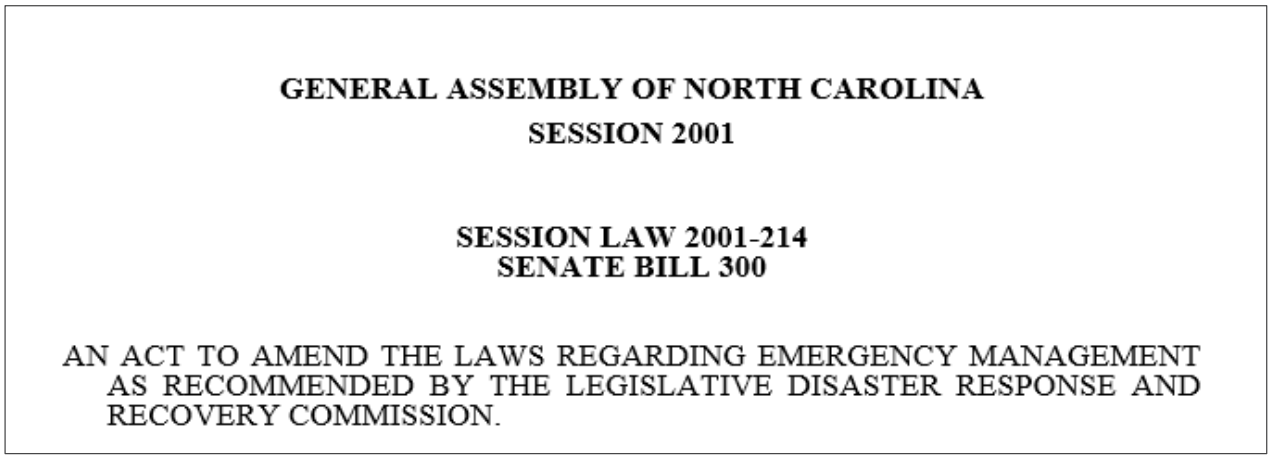
- Revitalized Federal Planning Requirements
  - State and Local Hazard Mitigation Plans
- Federal Grant Funding Eligibility
  - Hazard Mitigation Grant Program (HMGP)
  - Building Resilient Infrastructure and Communities (BRIC)
  - Flood Mitigation Assistance (FMA)
- DMA 2000 is intended to facilitate cooperation between state and local authorities on risk reduction measures and expedite funding allocation





NC SENATE BILL 300

- Passed in June of 2001, amends the North Carolina Emergency Management Act (166A)
  - Requires local hazard mitigation plans in order to maintain eligibility for Public Assistance (PA) for state-declared disasters



GENERAL ASSEMBLY OF NORTH CAROLINA
SESSION 2001

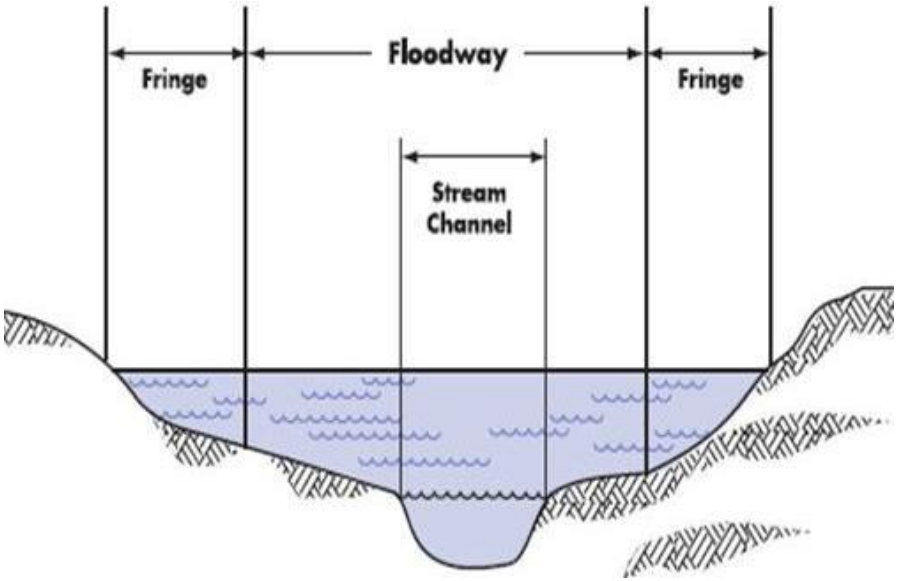
SESSION LAW 2001-214
SENATE BILL 300

AN ACT TO AMEND THE LAWS REGARDING EMERGENCY MANAGEMENT AS RECOMMENDED BY THE LEGISLATIVE DISASTER RESPONSE AND RECOVERY COMMISSION.

THINK OF MITIGATION IN THIS WAY…

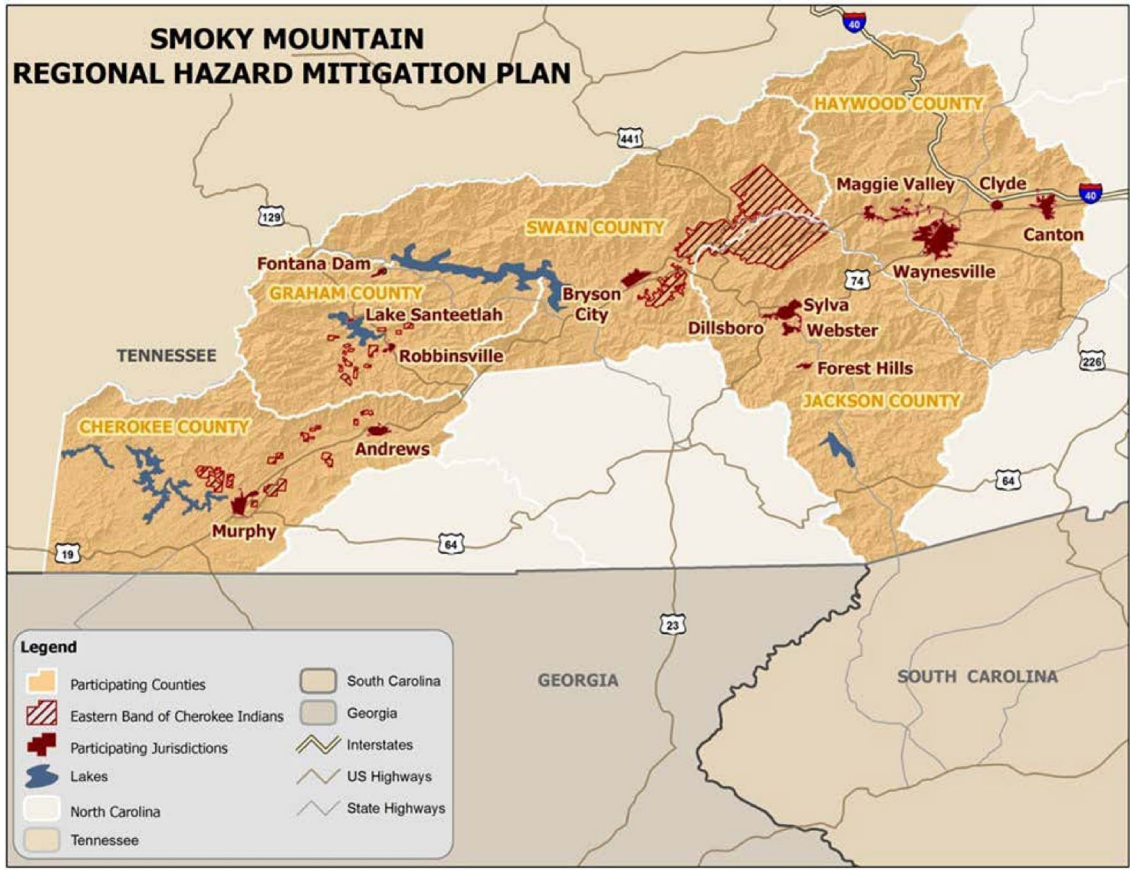
1) We want to mitigate hazard impacts on the existing development in our communities
   - Houses, businesses, infrastructure, critical facilities, etc.
2) We want to ensure that future development is conducted in a way that doesn't increase our vulnerability
   - Best done by having good plans, policies and procedures in place





HAZARD MITIGATION TECHNIQUES

1) Prevention
2) Property Protection
3) Natural Resource Protection
4) Structural Projects
5) Emergency Services
6) Public Education and Awareness



Flood Hazard Areas in the Smoky Mountain NC Region
Source: Federal Emergency Management Agency

PREVENTION







Planning and Zoning

Building codes

Open space preservation

Floodplain regulations

Stormwater management regulations

Drainage system maintenance

Capital improvements programming

PROPERTY PROTECTION



Acquisition

Relocation

Building elevation



Critical facilities protection



Retrofitting

Safe rooms

Shatter-resistant glass

Insurance



NATURAL RESOURCE PROTECTION

Floodplain protection

Watershed management

Riparian buffers

Forest management

Erosion and sediment control

Wetland restoration

Habitat preservation









STRUCTURAL PROJECTS



Reservoirs

Dams, levees

Floodwalls

Stormwater diversions



Detention/retention basins



Channel modification



Storm sewers

EMERGENCY SERVICES

Warning systems

Emergency response equipment

Shelters

Evacuation planning

Emergency response training

Sandbagging

Temporary shutters







PUBLIC EDUCATION AND AWARENESS





- Outreach projects
- Speaker series
- Hazard map information
- Library materials
- School educational programs
- Hazard expositions
- Real estate disclosure
- Demonstration events







ICEBREAKER EXERCISE

Prevention	Property Protection	Natural Resource Protection	Structural Projects	Emergency Services	Public Education/ Awareness
Planning and zoning	Acquisition	Floodplain protection	Reservoirs	Warning systems	Outreach projects
Building codes	Relocation	Watershed management	Dams, levees, dikes	Emergency response equipment	Speaker series/ demonstration events
Open space preservation	Building elevation	Riparian buffers	Floodwalls	Shelter Operations	Hazard map information
Floodplain regulations	Critical facilities protection	Forest management	Stormwater diversions	Evacuation planning and management	Real estate disclosure
Stormwater management regulations	Retrofitting	Erosion and sediment control	Detention/ retention basins	Emergency response training and exercises	Library materials
Drainage system maintenance	Safe rooms, shutters, shatter-resistant glass	Wetland preservation and restoration	Channel modification	Sandbagging for flood protection	School children educational programs
Capital improvements programming	Insurance	Habitat preservation	Storm sewers	Temporary shutters	Hazard expositions
Setbacks					

KEY OBJECTIVES

- Coordinate between five counties and EBCI to update the regional plan
- Complete update of existing plan to demonstrate progress and reflect current conditions
- Current plan expires May 20, 2023
- Increase public awareness and education
- Maintain grant eligibility for participating jurisdictions
- Update plan in accordance with Community Rating System (CRS) requirements
  - Cherokee County
- Maintain compliance with State and Federal requirements

NEW ELEMENTS

- Will use NCEM's RMT - Hazard Mitigation Plan Tool
  - Website used to create, update, customize, and monitor plans
  - Promotes consistency throughout NC
- Update plan to include CRS 510 Compliance
  - Only for CRS Communities (Cherokee County)
- Risk Mapping, Assessment and Planning (Risk MAP)
  - Flood Risk Products and Tools
- Integrate Community Wildfire Protection Plans (CWPPs) elements
- Conduct Resilience Assessment
  - North Carolina Scorecard
- EMAP Compliant
  - Technological and Manmade Hazards

PROJECT EXPECTATIONS

- Any hazards on which you would like us to focus?
- Any areas of vulnerability on which to focus?
  - More of a focus on identification of problems and the specific solutions to those problems
- Anything else to highlight or consider?

RMT – NCEM'S HAZARD MITIGATION PLAN TOOL

RMT HMP: Create Hot Spot Map for River Flooding

Information | Basemaps | Legend

Potential Dollar Losses By Sector

To view hot spots:

- If applicable, select a return period
- Select a sector
- Select county to display
- Click Show Results

Find address or place

Choose Return Period

10 Year | 25 Year | 50 Year | 100 Year | 500 Year

Choose A Sector

All Damages

Select County

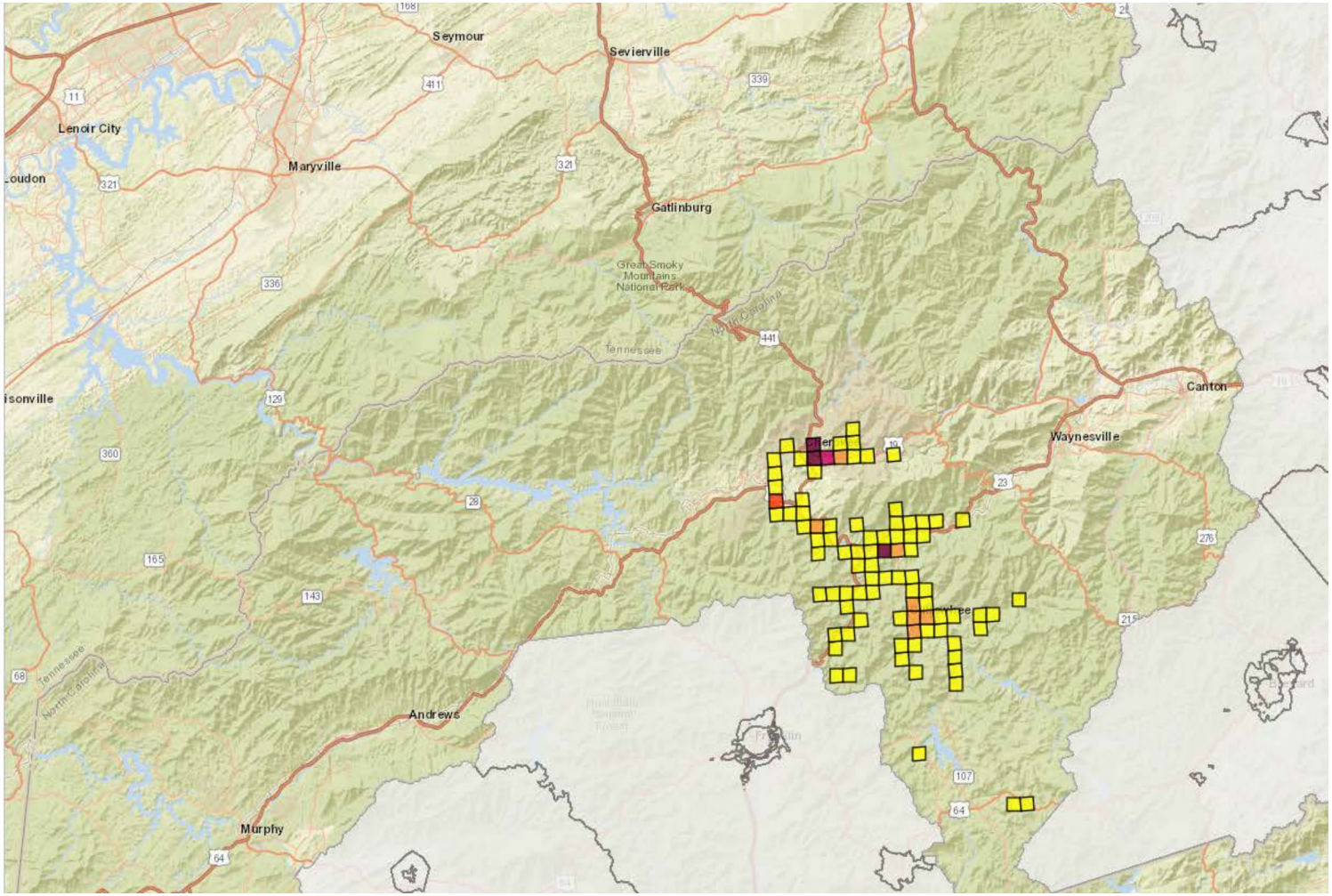
Jackson

Show Results

At Risk Properties

Show 10 entries Search:

Building #	Replacement Value ($)	Damages ($)	Occupancy
			No



PARTICIPATING JURISDICTIONS

Cherokee County	• Town of Andrews • Town of Murphy
Graham County	• Town of Fontana • Town of Lake Santeetlah • Town of Robbinsville
Swain County	• Town of Bryson City
Haywood County	• Town of Canton • Town of Clyde • Town of Maggie Valley • Town of Waynesville
Jackson County	• Town of Dillsboro • Village of Forest Hills • Town of Sylva • Town of Webster
Eastern Band of Cherokee Indians	

PROJECT TASKS

1. Planning Process
2. Risk Assessment
3. Capability Assessment
4. Mitigation Strategy
5. Plan Maintenance
6. Documentation



PLANNING PROCESS

- Reconvene Hazard Mitigation Planning Team (HMPT)
- Widespread public participation and outreach to key stakeholders
- Data collection and analysis
- Plan preparation and submission

RISK ASSESSMENT

- Hazard Identification and Analysis
  - Detailed profiles for all hazards
    - Hazard description
    - Historical occurrences
    - Known hazard boundaries
  - Priority Risk Index (PRI)
- Vulnerability Assessment
  - Asset inventory (exposure)
  - Loss estimates
- Development Trends and Implications

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	

HAZARD IDENTIFICATION

State of North Carolina Hazard Mitigation Plan Hazards

Natural Hazards	Technological Hazards
Flooding	Hazardous Substances
Hurricanes and Coastal Hazards	— Hazardous Materials
Severe Winter Weather	— Hazardous Chemicals
Excessive Heat	— Oil Spill
Earthquakes	Radiological Emergency – Fixed Nuclear Facilities
Wildfires	Terrorism
Dam Failures	— Chemical
Drought	— Biological
Tornadoes/Thunderstorms	— Radiological
Geological	— Nuclear
— Landslides/Rock Fall	— Explosive
— Sinkholes	Cyber
Infectious Disease	Electromagnetic Pulse

HAZARD IDENTIFICATION

HIGH RISK	Severe Winter Weather Flood Tornadoes/Severe Thunderstorms Hurricane and Coastal Hazards
MODERATE RISK	Wildfires Earthquakes Infectious Disease Cyber Dam Failure Hazardous Substances Geological (Landslides)
LOW RISK	Terrorism Drought Electromagnetic Pulse Radiological Emergency – Fixed Nuclear Facilities

VULNERABILITY ASSESSMENT

- Where possible, identify types and numbers of assets at risk to hazards.
- Consider other types of vulnerability as well
  - Social, economic, environmental

- THINK – WHAT ARE OUR PROBLEMS/PROBLEM AREAS?

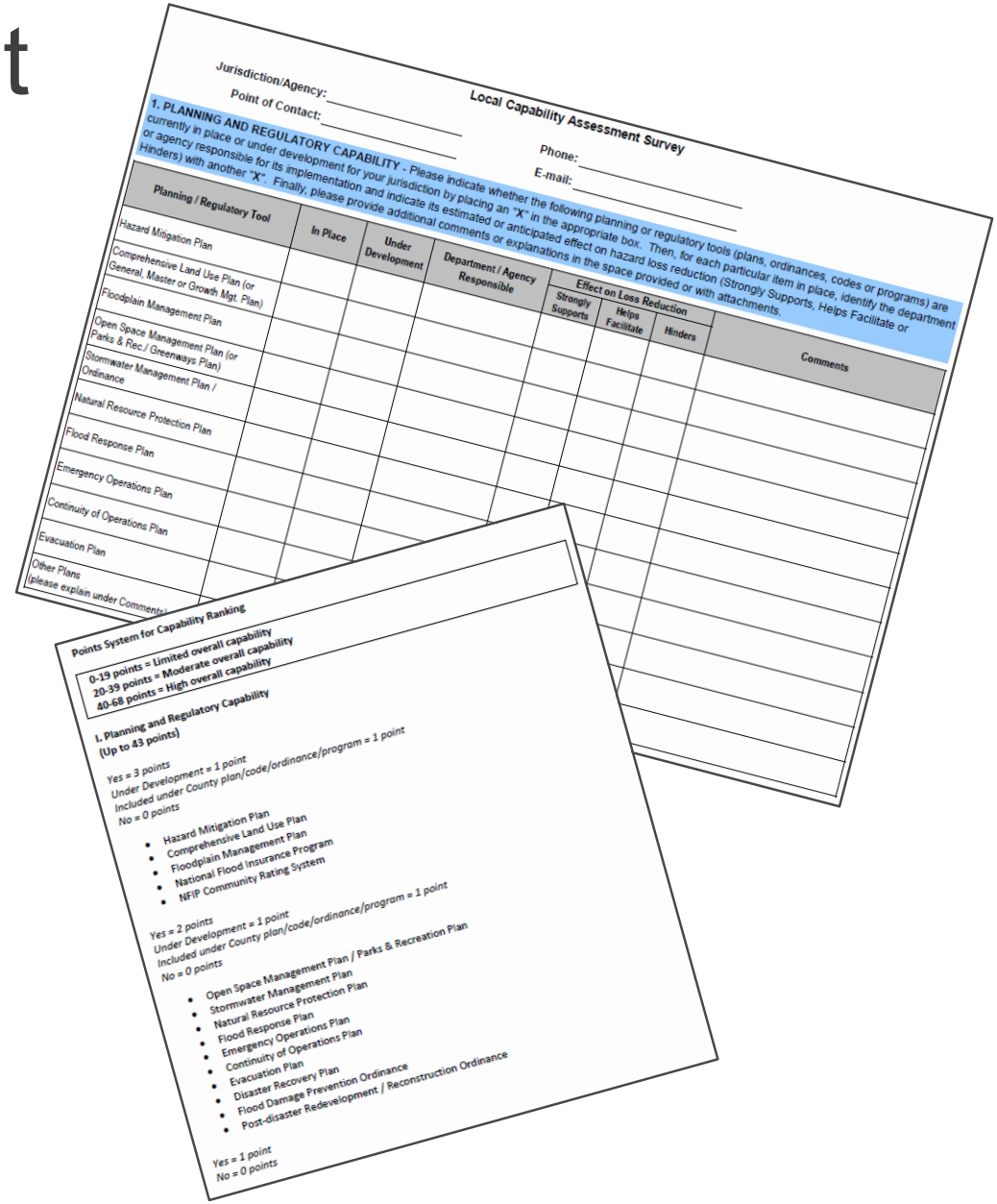
CAPABILITY ASSESSMENT

- Capability Assessment Survey
  - Measures existing capabilities
    - Planning and regulatory
    - Administrative and technical
    - Fiscal
    - Political

Plan Policy, Program or Ordinance	Percentage
Capital Improvements Plan	54%
Historic Preservation Plan	0%
Zoning Ordinance	97%
Subdivision Ordinance	89%
Flood Damage Prevention Ordinance	86%
Post-Disaster Redevelopment Plan	0%
Building Code	100%
Fire Code	100%

CAPABILITY ASSESSMENT

- Capability Assessment Survey
  - Measures existing capabilities
    - Planning and regulatory
    - Administrative and technical
    - Fiscal
    - Political



Local Capability Assessment Survey

Jurisdiction/Agency: _____

Point of Contact: _____

Phone: _____

E-mail: _____

1. PLANNING AND REGULATORY CAPABILITY - Please indicate whether the following planning or regulatory tools (plans, ordinances, codes or programs) are currently in place or under development for your jurisdiction by placing an "X" in the appropriate box. Then, for each particular item in place, identify the department or agency responsible for its implementation and indicate its estimated or anticipated effect on hazard loss reduction (Strongly Supports, Helps Facilitate or Hinders) with another "X". Finally, please provide additional comments or explanations in the space provided or with attachments.

Planning / Regulatory Tool	In Place	Under Development	Department / Agency Responsible	Effect on Loss Reduction			Comments
				Strongly Supports	Helps Facilitate	Hinders	
Hazard Mitigation Plan							
Comprehensive Land Use Plan (or General, Master or Growth Mgt. Plan)							
Floodplain Management Plan							
Open Space Management Plan (or Parks & Rec./ Greenways Plan)							
Stormwater Management Plan / Ordinance							
Natural Resource Protection Plan							
Flood Response Plan							
Emergency Operations Plan							
Continuity of Operations Plan							
Evacuation Plan							
Other Plans (please explain under Comments)							

Points System for Capability Ranking

0-19 points = Limited overall capability
20-39 points = Moderate overall capability
40-68 points = High overall capability

I. Planning and Regulatory Capability
(Up to 43 points)

Yes = 3 points
Under Development = 1 point
Included under County plan/code/ordinance/program = 1 point
No = 0 points

- Hazard Mitigation Plan
- Comprehensive Land Use Plan
- Floodplain Management Plan
- National Flood Insurance Program
- NFIP Community Rating System

Yes = 2 points
Under Development = 1 point
Included under County plan/code/ordinance/program = 1 point
No = 0 points

- Open Space Management Plan / Parks & Recreation Plan
- Stormwater Management Plan
- Natural Resource Protection Plan
- Flood Response Plan
- Emergency Operations Plan
- Continuity of Operations Plan
- Evacuation Plan
- Disaster Recovery Plan
- Flood Damage Prevention Ordinance
- Post-disaster Redevelopment / Reconstruction Ordinance

Yes = 1 point
No = 0 points

MITIGATION STRATEGY

- Mitigation Goals
  - Based upon findings of the risk and capability assessments
- Identification and analysis of mitigation measures
  - Prevention, property protection, natural resource protection, structural projects, emergency services, and public education and awareness

MITIGATION ACTION PLAN

EXAMPLE from Previous Update

Action #	Description	Hazard(s) Addressed	Priority	Lead Agency/ Responsibility	Potential Funding Source	Target Completion Date	Status
P-13	Comprehensive review of existing emergency response plans to continuously update and revise response plans.	All	Moderate	County Emergency Management	N/A	2018	In progress. Plan and advisory committee in development phase.

PLAN MAINTENANCE

- Monitoring and reporting
- Evaluating and updating
- Implementation mechanisms
- Continued public involvement



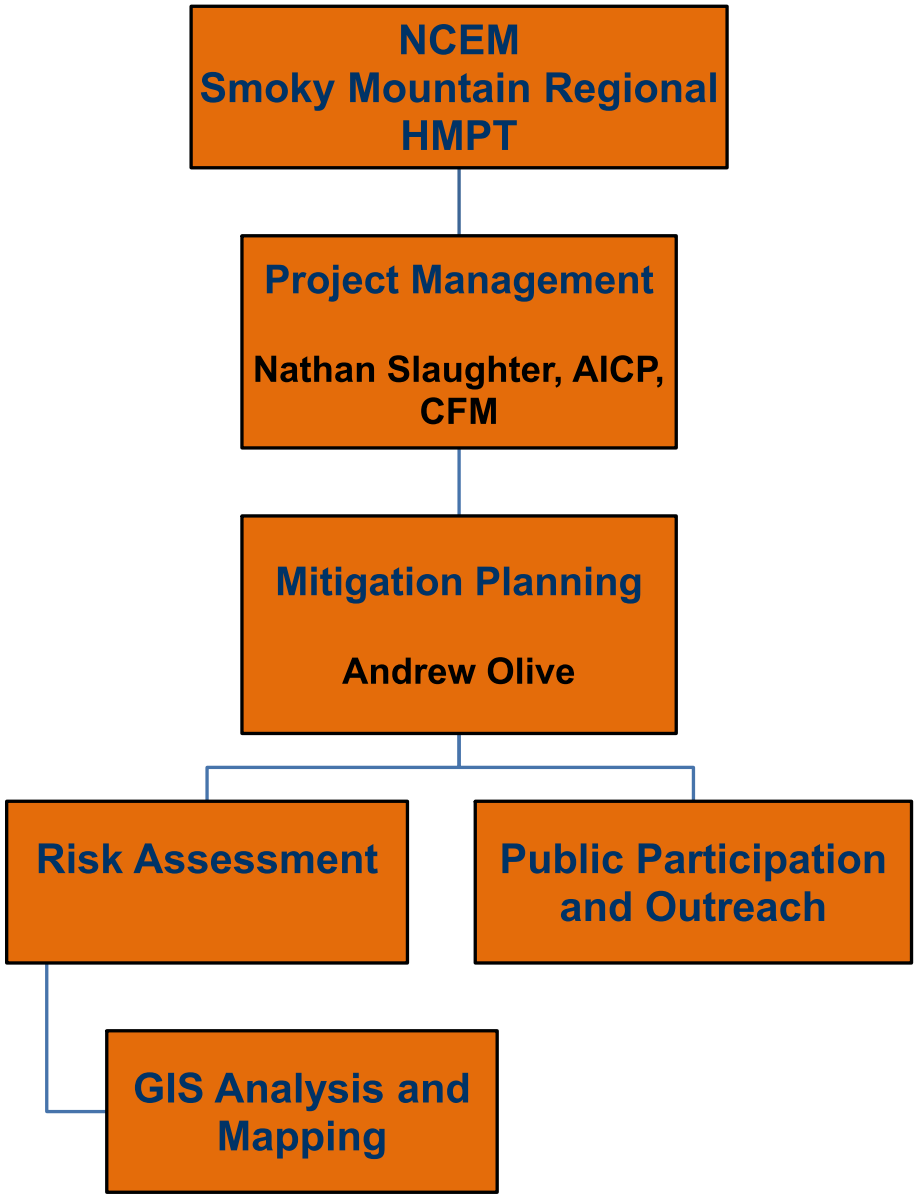
DOCUMENTATION

- Full description of planning process
  - Use of best available data
- Plan adoption
  - Local resolution required for final FEMA approval
- Local Mitigation Plan Review Tool "Crosswalk"

PROJECT SCHEDULE

Project Tasks	Month							
	OCT	NOV	DEC	JAN	FEB	MARCH	APRIL	MAY 2022-2023
Notice to Proceed	√							
Planning Process								
Risk Assessment								
Capability Assessment								
Mitigation Strategy								
Plan Maintenance Procedures								
Documentation								
Meetings	OCT	NOV	DEC	JAN	FEB	MARCH	APRIL	MAY 2022-2023
Kickoff Meeting	√							
Regional Hazard Mitigation Team Meetings	√			√				√
Open Public Meetings		√		√				√
Milestones	OCT	NOV	DEC	JAN	FEB	MARCH	APRIL	MAY 2022-2023
Submission of Draft Plan to Planning Team						√		
Submission of Draft Plan to NCEM/FEMA						√		
Completion of Final Plan/Conditional FEMA Approval								√
Local Adoption of Final Plan								√
Submission of Final Plan to NCEM/FEMA								√

PROJECT STAFFING



ROLES & RESPONSIBILITIES

ESP Associates, Inc.	County/EBCI Leads	Participating Jurisdictions
• Technical Assistance - Planning guidance - State and federal compliance • Data Collection & Analysis - Risk assessment - Capability assessment - Summarize results / report findings • Facilitate HMP meetings, workshops and open public meetings • Plan Preparation	• Active participation in planning process - Data collection and exchange - Public awareness and stakeholder involvement - Arrange and host HMP meetings - Mitigation strategy development - Plan review & feedback • Plan Adoption • Project management - Central point of contact - Communication and coordination with participating jurisdictions, NCEM and FEMA	• Active participation in planning process - Data collection and exchange - Public awareness and stakeholder involvement - Attend HMPT meetings -Mitigation strategy development - Plan review & feedback • Plan Adoption

PUBLIC SURVEY

- Used to collect input from citizens and other stakeholders that aren't able to actively participate in the planning process. The survey will be available in hard copy and online formats.

- Survey is live!

https://s.surveyplanet.com/sZ2l0JODT

- Please advertise on County and/or Municipal websites, Facebook, Twitter, etc so we can ensure good participation

NEXT STEPS

- Determine any additional members to participate on the Hazard Mitigation Planning Team
- Schedule Hazard Mitigation Planning Team meeting (Mitigation Strategy Workshop in early 2022)
- Initiate data collection efforts – We'll need GIS data (**critical facility locations, parcels, building footprints, townships**)
- Begin public outreach – for CRS we need to conduct public meeting within 60 days

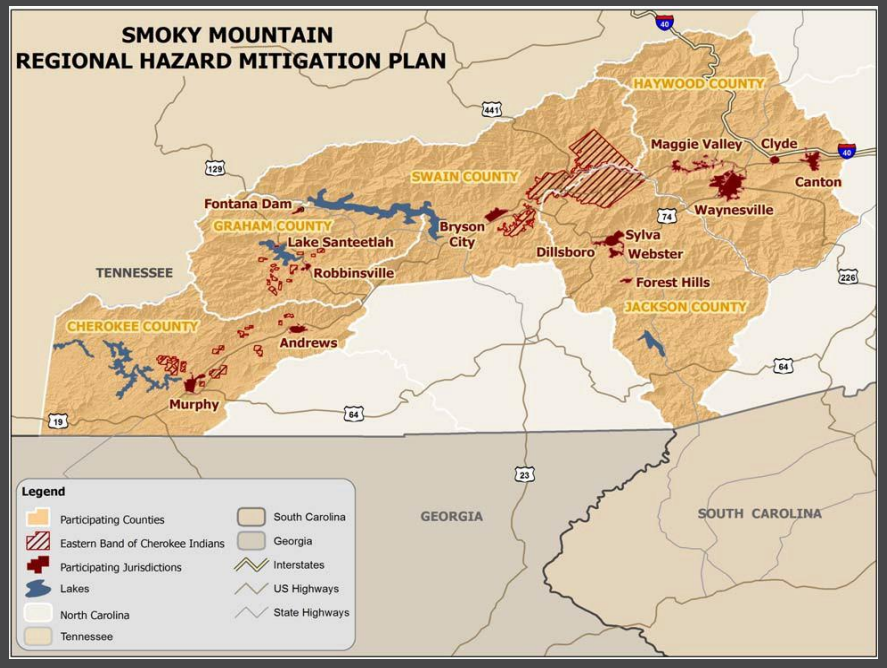
QUESTIONS, ISSUES OR CONCERNS

- Nathan Slaughter
  - (919) 415-2726
  - nslaughter@espassociates.com
- Andrew Olive
  - (919) 415-2757
  - aolive@espassociates.com

WELCOME

Smoky Mountain

Regional Hazard Mitigation Plan Update



ESP

Mitigation Strategy Meeting
March 24, 2022

AGENDA

I. Introductions – 15 minutes
II. Mitigation Recap – 10 minutes
III. Project Overview – 10 minutes
IV. Risk Assessment Findings – 25 minutes
V. Capability Assessment Findings – 15 minutes
VI. Mitigation Strategy – 20 minutes
VII. Summary of Public Survey – 10 minutes
VIII. Plan Maintenance – 5 minutes
IX. Next Steps – 10 minutes

INTRODUCTIONS

- **ESP Associates, Inc.**
- **County Staff**
- **EBCI**
- **Municipal Staff**
- **NCEM Staff**
- **Other Stakeholders**

MITIGATION REFRESHER

“mit-i-gate”

1: to cause to become less harsh or hostile.

2: to make less severe or painful.

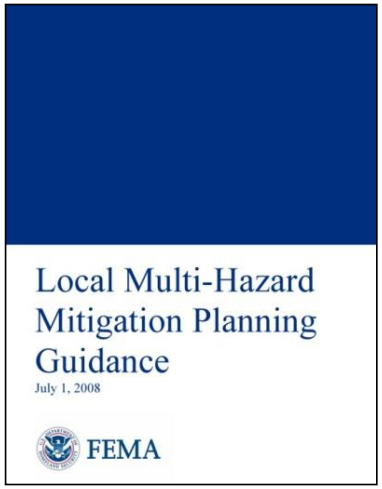
Hazard Mitigation

Any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards.

DISASTER MITIGATION ACT OF 2000

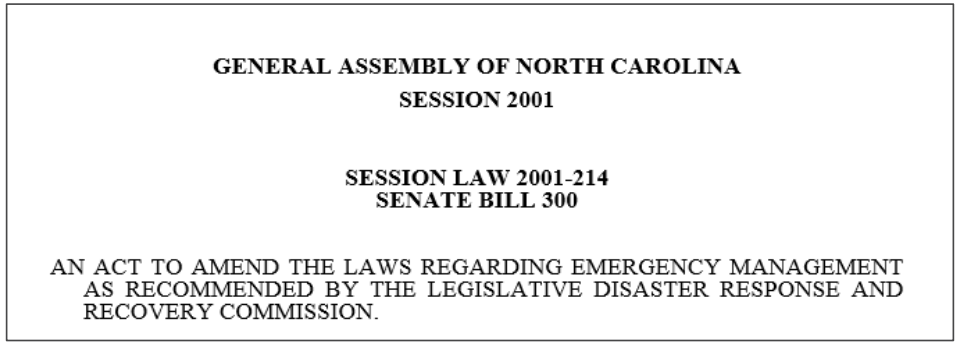
- Revitalized Federal Planning Requirements
  - State and Local Hazard Mitigation Plans
- Federal Grant Funding Eligibility
  - Hazard Mitigation Grant Program (HMGP)
  - Flood Mitigation Assistance (FMA)
  - Building Resilient Infrastructure and Communities (BRIC)
- DMA 2000 is intended to facilitate cooperation between state and local authorities on risk reduction measures and expedite funding allocation





NC SENATE BILL 300

- Passed in June of 2001, amends the North Carolina Emergency Management Act (166A)
  - Requires local hazard mitigation plans in order to maintain eligibility for Public Assistance (PA) for state-declared disasters



GENERAL ASSEMBLY OF NORTH CAROLINA
SESSION 2001

SESSION LAW 2001-214
SENATE BILL 300

AN ACT TO AMEND THE LAWS REGARDING EMERGENCY MANAGEMENT AS RECOMMENDED BY THE LEGISLATIVE DISASTER RESPONSE AND RECOVERY COMMISSION.

KEY OBJECTIVES

- Coordinate between five (5) counties and the EBCI to update the regional plan
- Complete update of existing plan to demonstrate progress and reflect current conditions
- Increase public awareness and education
- Maintain grant eligibility for participating jurisdictions
- Update plan in accordance with Community Rating System (CRS) requirements
- Maintain compliance with State and Federal requirements
- Current plan expires May 20, 2023

PARTICIPATING JURISDICTIONS

The plan approval extends to the following participating jurisdictions that provided a copy of their resolutions adopting the plan:

Cherokee County, Unincorporated
Town of Andrews
Town of Murphy
Graham County, Unincorporated
Town of Fontana Dam
Town of Lake Santeetlah
Town of Robbinsville
Haywood County, Unincorporated
Town of Clyde
Town of Maggie Valley
Town of Waynesville

Jackson County, Unincorporated
Town of Dillsboro
Town of Sylva
Village of Forest Hills
Town of Webster
Swain County, Unincorporated
Town of Bryson City
Eastern Band of Cherokee Indians

PROJECT TASKS

1. Planning Process
2. Risk Assessment
3. Capability Assessment
4. Mitigation Strategy
5. Plan Maintenance
6. Documentation



PLANNING PROCESS

Mitigation Planning Process

- Used by state, tribal, and local leaders to understand risks from natural hazards
- Four key elements (as identified on the chart with a "★")
- Three major components (Meetings, Documentation Preparation, & Execution)



RISK ASSESSMENT

- Hazard Identification and Analysis
  - Detailed profiles for all natural hazards
    - Hazard description
    - Historical occurrences
    - Known hazard boundaries
  - Priority Risk Index (PRI)

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**
☑ Tornado	☑ Dam and Levee Failure
☑ Severe Thunderstorm	☑ 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 Smoky Mountain Region hazard risk assessment.

RISK ASSESSMENT FINDINGS

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.

- Hazard Identification
- Hazard Profiles
- Hazard Vulnerability Assessment

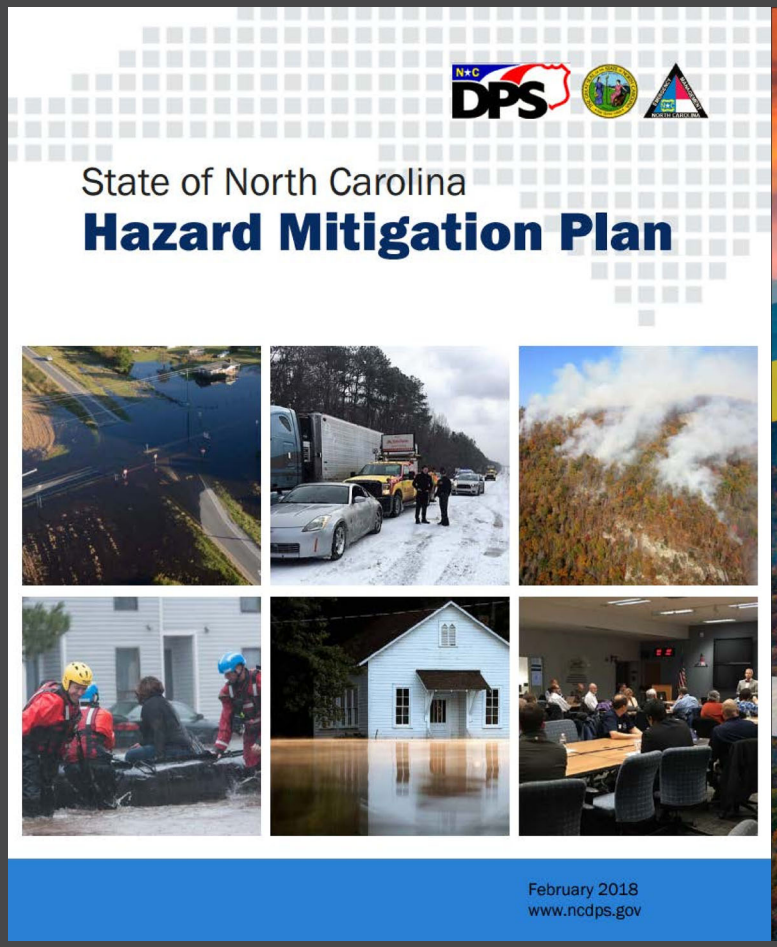
HAZARD IDENTIFICATION

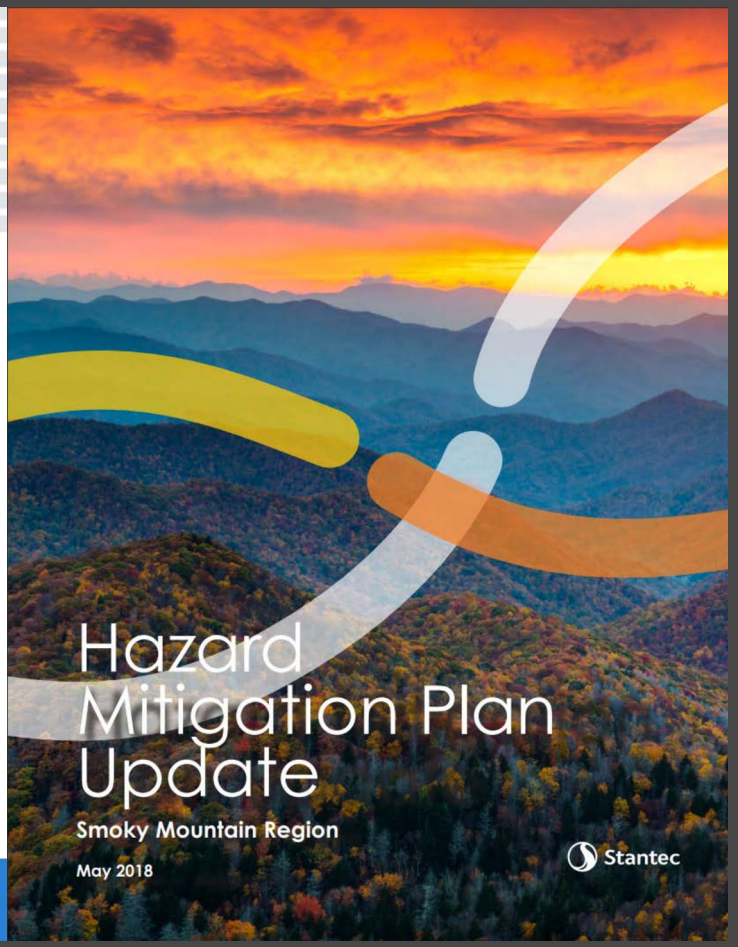
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	☐ Storm Surge
	OTHER HAZARDS
	☑ Hazardous Materials Incident
	☐ Terror Threat
	☑ Wildfire

☑ = Hazard considered significant enough for further evaluation in the Smoky Mountain Region hazard risk assessment.

HAZARD COMPARISON





HAZARD COMPARISON

Hazards Included in the North Carolina State Hazard Mitigation Plan 2018

- Flooding
- Hurricane & Coastal Storm
- Severe Winter Weather
- Excessive Heat
- Earthquake
- Wildfire
- Dam Failure
- Drought
- Tornado & Thunderstorm
- Geological Hazards
  - Landslide/Rock Fall
  - Sinkhole
  - Coastal Erosion
- Infectious Disease (New)

Hazards Included in the Smoky Mountain Regional Hazard Mitigation Plan 2018

- Flooding
- Hurricane & Tropical Storm
- Winter Storm & Freeze
- Hailstorm
- Earthquake
- Wildfire
- Dam & Levee Failure
- Drought
- Tornado
- Severe Thunderstorm
- Lightning
- Geological Hazards
  - Landslide
  - Erosion
- Hazardous Materials Incident

A COUPLE OF CAVEATS

1. **We utilized *Best Available Data***
   - Useful, but events are often under-reported
2. **Keep the end goal in sight**
   - The risk assessment's purpose is to compare hazards and determine which should be the focus of your mitigation actions
   - The detailed numbers are informative, but remember the big picture
3. **This is YOUR risk assessment**
   - The data we provide is beneficial, but YOU live here! Your recommendations for adjustments are welcomed and encouraged!

HAZARD EVENTS SINCE PREVIOUS PLAN

Hazard Type	Number of Reported Events in Cherokee County	Number of Reported Events in Graham County	Number of Reported Events in Haywood County	Number of Reported Events in Jackson County	Number of Reported Events in Swain County
Cold/Wind Chill	0	2	5	7	4
Flash Flood	2	0	2	3	4
Flood	0	0	0	1	0
Hail	0	1	0	0	1
Heavy Snow	3	1	5	3	4
High Wind	1	0	0	0	0
Lightning	0	0	0	0	1
Strong Wind	0	0	0	0	0
Thunderstorm Wind	10	7	7	5	6
Tornado	0	0	0	0	0
Tropical Storm	0	1	1	0	1
Winter Storm	0	1	0	0	0
Winter Weather	0	10	13	18	11
Total Number of Reported Events (2018-2021)	**16**	**23**	**32**	**37**	**32**

PRESIDENTIAL DISASTER DECLARATIONS

Since the last plan (2018)

- DR-4487 – COVID-19 Pandemic
  - March 25, 2020
- DR-4543 – Severe Storms, Tornadoes and Flooding
  - May 8, 2020
- DR-4617 - TS Fred



Source: WLOS

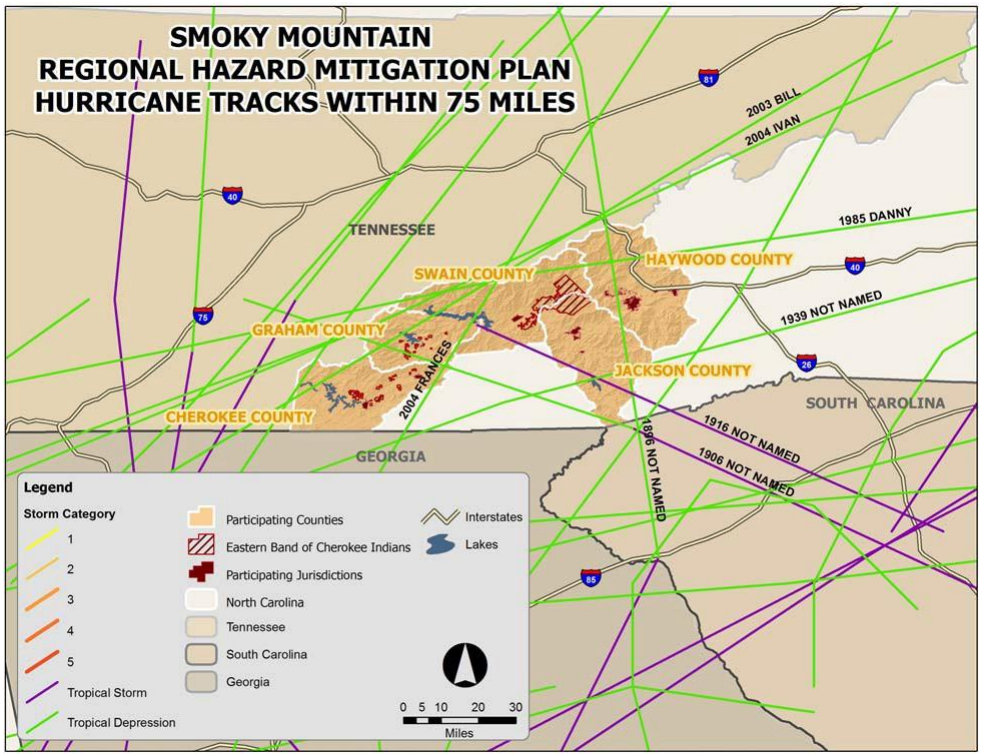
DROUGHT

- Drought occurrences in eighteen of last 19 years (2000 – 2019)
  - Primarily 3 long-term events
    - All events were regional (multiple counties affected)
- Losses are difficult to track
- Future occurrences are *likely*

Year	Cherokee County	Graham County	Haywood County	Jackson County	Swain County
2000	Extreme Drought	Extreme Drought	Exceptional Drought	Exceptional Drought	Exceptional Drought
2001	Extreme Drought	Extreme Drought	Extreme Drought	Extreme Drought	Extreme Drought
2002	Extreme Drought	Extreme Drought	Extreme Drought	Exceptional Drought	Extreme Drought
2003	None	None	None	None	None
2004	Abnormally Dry	Abnormally Dry	Abnormally Dry	Abnormally Dry	Abnormally Dry
2005	Abnormally Dry	Abnormally Dry	Abnormally Dry	Abnormally Dry	Abnormally Dry
2006	Moderate Drought	Moderate Drought	Severe Drought	Severe Drought	Severe Drought
2007	Exceptional Drought	Exceptional Drought	Exceptional Drought	Exceptional Drought	Exceptional Drought
2008	Exceptional Drought	Exceptional Drought	Exceptional Drought	Exceptional Drought	Exceptional Drought
2009	Severe Drought	Severe Drought	Severe Drought	Extreme Drought	Severe Drought
2010	Moderate Drought	Moderate Drought	Moderate Drought	Moderate Drought	Moderate Drought
2011	Moderate Drought	Moderate Drought	Abnormally Dry	Severe Drought	Moderate Drought
2012	Severe Drought	Abnormally Dry	Moderate Drought	Moderate Drought	Abnormally Dry
2013	None	Abnormally Dry	Abnormally Dry	Abnormally Dry	Abnormally Dry
2014	Abnormally Dry	Abnormally Dry	Abnormally Dry	Abnormally Dry	Abnormally Dry
2015	Abnormally Dry	Abnormally Dry	Severe Drought	Severe Drought	Moderate Drought
2016	Exceptional Drought	Exceptional Drought	Extreme Drought	Exceptional Drought	Exceptional Drought
2017	Extreme Drought	Extreme Drought	Extreme Drought	Extreme Drought	Extreme Drought
2018	Moderate Drought	Moderate Drought	Abnormally Dry	Abnormally Dry	Abnormally Dry
2019	Severe Drought	Severe Drought	Severe Drought	Severe Drought	Moderate Drought

HURRICANE AND COASTAL HAZARDS

- 29 storm tracks have come within 75 miles of the region since 1896
  - One tropical storm tracked directly through the region
- Remnants are of great concern
  - Flooding, landslides
- Recent Disaster Declarations
- Future occurrences are *likely*



HURRICANES AND COASTAL HAZARDS, CONTINUED

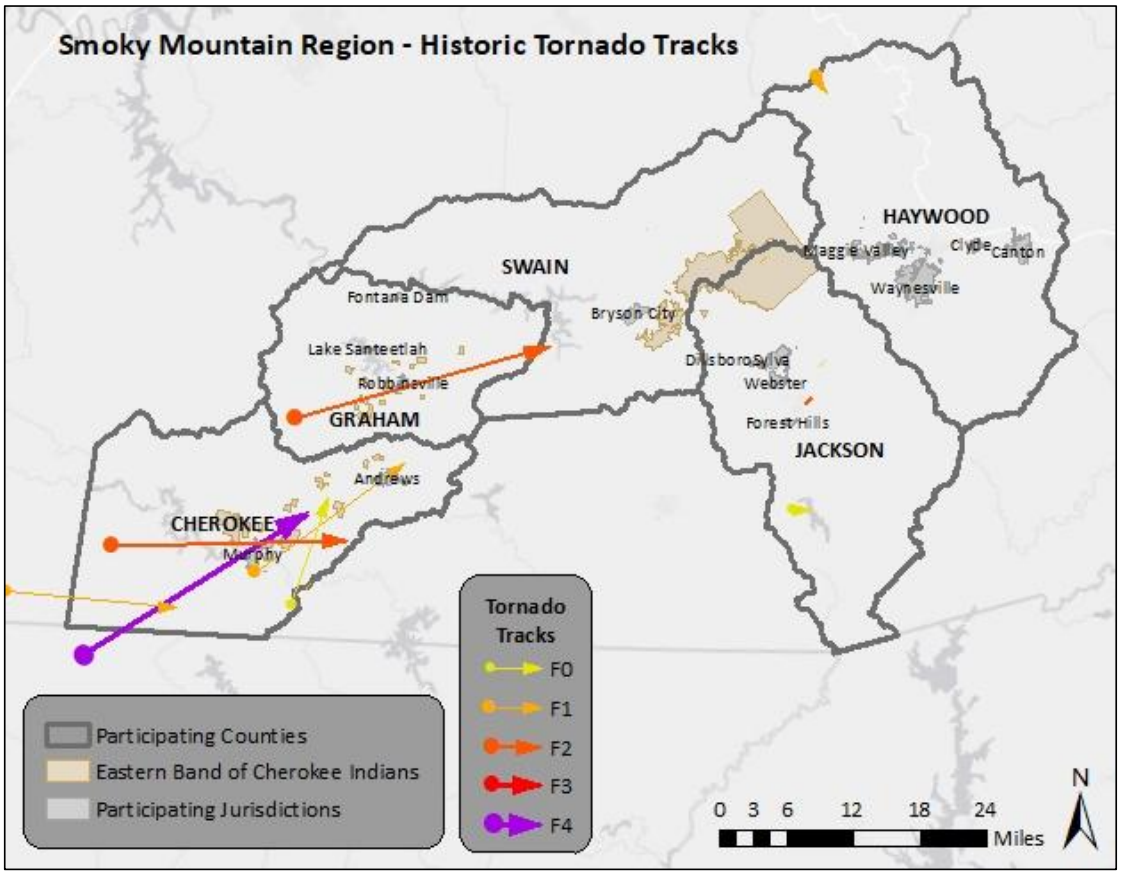
- Tropical Storm Fred
  - Some areas received as much as 10 inches of rain in a 48 hour period
  - NCEI reported $200 million in property damages
    - Total of 6 fatalities were reported by Haywood County



Source: CNN - Weather– "*2 dead and 20 unaccounted for in North Carolina flooding after the remnants of Tropical Storm Fred slam area*; https://www.cnn.com/2021/08/19/weather/post-tropical-cyclone-fred-thursday/index.html

TORNADOES

- 20 recorded events since 1973
  - 6 deaths and 38 injuries reported
  - Over $28.2 million in property damage
- Greatest magnitude = F4
- Uniform exposure across entire region
- Future occurrences are *possible*



TORNADO EVENTS

Location	Number of Occurrences	Deaths	Injuries	Property Damage (2020)
Cherokee County	**9**	**4**	**26**	**$27,175,000**
Andrews	0	0	0	$0
Murphy	0	0	0	$0
Unincorporated Area	9	4	26	$27,175,000
Graham County	**1**	**2**	**11**	**$250,000**
Fontana	0	0	0	$0
Lake Santeetlah	0	0	0	$0
Robbinsville	0	0	0	$0
Unincorporated Area	1	2	11	$250,000
Haywood County	**2**	**0**	**1**	**$250,000**
Canton	0	0	0	$0
Clyde	0	0	0	$0
Maggie Valley	0	0	0	$0
Waynesville	0	0	0	$0
Unincorporated Area	2	0	1	$250,000

TORNADO EVENTS

Jackson County	**3**	**0**	**0**	**$300,250**
Dillsboro	0	0	0	$0
Forest Hills	0	0	0	$0
Sylva	0	0	0	$0
Webster	0	0	0	$0
Unincorporated Area	3	0	0	$300,250
Swain County	**3**	**0**	**0**	**$252,500**
Bryson City	0	0	0	$0
Unincorporated Area	3	0	0	$252,500
Eastern Band of Cherokee Indians	**2**			
SMOKY MOUNTAIN REGION TOTAL	**20**	**6**	**38**	**$28,227,750**

SEVERE THUNDERSTORMS AND HIGH WINDS

- 565 severe thunderstorm events recorded since 1959
  - 1 death, 6 injuries
  - Over $4.5 million in property damage
- 7 Disaster Declarations
- Uniform exposure across the entire region
  - High winds
- Future occurrences are *highly likely*

SEVERE THUNDERSTORM EVENTS

Location	Number of Occurrences	Deaths	Injuries	Property Damage (2020)
Cherokee County	**155**	**0**	**0**	**$799,000**
Andrews	11	0	0	$110,000
Murphy	60	0	0	$389,000
Unincorporated Area	54	0	0	$300,000
Graham County	**102**	**0**	**3**	**$590,000**
Fontana	8	0	0	$0
Lake Santeetlah	3	0	0	$0
Robbinsville	28	0	3	$44,000
Unincorporated Area	63	0	0	$546,000
Haywood County	**64**	**0**	**0**	**$730,290**
Canton	7	0	0	$6,000
Clyde	3	0	0	$0
Maggie Valley	13	0	0	$50,000
Waynesville	14	0	0	$97,000
Unincorporated Area	27	0	0	$577,290

SEVERE THUNDERSTORM EVENTS, CONTINUED

Jackson County	**154**	**0**	**2**	**$1,796,580**
Dillsboro	1	0	0	$0
Forest Hills	0	0	0	$0
Sylva	23	0	0	$184,000
Webster	3	0	0	$10,000
Unincorporated Area	127	0	2	$1,602,580
Swain County	**90**	**1**	**1**	**$621,000**
Bryson City	25	0	1	$10,000
Unincorporated Area	65	1	0	$611,000
Eastern Band of Cherokee Indians	**--**	**--**	**--**	**--**
SMOKY MOUNTAIN REGION TOTAL	**565**	**1**	**6**	**$4,536,870**

HAILSTORMS

- 221 recorded events
  - 1977-2020
  - Over $1.06 million in property damage
  - 3.0” hailstones reported
- Similar exposure across entire region
- Future occurrences are *likely*

HAILSTORM EVENTS

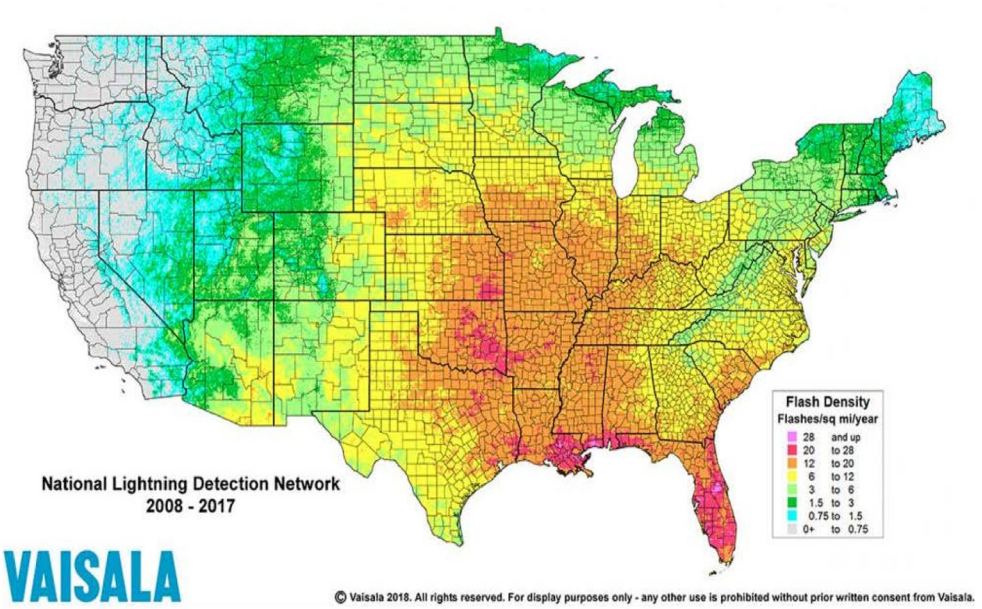
Location	Number of Occurrences	Deaths	Injuries	Property Damage (2020)
Cherokee County	**52**	**0**	**0**	**$10,000**
Andrews	10	0	0	$0
Murphy	15	0	0	$0
Unincorporated Area	27	0	0	$10,000
Graham County	**33**	**0**	**0**	**$0**
Fontana	1	0	0	$0
Lake Santeetlah	0	0	0	$0
Robbinsville	17	0	0	$0
Unincorporated Area	15	0	0	$0
Haywood County	**58**	**0**	**0**	**$50,000**
Canton	10	0	0	$50,000
Clyde	3	0	0	$0
Maggie Valley	3	0	0	$0
Waynesville	19	0	0	$0
Unincorporated Area	23	0	0	$0

HAILSTORM EVENTS, CONTINUED

Jackson County	**58**	**0**	**0**	**$1,000,000**
Dillsboro	1	0	0	$0
Forest Hills	0	0	0	$0
Sylva	11	0	0	$1,000,000
Webster	2	0	0	$0
Unincorporated Area	44	0	0	$0
Swain County	**20**	**0**	**0**	**$0**
Bryson City	11	0	0	$0
Unincorporated Area	9	0	0	$0
Eastern Band of Cherokee Indians	**--**			**--**
SMOKY MOUNTAIN REGION TOTAL	221	0	0	$1,060,000

LIGHTNING

- 23 recorded lightning events since 1997
  - 0 deaths, 1 injury reported
  - Over $2.8 million in property damages
- Uniform exposure across the region
- Future occurrences are *highly likely*



LIGHTNING EVENTS

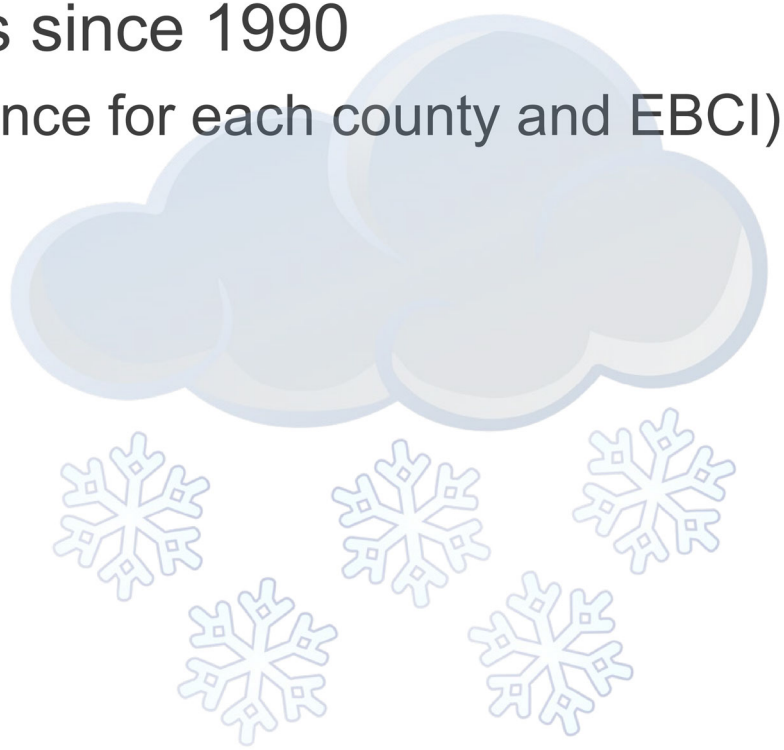
Location	Number of Occurrences	Deaths	Injuries	Property Damage (2020)
Cherokee County	**0**	**0**	**0**	**$0**
Andrews	0	0	0	$0
Murphy	0	0	0	$0
Unincorporated Area	0	0	0	$0
Graham County	**1**	**0**	**0**	**$0**
Fontana	0	0	0	$0
Lake Santeetlah	0	0	0	$0
Robbinsville	1	0	0	$0
Unincorporated Area	0	0	0	$0
Haywood County	**5**	**0**	**2**	**$113,000**
Canton	3	0	0	$103,000
Clyde	0	0	0	$0
Maggie Valley	1	0	0	$10,000
Waynesville	0	0	0	$0
Unincorporated Area	1	0	2	$0

LIGHTNING EVENTS, CONTINUED

Jackson County	**15**	**1**	**10**	**$2,640,000**
Dillsboro	1	0	0	$10,000
Forest Hills	0	0	0	$0
Sylva	2	0	0	$30,000
Webster	0	0	0	$0
Unincorporated Area	12	1	10	$2,600,000
Swain County	**2**	**0**	**2**	**$100,000**
Bryson City	0	0	0	$0
Unincorporated Area	2	0	2	$100,000
Eastern Band of Cherokee Indians	**--**			**--**
SMOKY MOUNTAIN REGION TOTAL	**23**	**1**	**14**	**$2,853,000**

SEVERE WINTER WEATHER

- 747 recorded winter weather events since 1990
  - Some events counted up to 5 times (once for each county and EBCI)
  - Uniform exposure in the region
  - No deaths or injuries reported
- 4 Disaster Declarations
  - Blizzard of 1996
  - 1996 Winter Storm
  - 2003 Ice Storm
  - 2010 Winter Storm
- Future occurrences are *highly likely*



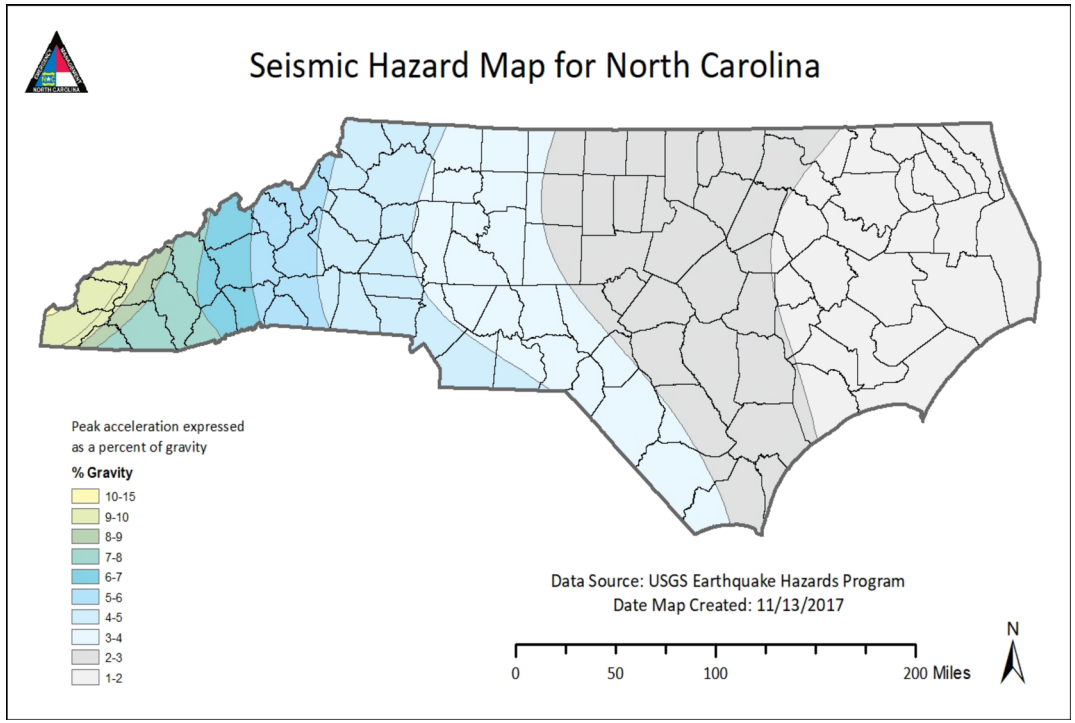
SEVERE WINTER WEATHER EVENTS

Location	Number of Occurrences	Deaths	Injuries	Property Damage (2012)
Cherokee County	11	0	0	$849,826
Graham County	140	0	0	$994,449
Haywood County	181	0	0	$6,198,575
Jackson County	245	0	0	$20,001,310
Swain County	160	0	0	$6,205,187
Eastern Band of Cherokee Indians	10	0	0	--
SMOKY MOUNTAIN REGION TOTAL	**747**	**0**	**0**	**$34,249,347**

EARTHQUAKE

- 82 earthquakes have affected the Smoky Mountain Region since 1874
- Future occurrences are *possible*

Probability of a major earthquake within the next 50 years:	
Cherokee County	% 10-14
Graham County	% 14-20
Jackson County	% 14-20
Haywood County	% 10-14
Swain County	% 10-14



EARTHQUAKE, CONTINUED

- Sparta Earthquake
  - 5.2 magnitude earthquake
  - Second strongest in NC since 1900
  - Five other minor earthquakes were measured in the area



Source: The Weather Channel – "*Magnitude Earthquake Rattles North Carolina, South Carolina, Virginia, Tennessee; Roads Cracked, dishes broken*."; https://weather.com/news/news/2020-08-09-earthquake-north-carolina-south-carolina-tennessee

EARTHQUAKE EVENTS

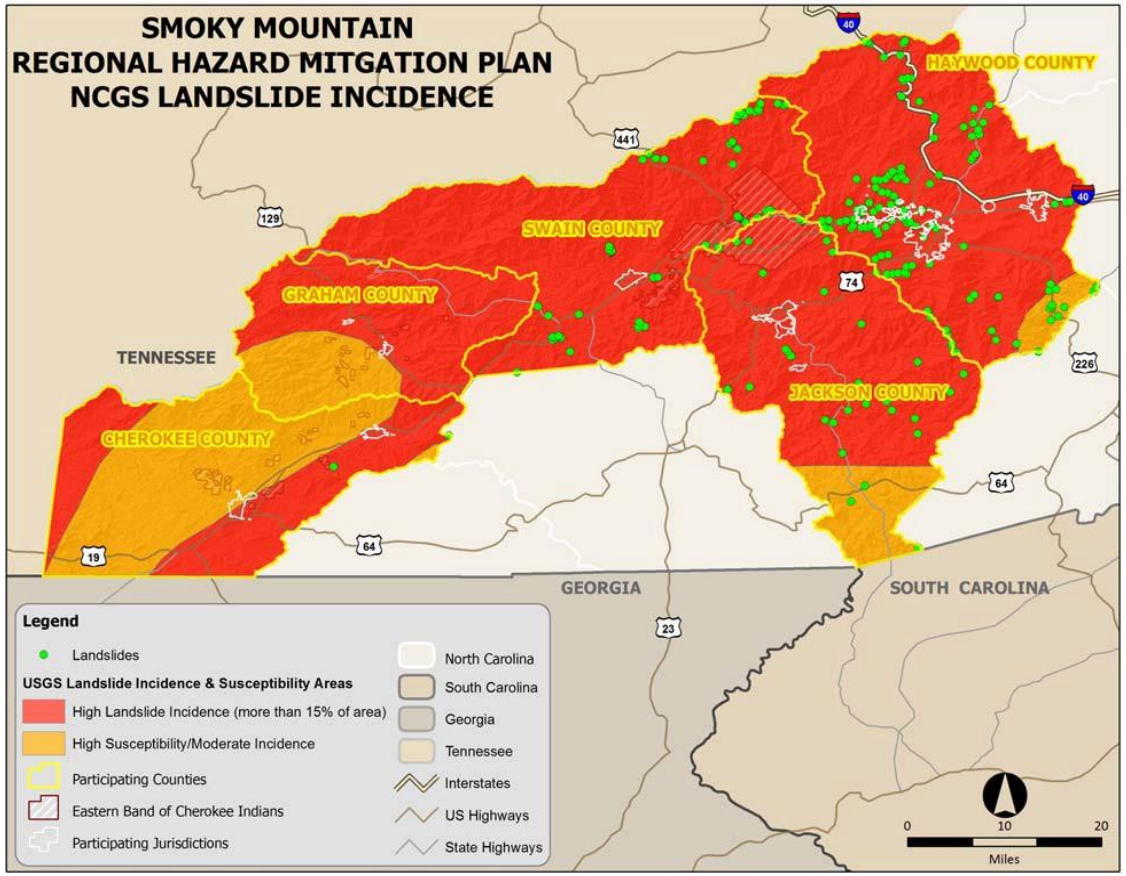
Location	Number of Occurrences	Greatest MMI Reported	Richter Scale Equivalent
Andrews	8	IV	
Murphy	16	V	
Cherokee County	**24**	**V (slightly strong)**	**< 4.8**
Dillsboro	**3**	**V**	
Forest Hills	-	-	
Sylva	8	V	
Webster	3	V	
Jackson County	**14**	**V (slightly strong)**	**< 4.8**
Bryson City	**7**	**V**	
Swain County	**7**	**V (slightly strong)**	**< 4.8**

EARTHQUAKE EVENTS - CONTINUED

Location	Number of Occurrences	Greatest MMI Reported	Richter Scale Equivalent
Canton	5	V	
Clyde	3	V	
Maggie Valley	-	-	
Waynesville	11	VII	
Haywood County	**19**	**VII (very strong)**	**< 6.1**
Fontana	6	V	
Lake Santeetlah	-	-	
Robbinsville	12	V	
Graham County	**18**	**V (slightly strong)**	**< 4.8**

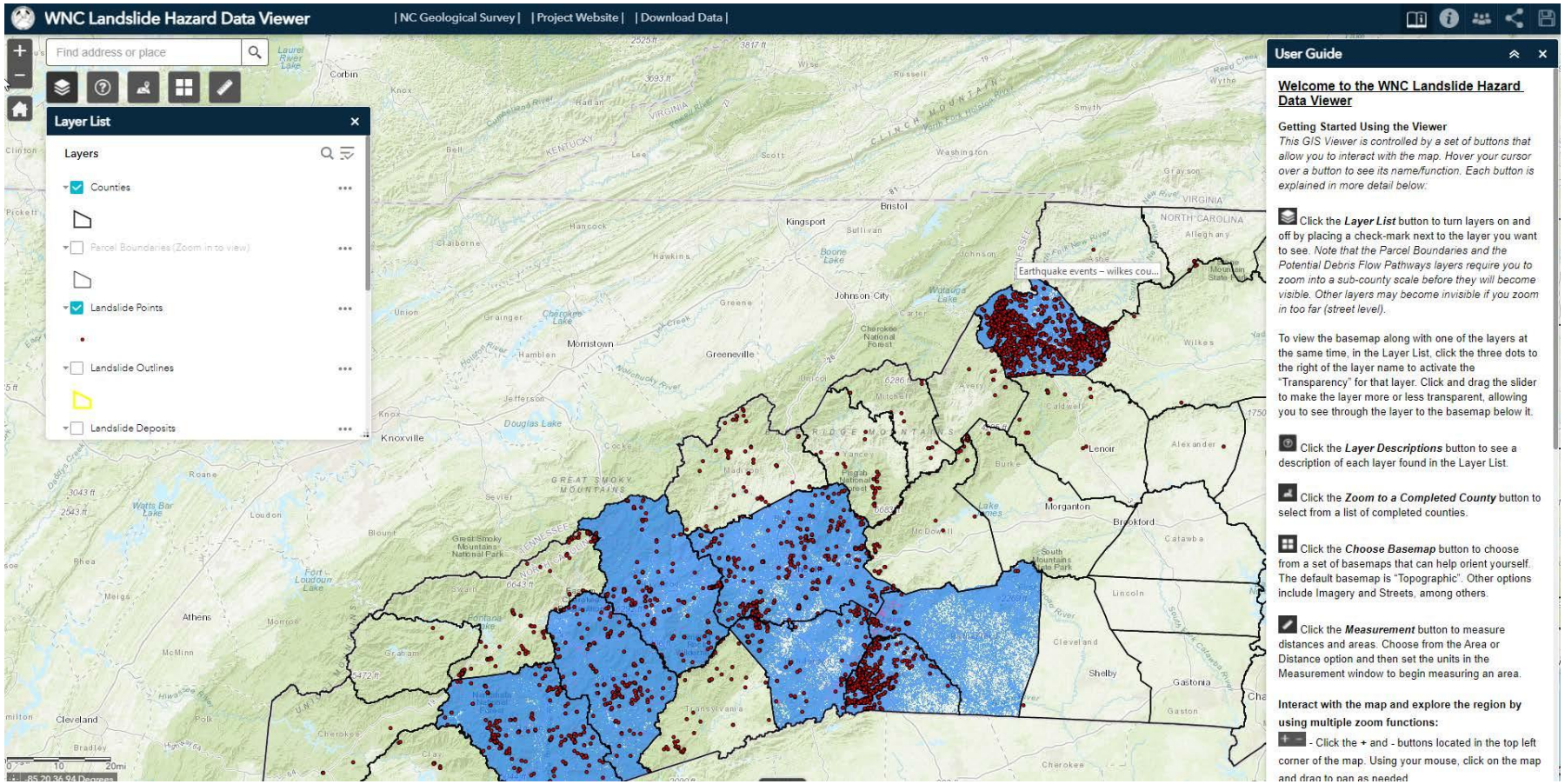
LANDSLIDE

- Many slides associated with heavy rains or tropical systems
- Entire region is susceptible
  - Some areas more than others
- 227 occurrences throughout region
- Future occurrences are *possible*
  - Slides frequently occur at sites of previous slides



LANDSLIDE VIEWER

Developed by NCGS

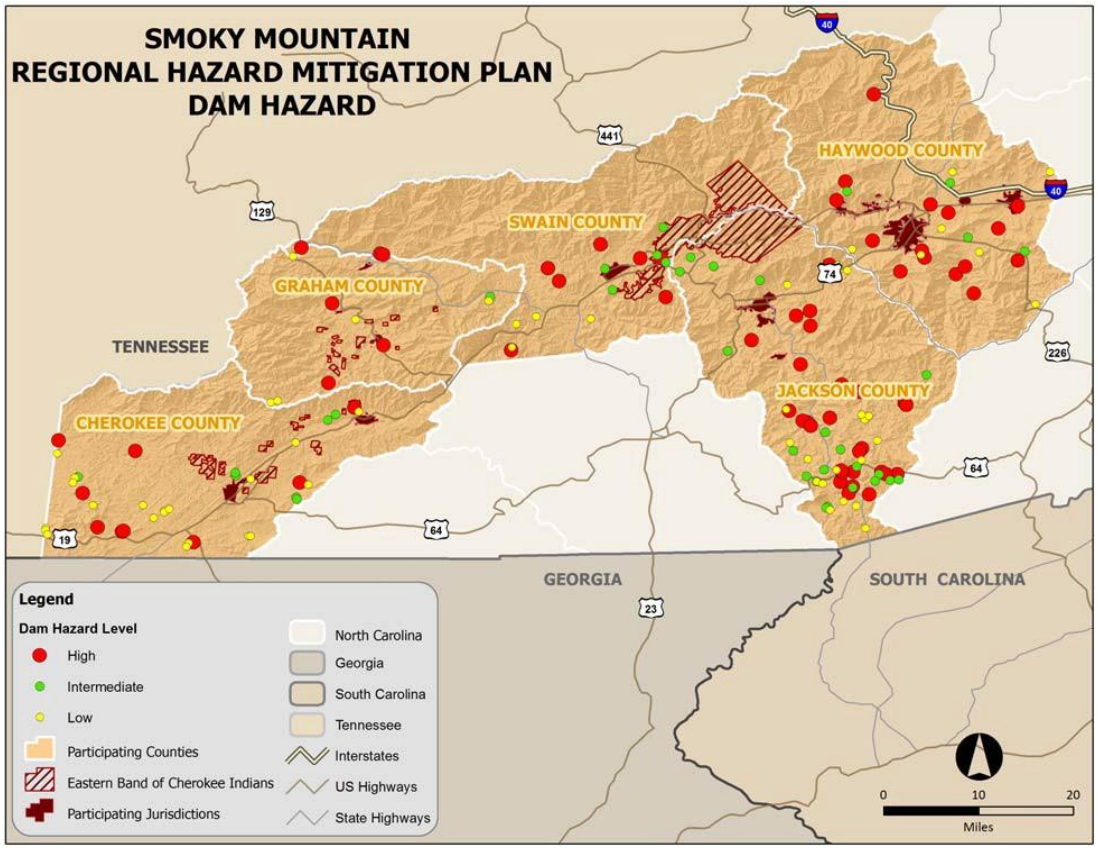


DAM AND LEVEE FAILURE

- 71 high hazard dams in the region
- 2 significant breaches reported
- Future occurrences are *unlikely*

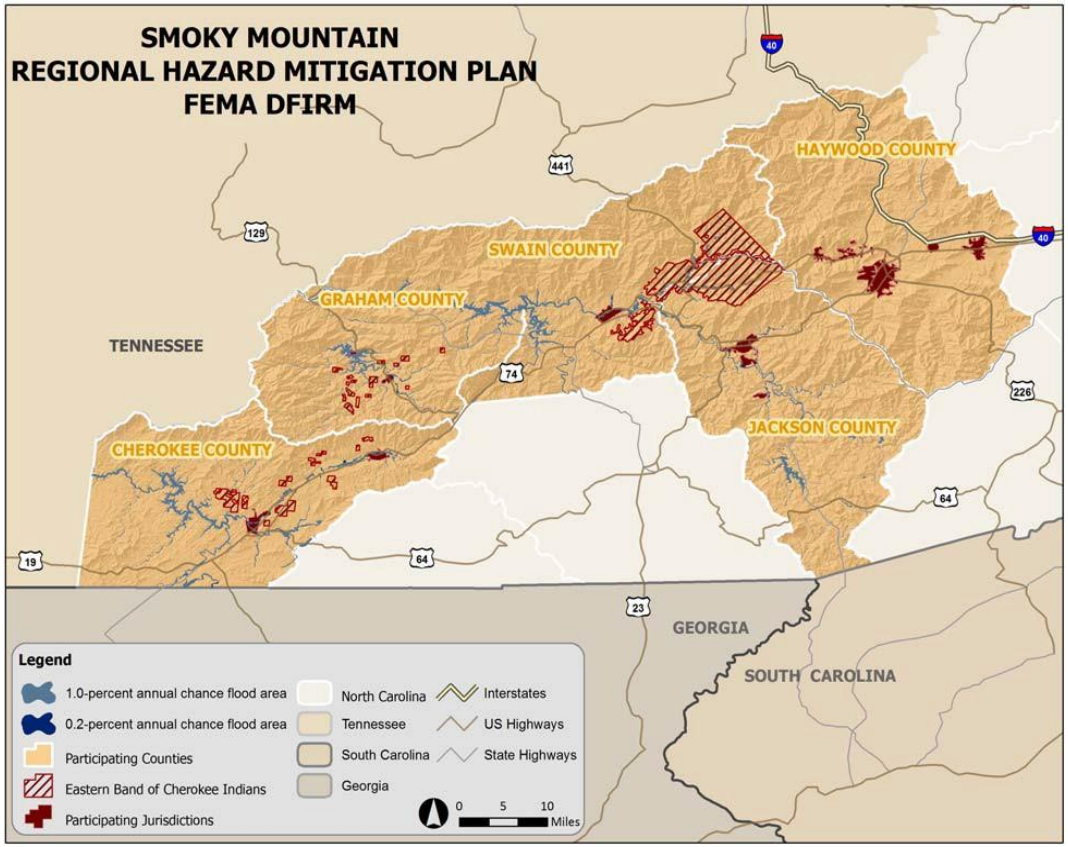
Smoky Mountain Region	Number of High Hazard Dams
Cherokee County	11
Graham County	7
Haywood County	17
Jackson County	28
Swain County	8

Source: North Carolina Division of Energy, Mineral, and Land Resources



FLOOD

- NCEI indicates 127 flood events since 1993.
  - Over $32.2 million in property damage
- NFIP Losses:
  - 294 reported losses since 1970
  - Approximately $9.3 million in claims
- Repetitive Loss:
  - 29 non-mitigated properties in Smoky Mountain Region as of 2017, 75 losses
  - Over $2.7 million in total payments
- Future occurrences are *highly likely*



FLOODING EVENTS

Location	Number of Occurrences	Deaths	Injuries	Property Damage (2020)
Cherokee County	**15**	**0**	**0**	**$1,720,000**
Andrews	1	0	0	$0
Murphy	6	0	0	$14,000
Unincorporated Area	8	0	0	$1,706,000
Graham County	**11**	**0**	**0**	**$370,000**
Fontana	1	0	0	$0
Lake Santeetlah	0	0	0	$0
Robbinsville	0	0	0	$0
Unincorporated Area	10	0	0	$370,000
Haywood County	**30**	**3**	**0**	**$24,526,500**
Canton	1	0	0	
Clyde	1	0	0	
Maggie Valley	3	0	0	$20,000
Waynesville	7	0	0	$555,000
Unincorporated Area	18	3	0	$23,951,500

FLOODING EVENTS, CONTINUED

Jackson County	**42**	**0**	**0**	**$1,184,000**
Dillsboro	1	0	0	
Forest Hills	0	0	0	
Sylva	8	0	0	$156,000
Webster	0	0	0	
Unincorporated Area	33	0	0	$1,028,000
Swain County	**29**	**0**	**0**	**$4,496,500**
Bryson City	11	0	0	$295,000
Unincorporated Area	18	0	0	$4,201,500
Eastern Band of Cherokee Indians				
SMOKY MOUNTAIN REGION TOTAL	**127**	**3**	**0**	**$32,297,000**

FLOOD – NFIP – CHEROKEE COUNTY

Location	Flood Losses	Claims Payments
Cherokee County	**46**	**$538,071**
Andrews	5	$192,489
Murphy	4	$24,946
Unincorporated Area	37	$320,636

FLOOD VULNERABILITY – CHEROKEE COUNTY

Location	Pre-Firm Buildings at Risk	Residential Buildings at Risk		Commercial Buildings at Risk		Public Buildings at Risk		Total Buildings at Risk	
		Number	Damages	Number	Damages	Number	Damages	Number	Damages
Cherokee County	**421**	**380**	**$7,115,054**	**30**	**$1,395,126**	**11**	**$458,420**	**421**	**$8,968,601**
Andrews	63	50	$183,246	13	$932,510	0	$0	63	$1,115,756
Murphy	17	6	$21,606	3	$108,867	8	$125,253	17	$255,726
Unincorporated Area	341	324	$6,910,202	14	$353,749	3	$333,167	341	$7,597,119

FLOOD – NFIP – GRAHAM COUNTY

Location	Flood Losses	Claims Payments
Graham County	**4**	**$10,847**
Fontana*	*	*
Lake Santeetlah*	0	$0
Robbinsville	0	$0
Unincorporated Area	4	$10,847

* Fontana Dam is covered by Graham County. They do not participate separately but activities are covered by the county.

FLOOD VULNERABILITY – GRAHAM COUNTY

Location	Pre-Firm Buildings at Risk	Residential Buildings at Risk		Commercial Buildings at Risk		Public Buildings at Risk		Total Buildings at Risk	
		Number	Damages	Number	Damages	Number	Damages	Number	Damages
Graham County	**334**	**356**	**$2,687,867**	**23**	**$385,394**	**5**	**$79,518**	**384**	**$3,152,779**
Fontana									
Lake Santeetlah	0	0	$0	0	$0	0	$0	0	$0
Robbinsville	29	28	$435,305	1	$1,895	0	$0	29	$437,200
Unincorporated Area	305	328	$2,252,562	22	$383,499	5	$79,518	355	$2,715,579

FLOOD – NFIP – HAYWOOD COUNTY

Location	Flood Losses	Claims Payments
Haywood County	**236**	**$7,972,928**
Canton	59	$3,045,873
Clyde	149	$3,874,583
Maggie Valley	4	$6,552
Waynesville	11	$82,430
Unincorporated Area	45	$963,490

FLOOD VULNERABILITY – HAYWOOD COUNTY

Location	Pre-Firm Buildings at Risk	Residential Buildings at Risk		Commercial Buildings at Risk		Public Buildings at Risk		Total Buildings at Risk	
		Number	Damages	Number	Damages	Number	Damages	Number	Damages
Haywood County	**2,417**	**2,411**	**$40,656,800**	**512**	**$33,082,312**	**39**	**$5,486,259**	**2,962**	**$79,225,372**
Canton	129	54	$1,829,462	87	$11,081,335	7	$1,407,397	148	$14,318,193
Clyde	226	213	$9,392,601	34	$2,200,209	9	$1,386,834	256	$12,979,645
Maggie Valley	205	192	$2,205,569	64	$3,952,194	5	$241,163	261	$6,398,926
Waynesville	1,261	1,152	$15,512,444	182	$13,982,069	8	$1,866,967	1,342	$31,361,481
Unincorporated Area	596	800	$11,716,724	145	$1,866,505	10	$583,898	955	$14,167,127

FLOOD – NFIP – JACKSON COUNTY

Location	Flood Losses	Claims Payments
Jackson County	**20**	**$546,227**
Dillsboro	4	$307,079
Forest Hills	0	$0
Sylva	3	$116,847
Webster	0	$0
Unincorporated Area	13	$122,301

FLOOD VULNERABILITY – JACKSON COUNTY

Location	Pre-Firm Buildings at Risk	Residential Buildings at Risk		Commercial Buildings at Risk		Public Buildings at Risk		Total Buildings at Risk	
		Number	Damages	Number	Damages	Number	Damages	Number	Damages
Jackson County	**1279**	**1106**	**$11,826,845**	**151**	**$7,839,330**	**22**	**$2,124,471**	**1279**	**$21,790,645**
Dillsboro	23	6	$47,875	17	$215,543	0	$0	23	$263,417
Forest Hills	7	7	$67,485	0	$0	0	$0	7	$67,485
Sylva	112	73	$1,186,336	37	$3,655,543	2	$114,132	112	$4,956,011
Webster	16	14	$343,624	2	$56,013	0	$0	16	$399,637
Unincorporated Area	1,121	1,006	$10,181,525	95	$3,912,231	20	$2,010,339	1,121	$16,104,095

FLOOD – NFIP – SWAIN COUNTY

Location	Flood Losses	Claims Payments
Swain County	**9**	**$264,204**
Bryson City	5	$237,853
Unincorporated Area	4	$26,351

FLOOD VULNERABILITY – SWAIN COUNTY

Location	Pre-Firm Buildings at Risk	Residential Buildings at Risk		Commercial Buildings at Risk		Public Buildings at Risk		Total Buildings at Risk	
		Number	Damages	Number	Damages	Number	Damages	Number	Damages
Swain County	**688**	**521**	**$6,489,171**	**155**	**$9,783,825**	**11**	**$270,595**	**687**	**$16,543,591**
Bryson City	203	104	$1,950,945	97	$7,057,206	2	$89,747	203	$9,097,898
Unincorporated Area	485	417	$4,538,226	58	$2,726,619	9	$180,848	484	$7,445,693

FLOOD – NFIP – EBCI

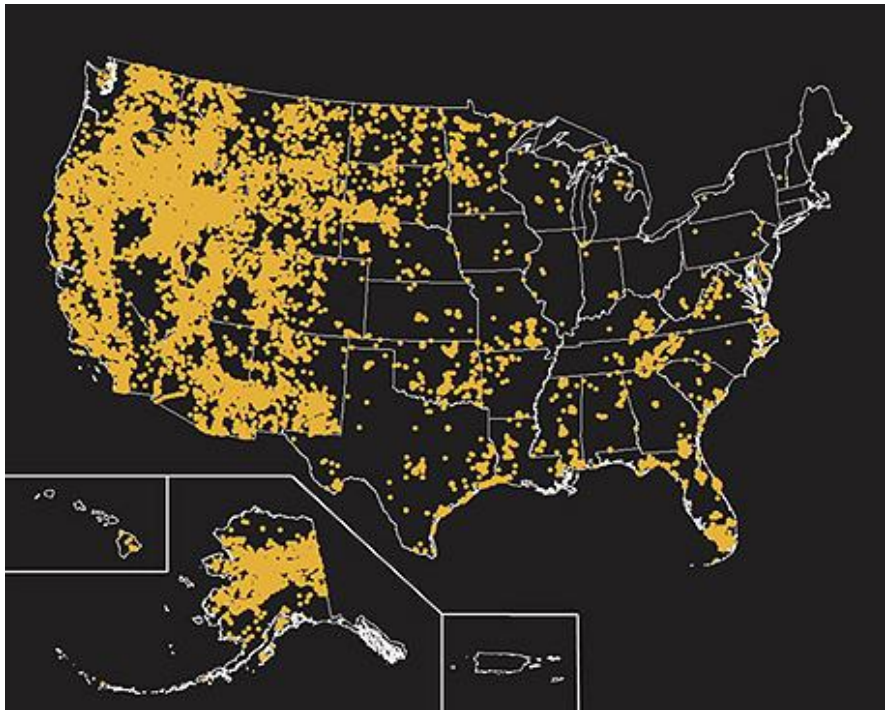
Location	Flood Losses	Claims Payments
Eastern Band of Cherokee Indians	**3**	**$236,298**

FLOOD VULNERABILITY – EBCI

Location	Pre-Firm Buildings at Risk	Residential Buildings at Risk		Commercial Buildings at Risk		Public Buildings at Risk		Total Buildings at Risk	
		Number	Damages	Number	Damages	Number	Damages	Number	Damages
Eastern Band of Cherokee Indians	**3,991**	**3,438**	**$596,835**	**461**	**$661,605**	**89**	**$162,674**	**3,988**	**$1,421,115**

Wildfire Vulnerability

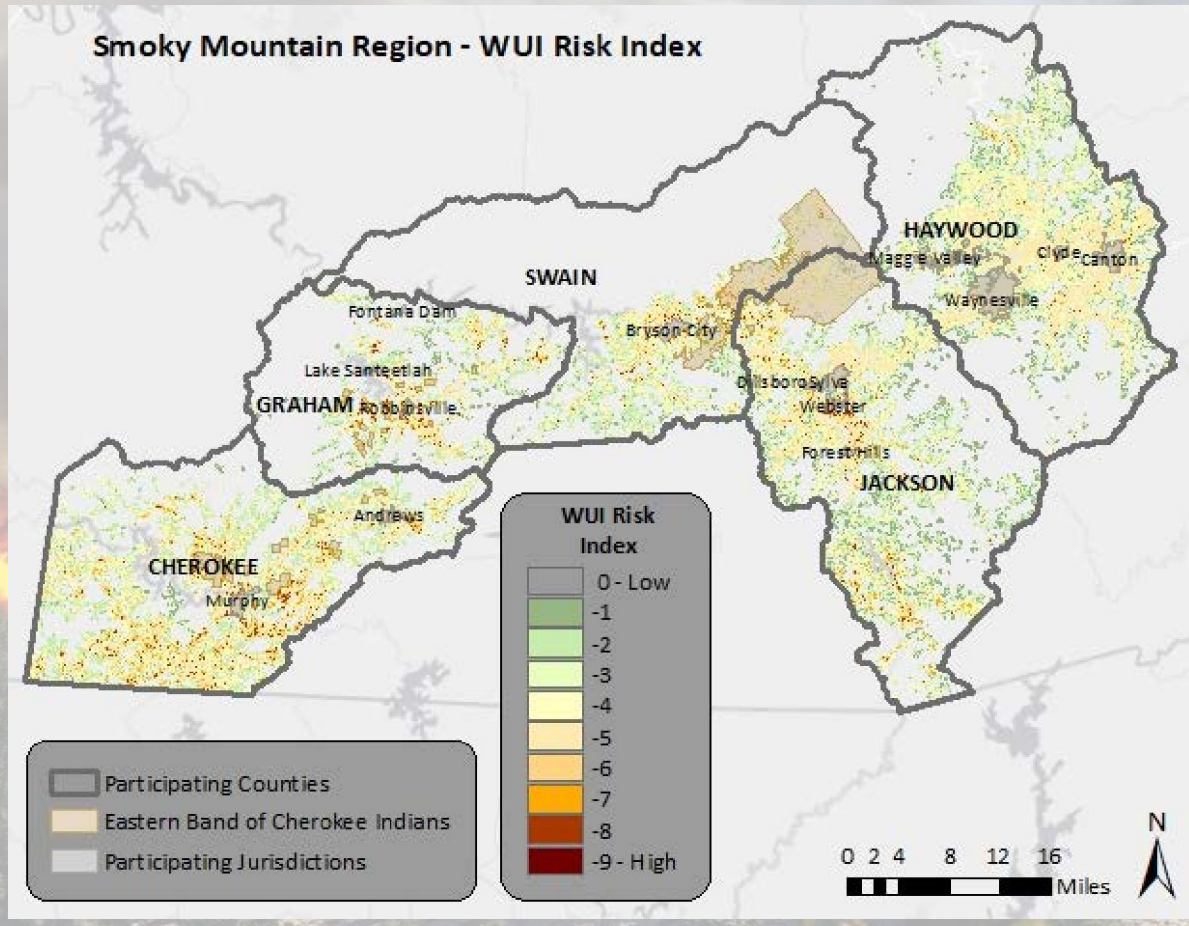
- Map represents fires > 250 acres
- Relative Risk of Wildfire
  - Larger fires possible
- 10-year averages (2008-2017)
  - 64,565 Wildfires
  - 6,571,242 Acres
  - National Interagency Fire Center



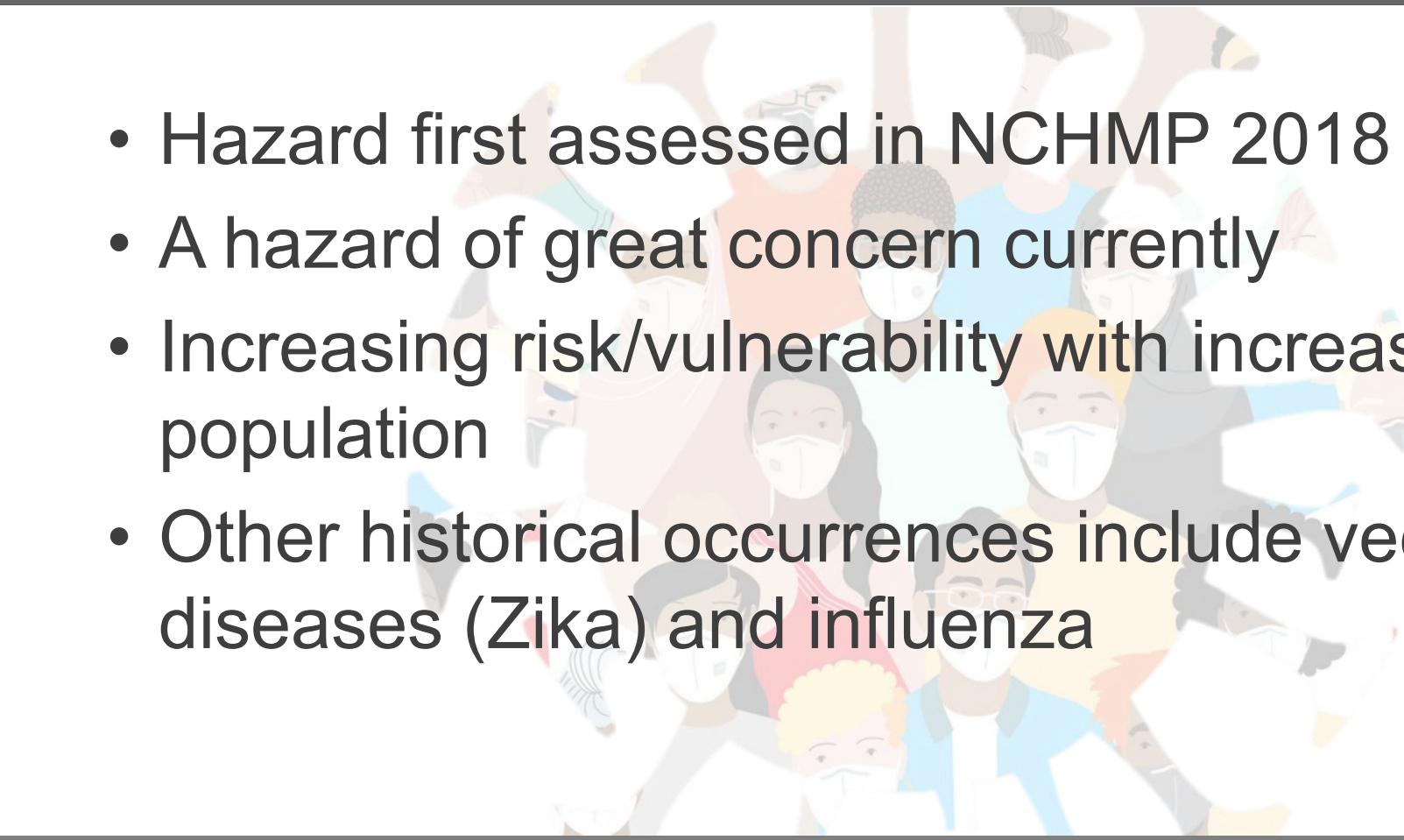
WILDFIRE, CONTINUED

- Wildfire Ignition Density
  - Likelihood of wildfire igniting in an area

  Southern Wildfire Risk Assessment
- Wildfire Urban Interface Risk Index
  - Rating of potential impact of wildfire on people and their homes
- Future occurrences are *likely*



INFECTIOUS DISEASE



- Hazard first assessed in NCHMP 2018
- A hazard of great concern currently
- Increasing risk/vulnerability with increasing population
- Other historical occurrences include vector-borne diseases (Zika) and influenza

INFECTIOUS DISEASE, CONTINUED

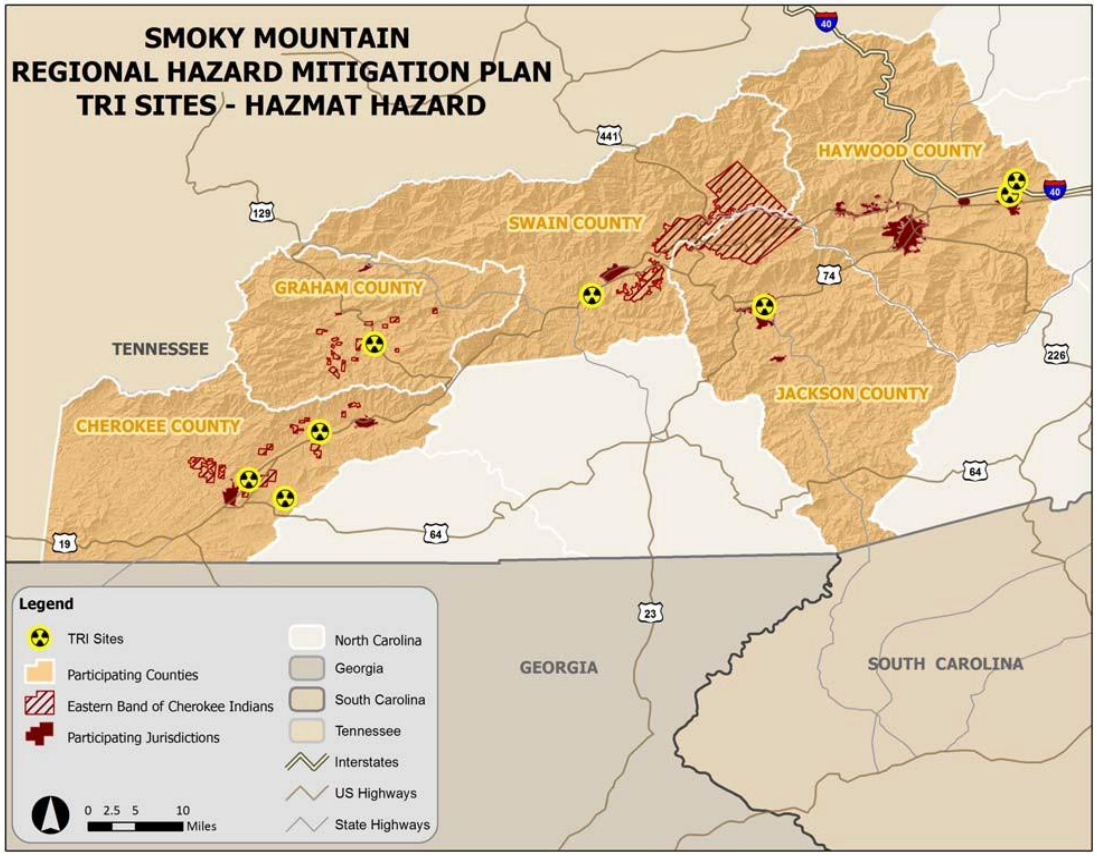
- One disaster declaration in the region
  - COVID-19 Pandemic on March 24, 2020
- NC DHHS reports 37,117 cases in region as of 3/23/22

Location	Number of Cases	Number of Deaths*
Cherokee County	7.096	117
Graham County	2,269	30
Haywood County	12,883	198
Jackson County	9,282	86
Swain County	2,069	38
Eastern Band of Cherokee Indians	3,518	32
Smoky Mountain Region Total	**37,117**	**501**

**Deaths reflect deaths in persons with laboratory-confirmed COVID-19 reported by local health departments to the NC Department of Health and Human Services.*

HAZARDOUS SUBSTANCES

- 58 serious events reported since 1970
  - *PHMSA*
- 8 TRI Facilities in the region
  - *EPA*
- Future occurrences are *possible*



HAZARDOUS SUBSTANCES EVENTS

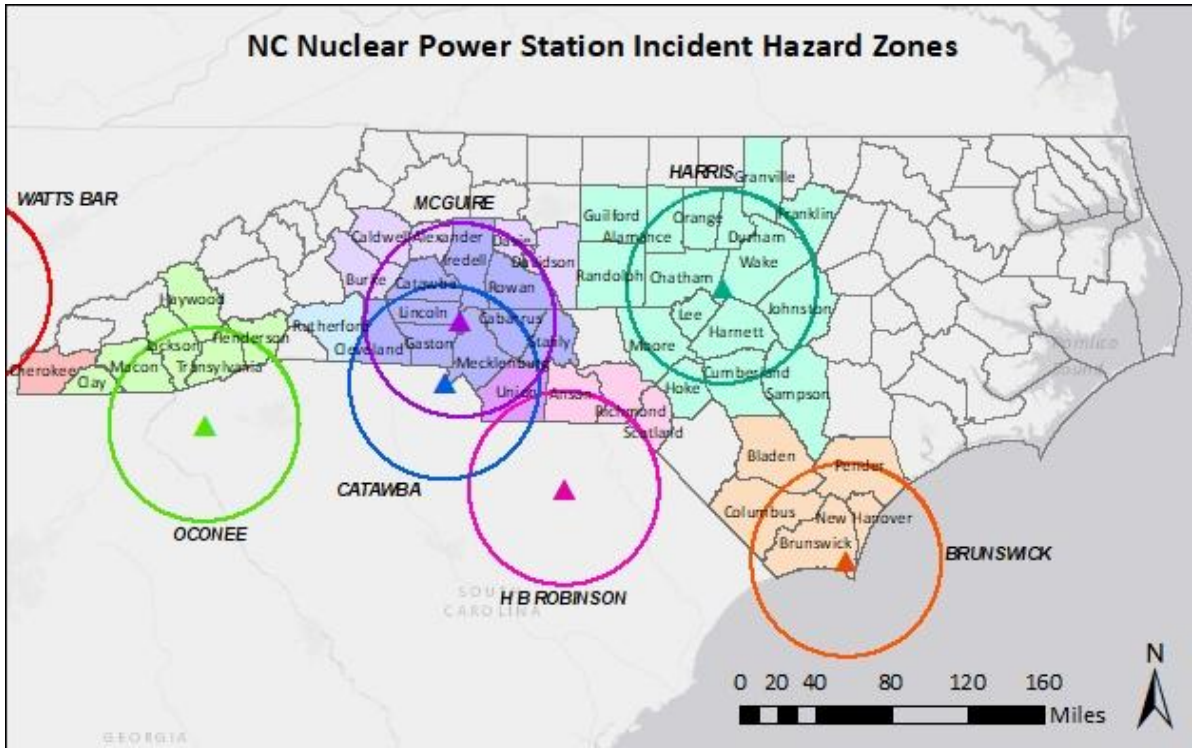
Location	Number of Occurrences	Deaths	Injuries	Property Damage (2020)
Cherokee County	**3**	**0**	**0**	**$0**
Andrews	0	0	0	$0
Murphy	3	0	0	$0
Unincorporated Area	0	0	0	$0
Graham County	**1**	**0**	**0**	**$0**
Fontana*	0	0	0	$0
Lake Santeetlah	0	0	0	$0
Robbinsville	1	0	0	$0
Unincorporated Area	0	0	0	$0
Haywood County	**32**	**0**	**0**	**$168,961**
Canton	12	0	0	$10,579
Clyde	5	0	0	$84,950
Maggie Valley	1	0	0	$4,000
Waynesville	14	0	0	$69,792
Unincorporated Area	0	0	0	$0

HAZARDOUS SUBSTANCES EVENTS, CONTINUED

Jackson County	**9**	**0**	**0**	**$2,115**
Dillsboro	0	0	0	$0
Forest Hills	0	0	0	$0
Sylva	7	0	0	$0
Webster	0	0	0	$0
Unincorporated Area	2	0	0	$2,115
Swain County	**13**	**0**	**0**	**$2,115**
Bryson City	11	0	0	$0
Unincorporated Area	2	0	0	$2,115
Eastern Band of Cherokee Indians				
SMOKY MOUNTAIN REGION TOTAL	**58**	**0**	**0**	**$173,191**

RADIOLOGICAL EMERGENCY – FIXED NUCLEAR FACILITIES

- Cherokee, Jackson, and Haywood County are within 50 miles of a nuclear facility
  - Watts Bar Nuclear Plant
  - Oconee Nuclear Station
- Future occurrences are *unlikely*



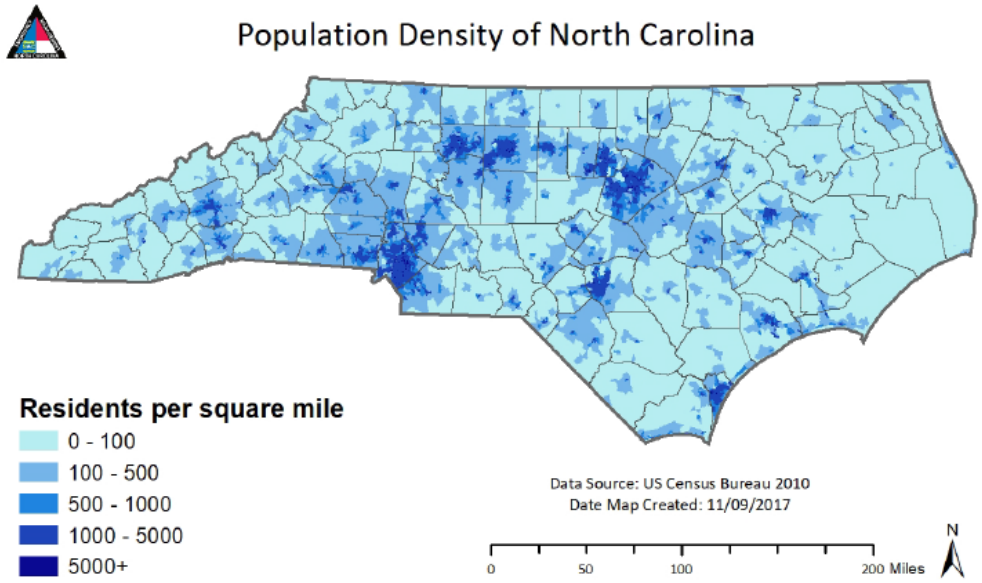
TERROR THREAT

- Examples
  - Assassinations/Armed Attack
  - Kidnapping
  - Hijacking
  - Bomb Scares and Bombing
  - Cyber Attack
  - Chemical Agent
  - Biological Agent
  - Nuclear Bomb
  - Radiological Agent
- No reported events
- Future occurrences are *unlikely*

Threat Level	Description
SEVERE	Severe Risk of Terrorist Attacks
HIGH	High Risk of Terrorist Attacks
ELEVATED	Significant Risk of Terrorist Attacks
GUARDED	General Risk of Terrorist Attacks
LOW	Low Risk of Terrorist Attacks

TERROR THREAT, CONTINUED

All areas are vulnerable to terrorism, but terror threats tend to target more densely populated areas



U.S. Department of Homeland Security Critical Infrastructure Sectors	
Areas of Assembly	Energy
Agriculture and Food	Government Facilities
Banking and Finance	Healthcare and Public Health
Chemical	Information Technology
Commercial Facilities	National Monuments and Icons
Communications	Nuclear Reactors, Materials, and Waste
Critical Manufacturing	Postal and Shipping
Dams	Transportation Systems
Defense Industrial Base	Water
Emergency Services	

CYBER

- NC Department of Information Technology specializes in cybersecurity
- "Non-payment/non – delivery" highest number of cybercrimes in NC
- Future occurrences are *likely*

Crime Type by Victim Count			
Crime Type	*Victim Count*	*Crime Type*	*Victim Count*
419/Overpayment	614	Health Care Related	10
Advanced Fee	384	IPR/Copyright and Counterfeit	58
Auction	442	Identity Theft	345
BEC/EAC	254	Investment	28
Charity	10	Lottery/Sweepstakes	119
Civil Matter	28	Malware/Scareware	62
Confidence Fraud/Romance	326	Misrepresentation	102
Corporate Data Breach	74	No Lead Value	121
Credit Card Fraud	274	Non-payment/Non-Delivery	1,844
Crimes Against Children	19	Other	218
Criminal Forums	0	Personal Data Breach	569
Denial of Service	28	Phishing/Vishing/Smishing/Pharming	399
Employment	467	Ransomware	67
Extortion	468	Re-shipping	25
Gambling	1	Real Estate/Rental	280
Government Impersonation	319	Tech Support	298
Hacktivist	2	Terrorism	6
Harassment/Threats of Violence	364	Virus	29
Descriptors*			
Social Media	455	Virtual Currency	38

Source: FBI Cybercrime Compliant Center, 2016

ELECTROMAGNETIC PULSE

- The Critical Infrastructure Protection Act (CIPA) added to the Homeland Security Act of 2002
    - Protects Americans from EMPs
- Densely populated may be more prone to damages from an EMP
    - No reports of EMP occurrences in the region
- Future occurrences are *unlikely*

PRIORITY RISK INDEX (PRI)

Qualitative method to “rank” identified hazards based on:

- Probability (30%)
- Impact (30%)
- Spatial Extent (20%)
- Warning Time (10%)
- Duration (10%)

Highest possible PRI value = 4.0

Smoky Mountain Region Highest Value = 3.3

PRI EXPLAINED

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	

PRI EXPLAINED, CONTINUED

PRI Category	Degree of Risk			Assigned Weighting Factor
	Level	Criteria	Index Value	
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	

PRI RESULTS

Hazard	Sub hazard(s) Assessed	Category/Degree of Risk					
		Probability	Impact	Spatial Extent	Warning Time	Duration	PRI Score
Natural Hazards							
Drought		Likely	Minor	Large	More than 24 hours	More than 1 week	2.5
Hurricane and Coastal Hazards		Likely	Limited	Large	More than 24 hours	Less than 24 hours	2.6
Tornadoes/ Thunderstorms	Hailstorm, Lightning	Highly Likely	Limited	Moderate	6 to 12 hours	Less than 6 hours	2.8
Severe Winter Weather		Likely	Critical	Large	More than 24 hours	Less than 1 week	3.3
Earthquakes		Likely	Minor	Moderate	Less than 6 hours	Less than 6 hours	2.3
Geological	Landslide, Sinkholes, Erosion	Highly Likely	Limited	Small	Less than 6 hours	Less than 6 hours	2.1
Dam Failure		Unlikely	Critical	Moderate	Less than 6 hours	Less than 24 hours	2.3
Flooding		Highly Likely	Critical	Small	6 to 12 hours	Less than 1 week	3.1
Other Hazards							
Wildfires		Likely	Minor	Small	Less than 6 hours	Less than 1 week	2.4
Infectious Disease		Unlikely	Limited	Moderate	More than 24 hours	More than 1 week	2.0
Technological Hazards							
Hazardous Substances		Possible	Limited	Small	Less than 6 hours	Less than 24 hours	2.2
Radiological Emergency	Fixed Nuclear Facilities	Unlikely	Critical	Moderate	6 to 12 hours	Less than 1 week	2.4
Terrorism		Unlikely	Critical	Moderate	Less than 6 hours	More than 1 week	2.6
Cyber		Likely	Minor	Moderate	Less than 6 hours	Less than 1 week	2.6
Electromagnetic Pulse		Unlikely	Limited	Large	Less than 6 hours	More than 1 week	2.5

#3

#1

#2

CONCLUSIONS ON HAZARDS RISK

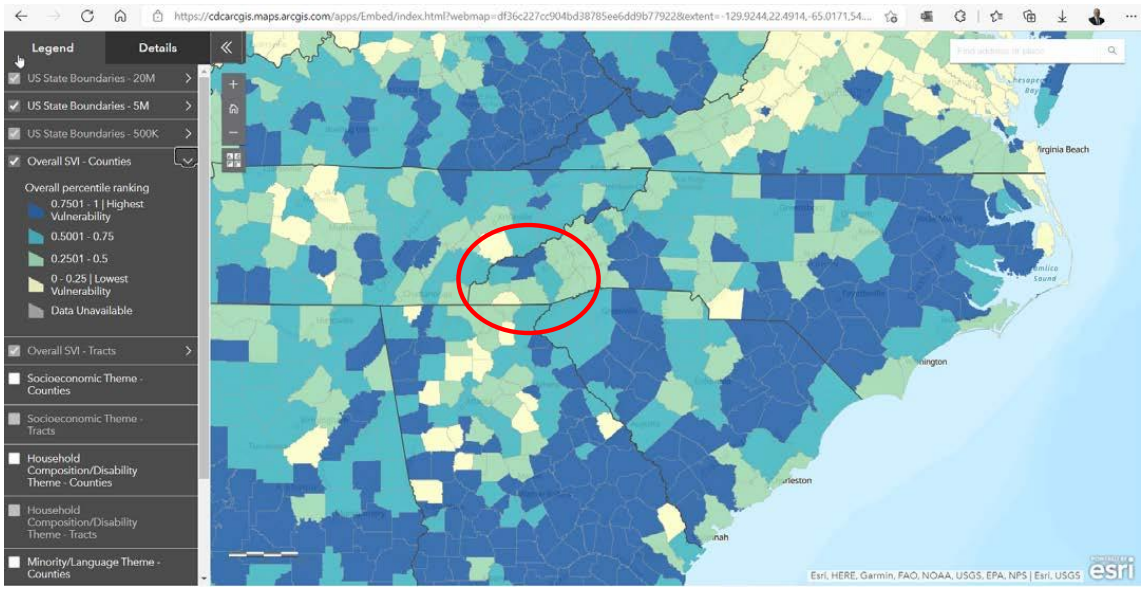
HIGH RISK	Severe Winter Weather Flood Tornadoes/Severe Thunderstorm Hurricane and Coastal Hazards
MODERATE RISK	Drought Wildfire Cyber Infectious Disease Earthquake Dam Failure Hazardous Substances Geological (Landslide)
LOW RISK	Radiological Emergency Terrorism Electromagnetic Pulse

SOCIAL VULNERABILITY

Socially vulnerable populations can be more susceptible to hazard events, based on respective factors including their physical and financial ability to react or respond during a hazard and the location and construction quality of their housing.

Demographics that can be used as indicators when quantifying social vulnerability include, but are not limited to:

- Those living in low-income households. Percent poverty is a function of the number of people in a household, that household's income, and if household income meets a threshold as defined by the US Census
- The elderly - persons aged 65 and over - as a percent of total population; and
- Children - persons under the age of 5 - as a percent of total population.



SOCIAL VULNERABILITY - CONTINUED

Vulnerable populations are likely to be seriously impacted by disasters, and least able to recover without additional support. The strength and capacity of a community's response and recovery system involves attentiveness to its most vulnerable citizens.

Jurisdiction	Total Population	Poverty Level	Elderly (65+ yrs)	Children (<5 yrs)	Disability (<65 yrs)
Population Demographics					
Cherokee County	28,774	15.1%	30.5%	4.2%	12.0%
Graham County	8,030	16.6%	24.5%	4.8%	12.9%
Haywood County	62,089	13.6%	25.0%	4.9%	13.5%
Jackson County	43,109	16.6%	19.9%	4.4%	10.7%
Swain	14,117	13.9%	19.6%	6.1%	13.1%
Eastern Band of Cherokee Indians	7,680	18.6%	15%	-	-

Source: Census Bureau, Quick Facts (2010)

CAPABILITY ASSESSMENT

Purpose

- Measures community capability to implement hazard mitigation activities
- Identifies and targets gaps, conflicts and opportunities with existing local plans, programs, policies, etc.
- Identifies mitigation measures already in place or underway

Capability Assessment Survey

- Measures existing capabilities
  - Planning and regulatory
  - Administrative and technical
  - Fiscal
  - Political

** Coupled with the Risk Assessment, the Capability Assessment helps to form the foundation for identifying Mitigation Actions*

CAPABILITY INDICATORS

- **National Flood Insurance Program (NFIP) Participation**
- **Community Rating System (CRS) Participation**
- **Building Code Effectiveness Grading Schedule (BCEGS)**
- **Local Capability Assessment Survey**
  - Inventory and evaluation of existing plans, policies, programs and ordinances
  - Measures administrative, technical, fiscal and political capability
  - Includes self-assessment of local capabilities

CAPABILITY ASSESSMENT - CONTINUED

- All jurisdictions currently participate in the NFIP
- Cherokee County participates in CRS
  - Others may want to consider as mitigation action
  - Most beneficial to areas with many NFIP policies

The National Flood Insurance Program provides insurance to help reduce the socio-economic impact of floods.



CAPABILITY ASSESSMENT - CONTINUED

Plan Policy, Program or Ordinance	Percentage*
Hazard Mitigation Plan	100%
Disaster Recovery Plan	0%
Comprehensive Land Use Plan	100%
Floodplain Management Plan	0%
Stormwater Management Plan	40%
Emergency Operations Plan	100%
Continuity of Operations Plan	60%

* Percentage of jurisdictions with item in place / under development

CAPABILITY ASSESSMENT - CONTINUED

Plan Policy, Program or Ordinance	Percentage*
Capital Improvements Plan	100%
Historic Preservation Plan	0%
Zoning Ordinance	60%
Subdivision Ordinance	100%
Flood Damage Prevention Ordinance	100%
Post-Disaster Redevelopment Plan	0%
Building Code	100%
Fire Code	100%

* Percentage of jurisdictions with item in place / under development

CAPABILITY ASSESSMENT - CONTINUED

- Planning and Regulatory Capability
  - Most jurisdictions are in Moderate or High range
- Administrative and Technical Capability
  - Variation between the jurisdictions (mainly with respect to planners, grant writers, etc.)
  - 100% of jurisdictions have staff skilled in GIS or access to GIS resources
  - All jurisdictions have emergency manager and floodplain manager
- Fiscal Capability
  - Most jurisdictions in the Moderate range
  - 100% have partnering arrangements or intergovernmental agreements

CONCLUSIONS ON CAPABILITY

	Low Vulnerability	Moderate Vulnerability	High Vulnerability
High Capability	**Best** Case Scenario		
Moderate Capability			
Low Capability			**Worst** Case Scenario

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.

Mitigation Strategy Development

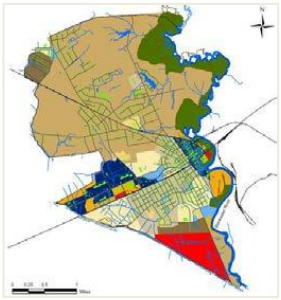
The Mitigation Action Plan is organized by mitigation strategy category (Prevention, Property Protection, Natural Resource Protection, Structural Projects, Emergency Services, or Public Education and Awareness). The following are the key elements described in the Mitigation Action Plan:

- 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.

THINK OF MITIGATION THIS WAY…

1) We want to mitigate hazard impacts on the existing development in our communities
   - Houses, businesses, infrastructure, critical facilities, etc.
2) We want to ensure that future development is conducted in a way that doesn't increase our vulnerability
   - Best done by having good plans, policies and procedures in place







THINK OF MITIGATION ACTIONS THIS WAY

- Risk Assessments help us identify Problem Statements:
  - EXAMPLE: Our community has X properties in the floodplain.
- A Mitigation Action helps identify a solution to that problem:
  - EXAMPLE: Seek funding through FEMA Mitigation Grant programs to remove flood prone properties from the floodplain.

MITIGATION TECHNIQUES

Prevention	Property Protection	Natural Resource Protection	Structural Projects	Emergency Services	Public Education/ Awareness
Planning and zoning	Acquisition	Floodplain protection	Reservoirs	Warning systems	Outreach projects
Building codes	Relocation	Watershed management	Dams, levees, dikes	Emergency response equipment	Speaker series/ demonstration events
Open space preservation	Building elevation	Riparian buffers	Floodwalls	Shelter Operations	Hazard map information
Floodplain regulations	Critical facilities protection	Forest management	Stormwater diversions	Evacuation planning and management	Real estate disclosure
Stormwater management regulations	Retrofitting	Erosion and sediment control	Detention/ retention basins	Emergency response training and exercises	Library materials
Drainage system maintenance	Safe rooms, shutters, shatter-resistant glass	Wetland preservation and restoration	Channel modification	Sandbagging for flood protection	School children educational programs
Capital improvements programming	Insurance	Habitat preservation	Storm sewers	Temporary shutters	Hazard expositions
Setbacks					

Step 1: Review Regional Goals

	Goal
Goal #1	Increase public awareness of hazard mitigation and hazard risk.
Goal #2	Enhance or create new policies that will help reduce the damaging effects of all hazards including natural, man-made and technological hazards.
Goal #3	Increase capabilities to support and implement effective mitigation measures.
Goal #4	Identify and mitigate development and infrastructure in known hazard areas and consider the risks, impacts, and potential mitigation measures to incorporate if proposing to build new structures in known hazard areas.
Goal #5	Encourage conservation of natural environments including forests, surface waters, wetlands, floodplains, and stream corridors.
Goal #6	Improve emergency service capabilities by identifying and seeking funding for necessary equipment as well as fostering regional cooperation for response and recovery.

MITIGATION STRATEGY - CONTINUED

Step 2: Update Mitigation Actions

- Provide status update for existing mitigation actions (completed, deleted, deferred)

Jurisdiction	Mitigation Actions	Jurisdiction	Mitigation Actions
Cherokee County	25	Haywood County	32
Town of Andrews	15	Town of Canton	20
Town of Murphy	15	Town of Clyde	20
Graham County	25	Town of Maggie	21
Town of Fontana Dam	8	Town of Waynesville	20
Town of Lake Santeetlah	9	Jackson County	24
Town of Robbinsville	12	Town of Dillsboro	10
Swain County	19	Village of Forest Hills	24
Town of Bryson City	17	Town of Sylva	27
Eastern Band of Cherokee Indians	44	Town of Webster	27

MITIGATION STRATEGY - CONTINUED

Step 3: Identification of New Actions

- Identify and discuss a full range of possible mitigation projects/available mitigation techniques
  - Consistent with mitigation goals and other community objectives
  - Based on hazard risk and local capability
- Critical facilities that need retrofitting/relocated
- Projects/activities to reduce hazard impacts
- Alleviate repetitive flood losses
- Others? (Emergency Services, Prevention, Natural Resource Protection, Property Protection, Structural Projects, Public Education)

MITIGATION STRATEGY - CONTINUED

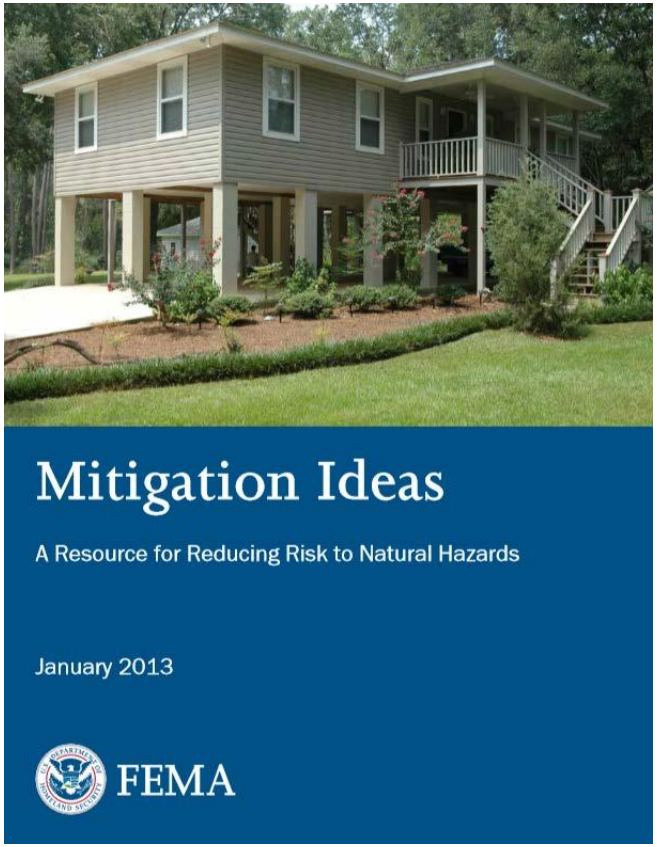
Alleviate repetitive loss properties

Location	Number of Properties	Number of Losses	Total Payments
Cherokee County	8	12	$131,655
Graham County	0	0	$0
Haywood County	17	28	$1,493,231
Jackson County	2	4	$66,433
Swain County	1	5	$246,564
Eastern Band of Cherokee Indians	1	3	$236,298
Smoky Mountain Region Total	**23**	**52**	**$2,174,181**

MITIGATION STRATEGY - CONTINUED

In General…

- Strengthen and Protect Critical Facilities
- Educate Public
  - Seasonal hazard awareness weeks
  - Encourage household preparedness (www.ready.gov)
- Identify pre-existing structures/rooms for sheltering
- Discourage future building in known hazard areas
  - Flood prone areas are often great for parks!
  - Create regulations to prevent development or require more stringent building standards



MITIGATION STRATEGY - CONTINUED

Potential Actions to Mitigate Winter Weather

Buildings and infrastructure can be protected from the impacts of winter storms with the following regulations:

- Adopting the International Building Code (IBC) and International Residential Code (IRC).
- Ensuring the development and enforcement of building codes for roof snow loads.
- Discouraging flat roofs in areas that experience heavy snows.
- Adding building insulation to walls and attics.
- As buildings are modified, using new technology to create or increase structural stability.
- Retrofitting public buildings to withstand snow loads and prevent roof collapse.

MITIGATION STRATEGY - CONTINUED

Potential Actions to Mitigate Winter Weather

Power lines can be protected from the impacts of winter storms with the following techniques:

- Establishing standards for all utilities regarding tree pruning around lines.
- Burying overhead power lines.
- Using designed-failure mode for power line design to allow lines to fall or fail in small sections rather than as a complete system to enable faster restoration.
- Installing redundancies and loopfeeds.

MITIGATION STRATEGY - CONTINUED

Potential Actions to Mitigate Winter Weather

Public awareness of severe winter storms can be improved through the following efforts:

- Informing the public about severe winter weather impacts.
- Producing and distributing family and traveler emergency preparedness information about severe winter weather hazards.
- Including safety strategies for severe weather in driver education classes and materials.
- Encouraging homeowners to install carbon monoxide monitors and alarms.
- Educating citizens that all fuel-burning equipment should be vented to the outside.

Protect vulnerable populations from the impacts of severe winter storms through the following efforts:

- Identifying specific at-risk populations that may be exceptionally vulnerable in the event of long-term power outages.
- Organizing outreach to vulnerable populations, including establishing and promoting accessible heating centers in the community.

MITIGATION STRATEGY - CONTINUED

Potential Actions to Mitigate Flooding

Local planning and regulatory efforts can be improved by:

- Designating a local floodplain manager and/or CRS coordinator who achieves CFM certification.
- Establishing watershed-based planning initiatives to address the flood hazard with neighboring jurisdictions.
- Limiting the percentage of allowable impervious surface within developed parcels.
- Adding or increasing “freeboard” requirements (feet above base flood elevation) in the flood damage ordinance.

MITIGATION STRATEGY - CONTINUED

Potential Actions to Mitigate Flooding

Structure and Infrastructure Projects can be conducted safely by:

- Removing existing structures from flood hazard areas
- Installing, re-routing, or increasing the capacity of a storm drainage system.
- Conducting regular maintenance for drainage systems and flood control substances

Natural Systems can be protected through:

- Protecting and preserving wetlands to help prevent flooding in other areas.
- Developing an open space acquisition, reuse, and preservation plan targeting hazard areas.

MITIGATION STRATEGY - CONTINUED

Potential Actions to Mitigate High Wind/Thunderstorm/Tornado

- Strengthen building codes
  - Tie-down requirements for manufactured housing
  - Require structural bracing, straps/clips, anchor bolts, etc.
- Protect power lines/traffic signals
  - Schedule regular inspections of utility poles to ensure quality
  - Mast arms for traffic lights
- Retrofit buildings/facilities
  - Anchor roof-mounted ventilation and heat/AC units
  - Use load path connectors to strengthen structure
- Safe rooms
  - Require in new schools, nursing homes
  - Encourage construction in shopping malls, fairgrounds, manufactured home parks

MITIGATION ACTION PLAN

EXAMPLE

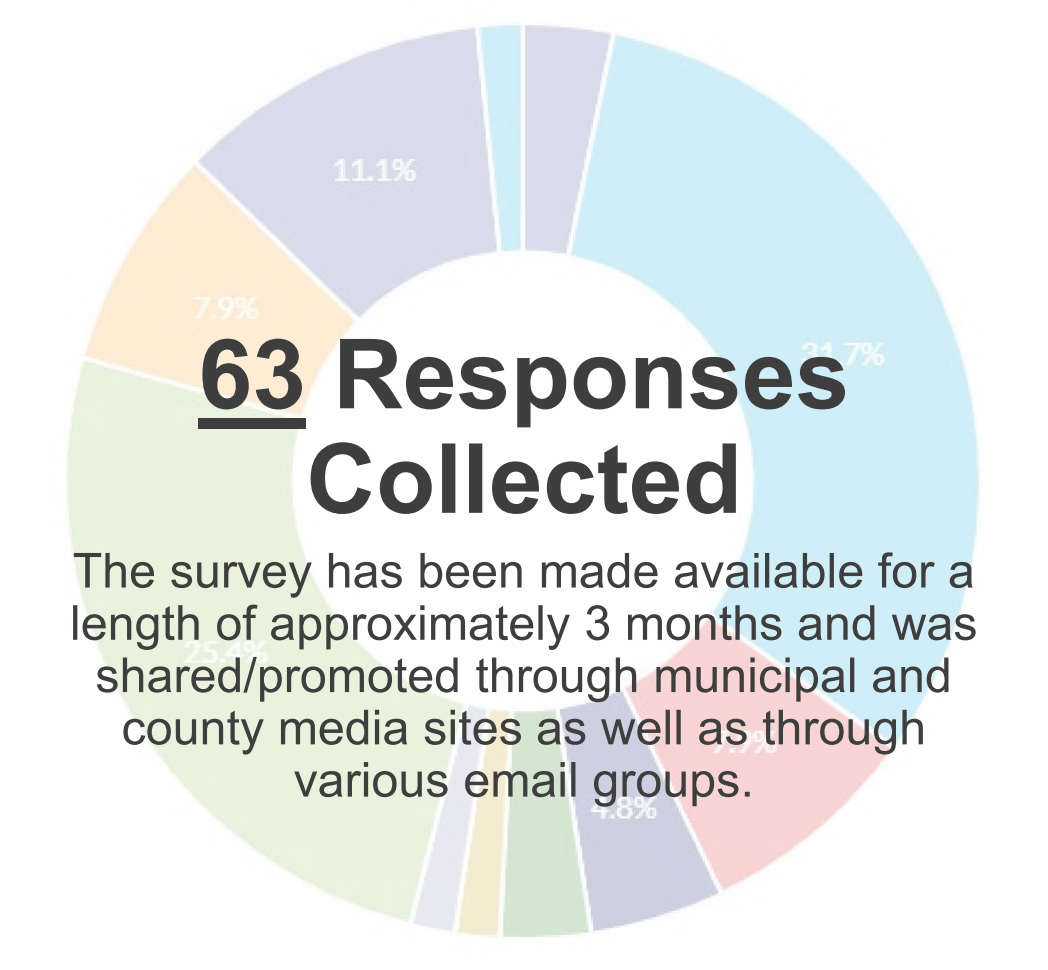
ACTION #PP-13

Evaluate safety and security of critical services (public and private) and facilities – roads, bridges, water, sewer, electricity, etc. – and critical facilities – fire, rescue, medical, etc.

Category:	Property Protection
Hazard Addressed:	Flood
Priority:	High
Potential Funding Sources:	Local
Lead Agency/Department:	Board of Commissioners, Emergency Management, WSACC, Power and Gas Companies, Carolinas Medical Center, NCDOT
Target Completion Date:	2019
Implementation Status (2014):	Deferred. This action will be revisited during the 2019 update of the hazard mitigation plan.



PUBLIC SURVEY RESULTS

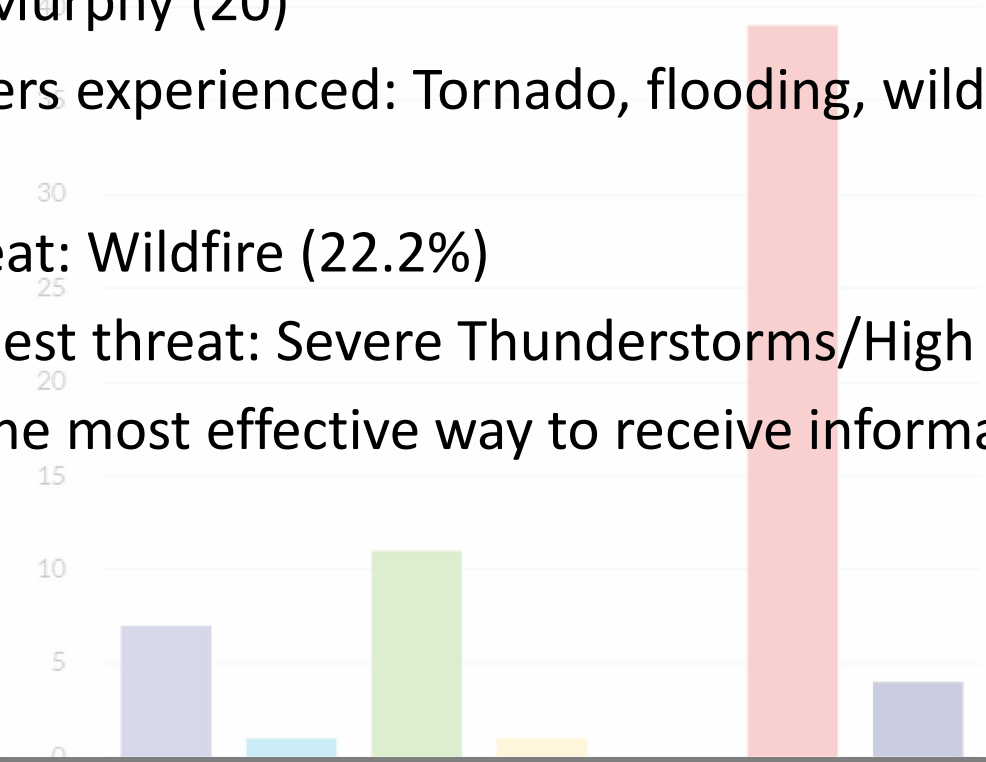


63 Responses Collected

The survey has been made available for a length of approximately 3 months and was shared/promoted through municipal and county media sites as well as through various email groups.

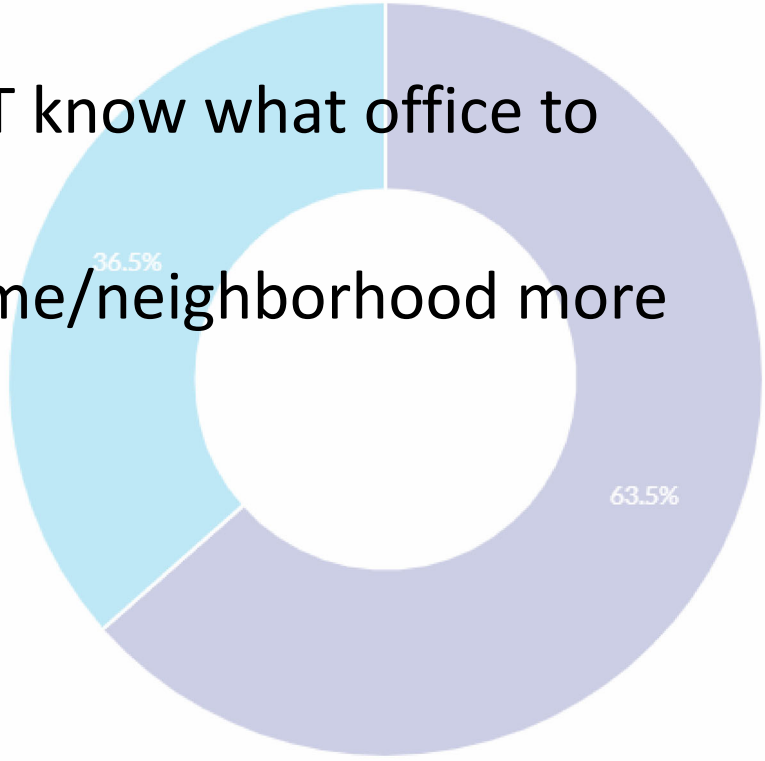
PUBLIC SURVEY RESULTS

- 63 public responses for the region
  - Most from Murphy (20)
  - Most disasters experienced: Tornado, flooding, wildfires, winter weather
  - Highest threat: Wildfire (22.2%)
  - Second highest threat: Severe Thunderstorms/High Wind (19%)
  - Internet is the most effective way to receive information (61.9%



PUBLIC SURVEY RESULTS - CONTINUED

- 71.4% are interested in making their homes/neighborhoods more resistant to hazards
- **66.7%** of responses said they do NOT know what office to contact regarding risk reduction
- Examples of steps taken to make home/neighborhood more resistant to disasters:
  - Vegetation maintenance
  - Drainage improvements
  - Generators



PUBLIC SURVEY RESULTS - CONTINUED

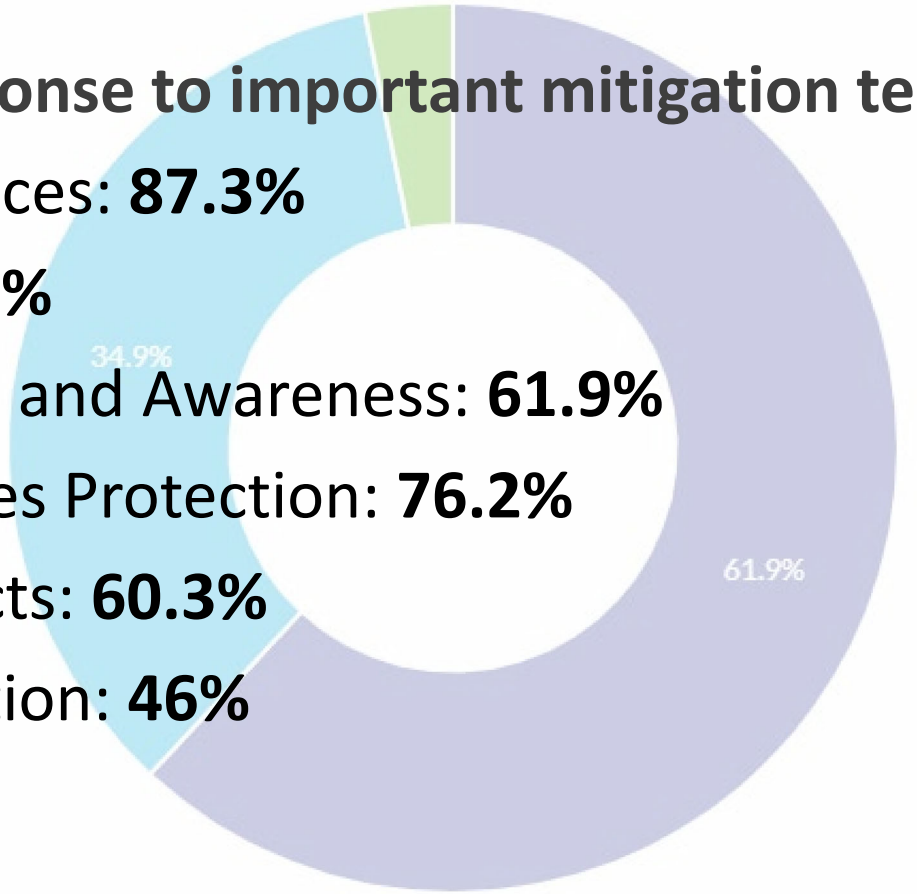
What are some steps your local government could take to reduce or eliminate the risk of future hazard damages?

- “Better infrastructure and communication.”
- “Properly maintain town/county roadways.”
- “Training for government officials and first responders.”
- “Improved drainage in low-lying areas.”
- “Vegetation maintenance especially near powerlines.”
- “Develop proactive plans to address hazards.”

PUBLIC SURVEY RESULTS - CONTINUED

Community's response to important mitigation techniques:

- Emergency Services: **87.3%**
- Prevention: **77.8%**
- Public Education and Awareness: **61.9%**
- Natural Resources Protection: **76.2%**
- Structural Projects: **60.3%**
- Property Protection: **46%**



PLAN MAINTENANCE

- Monitoring and reporting
- Evaluating and updating
- Implementation mechanisms
- Continued public involvement



NEXT STEPS

- Provide updates for existing Mitigation Actions
- Provide “new” Mitigation Actions
- Complete draft of plan to be delivered by ESP
- Current Plan Expires: May 2023



QUESTIONS, ISSUES OR CONCERNS

- Nathan Slaughter, AICP, CFM
  - (919) 415-2726
  - nslaughter@espassociates.com
- Andrew Olive
  - aolive@espassociates.com
- Hannah Delude
  - hdelude@espassociates.com

ESP

Meeting Summary

Total Number of Participants	12
Meeting Title	Smoky Mountain Regional HMP Update: Kickoff Meeting
Meeting Start Time	10/27/2021, 9:50:32 AM
Meeting End Time	10/27/2021, 11:04:53 AM
Meeting Id	50e8d2f1-7270-4d7d-b609-f85fef52c09e

Full Name	Join Time	Leave Time	Duration	Email	Role	Participant ID (UPN)
Nathan Slaughter	10/27/2021, 9:50:32 AM	10/27/2021, 11:01:51 AM	1h 11m	nslaughter@espassociates.com	Organizer	nslaughter@espassociates.com
Crew, John (NCEM)	10/27/2021, 9:56:22 AM	10/27/2021, 11:01:47 AM	1h 5m	John.Crew@ncdps.gov	Presenter	John.Crew@ncdps.gov
Baker, Carl (NCEM)	10/27/2021, 9:56:23 AM	10/27/2021, 11:01:54 AM	1h 5m	carl.baker@ncdps.gov	Presenter	carl.baker@ncdps.gov
David Breedlove (Guest)	10/27/2021, 9:56:23 AM	10/27/2021, 11:04:53 AM	1h 8m		Presenter	
Robert Panther	10/27/2021, 9:56:42 AM	10/27/2021, 11:01:52 AM	1h 5m	robepant@ebci-nsn.gov	Presenter	robepant@ebci-nsn.gov
Cherokee County (Guest)	10/27/2021, 9:59:01 AM	10/27/2021, 11:04:49 AM	1h 5m		Presenter	
Joshua Turner	10/27/2021, 9:59:11 AM	10/27/2021, 11:02:49 AM	1h 3m	jturner@ebci-nsn.gov	Presenter	jturner@ebci-nsn.gov
Swain County EOC (Guest)	10/27/2021, 9:59:11 AM	10/27/2021, 11:01:55 AM	1h 2m		Presenter	
Zack Koonce	10/27/2021, 9:59:55 AM	10/27/2021, 11:02:32 AM	1h 2m	zack.koonce@haywoodcountync.gov	Presenter	zack.koonce@haywoodcountync.gov
Mollie Grant	10/27/2021, 10:01:59 AM	10/27/2021, 11:01:56 AM	59m 57s	mollgran@ebci-nsn.gov	Presenter	mollgran@ebci-nsn.gov
Lara Feinberg	10/27/2021, 10:02:43 AM	10/27/2021, 11:01:47 AM	59m 4s	lfeinberg@jsdwater.org	Presenter	lfeinberg@jsdwater.org
18283596430	10/27/2021, 10:04:49 AM	10/27/2021, 11:02:05 AM	57m 16s		Attendee	

Meeting Summary

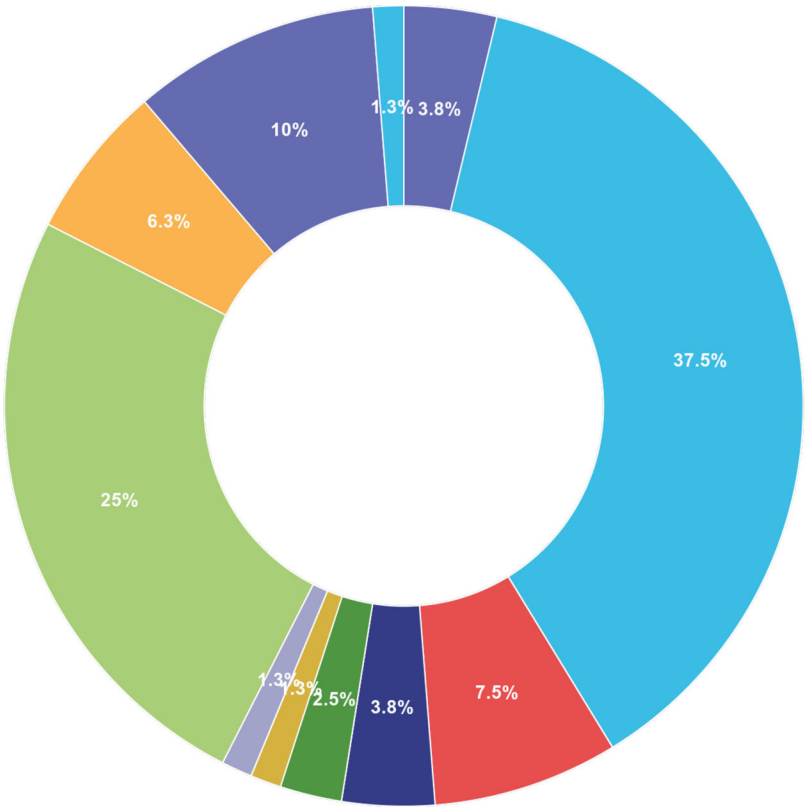
Total Number of Participants	30
Meeting Title	Smoky Mountain Regional HMP - Mitigation Strategy Meeting
Meeting Start Time	3/24/2022, 9:50:38 AM
Meeting End Time	3/24/2022, 11:37:17 AM
Meeting Id	49903e35-8d2c-4c48-ae59-3eb1a6c2e699

Full Name	Join Time	Leave Time	Duration	Email	Role	Participant ID (UPN)
Nathan Slaughter	3/24/2022, 9:50:38 AM	3/24/2022, 11:30:47 AM	1h 40m	nslaughter@espassociates.com	Organizer	nslaughter@espassociates.com
jodie ferguson (Guest)	3/24/2022, 9:54:26 AM	3/24/2022, 11:30:36 AM	1h 36m		Presenter	
David Breedlove (Guest)	3/24/2022, 9:54:26 AM	3/24/2022, 11:30:34 AM	1h 36m		Presenter	
Sam Davis (Guest)	3/24/2022, 9:56:11 AM	3/24/2022, 11:30:42 AM	1h 34m		Presenter	
Baker, Carl (NCEM)	3/24/2022, 9:56:25 AM	3/24/2022, 11:30:54 AM	1h 34m	carl.baker@ncdps.gov	Presenter	carl.baker@ncdps.gov
Zack Koonce	3/24/2022, 9:56:43 AM	3/24/2022, 10:57:54 AM	1h 1m	zack.koonce@haywoodcountync.gov	Presenter	zack.koonce@haywoodcountync.gov
Lara Feinberg	3/24/2022, 9:57:25 AM	3/24/2022, 10:04:22 AM	6m 57s	lfeinberg@jsdwater.org	Presenter	lfeinberg@jsdwater.org
Lara Feinberg	3/24/2022, 10:06:40 AM	3/24/2022, 11:30:19 AM	1h 23m	lfeinberg@jsdwater.org	Presenter	lfeinberg@jsdwater.org
Jeanine M. Harris	3/24/2022, 9:57:44 AM	3/24/2022, 11:30:30 AM	1h 32m	Jeanine.Harris@haywoodcountync.gov	Presenter	jeanine.harris@haywoodcountync.gov
Todd Dillard (Guest)	3/24/2022, 9:57:48 AM	3/24/2022, 11:30:29 AM	1h 32m		Presenter	
Robin Caldwell (Guest)	3/24/2022, 9:58:10 AM	3/24/2022, 11:30:50 AM	1h 32m		Presenter	
Misty Tabor (Guest)	3/24/2022, 9:58:19 AM	3/24/2022, 11:30:36 AM	1h 32m		Presenter	
Hannah Delude	3/24/2022, 9:58:37 AM	3/24/2022, 11:30:37 AM	1h 31m	hdelude@espassociates.com	Presenter	hdelude@espassociates.com
Mello, John (NCEM)	3/24/2022, 9:58:39 AM	3/24/2022, 11:30:45 AM	1h 32m	John.Mello@ncdps.gov	Presenter	John.Mello@ncdps.gov
Robert Smith (Guest)	3/24/2022, 9:58:56 AM	3/24/2022, 11:30:47 AM	1h 31m		Presenter	
Chief Jeff Haynes	3/24/2022, 9:59:47 AM	3/24/2022, 11:30:30 AM	1h 30m	Jeff.Haynes@haywoodcountync.gov	Presenter	jeff.haynes@haywoodcountync.gov
Travis Donaldson	3/24/2022, 9:59:56 AM	3/24/2022, 11:37:17 AM	1h 37m	Travis.Donaldson@haywoodcountync.gov	Presenter	travis.donaldson@haywoodcountync.gov
Crew, John (NCEM)	3/24/2022, 9:59:59 AM	3/24/2022, 11:30:30 AM	1h 30m	John.Crew@ncdps.gov	Presenter	John.Crew@ncdps.gov
18284797967	3/24/2022, 10:00:10 AM	3/24/2022, 11:03:37 AM	1h 3m		Attendee	
Nick Scheuer	3/24/2022, 10:00:51 AM	3/24/2022, 11:17:48 AM	1h 16m	nscheuer@cantonnc.com	Presenter	nscheuer@cantonnc.com
Maria Hass (Guest)	3/24/2022, 10:00:53 AM	3/24/2022, 11:33:30 AM	1h 32m		Presenter	
Cody W Grasty	3/24/2022, 10:01:18 AM	3/24/2022, 11:30:53 AM	1h 29m	cody.grasty@haywoodcountync.gov	Presenter	cody.grasty@haywoodcountync.gov
Andrew Olive	3/24/2022, 10:02:54 AM	3/24/2022, 11:30:57 AM	1h 28m	aolive@espassociates.com	Presenter	aolive@espassociates.com
Robert Panther	3/24/2022, 10:03:27 AM	3/24/2022, 11:30:54 AM	1h 27m	robepant@ebci-nsn.gov	Presenter	robepant@ebci-nsn.gov
Brian Stevens	3/24/2022, 10:03:32 AM	3/24/2022, 11:30:37 AM	1h 27m	Brian.Stevens@grahamcounty.org	Presenter	brian.stevens@grahamcounty.org
Joy (Guest)	3/24/2022, 10:04:48 AM	3/24/2022, 11:30:29 AM	1h 25m		Presenter	
Lisa Stinnett	3/24/2022, 10:05:04 AM	3/24/2022, 10:19:01 AM	13m 56s	lstinnett@cantonnc.com	Presenter	lstinnett@cantonnc.com
Ira Dove	3/24/2022, 10:05:39 AM	3/24/2022, 11:30:31 AM	1h 24m	ira.dove@haywoodcountync.gov	Presenter	ira.dove@haywoodcountync.gov
Regina (Guest)	3/24/2022, 10:07:29 AM	3/24/2022, 11:31:29 AM	1h 24m		Presenter	
18284883335	3/24/2022, 10:13:10 AM	3/24/2022, 11:30:45 AM	1h 17m		Attendee	
Jon Crist (Guest)	3/24/2022, 11:16:30 AM	3/24/2022, 11:30:33 AM	14m 2s		Presenter	

Smoky Mountain Regional Hazard Mitigation Plan - Public Survey

Please take my survey - thanks!

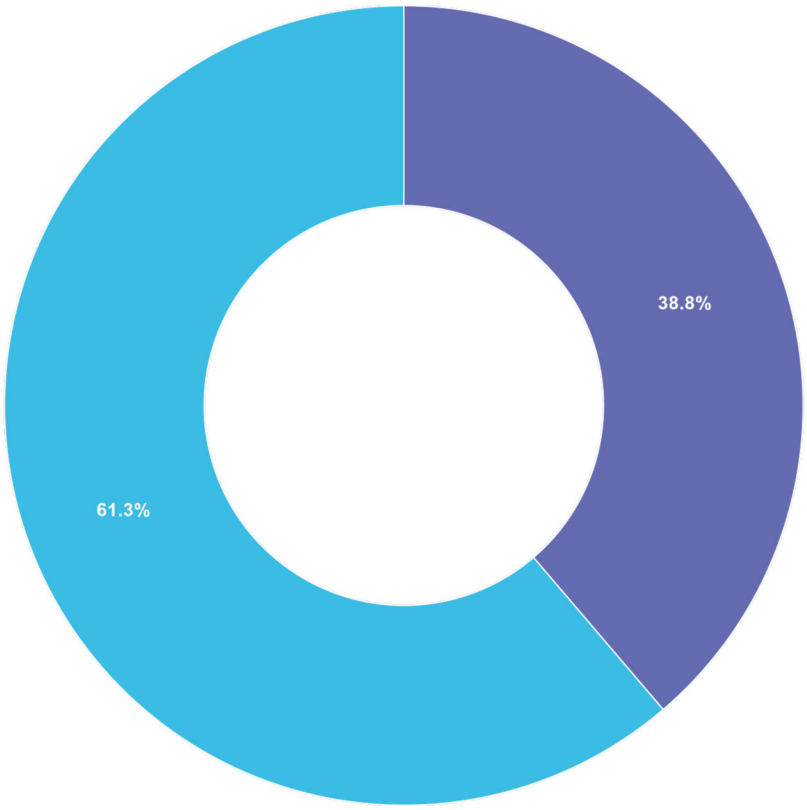
Q1 1\. Where do you live?*



Answered: 80 **Unanswered:** 0

Choice	Total
Andrews	3
Murphy	30
Fontana	0
Lake Santeetlah	0
Robbinsville	0
Bryson City	6
Canton	3
Clyde	0
Maggie Valley	2
Waynesville	1
Dillsboro	0
Forest Hills	0
Sylva	1
Webster	0
Unincorporated Cherokee County	20
Unincorporated Graham County	0
Unincorporated Haywood County	5
Unincorporated Jackson County	0
Unincorporated Swain County	8
Eastern Band of Cherokee Indians Tribal Reservation Lands	1

Q2 2\. Have you ever experienced or been impacted by a disaster in Cherokee, Graham, Swain, Haywood, or Jackson County?*



Answered: 80 **Unanswered:** 0

	Choice	Total
●	Yes	31
●	No	49

Q3 3\. If “Yes,” please explain.

Wednesday, April 13, 2022, 4:30 PM UTC

Tornado

Monday, March 28, 2022, 2:48 AM UTC

Flooding

Wednesday, March 23, 2022, 1:57 AM UTC

Flooding Hiwassee river

Saturday, March 5, 2022, 9:41 PM UTC

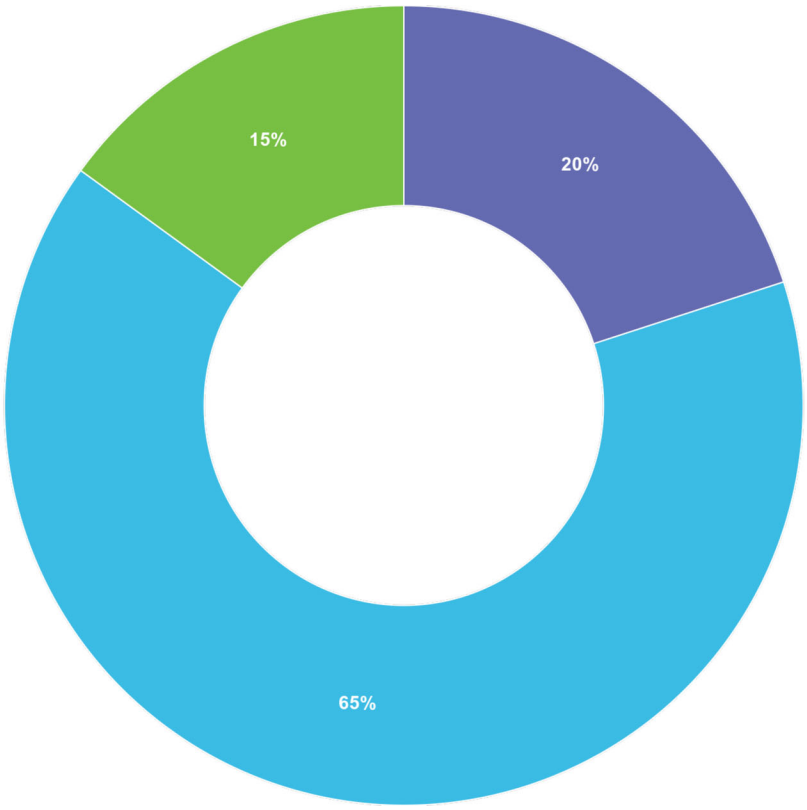
COVID, weather realated, house broke into

Sunday, February 13, 2022, 6:20 PM UTC

Eviction

Answered: 30 **Unanswered:** 50

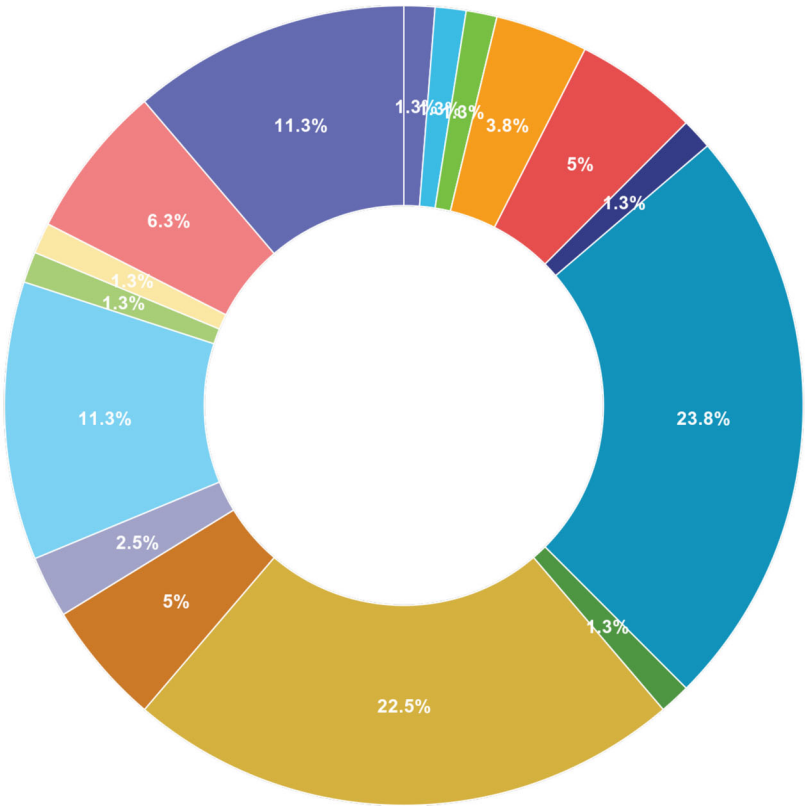
Q4 4\. How concerned are you about the possibility of your community being impacted by a disaster?*



Answered: 80 **Unanswered:** 0

	Choice	Total
	Extemely concerned	16
	Somewhat concerned	52
	Not concerned	12

Q5 5\. Please select the **one** hazard you think is the highest threat to your neighborhood:*

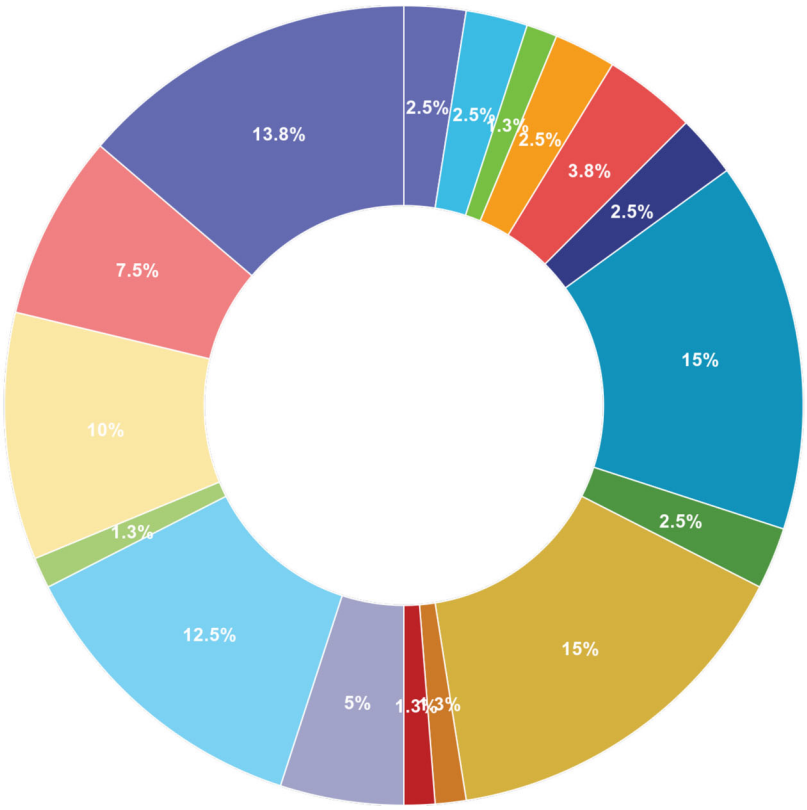


Answered: 80 **Unanswered:** 0

	Choice	Total
	Cyber Attack	1
	Drought	1
	Electromagnetic Pulse (EMP)	1
	Excessive Heat	0
	Hazardous Substances	3
	Infectious Disease (like COVID-19)	4
	Lightning	1
	Severe Thunderstorms/High Winds	19
	Terrorism	1
	Wildfire	18

Choice	Total
Dam Failure	4
Earthquakes	0
Erosion	2
Flooding	9
Hurricane and Coasta; Hazards	1
Landslides	1
Radiological Emergency	0
Severe Winter Weather	5
Tornadoes	9

Q6 6\. Please select the **one** hazard you think is the second highest threat to your neighborhood:*



Answered: 80 **Unanswered:** 0

Choice	Total
Cyber Attack	2
Drought	2
Electromagnetic Pulse (EMP)	1
Excessive Heat	0
Hazardous Substances	2
Infectious Disease	3
Lightning	2
Severe Thunderstorms/High Wind	12
Terrorism	2
Wildfire	12

Choice	Total
Dam Failure	1
Earthquake	1
Erosion	4
Flooding	10
Hurricane and Coastal Hazards	1
Landslides	8
Radiological Emergency	0
Severe Winter Weather	6
Tornado	11

Q7 7\. Are there any other hazards that you feel pose a wide-scale threat to your community? If so, please explain:

Friday, May 27, 2022, 2:07 PM UTC

Not really sure I'm just buying in Murphy NC

Tuesday, May 17, 2022, 9:13 PM UTC

Lake of planned unit developments

Thursday, April 28, 2022, 1:55 PM UTC

Brush fires

Monday, April 25, 2022, 1:38 AM UTC

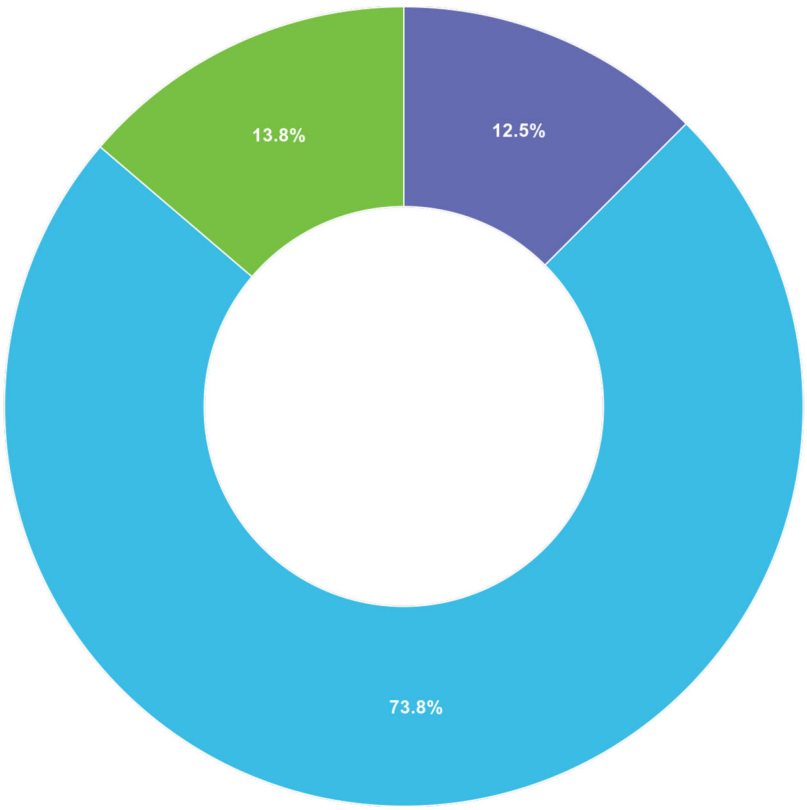
Crypto Mining. Crypto mining will destroy quality of life due to the noise from the fans to keep the computers cool.

Monday, March 28, 2022, 2:48 AM UTC

Safety hazards cause by homeless criminals

Answered: 33 **Unanswered:** 47

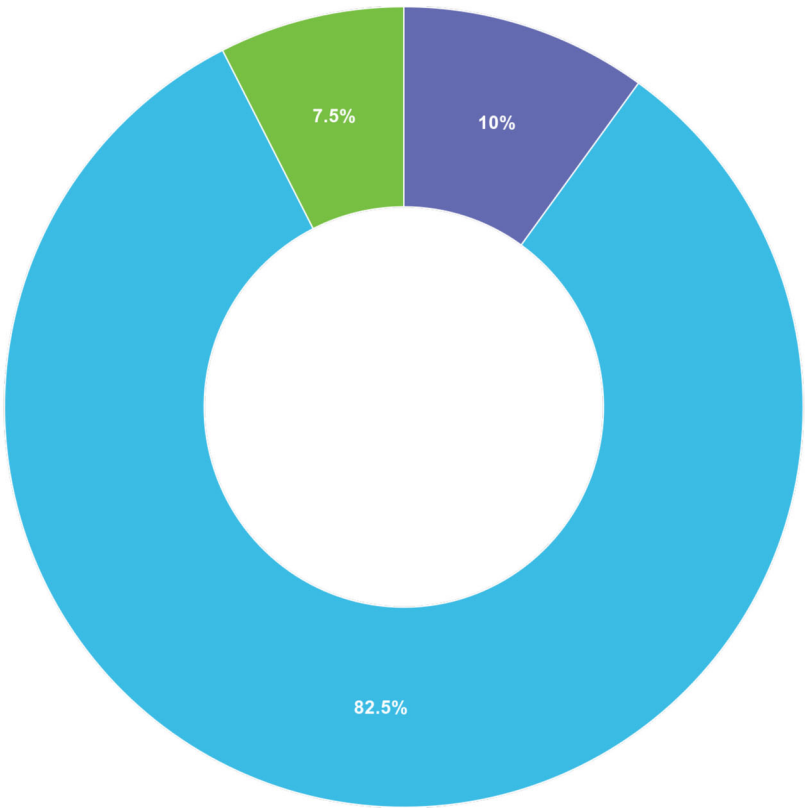
Q8 8\. Is your home located in a floodplain?*



Answered: 80 **Unanswered:** 0

Choice	Total
Yes	10
No	59
I'm not sure	11

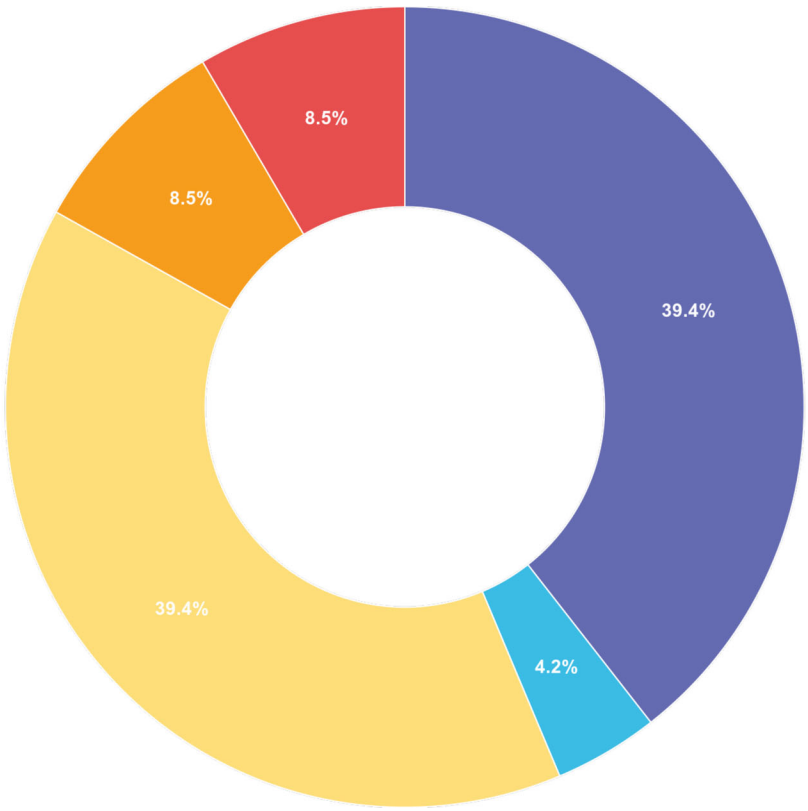
Q9 9\. Do you have flood insurance?*



Answered: 80 **Unanswered:** 0

Choice	Total
Yes	8
No	66
I'm not sure	6

Q10 10\. If you do not have flood insurance, why not?



Answered: 71 **Unanswered:** 9

Choice	Total
Not located in floodplain	28
Too expensive	3
Not necessary because it never floods	0
Not necessary because I am elevated or otherwise protected	28
Never really considered it	6
Other	6

Q11 11\. If "Other," please explain:

Saturday, March 5, 2022, 9:41 PM UTC

My home is covered

Sunday, February 13, 2022, 6:20 PM UTC

Slumlord

Tuesday, February 8, 2022, 3:27 PM UTC

we have to wait until our home insurance renews to add it to our policy

Monday, February 7, 2022, 5:42 PM UTC

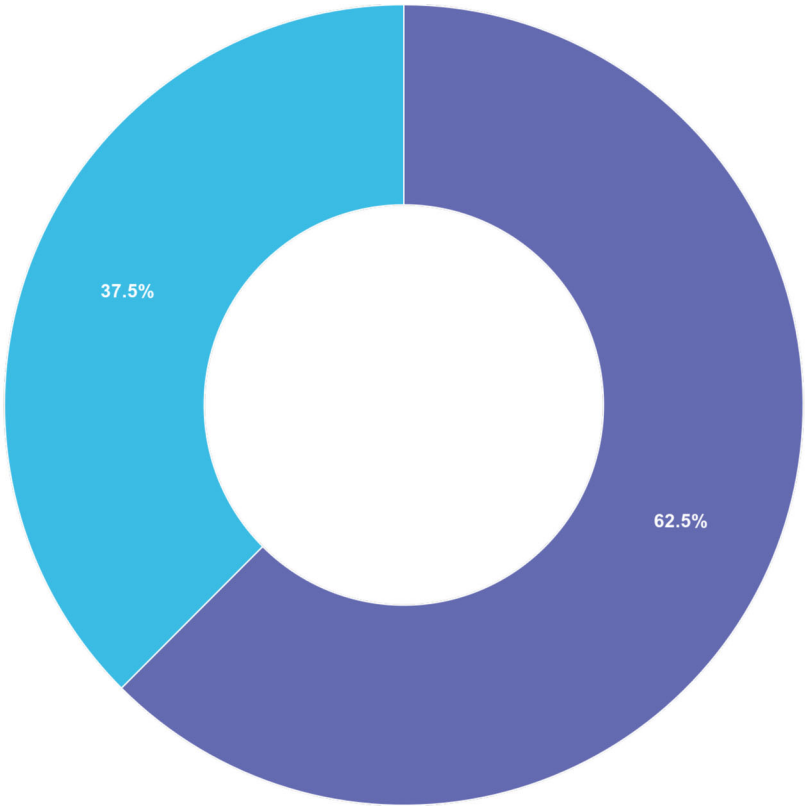
N/A

Monday, February 7, 2022, 4:39 PM UTC

NA

Answered: 6 **Unanswered:** 74

Q12 12\. Have you taken any steps to make your home or neighborhood more resistant to hazards?*



Answered: 80 **Unanswered:** 0

Choice	Total
Yes	50
No	30

Q13 13\. If "Yes," please explain:

Tuesday, May 17, 2022, 9:13 PM UTC

cameras and added security

Monday, April 25, 2022, 7:34 PM UTC

clearings around house and outbuildings

Thursday, April 21, 2022, 2:47 PM UTC

Keep vegetation near home clear. Built the house out of flood plan. Limited storage of combustibles.

Wednesday, April 20, 2022, 11:49 PM UTC

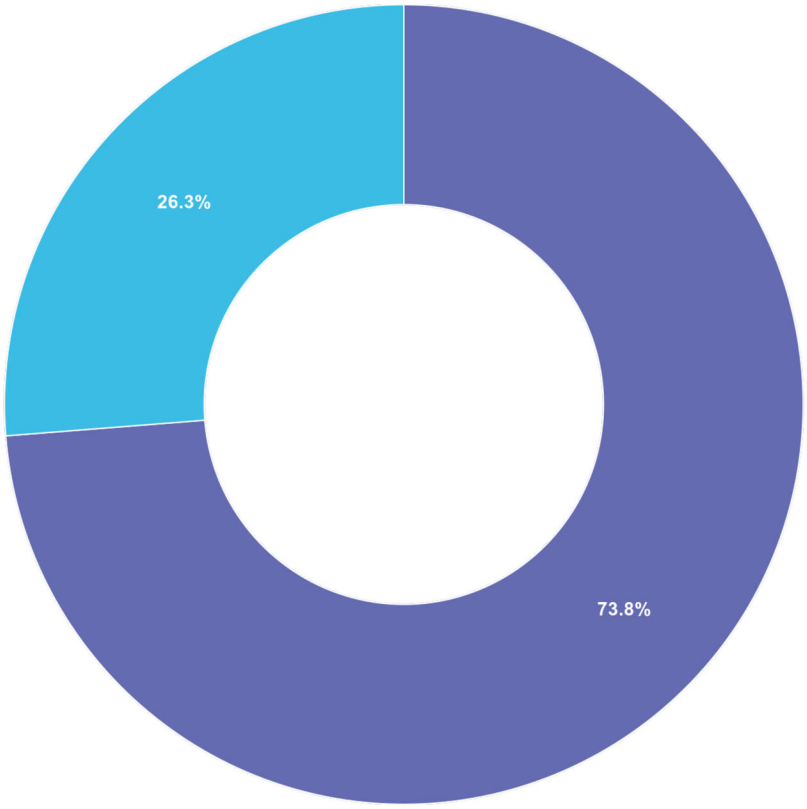
Removed flammable vegetation from area reducing wildfire threat

Saturday, April 16, 2022, 7:01 AM UTC

Fill

Answered: 44 **Unanswered:** 36

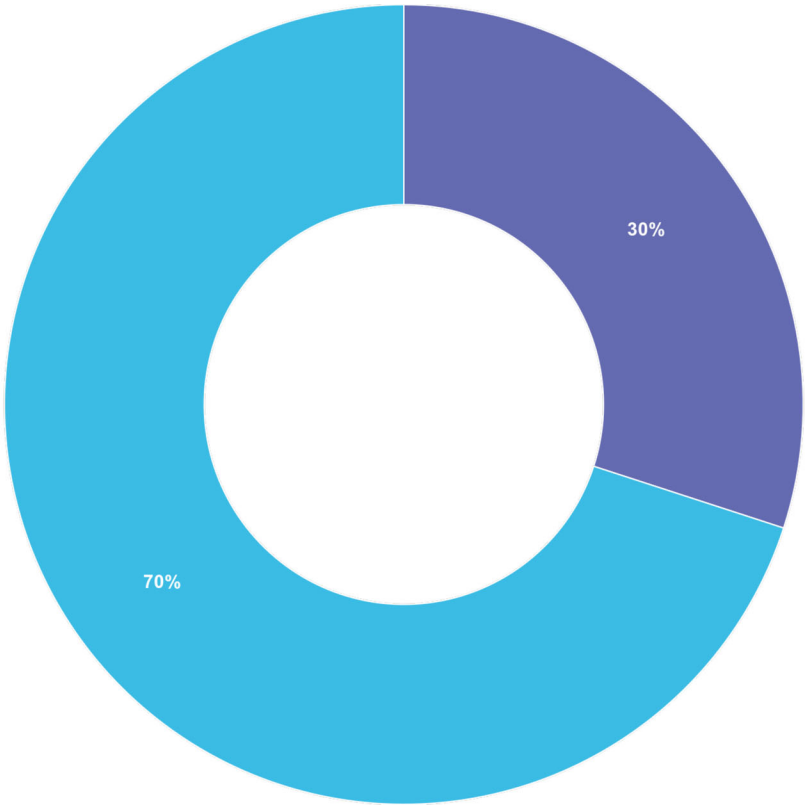
Q14 14\. Are you interested in making your home or neighborhood more resistant to hazards?*



Answered: 80 **Unanswered:** 0

Choice	Total
Yes	59
No	21

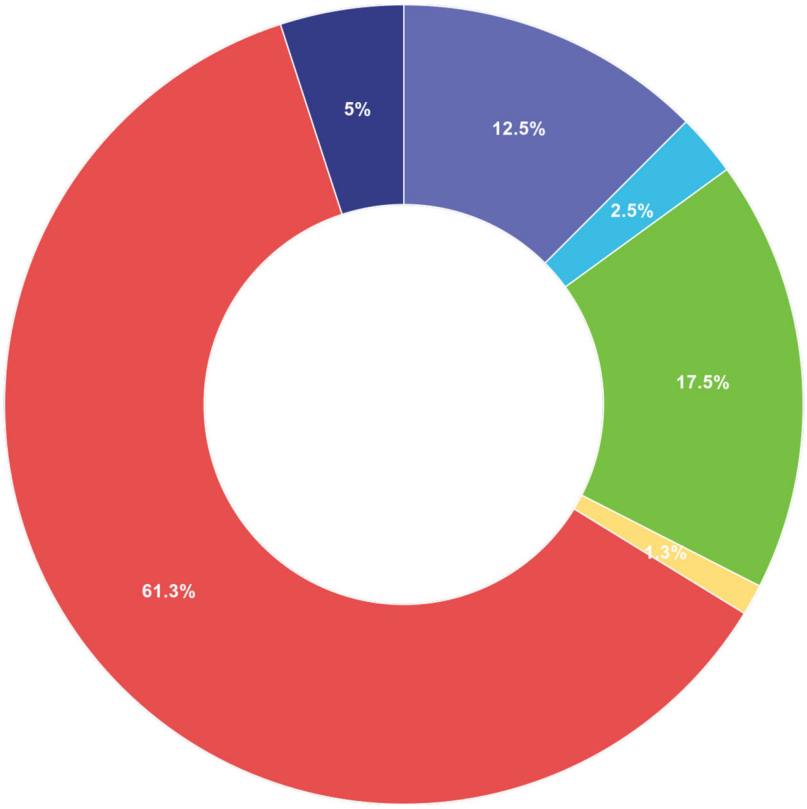
Q15 15\. Do you know what office to contact to find out more information about how to reduce your risks to hazards in your area?*



Answered: 80 **Unanswered:** 0

Choice	Total
Yes	24
No	56

Q16 16\. What is the most effective way for you to receive information about how to make your home and neighborhood more resistant to hazards?*



Answered: 80 **Unanswered:** 0

Choice	Total
Newspaper	10
Radio	2
Mail	14
School Meetings	1
Television	0

Choice	Total
Internet (including social media)	49
Public Wokshops/Meetings	4

Q17 17\. Are there any other ways you prefer to receive information? If so, please explain:

Friday, May 27, 2022, 2:07 PM UTC

Email

Thursday, May 26, 2022, 11:49 PM UTC

Text message

Monday, April 25, 2022, 7:34 PM UTC

social media

Monday, April 25, 2022, 1:38 AM UTC

Text messages with links to the appropriate information.

Wednesday, April 20, 2022, 11:49 PM UTC

Email

Answered: 26 **Unanswered:** 54

Q18 18\. In your opinion, what are some steps your local government could take to reduce or eliminate the risk of future hazard damages in your neighborhood?

Friday, May 27, 2022, 2:07 PM UTC

Take action now start with your worse areas first,

Monday, April 25, 2022, 7:34 PM UTC

clean up junky properties

Monday, April 25, 2022, 1:38 AM UTC

Need fire hydrants installed in my neighborhood.

Thursday, April 21, 2022, 2:47 PM UTC

Close all the real estate agencies that are cutting all the trees and dozing all the land

---

Wednesday, April 20, 2022, 11:49 PM UTC

Enhance EMS efforts like Fanon County GA

Answered: 45 **Unanswered:** 35

Q19 19\. Are there any other issues regarding the reduction of risk and loss associated with hazards or disasters in the community that you think are important? If so, please explain:

Wednesday, April 20, 2022, 11:49 PM UTC

Take advantage of some federal funding for Emergency Management programs like establishing CERT teams

---

Wednesday, March 23, 2022, 6:43 PM UTC

The increasing reliance of web services and internet notifications in an are that has vast stretches with no service available.

Saturday, March 5, 2022, 9:41 PM UTC

No

Sunday, February 13, 2022, 6:20 PM UTC

Police snitches and abuse towards women

Wednesday, February 9, 2022, 11:45 AM UTC

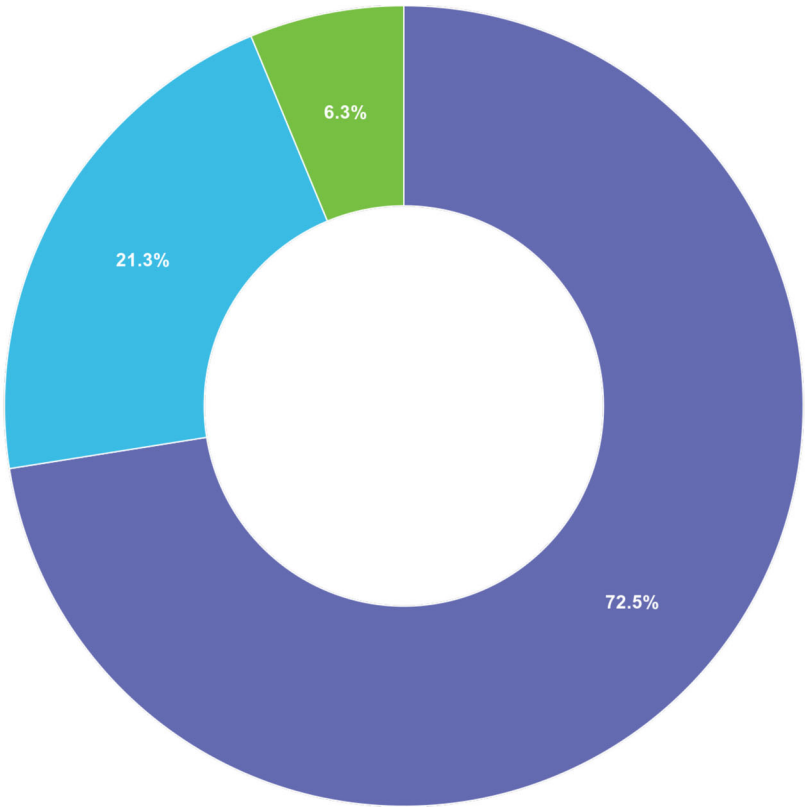
Education is key to helping prevent man made disasters like forest fires and the failed Biden presidency.

Answered: 20 **Unanswered:** 60

Q20 A number of community-wide activities can reduce our risk from hazards. In general, these activities fall into one of the following six broad categories. In the next six questions, please tell us how important you think each one is for your community to consider pursuing.

20\. **Prevention** - Administrative or regulatory actions that influence the way land is developed and buildings are built. Examples include planning and zoning, building

codes, open space preservation, and floodplain regulations.*

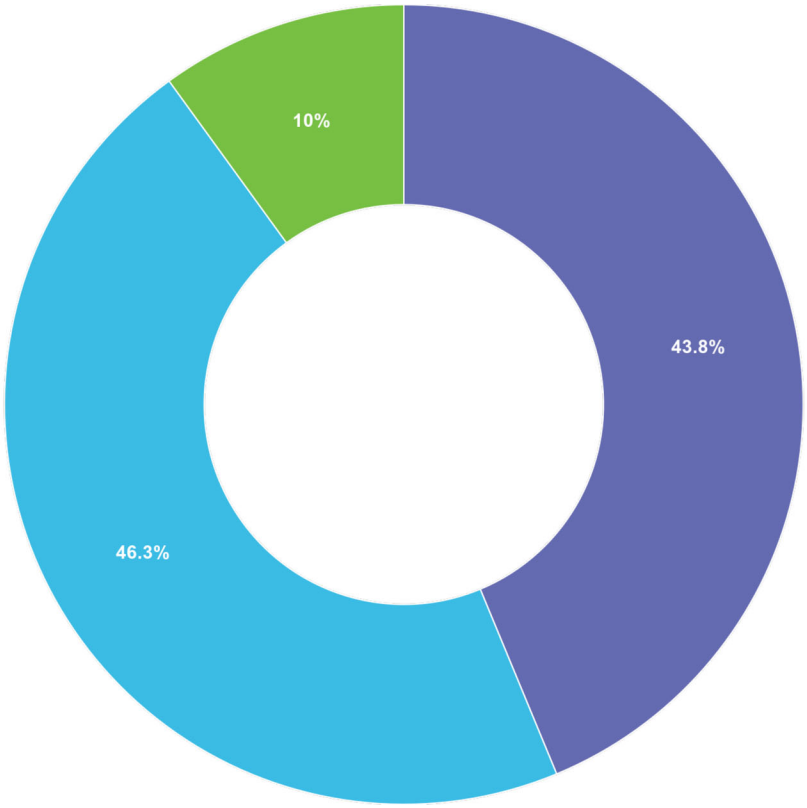


Answered: 80 **Unanswered:** 0

Choice	Total
Very important	58
Somewhat important	17
Not important	5

Q21 21\. **Property Protection** - Actions that involve the modification of existing buildings to protect them from a hazard or removal from the hazard area.

(Examples include acquisition, relocation, elevation, structural retrofits, and storm shutters.)*

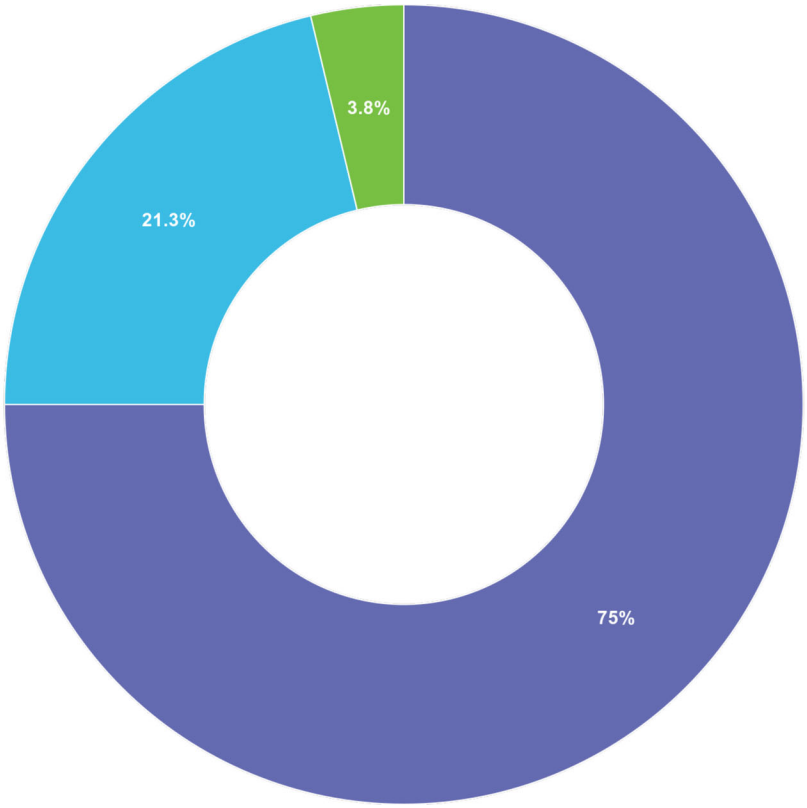


Answered: 80 **Unanswered:** 0

Choice	Total
Very important	35
Somewhat important	37

Choice	Total
Not important	8

Q22 22\. **Natural Resource Protection** - Actions that, in addition to minimizing hazard losses, also preserve or restore the functions of natural systems. (Examples include: floodplain protection, habitat preservation, slope stabilization, riparian buffers, and forest management.)*

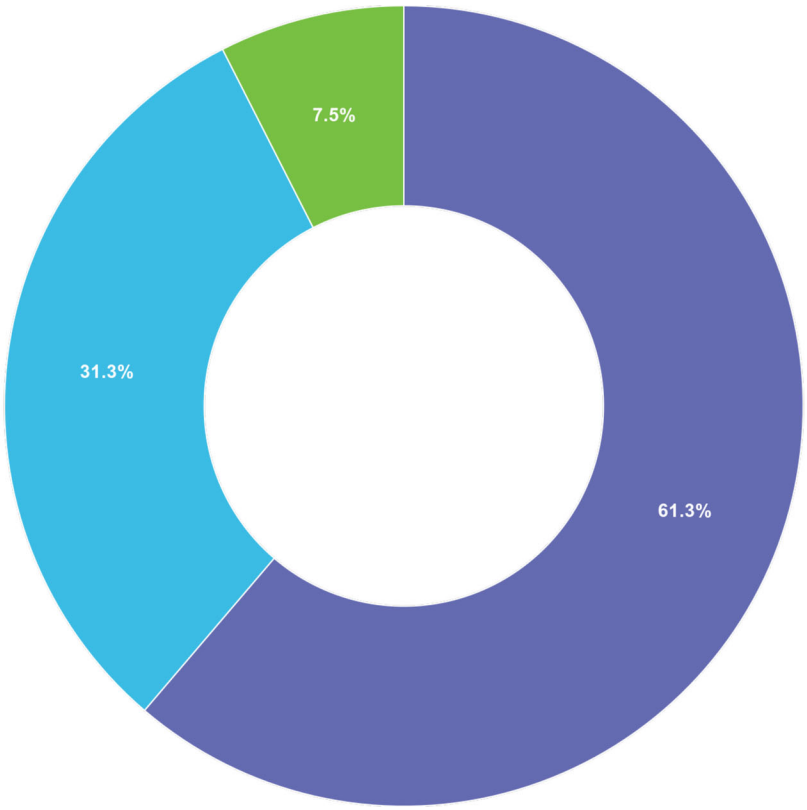


Answered: 80 **Unanswered:** 0

Choice	Total
Very important	60
Somewhat important	17
Not important	3

Q23 23\. **Structural Projects** - Actions intended to lessen the impact of a hazard by modifying the natural progression of the hazard.

(Examples include dams, levees, detention/retention basins, channel modification, retaining walls and storm sewers.)*

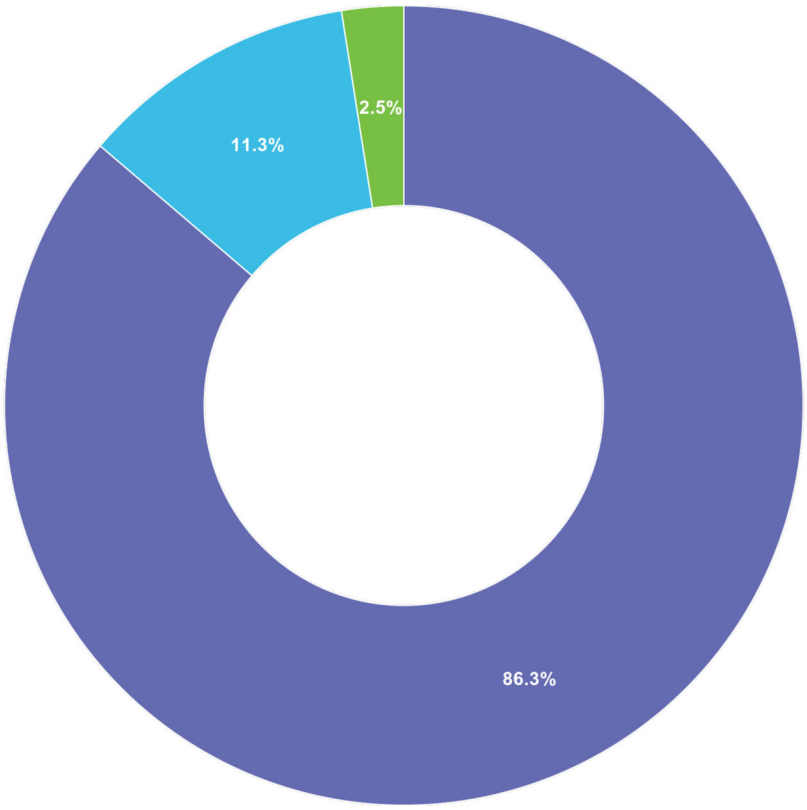


Answered: 80 **Unanswered:** 0

Choice	Total
Very important	49
Somewhat important	25
Not important	6

Q24 24\. **Emergency Services** - Actions that protect people and property during and immediately after a hazard event.

(Examples include warning systems, evacuation planning, emergency response training, and protection of critical emergency facilities or systems.)*



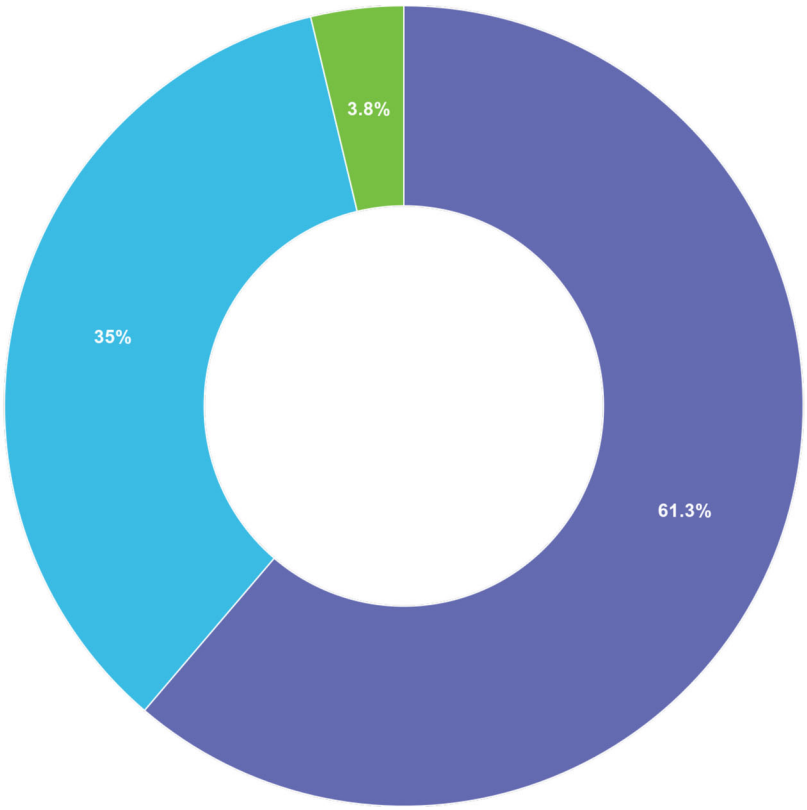
Answered: 80 **Unanswered:** 0

	Choice	Total
●	Very important	69
●	Somewhat important	9
●	Not important	2

Q25 25\. **Public Education and Awareness** - Actions to inform citizens about hazards and the techniques they can use to protect themselves and their property.

(Examples include outreach projects, school education programs, library materials and

demonstration events.)*



Answered: 80 **Unanswered:** 0

Choice	Total
Very important	49
Somewhat important	28
Not important	3

Q26 This survey may be submitted anonymously; however, if you provide us with your name and contact information below, we will have the ability to follow up with you to learn more about your ideas or concerns. (Optional)

Tuesday, April 19, 2022, 9:40 PM UTC

Rettbergj@netzero.com

Wednesday, March 23, 2022, 1:57 AM UTC

Teressa Seaborn

Seaborn76@gmail.com

Monday, March 7, 2022, 10:45 PM UTC

No, thank you!

Saturday, March 5, 2022, 9:41 PM UTC

Adolf Hitler

Tuesday, February 8, 2022, 10:57 PM UTC

Bobby Barton

(828) 557-8317

Answered: 18 **Unanswered:** 62

NEIGHBORING JURISDICTIONS

State	Neighboring Jurisdiction	Name	Position
NC	Clay County	Ricky Lancaster	Emergency Management Coordinator
NC	Macon County	Warren Cabe	Emergency Management Coordinator
NC	Transylvania County	Kevin Shook	Emergency Management Coordinator
NC	Madison County	Caleb Dispenza	Emergency Management Coordinator
NC	Buncombe County	Angie Ledford	Emergency Management Division Manager
NC	Henderson County	Jimmy Brissie	Emergency Management Director
TN	Polk County	Stephen Lofty	Emergency Management Coordinator
TN	Monroe County	David Chambers	Emergency Management Coordinator
TN	Blount County	Lance Coleman	Emergency Management Coordinator
TN	Sevier County	John Mathews	Emergency Management Coordinator
TN	Cocke County	David Breeding	Emergency Management Coordinator
GA	Fannin County	Rick Graham	Emergency Management Coordinator
GA	Union County	David Dyer	Emergency Management Coordinator
SC	Oconee County	Karla Hulsey	Emergency Management Coordinator

Nathan Slaughter

From: Nathan Slaughter
Sent: Saturday, June 18, 2022 10:30 AM
To: Ricky Lancaster; Kevin Shook; Angela Ledford; Caleb Dispenza; polktnema@yahoo.com; mc.ema@monroetn.com; lcoleman@blounttn.org; jmathews@seviercountytn.gov; ccema.benton@gmail.com; rgraham@fannincountyga.org; ucfd@uniongov.com; khulsey@oconee.ga.us; Jimmy Brissie; Warren Cabe
Subject: Notification - Smoky Mountain Regional Hazard Mitigation Plan

Importance: Low

Good morning,

You are receiving this email because a neighboring North Carolina community (Cherokee County, Graham County, Haywood County, Jackson County, Swain County, or the Eastern Band of Cherokee Indians), along with participating municipaliities, are in the process of updating the region's Hazard Mitigation Plan as required by the Federal Emergency Management Agency (FEMA). The purpose of this plan is to identify and assess the region's hazard risk and determine strategies for how to best minimize or manage those risks. Upon completion, the plan will represent a comprehensive update to the existing multi-jurisdictional Hazard Mitigation Plan for the region.

You are being notified of this planning process for two purposes:

1) FEMA requires that neighboring jurisdictions be provided an opportunity to be involved in the planning process.
2) You may want to contribute information to this planning effort.

I am the project manager for plan update, and I would be happy to discuss any input you may have. In addition, please let me know if you would like receive a copy of the draft plan once it is complete.

No further action is required. However, should you have any questions or input regarding the Smoky Mountain Regional Hazard Mitigation Plan, please do not hesitate to contact me.

Nathan Slaughter, AICP, CFM
Department Manager – Hazard Mitigation
ESP Associates, Inc.
2200 Gateway Centre Boulevard – Suite 216
Morrisville, NC 27560
www.espassociates.com

nslaughter@espassociates.com
919.415.2726 | Direct
919.678.1070 | Office
919.244.9536 | Cell
Connect with me on LinkedIn

APPENDIX E
COMPLETED MITIGATION ACTIONS

Cherokee County Completed Mitigation Actions

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Prevention								

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
	Develop a method for a central repository of information regarding hazards including documents from the county and all municipalities. This repository would become the central focus for research into such hazards.							

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
	Up-to-date digital (GIS) floodplain layers and maps that would allow the county mapping department to assess parcels, addresses, and ownership as well as define or otherwise delineate the type of structure in the floodplain (residential, commercial, etc.) and							

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
P-3	Consolidation of written (electronic or plain copy) documents into a single, searchable, integrated plan that incorporates all phases of a comprehensive emergency management program. This would all emergency	All	Moderate	County Emergency Management; County EOP task	Unknown	Local, State, Federal	Completed	Completed as of 2012 plan update.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
P-4	Use of technology to accomplish an automated system to coordinate plans information, development information, road expansion information, or other demographics if desired. Further, it is desired that towns and county automated systems that contain	All	Moderate	County IT; County Planning	Unknown	Local, State, Federal	Completed	Completed. Summer 2012.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
P-5	To establish, where feasible, joint (town and county) guidelines for hazard mitigation implementation and to use all available information in the decision making process that is likely to effect within a five year period, based on growth projections, a municipal	All	Moderate	County Emergency Management; Hazard Mitigation Task	Unknown	Local, State, Federal	Completed	Completed. Though zoning is not enforced in county, all jurisdictions share building staff and knowledge reference flood

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
P-6	To establish, where feasible, joint (town and county) mitigation funding sources. To establish joint searches for opportunities to implement hazard mitigation goals, objectives, or recommendations.	All	Moderate	County/Town Executives; County Grants Management	Unknown	Local, State, Federal	Completed	Completed. Though zoning is not enforced in county, all jurisdictions share building staff and knowledge reference flood plain and code enforcement.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
P-7	Formation of a cooperative hazard mitigation program to integrate hazard mitigation into new developments, commercial districts, land use planning, growth planning, infrastructure, and other initiatives.	All	Moderate	County/Town Executives	Unknown	Local, State, Federal	Completed	Completed. Though zoning is not enforced in county, all jurisdictions share building staff and knowledge reference flood plain and code enforcement.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
P-8	Follow the goals and recommendations for goal achievement outlined by the NC Forest Service to reduce the vulnerability of wildfires that would likely effect urban populations.	Wildfire	Moderate	NC Forest Service; County Fire Marshal; County/Town Fire Departments; County/Town	Unknown	Local, State, Federal	Completed	Completed as of 2012 plan update.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
P-9	Research and implement Wildfire Mitigation goals as set forth by the NC Forest Service and other officials to reduce the risk to and the vulnerability from wildfire whether accidentally or purposefully set.	Wildfire	Moderate	NC Forest Service; County Fire Marshal; County/Town Fire Departments; County/Town	Unknown	Local, State, Federal	July 1, 2008	Completed as of 2012 plan update.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
P-12	Continue participation in NFIP and work toward CRS System.	All	High	County/Town Administration; County Building Inspection; County Emergency Management	N/A	General Fund	Completed	Completed

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
P-13	Comprehensive review of existing emergency response plans to continuously update and revise as appropriate.	All	Moderate	County Emergency Management	N/A	General Fund	Completed	In progress. Plan and advisory committee in development phase.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Emergency Services								

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
ES-1	To establish, where feasible, additional emergency response forces, by at least 10% that are trained, equipped and prepared to respond to a variety of emergency and disaster situations.	All	Moderate	Hazard Mitigation Task Force	Unknown	General Fund	July 1, 2006	Completed.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
ES-2	Coordinate response and recovery efforts with other communities and counties.	All	Moderate	County Emergency Management	N/A	General Fund	Completed	Complete. Mutual aid agreements in place.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Public Education and Awareness								

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
PEA-1	To establish, where feasible, joint (town and county) public education materials and public education for hazard mitigation implementation.	All	Moderate	Hazard Mitigation Task Force	Unknown	Local, State, Federal	Completed	Completed as part of 2012 plan update.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
PEA-2	Explore the possibility of developing an internet-based emergency information website.	All	Low	County Emergency Management	N/A	General Fund	Complete	Complete

Town of Andrews Completed Mitigation Actions

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Prevention								
P-1	Develop a method for a central repository of information regarding hazards, including documents from the county and all municipalities. This repository would become the central focus for research into such hazards.	All	Moderate	County/Town Administration	Unknown	Local, State, Federal	December 31, 2008	Completed.
P-2	Up-to-date digital (GIS) floodplain layers and maps that would allow the county mapping department to assess parcels, addresses, and ownership as well as define or otherwise delineate the type of structure in the floodplain (residential, commercial, etc.) and incorporate an up-to-date digital (GIS) inundation map from the US Army Corps of Engineers to access parcels, addresses, and ownership as well as otherwise delineate the type of structure in the area of potential inundation (residential, commercial, etc.)	Flood	Moderate	County Mapping/GIS/IT	Unknown	Local, State, Federal	December 31, 2008	Completed.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
P-3	Consolidation of written (electronic or plain copy) documents into a single, seamless, integrated plan that incorporates all phases of a comprehensive emergency management program. This would all emergency managers, planners, and elected officials an opportunity to examine their mitigation efforts in conjunction with preparedness plans, response procedures, and recovery activity.	All	Moderate	County Emergency Management; County EOP Task Force	Unknown	Local, State, Federal	July 1, 2005	Completed.
P-4	Use of technology to accomplish an automated system to coordinate plans information, development information, road expansion information, or other demographics if desired. Further, it is desired that towns and county automated systems that contain such information have the ability to be integrated with one another and relative information shared between the systems.	All	Moderate	County IT; County Planning	Unknown	Local, State, Federal	July 1, 2005	Completed. Summer 2012.
P-8	Follow the goals and recommendations for goal achievement outlined by the NC Forest Service to reduce the vulnerability of wildfires that would likely effect urban populations.	Wildfire	Moderate	NC Forest Service Cherokee; County Fire Marshal; County and municipal Fire Departments	Unknown	Local, State, Federal	July 1, 2007	Completed.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
P-9	Research and implement Wildfire Mitigation goals as set forth by the NC Forest Services and other fire officials to reduce the risk to and the vulnerability from wildfire whether accidentally or purposefully set.	Wildfire	Moderate	NC Forest Service; County Fire Marshal; County/Town Fire Departments; County/Town Administration	Unknown	Local, State, Federal	July 1, 2008	Completed.
Emergency Services								
ES-1	To establish, where feasible, additional emergency response forces, by at least 10%, that are trained, equipped, and prepared to respond to a variety of emergency and disaster situations.	All	Moderate	County/Town Executives; County Grants Administration	Unknown	General Fund	Complete	Completed as of 2012 plan update.
ES-2	Coordinate response and recovery efforts with other communities and counties.	All	Moderate	County Emergency Management	N/A	General Fund	Complete	Complete. Mutual aid agreements in place.
Public Education and Awareness								
PEA-1	To establish, where feasible, joint (town and county) public education materials and public education for hazard mitigation implementation.	All	Moderate	Hazard Mitigation Task Force	Unknown	Local, State, Federal	Completed	Completed as of 2012 plan update.
PEA-2	Explore the possibility of developing an internet-based emergency information website.	All	Low	County Emergency Management	N/A	General Fund	Complete	Complete

Town of Murphy Completed Mitigation Actions

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Prevention								
P-1	Develop a method for a central repository of information regarding hazards, including documents from the county and all municipalities. This repository would become the central focus for research into such hazards.	All	Moderate	County/Town Administration	Unknown	Local, State, Federal	Completed	Completed as of 2012 plan update.
P-2	Up-to-date digital (GIS) floodplain layers and maps that would allow the county mapping department to assess parcels, addresses, and ownership as well as define or otherwise delineate the type of structure in the floodplain (residential, commercial, etc.) and incorporate an up-to-date digital (GIS) inundation map from the US Army Corps of Engineers to access parcels, addresses, and ownership as well as otherwise delineate the type of structure in the area of potential inundation (residential, commercial, etc.)	Flood	Moderate	County Mapping/GIS/IT	Unknown	Local, State, Federal	Completed	Completed as of 2012 plan update.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
P-3	Consolidation of written (electronic or plain copy) documents into a single, seamless, integrated plan that incorporates all phases of a comprehensive emergency management program. This would all emergency managers, planners, and elected officials an opportunity to examine their mitigation efforts in conjunction with preparedness plans, response procedures, and recovery activity.	All	Moderate	County Emergency Management; County EOP Task Force	Unknown	Local, State, Federal	Completed	Completed as of 2012 plan update.
P-4	Use of technology to accomplish an automated system to coordinate plans information, development information, road expansion information, or other demographics if desired. Further, it is desired that towns and county automated systems that contain such information have the ability to be integrated with one another and relative information shared between the systems.	All	Moderate	County IT; County Planning	Unknown	Local, State, Federal	Completed	Completed as of 2012 plan update.
P-8	Follow the goals and recommendations for goal achievement outlined by the NC Forest Service to reduce the vulnerability of wildfires that would likely effect urban populations.	Wildfire	Moderate	NC Forest Service Cherokee; County Fire Marshal; County and municipal Fire Departments	Unknown	Local, State, Federal	Completed	Completed as of 2012 plan update.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
P-9	Research and implement Wildfire Mitigation goals as set forth by the NC Forest Services and other fire officials to reduce the risk to and the vulnerability from wildfire whether accidentally or purposefully set.	Wildfire	Moderate	NC Forest Service; County Fire Marshal; County/Town Fire Departments; County/Town Administration	Unknown	Local, State, Federal	Completed	Completed as of 2012 plan update.
Emergency Services								
ES-1	To establish, where feasible, additional emergency response forces, by at least 10%, that are trained, equipped, and prepared to respond to a variety of emergency and disaster situations.	All	Moderate	County/Town Executives; County Grants Administration	Unknown	General Fund	Completed	Completed as of 2012 plan update.
Public Education and Awareness								
PEA-1	To establish, where feasible, joint (town and county) public education materials and public education for hazard mitigation implementation.	All	Moderate	Hazard Mitigation Task Force	Unknown	Local, State, Federal	Completed	Completed as of 2012 plan update.

Graham County Completed Mitigation Actions

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Prevention								
P-1	Floodplain maps are over 20 years old and areas of intense urbanization are currently unmapped. The existing maps are at scales that do not align with current detailed tax maps. Remapping the entire floodplain is recommended to properly align existing small scale FIRM maps that approximate floodplain boundaries with larger scale detailed maps in order to provide detailed flood hazard information.	Flood	High	County Floodplain Manager	Unknown	State and FEMA funding	Completed	Completed. On February 21, 2011, the floodplain ordinance was rescinded to old ordinance.
P-2	Continue to enforce building codes as they apply to protection from hazards is essential to maintaining adequate public safety. Constant vigilance regarding construction in flood prone areas is imperative to ensure all construction meets flood protection measures. Enforcement of all floodplain requirements, including building and other codes, must be coordinated and systematically applied with adequate follow-up to ensure compliance.	Flood	High	County Building Inspector	Unknown	Self-funded	Completed	Completed August 2012
P-10	Ensure that manufactured homes are installed and secured properly.	Flood; Wind	High	County Building Inspector	Unknown	Self-funded	Completed	Completed. Inspections department ensures compliance before issuing occupancy permits.
P-11	Integrate County/municipality EOP Plan with Hazard Mitigation Plan as a way to mitigate unforeseeable hazard events.	All	Low	County Emergency Management Director	Unknown	Self-funded; Partially state funded	Completed	This action is underway with annual update.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
P-12	Develop a natural hazards vulnerability assessment for the next update of the hazard mitigation plan.	All	High	County Emergency Management Director; NCDEM	Unknown	Self-funded	Completed	Completed. Natural hazards were assessed in the hazard mitigation plan in 2012 and 2017.

Town of Lake Santeetlah Completed Mitigation Actions

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Prevention								
P-1	Floodplain maps are over 20 years old and areas of intense urbanization are currently unmapped. The existing maps are at scales that do not align with current detailed tax maps. Remapping the entire floodplain is recommended to properly align existing small scale FIRM maps that approximate floodplain boundaries with larger scale detailed maps in order to provide detailed flood hazard information.	Flood	High	County Floodplain Manager	Unknown	State and FEMA funding	Completed	Completed. On February 21, 2011, the floodplain ordinance was rescinded to old ordinance.
P-3	Continued consistency in enforcing the codes as they apply to protection from hazards is essential to maintaining adequate public safety. Constant vigilance regarding construction in flood prone areas is imperative to ensure all construction meets required flood protection measures. Enforcement of all floodplain requirements, including building and other codes, must be coordinated and systematically applied with adequate follow-up to ensure compliance.	Flood	High	Town Government in cooperation with County Government	Unknown	Local	Completed	Completed. Regulations passed in Passed in 2008.

Town of Lake Robbinsville Completed Mitigation Actions

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Prevention								
P-1	Floodplain maps are over 20 years old and areas of intense urbanization are currently unmapped. The existing maps are at scales that do not align with current detailed tax maps. Remapping the entire floodplain is recommended to properly align existing small scale FIRM maps that approximate floodplain boundaries with larger scale detailed maps in order to provide detailed flood hazard information.	Flood	High	County Floodplain Manager	Unknown	State and FEMA funding	Completed	Completed. On February 21, 2011, the floodplain ordinance was rescinded to old ordinance.
P-2	Ensure that manufactured homes are installed and secured properly.	Flood; Wind	High	Town Government	Unknown	Local funds	Completed	Completed. Inspections department ensures compliance before issuing occupancy permits.
P-4	Develop a natural hazards vulnerability assessment for the next update of the hazard mitigation plan.	All	High	County Emergency Management Directors, NCEM	Unknown	Self-funded	Completed	Completed. The hazard mitigation plan includes a vulnerability assessment.

Haywood County Completed Mitigation Actions

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Prevention								
P-5	Complete a comprehensive review of existing regulations to determine where changes need to be made to increase flood hazards mitigation.	Flood	High	County Planning	Unknown	Local	Completed	Completed. New flood damage prevention ordinance.
P-7	Purchase and make use of ArcView GIS mapping format.	Flood	Moderate	County IT	Unknown	Local	2008	Completed. Using ArcView GIS with FTE position.
Emergency Services								
ES-1	Develop emergency notification system in coordination with existing natural hazard emergency notification systems.	Earthquake	Moderate	County Emergency Management	Unknown	Local; State; Federal	Completed.	Completed.
Structural Projects								
S-1	Continue coordination of efforts with NCDOT and local municipalities to erect landslide barriers along roadways identified in high risk landslide areas.	Erosion; Landslide		County Emergency Management; County Planning	Unknown	Local; NCDOT	Ongoing	Deleted. At this time, Haywood County does not have the time, staff or money to implement this action. It will be revisited at the next 5 year update.
Public Education and Awareness								
PEA-4	Develop educational brochures informing local residents on techniques they can utilize to address flood hazard mitigation.	Flood	High	County Planning	Unknown	Federal	2007	Completed.
PEA-7	Development of education materials/brochures to educate local residents on flood hazards produced by thunderstorm events.	Thunderstorm	High	County Emergency Management	Unknown	Local	2007	Deleted. At this time, Haywood County does not have the time, staff or money to implement this action. It will be revisited at the next 5 year update.

Town of Canton Completed Mitigation Actions

Emergency Services								
ES-1	Develop emergency notification system in coordination with existing natural hazard emergency notification systems.	Earthquake	Moderate	County Emergency Management	Unknown	Local	2009	Completed.
Structural Projects								

Town of Clyde Completed Mitigation Actions

Emergency Services								
ES-1	Develop emergency notification system in coordination with existing natural hazard emergency notification systems.	Earthquake	Moderate	County Emergency Management	Unknown	Local	Completed	Completed. 2009.
Public Education and Awareness								
PEA-2	Development of educational materials/brochures to educate local residents on wildfire prevention.	Wildfire	High	Town; County	Unknown	Local	Completed	Completed. 2008.
PEA-4	Development of educational materials/brochures to educate local residents on preventative steps that can be taken to offset problems created during winter storm events.	Severe Winter Storm	High	Town; County	Unknown	Local	Completed	Completed. 2008.
PEA-6	Development of education materials/brochures to educate local residents on flood hazards produced by thunderstorm events.	Thunderstorm	High	Town	Unknown	Local	Completed	Completed. 2008.
PEA-7	Development of educational materials/brochures to educate local residents on dangers of tornadoes.	Tornado	High	Town; County Emergency Management	Unknown	Local	Completed	Completed. 2008.
PEA-8	Development of educational materials/brochures to educate local residents on preventative steps that can be taken to prevent landslides.	Erosion; Landslide	High	Town; County Emergency Management	Unknown	Local	Completed	Completed. 2008

Town of Waynesville Completed Mitigation Actions

Emergency Services								
ES-1	Develop emergency notification system in coordination with existing natural hazard emergency notification systems.	Earthquake	Moderate	County Emergency Management	Unknown	Local budget	Completed	Completed.
Structural Projects								
S-1	Continue coordination of efforts with NCDOT and local municipalities to erect landslide barriers along roadways identified in high risk landslide areas.	Erosion; Landslide	Moderate	NCDOT	Unknown	NCDOT	Completed	Completed.

Jackson County Completed Mitigation Actions

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Prevention								
P-1	Floodplain maps are over 20 years old and areas of intense urbanization are currently unmapped. The existing maps are at scales that do not align with current detailed tax maps. Remapping the entire floodplain is recommended to properly align existing small scale FIRM maps that approximate floodplain boundaries with larger scale detailed maps in order to provide detailed flood hazard information.	Flood	High	County Emergency Management	Unknown	General revenue	2004-2009	Completed. New floodplain maps have been placed into the Jackson County GIS System.
P-2	Continued consistency in enforcing the codes as they apply to protection from hazards is essential to maintaining adequate public safety to continue compliance with NFIP. Constant vigilance regarding construction in flood prone areas is imperative to ensure all construction meets required flood protection measures. Enforcement of all floodplain requirements, including building and other codes, must be coordinated and systematically applied with adequate follow-up to ensure compliance.	Flood	High	County Erosion Control Officer	Unknown	General revenue	Completed	Ongoing. There is still a need for this action as the County continues to enforce codes that apply to hazards and public safety of the citizens of Jackson County.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
P-3	Review the Emergency Operations Plan on an annual basis to ensure that it is kept current.	All	High	County Emergency Management	Unknown	General revenue	Completed. Annual reviews	Jackson County Emergency Management reviews the Emergency Operations Plan on an annual basis and amends the plan as necessary.
P-5	Develop a fire management plan that includes a clear statement of objectives and which incorporates information on land, threatened structures, degree of fire risk, fire history, and fire management measures.	Wildfire	High	County Fire Marshal	Unknown	General revenue	Completed	The County Fire Marshal reviews the County's fire management plan and amends the plan as necessary.
P-6	Create a subdivision ordinance that would specify a width and grade for entrance and exit routes to ensure the accessibility of emergency vehicles.	All	High	County Planning	Unknown	General revenue	Completed	Completed. The County has an adopted Subdivision Ordinance that include standards for roadway design. The Planning Department maintains the ordinance and recommends amendments as necessary.
P-7	Expand the Land Use Plan to address grade of banks on residential and commercial property.	Flood; Landslide; Severe Thunderstorm	Moderate	County Erosion Control Officer	Unknown	General revenue	Completed	Completed. The County's land use plan supports the Mountain and Hillside Development Ordinance which includes regulations regarding development on steep slopes.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
P-8	Acquire small GPS system to document hazard locations for local and state use.	All	High	County Emergency Management	Unknown	General revenue	Completed	Completed. The County has acquired a small GPS system to assist with the documentation of hazard location for local and state use.
P-9	Ensure that manufactured homes are properly installed and secured properly.	Flood; Tornado; Landslide; Wind	High	County Building Inspections	Unknown	General revenue	Completed	Completed. The County Building Inspections department continues to enforce all building code requirements for manufactured homes.
Property Protection								
PP-1	Evaluate the relocation, elevation, and floodproofing needs of all critical public structures or facilities within the floodplain and implement the necessary improvements.	Flood	High	County Building Inspections	Unknown	General revenue	Completed	Completed. Currently no critical public structures require relocation or elevation.
PP-2	Minimize placing new critical public facilities within the floodplain unless they promote an overriding public benefit, will not worsen hazard risk, will not directly promote development in floodplains, and are designed to withstand flood damage.	Flood	High	County Building Inspections	Unknown	General revenue	Completed	Completed. Will continue to enforce new building codes which prohibit building in floodplain.
Public Education and Awareness								

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
PEA-4	Maintain a publicly accessible copy of effective FIRM maps and FIS and support local requests of map updates to continue compliance with NFIP.	Flood	High	County Emergency Management	Unknown	General revenue	Completed	Completed. Effective FIRM maps and FIS are available to the public. The FIRM Maps can also be accessed on the County's online GIS system.

Town of Dillsboro Completed Mitigation Actions

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Prevention								
P-1	Update zoning ordinance in floodplain.	Flood	High	County Planning	Unknown	General revenue	Completed	Completed. Zoning ordinance updated.
P-2	Appoint a council member as community coordinator to work with other towns and counties in the area.	All	High	Town Mayor	Unknown	General revenue	Completed	Completed. Council member appointed and will be replaced when elected officials leave their post.
P-3	Continued consistency in enforcing codes as they apply to protection from hazards is essential to maintaining adequate public safety to continue compliance with NFIP. Constant vigilance regarding construction in flood prone areas is imperative to ensure all construction meets required flood protection measures. Enforcement of all floodplain requirements, including building and other codes, must be coordinated and systematically applied with adequate follow-up to ensure compliance.	Flood	High	County Planning	Unknown	General revenue	Completed	Completed. The Town of Dillsboro contracts with the Jackson County Building Inspections Department to administer the State building codes and the County's floodplain ordinance. This arrangement provides consistency in enforcement and helps ensure compliance with NFIP.
Public Education and Awareness								
PEA-2	Maintain a publically accessible copy of effective FIRM maps and FIS and support local requests of map updates to continue compliance with NFIP.	Flood	High	Town of Dillsboro	Unknown	General revenue	Completed	Completed. FIRM maps and FIS are accessible at the Jackson County Building Inspections Department and also available on the County's public web-based GIS system.

Village of Forest Hills Completed Mitigation Actions

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Prevention								
P-1	Floodplain maps are over 20 years old and areas of intense urbanization are currently unmapped. The existing maps are at scales that do not align with current detailed tax maps. Remapping the entire floodplain is recommended to properly align existing small scale FIRM maps that approximate floodplain boundaries with larger scale detailed maps in order to provide detailed flood hazard information.	Flood	High	County GIS and Tax	Unknown	General revenue	Completed	Completed. New floodplain maps have been implemented into the Jackson County GIS System.
P-2	Continued consistency in enforcing the codes as they apply to protection from hazards is essential to maintaining adequate public safety to continue compliance with NFIP. Constant vigilance regarding construction in flood prone areas is imperative to ensure all construction meets required flood protection measures. Enforcement of all floodplain requirements, including building and other codes, must be coordinated and systematically applied with adequate follow-up to ensure compliance.	Flood	High	County Building Inspections	Unknown	General revenue	Completed	The Village of Forest Hills contracts with the Jackson County Building Inspections Department to administer the State building codes and the County's floodplain ordinance. This arrangement provides consistency in enforcement and helps ensure compliance with NFIP.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
P-5	Develop a fire management plan that includes a clear statement of objectives and which incorporates information on land, threatened structures, degree of fire risk, fire history, and fire management measures.	Wildfire	High	Cullowhee Fire; County Fire Marshal	Unknown	General revenue	Completed	Completed. The Fire management plan is monitored and maintained by the County Fire Marshal.
P-6	Create a subdivision ordinance that would specify a width and grade for entrance and exit routes to ensure the accessibility of emergency vehicles.	All	High	Village Mayor; County Planning; County Building Inspections	Unknown	General revenue	Completed	Completed. Enforcement is by the Jackson County Building Inspections Department.
P-7	Expand the Land Use Plan to address grade of banks on residential and commercial property.	Landslide	High	Village Mayor	Unknown	General revenue	Completed	Completed. Accomplished with Hillside and Steep Slope Development Ordinance.
P-8	Acquire small GPS system to document hazard locations for local and state use.	All	High	Village Mayor; County Planning	Unknown	General revenue	Completed	Jackson County's Emergency Management Department assists with the acquiring and maintaining GPS data to document hazard locations for local and state use.
P-9	Ensure that manufactured homes are properly installed and secured properly.	Flood; Tornado; Wind; Lightning; Earthquake	High	Village Mayor; County Building Inspections	Unknown	General revenue	Completed	Through and interlocal agreement with the Village, the Jackson County Building Inspections Department ensures that all new manufactured homes are installed and secured as required by state building codes.
Public Education and Awareness								

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
PEA-2	Update the internet-based emergency information website to inform and educate citizens about potential risks from hazards and opportunities to mitigate them.	All	High	Village Mayor	Unknown	General revenue	Completed	Completed. The Village's website links to the County page that includes CodeRED warning information that is used by Jackson County Emergency Management to inform the public during disasters. The County's Emergency Management website also provides general information about emergency preparedness.
PEA-4	Maintain a publicly accessible copy of effective FIRM maps and FIS and support local requests of map updates to continue compliance with NFIP.	Flood	High	Village of Forest Hills	Unknown	General revenue	Completed	Completed. FIRM maps and FIS are accessible at the Jackson County Building Inspections Department and also available on the County's public web-based GIS system.

Town of Sylva Completed Mitigation Actions

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Prevention								
P-1	Floodplain maps are over 20 years old and areas of intense urbanization are currently unmapped. The existing maps are at scales that do not align with current detailed tax maps. Remapping the entire floodplain is recommended to properly align existing small scale FIRM maps that approximate floodplain boundaries with larger scale detailed maps in order to provide detailed flood hazard information.	Flood	High	County Tax and GIS	Unknown	General revenue	2009	Completed. New floodplain maps have been implemented into the Jackson County GIS System.
P-2	Continued consistency in enforcing the codes as they apply to protection from hazards is essential to maintaining adequate public safety to continue compliance with NFIP. Constant vigilance regarding construction in flood prone areas is imperative to ensure all construction meets required flood protection measures. Enforcement of all floodplain requirements, including building and other codes, must be coordinated and systematically applied with adequate follow-up to ensure compliance.	Flood	High	County Building Inspections	Unknown	General revenue	Completed	Completed. The Town of Sylva contracts with Jackson County to provide consistent code administration for building inspections, floodplain enforcement, and zoning code enforcements that includes steep slopes.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
P-5	Develop a fire management plan that includes a clear statement of objectives and which incorporates information on land, threatened structures, degree of fire risk, fire history, and fire management measures.	Wildfire	Moderate	County Erosion Control Officer	Unknown	General revenue	Completed	The Fire management plan is monitored and maintained by the County Fire Marshal.
P-6	Create a subdivision ordinance that would specify a width and grade for entrance and exit routes to ensure the accessibility of emergency vehicles.	All	High	Town Mayor	Unknown	General revenue	Completed	Completed. The Town of Sylva has a Subdivision Ordinance that specifies road construction standards. This is enforced through interlocal agreement by the Jackson County Planning Department.
P-7	Expand the Land Use Plan to address grade of banks on residential and commercial property.	Landslide	High	Town Mayor	Unknown	General revenue	Completed	Completed. The Town has adopted zoning regulations including steep slope regulations that are enforced through an interlocal agreement by the Jackson County Planning Department.
P-8	Acquire small GPS system to document hazard locations for local and state use.	All	High	County Planning	Unknown	General revenue	Completed	Completed. Jackson County's Emergency Management Department assists with the acquiring and maintaining GPS data to document hazard locations for local and state use.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
P-9	Integrate county and municipality EOP with Hazard Mitigation Plan as a way to mitigate unforeseeable hazard events.	All	Moderate	County Erosion Control Officer	Unknown	General revenue	Completed	The County and municipality continue to integrate their EOPs with the Regional Hazard Mitigation Plan. An updated Regional HMP is currently being undertaken and nay amendments necessary to ensure continued integration will be completed.
P-10	Adopt and implement stormwater management ordinance.	Flood; Severe Thunderstorm	High	County Planning	Unknown	General revenue	Completed	Completed. The Town's authority and regulations have been implemented and is implemented through the Inter-Local Agreement with Jackson County.
P-11	Adopt and implement hillside development ordinance.	Landslide	High	Town Mayor	Unknown	General revenue	Completed	Completed. The Town's authority and regulations have been implemented and is implemented through the Inter-Local Agreement with Jackson County.
P-12	Ensure that manufactured homes are installed and secured properly.	Flood; Tornado; Hail; Landslide; Wind; Lightning; Earthquake	High	County Building Inspections	Unknown	General revenue	Completed	Through an interlocal agreement with the Town, the Jackson County Building Inspections Department ensures that all new manufactured homes are installed and secured as required by state building codes.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Natural Resource Protection								
NRP-3	Adopt and implement sedimentation and erosion control ordinance.	Severe Winter Storm; Flood; Landslide; Severe Thunderstorm	High	County Erosion Control Department	Unknown	General revenue	Completed	Completed. The Town's authority and regulations have been implemented and is implemented through the Inter-Local Agreement with Jackson County.

Town of Webster Completed Mitigation Actions

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Prevention								
P-1	Floodplain maps are over 20 years old and areas of intense urbanization are currently unmapped. The existing maps are at scales that do not align with current detailed tax maps. Remapping the entire floodplain is recommended to properly align existing small scale FIRM maps that approximate floodplain boundaries with larger scale detailed maps in order to provide detailed flood hazard information.	Flood	High	County Tax and GIS	Unknown	General revenue	2009	Completed. New flood maps have been implemented into the Jackson County GIS System. This is being administered by the Inter-Local Agreement between the Town and County.
P-2	Continued consistency in enforcing the codes as they apply to protection from hazards is essential to maintaining adequate public safety to continue compliance with NFIP. Constant vigilance regarding construction in flood prone areas is imperative to ensure all construction meets required flood protection measures. Enforcement of all floodplain requirements, including building and other codes, must be coordinated and systematically applied with adequate follow-up to ensure compliance.	Flood	High	County Building Inspections	Unknown	General revenue	Completed	Completed. The Town of Webster contracts with the Jackson County Building Inspections Department to administer the State building codes and the County's floodplain ordinance. This arrangement provides consistency in enforcement and helps ensure compliance with NFIP.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
P-3	Review the Emergency Operations Plan on an annual basis to ensure that it is kept current.	All	High	County Emergency Management	Unknown	General revenue	Completed	The Jackson County Emergency Management Department assists the Town with reviewing the EOP on an annual basis and recommends any necessary amendments to the plan.
P-4	Expand the floodplain and tax data to include residential-commercial distinction and occupied-unoccupied distinction.	Flood	High	County Tax and GIS	Unknown	General revenue	Completed	The County continues to collect and maintain data related to occupancy and use.
P-5	Develop a fire management plan that includes a clear statement of objectives and which incorporates information on land, threatened structures, degree of fire risk, fire history, and fire management measures.	Wildfire	Moderate	County Fire Marshal; Fire Department	Unknown	General revenue	Completed	Completed/ongoing. The Fire management plan is developed and maintained by interlocal agreement by the County Fire Marshal.
P-6	Create a subdivision ordinance that would specify a width and grade for entrance and exit routes to ensure the accessibility of emergency vehicles.	All	High	Town Mayor; Town Council	Unknown	General revenue	Completed	Completed. The Town of Webster has adopted the County's Subdivision Ordinance that specifies road construction standards. This is enforced through interlocal agreement by the Jackson County Planning Department.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
P-7	Expand the Land Use Plan to address grade of banks on residential and commercial property.	Landslide	High	Town Mayor; Town Council	Unknown	General revenue	Completed	Completed. The Town has adopted the County's Mountain and Hillside Development Ordinance that addresses development on steep slopes. The County Planning Department administers the ordinance through an interlocal agreement.
P-8	Acquire small GPS system to document hazard locations for local and state use.	All	High	County Planning	Unknown	General revenue	Completed	Completed. Jackson County's Emergency Management Departments assists with the acquiring and maintaining GPS data to document hazard locations for local and state use.
P-9	Ensure that manufactured homes are properly installed and secured properly.	Flood; Tornado; Wind; Lightning; Earthquake	Moderate	County Building Inspections	Unknown	General revenue	Completed	Completed. Through an interlocal agreement with the Town, the Jackson County Building Inspection Department ensures that all new manufactured homes are installed and secured as required by state building codes.
Property Protection								

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
PP-2	Minimize placing new critical public facilities within the floodplain unless they promote an overriding public benefit, will not worsen hazard risk, will not directly promote development in floodplains, and are designed to withstand flood damage.	Flood	Moderate	County Building Inspections	Unknown	General revenue	Completed	Completed/ongoing. The Town will minimize the placement of critical facilities within the floodplain. If a critical facility is located within the floodplain the Town will comply with the County's floodplain ordinance.

Swain County Completed Mitigation Actions

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Prevention								
P-1	Floodplain maps are over 20 years old and areas of intense urbanization are currently unmapped. The existing maps are at scales that do not align with current detailed tax maps. Remapping the entire floodplain is recommended to properly align existing small scale FIRM maps that approximate floodplain boundaries with large scale detailed maps in order to provide detailed flood hazard information.	Flood	Moderate	County Emergency Management; County Mapping; Town Council NCDEM	Unknown	Federal	Completed	Completed. New flood maps were adopted in 2010.
P-2	Continued consistency in enforcing the codes as they apply to protection from hazards is essential to maintain adequate public safety. Constant vigilance regarding construction meets required flood protection measures. Enforcement of all floodplain requirements, including building and other codes, must be coordinated and systematically applied with adequate follow-up to ensure compliance.	Flood	Moderate	County Inspections Office; Town Council	Unknown	Staff time only	Completed	Completed/Ongoing. Requires continued funding and staff time to enforce codes for new and existing development.
P-3	Review the Emergency Operations Plan on an annual basis to ensure that it is kept current.	All	Moderate	County Emergency Management	Unknown	Staff time only	Completed	Ongoing annually.
P-7	Acquire a small GPS system to document hazard locations for local and state use.	All	Moderate	County Emergency Management	Unknown	Local	Completed	Completed.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
P-8	Integrate county/municipality EOP with Hazard Mitigation Plan as a way to mitigate unforeseeable hazard events.	All	Moderate	County Emergency Management; Town Council	Unknown	Local	Completed	Completed. In 2005.
Property Protection								
PP-2	Minimize placing new critical public facilities within the floodplain unless they promote an overriding public benefit, will not worsen hazard risk, will not directly promote development in floodplains, and are designed to withstand flood damage.	Flood	Moderate	County Emergency Management; County Inspections, Town Council	Unknown	Staff time	Completed.	Completed/Ongoing. Requires continuous action as new facilities are constructed.
PP-3	As additional grants become available, the County should apply for acquisition funds to purchase nonresidential properties that were damaged during a previous disaster when practical.	Flood	Moderate	County Emergency Management; Town Council	Unknown	State, Federal	Completed	There was limited political will to complete this action over the last five years.
Public Education and Awareness								
PEA-2	Explore the possibility of developing an internet-based emergency information website.	All	Moderate	County Emergency Management	Unknown	Local	Completed.	Completed in 2008.

Town of Bryson City Completed Mitigation Actions

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Prevention								
P-1	Ensure that manufactured homes are installed and secured properly.	Flood; Wind	Moderate	County Inspections Office, Town Council	Unknown	Staff time only	Currently in place	Completed. This action is currently in place and will continue as staff time allows.
P-2	Floodplain maps are over 20 years old and areas of intense urbanization are currently unmapped. The existing maps are at scales that do not align with current detailed tax maps. Remapping the entire floodplain is recommended to properly align existing small scale FIRM maps that approximate floodplain boundaries with large scale detailed maps in order to provide detailed flood hazard information.	Flood	Moderate	County Emergency Management; County Mapping; Town Council NCEM	Unknown	Federal funding	Completed	Completed. New flood maps were adopted in 2010.
P-3	Continued consistency in enforcing the codes as they apply to protection from hazards is essential to maintain adequate public safety. Constant vigilance regarding construction meets required flood protection measures. Enforcement of all floodplain requirements, including building and other codes, must be coordinated and systematically applied with adequate follow-up to ensure compliance.	Flood	Moderate	County Inspections Office; Town Council	Unknown	Staff time only	Completed	Completed/Ongoing. Requires continued funding and staff time to enforce codes for new and existing development.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
P-5	Create a subdivision ordinance that would specify a width and grade for entrance and exit routes to ensure the accessibility of emergency vehicles.	All	Moderate	County Emergency Management; County Fire Marshal; County Inspections Office; Town Council	Unknown	Staff time only	N/A	Delete. This action is no longer politically feasible for the City.
P-6	Integrate county/municipality EOP with Hazard Mitigation Plan as a way to mitigate unforeseeable hazard events.	All	Moderate	County Emergency Management; Town Council	Unknown	Local	Completed	Completed. In 2005.
Property Protection								
PP-2	Minimize placing new critical public facilities within the floodplain unless they promote an overriding public benefit, will not worsen hazard risk, will not directly promote development in floodplains, and are designed to withstand flood damage.	Flood	Moderate	County Emergency Management; Town Inspections Office	Unknown	Staff time	Currently in place	Completed/Ongoing. Requires continuous action as new facilities are constructed.

Eastern Band of Cherokee Indians Completed Mitigation Actions

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Prevention								
P-1	Formal recognition of Local Emergency Planning Committee (LEPC). Having an LEPC will further the coordination of multiple agency programs toward institutionalizing mitigation into routine operations.	All	High	Emergency Management; EBCI Tribal Council; EBCI LEPC	Unknown	N/A	Completed	Resolution No. 373 was passed on March 4, 1993 to the Tribal Council requesting the formal recognition of the LEPC and defining its role in implementing the Emergency Operations Plan.
P-4	Develop hazard and damage data tracking system. Using GIS, develop a centralized system to track hazard related data to provide tribal officials with essential information required to focus hazard mitigation, disaster response and disaster recovery efforts in the future.	All	High	EBCI Emergency Management; EBCI Tribal Planning; EBCI GIS	Unknown	Capital Budget	Completed	Completed/Ongoing: At new EOC we now have an onsite, part-time GIS person on staff to assist collecting data to develop a database to store the information.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
P-15	Train Cherokee and BIA Staff in Firewise community planning and prevention techniques, shifting the focus from suppression to prevention. The BIA Fire Management Plan focuses heavily on suppression of wildfires. While that is of critical importance, there are many very simple measures communities can take to protect existing development from being destroyed by wildfire and to design future developments in a way that minimizes their vulnerability associated with wildfire. Contact the National Fire Protection Association about opportunities to participate in its Firewise Communities training program. Identify funding to train not only Fire Department and Forrest Managers, but planning and environmental staff as well. Identify ways of incorporating techniques learned in training into existing mitigation related programs.	Wildfire	High	EBCI Emergency Management; EBCI Fire; BIA Cherokee Agency	Unknown	Tribal Training Funds; BIA; NFPA	Completed	Completed/ongoing. Coordination between Fire Department prevention team and BIA Training Coordinator will provide ongoing training and education.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
P-17	Expand Regulation of Open Debris Burning: Under Chapter 113 C of the Cherokee Code, open burning of leaves, brush and yard trimmings are allowed without a permit if the material to be burned originates on the property and no public pick up services are available. Research for the Risk Assessment portion of Section IV of this plan demonstrated that the overwhelming majority of wildfires are caused by debris burning. Modify Chapter 113 C so that permits are required for all debris burning, thereby giving tribal government the opportunity to establish permit conditions and, when necessary, perform site visits, to ensure that precautions are taken to prevent the spread of fire. Draft revised code language, review with BIA and Fire Department management and propose to Council. Develop permitting mechanism and best management practice conditions.	Wildfire	High	EBCI Environmental Planning	Unknown	Capital Budget; BIA	Completed	This is an important part of the Fire Department and Environmental Planning Process review.
P-19	Identify areas vulnerable to having access cutoff due to the impacts of severe winter storms and develop a plan to ensure continuity of critical services to these areas.	Winter Storm	High	EBCI Emergency Management; EBCI Fire; EBCI Police	Unknown	Capital Budget	Ongoing	COMPLETED in October 2006. Will work with the communities on shelters and Emergency Disaster Kits.

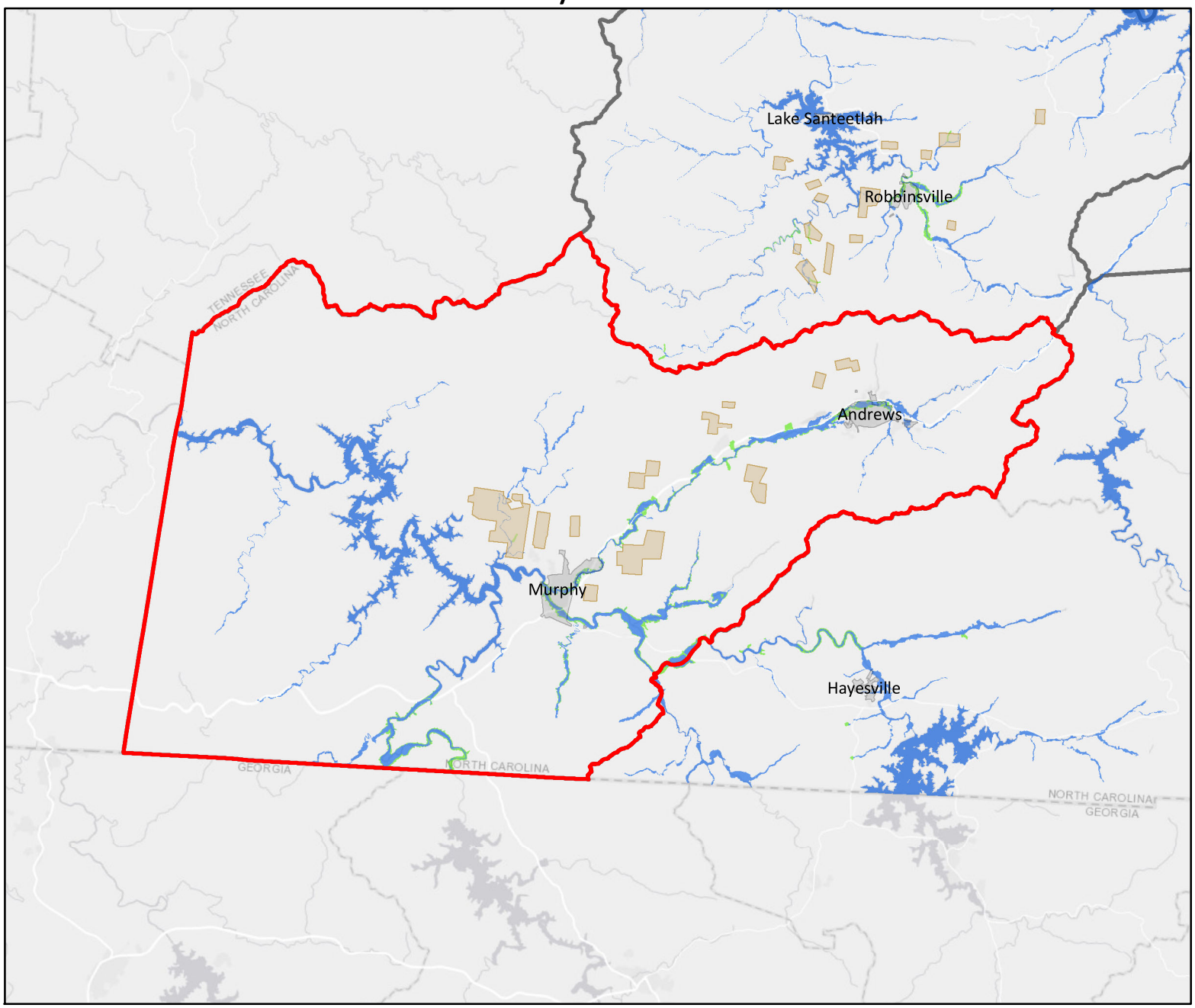
Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
P-25	Increase Security at Ceremonial Fairgrounds Develop a plan to address security during large events at Ceremonial Fairgrounds. Working with the subcommittee established in MM-1, develop an operational plan to define increased security measures during large and publicized events. Measures may include limiting access and egress points and patrolling them, surveillance monitoring and other activities.	Manmade	High	EBCI Emergency Management; EBCI Police	Unknown	Capital Budget	Completed	Completed/ongoing. Incident Action plans and increased security measures are implemented during large and publicized events.
Property Protection								
PP-3	Protect communications equipment behind police department and propane fuel tank behind casino. Install increased fencing around communications equipment and surveillance cameras which will feed to the Police Department. Install increased fencing around the large propane tank behind Harrah's casino to completely encapsulate the tank.	Manmade	High	EBCI Emergency Management; EBCI Police	Unknown	Capital Budget; Homeland Security Grant; Harrah's Casino	Completed	The fencing was COMPLETED in 2006 and the propane tank was removed and placed underground in 2007.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Estimated Cost	Potential Funding Sources	Implementation Schedule	Implementation Status (2022)
Emergency Services								
ES-2	Many of the identified emergency shelters are located in flood-prone locations. Identify and equip backup shelter for flooding disasters. Identify back up shelters for flooding disasters in anticipation of losing standard emergency shelters during flooding. Consider transportation access to the shelters and work with local churches outside of flood prone areas. Identify funding to equip alternate shelters with generators, cots and other essential needs.	Flood	High	EBCI Emergency Management	Unknown	Capital Budget; DHS/FEMA	COMPLETED	This action was COMPLETED prior to October 1, 2009. A new shelter was facility was built in the Big Y and Birdtown communities, and generators were purchased in the FY2011 budgets for these locations. The State EM will assist in purchasing a Transfer switch for the Birdtown Facility.

Appendix F
Flood Hazard Maps

This Appendix includes flood hazard maps for all participating jurisdictions.

Cherokee County - Flood Hazard Areas



Municipal Boundary

County Boundary

Eastern Band of Cherokee Indians

Flood Zone

100 Year Flood Zone

500 Year Flood Zone

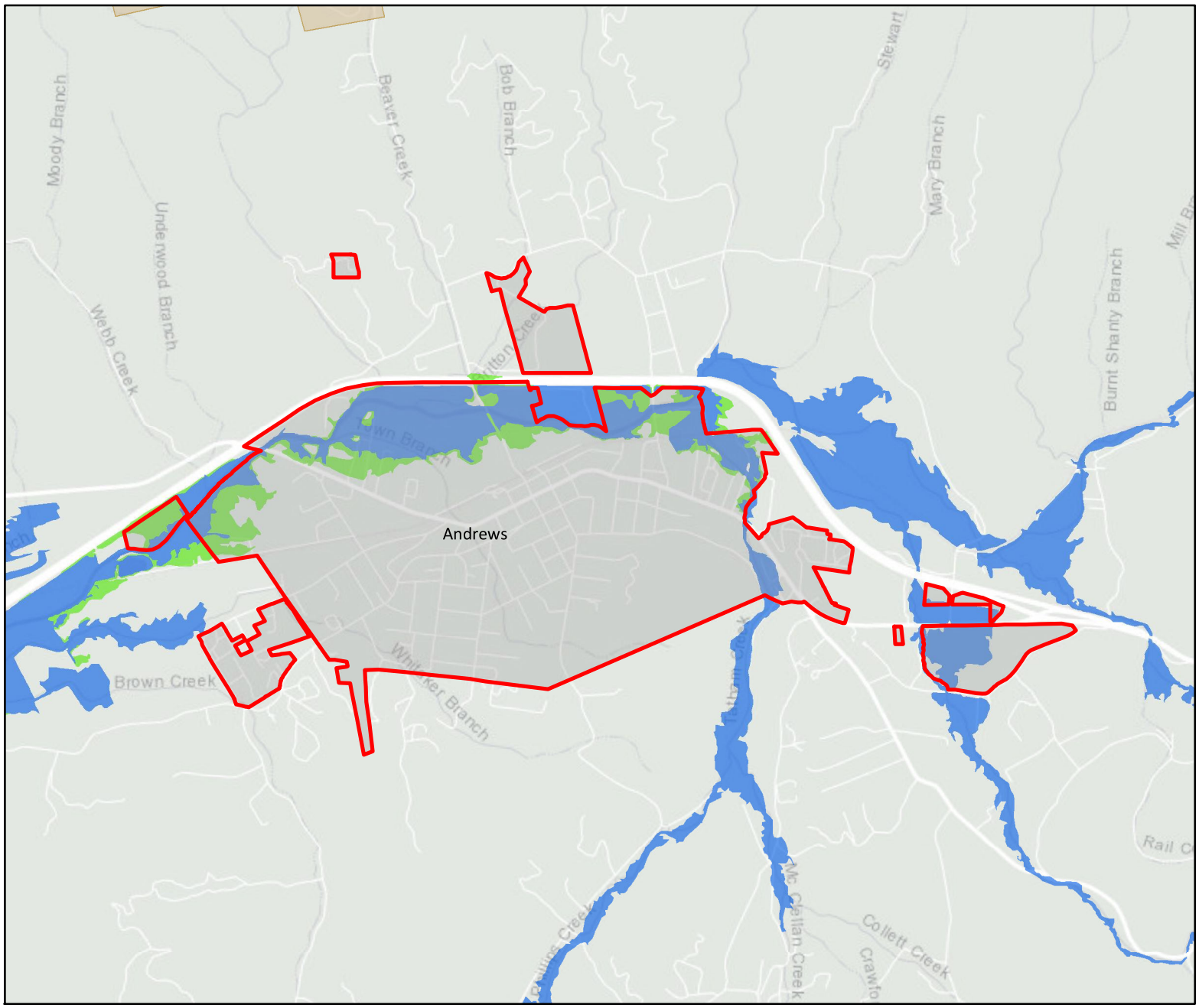
Coastal Flood Zone

Data Source: North Carolina Floodplain Mapping Program

0 3.25 6.5 13 Miles

N

Andrews - Flood Hazard Areas



Municipal Boundary

County Boundary

Eastern Band of Cherokee Indians

Flood Zone

100 Year Flood Zone

500 Year Flood Zone

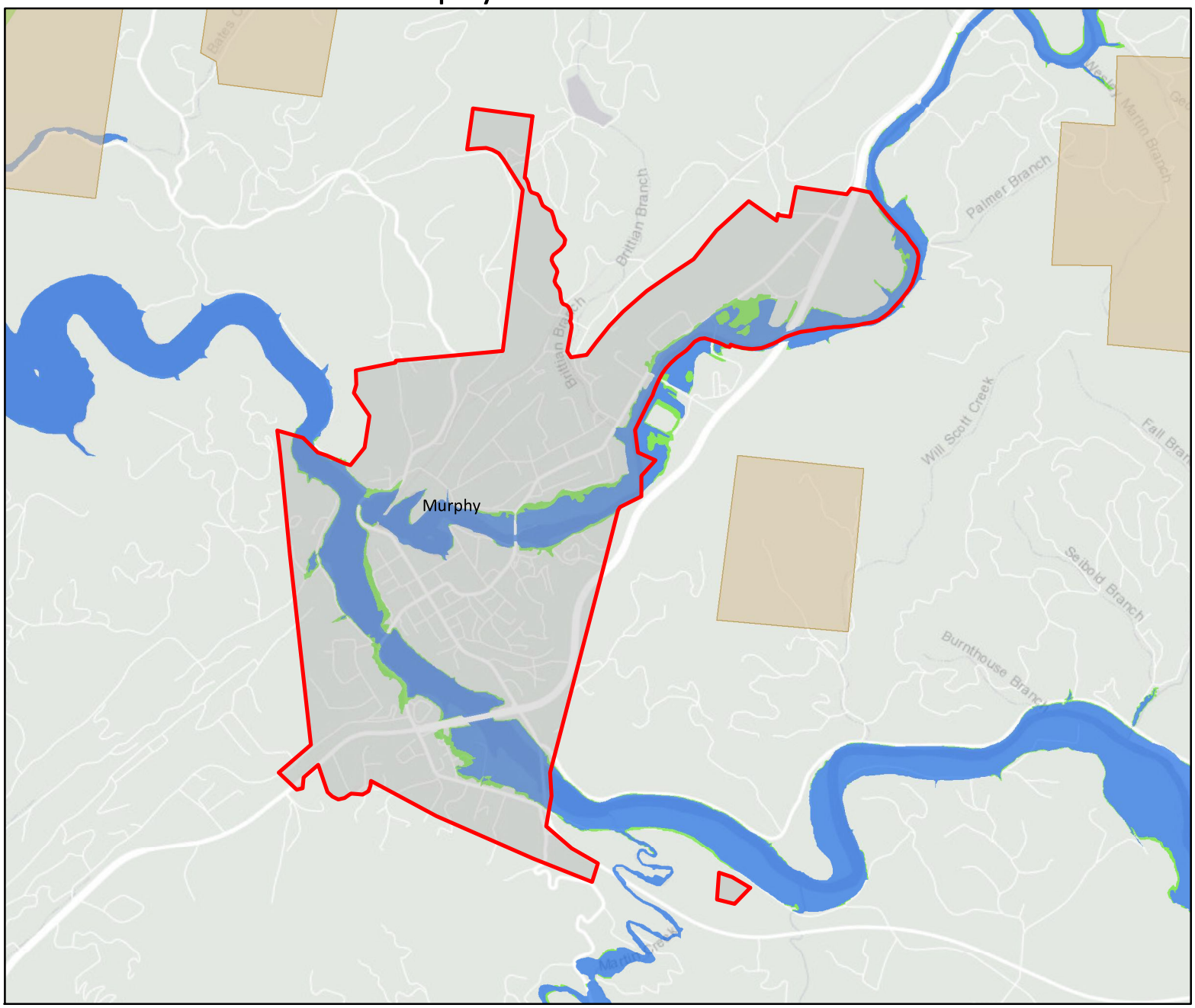
Coastal Flood Zone

Data Source: North Carolina Floodplain Mapping Program

0 0.275 0.55 1.1 Miles

N

Murphy - Flood Hazard Areas



Municipal Boundary

County Boundary

Eastern Band of Cherokee Indians

Flood Zone

100 Year Flood Zone

500 Year Flood Zone

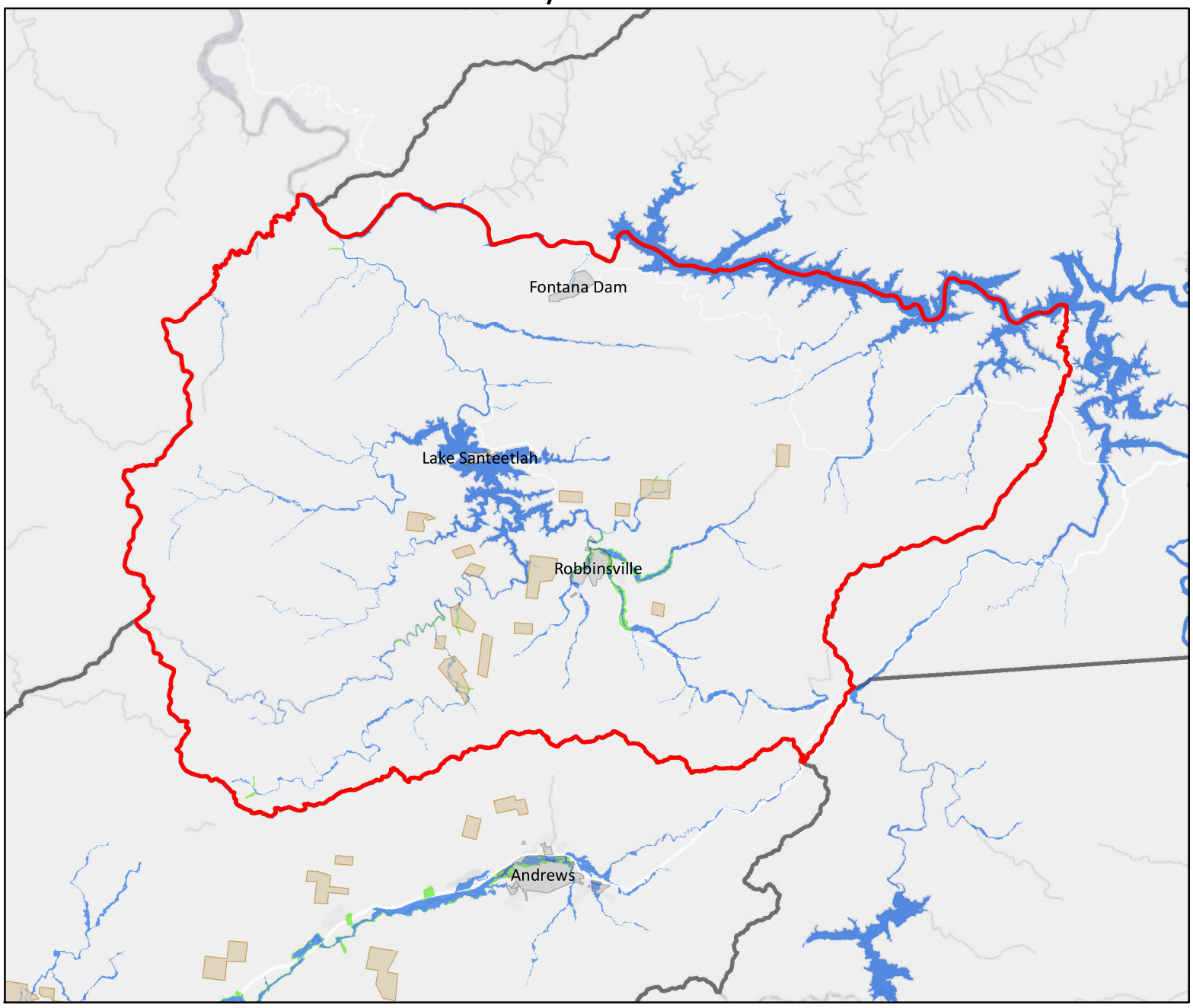
Coastal Flood Zone

Data Source: North Carolina Floodplain Mapping Program

0 0.325 0.65 1.3 Miles

N

Graham County - Flood Hazard Areas



Municipal Boundary
County Boundary
Eastern Band of Cherokee Indians

Flood Zone

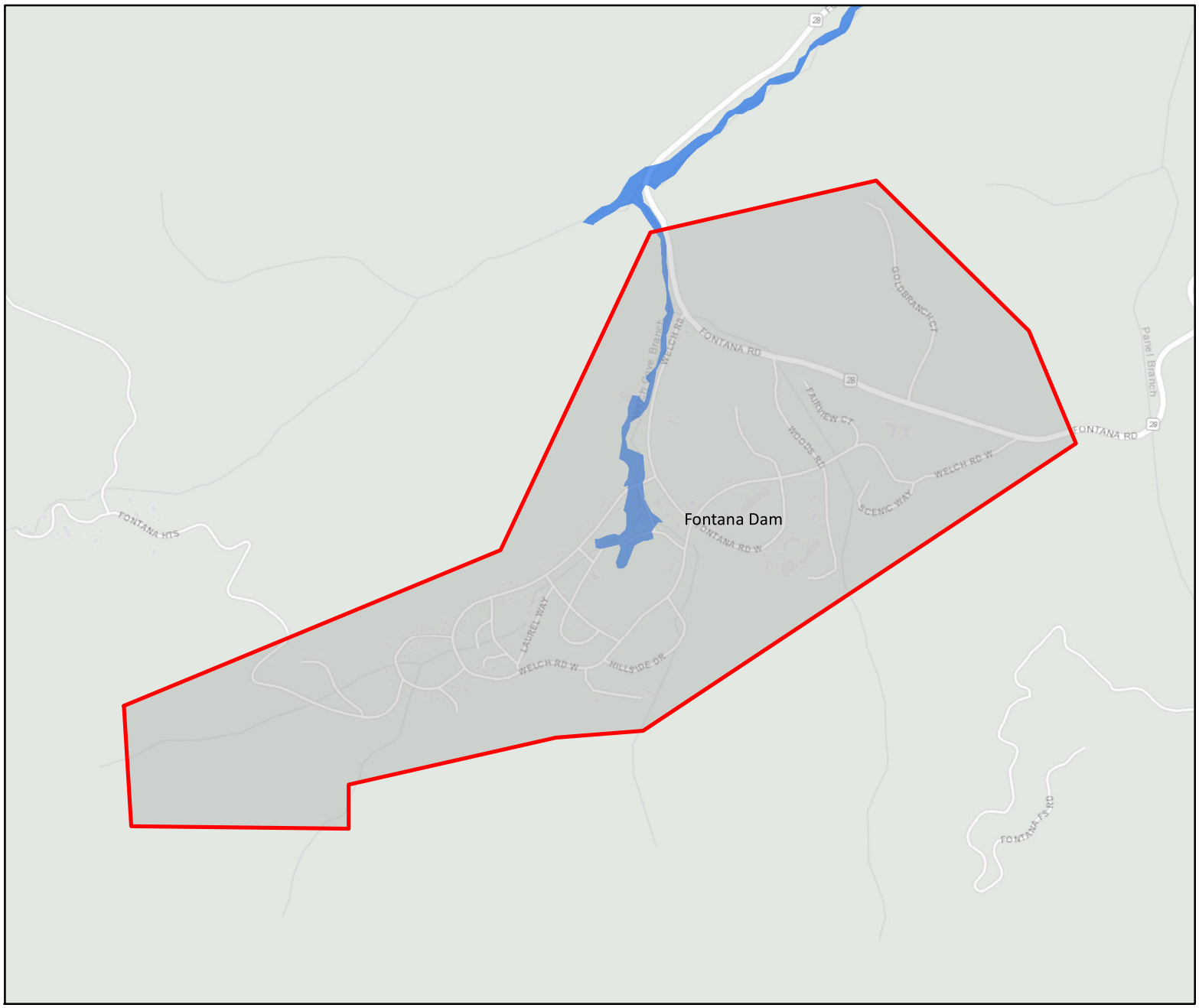
100 Year Flood Zone
500 Year Flood Zone
Coastal Flood Zone

Data Source: North Carolina Floodplain Mapping Program

0 2.25 4.5 9 Miles

N

Fontana Dam - Flood Hazard Areas



Municipal Boundary

County Boundary

Eastern Band of Cherokee Indians

Flood Zone

100 Year Flood Zone

500 Year Flood Zone

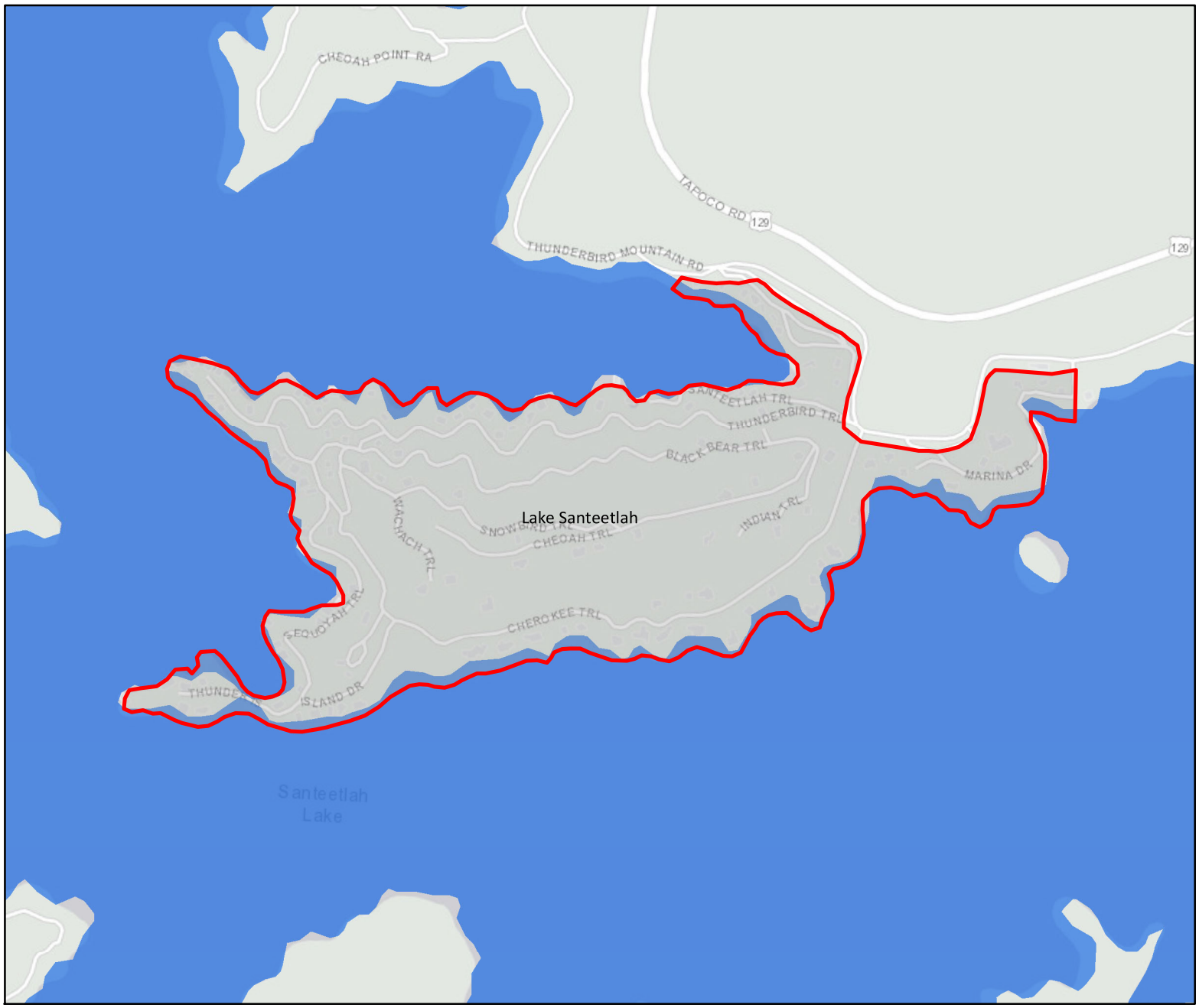
Coastal Flood Zone

Data Source: North Carolina Floodplain Mapping Program

0 0.1 0.2 0.4 Miles

N

Lake Santeetlah - Flood Hazard Areas



Municipal Boundary

County Boundary

Eastern Band of Cherokee Indians

Flood Zone

100 Year Flood Zone

500 Year Flood Zone

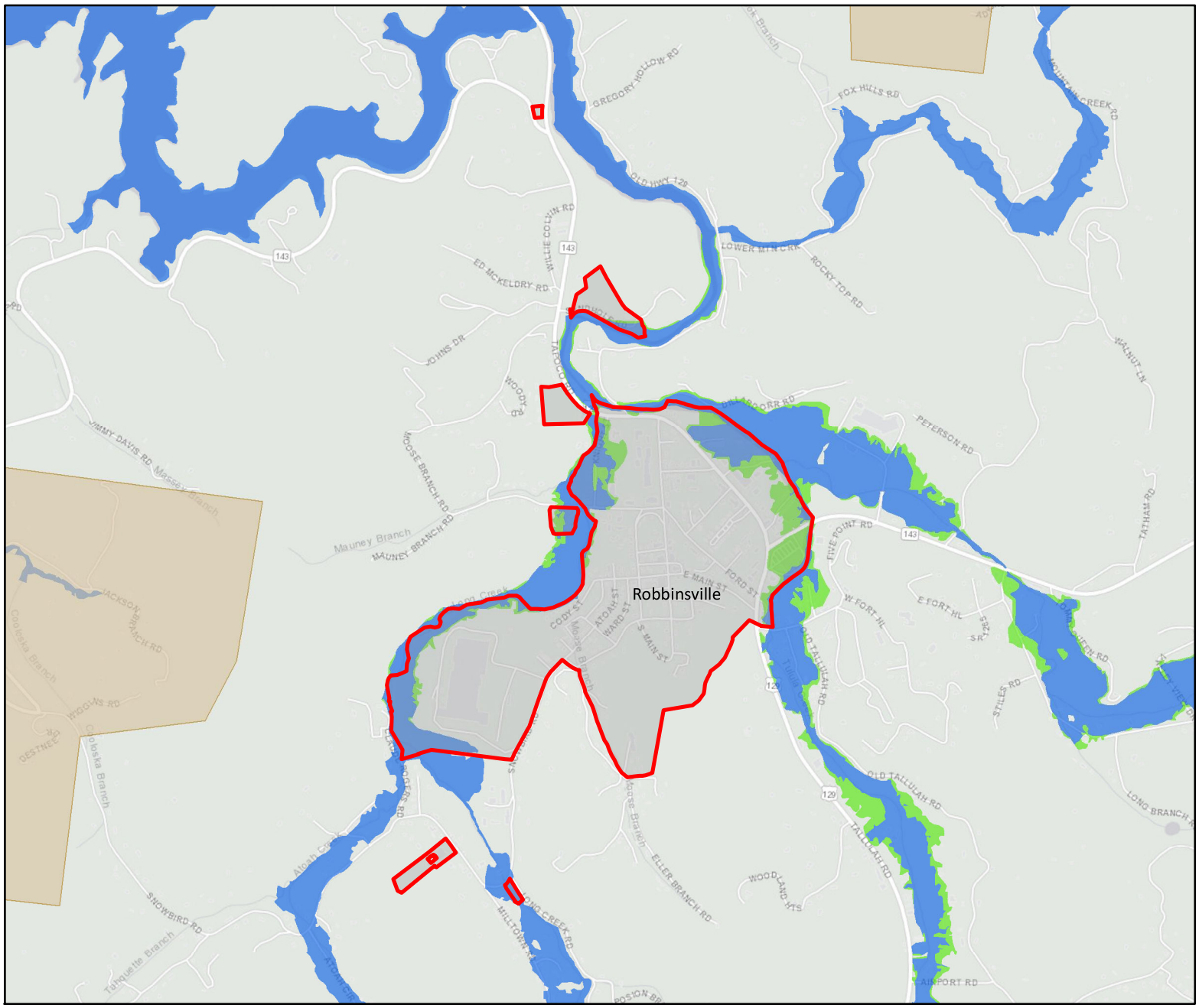
Coastal Flood Zone

Data Source: North Carolina Floodplain Mapping Program

0 0.075 0.15 0.3 Miles

N

Robbinsville - Flood Hazard Areas



Municipal Boundary

County Boundary

Eastern Band of Cherokee Indians

Flood Zone

100 Year Flood Zone

500 Year Flood Zone

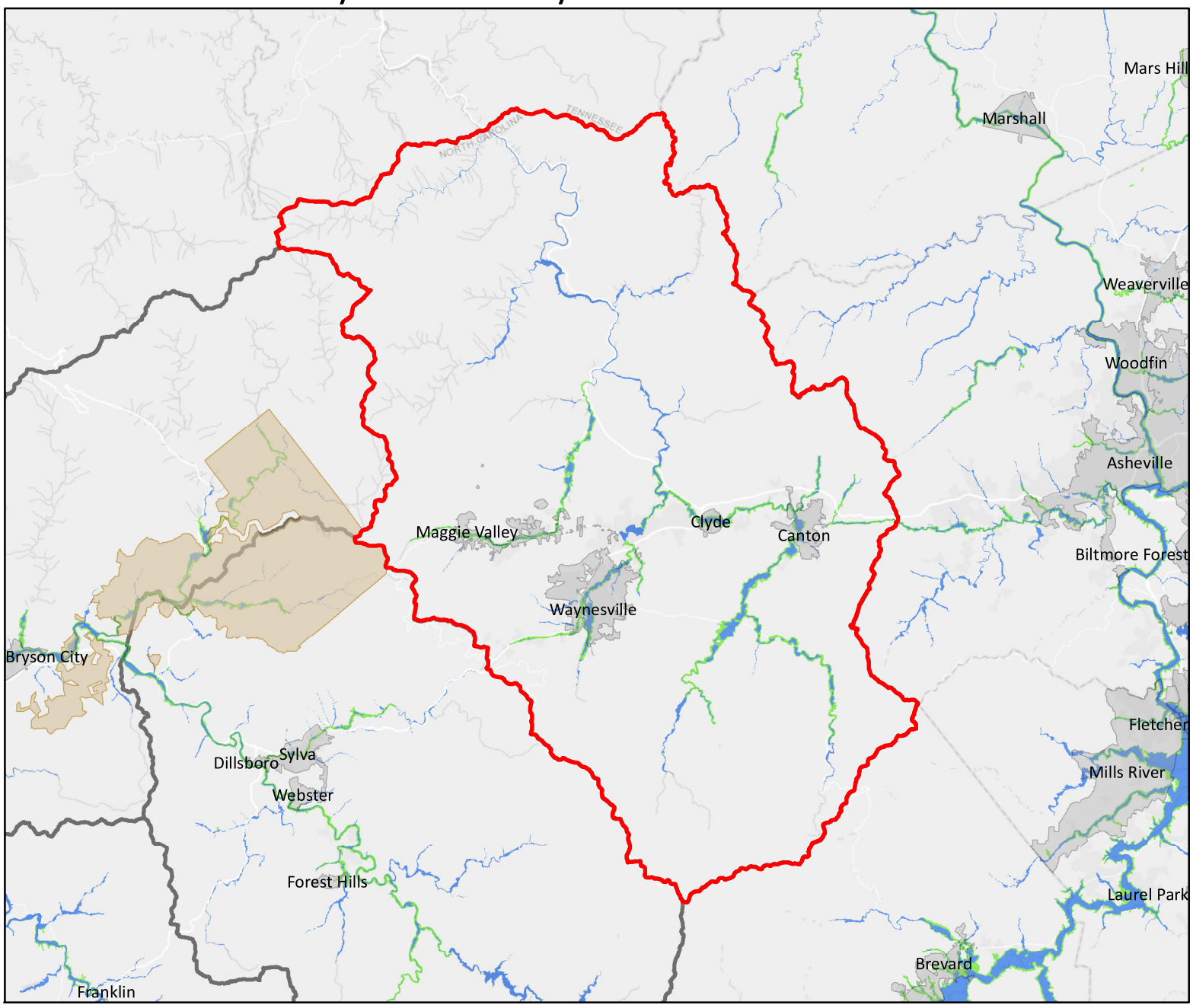
Coastal Flood Zone

Data Source: North Carolina Floodplain Mapping Program

0 0.225 0.45 0.9 Miles

N

Haywood County - Flood Hazard Areas



Municipal Boundary

County Boundary

Eastern Band of Cherokee Indians

Flood Zone

100 Year Flood Zone

500 Year Flood Zone

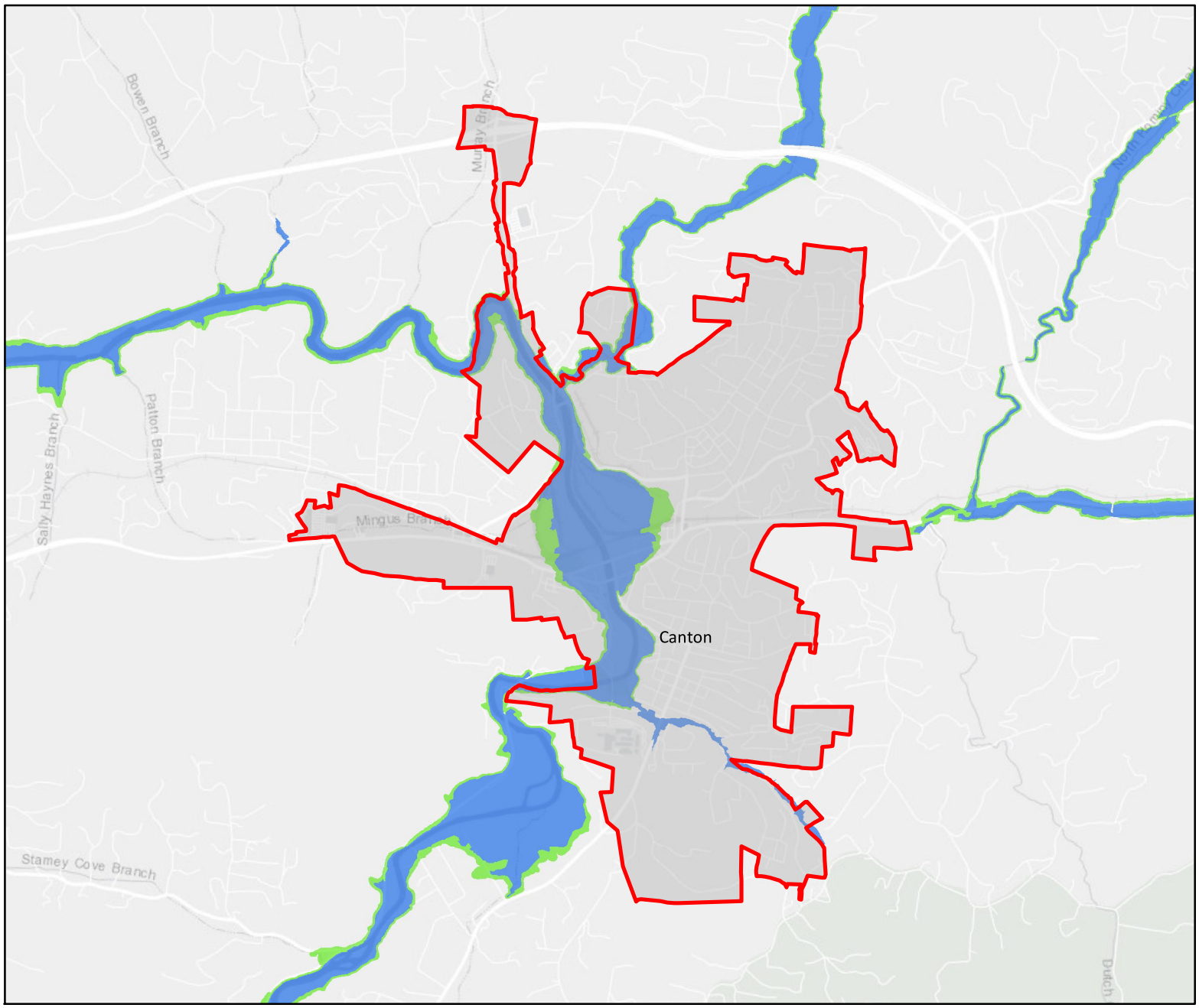
Coastal Flood Zone

Data Source: North Carolina Floodplain Mapping Program

0 3.75 7.5 15 Miles

N

Canton - Flood Hazard Areas



Municipal Boundary

County Boundary

Eastern Band of Cherokee Indians

Flood Zone

100 Year Flood Zone

500 Year Flood Zone

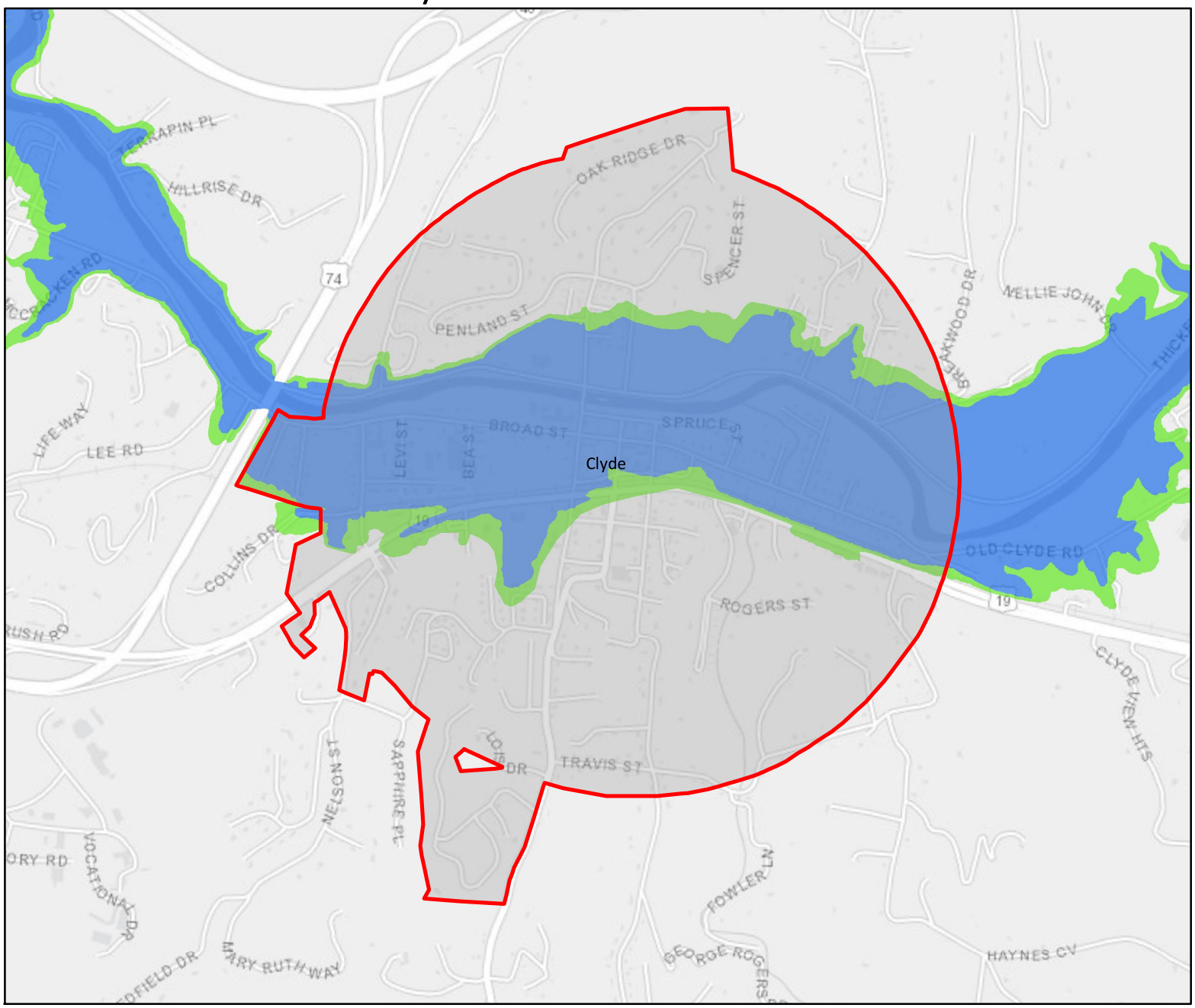
Coastal Flood Zone

Data Source: North Carolina Floodplain Mapping Program

0 0.35 0.7 1.4 Miles

N

Clyde - Flood Hazard Areas



Flood Zone

- 100 Year Flood Zone
- 500 Year Flood Zone
- Coastal Flood Zone

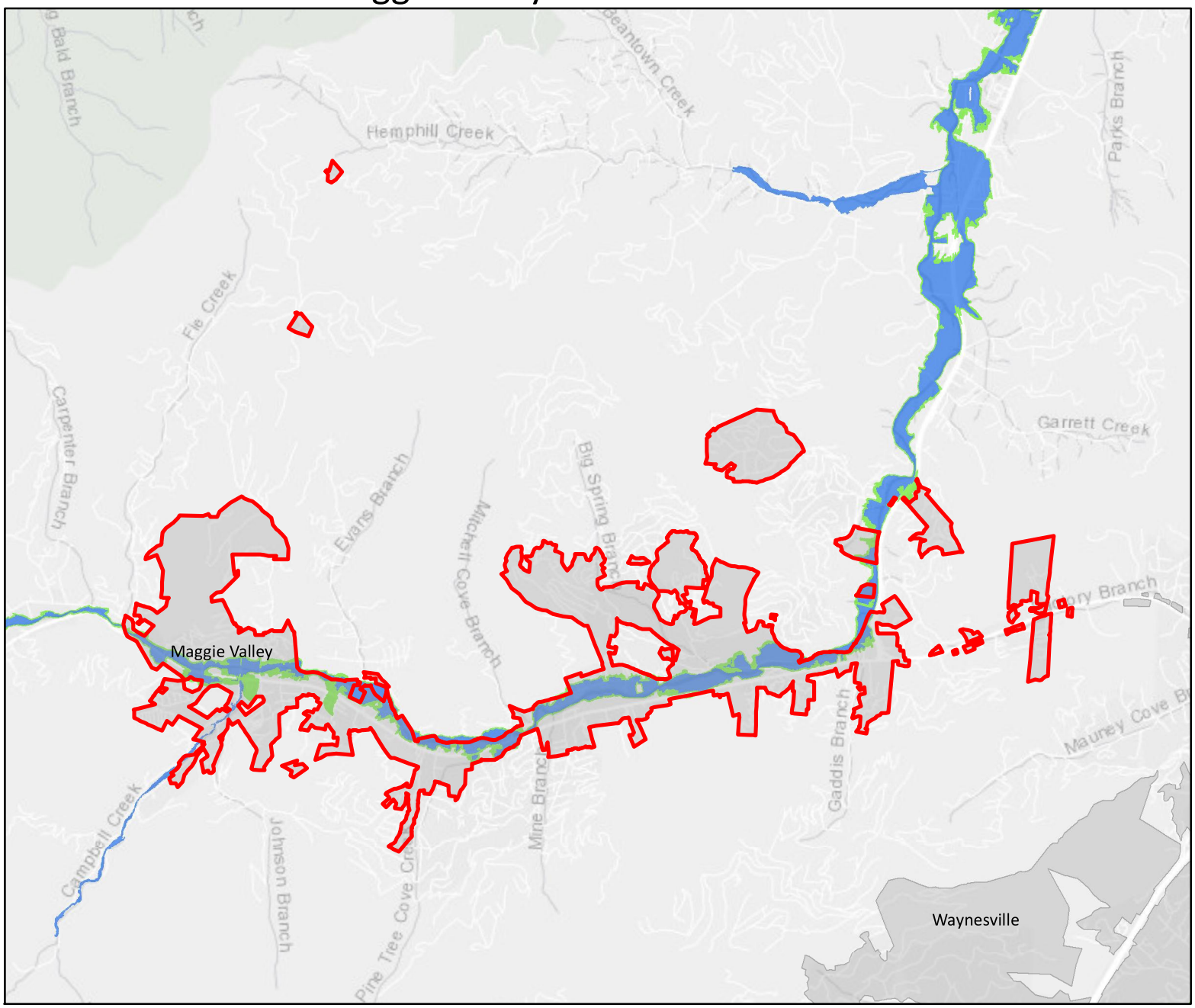
- Municipal Boundary
- County Boundary
- Eastern Band of Cherokee Indians

Data Source: North Carolina Floodplain Mapping Program

0 0.125 0.25 0.5 Miles

N

Maggie Valley - Flood Hazard Areas



Municipal Boundary

County Boundary

Eastern Band of Cherokee Indians

Flood Zone

100 Year Flood Zone

500 Year Flood Zone

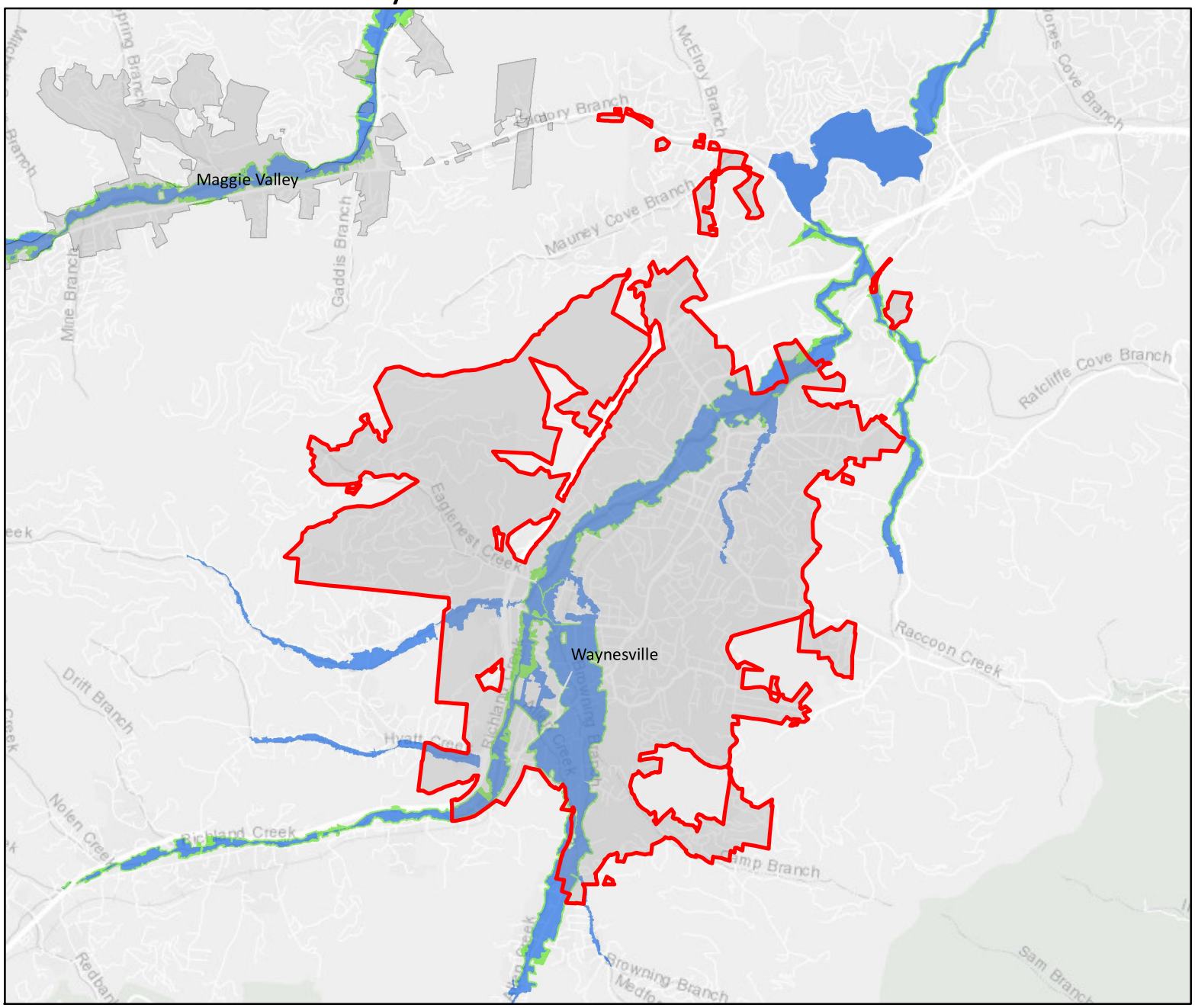
Coastal Flood Zone

Data Source: North Carolina Floodplain Mapping Program

0 0.5 1 2 Miles

N

Waynesville - Flood Hazard Areas



Municipal Boundary

County Boundary

Eastern Band of Cherokee Indians

Flood Zone

100 Year Flood Zone

500 Year Flood Zone

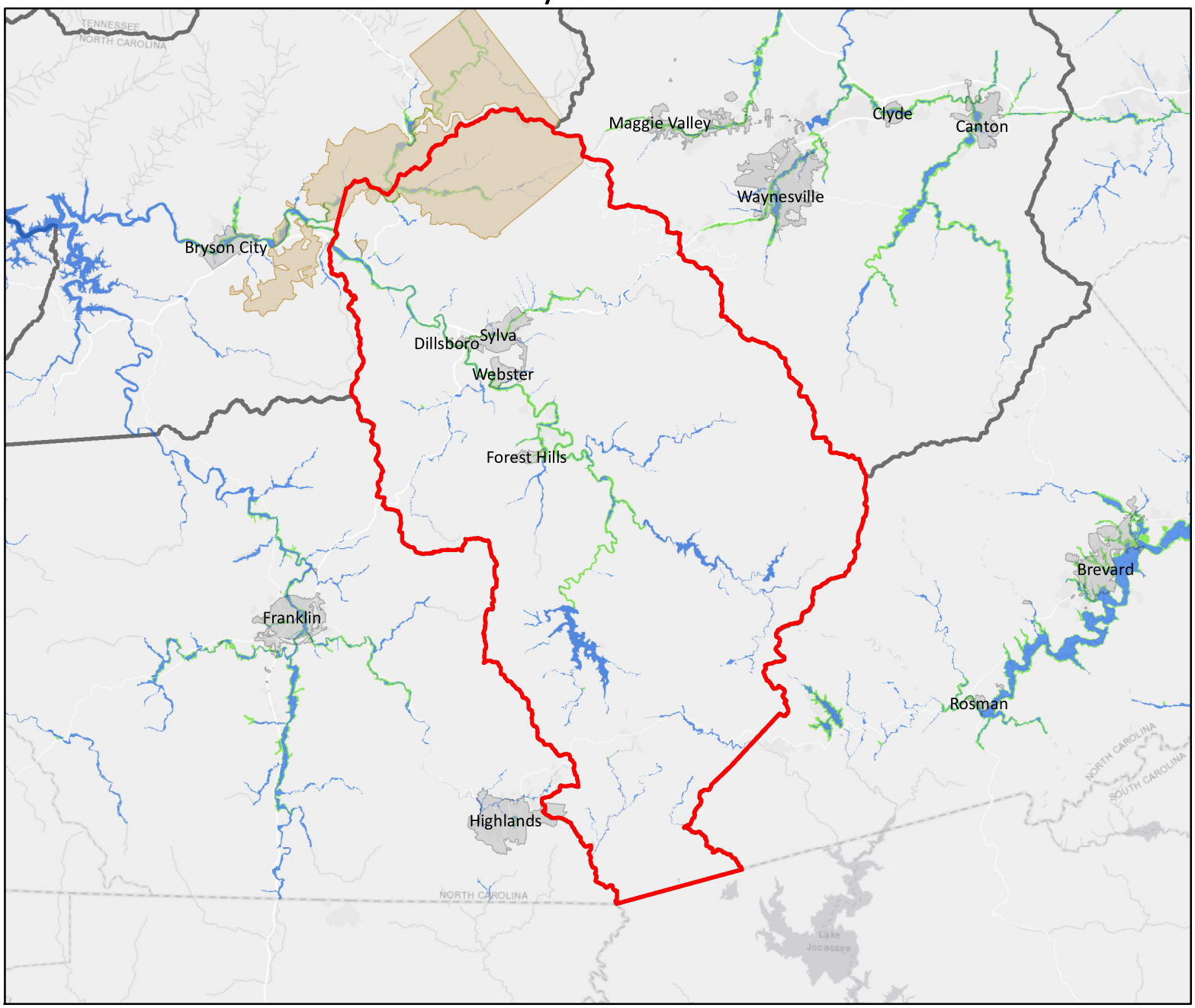
Coastal Flood Zone

Data Source: North Carolina Floodplain Mapping Program

0 0.5 1 2 Miles

N

Jackson County - Flood Hazard Areas



Municipal Boundary

County Boundary

Eastern Band of Cherokee Indians

Flood Zone

100 Year Flood Zone

500 Year Flood Zone

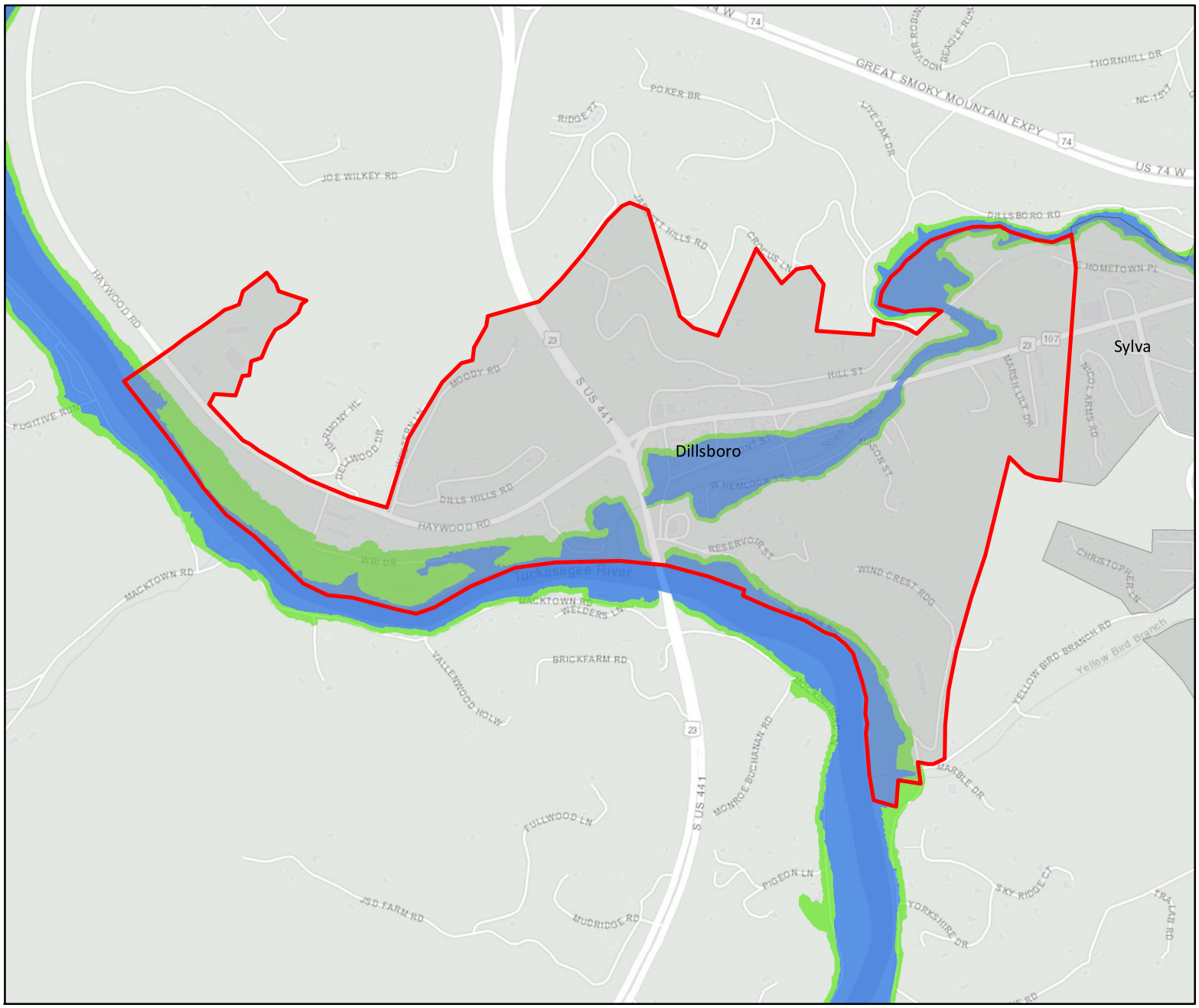
Coastal Flood Zone

Data Source: North Carolina Floodplain Mapping Program

0 4 8 16 Miles

N

Dillsboro - Flood Hazard Areas



Flood Zone

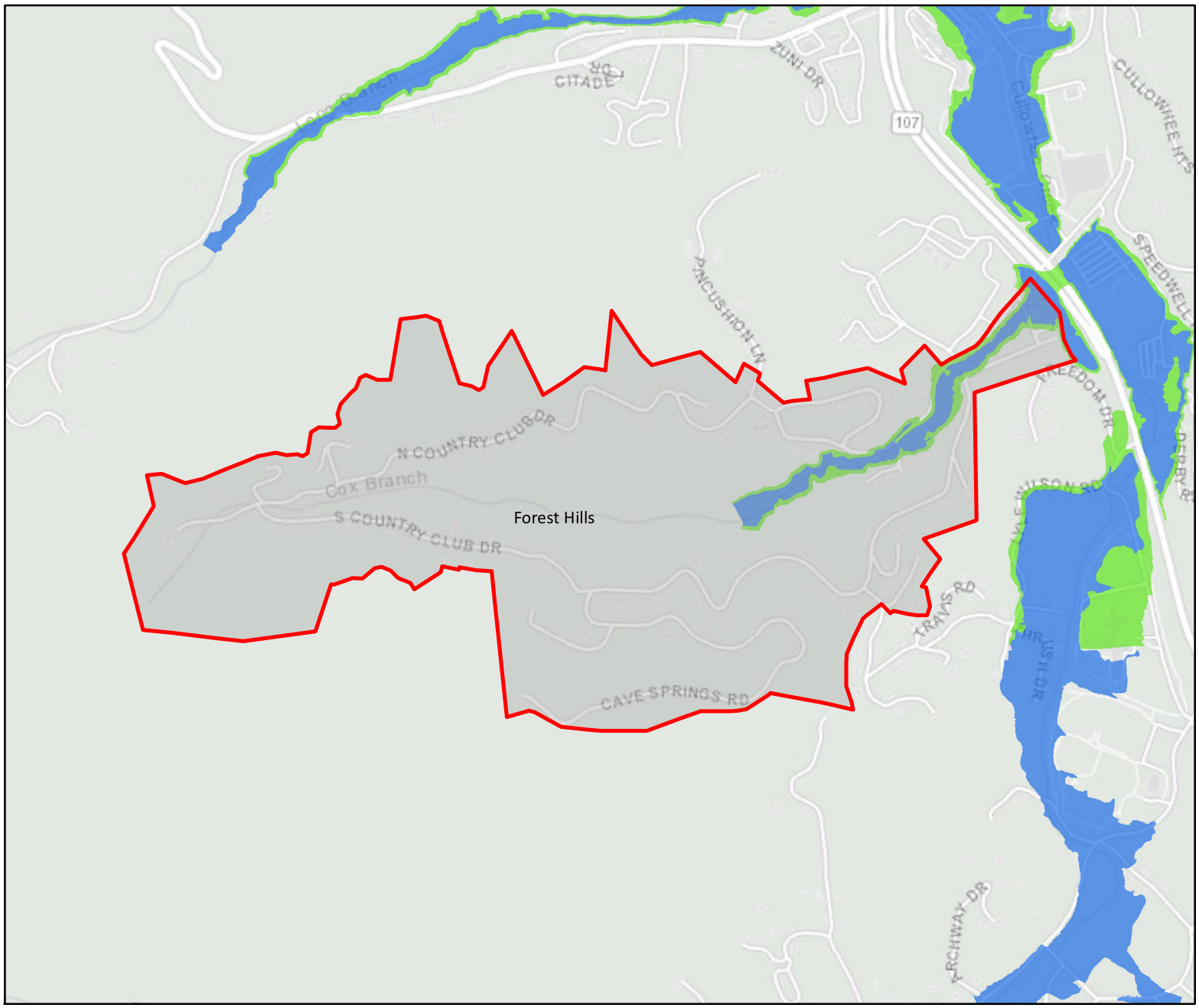
- Municipal Boundary
- County Boundary
- Eastern Band of Cherokee Indians
- 100 Year Flood Zone
- 500 Year Flood Zone
- Coastal Flood Zone

Data Source: North Carolina Floodplain Mapping Program

0 0.1 0.2 0.4 Miles

N

Forest Hills - Flood Hazard Areas



Municipal Boundary

County Boundary

Eastern Band of Cherokee Indians

Flood Zone

100 Year Flood Zone

500 Year Flood Zone

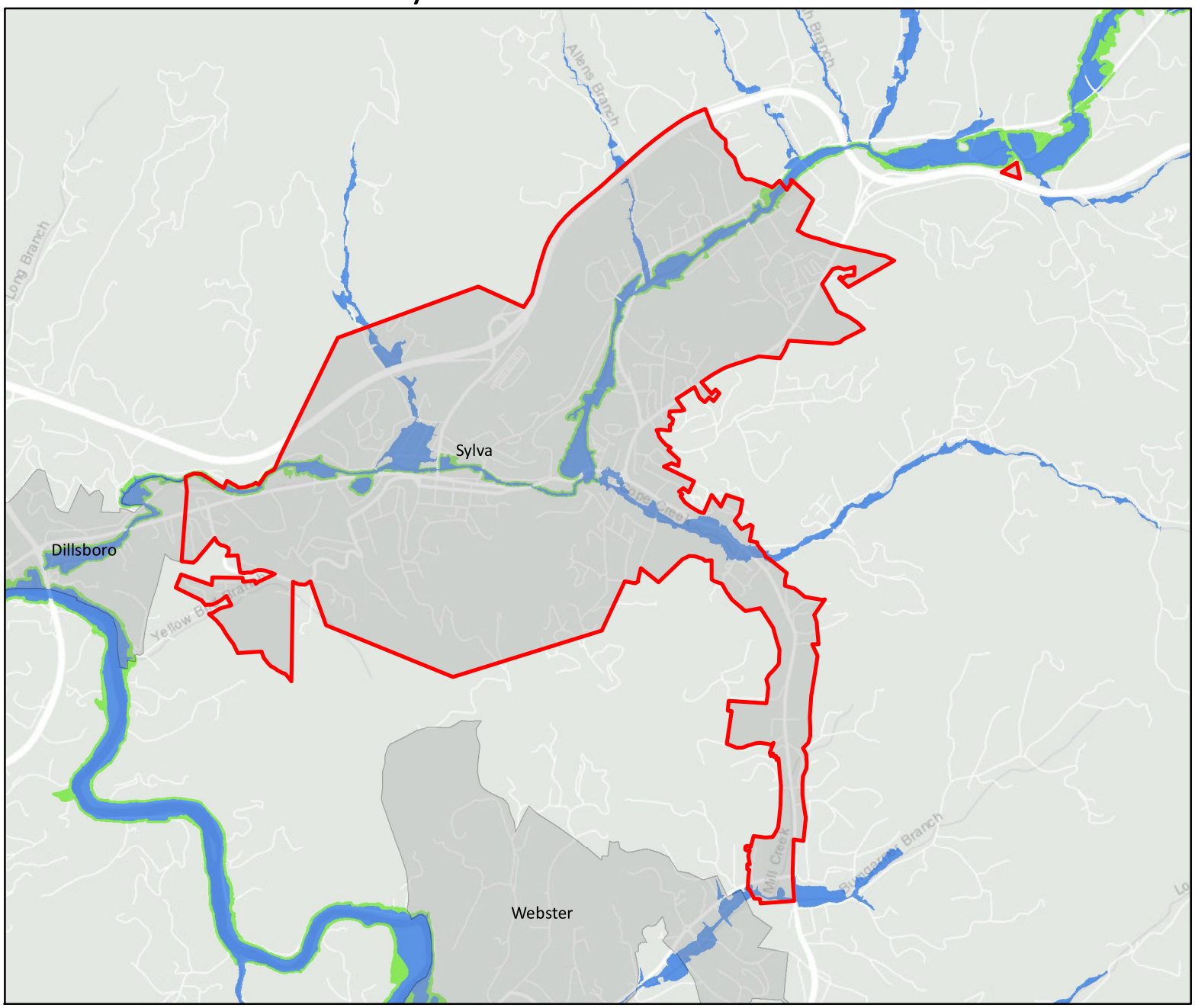
Coastal Flood Zone

Data Source: North Carolina Floodplain Mapping Program

0 0.125 0.25 0.5 Miles

N

Sylva - Flood Hazard Areas



Municipal Boundary
County Boundary
Eastern Band of Cherokee Indians

Flood Zone

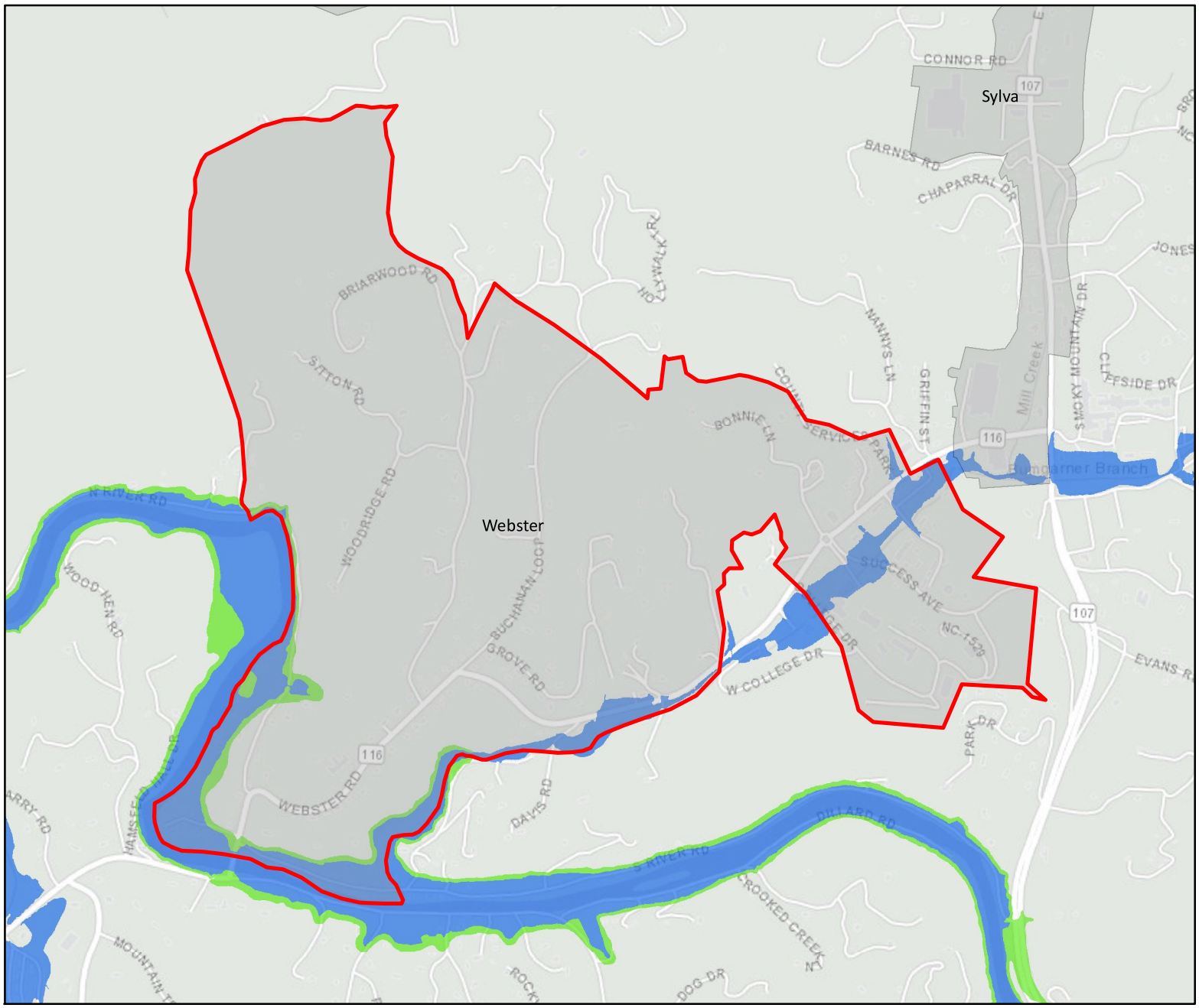
100 Year Flood Zone
500 Year Flood Zone
Coastal Flood Zone

Data Source: North Carolina Floodplain Mapping Program

0 0.325 0.65 1.3 Miles

N

Webster - Flood Hazard Areas



Municipal Boundary

County Boundary

Eastern Band of Cherokee Indians

Flood Zone

100 Year Flood Zone

500 Year Flood Zone

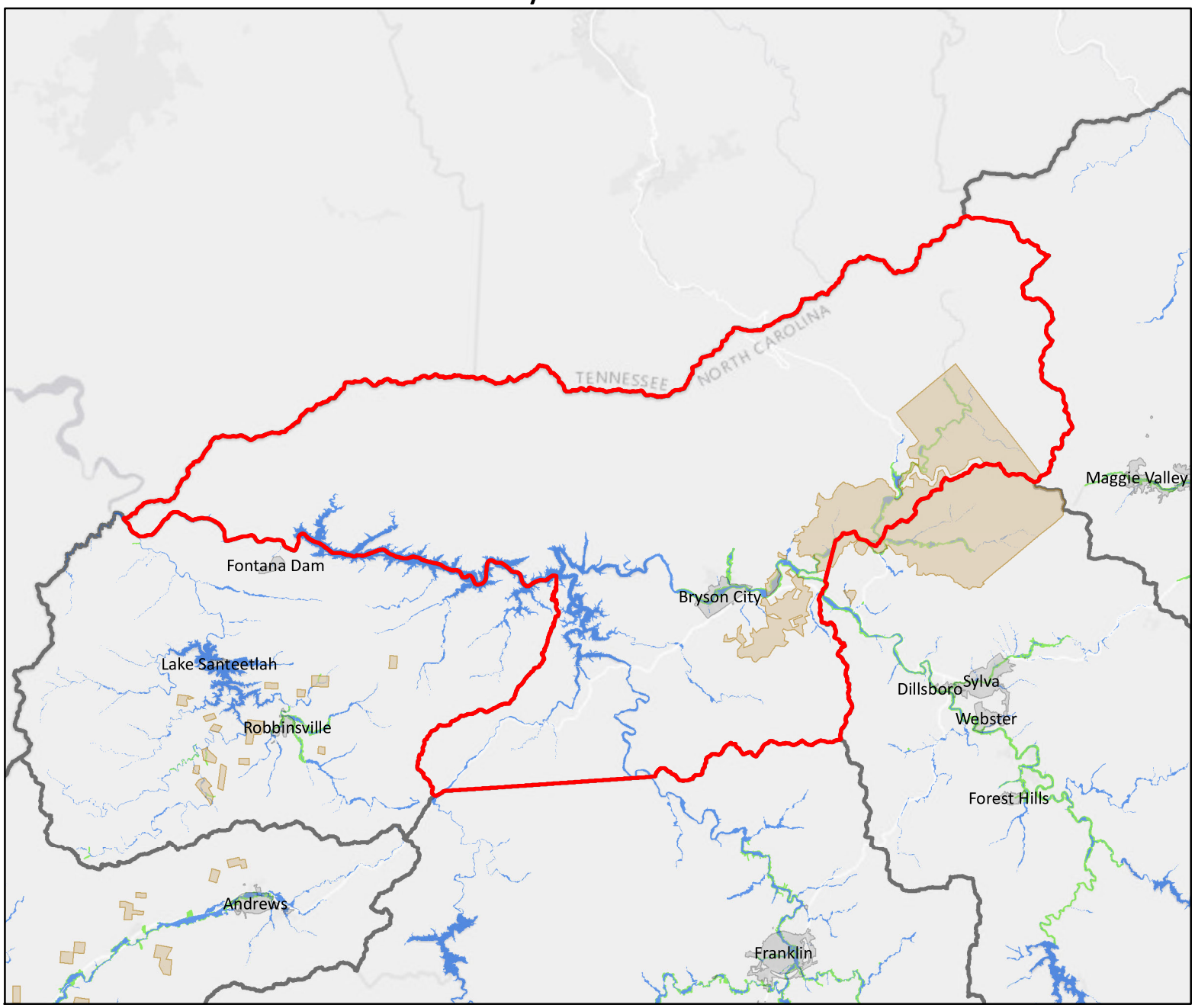
Coastal Flood Zone

Data Source: North Carolina Floodplain Mapping Program

0 0.15 0.3 0.6 Miles

N

Swain County - Flood Hazard Areas



Municipal Boundary

County Boundary

Eastern Band of Cherokee Indians

Flood Zone

100 Year Flood Zone

500 Year Flood Zone

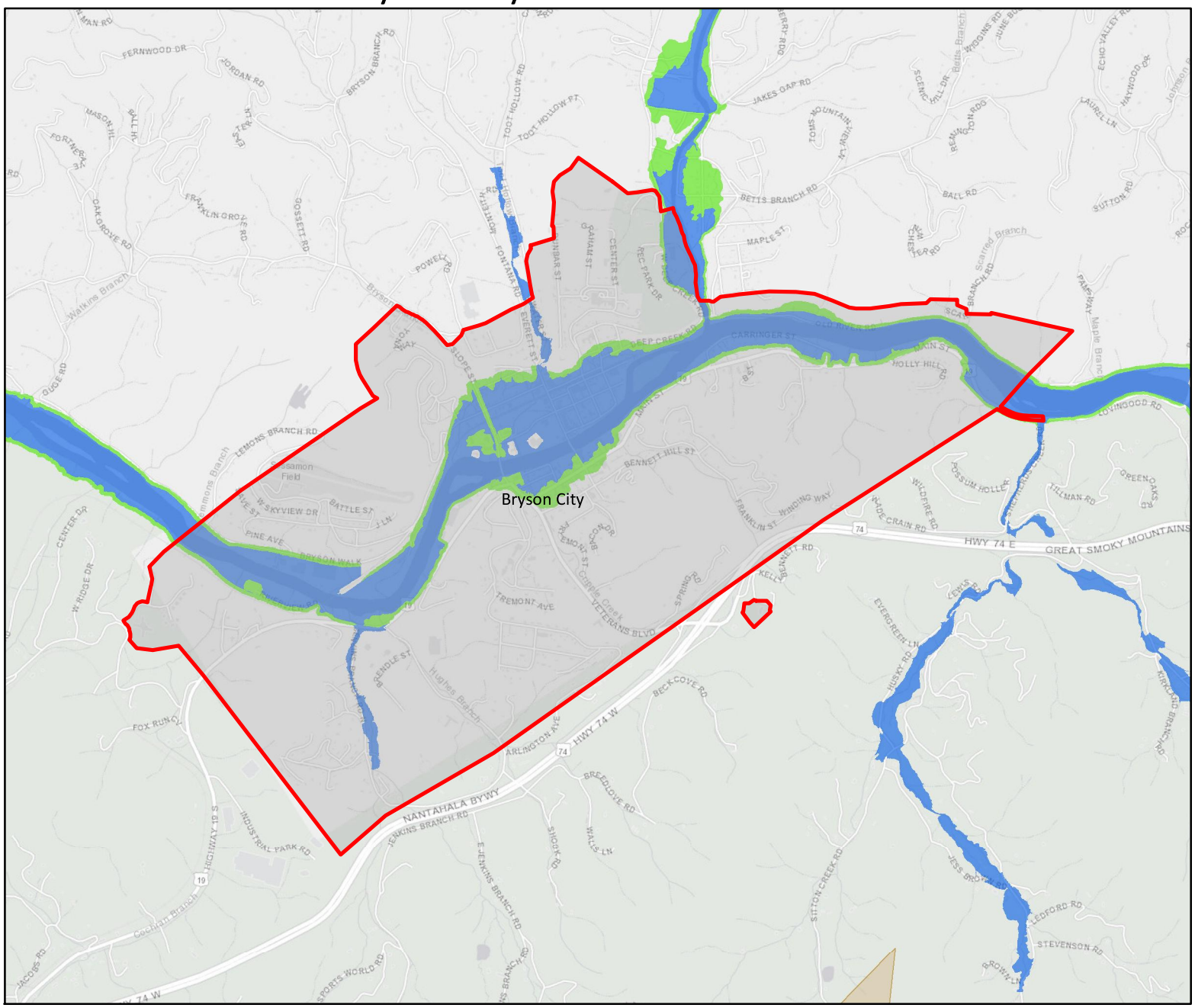
Coastal Flood Zone

Data Source: North Carolina Floodplain Mapping Program

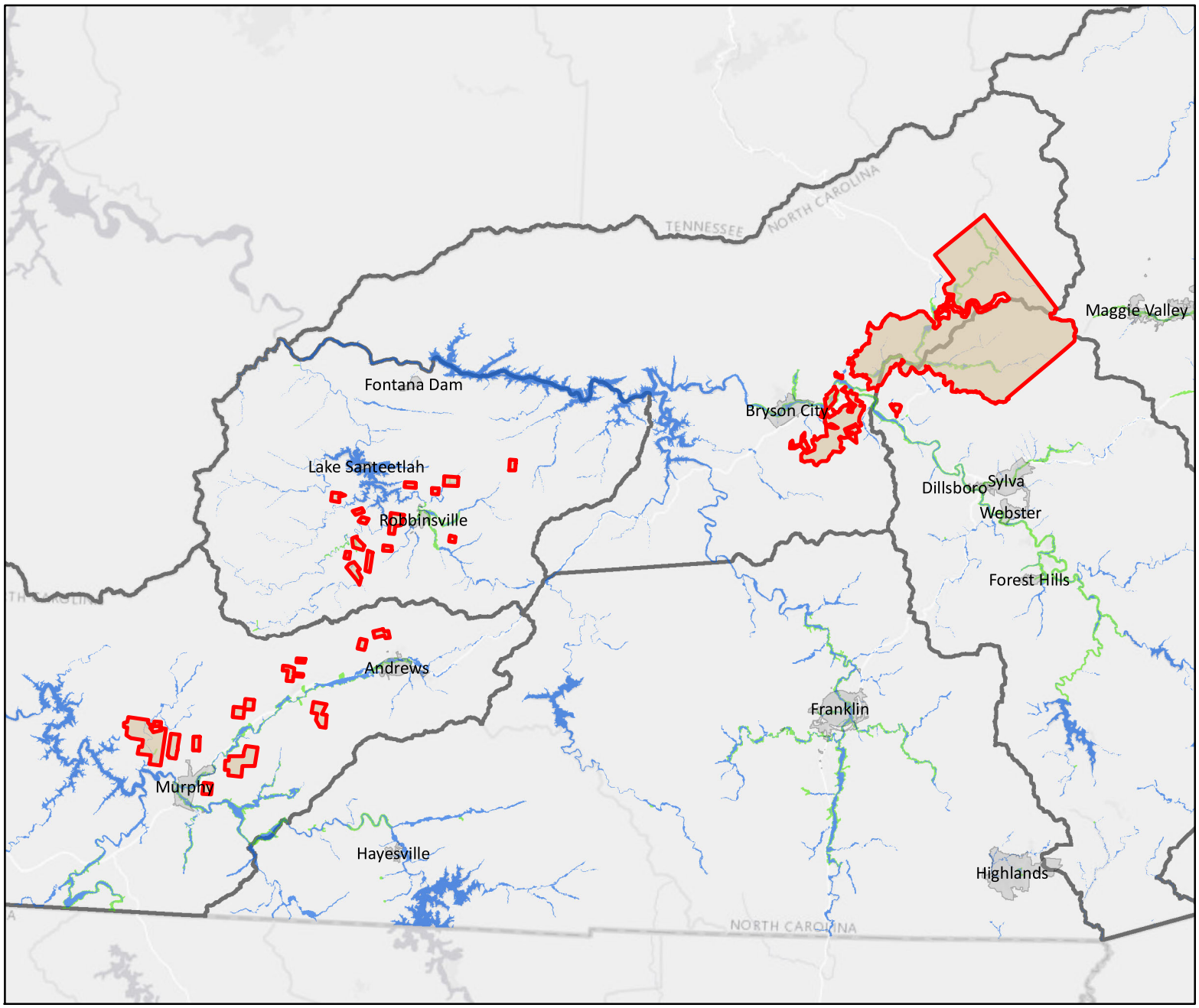
0 4.25 8.5 17 Miles

N

Bryson City - Flood Hazard Areas



Eastern Band of Cherokee Indians - Flood Hazard Areas



Municipal Boundary

County Boundary

Eastern Band of Cherokee Indians

Flood Zone

100 Year Flood Zone

500 Year Flood Zone

Coastal Flood Zone

Data Source: North Carolina Floodplain Mapping Program

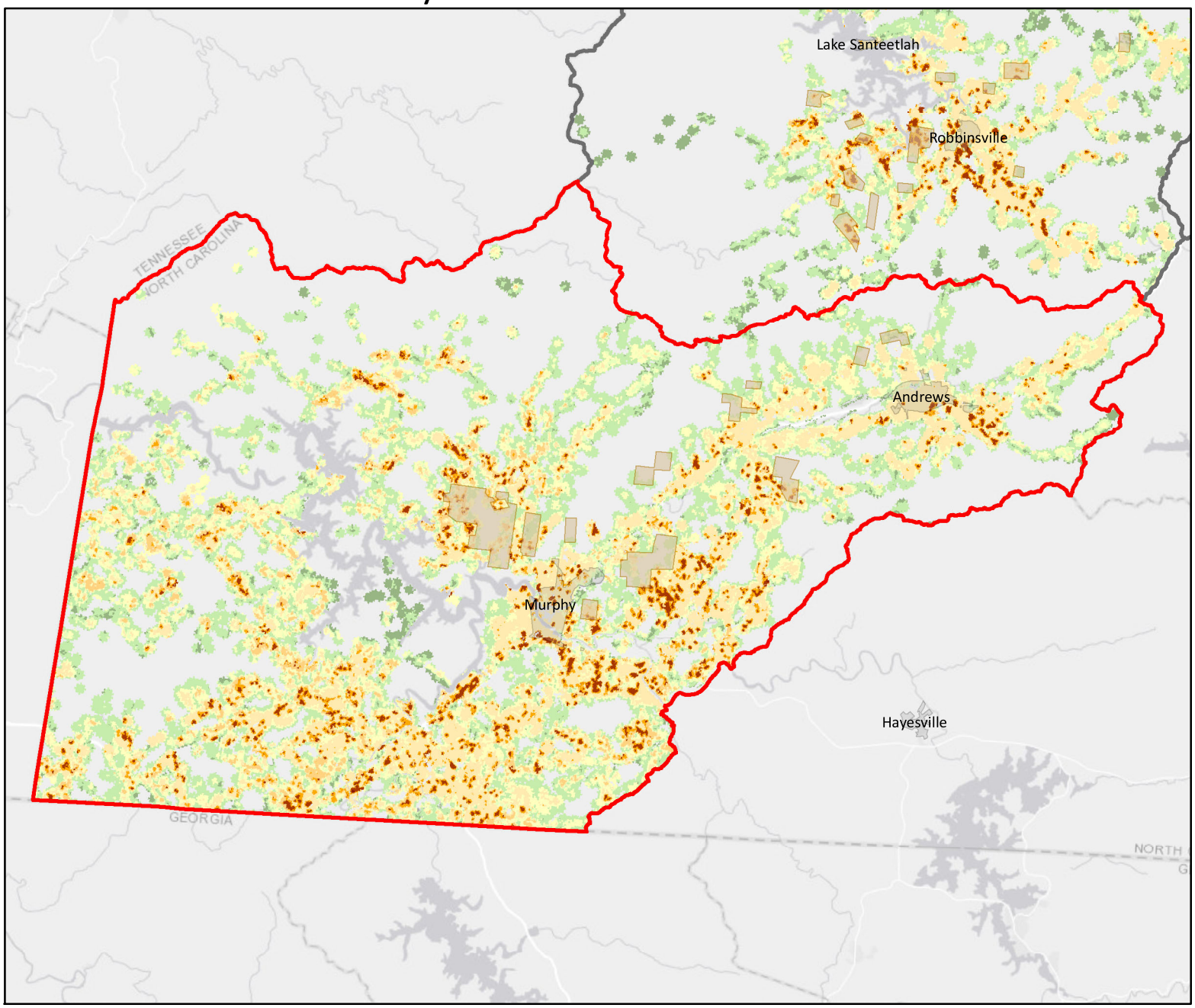
0 5 10 20 Miles

N

Appendix G
Wildfire Hazard Maps

This Appendix includes wildfire hazard maps for all participating jurisdictions.

Cherokee County - Wildland Urban Interface Risk Index



Municipal Boundary

County Boundary

Eastern Band of Cherokee Indians

WUI Risk Index

0 -3 -6 -9

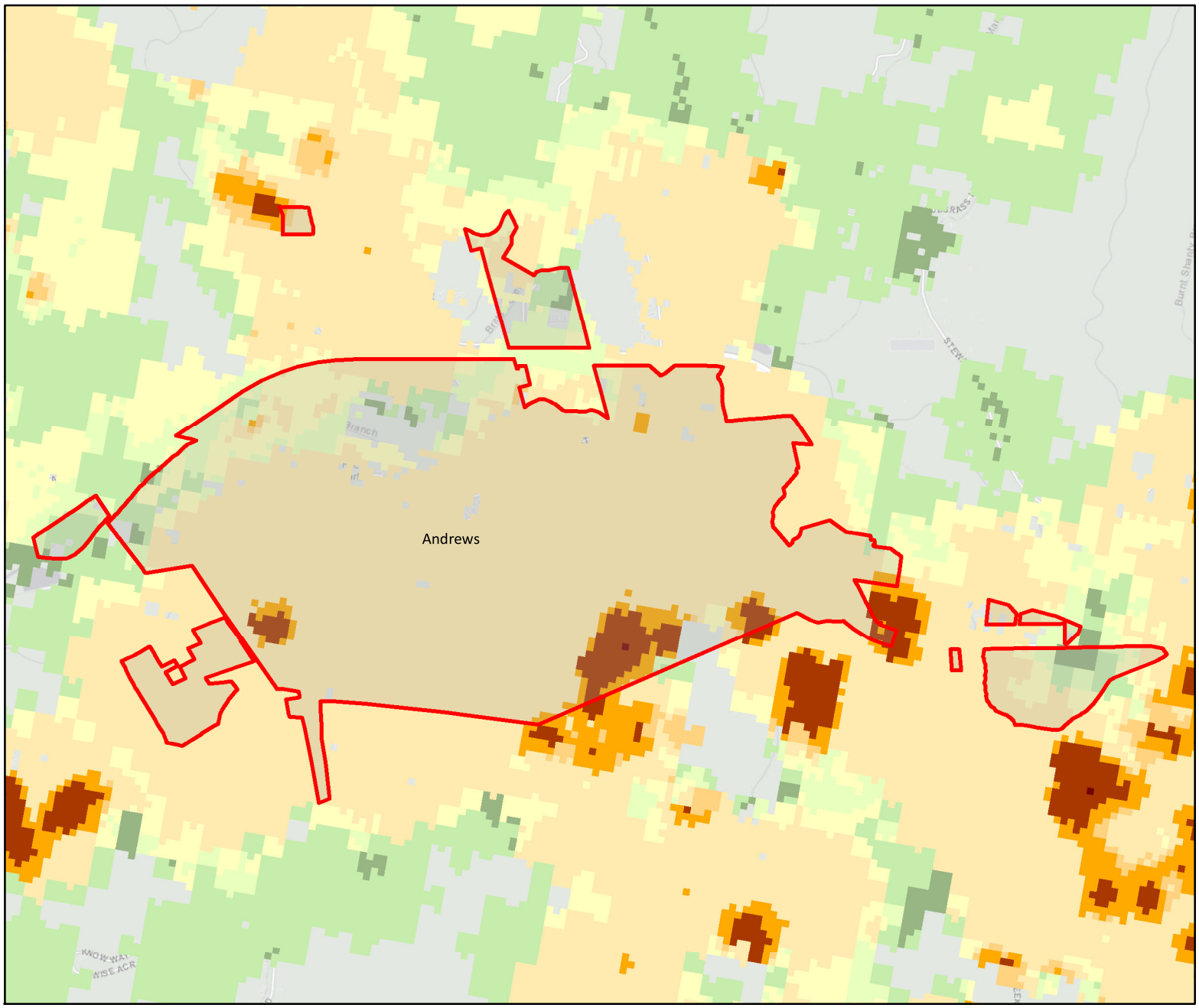
Low High

Data Source:SOUTHERN GROUP OF STATE FORESTERS
WILDFIRE RISK ASSESSMENT PORTAL

0 2.75 5.5 11 Miles

N

Andrews - Wildland Urban Interface Risk Index



Municipal Boundary

County Boundary

Eastern Band of Cherokee Indians

WUI Risk Index

0 -3 -6 -9

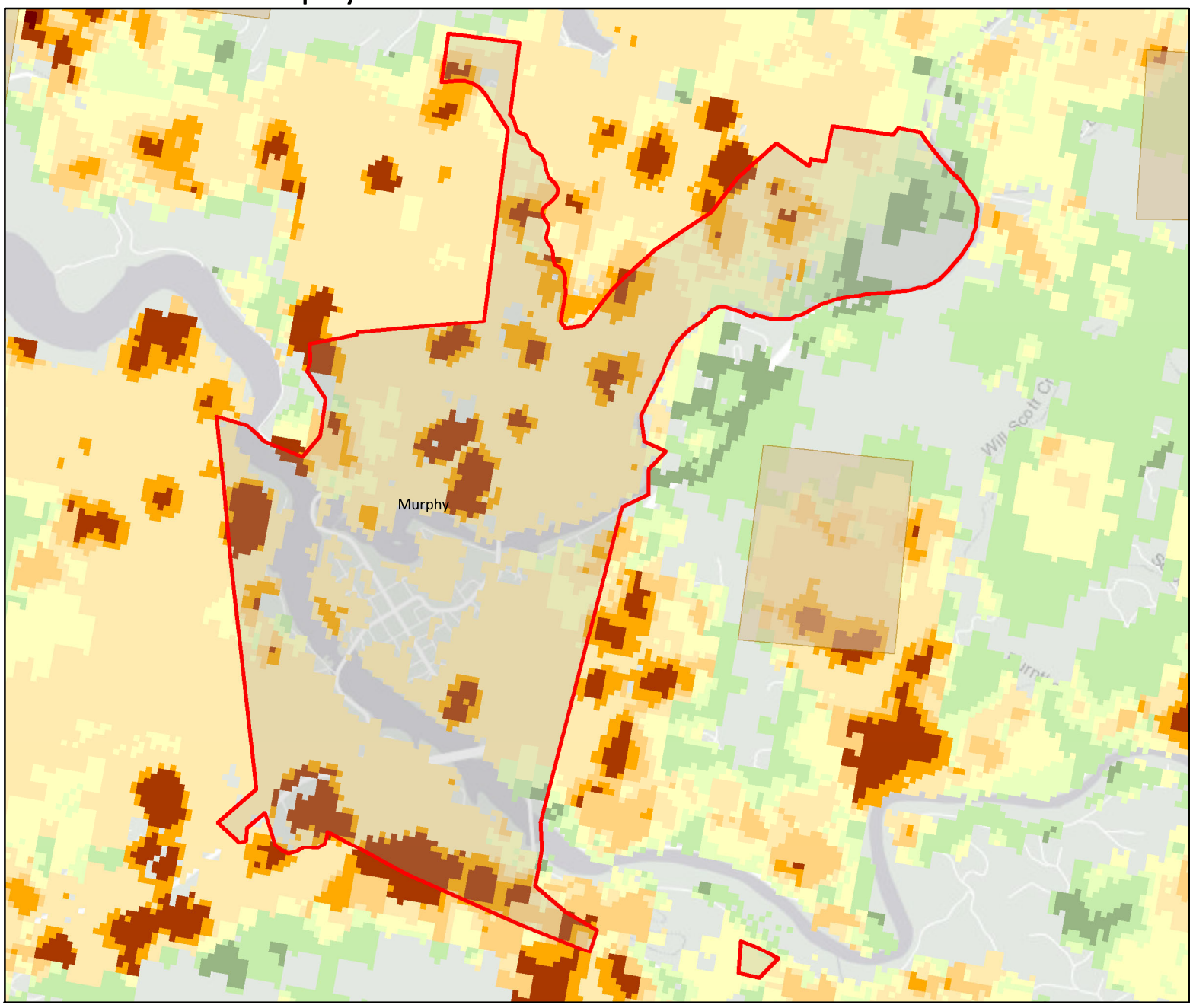
Low High

Data Source:SOUTHERN GROUP OF STATE FORESTERS
WILDFIRE RISK ASSESSMENT PORTAL

0 0.225 0.45 0.9 Miles

N

Murphy - Wildland Urban Interface Risk Index



Municipal Boundary

County Boundary

Eastern Band of Cherokee Indians

WUI Risk Index

0 -3 -6 -9

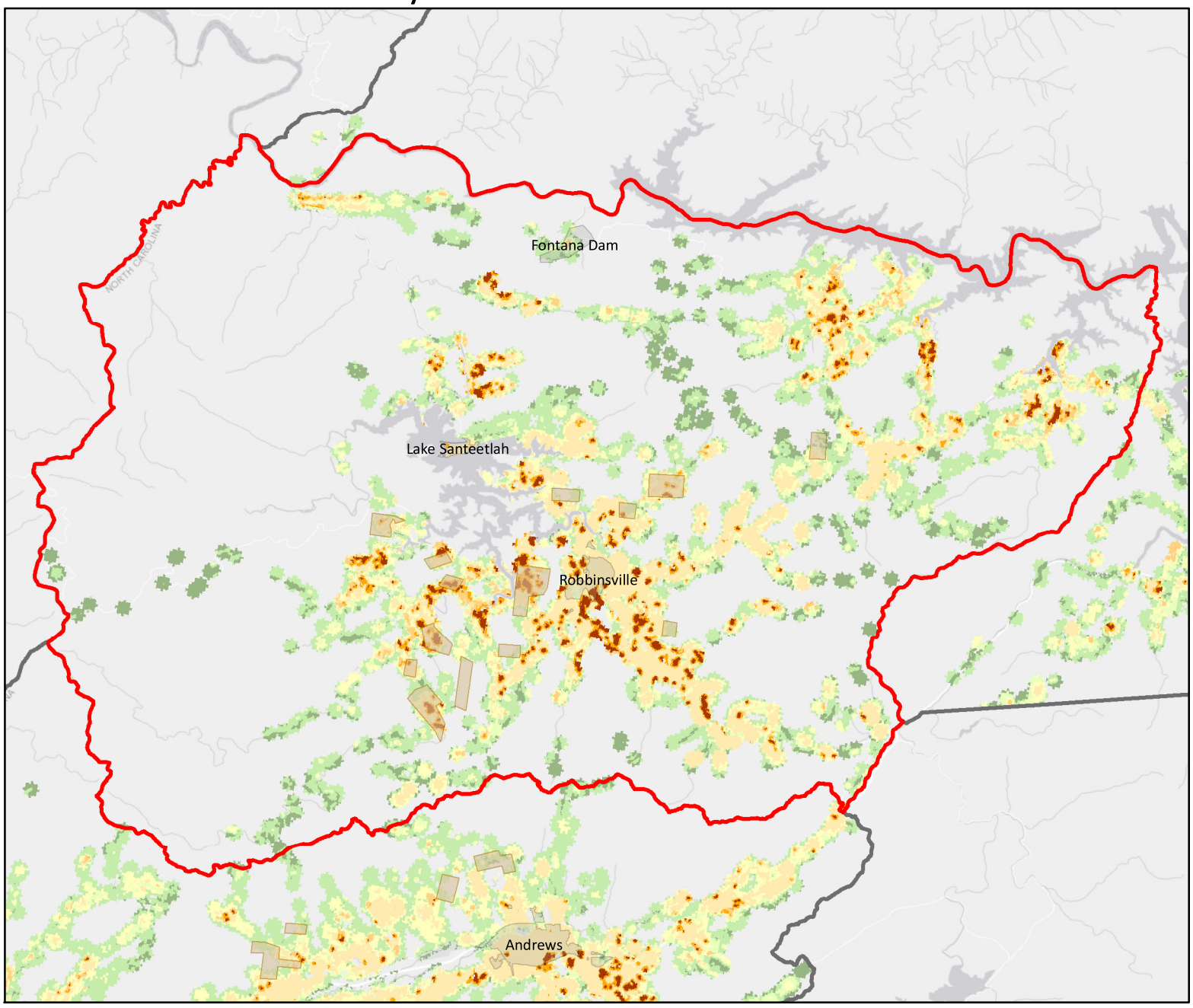
Low High

Data Source:SOUTHERN GROUP OF STATE FORESTERS
WILDFIRE RISK ASSESSMENT PORTAL

0 0.275 0.55 1.1 Miles

N

Graham County - Wildland Urban Interface Risk Index



Municipal Boundary
County Boundary
Eastern Band of Cherokee Indians

WUI Risk Index

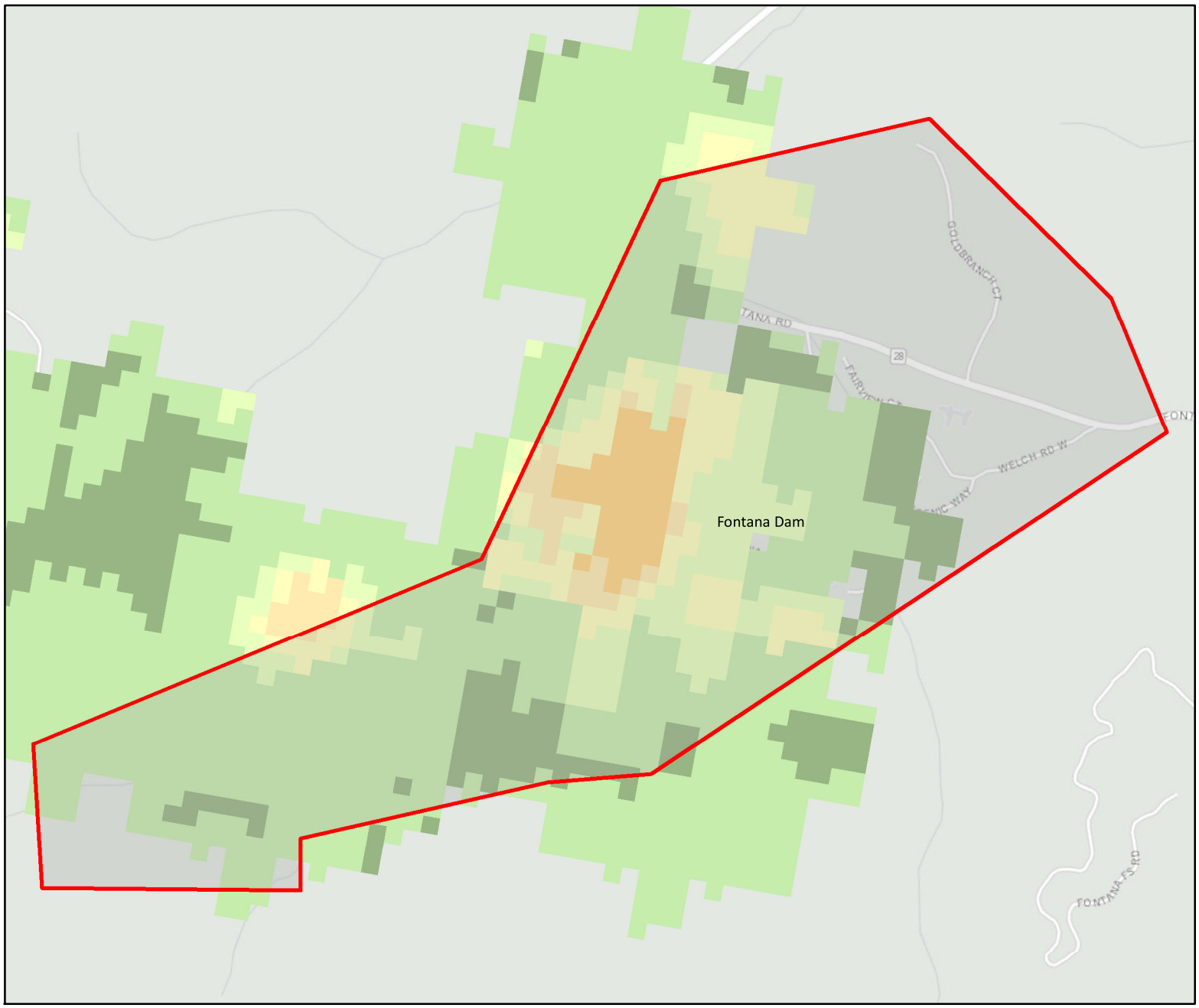
0 -3 -6 -9
Low High

Data Source:SOUTHERN GROUP OF STATE FORESTERS
WILDFIRE RISK ASSESSMENT PORTAL

0 2 4 8 Miles

N

Fontana Dam - Wildland Urban Interface Risk Index



Municipal Boundary

County Boundary

Eastern Band of Cherokee Indians

WUI Risk Index

0 -3 -6 -9

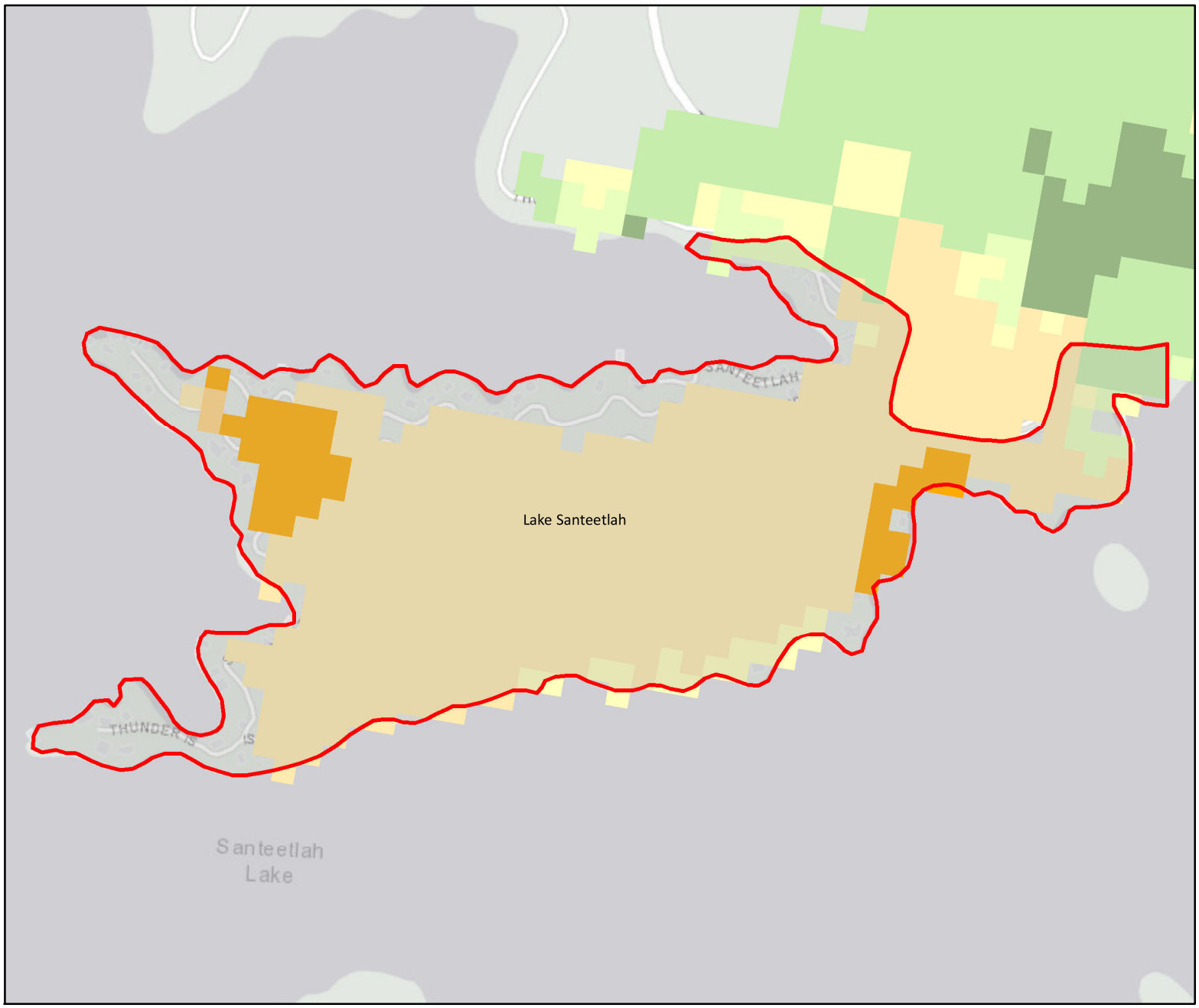
Low High

Data Source:SOUTHERN GROUP OF STATE FORESTERS
WILDFIRE RISK ASSESSMENT PORTAL

0 0.075 0.15 0.3 Miles

N

Lake Santeetlah - Wildland Urban Interface Risk Index



Municipal Boundary
County Boundary
Eastern Band of Cherokee Indians

WUI Risk Index

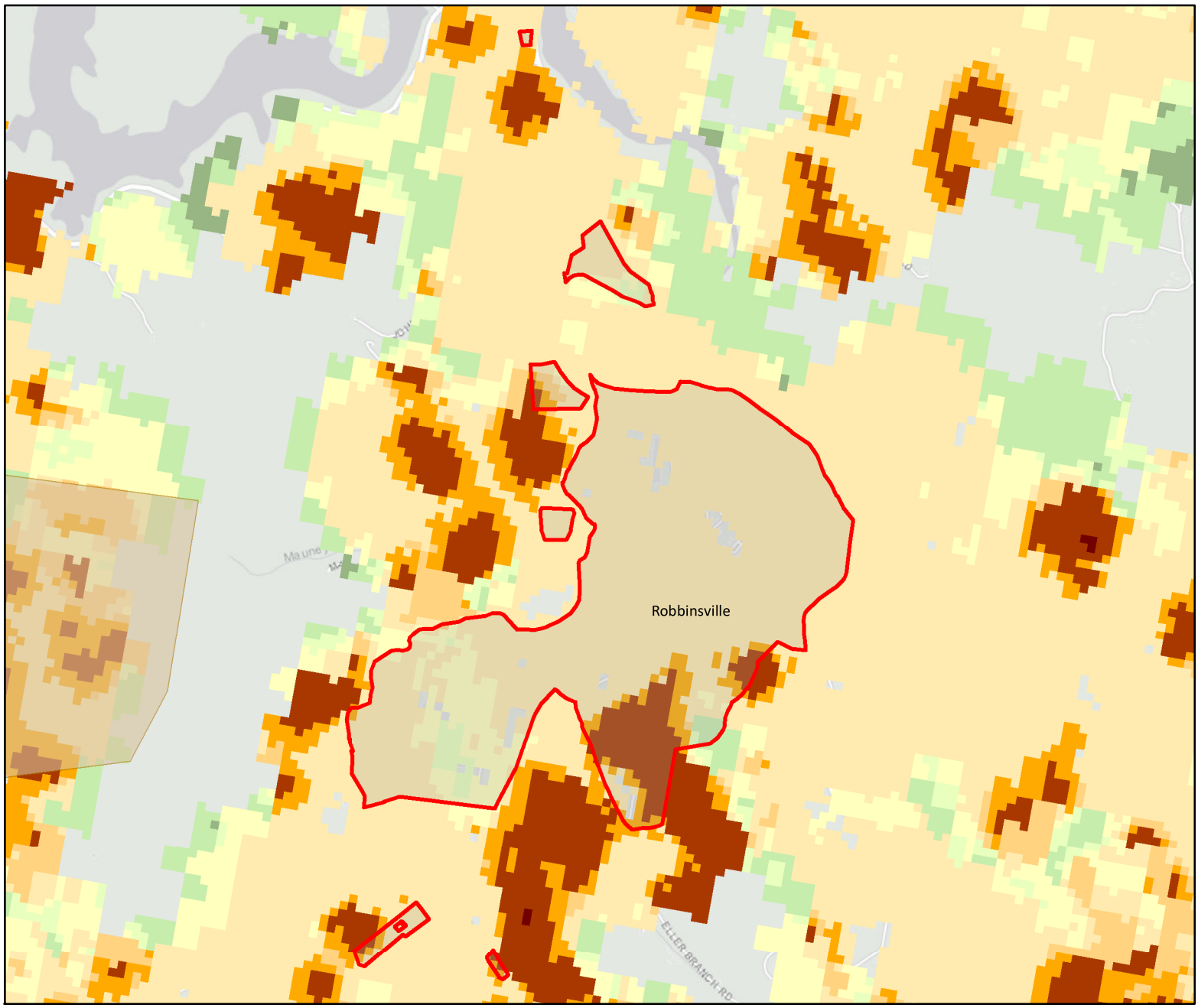
0 -3 -6 -9
Low High

Data Source:SOUTHERN GROUP OF STATE FORESTERS
WILDFIRE RISK ASSESSMENT PORTAL

0 0.05 0.1 0.2 Miles

N

Robbinsville - Wildland Urban Interface Risk Index



Municipal Boundary
County Boundary
Eastern Band of Cherokee Indians

WUI Risk Index

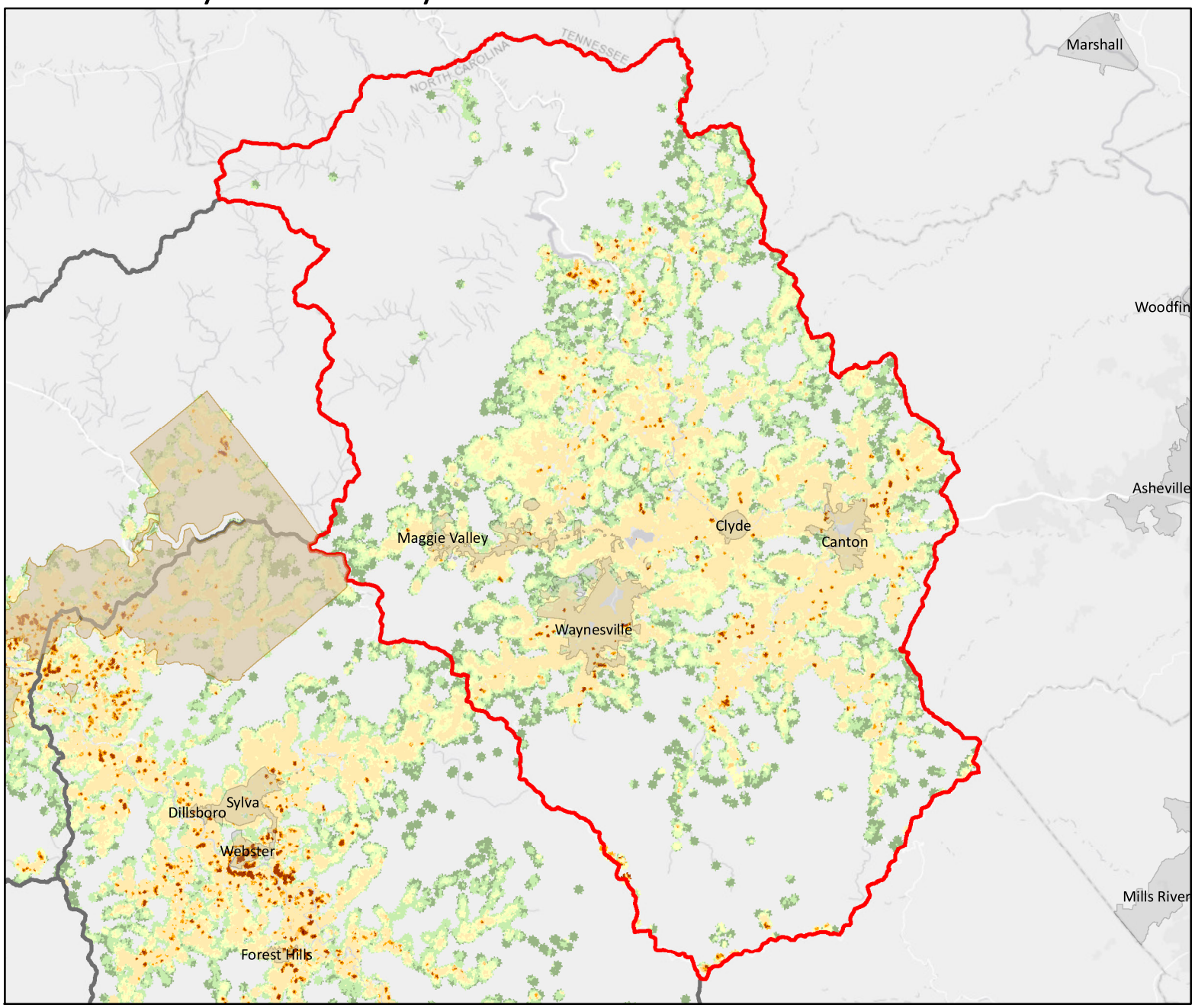
0 -3 -6 -9
Low High

Data Source:SOUTHERN GROUP OF STATE FORESTERS
WILDFIRE RISK ASSESSMENT PORTAL

0 0.2 0.4 0.8 Miles

N

Haywood County - Wildland Urban Interface Risk Index



Municipal Boundary

County Boundary

Eastern Band of Cherokee Indians

WUI Risk Index

0 -3 -6 -9

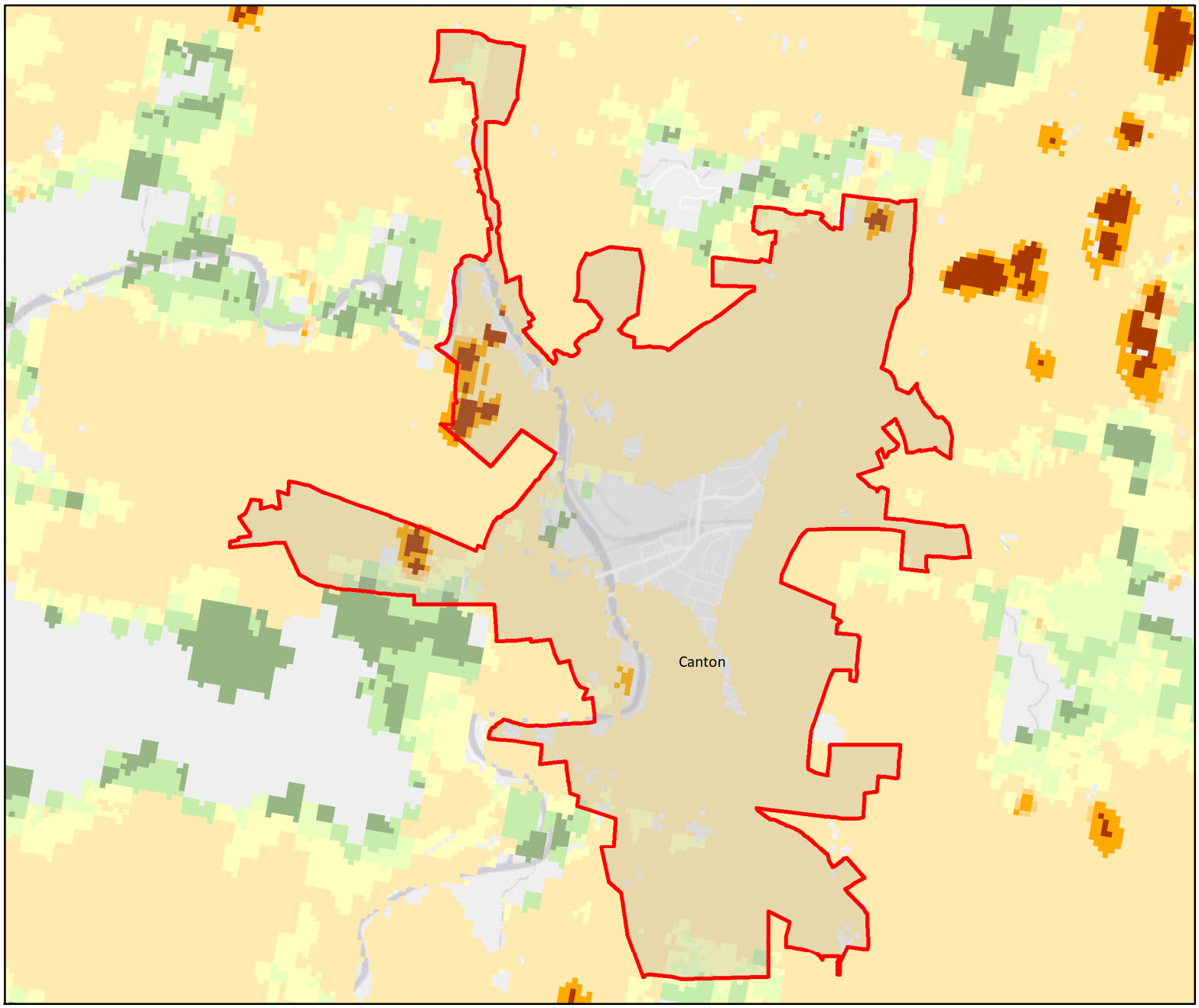
Low High

Data Source:SOUTHERN GROUP OF STATE FORESTERS
WILDFIRE RISK ASSESSMENT PORTAL

0 3.25 6.5 13 Miles

N

Canton - Wildland Urban Interface Risk Index



Municipal Boundary

County Boundary

Eastern Band of Cherokee Indians

WUI Risk Index

0 -3 -6 -9

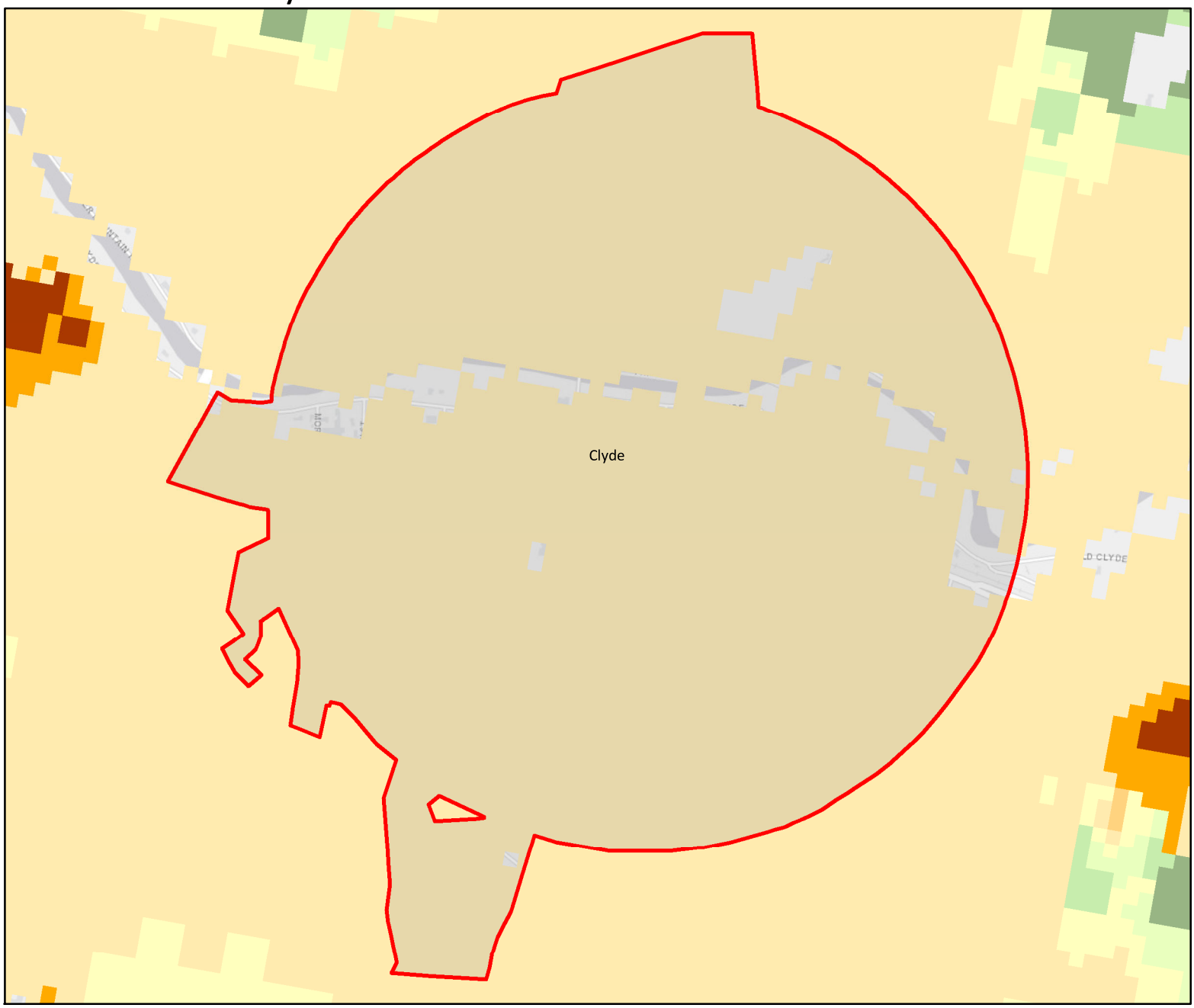
Low High

Data Source:SOUTHERN GROUP OF STATE FORESTERS
WILDFIRE RISK ASSESSMENT PORTAL

0 0.275 0.55 1.1 Miles

N

Clyde - Wildland Urban Interface Risk Index



Municipal Boundary

County Boundary

Eastern Band of Cherokee Indians

WUI Risk Index

0 -3 -6 -9

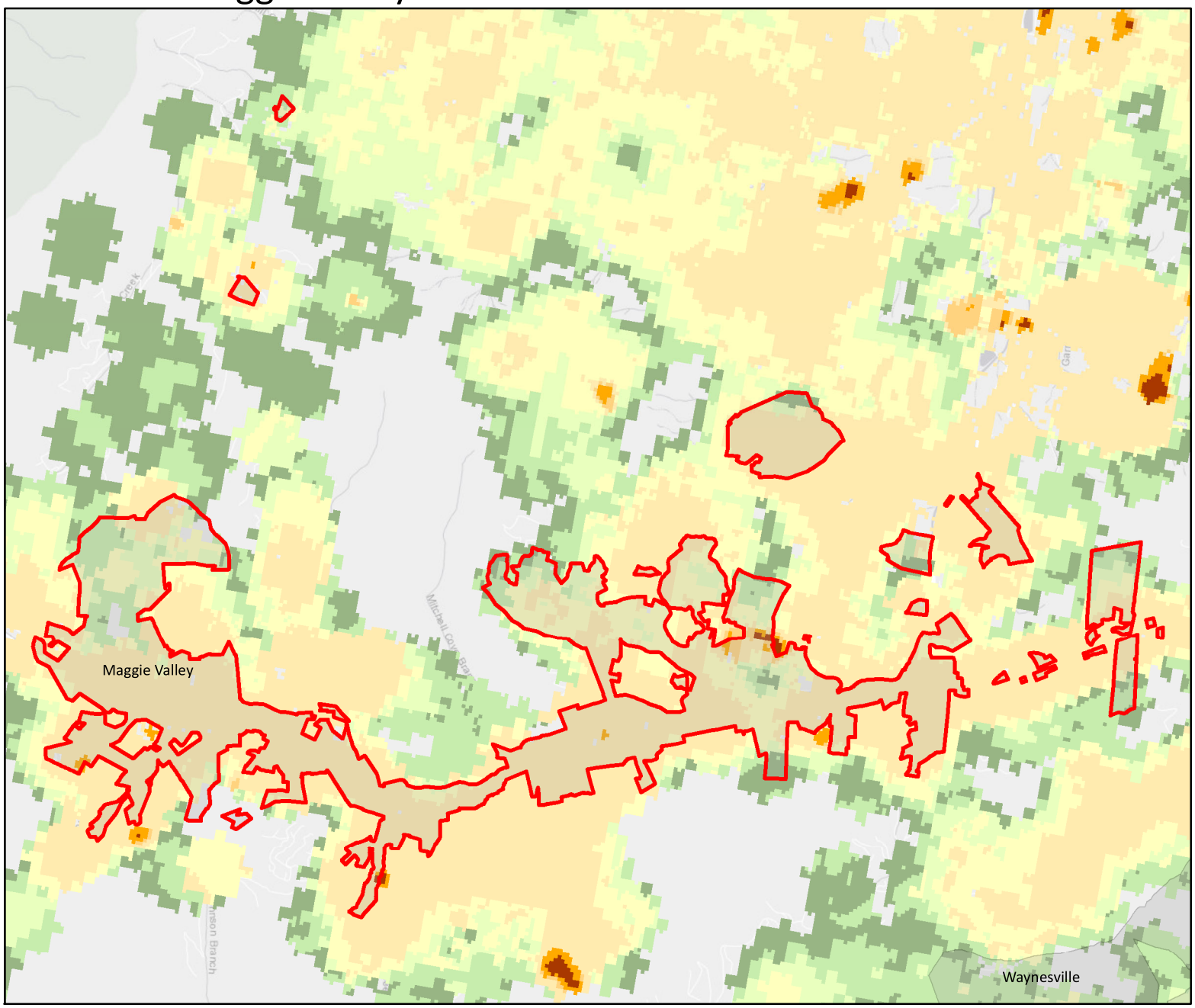
Low High

Data Source:SOUTHERN GROUP OF STATE FORESTERS
WILDFIRE RISK ASSESSMENT PORTAL

0 0.1 0.2 0.4 Miles

N

Maggie Valley - Wildland Urban Interface Risk Index



Municipal Boundary
County Boundary
Eastern Band of Cherokee Indians

WUI Risk Index

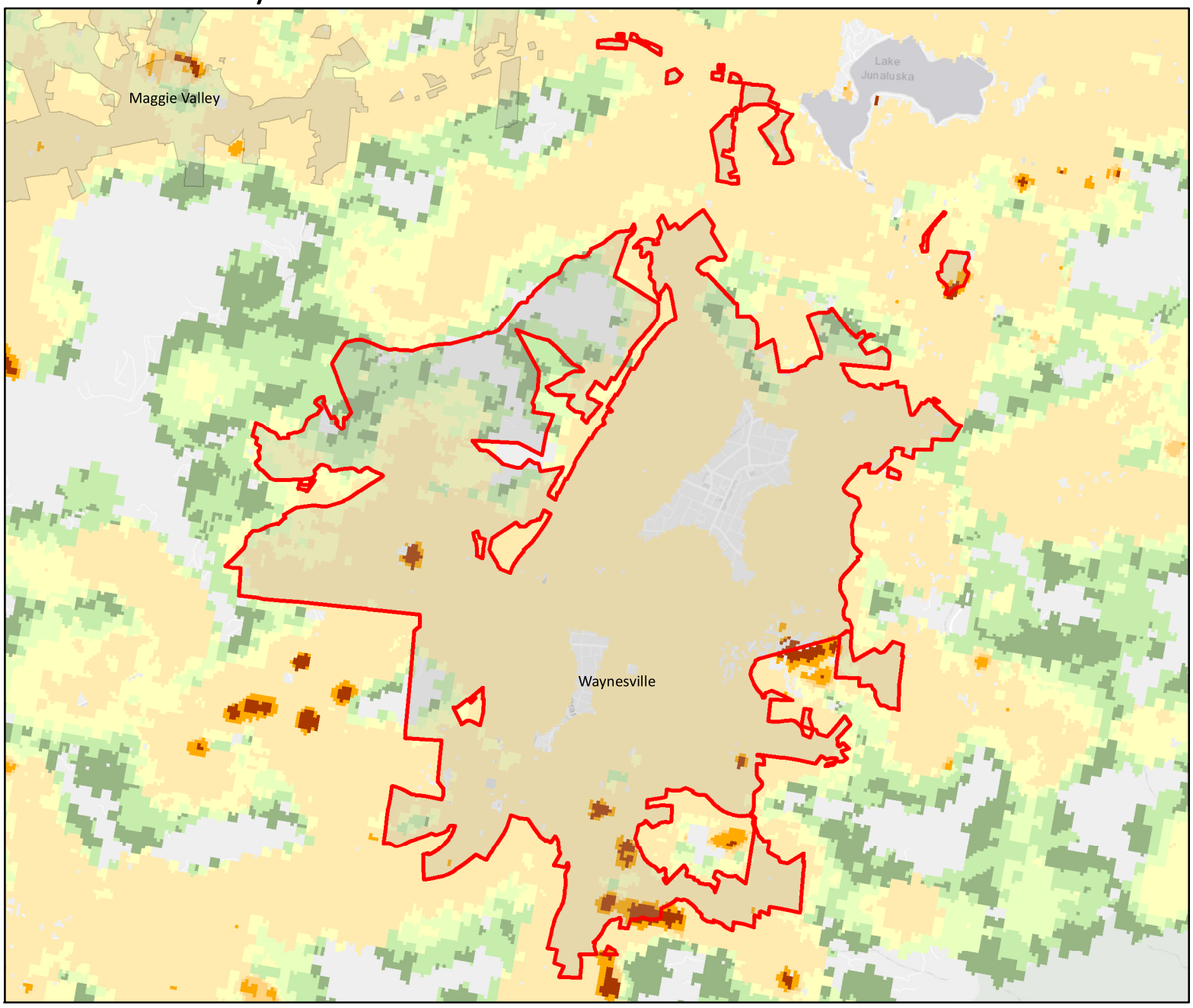
0 -3 -6 -9
Low High

Data Source:SOUTHERN GROUP OF STATE FORESTERS
WILDFIRE RISK ASSESSMENT PORTAL

0 0.45 0.9 1.8 Miles

N

Waynesville - Wildland Urban Interface Risk Index



Municipal Boundary
County Boundary
Eastern Band of Cherokee Indians

WUI Risk Index

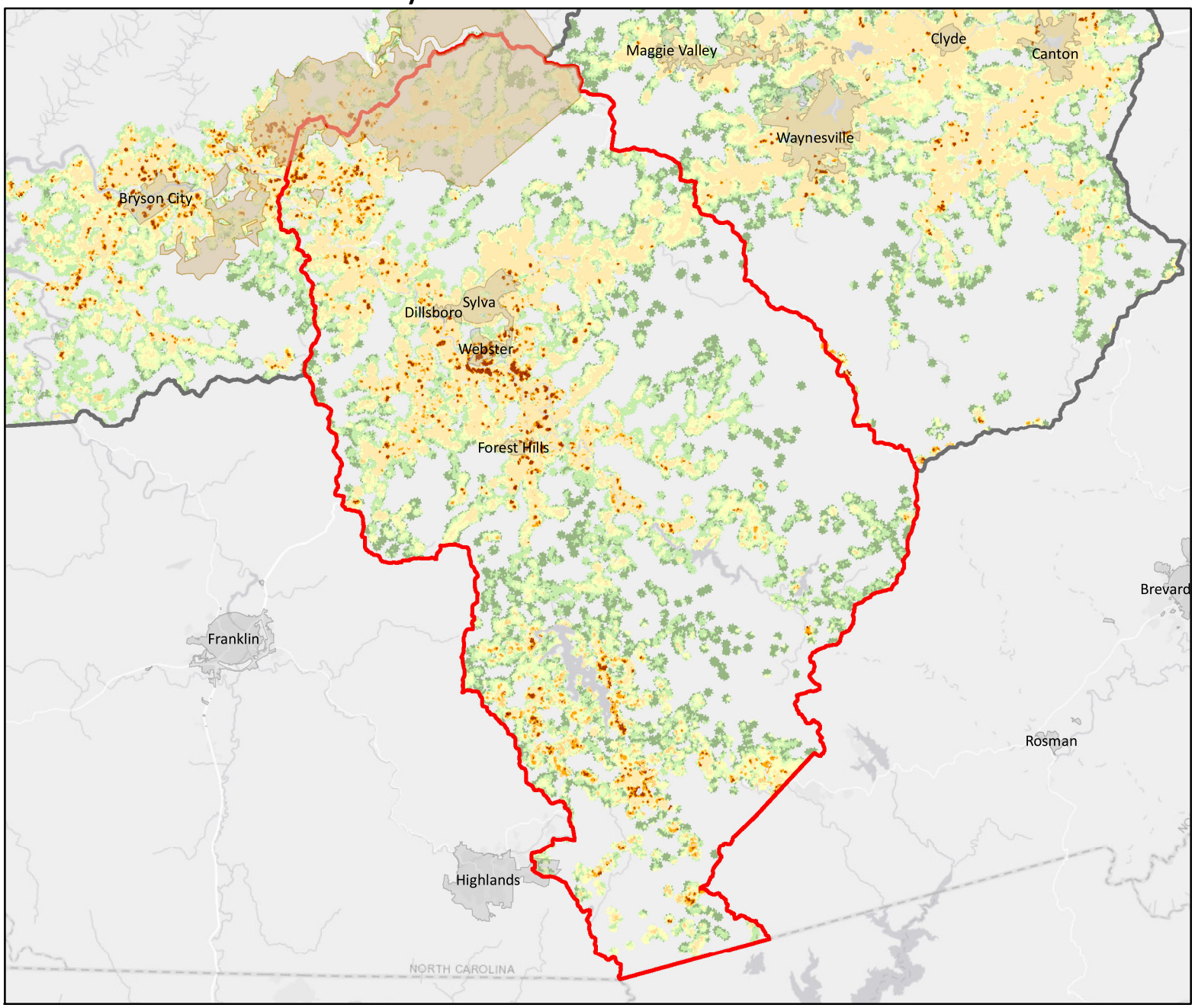
0 -3 -6 -9
Low High

Data Source:SOUTHERN GROUP OF STATE FORESTERS
WILDFIRE RISK ASSESSMENT PORTAL

0 0.5 1 2 Miles

N

Jackson County - Wildland Urban Interface Risk Index



Municipal Boundary

County Boundary

Eastern Band of Cherokee Indians

WUI Risk Index

0 -3 -6 -9

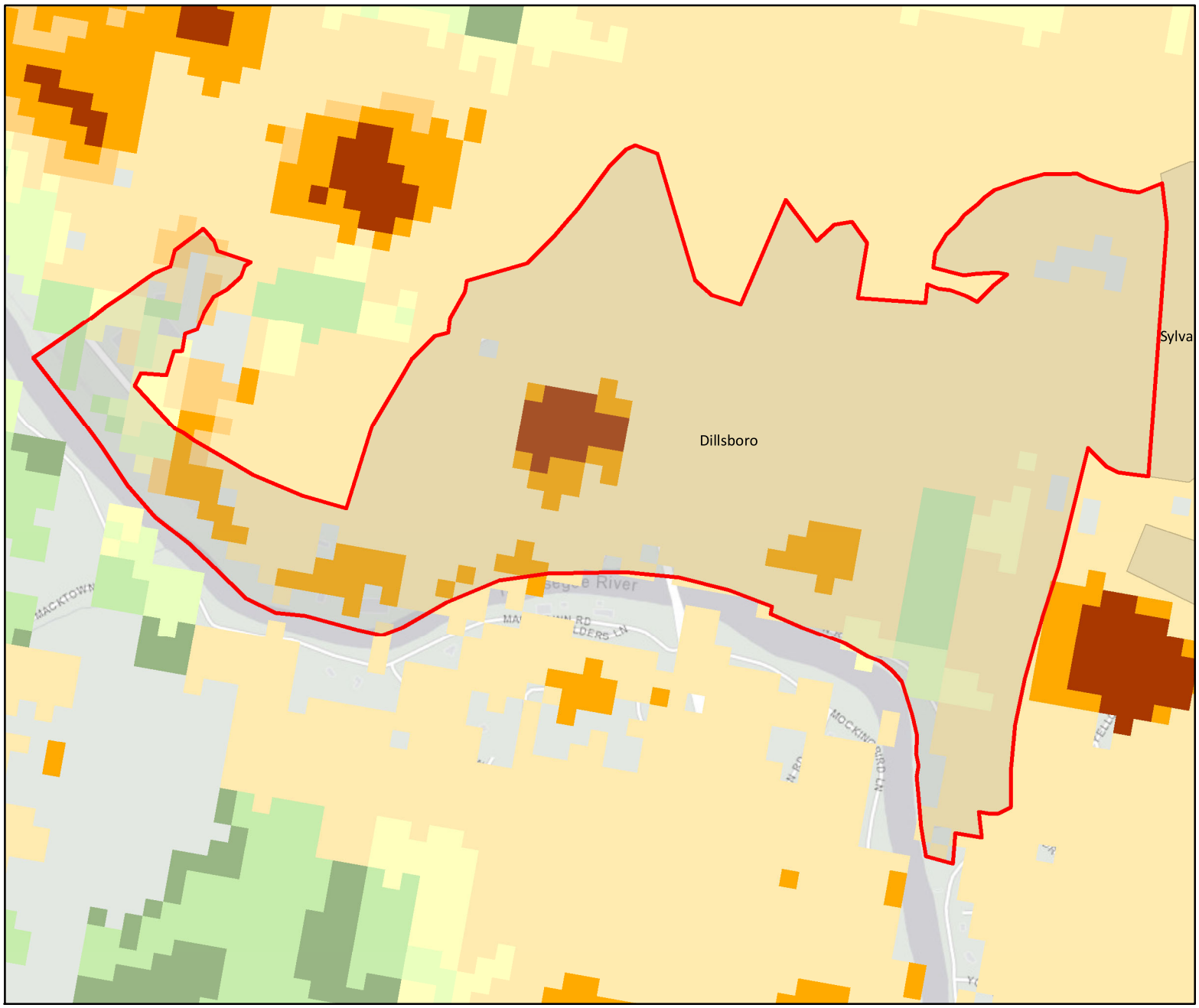
Low High

Data Source:SOUTHERN GROUP OF STATE FORESTERS
WILDFIRE RISK ASSESSMENT PORTAL

0 3.25 6.5 13 Miles

N

Dillsboro - Wildland Urban Interface Risk Index



Municipal Boundary
County Boundary
Eastern Band of Cherokee Indians

WUI Risk Index

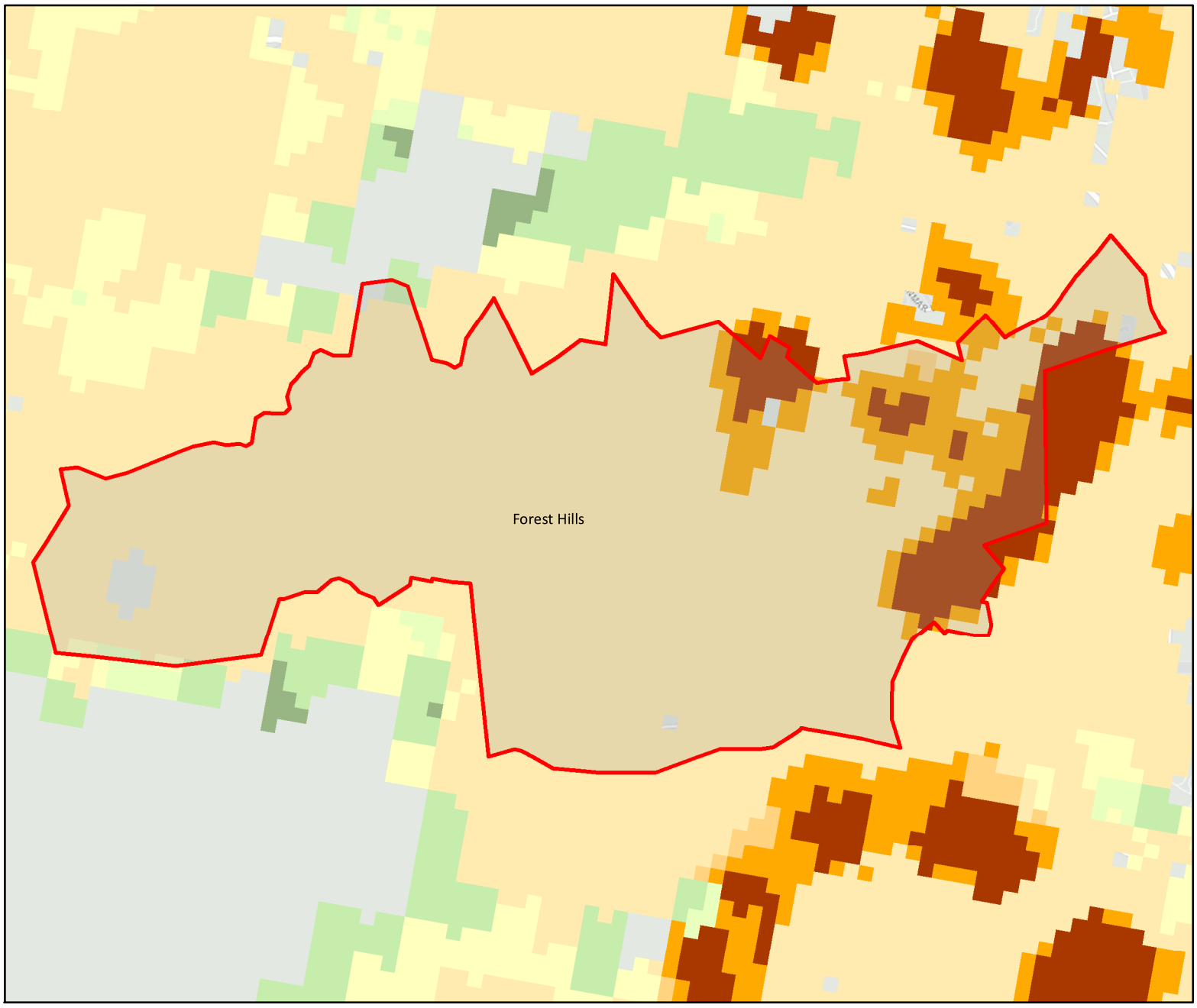
0 -3 -6 -9
Low High

Data Source:SOUTHERN GROUP OF STATE FORESTERS
WILDFIRE RISK ASSESSMENT PORTAL

0 0.075 0.15 0.3 Miles

N

Forest Hills - Wildland Urban Interface Risk Index



Municipal Boundary

County Boundary

Eastern Band of Cherokee Indians

WUI Risk Index

0 -3 -6 -9

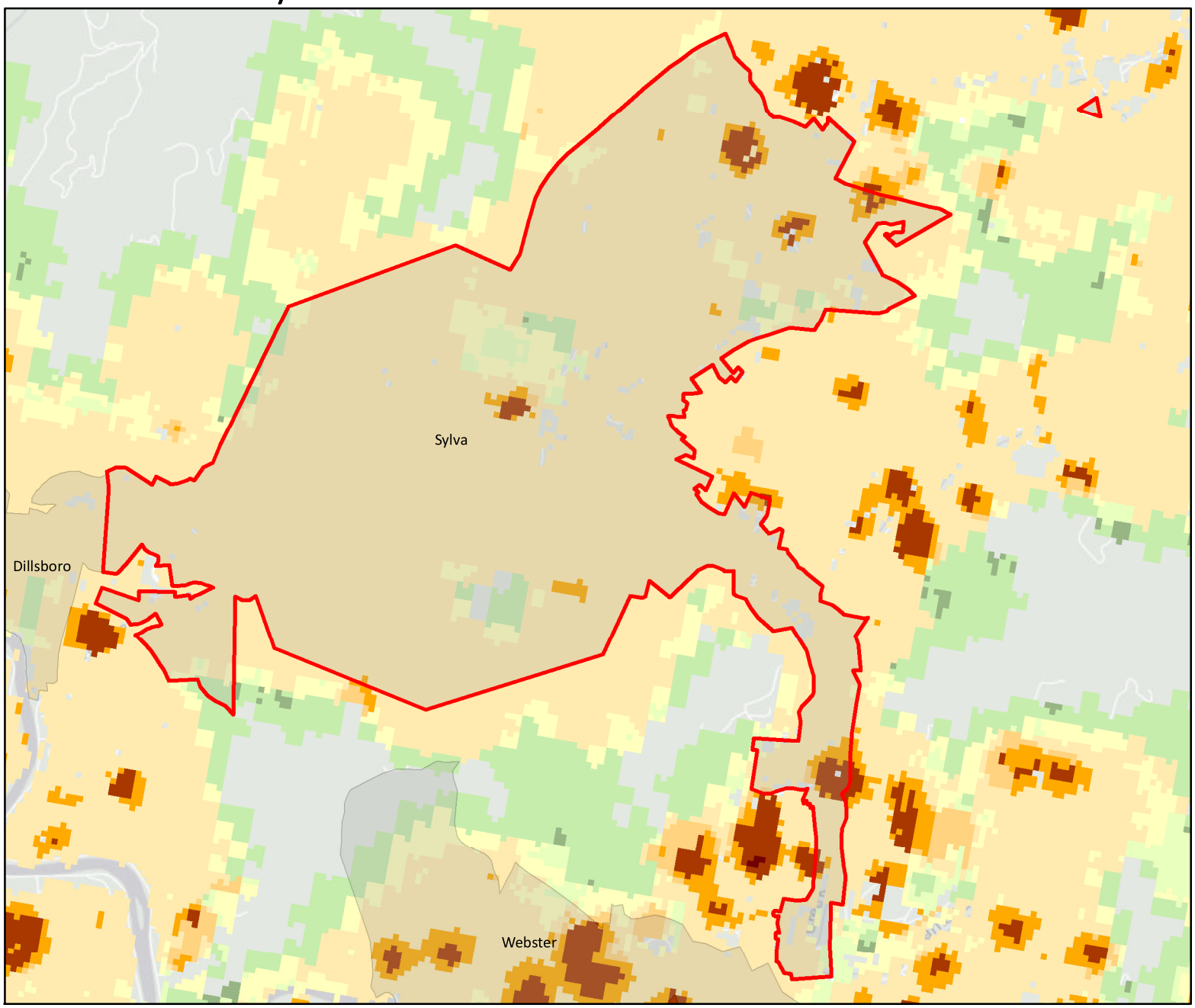
Low High

Data Source:SOUTHERN GROUP OF STATE FORESTERS
WILDFIRE RISK ASSESSMENT PORTAL

0 0.1 0.2 0.4 Miles

N

Sylva - Wildland Urban Interface Risk Index



Municipal Boundary
County Boundary
Eastern Band of Cherokee Indians

WUI Risk Index

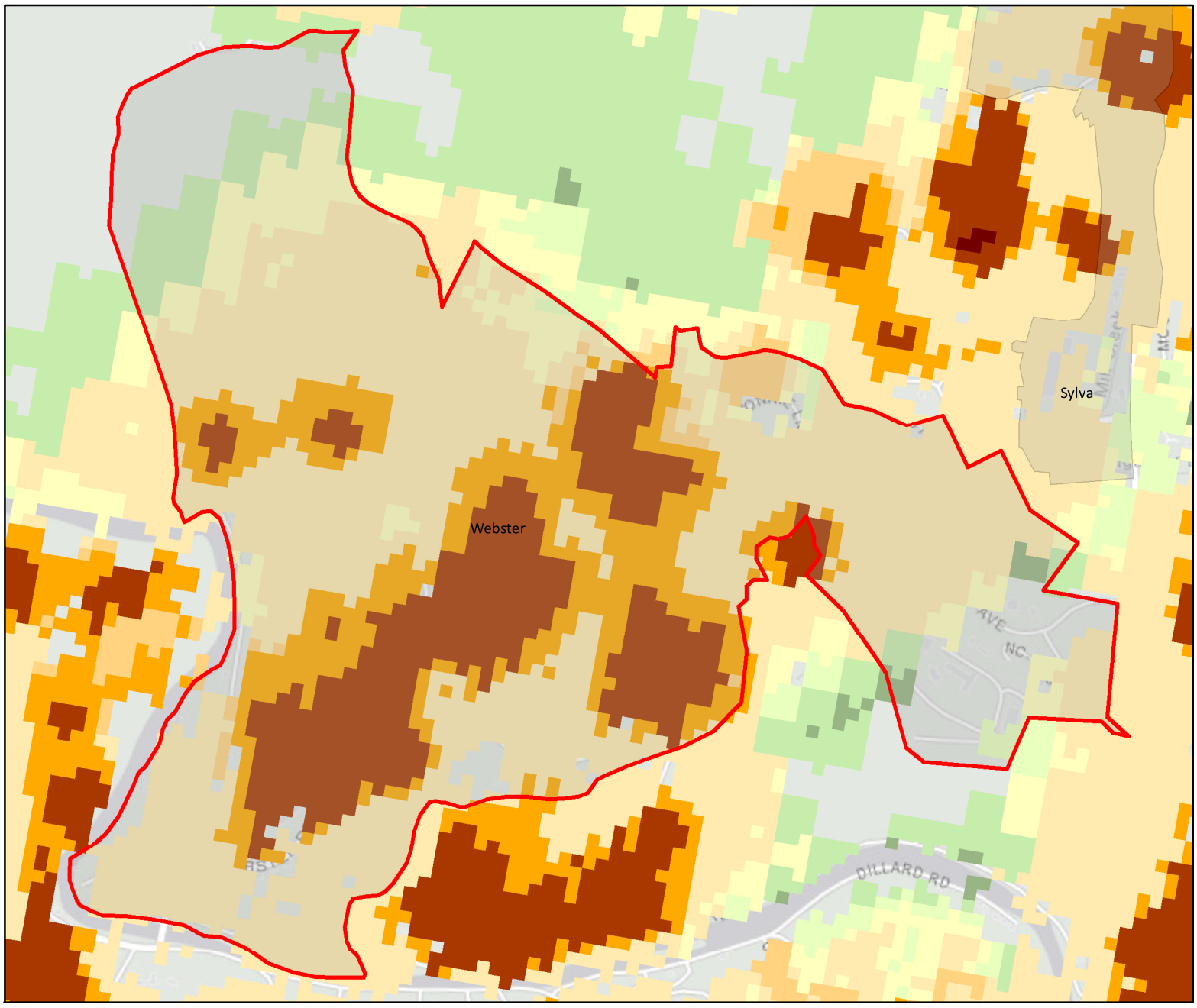
0 -3 -6 -9
Low High

Data Source:SOUTHERN GROUP OF STATE FORESTERS
WILDFIRE RISK ASSESSMENT PORTAL

0 0.275 0.55 1.1 Miles

N

Webster - Wildland Urban Interface Risk Index



Municipal Boundary

County Boundary

Eastern Band of Cherokee Indians

WUI Risk Index

0 -3 -6 -9

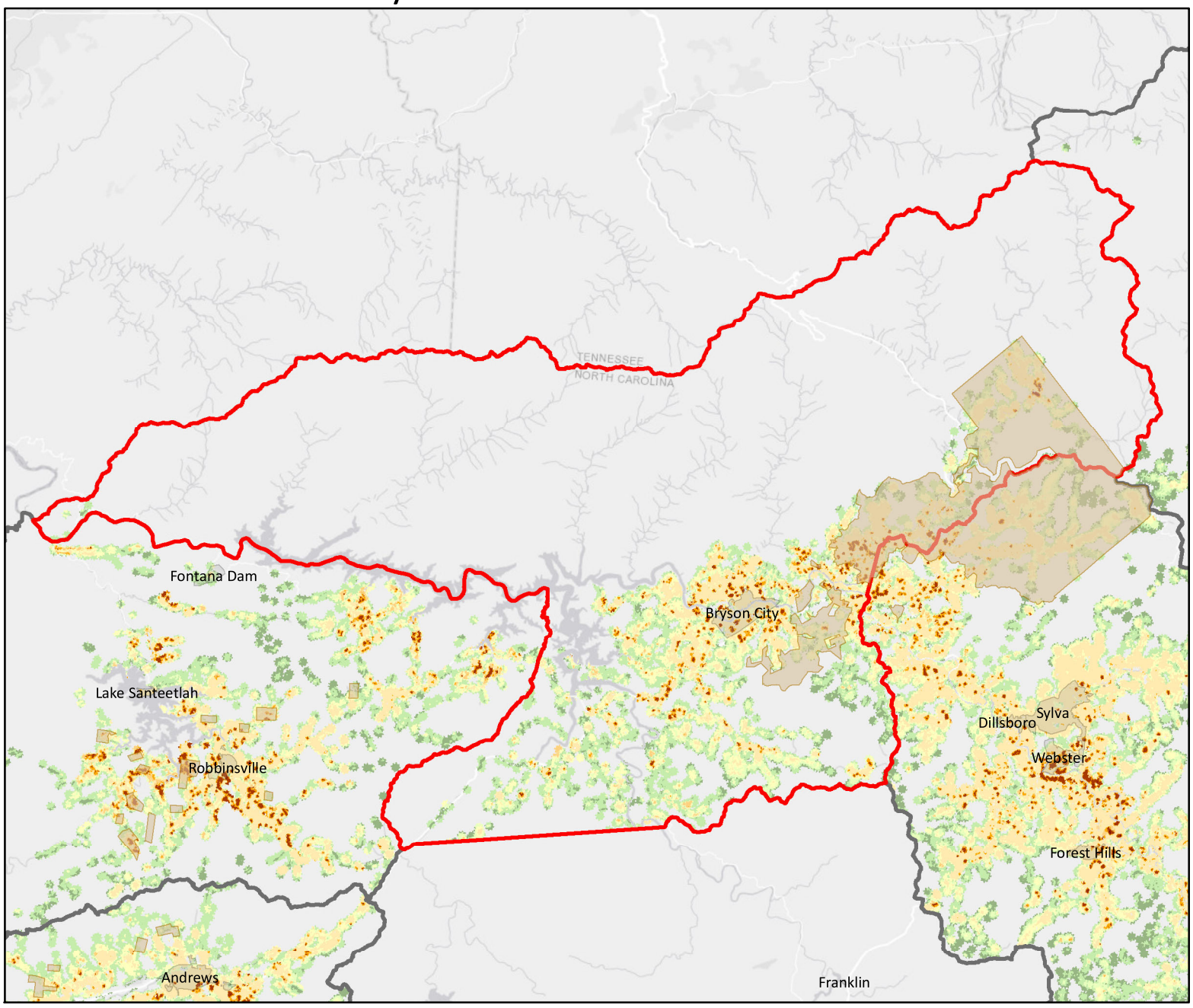
Low High

Data Source:SOUTHERN GROUP OF STATE FORESTERS
WILDFIRE RISK ASSESSMENT PORTAL

0 0.125 0.25 0.5 Miles

N

Swain County - Wildland Urban Interface Risk Index



Municipal Boundary

County Boundary

Eastern Band of Cherokee Indians

WUI Risk Index

0 -3 -6 -9

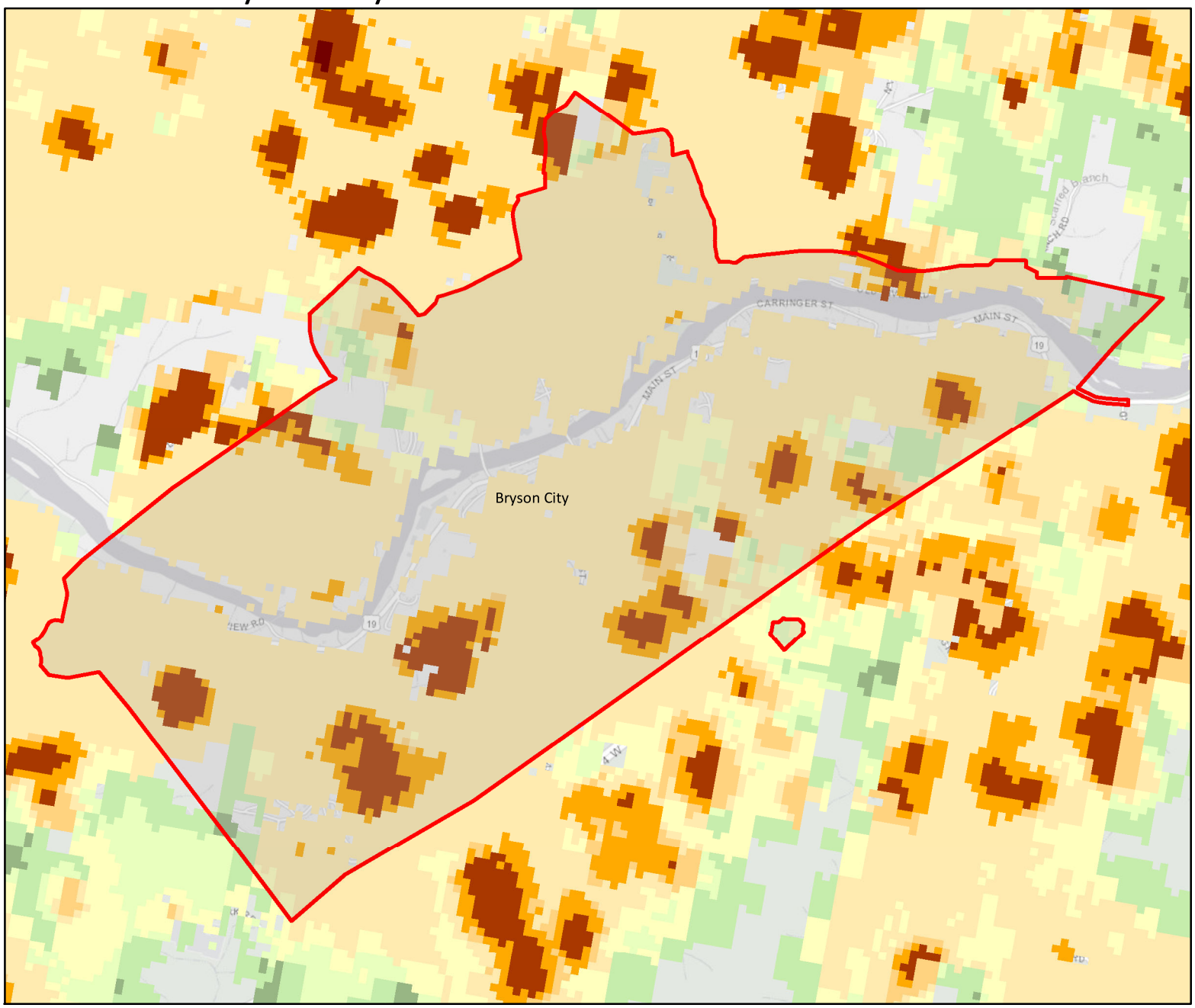
Low High

Data Source:SOUTHERN GROUP OF STATE FORESTERS
WILDFIRE RISK ASSESSMENT PORTAL

0 3.5 7 14 Miles

N

Bryson City - Wildland Urban Interface Risk Index



Municipal Boundary

County Boundary

Eastern Band of Cherokee Indians

WUI Risk Index

0 -3 -6 -9

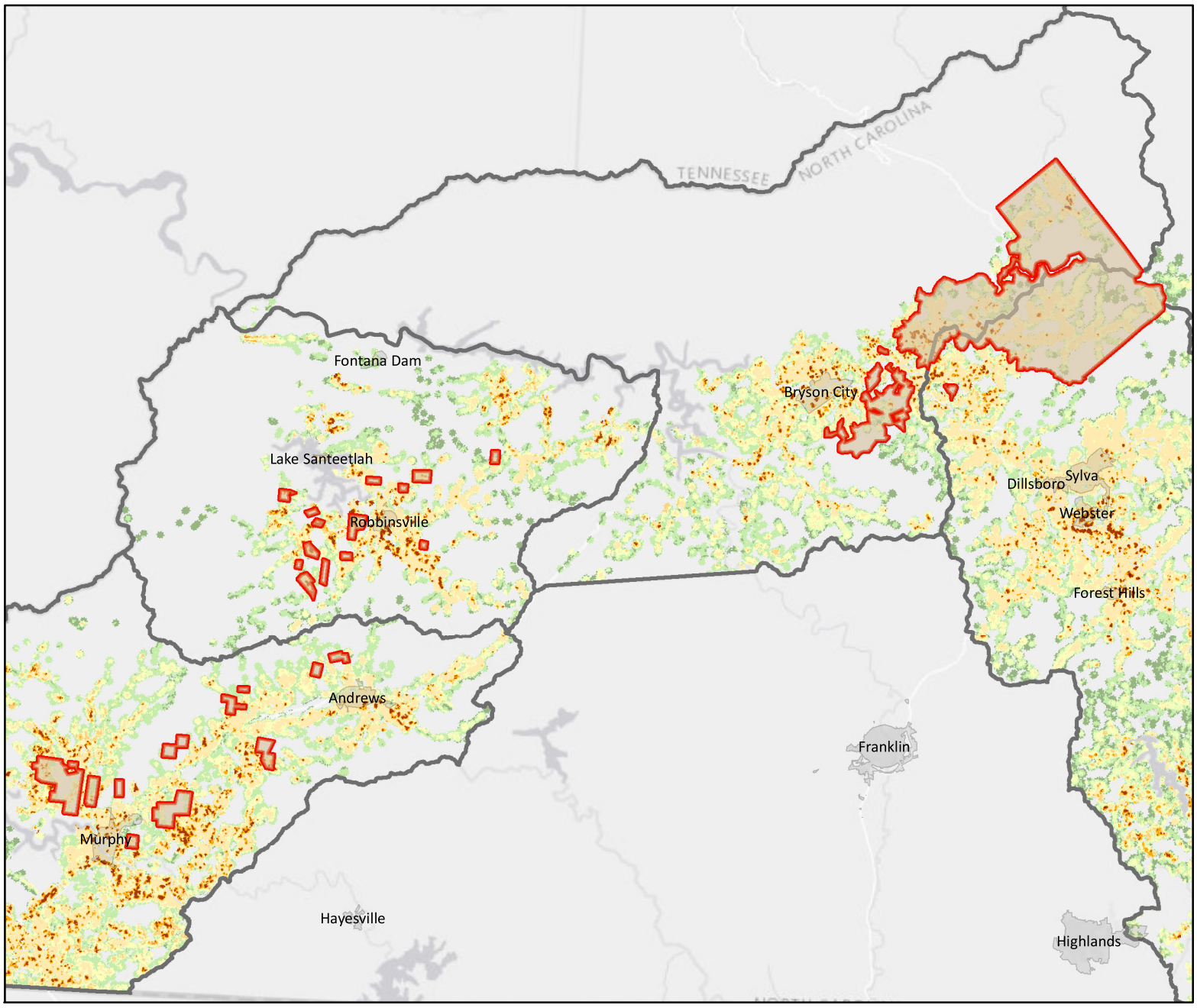
Low High

Data Source:SOUTHERN GROUP OF STATE FORESTERS
WILDFIRE RISK ASSESSMENT PORTAL

0 0.2 0.4 0.8 Miles

N

Eastern Band of Cherokee Indians - Wildland Urban Interface Risk Index



Municipal Boundary

County Boundary

Eastern Band of Cherokee Indians

WUI Risk Index

0 -3 -6 -9

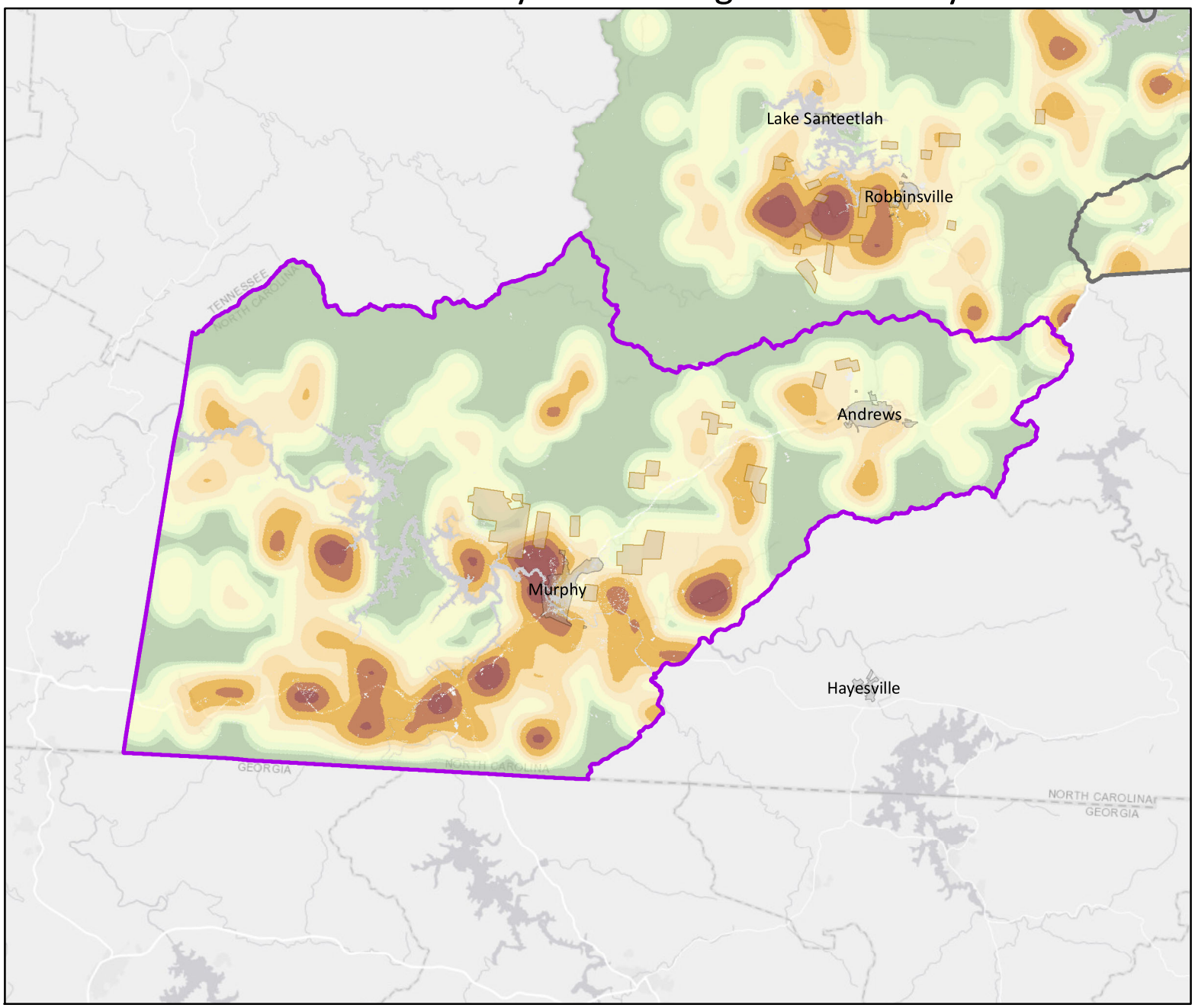
Low High

Data Source:SOUTHERN GROUP OF STATE FORESTERS
WILDFIRE RISK ASSESSMENT PORTAL

0 4.25 8.5 17 Miles

N

Cherokee County - Wildfire Ignition Density



Municipal Boundary
County Boundary
Eastern Band of Cherokee Indians

Wildfire Ignition Density Index

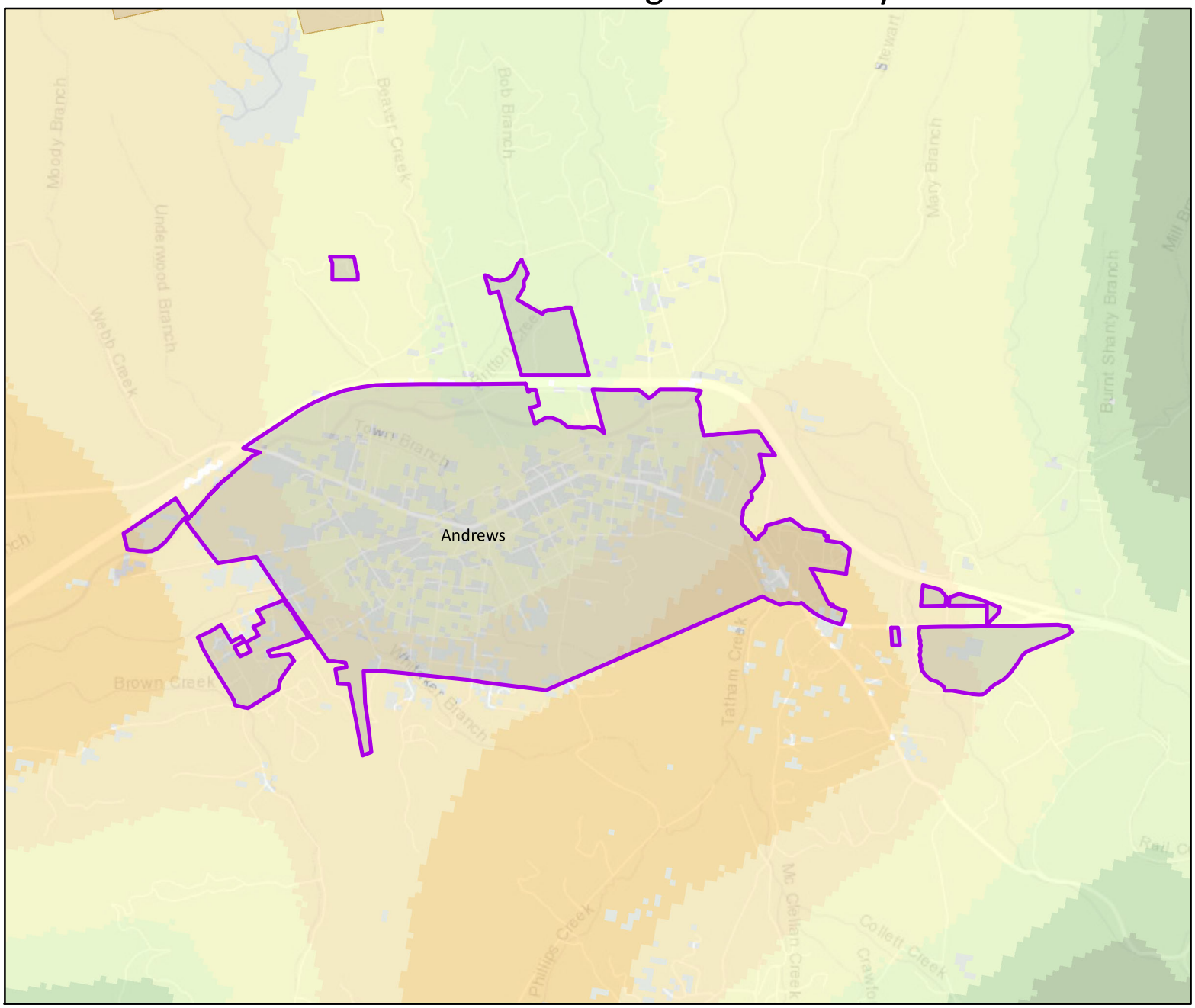
0 1 2 3 4 5 6 7 8 9

Data Source: SOUTHERN GROUP OF STATE FORESTERS
WILDFIRE RISK ASSESSMENT PORTAL

0 3 6 12 Miles

N

Andrews - Wildfire Ignition Density



Municipal Boundary

County Boundary

Eastern Band of Cherokee Indians

Wildfire Ignition Density Index

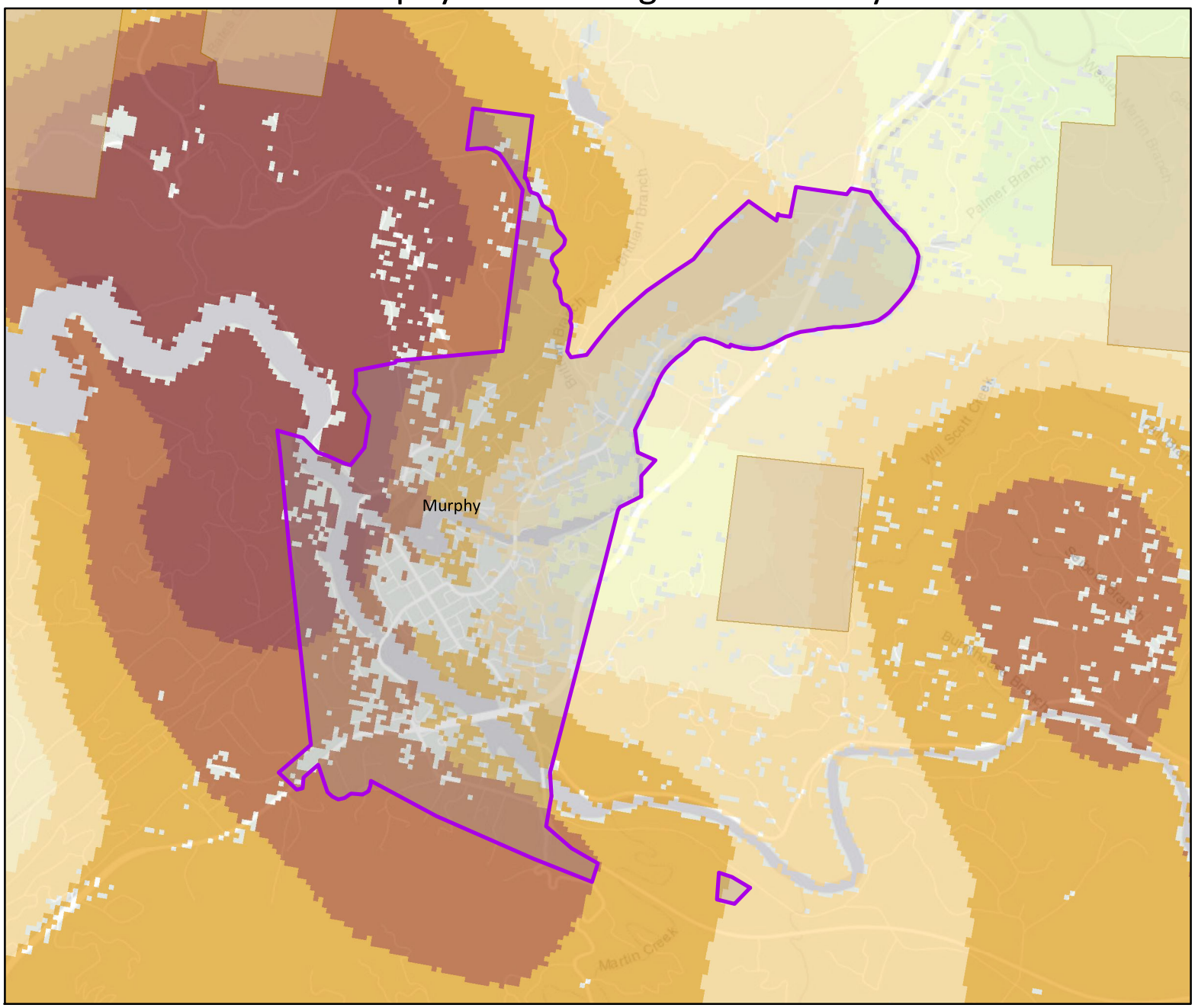
0 1 2 3 4 5 6 7 8 9

Data Source: SOUTHERN GROUP OF STATE FORESTERS
WILDFIRE RISK ASSESSMENT PORTAL

0 0.25 0.5 1 Miles

N

Murphy - Wildfire Ignition Density



Municipal Boundary
County Boundary
Eastern Band of Cherokee Indians

Wildfire Ignition Density Index

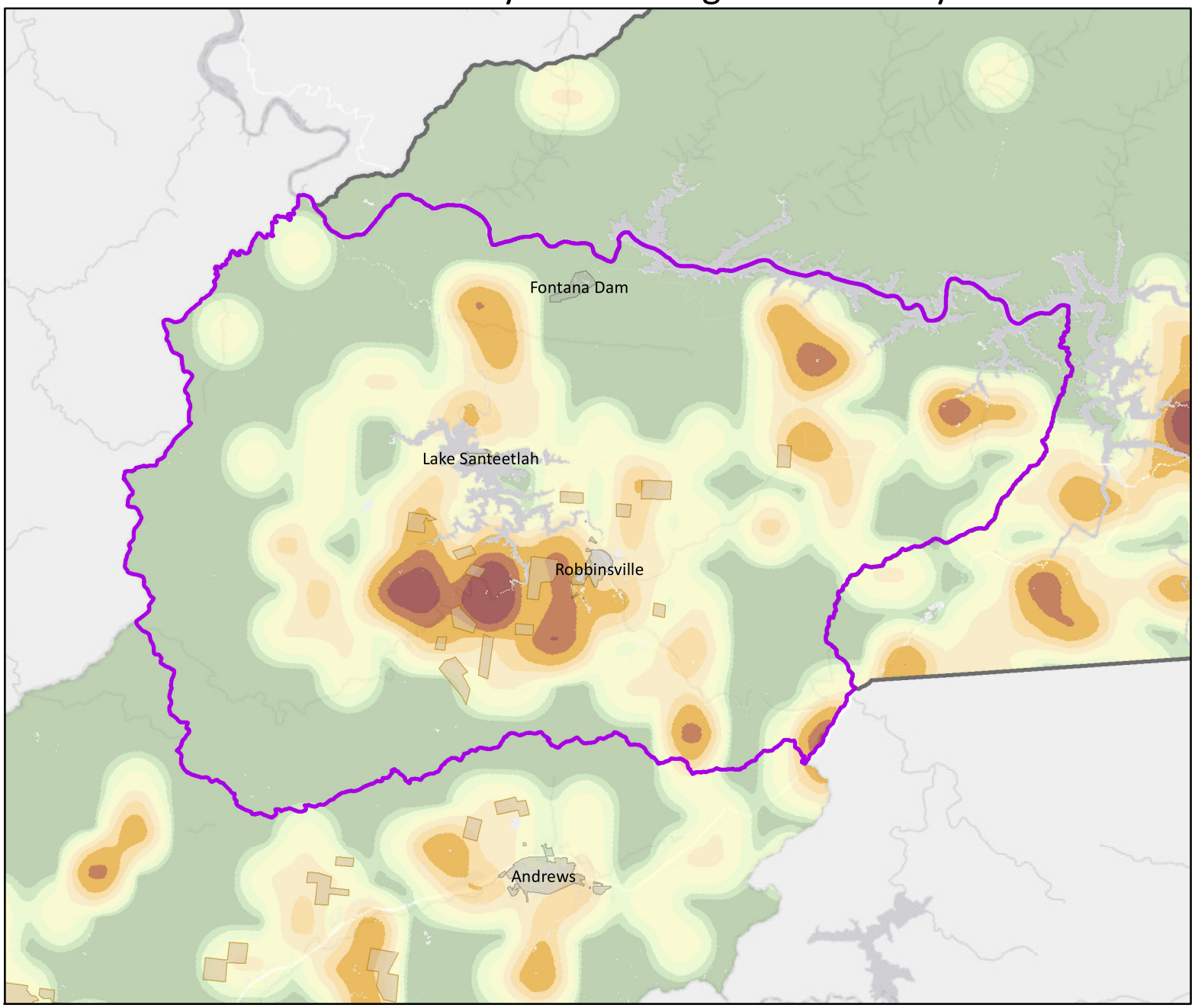
0 1 2 3 4 5 6 7 8 9

Data Source: SOUTHERN GROUP OF STATE FORESTERS
WILDFIRE RISK ASSESSMENT PORTAL

0 0.3 0.6 1.2 Miles

N

Graham County - Wildfire Ignition Density



Municipal Boundary
County Boundary
Eastern Band of Cherokee Indians

Wildfire Ignition Density Index

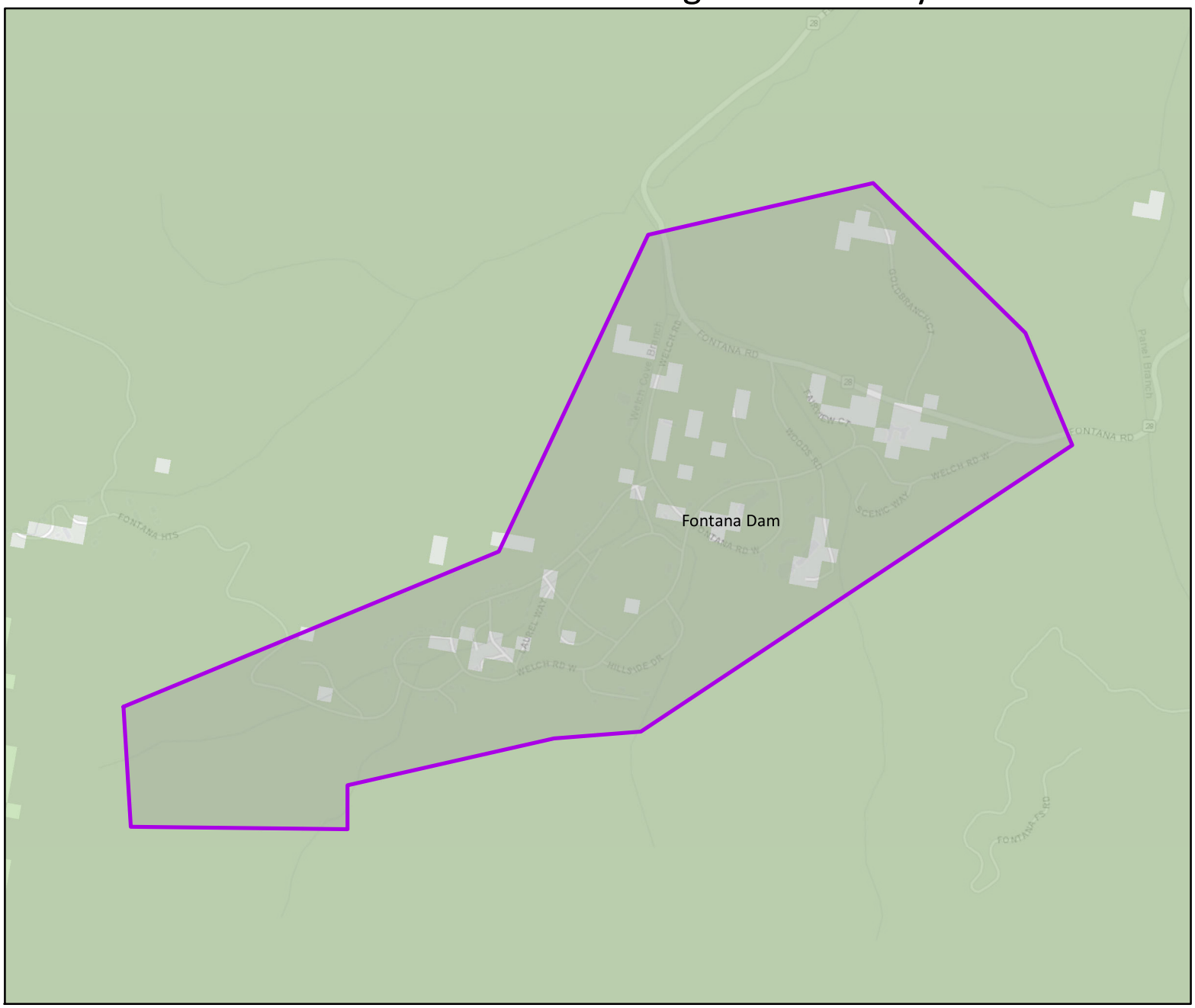
0 1 2 3 4 5 6 7 8 9

Data Source: SOUTHERN GROUP OF STATE FORESTERS
WILDFIRE RISK ASSESSMENT PORTAL

0 2 4 8 Miles

N

Fontana Dam - Wildfire Ignition Density



Municipal Boundary
County Boundary
Eastern Band of Cherokee Indians

Wildfire Ignition Density Index

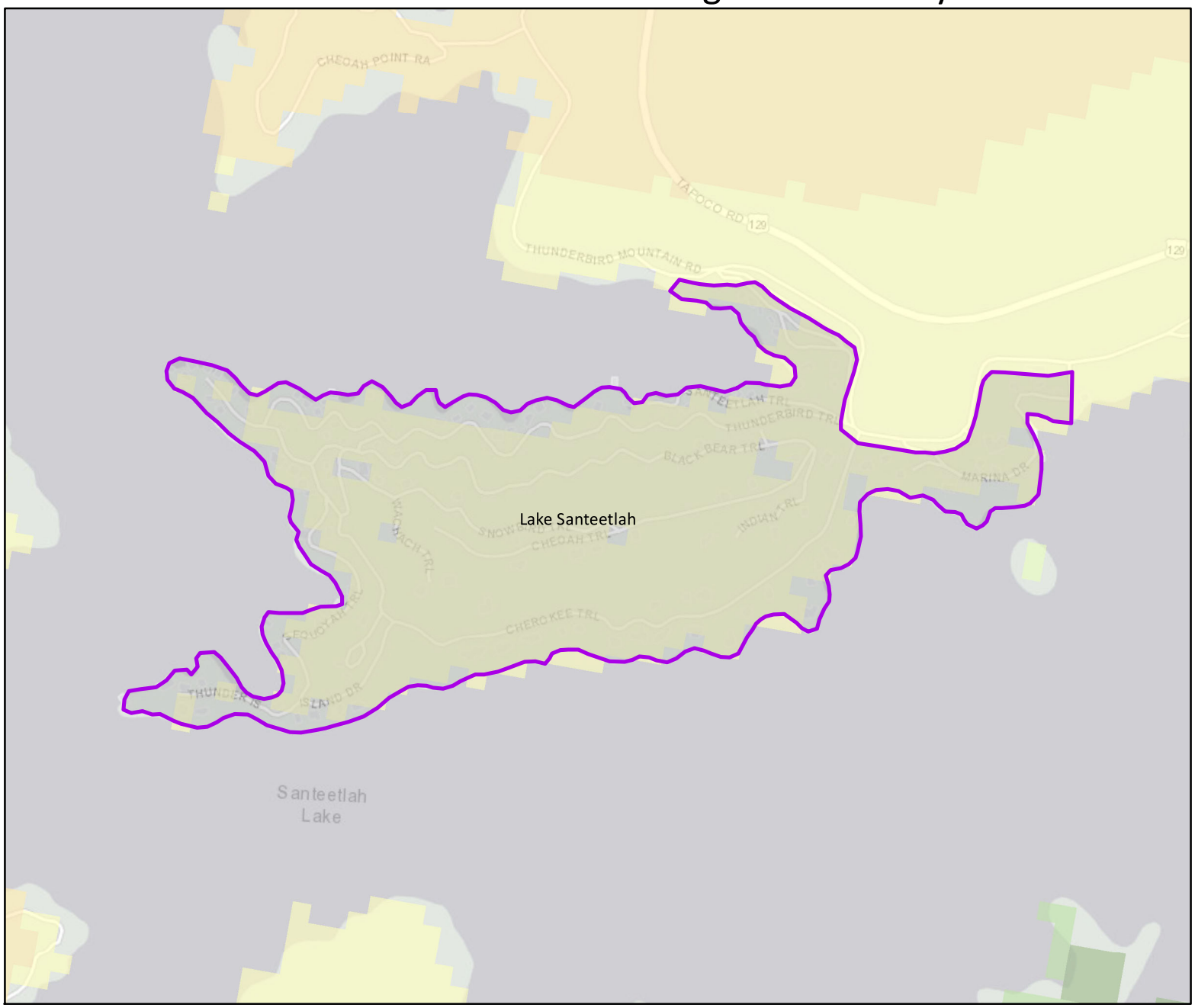
0 1 2 3 4 5 6 7 8 9

Data Source: SOUTHERN GROUP OF STATE FORESTERS
WILDFIRE RISK ASSESSMENT PORTAL

0 0.1 0.2 0.4 Miles

N

Lake Santeetlah - Wildfire Ignition Density



Municipal Boundary

County Boundary

Eastern Band of Cherokee Indians

Wildfire Ignition Density Index

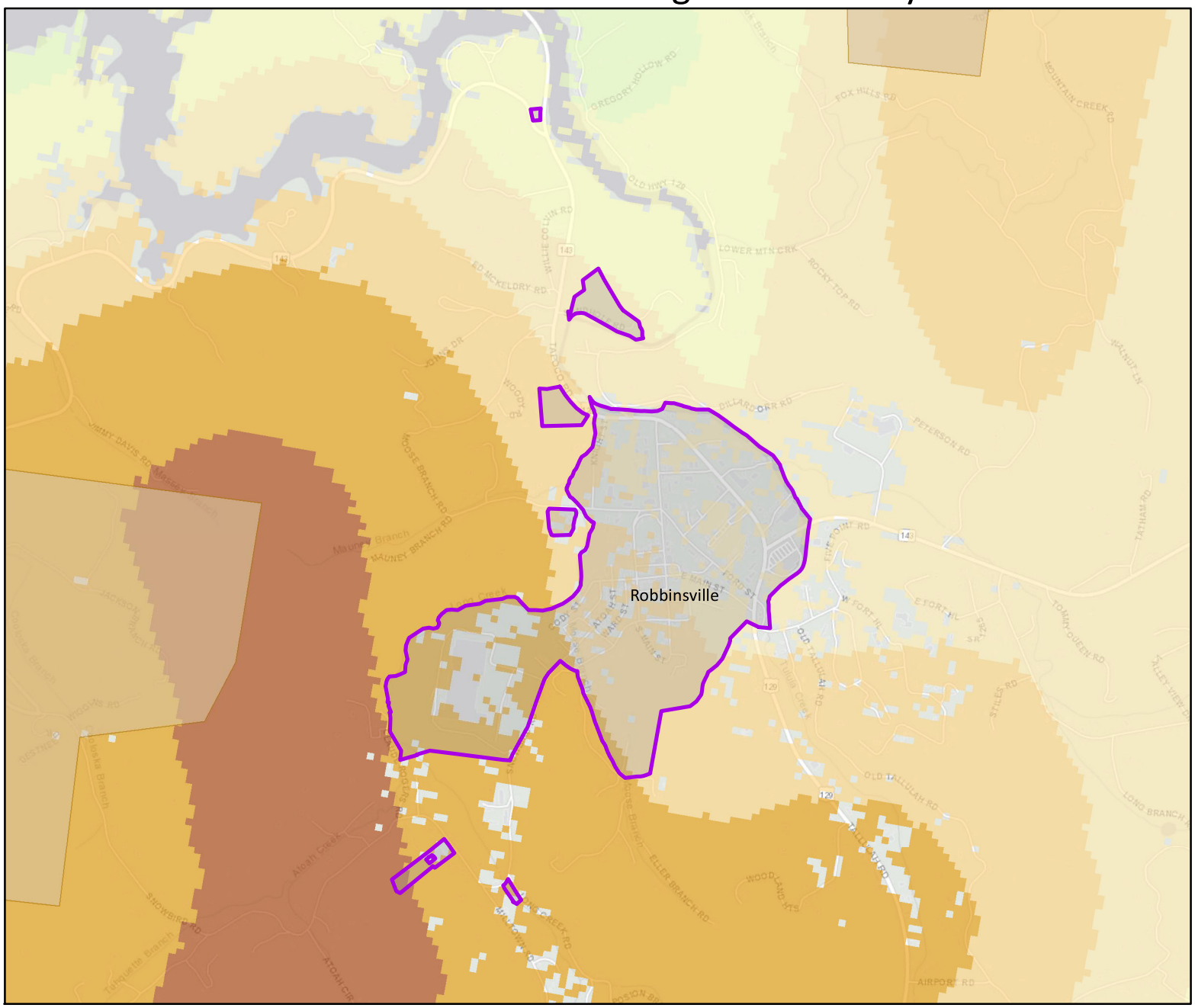
0 1 2 3 4 5 6 7 8 9

Data Source: SOUTHERN GROUP OF STATE FORESTERS WILDFIRE RISK ASSESSMENT PORTAL

0 0.075 0.15 0.3 Miles

N

Robbinsville - Wildfire Ignition Density



Municipal Boundary
County Boundary
Eastern Band of Cherokee Indians

Wildfire Ignition Density Index

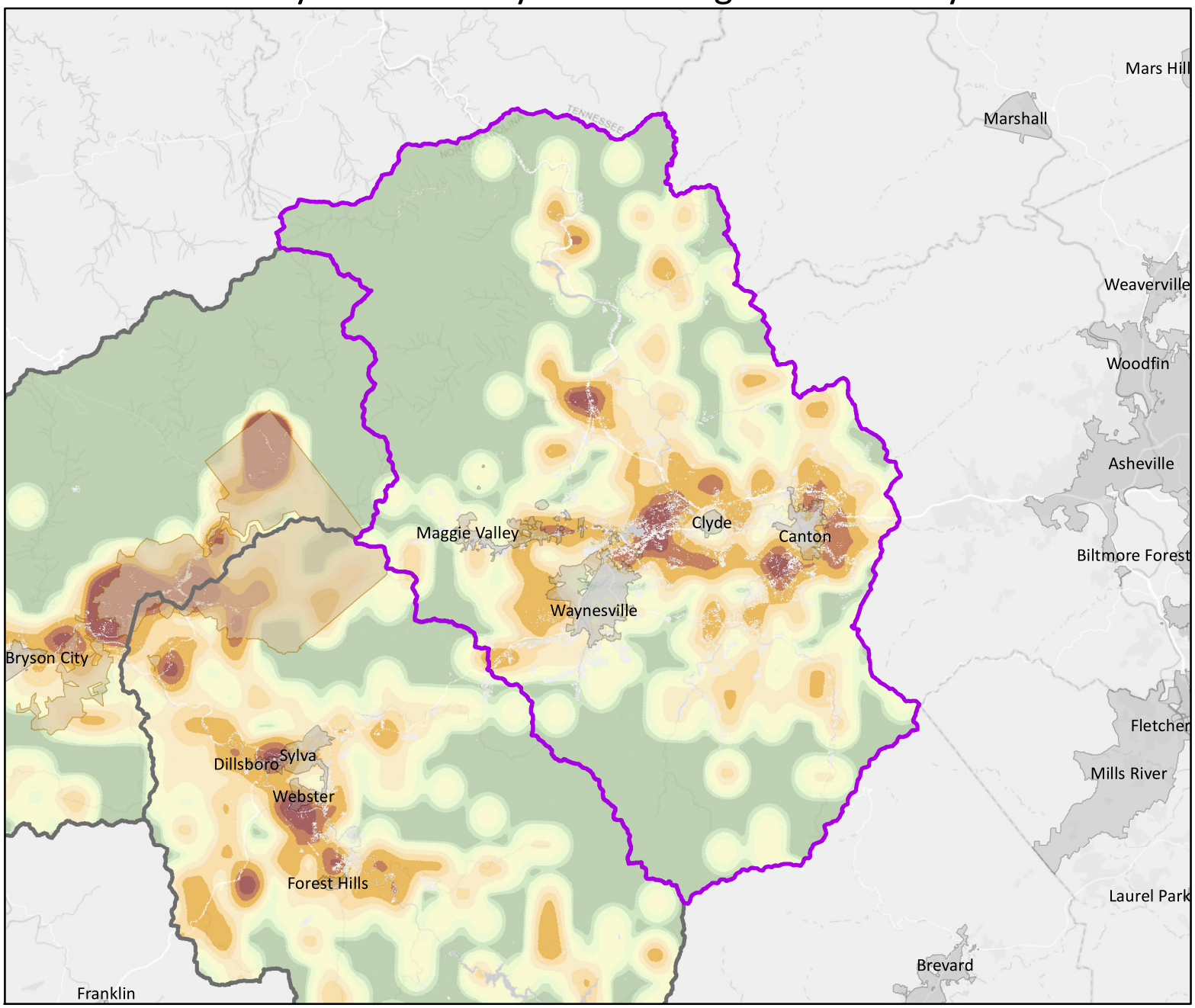
0 1 2 3 4 5 6 7 8 9

Data Source: SOUTHERN GROUP OF STATE FORESTERS
WILDFIRE RISK ASSESSMENT PORTAL

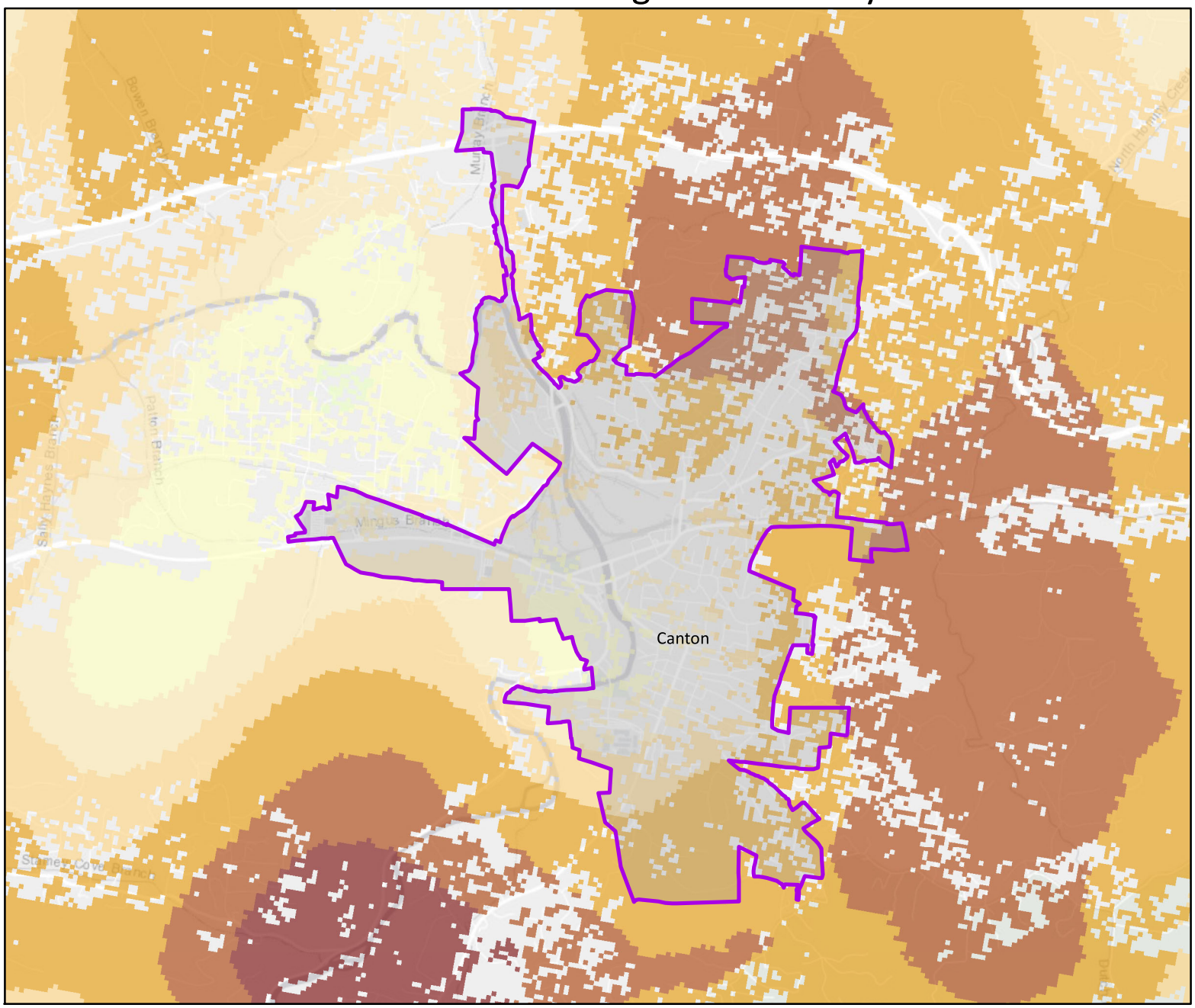
0 0.2 0.4 0.8 Miles

N

Haywood County - Wildfire Ignition Density



Canton - Wildfire Ignition Density



Municipal Boundary

County Boundary

Eastern Band of Cherokee Indians

Wildfire Ignition Density Index

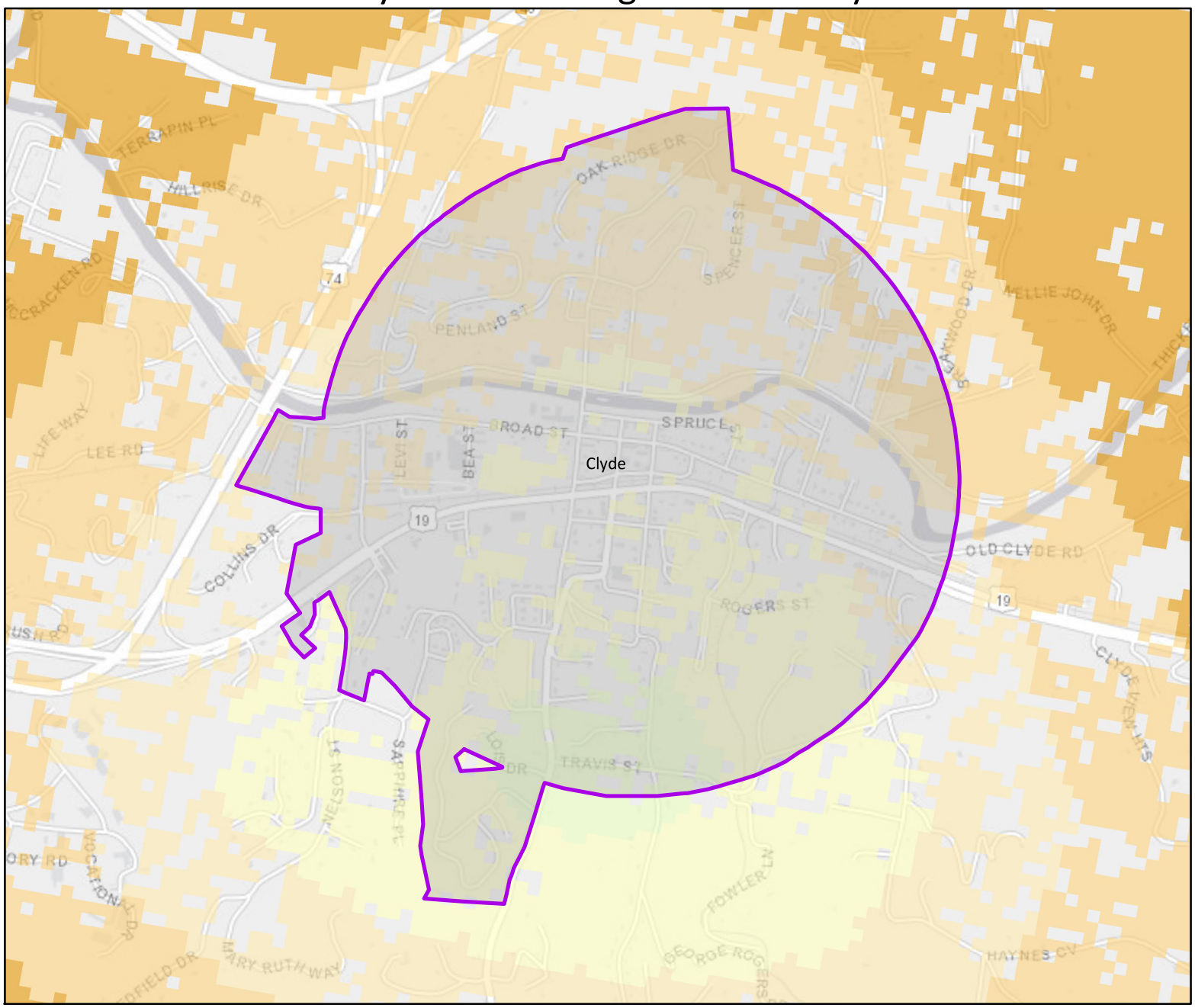
0 1 2 3 4 5 6 7 8 9

Data Source: SOUTHERN GROUP OF STATE FORESTERS
WILDFIRE RISK ASSESSMENT PORTAL

0 0.3 0.6 1.2 Miles

N

Clyde - Wildfire Ignition Density



Municipal Boundary

County Boundary

Eastern Band of Cherokee Indians

Wildfire Ignition Density Index

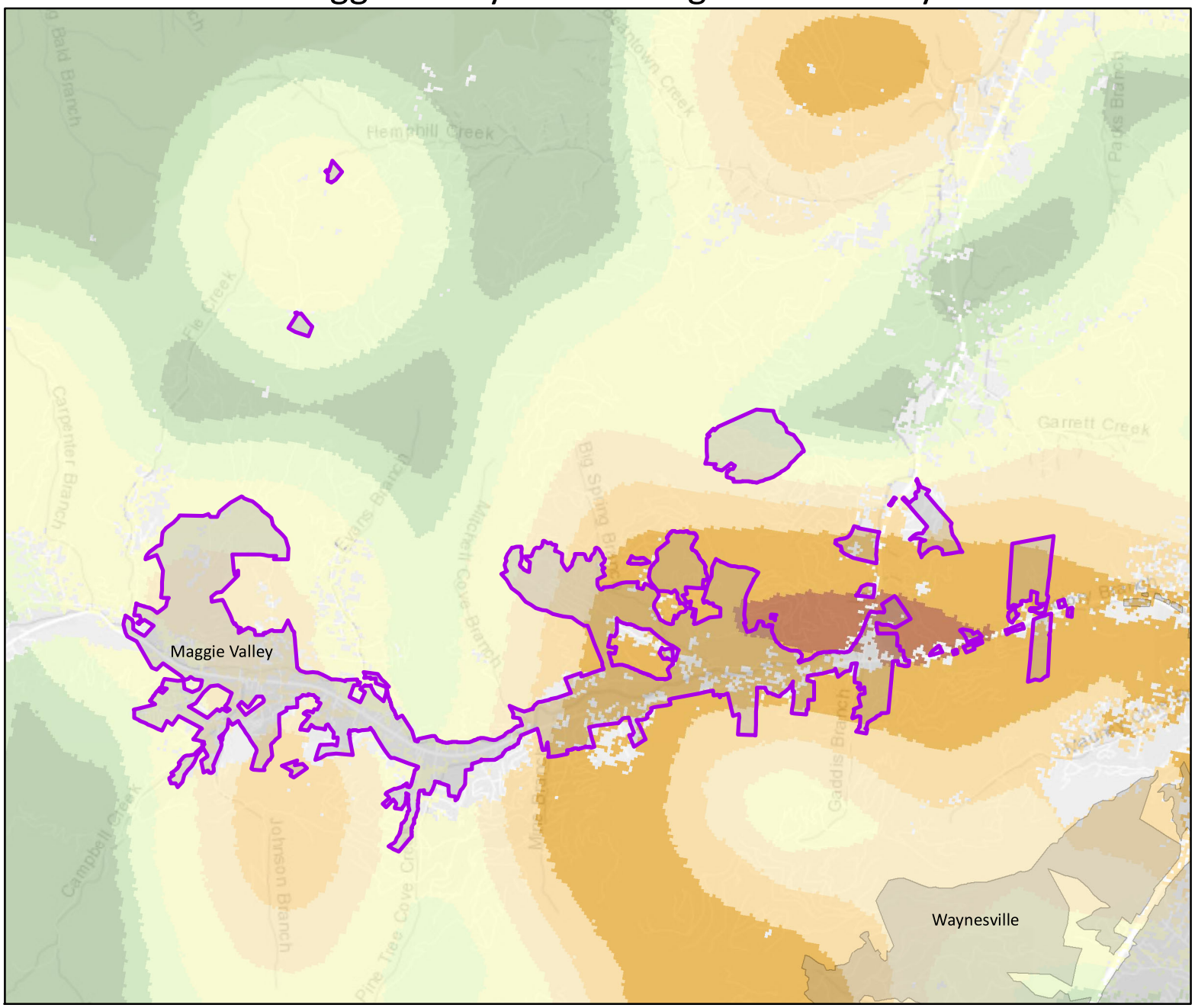
0 1 2 3 4 5 6 7 8 9

Data Source: SOUTHERN GROUP OF STATE FORESTERS
WILDFIRE RISK ASSESSMENT PORTAL

0 0.1 0.2 0.4 Miles

N

Maggie Valley - Wildfire Ignition Density



Municipal Boundary
County Boundary
Eastern Band of Cherokee Indians

Wildfire Ignition Density Index

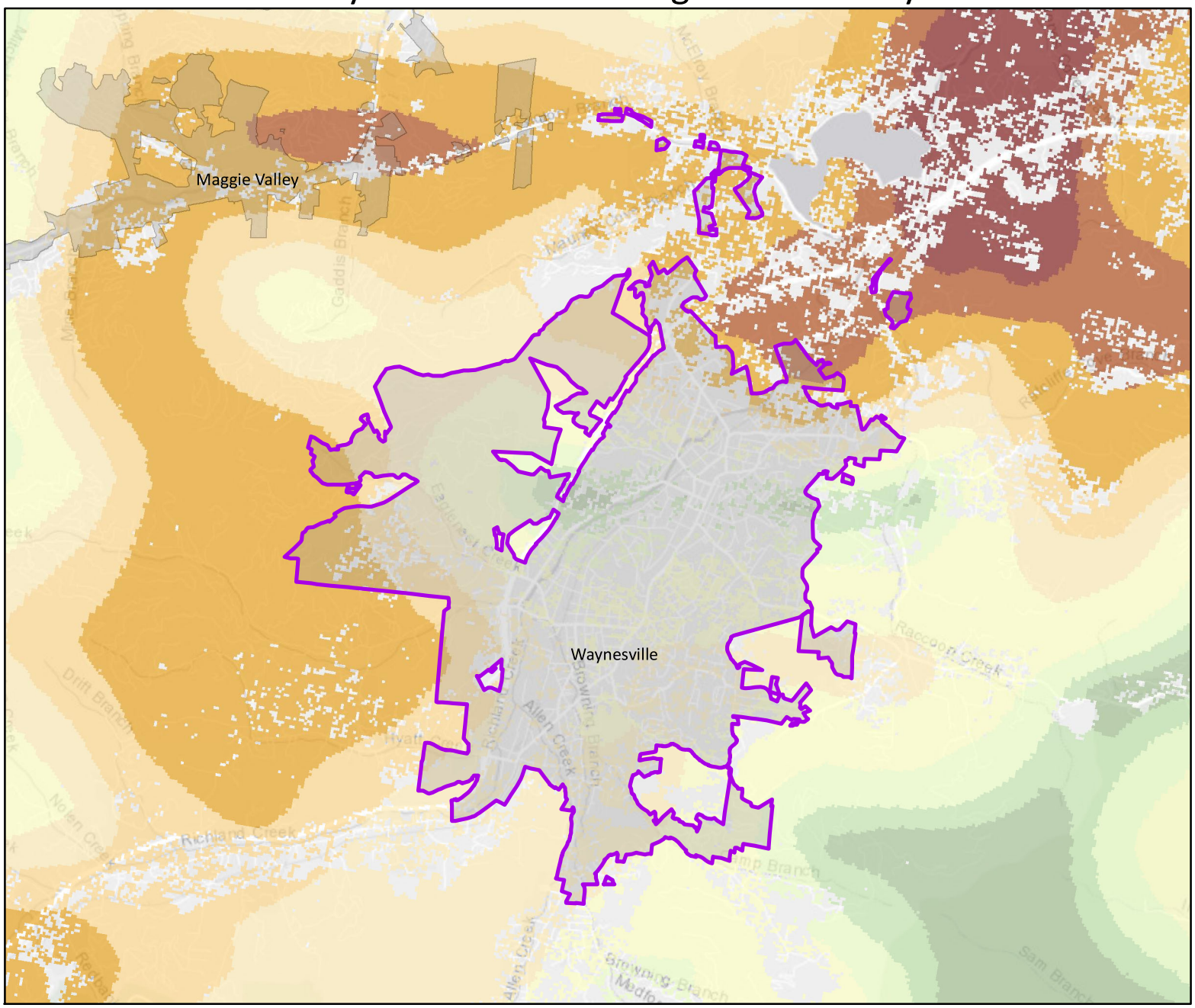
0 1 2 3 4 5 6 7 8 9

Data Source: SOUTHERN GROUP OF STATE FORESTERS
WILDFIRE RISK ASSESSMENT PORTAL

0 0.5 1 2 Miles

N

Waynesville - Wildfire Ignition Density



Municipal Boundary
County Boundary
Eastern Band of Cherokee Indians

Wildfire Ignition Density Index

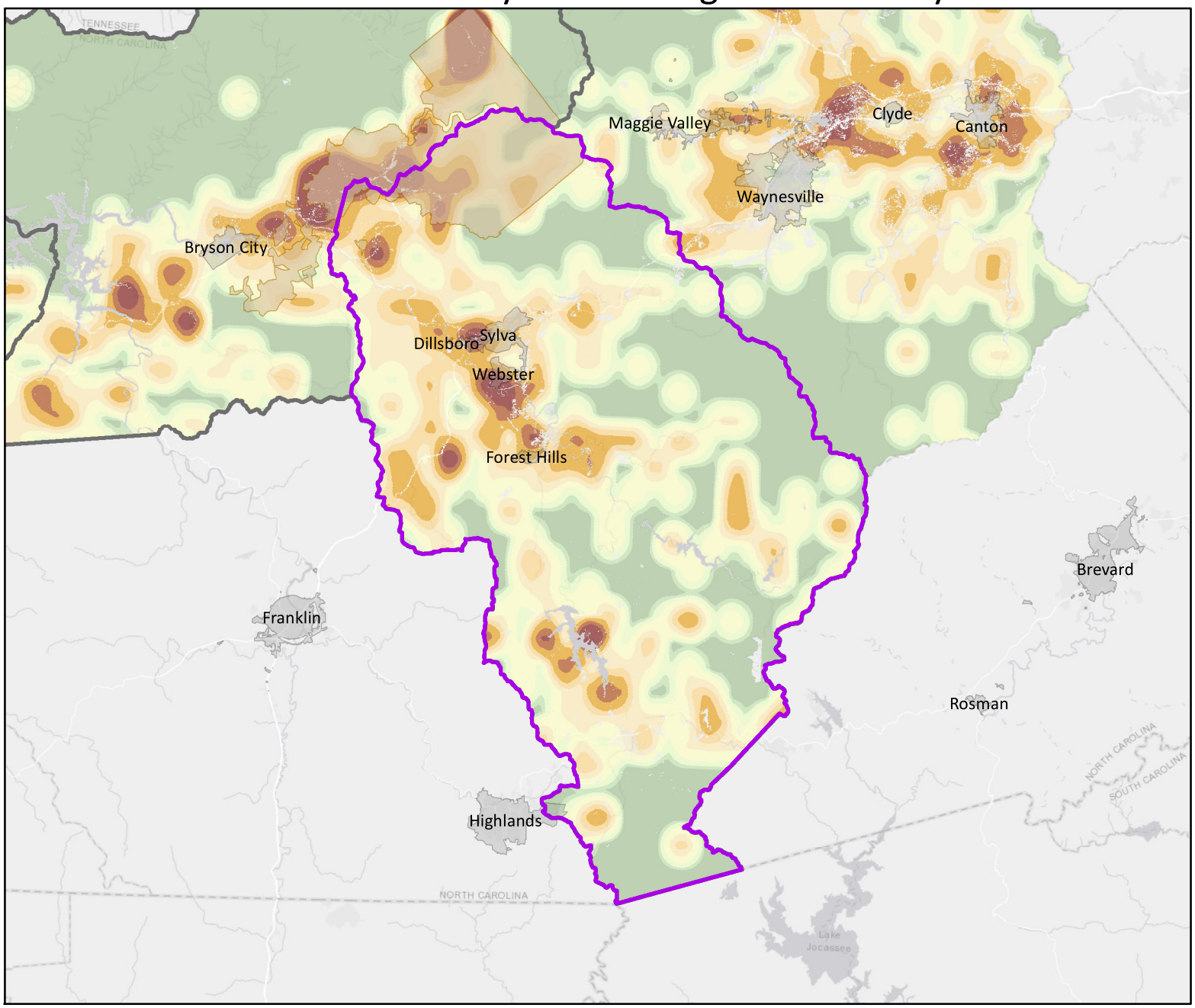
0 1 2 3 4 5 6 7 8 9

Data Source: SOUTHERN GROUP OF STATE FORESTERS
WILDFIRE RISK ASSESSMENT PORTAL

0 0.5 1 2 Miles

N

Jackson County - Wildfire Ignition Density



Municipal Boundary
County Boundary
Eastern Band of Cherokee Indians

Wildfire Ignition Density Index

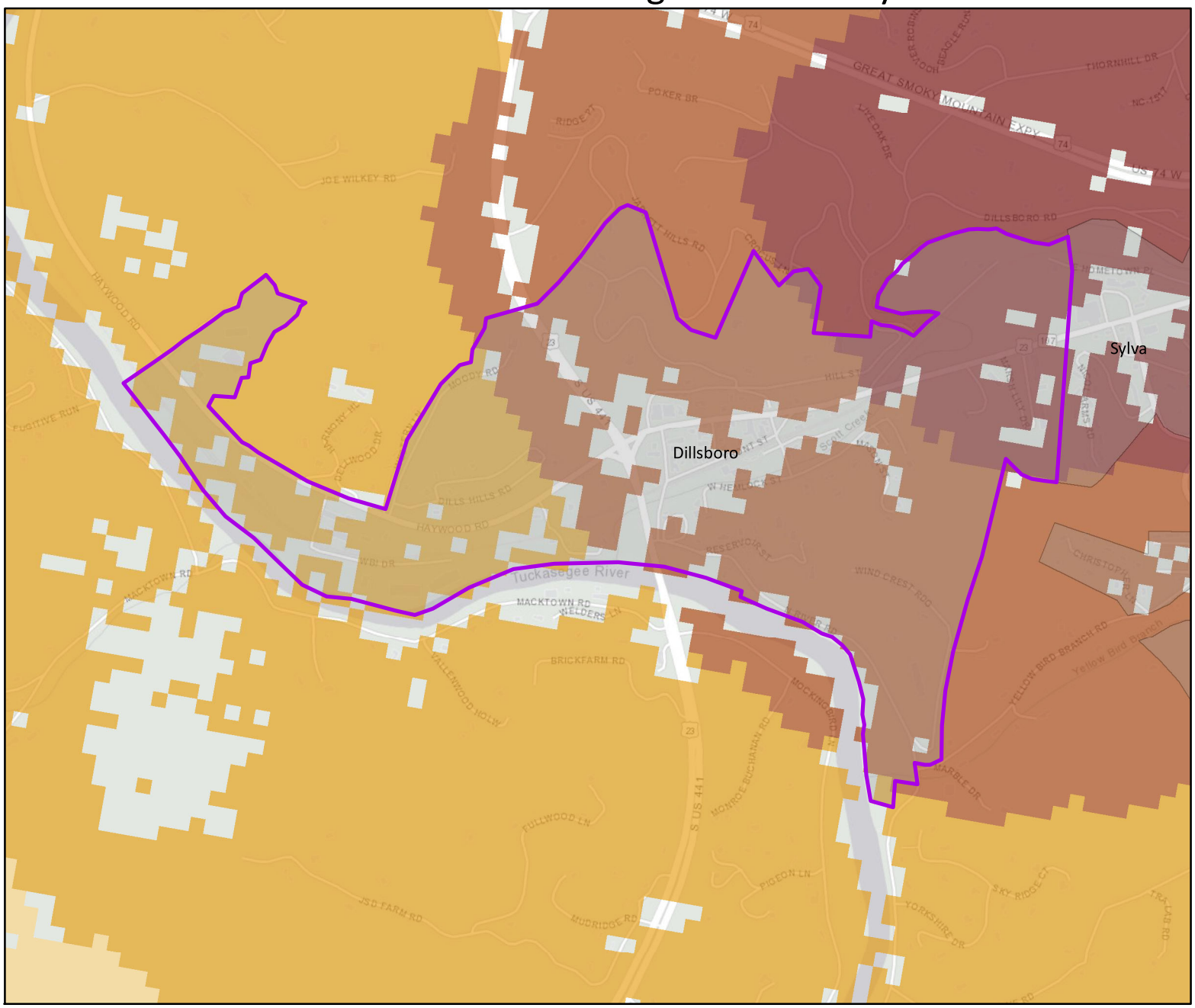
0 1 2 3 4 5 6 7 8 9

Data Source: SOUTHERN GROUP OF STATE FORESTERS
WILDFIRE RISK ASSESSMENT PORTAL

0 3.5 7 14 Miles

N

Dillsboro - Wildfire Ignition Density



Municipal Boundary

County Boundary

Eastern Band of Cherokee Indians

Wildfire Ignition Density Index

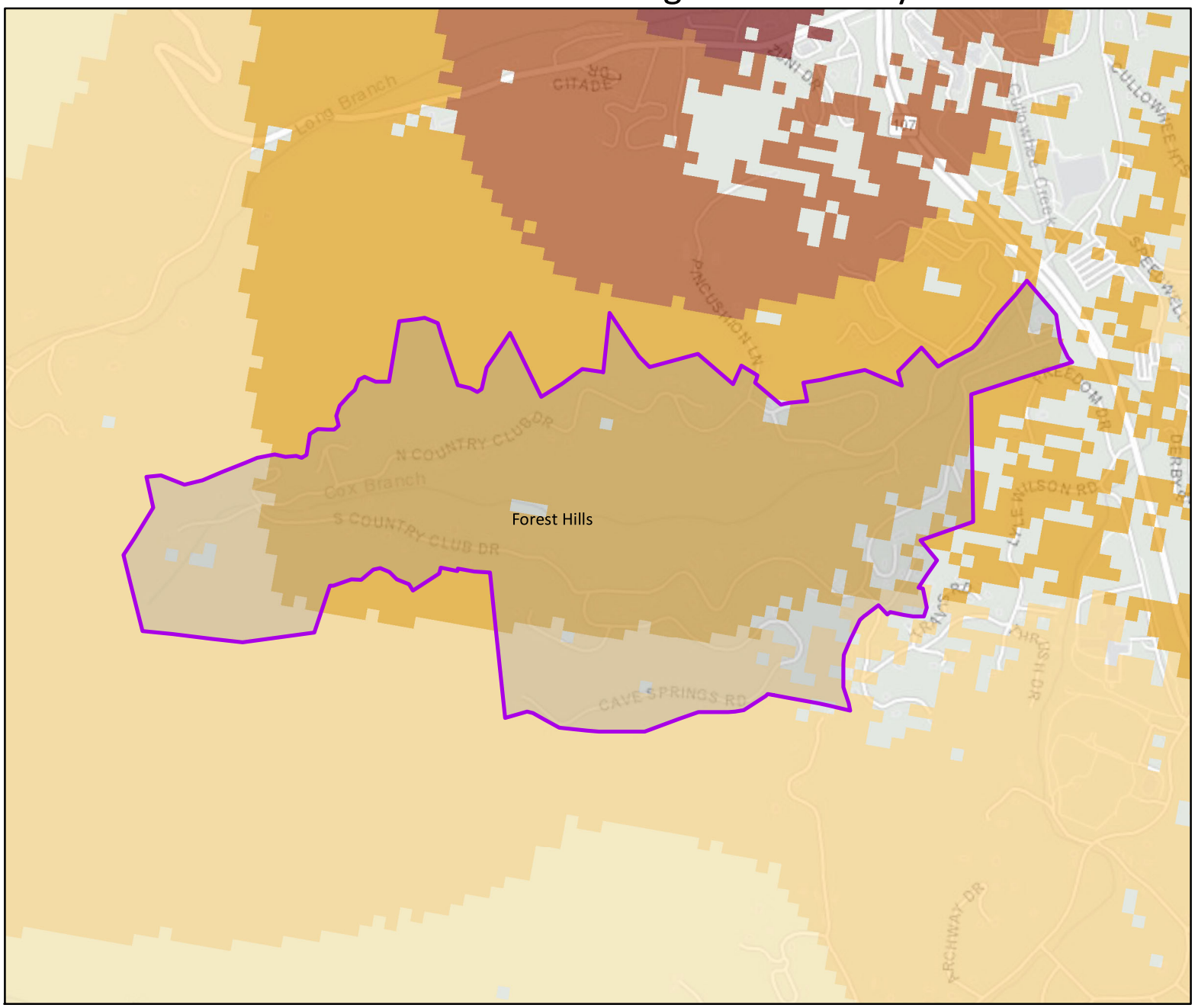
0 1 2 3 4 5 6 7 8 9

Data Source: SOUTHERN GROUP OF STATE FORESTERS
WILDFIRE RISK ASSESSMENT PORTAL

0 0.1 0.2 0.4 Miles

N

Forest Hills - Wildfire Ignition Density



Municipal Boundary

County Boundary

Eastern Band of Cherokee Indians

Wildfire Ignition Density Index

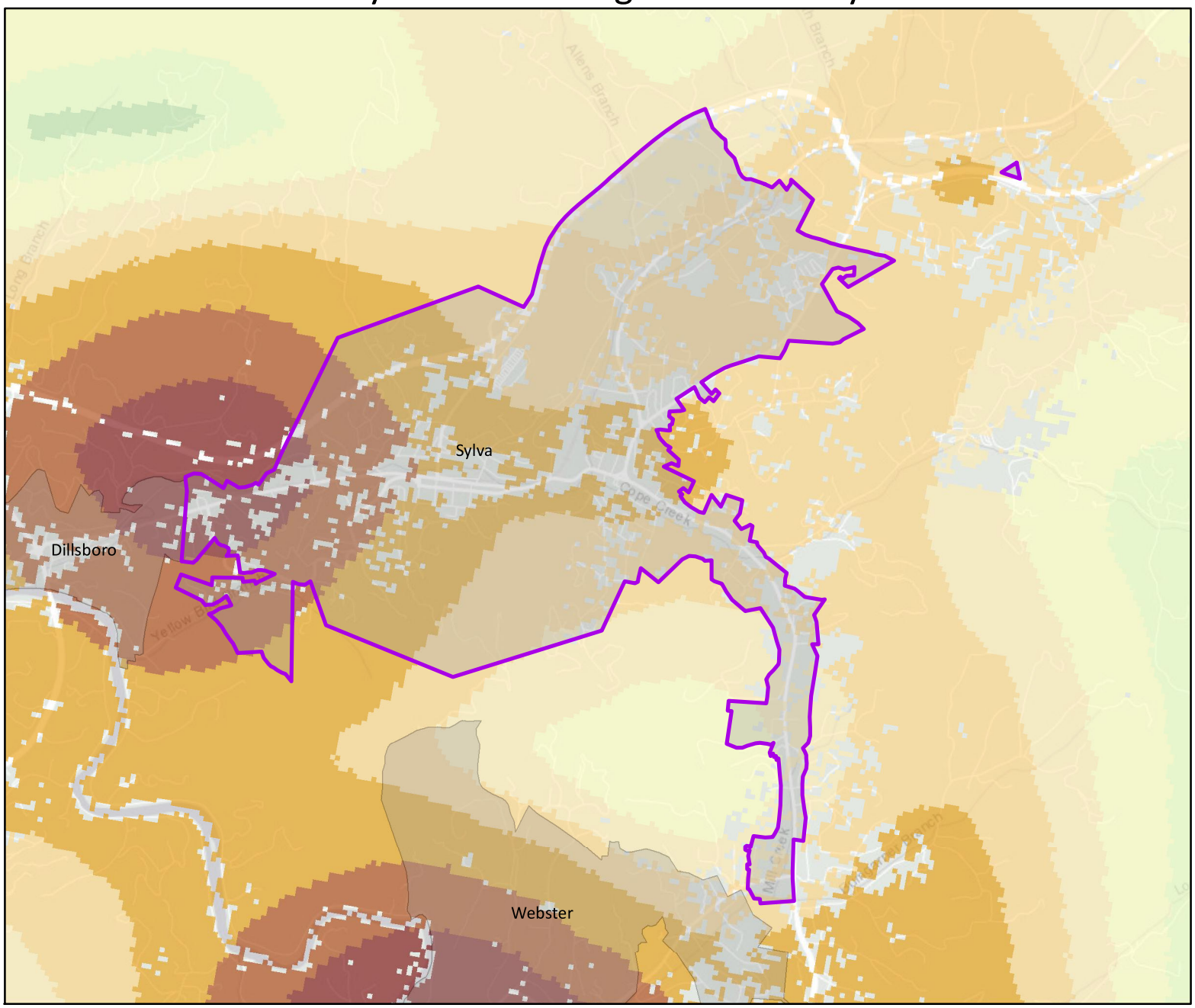
0 1 2 3 4 5 6 7 8 9

Data Source: SOUTHERN GROUP OF STATE FORESTERS
WILDFIRE RISK ASSESSMENT PORTAL

0 0.1 0.2 0.4 Miles

N

Sylva - Wildfire Ignition Density



Municipal Boundary
County Boundary
Eastern Band of Cherokee Indians

Wildfire Ignition Density Index

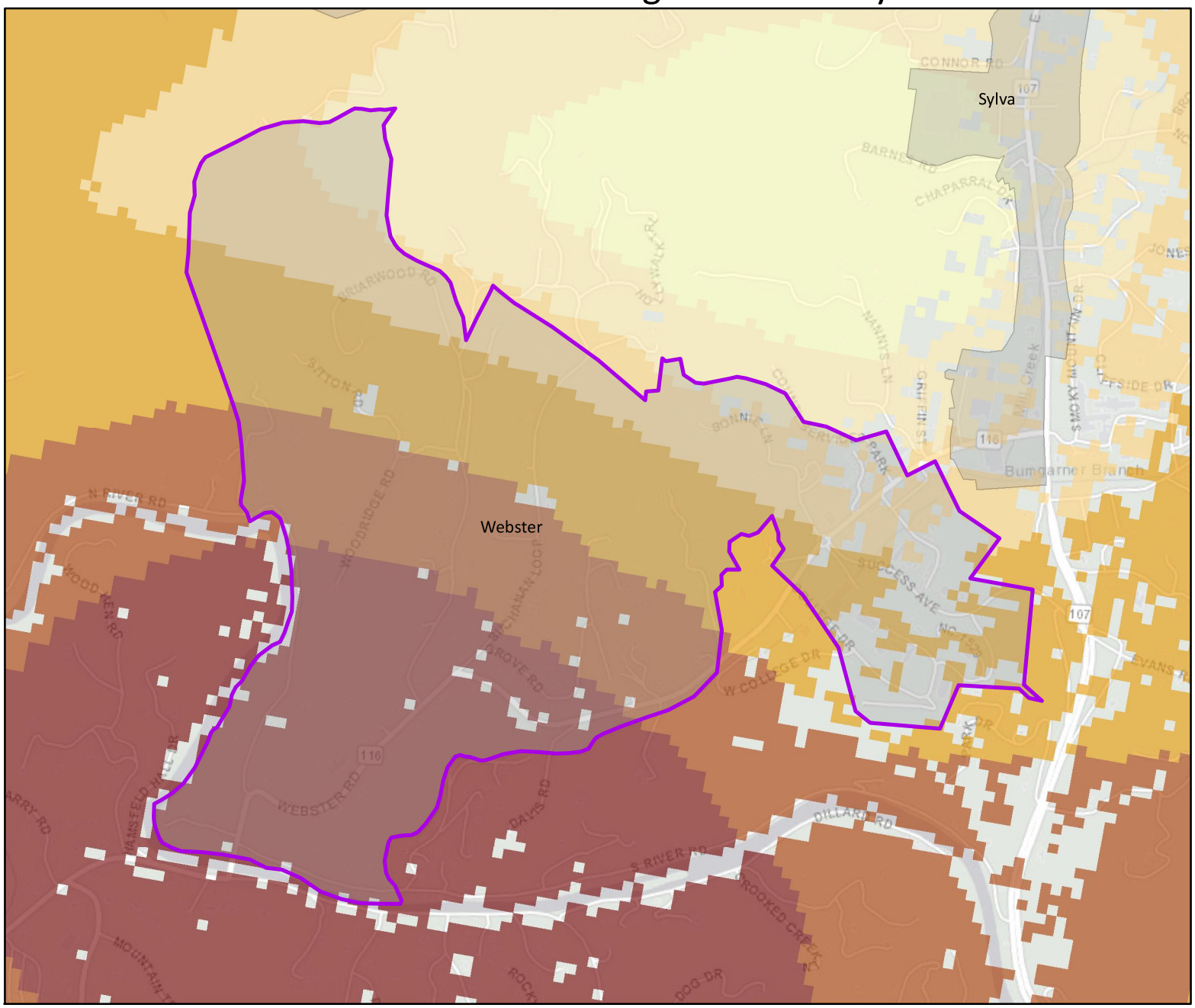
0 1 2 3 4 5 6 7 8 9

Data Source: SOUTHERN GROUP OF STATE FORESTERS
WILDFIRE RISK ASSESSMENT PORTAL

0 0.3 0.6 1.2 Miles

N

Webster - Wildfire Ignition Density



Municipal Boundary

County Boundary

Eastern Band of Cherokee Indians

Wildfire Ignition Density Index

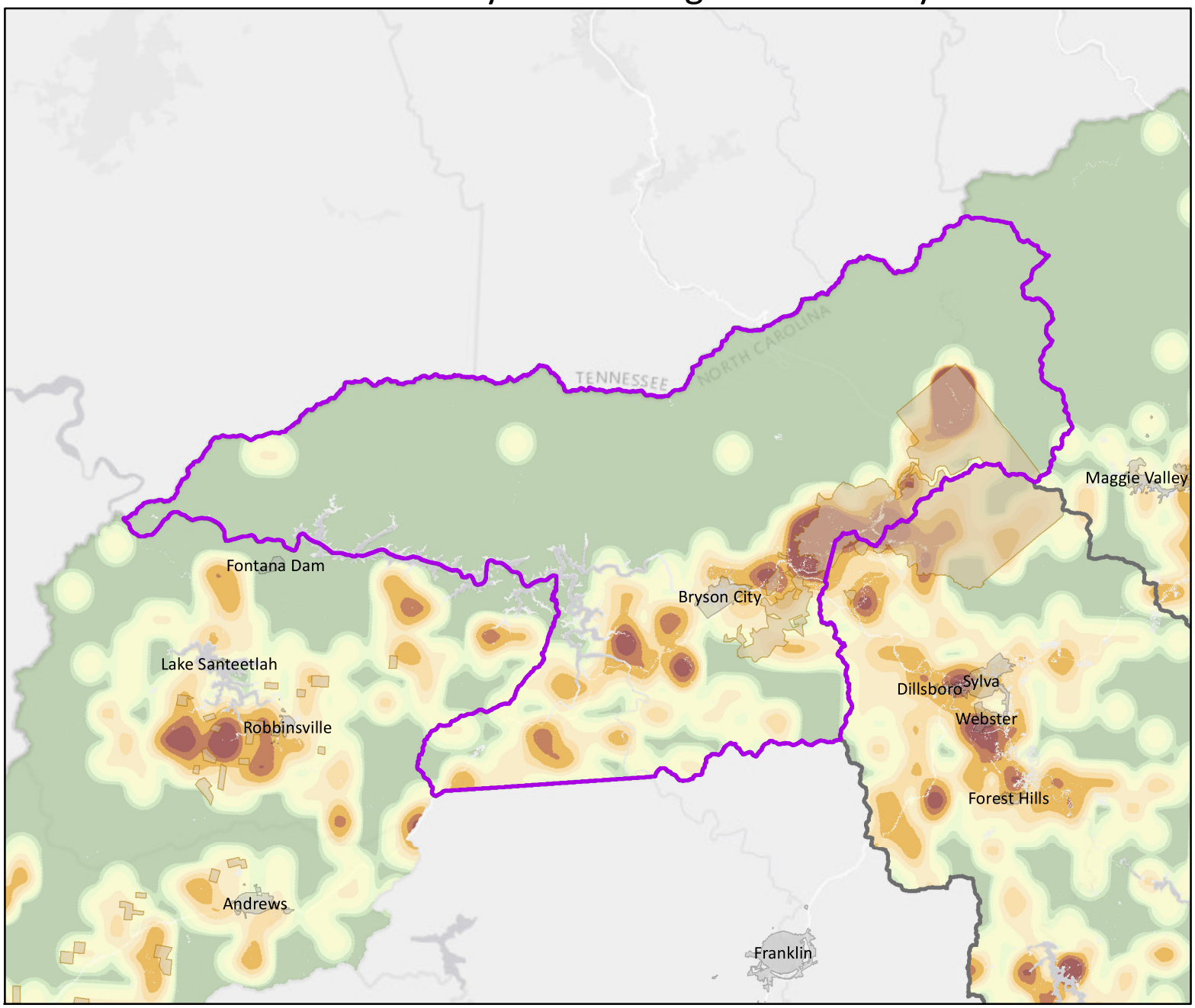
0 1 2 3 4 5 6 7 8 9

Data Source: SOUTHERN GROUP OF STATE FORESTERS
WILDFIRE RISK ASSESSMENT PORTAL

0 0.125 0.25 0.5 Miles

N

Swain County - Wildfire Ignition Density



Municipal Boundary
County Boundary
Eastern Band of Cherokee Indians

Wildfire Ignition Density Index

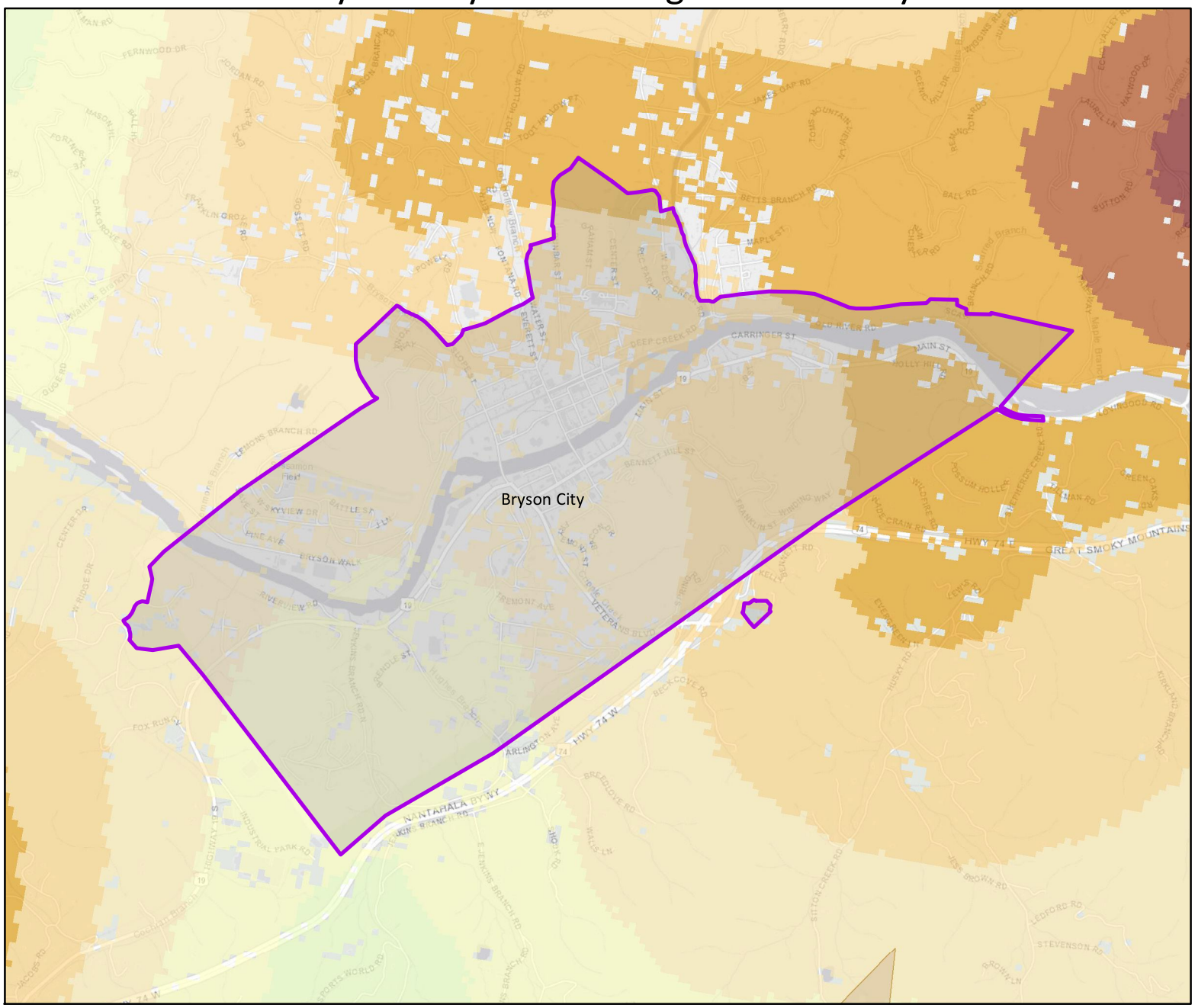
0 1 2 3 4 5 6 7 8 9

Data Source: SOUTHERN GROUP OF STATE FORESTERS
WILDFIRE RISK ASSESSMENT PORTAL

0 3.75 7.5 15 Miles

N

Bryson City - Wildfire Ignition Density



Municipal Boundary

County Boundary

Eastern Band of Cherokee Indians

Wildfire Ignition Density Index

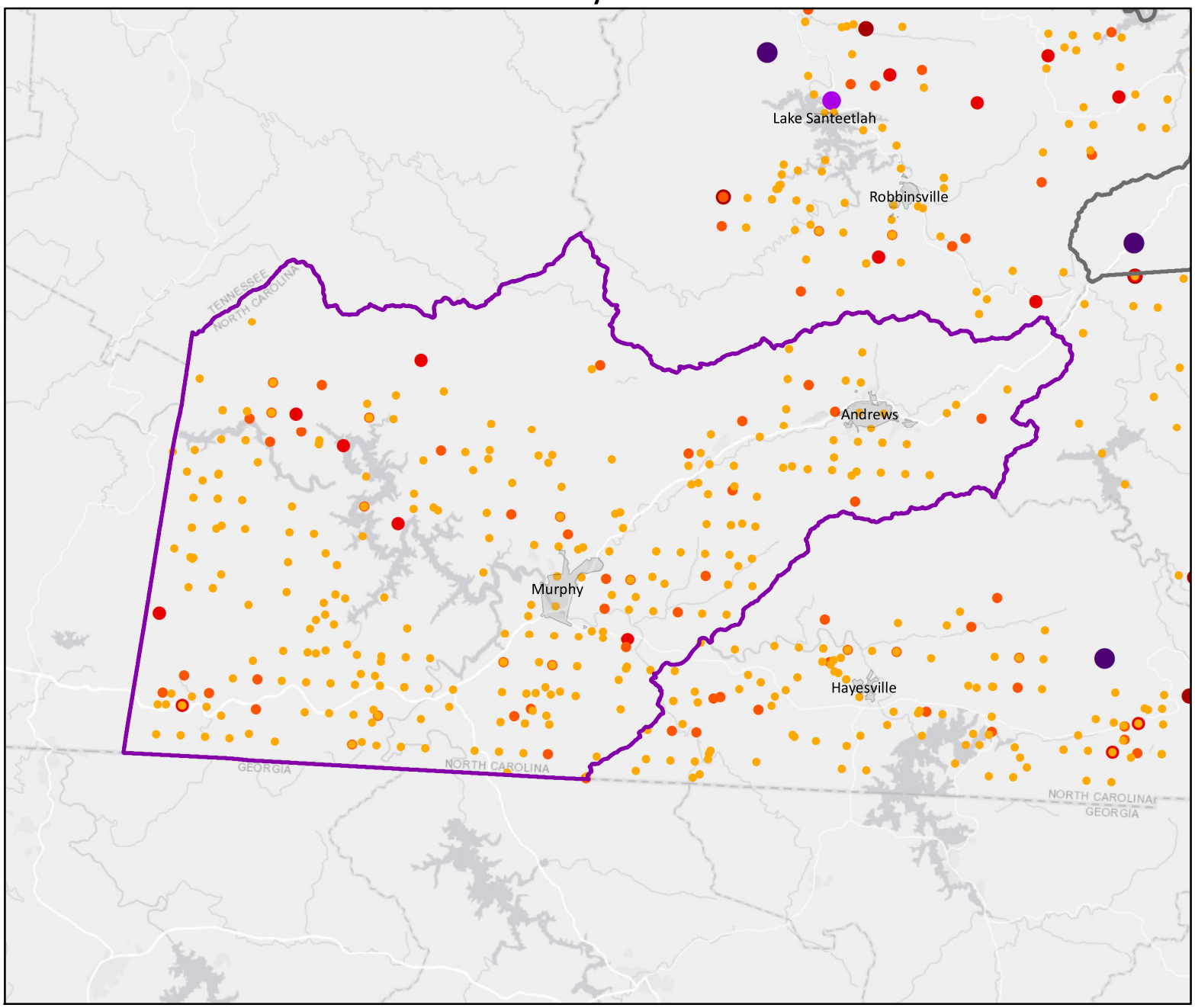
0 1 2 3 4 5 6 7 8 9

Data Source: SOUTHERN GROUP OF STATE FORESTERS
WILDFIRE RISK ASSESSMENT PORTAL

0 0.225 0.45 0.9 Miles

N

Cherokee County - Wildfire Events



Municipal Boundary
County Boundary
Eastern Band of Cherokee Indians

Acres Impacted

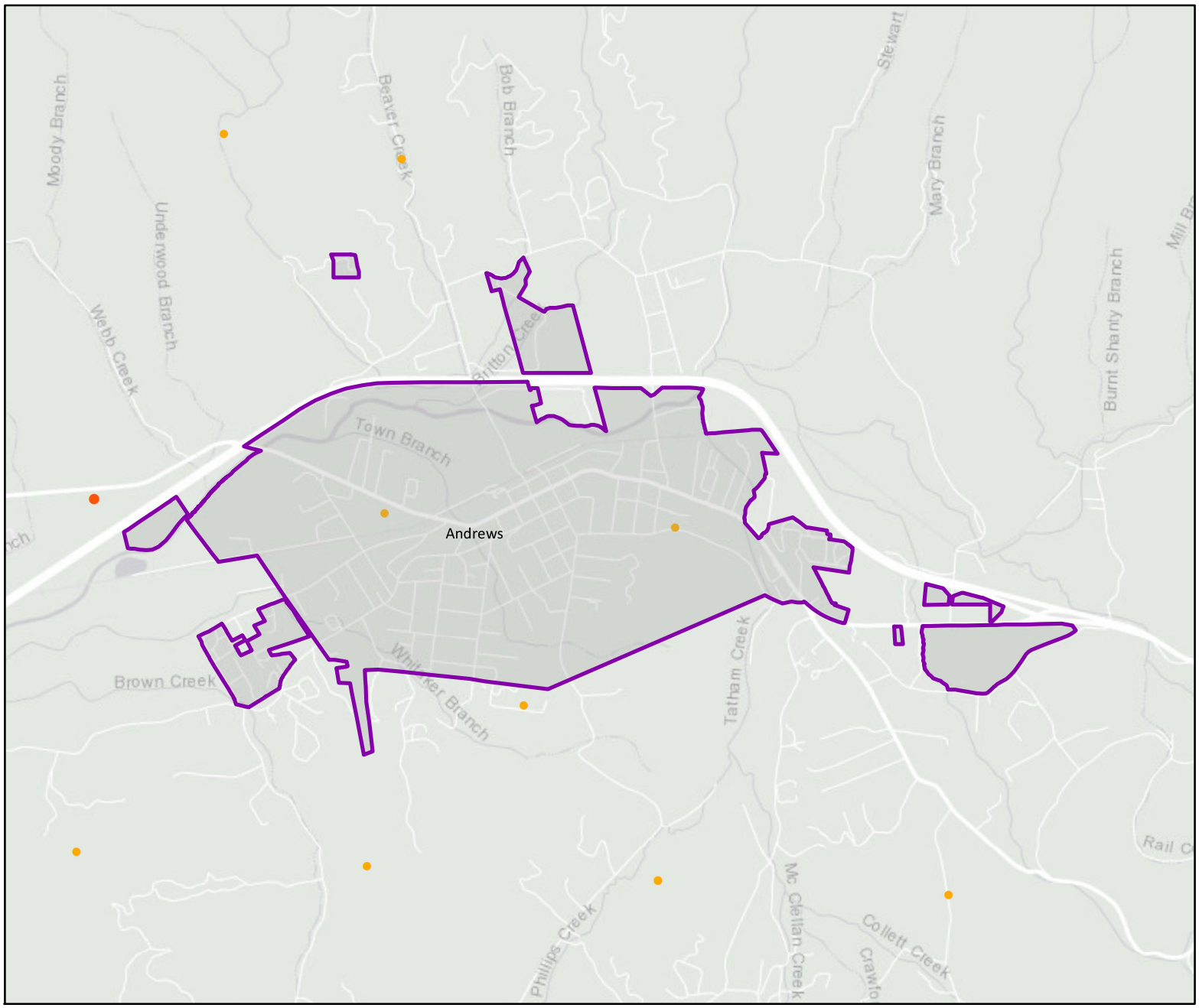
- 1 - 10
- 11 - 50
- 51 - 100
- 101 - 500
- 501 - 1000
- >1000

Data Source:SOUTHERN GROUP OF STATE FORESTERS
WILDFIRE RISK ASSESSMENT PORTAL

0 3.25 6.5 13 Miles

N

Andrews - Wildfire Events



Municipal Boundary

County Boundary

Eastern Band of Cherokee Indians

Acres Impacted

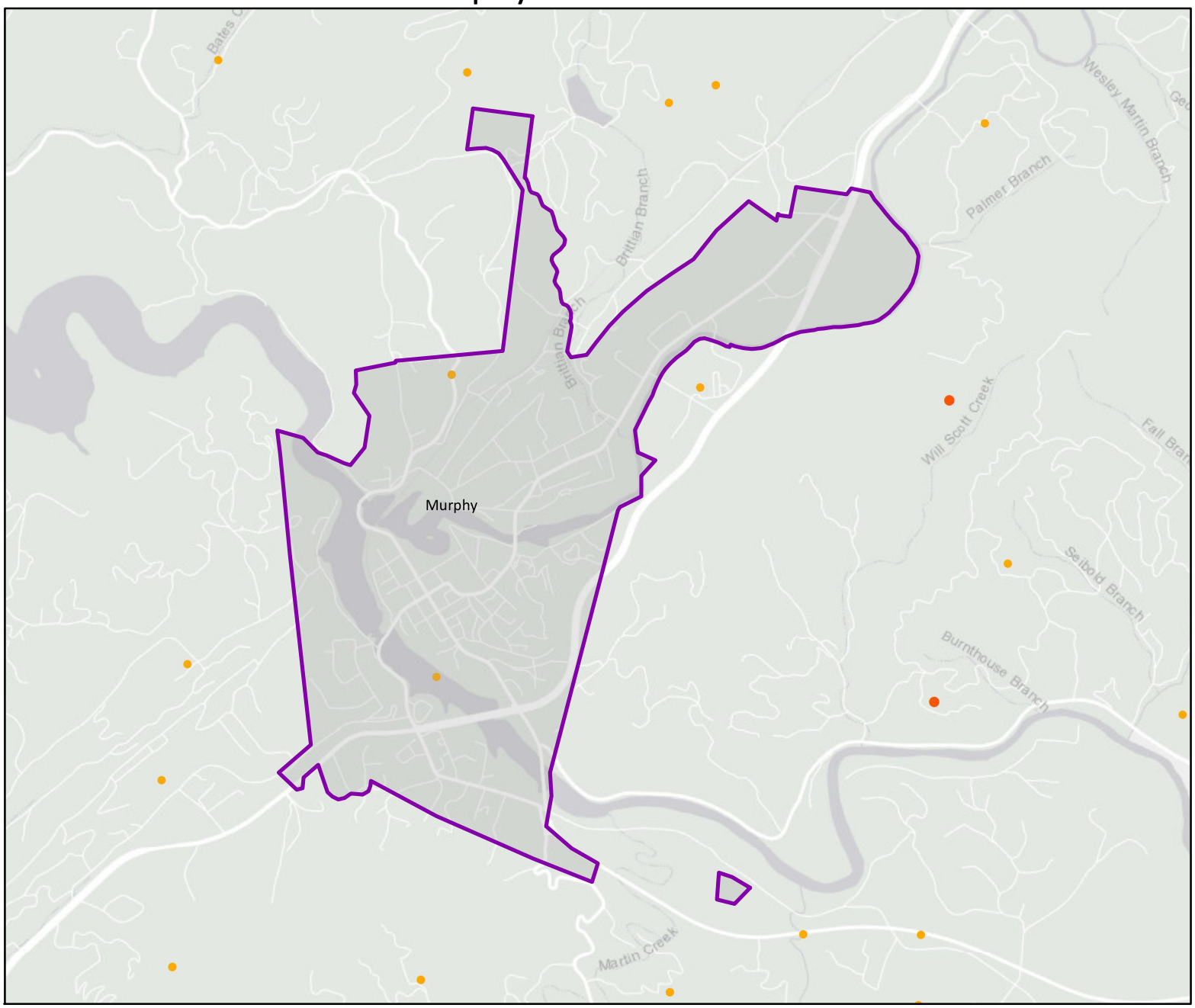
- 1 - 10
- 11 - 50
- 51 - 100
- 101 - 500
- 501 - 1000
- >1000

Data Source:SOUTHERN GROUP OF STATE FORESTERS WILDFIRE RISK ASSESSMENT PORTAL

0 0.275 0.55 1.1 Miles

N

Murphy - Wildfire Events



Municipal Boundary
County Boundary
Eastern Band of Cherokee Indians

Acres Impacted

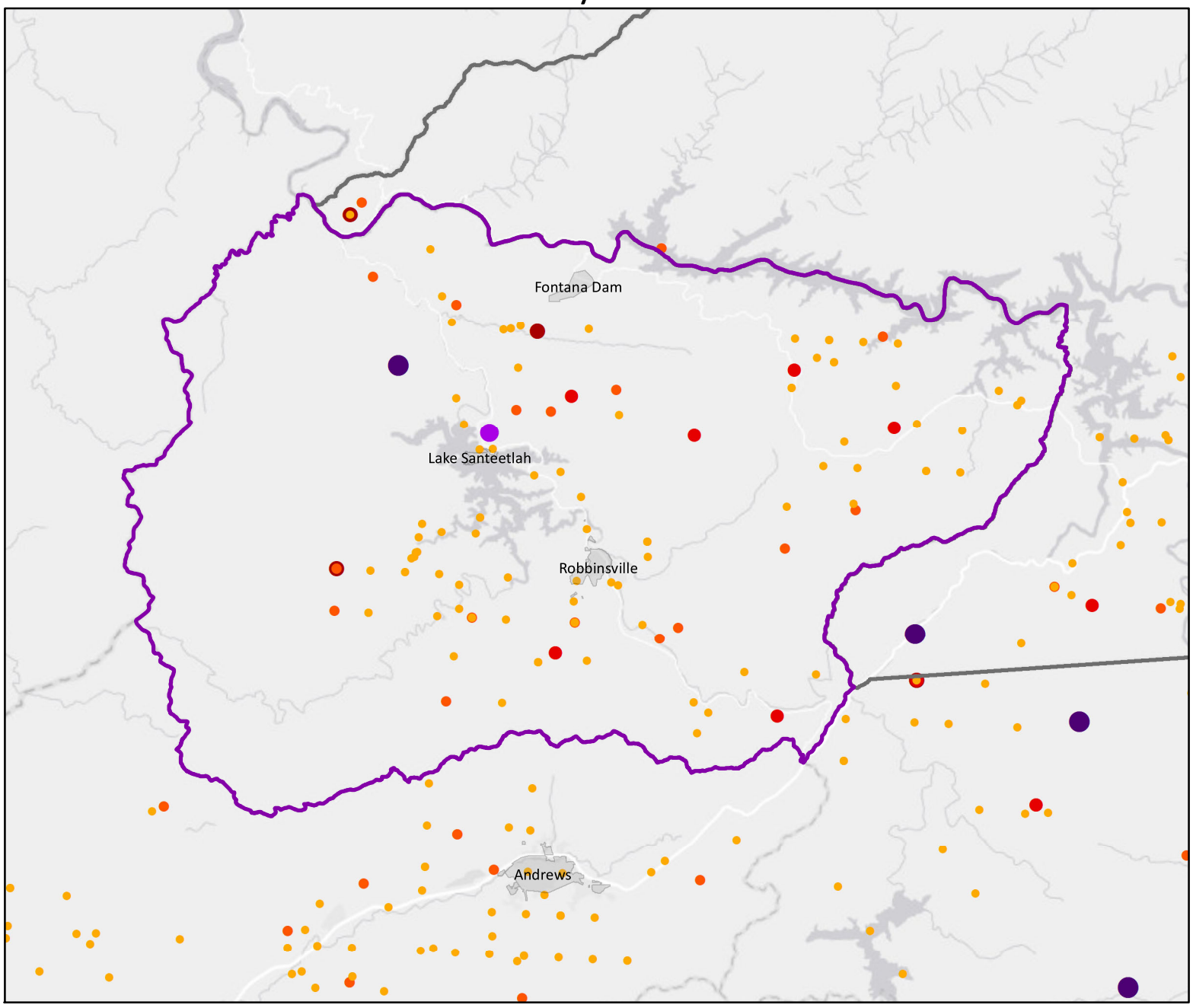
- 1 - 10
- 11 - 50
- 51 - 100
- 101 - 500
- 501 - 1000
- >1000

Data Source:SOUTHERN GROUP OF STATE FORESTERS
WILDFIRE RISK ASSESSMENT PORTAL

0 0.325 0.65 1.3 Miles

N

Graham County - Wildfire Events



Municipal Boundary
County Boundary
Eastern Band of Cherokee Indians

Acres Impacted

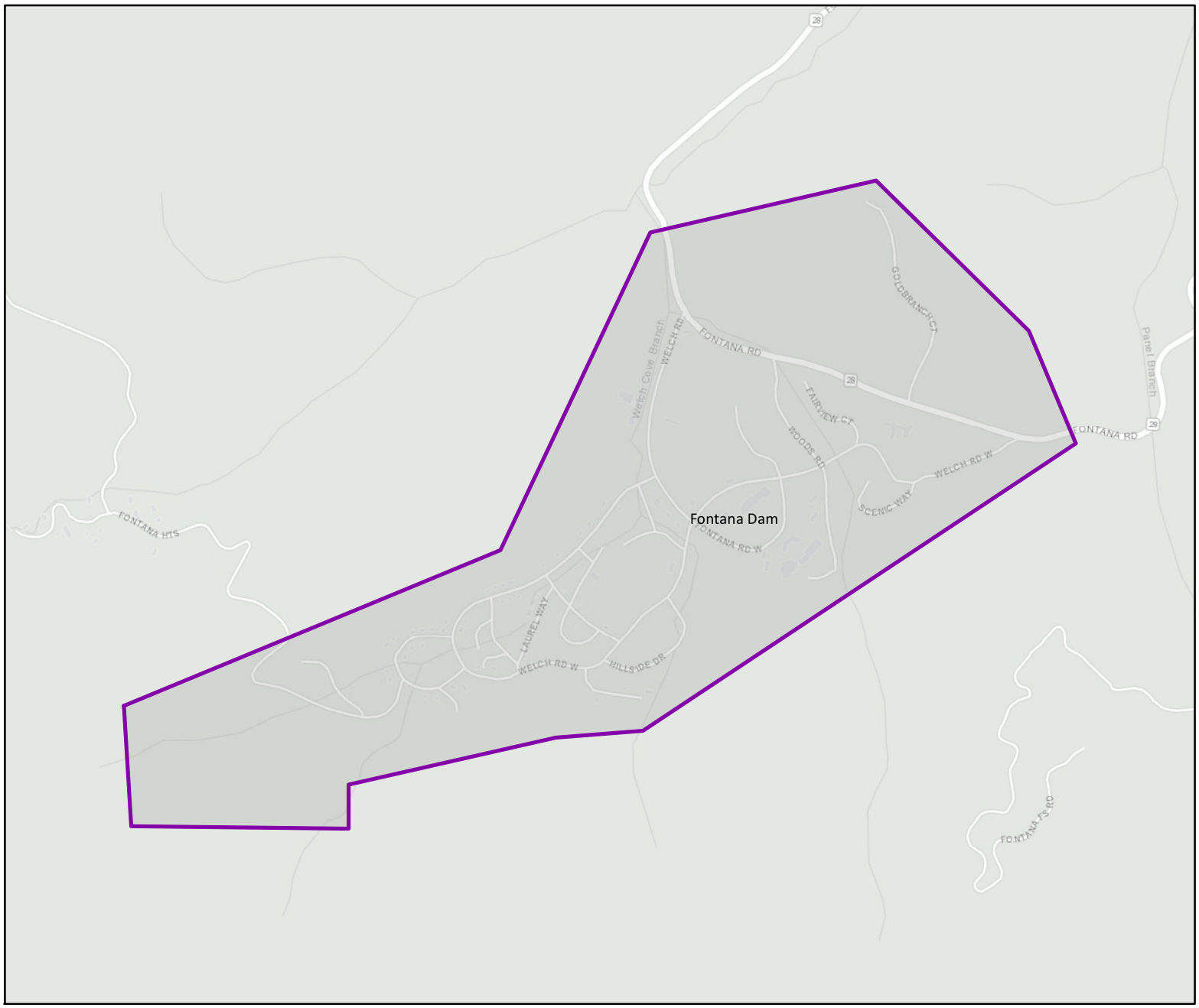
1 - 10	101 - 500
11 - 50	501 - 1000
51 - 100	>1000

Data Source:SOUTHERN GROUP OF STATE FORESTERS
WILDFIRE RISK ASSESSMENT PORTAL

0 2.5 5 10 Miles

N

Fontana Dam - Wildfire Events



Municipal Boundary

County Boundary

Eastern Band of Cherokee Indians

Acres Impacted

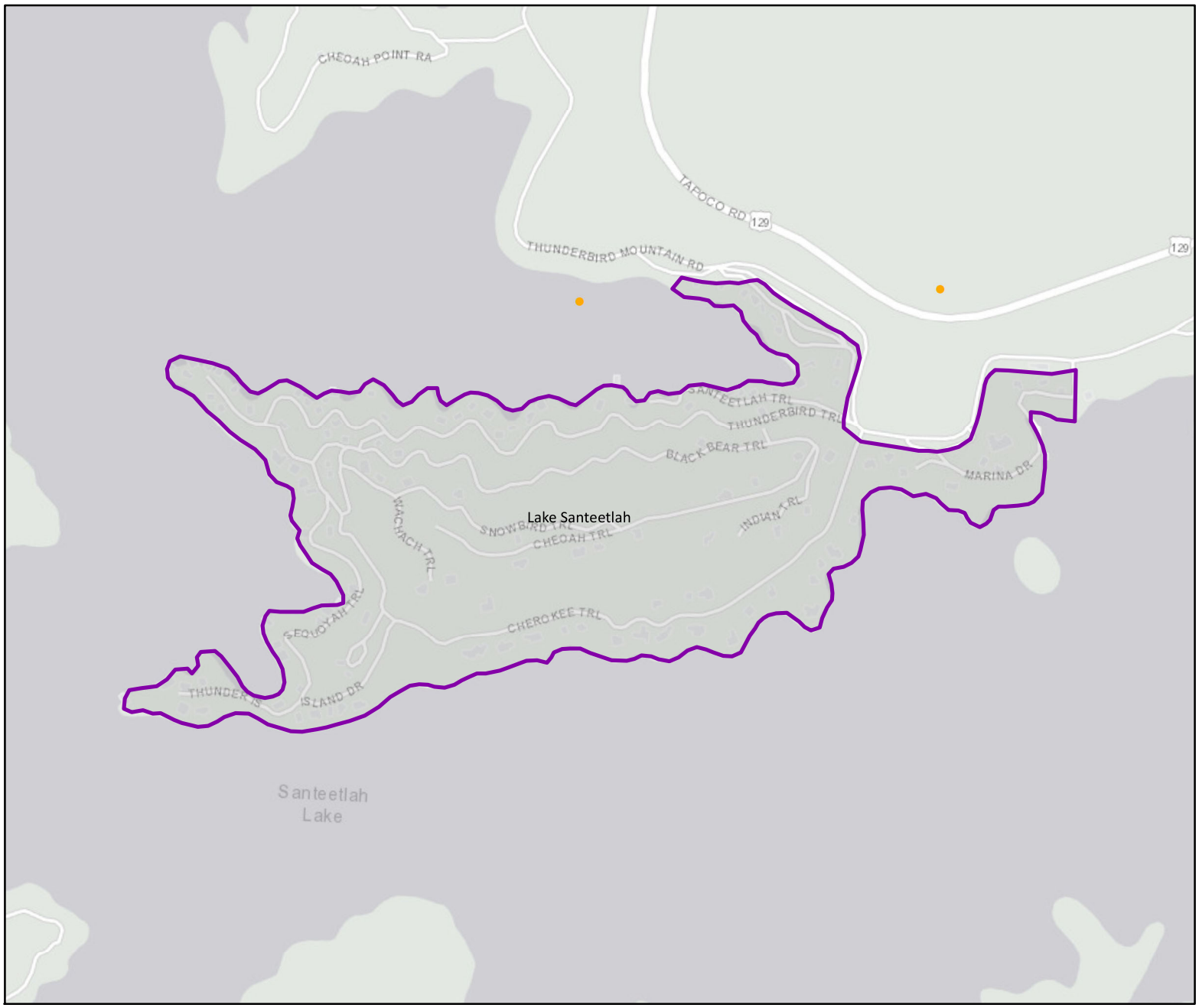
- 1 - 10
- 11 - 50
- 51 - 100
- 101 - 500
- 501 - 1000
- >1000

Data Source:SOUTHERN GROUP OF STATE FORESTERS WILDFIRE RISK ASSESSMENT PORTAL

0 0.1 0.2 0.4 Miles

N

Lake Santeetlah - Wildfire Events



Municipal Boundary

County Boundary

Eastern Band of Cherokee Indians

Acres Impacted

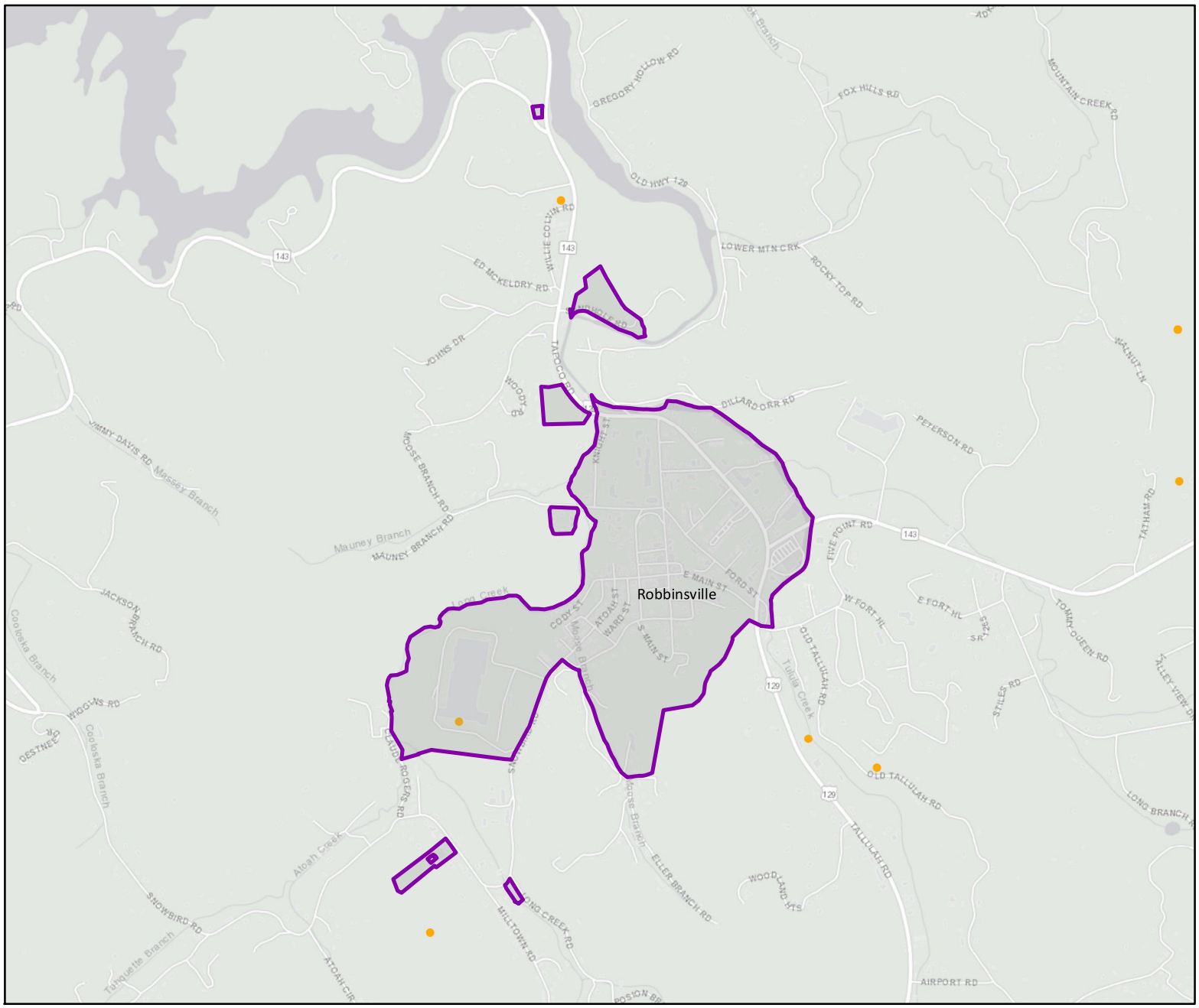
- 1 - 10
- 11 - 50
- 51 - 100
- 101 - 500
- 501 - 1000
- >1000

Data Source:SOUTHERN GROUP OF STATE FORESTERS WILDFIRE RISK ASSESSMENT PORTAL

0 0.075 0.15 0.3 Miles

N

Robbinsville - Wildfire Events



Municipal Boundary

County Boundary

Eastern Band of Cherokee Indians

Acres Impacted

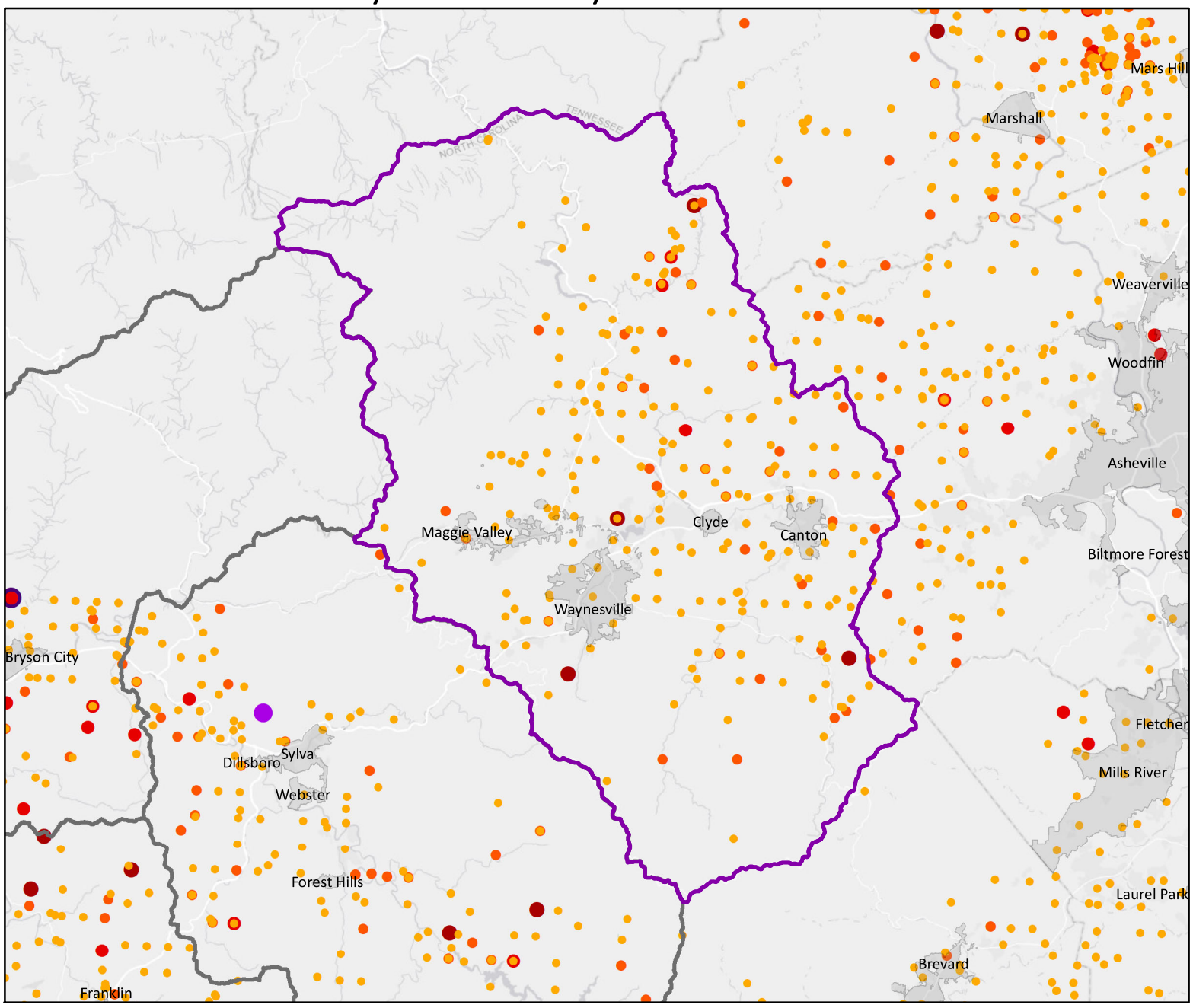
- 1 - 10
- 11 - 50
- 51 - 100
- 101 - 500
- 501 - 1000
- >1000

Data Source:SOUTHERN GROUP OF STATE FORESTERS WILDFIRE RISK ASSESSMENT PORTAL

0 0.225 0.45 0.9 Miles

N

Haywood County - Wildfire Events



Municipal Boundary

County Boundary

Eastern Band of Cherokee Indians

Acres Impacted

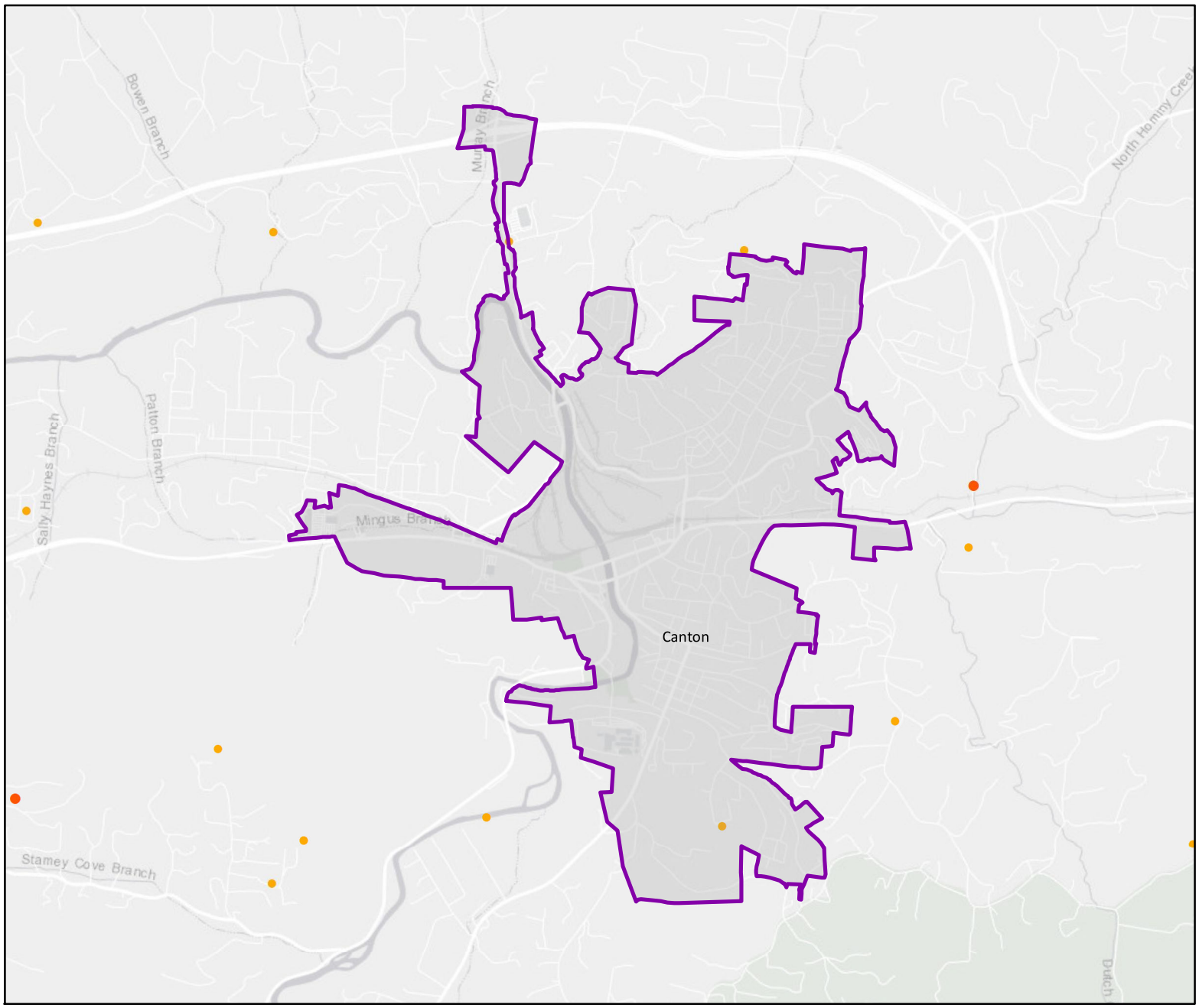
- 1 - 10
- 11 - 50
- 51 - 100
- 101 - 500
- 501 - 1000
- >1000

Data Source:SOUTHERN GROUP OF STATE FORESTERS
WILDFIRE RISK ASSESSMENT PORTAL

0 3.75 7.5 15 Miles

N

Canton - Wildfire Events



Municipal Boundary
County Boundary
Eastern Band of Cherokee Indians

Acres Impacted

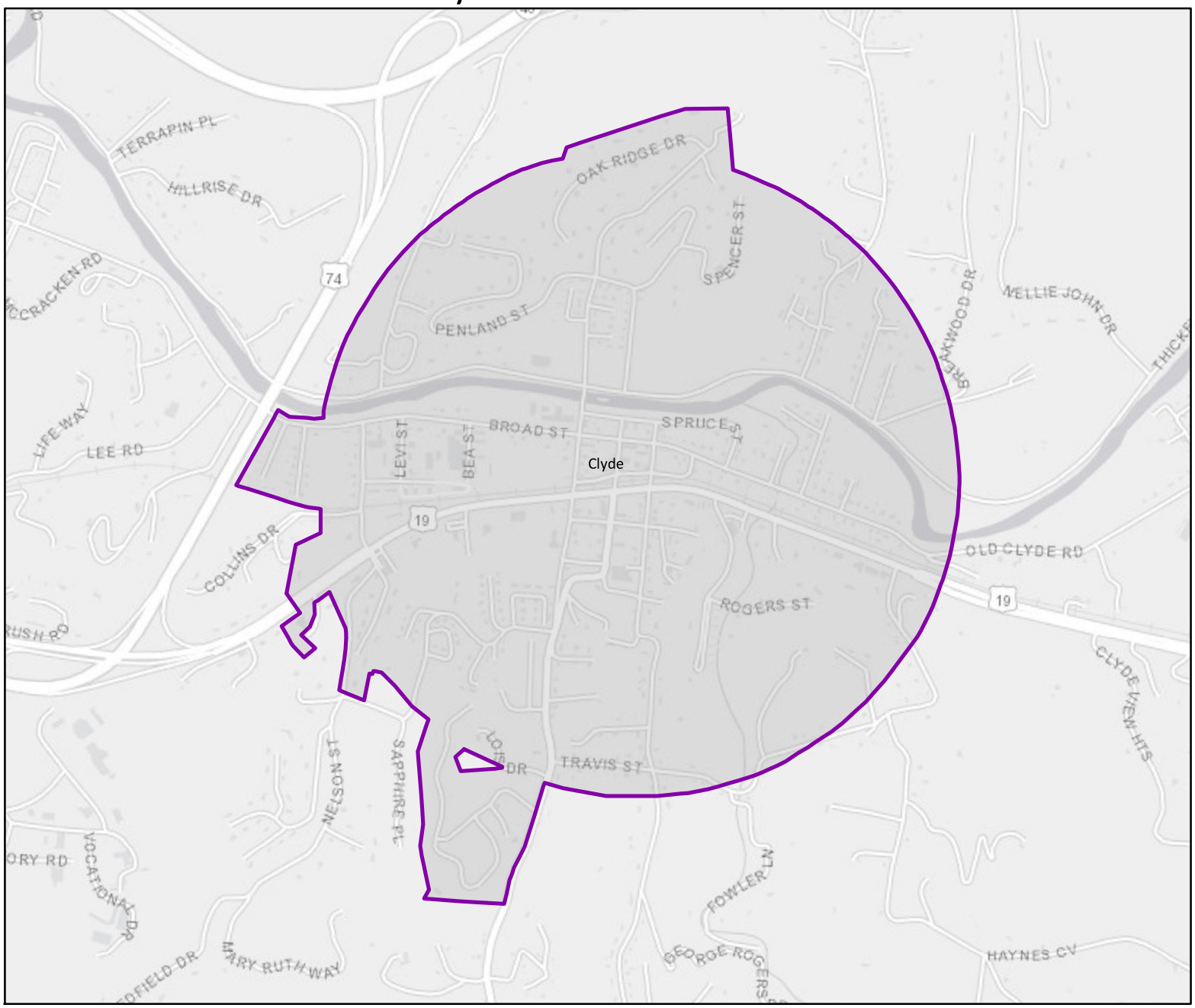
- 1 - 10
- 11 - 50
- 51 - 100
- 101 - 500
- 501 - 1000
- >1000

Data Source:SOUTHERN GROUP OF STATE FORESTERS
WILDFIRE RISK ASSESSMENT PORTAL

0 0.35 0.7 1.4 Miles

N

Clyde - Wildfire Events



Municipal Boundary
County Boundary
Eastern Band of Cherokee Indians

Acres Impacted

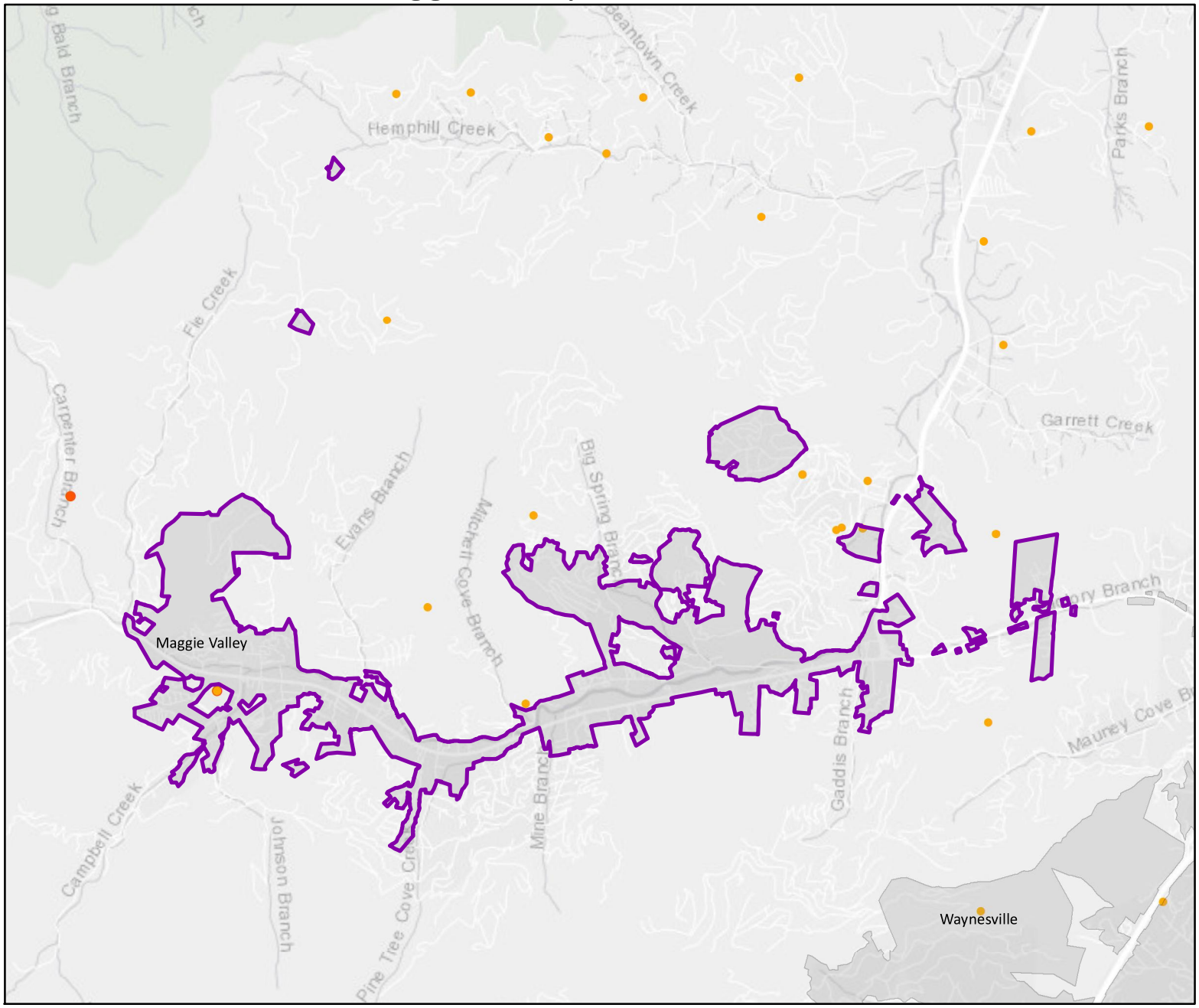
- 1 - 10
- 11 - 50
- 51 - 100
- 101 - 500
- 501 - 1000
- >1000

Data Source:SOUTHERN GROUP OF STATE FORESTERS
WILDFIRE RISK ASSESSMENT PORTAL

0 0.125 0.25 0.5 Miles

N

Maggie Valley - Wildfire Events



Municipal Boundary

County Boundary

Eastern Band of Cherokee Indians

Acres Impacted

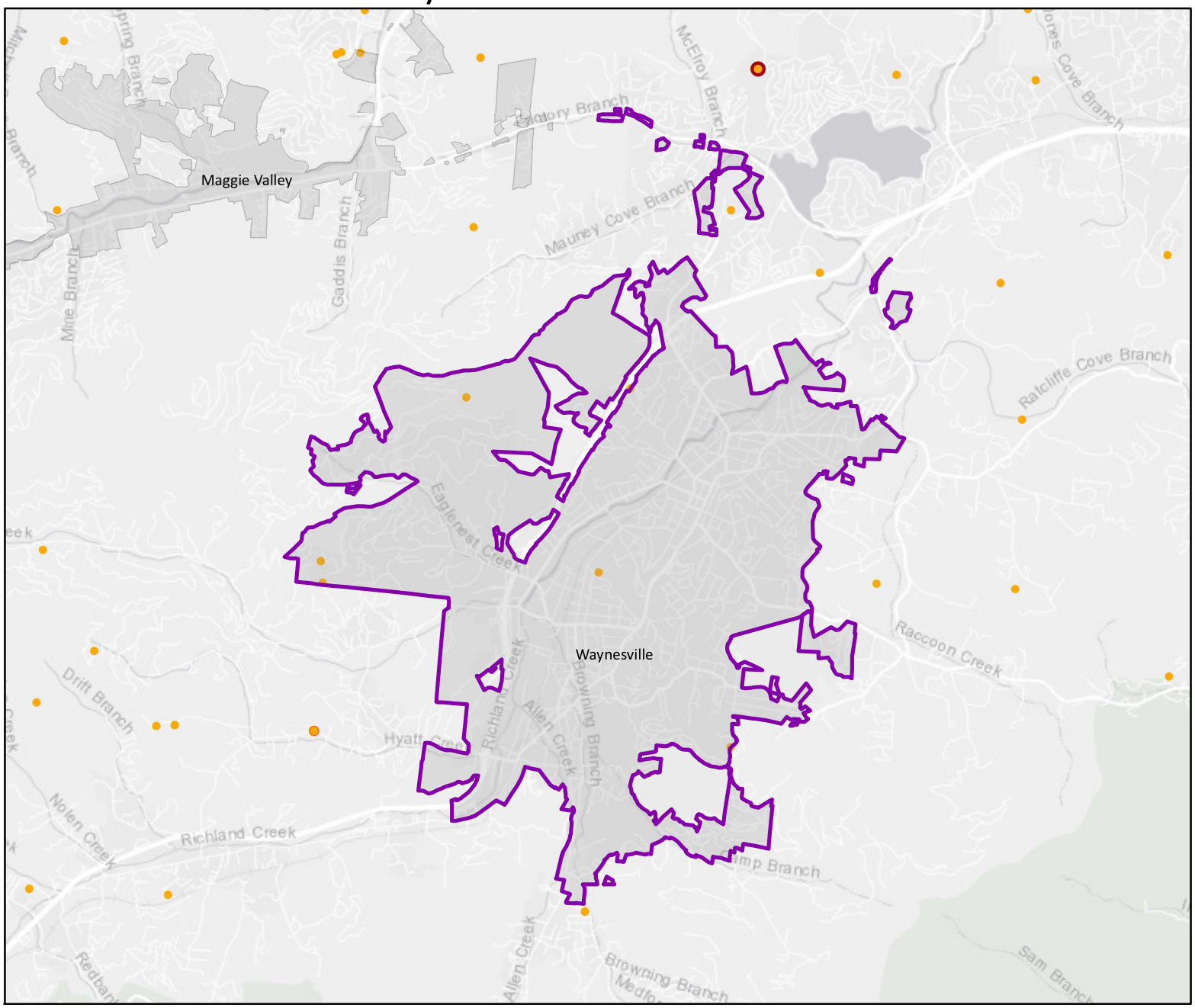
- 1 - 10
- 11 - 50
- 51 - 100
- 101 - 500
- 501 - 1000
- >1000

Data Source:SOUTHERN GROUP OF STATE FORESTERS
WILDFIRE RISK ASSESSMENT PORTAL

0 0.5 1 2 Miles

N

Waynesville - Wildfire Events



Municipal Boundary

County Boundary

Eastern Band of Cherokee Indians

Acres Impacted

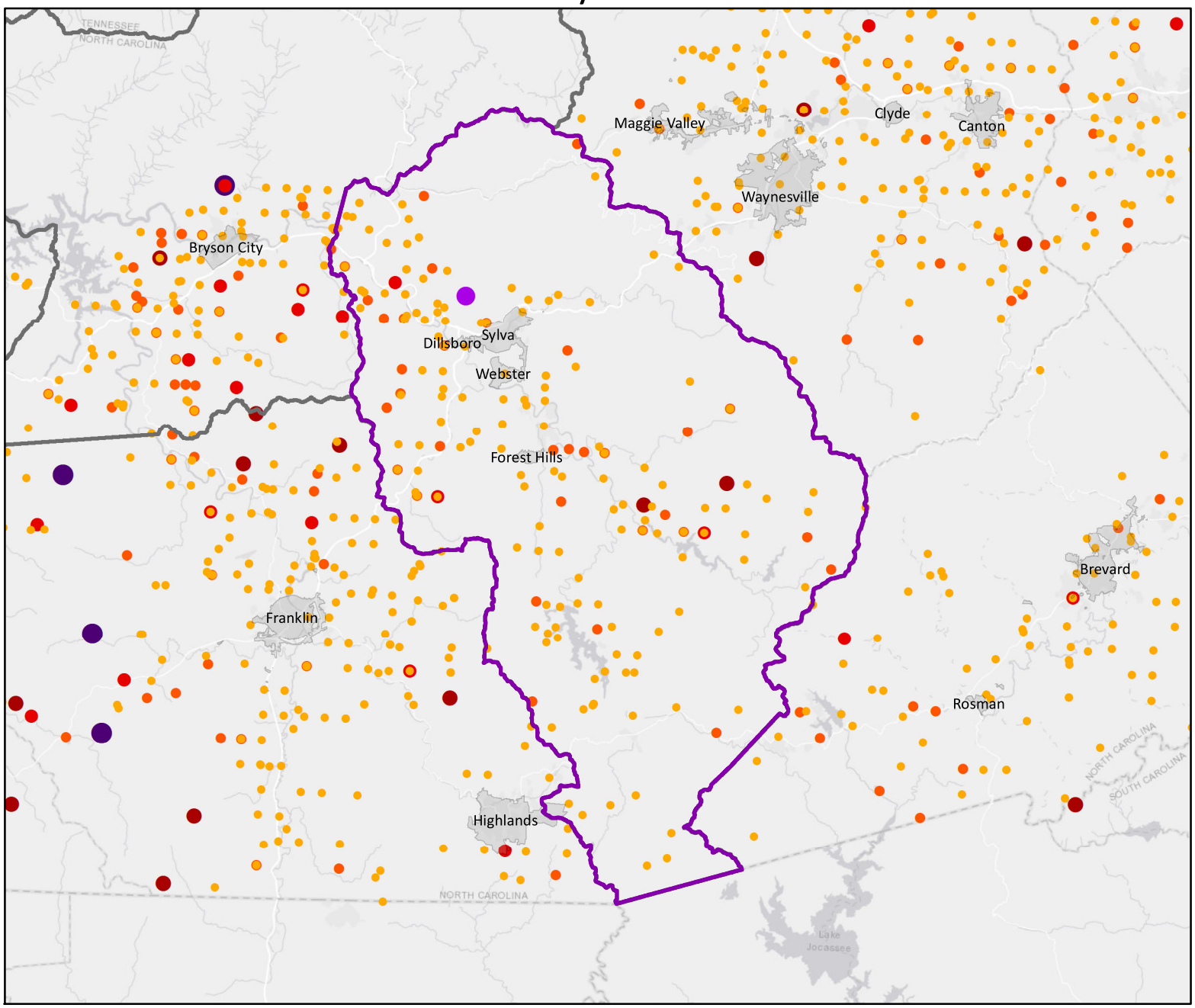
- 1 - 10
- 11 - 50
- 51 - 100
- 101 - 500
- 501 - 1000
- >1000

Data Source:SOUTHERN GROUP OF STATE FORESTERS
WILDFIRE RISK ASSESSMENT PORTAL

0 0.5 1 2 Miles

N

Jackson County - Wildfire Events



Municipal Boundary

County Boundary

Eastern Band of Cherokee Indians

Acres Impacted

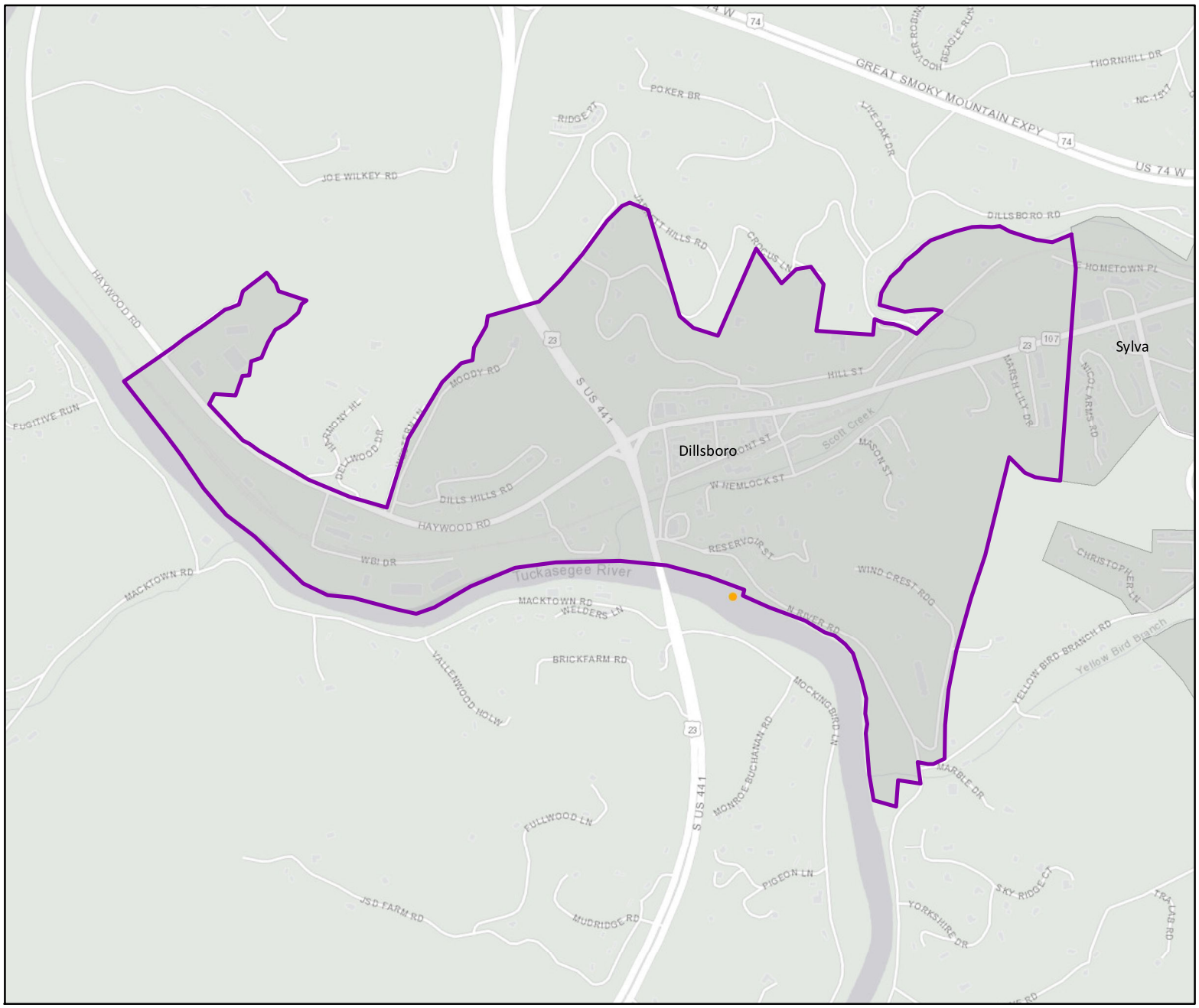
- 1 - 10
- 11 - 50
- 51 - 100
- 101 - 500
- 501 - 1000
- >1000

Data Source:SOUTHERN GROUP OF STATE FORESTERS WILDFIRE RISK ASSESSMENT PORTAL

0 4 8 16 Miles

N

Dillsboro - Wildfire Events



Municipal Boundary

County Boundary

Eastern Band of Cherokee Indians

Acres Impacted

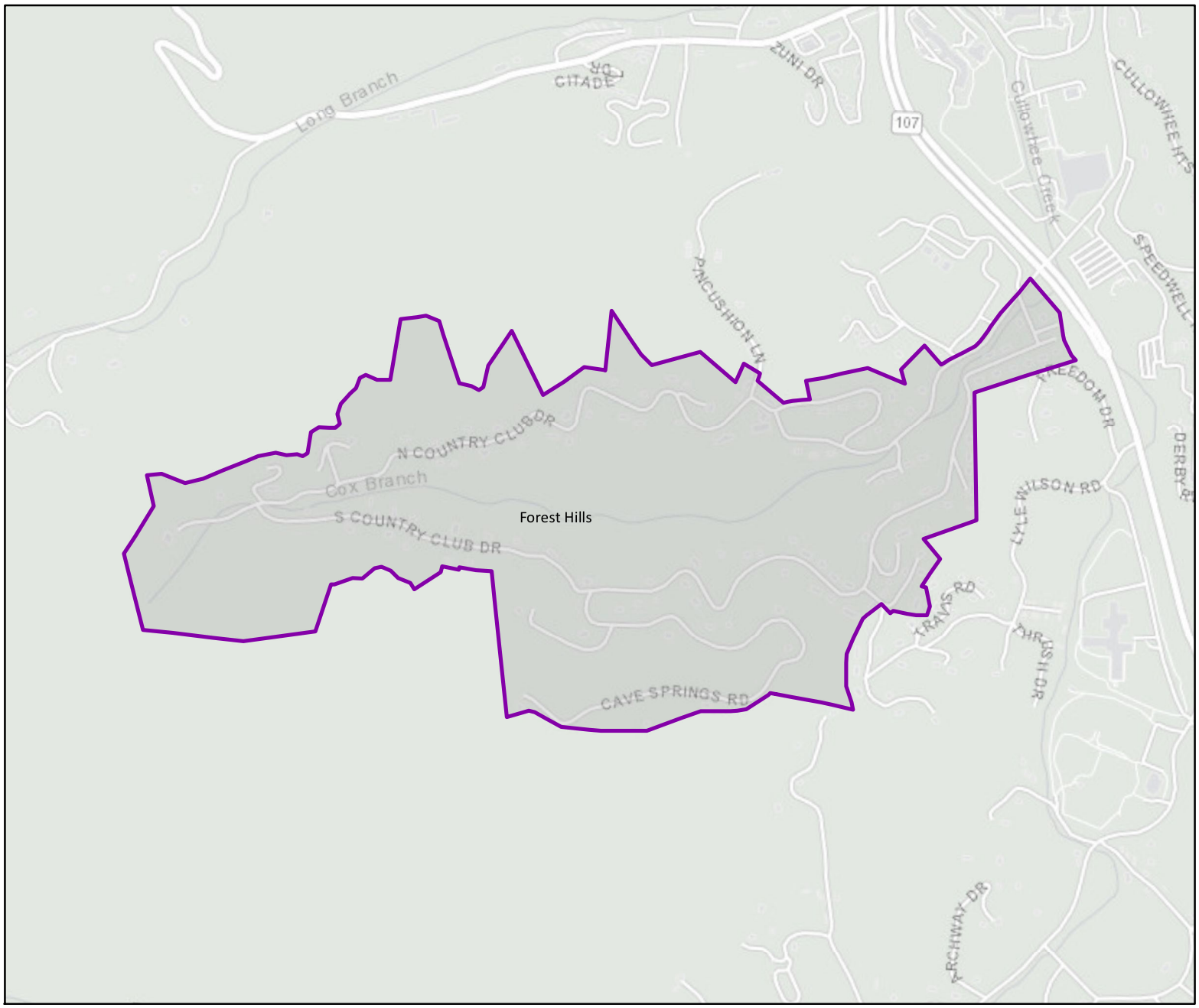
- 1 - 10
- 11 - 50
- 51 - 100
- 101 - 500
- 501 - 1000
- >1000

Data Source:SOUTHERN GROUP OF STATE FORESTERS WILDFIRE RISK ASSESSMENT PORTAL

0 0.1 0.2 0.4 Miles

N

Forest Hills - Wildfire Events



Municipal Boundary

County Boundary

Eastern Band of Cherokee Indians

Acres Impacted

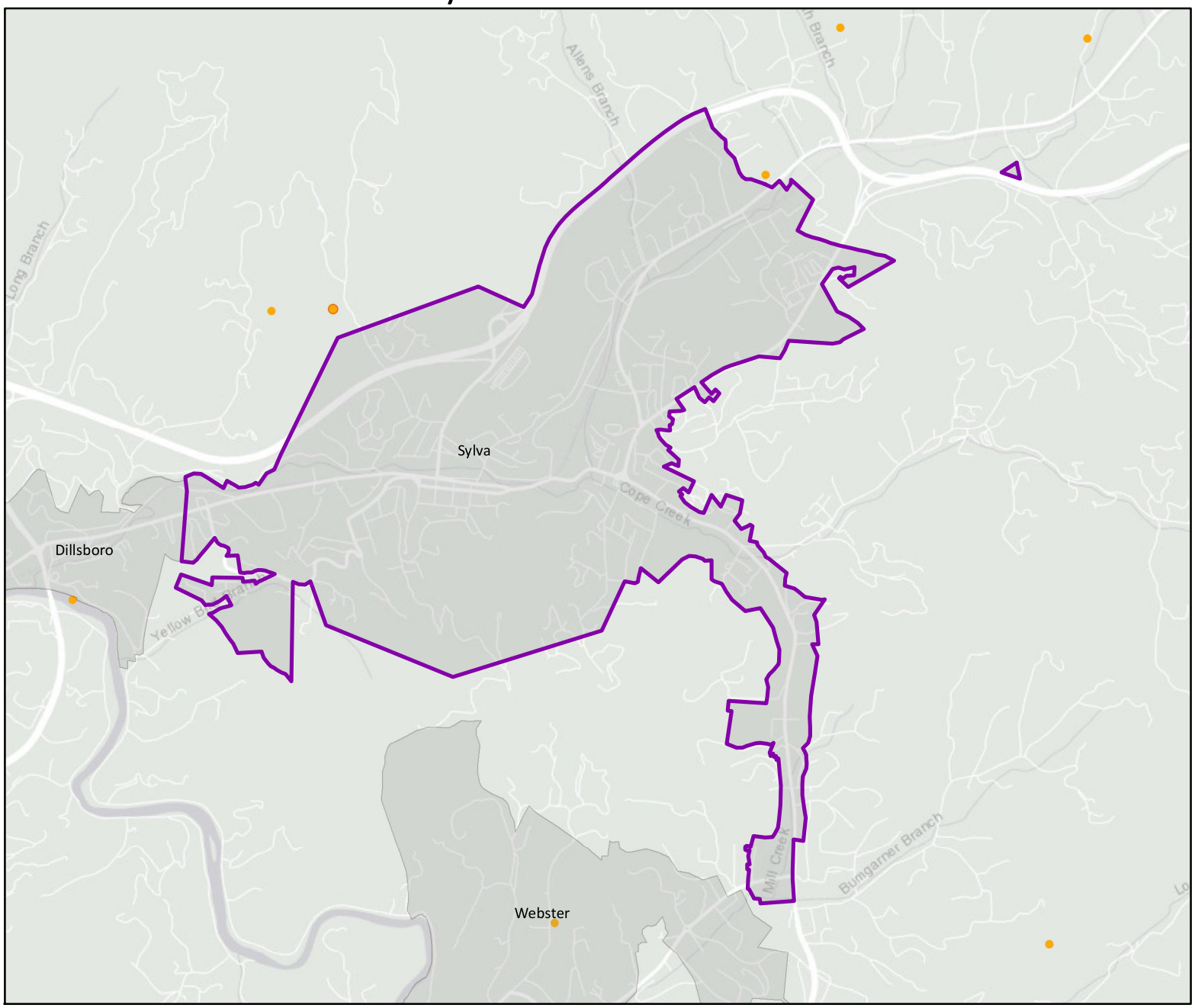
- 1 - 10
- 11 - 50
- 51 - 100
- 101 - 500
- 501 - 1000
- >1000

Data Source:SOUTHERN GROUP OF STATE FORESTERS WILDFIRE RISK ASSESSMENT PORTAL

0 0.125 0.25 0.5 Miles

N

Sylva - Wildfire Events



Municipal Boundary
County Boundary
Eastern Band of Cherokee Indians

Acres Impacted

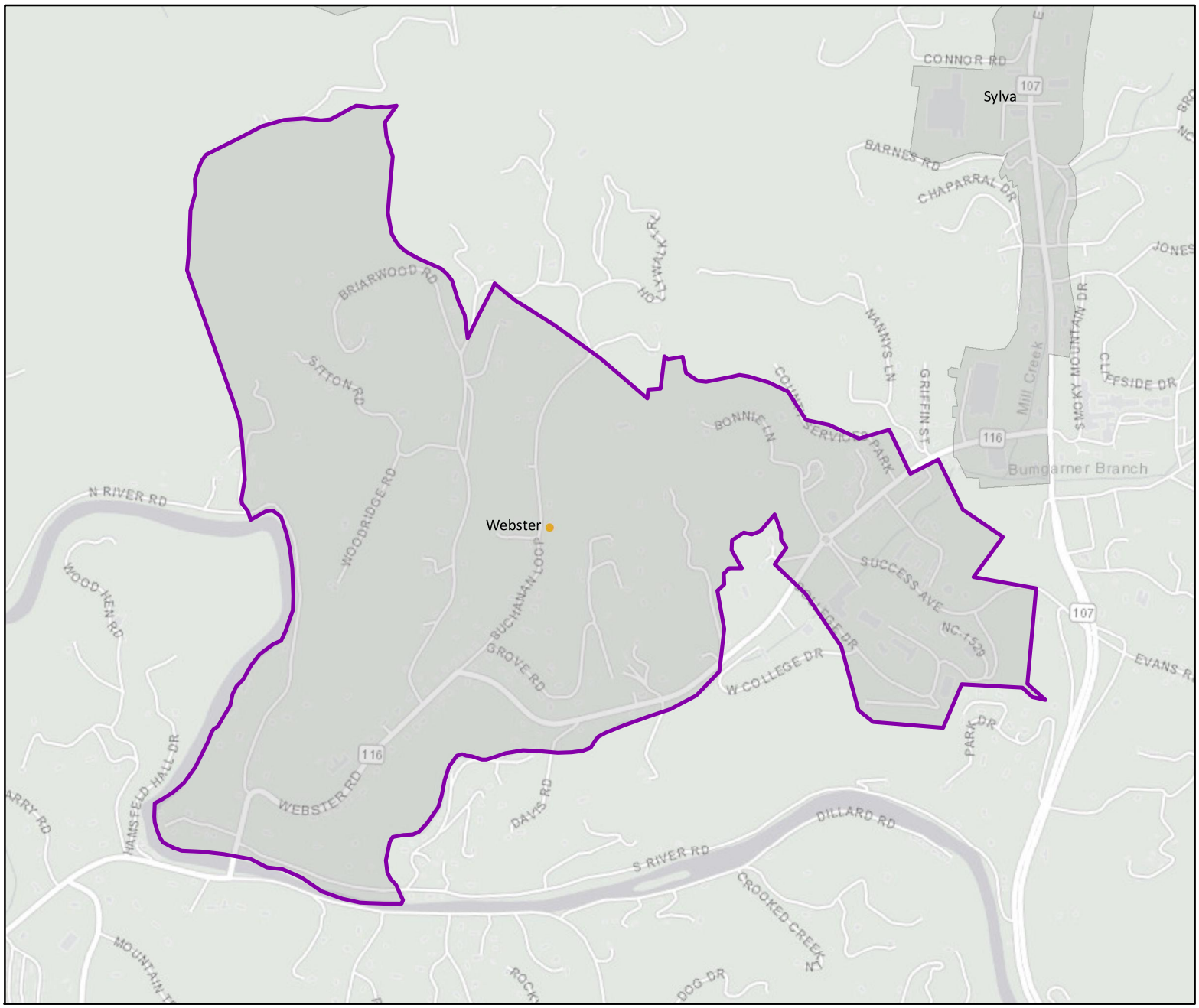
- 1 - 10
- 11 - 50
- 51 - 100
- 101 - 500
- 501 - 1000
- >1000

Data Source:SOUTHERN GROUP OF STATE FORESTERS
WILDFIRE RISK ASSESSMENT PORTAL

0 0.325 0.65 1.3 Miles

N

Webster - Wildfire Events



Municipal Boundary

County Boundary

Eastern Band of Cherokee Indians

Acres Impacted

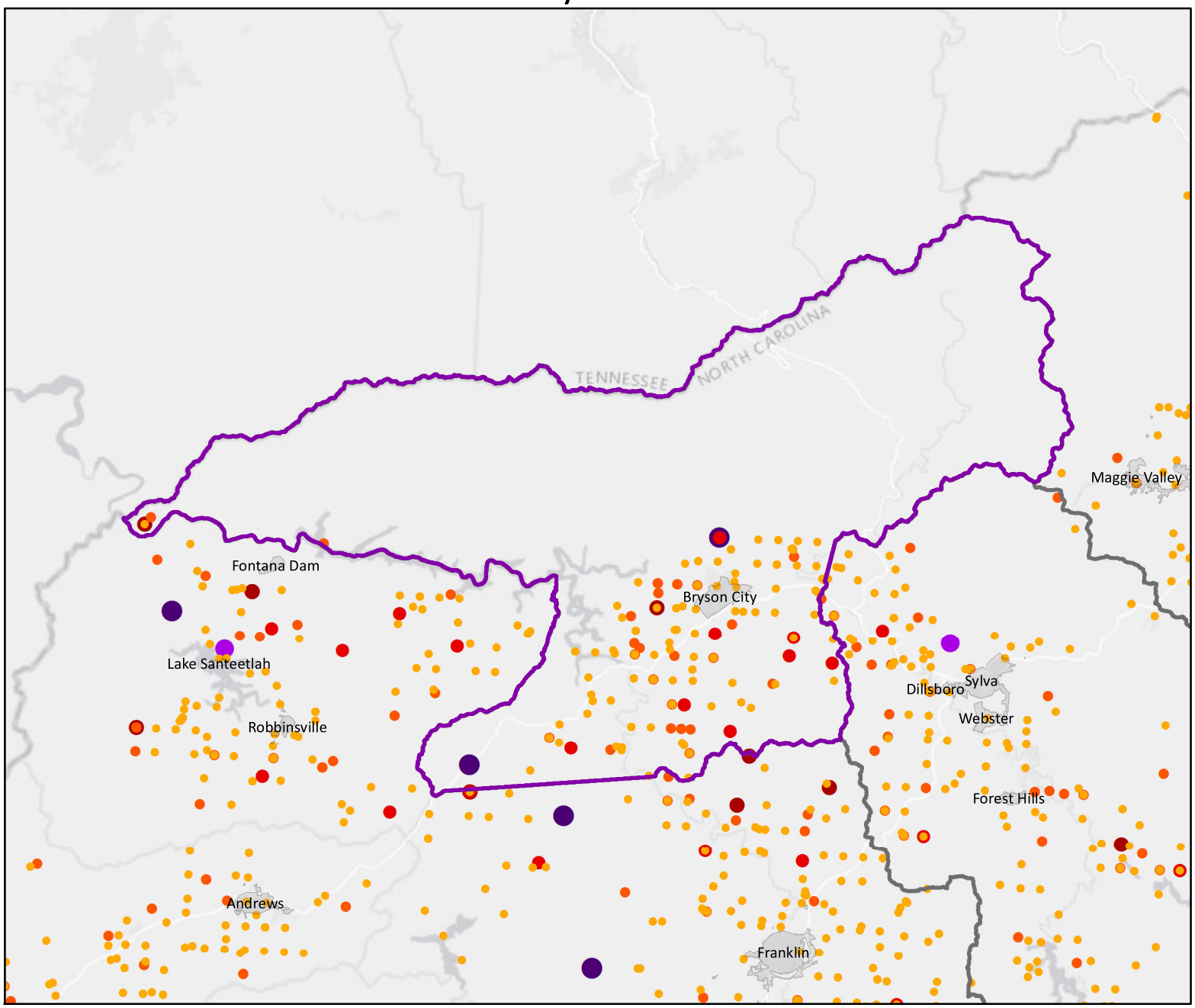
- 1 - 10
- 11 - 50
- 51 - 100
- 101 - 500
- 501 - 1000
- >1000

Data Source:SOUTHERN GROUP OF STATE FORESTERS WILDFIRE RISK ASSESSMENT PORTAL

0 0.15 0.3 0.6 Miles

N

Swain County - Wildfire Events



Municipal Boundary

County Boundary

Eastern Band of Cherokee Indians

Acres Impacted

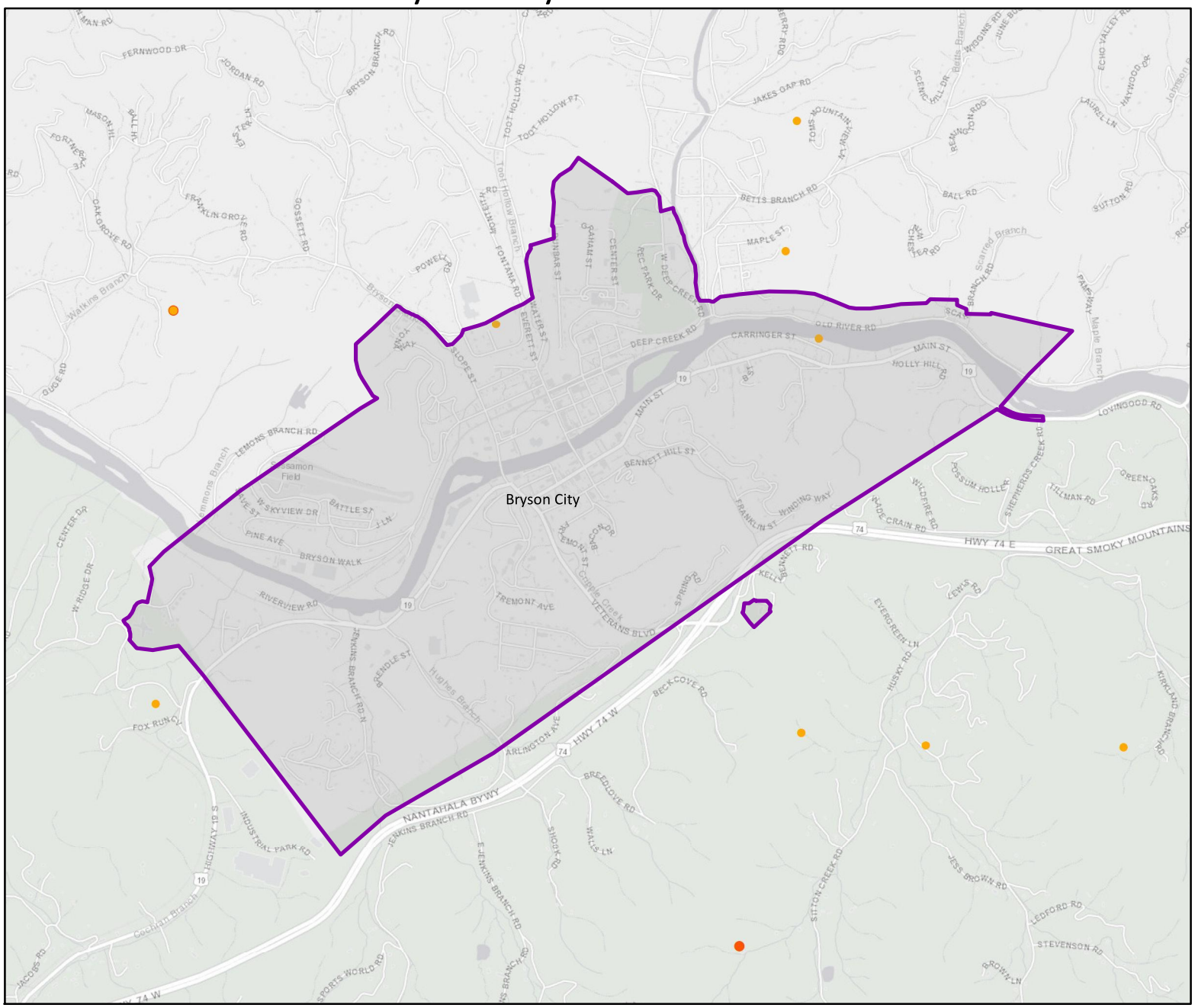
- 1 - 10
- 11 - 50
- 51 - 100
- 101 - 500
- 501 - 1000
- >1000

Data Source:SOUTHERN GROUP OF STATE FORESTERS
WILDFIRE RISK ASSESSMENT PORTAL

0 4.25 8.5 17 Miles

N

Bryson City - Wildfire Events



Municipal Boundary

County Boundary

Eastern Band of Cherokee Indians

Acres Impacted

- 1 - 10
- 11 - 50
- 51 - 100
- 101 - 500
- 501 - 1000
- >1000

Data Source:SOUTHERN GROUP OF STATE FORESTERS WILDFIRE RISK ASSESSMENT PORTAL

0 0.25 0.5 1 Miles

N

Appendix H
NCEI Storm Event Data

This section of the Plan includes the historic storm event data as reported to the National Centers for Environmental Information.

- H.1 – Flood
- H.2 – Hail
- H.3 – Lightning
- H.4 – Thunderstorm Wind
- H.5 – Tornado
- H.6 – Winter Weather

TABLE H.1: FLOOD EVENTS (2000-2021)

Location	Date	Description
Cherokee County		
Murphy	9/21/2009	Very heavy rainfall over several hours produced areal flooding from mid-morning to mid evening in Murphy, North Carolina. A few roads in and around Murphy, North Carolina had several inches to nearly a foot of water over the road. The vast majority of the flooding was along highway 19 in Cherokee county.
Murphy	9/26/2009	Heavy rainfall resulted in area flooding in the Murphy area, with all streams in vicinity out of their banks and several inches of water was reported to be over and flowing across low lying areas along highway 19.
Murphy	1/15/2013	Many roads closed across the county due to flooding.
Murphy	12/2/2015	Several homes had flooded basements along the banks of the Hiwassee and Valley Rivers. Several road closures. One person was evacuated from their home. One business along the Hiwassee River flooded.
Murphy	12/2/2015	Peace Valley KOA Campground near Murphy was evacuated due to flood waters.
Graham County		
	5/5/2003	A prolonged period of heavy rainfall resulted in gradual rises along creeks and streams, which eventually began flooding by the evening of the 5th. By the morning of the 6th, the flooding had become quite serious, with several bridges washed out.
	5/7/2003	Although flash flooding abated by noon across the southern mountains, many creeks and streams remained above flood stage through the afternoon hours.
	7/1/2003	Persistent moderate to heavy rainfall resulted in rock and mud slides across much of the county.
	9/16/2004	In response to persistent moderate to heavy rainfall associated with the remnants of Hurricane Ivan, severe flooding developed across the mountains for the second time in 9 days. Flooding first developed across the southwest mountains, when several small streams and creeks overflowed their banks, including Toot Hollow Creek near Bryson City. Several rescues were required during the evening in Macon County, as creeks and streams began to threaten homes. Overnight, flooding became more widespread, with Macon County enduring the worst of it. The Little Tennessee River overflowed its banks during the early morning of the 17th, and continued to flood through much of the day. The river flooded an industrial park in Macon County, causing extensive damage. In Swain County, 500,000 gallons of raw sewage and numerous natural gas tanks were swept down the river. Hundreds of structures were damaged or destroyed, and several private bridges were swept away. Portions of highways 105, 64, and 28 were all closed in Macon County, some due to major damage that was estimated to take several months to repair. In addition, a trout farm lost 60,000 pounds of fish.
	11/24/2004	Several mud slides partially or completely closed several roads in the northeast part of the county, including highway 28. Also, Corn Field Branch flooded, closing the Snowbird Recreation Area.
Haywood County		
	5/6/2003	Heavy rainfall resulted in gradual rises on creeks and streams, which began to flood during the early morning hours of the 6th. The most significant flooding occurred along Jonathan Creek. Some rock slides also occurred.
Clyde	11/19/2003	The Pigeon River flooded some property around Clyde.

Location	Date	Description
Clyde, Canton	9/7/2004	The remnants of Hurricane Frances brought very heavy rainfall to western North Carolina on the 7th and 8th, resulting in widespread severe flooding across the mountains and foothills. Flooding first developed in Transylvania County, as the Little River overflowed its banks during the afternoon. Shortly thereafter, flooding developed along Shaws Creek in Henderson County, and in the Cruso community of Haywood County. As moderate to heavy rainfall continued into the evening hours, flooding gradually worsened and expanded across the area. By the early morning hours of the 8th, flooding was widespread and severe across much of the area, with most creeks and streams in flood. Major flooding developed along the French Broad River, which reached a near-record stage of 25 feet at Blantyre, and 21 feet in Canton. In Haywood County, flooding along the Pigeon River was described as the worst in over 60 years. Hundreds of homes and businesses were damaged or destroyed across the area, necessitating a number of evacuations and rescues. Clyde and Canton endured the brunt of this damage. Numerous roads and bridges were washed out as well.
Canton	9/16/2004	After an extended period of moderate to heavy rainfall, flooding developed first across the western part of the county, when several secondary roads became covered with water. During the overnight hours, flooding overspread the county, affecting most valley communities, which endured the second devastating flood event in just 9 days. Severe flooding developed first along Allens and Hyatt Creeks, followed by another round of severe flooding along the Pigeon River, which reached a record of 23 feet in Canton. A 69-year-old woman died when she attempted to drive her vehicle through the flooded river in Canton. A 27-year-old woman and her 4-year-old son were also killed during the evening of the 18th, when the woman attempted to drive her SUV through the flooded Pigeon River which was flowing over a Forest Service road off of I-40. Numerous businesses and hundreds of homes were damaged or destroyed by flood water or landslides. The river washed out a large portion of interstate 40 near the Tennessee border. Numerous other roads and highways were damaged in places, including highways 209, 215, 19, and 276.
Maggie Valley	1/15/2013	Prolonged moderate to heavy rain caused Richland Creek to leave its banks and flood some local roads in the Waynesville area, including Water Street off of Dellwood Road. Water was up to the foundations of a couple buildings at this location. The creek also flooded the Frisbee golf course at the Waynesville Recreation Center. Tri Lakes Drive was flooded by Jonathan Creek near Maggie Valley. A couple small mudslides were also reported in the Maggie Valley area.
Jackson County		
Sylva	9/21/2009	Settlement Rd was flooded in Webster and Dillard Rd was closed due to flooding in Sylva. Also, Roy Tritt Rd was reported to be under water and closed two miles southeast of Cullowhee as was Helen Zachary Rd.
	1/15/2013	Old Number 4 Road was flooded in the extreme northern part of Jackson County.
Sylva	1/15/2013	Scott Creek left its banks and flooded areas around Sylva, including the bridge over Helmock Street on the east side of town. A couple private bridges were also flooded by the creek near Sylva. The Tuckasegee River flooded a low spot along Mockingbird Lane.
	12/29/2015	After more than 3 inches of rain fell over just a few hours in the headwaters of the Tuckasegee basin, Emergency manager reported flooding developed along the West Fork of the river during the early morning hours. Several trailers were inundated with water from the stream near the intersection of Highway 107 and Fred Smith Rd. Multiple evacuations became necessary near this location.

Location	Date	Description
	2/6/2020	Although heavy rain tapered off across Jackson County during the afternoon and evening, county comms reported multiple roads remained flooded and closed for several hours after the rain ended.
	5/6/2003	An extended period of heavy rainfall resulted in gradual rises, mainly along small creeks and streams. Flooding developed during the early morning hours of the 6th across southern and western portions of the counties.
	5/7/2003	Although flash flooding abated by noon across the southern mountains, many creeks and streams remained above flood stage through the afternoon hours.
	9/7/2004	Flooding developed in the early evening in areas near the Blue Ridge, from Highlands to Cashiers, then quickly spread to include locations such as Cullowhee, Bryson City, and Cherokee. Jackson and southern Macon counties were the hardest hit, as numerous creeks and streams flooded, including the Little Tennessee River. Several homes and businesses were damaged and a few private dams were breached or damaged in Macon County. Several sections of highway 281 were washed out in Jackson County. By early morning of the 8th, flood gates were open on all Jackson County dams, and numerous rescues and evacuations were underway.
	9/16/2004	After an extended period of moderate to heavy rainfall, flooding began in Jackson County during the late evening. Cope Creek was the first stream to flood, and evacuations became necessary along the creek. Evacuations also occurred along the Tuckasegee River, as flooding became quite severe overnight, exceeding the magnitude of the flood associated with Frances only 9 days earlier. Severe flooding also occurred along Scotts Creek, Caney Fork, and Cullowhee Creek. Scotts Creek covered Front Street in Dillsboro with 3 to 4 feet of water. Several landslides occurred, one of which destroyed several storage units at Lake Glenville. Large sections of some roads were washed out by slides or flood water, including portions of highways 19A, 281, 64, and 107, all of which were closed for long periods.
	6/12/2005	
	5/6/2003	An extended period of heavy rainfall resulted in gradual rises, mainly along small creeks and streams. Flooding developed during the early morning hours of the 6th across southern and western portions of the counties.
	5/7/2003	Although flash flooding abated by noon across the southern mountains, many creeks and streams remained above flood stage through the afternoon hours.
	11/19/2003	A creek in Cashiers overflowed its banks and covered an adjacent road with 2 to 3 feet of water.
	9/7/2004	Flooding developed in the early evening in areas near the Blue Ridge, from Highlands to Cashiers, then quickly spread to include locations such as Cullowhee, Bryson City, and Cherokee. Jackson and southern Macon counties were the hardest hit, as numerous creeks and streams flooded, including the Little Tennessee River. Several homes and businesses were damaged and a few private dams were breached or damaged in Macon County. Several sections of highway 281 were washed out in Jackson County. By early morning of the 8th, flood gates were open on all Jackson County dams, and numerous rescues and evacuations were underway.
	9/16/2004	After an extended period of moderate to heavy rainfall, flooding began in Jackson County during the late evening. Cope Creek was the first stream to flood, and evacuations became necessary along the creek. Evacuations also occurred along the Tuckasegee River, as flooding became quite severe overnight, exceeding the magnitude of the flood associated with Frances only 9 days earlier. Severe flooding also occurred along Scotts Creek, Caney Fork, and Cullowhee Creek. Scotts Creek

Location	Date	Description
		covered Front Street in Dillsboro with 3 to 4 feet of water. Several landslides occurred, one of which destroyed several storage units at Lake Glenville. Large sections of some roads were washed out by slides or flood water, including portions of highways 19A, 281, 64, and 107, all of which were closed for long periods.
	6/12/2005	Persistent, widespread heavy rain showers associated with moisture from tropical storm Arlene resulted in flooding across the southern mountains. County reported the Tuckasegee was out of its banks in several locations, with several roads closed, including Shook Cove Rd, Dillard Rd, and North & South River Rd. As water was released from various dams along the river, the flooding persisted well after heavy rain ended across the area.
Swain County		
	5/5/2003	A prolonged period of heavy rainfall resulted in gradual rises along creeks and streams, and flooding eventually developed during the early morning hours of the 6th. The Little Tennessee River was the first major stream to overflow its banks, which caused some flooding of adjacent roadways. Meanwhile, the Tuckaseegee and Oconaluftee Rivers and many other small tributaries began to flood during the pre-dawn hours.
	5/7/2003	Although flash flooding abated by noon across the southern mountains, many creeks and streams remained above flood stage through the afternoon hours.
Bryson City	11/19/2003	River Road flooded in Bryson City. The Little Tennessee overflowed its banks and flooded a portion of highway 28 near Needmore at the Macon County line. The Tuckasegee also flooded in spots in and around Bryson City.
Bryson City	9/7/2004	Flooding developed in the early evening in areas near the Blue Ridge, from Highlands to Cashiers, then quickly spread to include locations such as Cullowhee, Bryson City, and Cherokee. Jackson and southern Macon counties were the hardest hit, as numerous creeks and streams flooded, including the Little Tennessee River. Several homes and businesses were damaged and a few private dams were breached or damaged in Macon County. Several sections of highway 281 were washed out in Jackson County. By early morning of the 8th, flood gates were open on all Jackson County dams, and numerous rescues and evacuations were underway.
Byson City	9/16/2004	In response to persistent moderate to heavy rainfall associated with the remnants of Hurricane Ivan, severe flooding developed across the mountains for the second time in 9 days. Flooding first developed across the southwest mountains, when several small streams and creeks overflowed their banks, including Toot Hollow Creek near Bryson City. Several rescues were required during the evening in Macon County, as creeks and streams began to threaten homes. Overnight, flooding became more widespread, with Macon County enduring the worst of it. The Little Tennessee River overflowed its banks during the early morning of the 17th, and continued to flood through much of the day. The river flooded an industrial park in Macon County, causing extensive damage. In Swain County, 500,000 gallons of raw sewage and numerous natural gas tanks were swept down the river. Hundreds of structures were damaged or destroyed, and several private bridges were swept away. Portions of highways 105, 64, and 28 were all closed in Macon County, some due to major damage that was estimated to take several months to repair. In addition, a trout farm lost 60,000 pounds of fish.
	11/11/2009	Although heavy rain began to taper off during the pre-dawn hours, flooding persisted into the early afternoon in response to runoff from 3 to 4 inches of storm total rainfall.

Location	Date	Description
	12/9/2009	Several trailers were flooded along the Oconoluftee River just off highway 441 in Cherokee.
Bryson City	12/9/2009	The stream gauge on the Tuckasegee River at Bryson City briefly went above the established flood stage.
Bryson City	1/15/2013	The Tuckasegee River flooded Bear Hunter Campground in Bryson City. The trailers of several year-round residents of the campground had to be moved to higher ground. A motorist had to abandon their car after they drove into flood waters on Old River Road. East Deep Creek Circle and Island Street were also flooded by the river.
	1/15/2013	Flooded locations in and near the Cherokee Indian reservation included the Parkwary entrance (US-441), the Saunooke Bridge, which connects Big Cove Road to Newfound Gap Road, Meetinghouse Road and Whitewater Drive. Big Cove Road was also flooded in the Piney Grove area along Rabun Fork. Mt. Noble Road was damaged by mudslide. Oconaluftee Island Park was flooded for a while by the Oconaluftee River in Cherokee, though damage to the park was minimal. Several roads were damaged by flash flooding and landslides, resulting in a federal disaster declaration.
	1/17/2013	The Little Tennessee River flooded Needmore Rd in spots near the Macon County line. The road was closed for several hours.
	12/24/2015	After as much as 4 inches of rain fell in about 36 hours across southern Swain County, a stream gauge on the Little Tennessee near Needmore exceeded its established flood stage, indicating flooding of multiple side roads across the southern part of the county, including Needmore Rd near the Franklin County border.

TABLE H.2: HAIL EVENTS (2000-2021)

Location	Date	Size (in)	Description
Cherokee County			
	6/25/2001	0.75	Near Appalachia Lake.
	4/28/2002	1	Dime to quarter size hail reported near Marble.
	4/28/2002	1.75	Golf ball size hail reported near Peachtree.
	5/2/2002	1.75	Golf ball size hail reported at Hiwassee Dam.
	6/4/2002	0.88	Nickel sized hail reported near Marble.
Andrews	7/22/2002	0.75	Dime size hail was reported in and around Andrews.
Murphy	4/30/2003	0.75	3/4-inch hail reported by dispatch.
Murphy	6/6/2005	1.75	Golf ball-size hail reported in Murphy, by the public.
Murphy	4/19/2006	0.88	Nickel-size hail at Hanging Dog.
	4/21/2006	1.25	Half dollar-size hail near Marble.
Andrews	5/20/2006	0.75	Penny size hail was reported at Andrews.
Andrews	5/20/2006	1	Quarter size hail was reported at Andrews.
	5/20/2006	0.88	Nickel size hail was reported at Hiwassee Dam.
Murphy	5/21/2006	0.75	Penny size hail was reported three miles north of Murphy.
	5/20/2008	0.75	Penny to dime sized hail was reported in Andrews.
	8/2/2008	1	Dispatch reported quarter-size hail fell in Wolf Creek.
Murphy	3/28/2010	1.25	Half dollar hail was reported.
Murphy	3/28/2010	1.25	Half dollar size hail was reported.
	3/31/2012	1	Quarter sized hail fell in the Nantahala National Forest near Persimmon Lake four miles west of Murphy.
Murphy	4/26/2012	1	An individual from the public reported thunderstorms produced quarter-size hail in Murphy.
	3/17/2018	1	Quarter size hail was reported at Dickey Road in Murphy.
Graham County			
Robbinsville	6/14/2001	0.75	Spotter reported dime-sized hail near the Tennessee border.
	7/8/2001	0.75	Dime-sized hail fell at Stecoah. This storm was not related to the squall line that passed through hours earlier, but was associated with a secondary cluster of convection that moved out of east Tennessee later that evening.
	6/4/2002	0.88	
Robbinsville	6/20/2002	1.75	
Robbinsville	5/2/2003	0.75	
	5/15/2003	1.25	
Robbinsville	7/14/2004	0.75	
Robbinsville	5/20/2008	0.75	Hail covered the ground.
	5/8/2009	0.88	Scattered severe storms produced large hail and damaging winds over the North Carolina mountains.
	5/8/2009	1	Hail was reported on Meadow Branch Rd.

Location	Date	Size (in)	Description
	6/11/2009	0.75	Widespread severe weather affected western North Carolina as a line of storms moved across much of the region. Other severe storms also developed ahead of the line.
Robbinsville	9/27/2010	0.75	Low pressure moved northeast, across the western Carolinas and northeast Georgia during the afternoon and evening hours. Along with quite a bit of rain, a few severe storms affected the region, one of which produced an EF1 tornado in Burke County. The storm that produced the tornado was quite unusual, being a hybrid of a mature comma head and a breaking QLCS line segment.
	6/8/2011	1	Quarter size hail was reported on Carpenter Dr.
Robbinsville	4/26/2012	0.75	A well-organized MCS moved into the North Carolina Mountains around 8 a.m. EDT. The line weakened as it crossed the mountains, though it still downed a number of trees and produced small hail. The line did not produce any additional severe weather after emerging into the foothills, though it did hold together as it moved across the foothills and western piedmont and even produced periodic small hail.
Robbinsville	5/22/2013	1	Quarter size hail was reported in Robbinsville.
	7/19/2019	1	Public reported quarter size hail near Stecoah.
Haywood County			
Maggie Valley	5/3/2000	0.75	A severe thunderstorm produced dime size hail in portions of Haywood County.
	5/3/2000	0.75	A severe thunderstorm produced dime size hail in portions of Haywood County.
Canton	6/26/2000	1.75	An isolated severe thunderstorm produced golf ball size hail.
	6/3/2002	0.75	
Canton	6/4/2002	1	
Waynesville	6/4/2002	1.75	
Waynesville	6/4/2002	0.75	
	5/2/2003	0.75	
Waynesville	8/26/2003	1	
Waynesville	4/12/2004	0.75	
Clyde	5/8/2004	0.88	
Canton	5/8/2004	1	Penny to quarter size hail fell, causing damage to numerous vehicles.
	8/2/2004	1.25	
Canton	6/18/2005	0.75	
Waynesville	6/18/2005	1	
Waynesville	6/18/2005	0.88	Hail up to the size of nickels piled up along the side of the road in the Fines Creek area.
Waynesville	4/3/2006	1.75	Hail to the size of golf balls covered the ground.
	4/3/2006	1	
Waynesville	4/3/2006	0.88	Hail at least the size of nickels broke out a window and covered the ground in Waynesville.
Canton	4/3/2006	0.75	
Waynesville	4/8/2006	0.88	Numerous reports of hail, to the size of nickels, covering the ground.

Location	Date	Size (in)	Description
Maggie Vly	5/30/2006	1.75	
Waynesville	6/22/2006	0.88	Nickel size hail in the Allens Creek area.
	8/4/2006	0.75	
Waynesville	8/6/2006	0.88	Nickel size hail on Tree Line Trail.
	6/12/2007	1	Scattered severe storms developed over western North Carolina for a second day in a row. The storms mainly produced large hail.
Clyde	6/27/2007	0.75	Several severe storms affected western North Carolina during the afternoon and evening hours.
Canton	6/28/2007	1	A few severe storms affected western North Carolina during the afternoon and evening hours.
Waynesville	5/9/2008	1	Severe storms developed over western North Carolina during the evening hours and produced large hail.
Canton	6/9/2008	0.75	Several severe storms developed over western North Carolina during the afternoon and evening hours ahead of a cold front.
Canton	6/9/2008	0.75	Several severe storms developed over western North Carolina during the afternoon and evening hours ahead of a cold front.
Waynesville	6/9/2008	0.88	Several severe storms developed over western North Carolina during the afternoon and evening hours ahead of a cold front.
Waynesville	5/9/2009	0.75	A cold front moved through western North Carolina during the evening hours. The front was preceded by several severe thunderstorms.
	5/14/2009	0.88	Dime to nickel size hail was reported on I-40 near mile marker 10.
	6/2/2009	0.75	Hail reported in the Fines Creek community.
	4/9/2011	0.75	Thunderstorms initiated over the mountains of North Carolina during the afternoon hours. As the afternoon progressed, several supercell thunderstorms developed which tracked southeast across the foothills and piedmont along a slow-moving surface cold front. With unusually steep lapse rates over the region, several of the storms produced large hail. Fortunately, the supercells were a little elevated in nature, and only one, brief, weak tornado developed. Still, hail ranging up to the size of a softballs did quite a bit of damage over the region.
	4/9/2011	1.75	Golf ball size hail was reported on Sweetwater Dr.
	4/3/2012	1	A slow-moving thunderstorm dropped nickel to quarter size hail in the Cove Creek and Jonathan Creek areas.
West Canton	4/3/2012	1	Scattered thunderstorms developed over the North Carolina Mountains along a weak warm front during the afternoon hours. Some of the storms produced hail which ranged up to the size of quarters. Later in the evening a thunderstorm also produced some wind damage east of Charlotte.
	4/3/2012	1	Scattered thunderstorms developed over the North Carolina Mountains along a weak warm front during the afternoon hours. Some of the storms produced hail which ranged up to the size of quarters. Later in the evening a thunderstorm also produced some wind damage east of Charlotte.
	5/2/2012	1	Hail up to quarter size hail fell at a campground on Motorcycle Dr.
Clyde	7/1/2012	1.25	After a day where temperatures rose to record levels, including 104 degrees at the Charlotte Douglas International Airport, numerous severe storms developed over western North Carolina during the afternoon and evening hours. The wind shear was fairly weak, but there was considerable instability. This allowed some of the storms to organize into small bowing clusters, though the dominant mode was pulse severe.

Location	Date	Size (in)	Description
	7/1/2012	1	Quarter size hail fell in the Harmon Den area.
Canton	7/30/2012	1	A thunderstorm briefly produced large hail over North Carolina mountains.
Canton	8/8/2012	0.88	The combination of a dissipating frontal boundary and a hot and humid airmass resulted in numerous showers and thunderstorms over western North Carolina. Some of the thunderstorms caused localized wind damage and large hail. One storm dropped 3.5 inches of rain in a short period of time, causing a small area of flooding east of Charlotte.
Canton	8/12/2013	1	Quarter size hail was reported on the west side of Canton.
	6/19/2014	1	FD reported dime to quarter size hail in the Cruso community.
Waynesville	7/27/2014	1.75	Public reported quarter to golf ball size hail in the Waynesville area.
	7/13/2016	0.75	Spotter reported brief 3/4-inch hail off Old River Rd.
	7/13/2016	1	Public reported (via social media) pea to quarter size hail in the Bethel community.
Jackson County			
Sylva	12/16/2000	0.88	Trained spotter reported nickel-sized hail 8 miles north of Sylva.
	6/4/2002	1	
	7/1/2002	0.75	
Sylva	4/30/2003	0.75	
Sylva	8/26/2003	0.75	
	5/8/2004	1.75	
	5/8/2004	1	
	3/27/2005	0.88	
Sylva	4/12/2005	0.88	
	6/20/2005	0.75	
	4/3/2006	1	
Sylva	4/8/2006	0.75	
	4/19/2006	1	
	4/19/2006	1.75	Reported in the Caney Fork area.
Cashiers	4/20/2006	0.75	
	5/20/2006	1	Quarter size hail covered the ground on Tanassee Creek Rd just inside the Transylvania County line.
Sylva	5/30/2006	0.75	Hail reported in the Balsam area.
	6/12/2007	0.75	Scattered severe storms developed over western North Carolina for a second day in a row. The storms mainly produced large hail.
	6/22/2008	0.75	Reported on Bull Pen Rd.
	6/22/2008	0.75	Severe storms developed over the North Carolina mountains during the early afternoon hours. The storms progressed eastward during the afternoon and evening affecting much of western North Carolina.
	7/21/2008	0.75	Several severe storms affected western North Carolina during the afternoon and evening hours.
	5/8/2009	0.75	Scattered severe storms produced large hail and damaging winds over the North Carolina mountains.

Location	Date	Size (in)	Description
	5/8/2009	1	Scattered severe storms produced large hail and damaging winds over the North Carolina mountains.
	5/8/2009	1.5	Scattered severe storms produced large hail and damaging winds over the North Carolina mountains.
Dillsboro	5/16/2009	0.75	Hail was reported on the northwest side of town.
	6/2/2009	0.88	Hail up to the size of nickels fell for several minutes.
	5/11/2011	0.88	Nickel size hail fell in the Balsam area.
	6/1/2011	1.25	Hail up to half dollar size was reported in the Wolf Mountain area.
	6/6/2011	1	Thunderstorms produced a little large hail and lightning damage over the North Carolina mountains.
	6/6/2011	0.88	Thunderstorms produced a little large hail and lightning damage over the North Carolina mountains.
	6/8/2011	0.75	Numerous thunderstorms developed over the North Carolina mountains as an unseasonably hot airmass persisted across the region. The storms produced both large hail and damaging winds.
Webster	6/8/2011	1	Numerous thunderstorms developed over the North Carolina mountains as an unseasonably hot airmass persisted across the region. The storms produced both large hail and damaging winds.
	6/9/2011	1	Mainly dime to nickel size hail, with a few quarter-size stones, fell at Fox Run Ridge Rd.
	3/2/2012	1.75	Two supercell thunderstorms entered the North Carolina mountains during the evening hours. One of the storms produced a strong tornado in the town of Murphy in Cherokee County. The supercell remained surprisingly strong as it crossed the southern mountains, producing large hail and eventually another weak tornado in Jackson County. Later at night, storms organized into a broken line across Upstate South Carolina. The northern part of the line crossed the southern North Carolina piedmont where it produced a strong, brief tornado on the northeast side of Charlotte. The storm did not exhibit supercell characteristics, and the tornado spun up quite quickly as the line intersected a low-level boundary.
	4/3/2012	0.75	Penny size hail was reportedly covering the ground near Thorpe Dam.
	4/3/2012	1	Hail up to the size of quarters was reported to be covering the ground in Tuckasegee.
	4/26/2012	1.75	Golf ball size hail was reported 6 miles west northwest of Cashiers, with half dollar size hail reported in town.
	4/26/2012	1.5	A second severe thunderstorm dropped large hail in Cashiers and to the northwest of town.
	7/1/2012	1	Quarter size hail was reported in the Panthertown area.
	7/5/2012	1	A very unstable airmass and weak upslope flow helped trigger numerous thunderstorms over western North Carolina. Several of the storms produced wind damage and large hail. A long-lived line of storms moved across the North Carolina Mountains, causing quite a bit of wind damage during the late afternoon hours.
	6/19/2014	0.88	Public reported nickel size hail near Balsam.
	7/8/2016	0.88	Spotter reported nickel size hail near Whittier.
Webster	7/8/2016	1	HAM Radio operator reported quarter size hail near Sylva.

Location	Date	Size (in)	Description
	9/20/2017	1.25	Forest service personnel observed half dollar size hail at the Whitewater Falls parking area off Highway 281.
Swain County			
Bryson City	6/4/2002	0.75	
	6/20/2002	0.75	
Bryson City	7/2/2002	0.75	
	7/22/2002	0.75	
Bryson City	2/21/2005	0.88	
	4/19/2006	0.75	
	5/20/2008	0.75	Several clusters of severe thunderstorms developed over western North Carolina during the afternoon and evening hours ahead of a cold front.
Bryson City	6/9/2008	0.75	Several severe storms developed over western North Carolina during the afternoon and evening hours ahead of a cold front.
Bryson City	6/18/2011	0.88	A mature squall line crossed from eastern Tennessee, into the mountains of North Carolina, during the early afternoon hours. While the shear was fairly weak, the strong cold pool and moderate instability ahead of the line supported quite a bit of wind damage over the mountains. The convective complex continued to produce widespread, marginally severe wind damage as it moved across the foothills and piedmont of the western Carolinas the rest of the afternoon. There were, however, a few small areas of more concentrated damage with the MCS.
	6/24/2011	1	Quarter size hail fell at Cheoah Dam.
	4/3/2012	0.88	Nickel size hail fell in the Needmore community.
	4/3/2012	0.75	Scattered thunderstorms developed over the North Carolina Mountains along a weak warm front during the afternoon hours. Some of the storms produced hail which ranged up to the size of quarters. Later in the evening a thunderstorm also produced some wind damage east of Charlotte.
Bryson City	4/26/2012	1.25	Half dollar size hail fell in Bryson City.
Bryson City	4/26/2012	0.88	Thunderstorms developed during the afternoon along an outflow boundary from an MCS that crossed the region earlier in the day. The afternoon and evening storms produced large hail and some straight-line wind damage.
	5/22/2013	1	Quarter size hail fell 3 to 4 miles northeast of Bryson City, including at Bryson Dam.
	7/14/2015	1	Public reported quarter size hail in the Almond area.
Bryson City	9/5/2015	1	Public and spotters reported dime to nickel size hail on the north side of Bryson City, particularly along Deep Creek Rd near the entrance of the Great Smoky Mountains National Park.
Bryson City	4/25/2020	0.75	NWS co-op observer reported dime size hail covering the ground.

TABLE H.3: LIGHTNING EVENTS (2000-2021)

Location	Date	Description
Haywood County		
Canton	12/16/2000	Lightning struck a tree and then a house, causing some property damage.
Maggie Valley	5/8/2004	Lightning ignited a house fire.
Canton	5/19/2005	Lightning struck a building, resulting in some windows being blown out.
Canton	7/19/2005	Lightning struck a home, igniting a fire which destroyed the structure.
	6/22/2012	A father and son were injured by lightning while camping in the Graveyard Fields area along the Blue Ridge Parkway.
Jackson County		
Cashiers	7/3/2001	Lightning struck an unoccupied house, resulting in a fire that destroyed the structure and all of its contents.
Cashiers	7/2/2002	A man in a hot-tub was struck by lightning.
Cullowhee	5/8/2004	Lightning caused widespread power outages.
Sylva	6/27/2005	Lightning sparked a fire out an outbuilding on Cowee Ridge. The structure was destroyed.
Cashiers	6/27/2005	Lightning sparked a house fire, causing extensive damage to the structure and its contents.
Cullowhee	5/6/2009	Lightning ignited a fire at a home in the Briarwood Community, causing significant damage.
Sylva	5/16/2009	Lightning ignited a fire at a garage housing two vintage vehicles on Thorn Hill Rd.
Grimshawes	5/15/2010	Lightning ignited a fire at a condominium complex on Turning Leaf Lane. Two units were heavily damaged and two more received minor damage.
Big Ridge	4/25/2011	Lightning struck a house in the Glenridge area, igniting a fire that completely destroyed the home.
Bessie	4/27/2011	Lightning struck a home in the Finley Forest area, igniting a fire that destroyed the home.
Bessie	6/19/2011	Lightning started a fire at a home on Bright Mountain Rd, completely destroying the structure.
Dillsboro	12/21/2011	Lightning struck a propane tank at a water treatment plant, igniting a fire that destroyed some equipment.
Swain County		
Whittier	5/29/2012	Lightning started a fire at a home on Conley Mountain Association Rd. The home was completely destroyed.
Big Cove	6/22/2019	Broadcast media reported lightning struck and injured two people at Balsam Mountain Campground.

TABLE H.4: THUNDERSTORM WIND EVENTS (2000-2021)

Location	Date	Description
Cherokee County		
Countywide	2/13/2000	Trees down.
Marble	2/13/2000	Power lines down.
Countywide	11/9/2000	Trees down.
Violet	6/25/2001	Several trees down near Appalachia Lake.
Hiwassee Dam	7/3/2001	Two trees down.
Ranger	7/4/2001	Two trees down.
Countywide	10/25/2001	Trees down, mainly in the northern part of the county.
Murphy	5/2/2002	Law enforcement reported mobile home blown into road and trees down throughout county.
Murphy	5/13/2002	Trees reported down west of Murphy near the Tennessee border.
Murphy	6/4/2002	Trees reported down in Murphy.
Unaka	6/20/2002	Two trees were reported down in Unaka.
Murphy	7/30/2002	Numerous trees down in western half of county.
Countywide	11/11/2002	Several trees were reported down across the county.
Hiwassee Dam	5/5/2003	A few trees were reported down at Hiwassee Dam.
Hiwassee Dam	6/11/2003	Two large trees were reported down on highway 294 in the Hiwassee Dam area.
Oak Park	6/11/2003	Several trees and power lines down across the west portion of the county.
Ranger	7/13/2003	A few trees reported down by 911 dispatch.
Andrews	7/16/2003	Numerous trees reported down by Emergency Management Agency.
Murphy	8/15/2003	Several trees and power lines reported down by utility company.
Countywide	11/18/2003	Numerous trees were reported down across the county.
Murphy	5/22/2004	Several trees were reported down on power lines four miles west northwest of Murphy.
Murphy	5/31/2004	Numerous trees were reported down across the county.
Murphy	6/12/2004	Two trees down on power lines at Bear Paw Village
Murphy	6/12/2004	Tree down on Duke Lodge Road
Murphy	7/5/2004	Trees were reported down across the county.
Andrews	7/12/2004	A tree was reported down at the intersection of Junaluska and Andrews.
Murphy	7/13/2004	Trees were reported down in eastern and western sections of the county around 1245 am EDT on 07/14.
Hiwassee Dam	7/14/2004	Several trees were reported down in the Hiawassee Dam area.
Murphy	7/26/2004	A tree was reported down on Harshaw Road.
Murphy	7/26/2004	A tree was reported down on Country Walk Road.
Murphy	2/21/2005	Numerous trees down countywide
Murphy	6/6/2005	Numerous trees down countywide. Reported by the Sheriff's Office.
Andrews	8/3/2005	A few trees reported down in the Andrews area.
Murphy	8/4/2005	Several trees down near Murphy
Countywide	4/8/2006	Several trees and powerlines down across the eastern third of the county.
Murphy	5/20/2006	Several trees and power lines were reported down one mile west of Murphy.

Location	Date	Description
Murphy	5/20/2006	A few trees were reported down on power lines two miles east of Murphy.
Marble	5/27/2006	A few trees were reported down in Marble.
Andrews	6/23/2006	Several trees and powerlines down in Andrews.
Murphy	7/4/2006	Several trees were reported down in the National Forest west and northwest of Murphy.
Murphy	7/4/2006	Several trees and powerlines were reported down across the county with a concentration noted in the western part of the county.
Murphy	7/13/2006	Several trees and powerlines were reported down across the southern third of the county.
Countywide	7/21/2006	Numerous trees were reported down across the county.
Murphy	8/15/2006	Two trees down near Murphy.
Murphy	9/23/2006	A few trees were reported down on a private road near Murphy.
Murphy	9/28/2006	Numerous trees were reported down across the western third of the county.
Andrews	6/25/2007	Thunderstorm winds downed a tree at Andrews and numerous powerlines countywide.
Marble	1/30/2008	A junk car body was blown out of a yard in Marble.
Ogreeta	4/11/2008	Law enforcement reported 3 trees downed by thunderstorm winds near the Hiawassee Dam.
Valleytown	5/20/2008	Several trees were reported down in Andrews and the surrounding area.
Rhodo	5/20/2008	Two trees were reported down on Junalaska Road.
Postell	6/28/2008	Dispatch reported a tree downed by thunderstorm winds on Candy Mountain Road west of Murphy.
Ogreeta	6/28/2008	Dispatch reported a tree downed by thunderstorm winds at Hiawassee Dam.
Valleytown	6/28/2008	Dispatch reported a large tree downed on powerlines by thunderstorm winds in Andrews.
Murphy	7/6/2008	A few trees were reported down around Murphy.
Murphy	7/21/2008	Numerous trees were reported down across the county.
Murphy	7/22/2008	Numerous trees were reported down across the western half of the county.
Holhouse	7/28/2008	One tree was reported down in the southwest part of the county thirteen miles southwest of Murphy.
Mission	7/28/2008	One tree was reported down in the southeast part of the county four miles southeast of Murphy.
Johnsonville	8/2/2008	Dispatch reported a tree downed by thunderstorm winds in the western portions of the county.
Murphy	6/11/2009	A trained spotter reported several trees downed by thunderstorm winds in Murphy.
Murphy	6/17/2009	Law enforcement personnel reported one tree downed by thunderstorm winds in Murphy along with power outages.
Murphy	6/17/2009	Law enforcement personnel reported a few trees downed by thunderstorm winds in and around Murphy.
Ranger	6/21/2009	Law enforcement personnel reported one tree downed by thunderstorm winds southwest of Murphy.
Murphy	6/21/2009	Law enforcement personnel reported one tree downed by thunderstorm winds in Murphy.
Sunny Pt	6/28/2009	Law enforcement personnel reported one tree downed by thunderstorm winds southwest of Murphy.

Location	Date	Description
Hiwassee Dam	6/28/2009	Utility company personnel reported one tree and several powerlines downed by thunderstorm winds northwest of Murphy.
Marble	6/25/2010	Law enforcement personnel reported 1 tree downed by thunderstorm winds in Marble.
Hiwassee Dam	7/25/2010	Several trees and power lines were reported down around the Hiwassee Dam area.
Murphy	8/13/2010	Law enforcement personnel reported numerous trees downed by thunderstorm winds across the western half of the county.
Andrews	10/25/2010	Amateur radio personnel reported trees and powerlines downed by thunderstorm winds along with numerous tree limbs down around Andrews.
Murphy	2/25/2011	Law enforcement personnel reported one tree downed on Harshaw Road and several trees downed on US 19 by thunderstorm wind near Murphy.
Culberson	3/26/2011	A few trees were reported down in the vicinity of Bellview.
Hothouse	6/9/2011	Law enforcement personnel reported a few trees downed by thunderstorm winds 3 miles northwest of Hothouse.
Andrews	6/15/2011	Law enforcement personnel reported numerous trees and powerlines downed by thunderstorm wind in Andrews.
Hiwassee Dam	6/18/2011	Law enforcement personnel reported several trees downed by thunderstorm wind at the Hiawassee Dam.
Murphy	6/18/2011	Law enforcement personnel reported several trees downed by thunderstorm wind 6 miles southwest of Murphy in the Ranger area.
Murphy	6/19/2011	Law enforcement personnel reported several trees and powerlines downed by thunderstorm wind countywide.
Murphy	8/3/2011	Utility company personnel reported a tree downed on powerlines by thunderstorm wind near the Pleasant Valley community.
Murphy	8/3/2011	Utility company personnel reported a tree downed powerlines by thunderstorm wind at the intersection of Morgan Hill Road and Martins Creek Road near Murphy.
Murphy	8/8/2011	Trained spotter reported many trees and powerlines downed by thunderstorm wind near Murphy.
Murphy	7/31/2012	Two trees were reported down. One tree was downed in Murphy and the other fell in the vicinity of Texana.
Murphy	8/1/2012	Law enforcement personnel reported several trees were downed by a thunderstorm wind in Murphy.
Murphy	6/5/2013	Dispatch personnel reported several trees downed by thunderstorm wind across the county.
Murphy	6/8/2014	Law enforcement personnel reported 5 trees downed by thunderstorms wind in Murphy.
Murphy	6/10/2014	Law enforcement personnel reported several trees were downed by thunderstorm wind in Murphy.
Bates Creek	7/8/2014	Trees were reported down across the northwestern part of the county.
Murphy	7/8/2014	A few trees were reported down in Murphy.
Murphy	6/8/2015	A few trees were reported down in the area.
Valleytown	6/8/2015	A few trees were reported down.
Murphy	6/26/2015	A few trees were reported down.
Grape Creek	7/11/2015	Several trees were reported down west of Murphy.
Slow Creek	7/14/2015	A few trees were reported down.
Valleytown	7/14/2015	A few trees were reported down.

Location	Date	Description
Slow Creek	7/14/2015	A few trees were reported down.
Murphy	7/6/2016	Several trees were reported down across primarily the eastern half of the county.
Murphy	7/7/2016	A few trees were reported down in Murphy.
Ogreeta	7/8/2016	Several trees were reported down at the Hiwassee Dam and in western sections of Hiwassee Village.
Murphy	7/8/2016	Several trees were downed in the southern part of the county and east of Murphy.
Unaka	3/1/2017	Several trees were reported down across the county.
Murphy	3/21/2017	Several trees were reported down across the county.
Valleytown	4/22/2017	Several trees were uprooted. Also, a tree was reported down across westbound U.S. Highway 19/74 blocking traffic.
Murphy	5/27/2017	Several trees were reported down across the county.
Peachtree	3/17/2018	A tree fell on a house and a car and a roof was blown off a shed. Additionally, a fence was blown down on the property.
Peachtree	5/14/2018	Several trees were reported down three miles east of Murphy.
Murphy	6/23/2018	Numerous reports were received indicating downed trees and power lines around mile marker four on highway 64 in Murphy.
Murphy	6/23/2018	Numerous trees were reported down across the county.
Murphy	6/24/2018	Multiple trees were reported down along highway 64.
Valleytown	6/24/2018	Several trees were reported down at Valleytown.
Ogreeta	6/25/2018	Several trees were reported down at Hiwassee Dam.
Rhodo	7/19/2019	One tree was downed at the corner of Red Marble and Possum Trot Roads.
Tomotla	4/9/2020	Trees were reported down and the roof of an outbuilding was damaged.
Peachtree	4/13/2020	A roof was blown off a structure on Mount Wimpey Road.
Murphy	6/21/2020	A tree fell on top to two houses on Smoke Rise Drive.
Graham County		
Countywide	2/13/2000	Strong gradient winds ahead of an approaching squall line and cold front gusted from the south up to an estimated 60 mph. There were numerous reports of trees and power lines downed across Macon County. Severe thunderstorms then crossed the southwestern mountains of North Carolina, resulting in many more trees being blown down. Pea to dime size hail accompanied some of the thunderstorms as well.
Robbinsville	8/10/2000	Trees were blown down across power lines.
Fontana	7/9/2001	Large branches blown onto area roads overnight.
Robbinsville	10/24/2001	Numerous trees and power lines down countywide. The squall line reached the western part of the county, along the SkyWay, first.
Robbinsville	10/24/2001	Numerous trees and power lines down across the county. The squall line reached the center of the county, Robbinsville, shortly before 1 am. At least two of the trees fell onto automobiles.
Fontana	10/24/2001	Numerous trees and power lines down across the county. The squall line reached the resort community and caused some damage at campgrounds and cabins.
Stecoah	10/25/2001	Numerous trees and power lines down across the county. The squall line reached the eastern part of the county around 1 am.
Stecoah	5/2/2002	Many large limbs were blown down.

Location	Date	Description
Robbinsville	5/2/2002	Numerous trees and powerlines were blown down, resulting in widespread power outages. A tree was blown onto a house, resulting in damage.
Robbinsville	5/13/2002	Trees and powerlines were blown down.
Robbinsville	6/20/2002	Two trees were blown down.
Countywide	11/11/2002	Numerous trees were blown down and power outages occurred across the county.
Robbinsville	5/2/2003	Some trees were blown down.
Tapoco	5/31/2004	Trees and power lines were blown down.
Robbinsville	5/31/2004	Numerous trees and power lines were blown down.
Stecoah	5/31/2004	Trees and power lines were blown down.
Robbinsville	7/5/2004	Numerous trees were blown onto roads and power lines.
Fontana	7/13/2004	Numerous trees were blown down.
Countywide	2/21/2005	Numerous trees blown down countywide, many onto roads, and some into power lines, causing sporadic power outages. One tree fell on and damaged a mobile home in the Atoah Community. On Snowbird Road in Robbinsville, shingles were torn from a home, and the porch was torn from a mobile home next door.
Robbinsville	5/20/2005	Trees down. Also, power was out in town for a while in the morning, but it is unclear whether lightning or wind was the culprit.
Fontana	6/6/2005	Several trees down around Fontana Lake and highway 28.
Fontana	4/8/2006	One tree and several large tree limbs blown down.
Robbinsville	4/21/2006	The roof was blown off a barn near the intersection of Moose Branch Rd and highway 129. There were also quite a few trees blown down in the area. One tree fell on an automobile in the Snowbird area. There was also non-specific damage reported on the Skyway.
Robbinsville	5/13/2006	A couple trees blown down in Stecoah Valley.
Robbinsville	7/21/2006	Trees blown down near the Tennessee line.
Robbinsville	1/30/2008	Quite a few trees and power lines were blown down in and around Robbinsville.
Robbinsville	3/4/2008	Several trees blown down across the county.
Robbinsville	6/28/2008	Two trees were blown down.
Robbinsville	7/22/2008	A few trees were blown down.
Bear Creek	7/22/2008	A few trees were blown down.
Tapoco	7/22/2008	Numerous trees were blown down across the county.
Robbinsville	12/10/2008	Trees were blown down.
Tulula	12/10/2008	Trees were blown down in the Tulula community and in the Stecoah community.
Sweetgum	2/11/2009	A tree was blown down on Tallulah Rd and another on Old Tallulah Rd.
Cheoah	4/10/2009	A few trees were blown down in the Franks Creek area.
Brock	5/8/2009	Three trees were blown down.
Fontana	6/17/2009	Numerous trees were blown down across Fontana Village and vicinity.
Milltown	7/26/2010	Several trees were blown down along Little Snowbird Rd.
Brock	8/5/2010	Two trees were blown down on highway 28 near Lower Tuskeegee Rd.
Santeetlah	10/25/2010	Numerous trees were blown down across the county.

Location	Date	Description
Tapoco	4/4/2011	Numerous trees were blown down across the county.
Stecoah	6/7/2011	Two trees were blown down on highway 143, just south of highway 28.
Tapoco	6/15/2011	Widespread tree damage was reported across the county, with some trees on roads, homes, and vehicles.
Yellow Creek	6/18/2011	Numerous trees were blown down across the county.
Cheoah	6/19/2011	Two trees were blown down on Mountain Creek Rd, about 1.5 miles northeast of Robbinsville.
Santeetlah	6/19/2011	Two trees were blown down on state road 1122 in the Snowbird area.
Yellow Creek	8/3/2011	Multiple trees and large limbs were blown down across the county, especially in the Santeetlah Rd and highway 143 areas.
Tulula	8/8/2011	Two trees were blown down along highway 129. Power lines were also blown down in the area.
Fontana	7/1/2012	Several trees were reported to be blown down about 5 miles north of Robbinsville.
Stecoah	7/5/2012	Numerous trees and power lines were blown down along a wide swath across the northern part of the county, with the area from the Tapoco community to Fontana Village being the hardest hit.
Milltown	7/31/2012	Two trees were blown down in the Snowbird area.
Milltown	1/30/2013	Wind damage was reported over much of the central and eastern part of the county. Multiple trees were blown down, with one tree through a mobile home near Robbinsville.
Robbinsville	2/21/2014	A tree was blown down in downtown Robbinsville with another tree down on Highway 28 near Fontana Lake (8 NNE).
Robbinsville	5/22/2014	County comms reported multiple trees blown down on Highway 129 near Robbinsville.
Tapoco	7/14/2015	County comms reported numerous trees blown down throughout Graham County.
Tapoco	7/7/2016	County comms reported numerous trees blown down throughout the county.
Tapoco	3/21/2017	County comms reported numerous trees blown down.
Yellow Creek	5/24/2017	County comms reported multiple trees blown down across the county.
Santeetlah	6/3/2018	County comms reported two trees blown down just west of Lake Santeetlah.
Stecoah	6/23/2018	County comms reported a couple of trees blown down across Highway 28 in the Stecoah area.
Milltown	6/25/2018	County comms reported a few trees blown down in the Robbinsville area.
Yellow Creek	7/6/2018	Dam operator reported multiple trees blown down along Highway 129 between Cheoah dam and Lake Santeetlah.
Tapoco	6/21/2019	County comms reported multiple trees blown down across the county.
Milltown	1/11/2020	County comms reported numerous trees blown down throughout the county.
Tapoco	4/9/2020	County comms reported numerous tree limbs and at least two power lines blown down throughout Graham County.
Haywood County		
Countywide	8/10/2000	Numerous trees were blown down countywide.
Maggie Valley	6/22/2001	Trees blown over onto a propane tank at a day care center.
Canton	7/8/2001	Trees down across some yards in Canton.
Waynesville	10/25/2001	The top was blown out of a large tree, resulting in damage to a car and a house.

Location	Date	Description
Canton	1/24/2002	2 trees were reported blown down.
Waynesville	3/17/2002	Several trees were blown down in and around Waynesville. Some were blown onto power lines, resulting in outages.
Maggie Valley	5/2/2002	A few trees were blown down.
Waynesville	6/4/2002	Several trees were blown down. One fell on an automobile.
Waynesville	5/2/2003	A few trees and power lines were blown down.
Clyde	5/8/2004	
Waynesville	5/31/2004	Numerous trees were snapped off or blown down. Numerous power lines were blown down.
Lake Junaluska	5/31/2004	Large tree limbs were blown onto a trailer.
Lake Junaluska	7/5/2004	Some trees were blown down at Rogers Cove.
Canton	7/6/2004	Trees, large limbs, and power lines were blown down, and patio furniture was blown up and over a 4-foot barrier on the east side of Canton.
Canton	7/9/2004	Numerous tree limbs were blown down.
Lake Junaluska	8/2/2004	A couple of trees were blown down.
Canton	8/2/2004	Several trees were blown down.
Waynesville	2/21/2005	High winds blew down several tall pine trees in the Laurel Ridge area of Waynesville. Some of the trees fell on a vehicle and a home, causing minimal damage.
Canton	5/19/2005	Part of a tin roof off a barn.
Maggie Valley	4/3/2007	Electric coop reported power poles down in the Black Camp area west of Maggie Valley. Also, 5 to 6 trees were blown down across the central part of the county.
Pines Creek	7/8/2008	Trees and power lines were blown down in the Fines Creek area, including one tree down on I-40 near mile marker 13.
Clyde	7/22/2008	Trees were blown down on Paragon Parkway.
Cove Creek	6/10/2009	Trees were blown down near the Cove Creek community.
Morning Star	6/18/2009	Several trees were blown down on Dutch Cove Rd.
Cove	6/14/2010	Two trees were blown down on Rush Fork Rd. Another tree was blown down a little southwest of this location near the intersection of White Oak Rd and Fines Creek Rd.
Maggie Valley	10/25/2010	Numerous trees were blown down across the county.
Maggie Valley	4/4/2011	Numerous trees were blown down across the county. Some trees fell on homes in the Maggie Valley and Waynesville area.
Lake Junaluska	4/11/2011	Trees were blown down on highway 19.
Nellie	6/15/2011	Numerous trees were blown down across Haywood County, with some trees on vehicles and homes.
Waterville	2/29/2012	Multiple trees were blown down along I-40 north of Waynesville. Multiple power lines were blown down and a tree was blown down on a house on Pigeon St in Waynesville.
Waynesville	4/26/2012	Trees and power lines were blown down in Clyde, Canton, and on 5th St in Waynesville. Trees were likely blown down all the way to the Tennessee border, though no reports were collected from these remote locations.
Clyde	7/6/2012	Trees were blown down on Ward St, Relief Loop, and Travis St in Clyde with additional trees down in Waynesville.
Cove Creek	7/6/2012	Trees were blown down north of the Lake Junaluska area.

Location	Date	Description
Maggie Valley	1/30/2013	Numerous trees were blown down as a line of heavy rain showers and embedded thunderstorms moved across the county.
Maggie Valley	6/13/2013	A few trees were blown down from the Maggie Valley area to the Clyde area.
Waynesville	7/20/2013	Two trees were blown down near downtown Waynesville.
Maggie Valley	7/27/2014	Public reported the first of two severe thunderstorms produced damaging winds that blew down a few trees just north of Maggie Valley. Sporadic damage continued east to the Lake Junaluska (tree down on County Rd) and Waynesville and Canton areas, where trees were blown down on Ratcliff Rd (3 ENE Waynesville), Chambers Farm Ln (6 SSW Canton) and on Highway 276 (6 S Canton).
Maggie Valley	7/27/2014	Spotters and public reported a second severe thunderstorm, taking an almost identical track to one that moved through Haywood County an hour earlier, blew down additional trees just north of Maggie Valley, as well as trees and large limbs on the north and east side of Waynesville (including Old Country Rd).
Nellie	5/27/2017	County comms reported numerous trees blown down throughout the county, although the heaviest concentration of damage appeared to be in the Jonathan Creek area north of Waynesville.
Mt Sterling	6/26/2018	County comms reported numerous trees blown down in the northern part of Haywood County.
Hazelwood	8/30/2018	County comms reported multiple trees and power lines blown down in Waynesville, especially across the west side of town, including on Elysinia Ave, Pine Dr, and Hazelwood Ave.
Hazelwood	6/21/2019	County comms reported a tree blown down on Children St in Waynesville and another tree down in Clyde.
Sunburst	10/31/2019	County comms reported numerous trees and power lines blown down with the greatest concentration between Waynesville and Cruso.
Saunook	1/11/2020	Fire dept reported numerous trees and power lines blown down across Haywood County.
Cove	6/14/2020	Fire dept reported trees blown down in the Fines Creek area.
Cove	6/21/2020	County comms reported multiple trees blown down just southeast of Fines Creek.
Jackson County		
Sylva	8/10/2000	Several power lines were blown down and widespread power outages occurred.
Sylva	6/22/2001	Trees down just southeast of the Cherokee Indian Reservation in extreme northern Jackson County. One tree fell on a residence.
Sylva	8/11/2001	Severe thunderstorm winds brought down trees and power lines. Some of the trees had to be cut off area roads.
Cashiers	10/24/2001	Sheriff's Department reported trees were knocked down in Cashiers as a squall line moved across the county.
Sylva	10/25/2001	Winds blew down 30 to 40 trees at a small theme park and zoo. The trees crushed cages and caused other damage.
Cullowhee	10/25/2001	Trees and power lines were blown down across the county as a squall line raced across the higher terrain of North Carolina. A small plane tied down at the Jackson County airport was flipped and heavily damaged. Some trees fell onto roads. Trees were also blown down at Western Carolina University and in the Fairview area. A large amount of hail was also reported, but no size was known. About 4500 customers lost power.

Location	Date	Description
Webster	3/17/2002	The roof was torn off of a manufactured home and blown 250 feet into another home along Caney Fork 3 ESE of Cullowhee. In addition, trees were reported down in Webster, and several power lines were blown down in Cullowhee.
Sylva	5/2/2002	Trees and powerlines were blown down in the Dills Creek area, resulting in power outages.
Countywide	5/13/2002	Trees and powerlines were blown down.
Cashiers	6/4/2002	A few large limbs were blown down.
Cullowhee	5/2/2003	A few trees were blown down at Western Carolina University.
Cashiers	7/5/2003	A few trees were blown down.
Sylva	5/31/2004	Trees and power lines were blown down.
Sylva	6/22/2004	Some trees were blown down.
Sylva	7/5/2004	Numerous trees were blown down.
Sylva	7/25/2004	Some trees and power lines were blown down.
Cullowhee	8/20/2004	Large tree limbs were blown down. There were also sporadic power outages.
Sylva	4/3/2006	Trees downed in the Savannah community.
Cullowhee	5/20/2006	Several trees down in the Cullowhee area.
Cashiers	5/20/2006	A couple trees blown down.
Cashiers	6/23/2006	Quite a few trees and power lines down in the Cashiers area.
Sylva	7/21/2006	A tree down on power lines northwest of town and one on Dillard Rd.
Cashiers	10/11/2006	Trees blown down and damage to an outbuilding in the Glenville area near Lake Thorpe.
Sylva	4/3/2007	Trees blown down along Buff Creek Rd and Skyland Dr.
Cullowhee	8/24/2007	Trees blown down.
Cullowhee	1/30/2008	A few trees were blown down in the Cullowhee area.
Sylva	6/28/2008	Trees were blown down across the northern part of the county.
Webster	7/21/2008	Several trees and power lines were blown down.
Cullowhee	6/11/2009	Large limbs and some small trees were blown down.
Sylva	6/17/2009	A tree was blown down on a trailer on Cope Creek Rd.
Beta	6/17/2009	Trees were blown down across Dills Branch Rd.
Grimeshawes	6/17/2009	Trees were blown down on Whiteside Cove Rd.
Webster	6/18/2009	A few trees and large limbs were blown down from Webster to Cullowhee.
Gay	6/18/2009	Four homes were damaged by falling large tree limbs on Tathams Creek Rd.
Dillsboro	5/28/2010	Trees and power lines were blown down in the Dillsboro area.
Grimeshawes	5/28/2010	Utility company reported numerous trees blown down in the Bad Creek area on both sides of the state line.
Speedwell	6/25/2010	Several large trees were blown down in the Pressley Creek Rd area, with one tree on a vehicle. Also, several trees and large limbs were blown down along highway 107 between Tuckasegee and Glenville.
Sylva	9/22/2010	A few trees and power lines were blown down in the Sylva area.
Wilmot	10/25/2010	Numerous trees were blown down, mainly across the northern part of the county.
Norton	10/25/2010	Several trees and power lines were blown down in the Norton community.

Location	Date	Description
Cullowhee	2/28/2011	Numerous trees were blown down across the county.
Wilmot	4/4/2011	Numerous trees were blown down across the county, some falling on roads and structures. Several billboards were also destroyed on highway 74. Part of the roof was blown off a building at Smoky Mountain High School in Sylva.
Cashiers	4/27/2011	Law enforcement reported trees blown down in the Cashiers, Sapphire area with three different severe thunderstorms that moved across the region during the late night and early morning hours.
Cashiers	4/27/2011	Trees blown down in the Cashiers area with all three severe thunderstorms that moved across the region during the late night and early morning hours.
Cullowhee	6/8/2011	A large tree was split with additional large limbs blown down on the north side of town near the intersection of Ledbetter Rd and University Heights Rd.
Wilmot	6/15/2011	Numerous trees were blown down across the county. Multiple trees fell on homes and vehicles, especially in Sylva and Cullowhee. For the second time in a little over two months, part of the roof was peeled off of Smoky Mountain High School.
Norton	6/19/2011	Numerous trees were blown down in and around Cashiers, with some trees and homes and roads.
Dicks Creek	7/5/2012	Several trees were blown down, some on power lines, across the northern part of the county.
Wilmot	1/30/2013	Multiple trees were blown down across roads as a line of heavy rain showers and embedded thunderstorms moved across the county.
Sylva	6/13/2013	Several trees were blown down just to the north of Sylva.
Sylva	2/21/2014	A tree blown down in the Whittier area and a tree was down on power lines near Sylva.
Cullowhee	4/28/2014	FD reported several trees blown down in the Cullowhee area.
Balsam	7/27/2014	Media reported multiple trees blown down in the Soco Gap area.
Cullowhee	6/17/2015	Law enforcement reported numerous trees and power lines blown down on and in the vicinity of the Western Carolina University campus. The campus library and a couple of homes received minor roof damage from fallen trees.
Dicks Creek	6/24/2015	EOC relayed a report via social media of multiple trees and power lines on Eastern Band of Cherokee Indian land in northern Jackson County.
Cullowhee	8/14/2015	Newspaper reported four large pine trees were blown down, with one falling on a garage.
Greens Creek	7/7/2016	County comms reported a few trees and power lines blown down, mainly across the central part of the county.
Wilmot	7/8/2016	Newspaper reported multiple trees blown down across Jackson County.
Wilmot	5/27/2017	County comms reported numerous trees blown down throughout the county.
Grimeshawes	9/20/2017	Forest service personnel reported multiple large tree limbs blown down at the Whitewater Falls parking area off Highway 281.
Savannah	6/23/2018	County reported widespread trees and power lines blown down from the Savannah community toward Cashiers.
Wilmot	6/25/2018	County comms reported numerous trees blown down across the northern part of Jackson County.
Cashiers	6/21/2019	County comms reported multiple trees blown down across the county, especially toward the Cashiers area.
Barkers Creek	1/11/2020	County comms reported numerous trees and power lines blown down, with a few trees down on structures.
Cullowhee	7/21/2020	County comms reported trees and power lines blown down along Edgewater Rd.

Location	Date	Description
Wilmot	12/29/2021	Ham radio operator reported three trees blown down in northern Jackson County, including at Highway 74 and Bradley Branch Rd.
Swain County		
Countywide	2/13/2000	There were numerous reports of trees and power lines downed across Macon County. Severe thunderstorms then crossed the southwestern mountains of North Carolina, resulting in many more trees being blown down. Pea to dime size hail accompanied some of the thunderstorms as well.
Bryson City	8/10/2000	A tree and many large branches were blown down and blocking a road.
Bryson City	7/9/2001	Four reports of trees blown down around town.
Bryson City	10/24/2001	Numerous trees and power lines were knocked down as a squall line moved rapidly through the mountains. Western sections were affected first.
Bryson City	10/25/2001	Numerous trees and power lines down as a squall line moved rapidly through the mountains. The squall line reached the main population center shortly after 1 am.
Lauada	1/24/2002	A few trees were blown down around Fontana Lake. In addition, a power line was blown down, resulting in a power outage.
Smokemont	5/2/2002	Numerous trees were blown down. A tree and a power pole were blown down onto a house.
Bryson City	5/2/2002	Numerous trees were blown down in and around Bryson City.
Bryson City	5/13/2002	Numerous trees were blown down along Highway 19.
Cherokee	6/20/2002	A few trees were blown down, some onto homes.
Bryson City	7/2/2002	Numerous trees were blown down. The roof of a commercial building received damage.
Nantahala	11/11/2002	Trees were blown down in Nantahala gorge. Other scattered tree damage was reported across the county.
Needmore	5/2/2003	Several trees were blown down on Bryson Branch Rd.
Bryson City	7/10/2003	Some trees were blown down.
Cherokee	5/31/2004	Trees and power lines were blown down.
Alarka	5/31/2004	Some trees were blown down.
Bryson City	7/5/2004	Several trees fell on and blocked roads in the Nantahala gorge area.
Bryson City	7/14/2004	Trees were blown down onto highway 19/74 through the Nantahala gorge, blocking the road for a while.
Cherokee	4/3/2006	Trees and large limbs blown down along highway 441 north of Cherokee.
Bryson City	4/8/2006	Trees and large limbs were blown down in numerous locations across the county.
Bryson City	5/20/2006	Several trees down across roads around Newfound Gap.
Bryson City	7/21/2006	Trees were blown down on the north side of Bryson City and trees and power lines blown down in the Coopers Creek area east of town. Some of downed power lines started brush fires.
Bryson City	7/19/2007	Two trees blown down on Brush Creek Rd, with another tree down on highway 28 near the Macon line.
Bryson City	8/21/2007	Trees down on Greasy Branch Rd.
Bryson City	5/20/2008	Trees blown down from the Nantahala Gorge area to west of Bryson City.
Bryson City	5/20/2008	Trees blown down.
Bryson City	6/28/2008	Numerous trees and power lines were blown down across the county.
Bryson City	7/21/2008	Several trees were blown down.

Location	Date	Description
Cherokee	12/10/2008	Trees were blown down in the Oconaluftee area.
Proctor	6/11/2009	Trees were blown down throughout the county.
Ela	7/26/2010	Several large tree limbs were blown down on the east side of Bryson City. One branch went through a carport roof.
Unahala	7/31/2010	Several trees were blown down.
Almond	10/25/2010	Numerous trees and power lines were blown down across the county.
Almond	2/28/2011	Several trees were blown down from the Almond area to the Alarka area.
Almond	4/4/2011	Numerous trees were blown down across the county, with the area from Fontana Lake to just west of Bryson City being the hardest hit.
Proctor	6/15/2011	Numerous trees were blown down across the county. Seven homes were damaged by falling trees, and at least one home was a total loss.
Birdtown	6/22/2011	A tree blown down on Coopers Creek Rd, about 6 miles northeast of Bryson City. A tree also fell on Old Soco Rd in Cherokee.
Wesser	4/26/2012	Multiple trees were blown down in the Nantahala Gorge.
Ravensford	7/5/2012	Numerous trees were blown down across the north and east part of the county. The strong winds were mainly the result of outflow from an intense storm that developed and dissipated east of Cherokee.
Solola Vly	7/5/2012	Numerous trees were blown down across multiple Smoky Mountain trails from near Clingman's Dome to the Twentymile Creek area.
Roundhill	1/30/2013	Multiple trees were blown down across the county.
Almond	5/21/2013	Multiple trees were down in the Almond area.
Hewitt	6/10/2014	County comms reported multiple trees blown down near the Nantahala community.
Bryson City	6/10/2014	County comms reported numerous trees and power lines blown down in the Brush Creek area.
Birdtown	7/27/2014	Broadcast media reported a 53-year-old man was extricated from his vehicle then later died from injuries suffered after a tree fell on his vehicle as he was traveling along Old Number 4/Jess Nations Rd. Other trees were reported down in the area as well.
Bryson City	7/14/2015	County comms reported multiple trees blown down on Fontana Rd.
Unahala	6/26/2016	County comms reported a couple of trees blown down on Deep Gap Rd.
Proctor	7/7/2016	County comms reported numerous trees blown down throughout Swain County.
Proctor	7/8/2016	County comms reported a few trees blow down across the county.
Proctor	5/27/2017	County comms reported numerous trees blown down throughout Swain County, especially in the Bryson City area.
Bryson City	6/25/2018	County comms employee observed a couple of large trees blown down in Bryson City.
Solola Valley	6/26/2018	County comms reported numerous trees blown down in the county.
Hewitt	6/21/2019	County comms reported trees blown down across Highway 19 in the Nantahala Gorge.
Almond	1/11/2020	County comms reported multiple trees blown down across the southern part of Swain County.
Cherokee	4/25/2020	Public reported a tree blown down on a house in Cherokee.
Proctor	6/21/2021	County dispatch reported multiple trees and power lines blown down across portions of Swain County.

TABLE H.5: TORNADO (2000-2021)

Location	Date	Scale	Description
Cherokee County			
POSTELL	3/2/2012	EF2	An EF-2 tornado with maximum wind speeds around 120 mph produced a damage path|21.5 miles long and 400 yards wide. The tornado track extended across almost the entire county and damaged the northern part of Murphy. The storm destroyed five homes and five businesses. The number of structures affected totaled one hundred eighteen. In Murphy, a Feed Store and two rows of commercial storage units were destroyed. Also, a shopping strip with a Sherwin-Williams store suffered heavy damage. Surprisingly there were no injuries reported despite the heavy damage and long track.
PEACHTREE	3/17/2018	EF0	This tornado started near Upper Peachtree Road and Lizzie Elliot Road. It damaged a business nearby this intersection and tracked into the field behind it. There was debris scattered about the field and an overturned trailer near the creek. The tornado crossed and dissipated just past Lunsford Road and Pipes Branch. There was extensive tree and structural damage to homes and barns along Lunsford Road.
Haywood County			
MT STERLING	6/13/2013	EF1	An NWS storm survey found part of an EF1 tornado track in the Big Creek area of the Great Smoky Mountains National Park. An area of extensive tree damage was found about 3.5 miles up the Big Creek trail from its terminus at Big Creek Campground. This was near the end of the damage path, about 15 miles north northwest of Maggie Valley. Hundreds of small trees were snapped 10 to 20 feet above ground level, and dozens of large trees were uprooted along a 0.5-mile section of the trail. Although the rugged terrain prevented a complete survey, the survey team observed a concentrated path of additional significant tree damage along a ridge about 1 mile west of Big Creek and 1 mile east of Low Gap. Discussions with a National Park Service maintenance crew and with a survey team from the University of North Carolina at Asheville indicated that the tornado either developed near or crossed the state line along the crest of the Smokies near Low Gap. A hiker was injured by a fallen tree on Low Gap Trail and required airlifting when he was discovered the next day. This was the first non-F/EF0 tornado ever documented on the NC side of the park.
Jackson County			
ERASTUS	3/2/2012	EF0	An NWS storm survey found the path of a weak tornado in the Lake Glenville area. The tornado began along Pine Creek Rd about halfway between the Macon County line and the Lake. It traveled east southeast from there, crossing North Norton Rd and Woods Mountain Trail. Multiple trees were uprooted and snapped and a few homes and one church received minor roof damage. The tornado then crossed the lake and affected Glenshore Dr snapping and uprooting more trees and causing a tree to fall on a home, damaging the roof. The damage path ended there, at the shore of Lake Glenville.
Swain County			
SOLOLA VLY	3/2/2012	EF0	A NWS Storm Survey found a short damage path of a weak tornado in a remote section of the Great Smoky Mountains. Several small trees were snapped and a large tree uprooted along the 100-yard path.

TABLE H.6: WINTER WEATHER (2000-2021)

Date	Description
Cherokee County	
12/2/2000	Widespread snow fell across southwest North Carolina. Amounts averaged 1 to 2 inches in the valleys to 3 to 4 inches across the higher elevations.
12/18/2000	Widespread light snow fell across extreme southwest North Carolina. Amounts averaged between 1 and 3 inches.
1/1/2001	A strong upper-level disturbance swept through the Tennessee Valley and southern Appalachians bringing a round of light snow to the area. Amounts were generally 1 inch or less.
1/20/2001	An area of low pressure moved northeast across the southern Appalachians, bringing light snow to the region. Amounts averaged from 1/2 inch to 2 inches.
3/20/2001	A low-pressure system passing to the south and east of the southern Appalachians and Tennessee Valley dropped snow of varying depth. Around 12 inches fell on the highest elevations in Clay County. Little if any snow was reported elsewhere in Clay and Cherokee Counties.
1/5/2002	A winter storm brought only light amounts to extreme southwest North Carolina. Amounts averaged between a dusting and 1 inch.
1/16/2003	A storm system moved east from the Southern Plains across the Tennessee Valley of Alabama into the Southern Appalachians bringing snowfall totals ranging from 2 to 4 inches across Cherokee and Clay counties of extreme southwest North Carolina.
1/9/2004	A winter storm system moved across the region early in the morning January 9th producing light snowfall in Cherokee and Clay counties. Amounts were generally around an inch or less.
2/1/2007	A winter storm dumped up to 6 inches of snow across the higher elevations of extreme southwest North Carolina. 1 to 2 inches fell across the lower elevations. Snow 4 inches deep was reported across the higher elevations.
12/2/2000	Widespread snow fell across southwest North Carolina. Amounts averaged 1 to 2 inches in the valleys to 3 to 4 inches across the higher elevations.
12/18/2000	Widespread light snow fell across extreme southwest North Carolina. Amounts averaged between 1 and 3 inches.
1/1/2001	A strong upper-level disturbance swept through the Tennessee Valley and southern Appalachians bringing a round of light snow to the area. Amounts were generally 1 inch or less.
1/20/2001	An area of low pressure moved northeast across the southern Appalachians, bringing light snow to the region. Amounts averaged from 1/2 inch to 2 inches.
3/20/2001	A low-pressure system passing to the south and east of the southern Appalachians and Tennessee Valley dropped snow of varying depth. Around 12 inches fell on the highest elevations in Clay County. Little if any snow was reported elsewhere in Clay and Cherokee Counties.
1/5/2002	A winter storm brought only light amounts to extreme southwest North Carolina. Amounts averaged between a dusting and 1 inch.
1/16/2003	A storm system moved east from the Southern Plains across the Tennessee Valley of Alabama into the Southern Appalachians bringing snowfall totals ranging from 2 to 4 inches across Cherokee and Clay counties of extreme southwest North Carolina.
1/9/2004	A winter storm system moved across the region early in the morning January 9th producing light snowfall in Cherokee and Clay counties. Amounts were generally around an inch or less.
2/1/2007	A winter storm dumped up to 6 inches of snow across the higher elevations of extreme southwest North Carolina. 1 to 2 inches fell across the lower elevations. Snow 4 inches deep was reported across the higher elevations.
Graham County	
1/16/2000	A quick burst of freezing rain and sleet caused numerous traffic accidents across the mountains. The precipitation was light - less than a tenth of an inch in most places, but as high as one third inch near Robbinsville.

Date	Description
2/6/2002	Light snow and sleet fell for much of the day. Up to 2 inches of accumulation was reported in a few locations, while most areas had only a dusting. By late afternoon, most locations had changed over to rain.
12/4/2002	Two inches of snow fell at Highlands, Cashiers, and Nantahala, while the highest elevations along the Tennessee border received as much as 6 inches. A combination of sleet, freezing rain, and rain was observed in the major valleys, with no significant accumulations.
12/22/2002	Freezing rain developed during the early morning across the North Carolina mountains, and some roads and bridges became ice covered. A few traffic accidents resulted.
1/6/2003	Light snow fell for much of the day across the western mountains of North Carolina. By evening, 1 to 3 inches had accumulated, mainly in areas above 3000 feet. The snow was accompanied by wind gusts of up to 50 mph.
1/19/2003	Mainly light snow produced accumulations of 1 to 2 inches across much of the North Carolina mountains, although some high elevation areas along the Tennessee border received 3 to 6 inches, while locations near the Blue Ridge received little more than a dusting. In addition, gusty winds resulted in blowing snow across a portion of the area, with some snow drifts to one-and-a-half feet.
2/9/2003	An extended period of intermittent light snow produced spotty accumulations of 1 to 2 inches within the major valleys of the North Carolina mountains. The higher elevations received as much as 4 inches, especially the highest peaks along the Tennessee border.
2/18/2003	A brief period of light snow resulted in little more than a dusting of snowfall, which was enough to cause some slick spots on roads.
2/23/2003	Light snow resulted in accumulations of an inch or less across the mountains along the Tennessee border. This resulted in some slick spots on area roads.
3/30/2003	A light, wet snow developed around midnight across the southern and central mountains, and gradually intensified through dawn. By sunrise, 1 to 2 inches had accumulated across much of the area.
3/30/2003	After a brief lull, snow redeveloped during the afternoon across the mountains. By midnight, an additional 1 to 3 inches of snow had fallen, mainly in areas along the Tennessee border. Some of the highest peaks received as much as an additional 6 inches.
11/28/2003	The first significant snowfall of the season dumped 1 to 3 inches of snow in some of the major valleys of the North Carolina mountains, and in the higher elevations of the foothills. As much as 6 inches accumulated in the higher elevations of the Balsams and the Smokies.
12/3/2003	Light snow, mixed at times with sleet, fell across the North Carolina mountains, accumulating up to an inch in some areas.
12/5/2003	Light snow fell across portions of the North Carolina mountains during the evening. Accumulations in most locations were an inch or less, although some locations along the Tennessee border received 2 to 3 inches.
12/18/2003	Light snow developed during the evening of the 18th across the North Carolina mountains. Accumulations were light during this time, but some icy roads developed in the higher elevations. The snow became heavier late in the evening.
1/9/2004	Light snow developed across much of western North Carolina during the early morning hours of the 9th. By mid-morning, 1 to 2 inches had accumulated across much of the area. There were some isolated 3-inch amounts in the higher terrain along the Tennessee border. Many roads became slick and hazardous.
1/27/2004	Light snow developed across the Tennessee border counties during the evening of the 27th, and continued into the early morning hours of the 28th. Accumulations of 1 to 3 inches occurred, mainly right along the state line.
2/7/2004	Light snow developed across portions of the North Carolina mountains during the afternoon, and continued into the morning of the 8th. Up to 2 inches accumulated by the time the snow ended.

Date	Description
2/12/2004	Light snow developed across the southern mountains during the early morning hours, and accumulated up to 2 inches in some areas by daybreak.
2/26/2004	Light snow developed during the pre-dawn hours across the southwest mountains. Up to 3 inches accumulated by late morning.
3/30/2004	Light snow fell across much of the southern and central mountains, as well as the foothills, but accumulations were generally an inch or less.
4/13/2004	Light snow fell during the late evening and overnight hours across the North Carolina mountains. Accumulations of up to an inch occurred on grassy surfaces.
12/14/2004	Snow fell, along with winds sustained at 30 mph gusting to 40 mph, and accumulated generally from 1 to 3 inches across much of the mountains. Areas along the TN state line received the most, with areas around Highlands and Cashiers also receiving similar amounts.
1/22/2005	Light snow fell across the southern and central mountains overnight. The heaviest accumulations occurred near the Tennessee border, where 1–2-inch totals were common. Some of the higher elevations received as much as 4 inches. Accumulations tapered off rapidly toward the east, as locations from Franklin to Waynesville to Asheville received only a dusting. Roads became very slick and hazardous, and there were several traffic accidents, especially on I-40 through Haywood County.
2/10/2005	Light snow began to fall during the pre-dawn hours across the mountains, and continued off and on for much of the day. Accumulations ranged from a trace to an inch in locations from Bryson City to Waynesville to Asheville. However, locations along the Tennessee border, including the lower end of the French Broad Valley, received as much as 3 inches. Slick roads resulted in quite a few traffic accidents across the area.
2/28/2005	Snow showers redeveloped during the evening of the 28th, continuing off and on through the evening of the 1st. Additional snowfall accumulations of 1 to 2 inches were observed. The higher elevations along the Tennessee border were the main areas affected. However, some valley locations as far east as northern Buncombe and northern Jackson counties received light accumulations.
3/1/2005	Snow showers redeveloped during the evening of the 28th, continuing off and on through the evening of the 1st. Additional snowfall accumulations of 1 to 2 inches were observed. The higher elevations along the Tennessee border were the main areas affected. However, some valley locations as far east as northern Buncombe and northern Jackson counties received light accumulations.
3/8/2005	Snow showers developed behind a cold front across the western mountains during the morning hours and continued through much of the day. By the time the snow tapered off to flurries during the evening, isolated accumulations as high as 6 inches were observed in the higher elevations along the Tennessee border. However, the valleys generally received less than 2 inches.
3/11/2005	Snow showers developed behind a cold front across the western mountains during the afternoon of the 11th, and continued into the early morning hours of the 12th. By the time the snow ended, accumulations generally ranged from a trace to 2 inches across the area, although isolated higher amounts occurred in the higher elevations.
4/2/2005	Wet snow, heavy at times, developed in the higher elevations of the North Carolina mountains during the morning. By early evening, snowfall amounts ranged from trace amounts to 4 inches, mainly in areas above 3500 feet. By early evening, some of the highest elevations reached heavy snowfall criteria, mainly above 4000 feet. Light accumulations were reported in locations as low as 3000 feet. Meanwhile, the major valleys received mostly rain.
4/23/2005	A late season storm brought significant snowfall to the mountains of North Carolina. Accumulations were highly variable across the area, with as much as 8 inches falling in the higher elevations. However, even locations in the lower French Broad Valley observed up to 3 inches.
11/21/2005	Rain quickly transitioned to heavy snow across the higher elevations of the North Carolina mountains during the evening of the 21st. Snow quickly accumulated to depths of 1 to 3 inches,

Date	Description
	mainly in areas above about 3500 feet. Highway 441 was closed through the Smokies for a brief period of time. Portions of the Blue Ridge Parkway were also reported to be slick and hazardous. Mainly rain fell in the valleys during this time.
12/26/2005	Snow showers began around midnight and persisted through the overnight and morning hours across the western mountains. For the most part, accumulations ranged from 1 to 2 inches along the Tennessee border, with only trace amounts reported in areas from Robbinsville, to Bryson City, to Waynesville and Marshall. Isolated amounts of 3 to 5 inches were reported, especially in the higher elevations of Madison County.
1/30/2006	Rain changed to snow or a rain and snow mixture across the mountains of North Carolina for a brief period during the evening. In some locations, snow quickly accumulated to 1 to 2 inches before ending, mainly in areas above 3000 feet.
2/8/2006	Snow developed over the mountains during the evening and continued through much of the overnight hours. Accumulations ranged from 2 to 3 inches in the Pigeon River and Little Tennessee valleys to 1-2 inches in the lower French Broad valley and the high valleys of the northern mountains. Up to 8 inches fell in the higher elevations of the central mountains.
2/11/2006	
2/18/2006	The southern valleys saw a mixture of sleet, snow, and rain, while the central valleys and higher elevations saw sleet, snow and freezing rain which developed around sunrise and continued off and on through most of the day. Precipitation amounts were light, but numerous slick spots developed on roads, especially in the higher elevations. Numerous accidents resulted.
3/22/2006	Snow developed across the higher elevations of the North Carolina mountains during the evening and persisted through the overnight hours. By the morning of the 23rd, snow had accumulated to 1-3 inches, mainly in areas above 4000 feet.
11/19/2006	The first significant snowfall of the season in the North Carolina mountains mainly affected areas along the Tennessee border above 4000 feet. Accumulations of up to 4 inches were reported across the higher elevations along the Cherohala Skyway, in the Smokies, and across the northern mountains. Some light snow and sleet occurred in the valleys, but accumulations were limited to a dusting at best.
12/7/2006	Light snow accumulated to depths ranging from a trace in the valleys to up to 2 inches in the higher elevations near the Tennessee border. The combination of the snow and very cold temperatures caused roads to become very slick and hazardous. Numerous traffic accidents resulted.
1/21/2007	Light rain and freezing rain fell across the mountains for much of the day. Ice accretion was most concentrated in areas along and near the Blue Ridge, where around a tenth of an inch of ice accumulation was common, mainly on trees, power lines, and other elevated surfaces. However, some icy spots did develop on roads, and there were sporadic traffic accidents. In locations west of the Blue Ridge, significant accumulations of ice were mainly confined to the higher elevations, as the valleys warmed above freezing early in the day.
1/28/2007	Snow was mainly confined to the highest elevations during the morning. However, snow levels dropped quickly behind a front, and scattered to numerous snow showers produced 1 to 3 inches of snow along the Tennessee border through the day. South of I-40, accumulations were mainly confined to the higher elevations. However, most locations from the lower French Broad valley north received measurable snowfall. Due to very cold temperatures, the snow caused many roads to become slick and hazardous. Numerous vehicle accidents were reported, especially across the northern mountains.
1/1/2008	Scattered snow showers developed over the western mountains of North Carolina, and as far south and east as the foothills before dissipating during the late evening and overnight hours. By sunrise, accumulations ranged from trace amounts over the lower elevations of the foothills, to 4 inches across the higher elevations of the Blue Ridge mountains.

Date	Description
1/22/2008	Freezing drizzle developed during the morning hours across the valleys of the southwest mountains. Icy spots developed on some roads, and there were quite a few traffic accidents reported.
10/27/2008	The first mountain snowfall of the season produced accumulations as high as 4 inches, mainly across the higher elevations along the Tennessee border. However, even valley locations as far south and east as Cashiers, Black Mountain, and Brevard saw up to a half inch of snowfall.
11/21/2008	Light snow showers began falling across the mountains of North Carolina around midnight, and continued off and on through the overnight and morning hours. Total accumulations ranged from trace amounts in the lower elevations near the Blue Ridge to as much as 3 or 4 inches in the higher elevations near the Tennessee border.
1/8/2009	Northwesterly, upslope winds brought a period of light to moderate snow showers to the southwest mountains of North Carolina, primarily along the Tennessee line. Accumulations ranged from 1 to 3 inches, mostly above 3000 feet.
1/13/2009	Light to moderate snow showers developed across much of the North Carolina mountains during the late evening. Snowfall amounts ranged from trace amounts to 3 inches or so in areas from the Smokies, to the lower and middle French Broad Valley, to the northern mountains.
1/17/2009	Snow showers developed across the mountains of western North Carolina during the late evening, and continued off and on for much of the night, before tapering off on the morning of the 18th. Snow accumulations ranged from trace amounts to amounts of around 3 inches.
2/2/2009	Light snow showers developed during the evening of the 2nd, and continued off and on for two days. Total accumulations ranged from amounts up to 2 inches in the lower elevations, to about 4 inches across many high elevation areas. Locally higher amounts occurred in the higher elevations along the Tennessee border.
3/1/2009	Light rain changed to light snow across portions of the southwest mountains of North Carolina during the early afternoon hours. The snow continued off and on through the afternoon before ending during mid-evening. Accumulations generally ranged from a dusting to an inch.
10/17/2009	The first high elevation snowfall of the season occurred as moist northwest flow developed behind a strong cold front, resulting in scattered snow showers. Accumulations were mainly confined to areas along the Tennessee border, above 4000 feet, where as much as 2 inches fell. However, locations as far south as the high elevations above Lake Toxaway saw a dusting.
12/18/2009	A strengthening area of low pressure moved out of the Gulf of Mexico, across southern Georgia, and then up the southeast coast. As the low passed south of the region, snow became heavy across the southern and central mountains, as well as the Smokies and surrounding valleys late in the morning. Heavy snow developed a little later over the northern mountains. The heavy snow continued throughout the afternoon. Snowfall rates of 1-2 inches per hour became common across the area during the afternoon. Meanwhile, warming temperatures allowed the snow to mix with and eventually change to rain and sleet in the southwest mountain valleys. The heavy, wet snow combined with gusty winds to cause numerous trees and power lines to fall across the area during the afternoon. Widespread power outages resulted, and some customers were without power for as much as a week. Even longer outages affected parts of the northern mountains. ||The snow ended over the Blue Ridge and the central mountains on the evening of the 18th. However, wrap around snow showers developed along the Tennessee line, resulting in additional snow accumulations overnight and into the morning hours of the 19th. Total accumulations ranged from 12-18 inches across the lower northern mountain valleys, to 2-3 feet in the higher elevations along the Tennessee border, and in areas along the eastern escarpment. Over the southern and central mountains, total accumulations ranged from 6-10 inches in the lower elevations near the southern escarpment, to as much as 2 feet in the higher elevations. While the southwest mountain valleys generally saw only 3-5 inches, 2-3 feet of total snowfall was reported in the higher elevations of the Smokies and along the Cherohala Skyway in Graham County. Hundreds of traffic accidents were reported during the storm, and continued for several days thereafter, as continuous melting and refreezing of ice and snow resulted in treacherous

Date	Description
	road conditions during the late night and morning hours. Hospitals reported 100s of cases and slips and falls during this time as well.
1/2/2010	A very cold and moist northwest flow resulted in the development of scattered to numerous snow showers across the Tennessee border counties, and the higher elevations of Buncombe County, during the early morning hours. The higher elevations along the Tennessee line saw 2 to 4 inches of powdery snow, while the lower elevations received anywhere from trace amounts to 2 inches. The snow was a little heavier in Avery County, were total accumulations ranged from 2 to 3 inches in the lower valleys to 4-6 inches in the higher elevations along the state line.
1/4/2010	Another round of very cold and moist northwest flow resulted in development of scattered to numerous snow showers across the western mountains overnight on the 4th. The showers persisted off and on through the day of the 5th. 24-hour snowfall totals of 1-4 inches were common across the area, with the highest amounts occurring over the higher elevations. Over Avery County, heavy snow accumulations occurred, with amounts ranging from 2-3 inches near the Blue Ridge, to 6-8 inches in the higher elevations along the Tennessee border.
1/7/2010	A very cold and moist northwest flow resulted in development of scattered to numerous snow showers across the western mountains during the evening of the 7th. The snow showers continued across much of the Tennessee border counties through the day on the 8th, with heavy accumulations reached in some areas by late morning. Total accumulations ranged from 1-3 inches over the lower French Broad Valley, to 3-6 inches across the northern mountains. Over the southwest mountains, total snowfall accumulations ranged from trace amounts in the valleys beneath the Smokies, to 2-4 inches in the higher elevations along the Tennessee border.
1/9/2010	A very cold and moist northwest flow resulted in development of scattered to numerous snow showers across the western mountains during the evening of the 9th, continuing into the 10th. Total snowfall accumulations were highly variable across the area, ranging from trace amounts in the valleys beneath the Smokies to as much as 4 inches in some areas.
2/4/2010	Low pressure moved across the deep south, spreading light snow over the southern mountains of North Carolina during the late afternoon. The snow gradually spread north and east into the North Carolina foothills and piedmont during the evening and overnight hours. The snow mixed with sleet during the evening, before changing to mostly sleet after midnight, then changing to rain as temperatures warmed during the pre-dawn hours. Total accumulations of sleet and snow ranged from trace amounts along the edge of the southern escarpment of the Blue Ridge, to 3 inches north of I-40 and in the higher elevations of the Balsams. Heavier snow fell across the central and northern mountains as well as the foothills of North Carolina, which is detailed elsewhere in Storm Data.
2/10/2010	Moist northwest flow behind a cold front produced numerous snow showers across the western mountains of North Carolina during the early morning hours. Snow began to quickly accumulate, and by late morning, snowfall ranged from trace across the interior valleys from Asheville, to Waynesville, to Franklin, to an inch or two in the valleys near the Tennessee border, to 4 to 5 inches in the higher elevations. Gusty winds of 30 to 40 mph caused periods of blizzard-like conditions, with considerable blowing and drifting snow. A few trees and power lines were blown down across the area as well.
2/12/2010	Light snow developed during the early evening across the mountains, and then quickly spread into the foothills and the western piedmont through the evening. Total snowfall ranged from an inch or two in areas north of I-40, to as much as three inches in areas further to the south.
2/15/2010	A band of light to moderate snow moved rapidly across the North Carolina mountains during the morning. Higher elevations saw as much as 4 inches of snow, with most valley locations receiving an inch or less.
2/15/2010	Scattered to numerous northwest flow snow showers developed on the evening of the 15th, and continued on and off for more than two days. Three-day totals varied widely across the area, depending upon terrain. While the lower elevations from Bryson City, to Waynesville and Sylva, to Asheville saw little more than a dusting, some of the higher elevations along the Tennessee

Date	Description
	border, including the Smokies and the Cherohala Skyway received 6 or more inches during the period.
3/3/2010	Northwest flow snow showers developed during the pre-dawn hours across the Tennessee border counties, and persisted off and on for the next 24 hours. By the morning of the 4th, total accumulations ranged from trace amounts in the valleys below the Smokies, to 2-5 inches in the higher elevations along the state line.
3/22/2010	Snow showers developed over the mountains during the early afternoon, and continued into the evening hours. Total snowfall ranged from trace amounts in the valleys, to as much as 4 inches at the highest peaks.
12/4/2010	A storm system brought light snow to the high elevations of the North Carolina mountains early on the 4th. By early afternoon, 1 to 3 inches of snow was reported across the higher elevations, mainly above 3500 feet. After an arctic cold front passed through the area, snow levels dropped quickly during the afternoon and evening, while strong northwest winds resulted in development of scattered to numerous snow showers. The snow showers persisted for almost three days, with snowfall piling up steadily over the ensuing 60 hours. By the morning of the 7th, 3-day accumulations ranged from around 10 inches in the higher elevations of the Smokies, to as much as 18 inches in the higher elevations of the northern mountains. Snowfall totals in the lower elevations were much less, generally 2-6 inches in the valleys of the Tennessee border counties. Gusty winds and very cold temperatures also resulted in wind chill values below 0 in many areas during the overnight and early morning hours.
12/15/2010	Light precipitation fell across the mountains during the evening, and continued for much of the overnight. Precipitation mainly fell as freezing rain, although some areas saw a period of light accumulating snow at the onset. By late morning, most areas had received at least a trace of ice accretion, resulting in very slippery roads. Over the piedmont and foothills, the majority of the precipitation fell as freezing rain and freezing drizzle. Most areas saw at least trace amounts of ice, with some areas along the I-40 corridor seeing as much as a tenth of an inch. Very hazardous driving conditions existed across the northern foothills and northwest Piedmont. Locations closer to I-85 only saw a light glaze on elevated surfaces and patchy slick spots on roads. Hundreds of traffic accidents were reported across the region. Temperatures warmed above freezing in most areas by late morning.
1/5/2011	A weak area of low pressure brought a brief period of light snow to the western mountains of North Carolina during the evening. Total accumulations ranged from 1 to 3 inches across the area.
1/24/2011	A quick shot of snow produced light accumulations in a brief period of time across the mountains during the pre-dawn hours. Although most areas saw little more than a dusting, roads became very slick, and numerous traffic accidents occurred during the morning rush, especially in areas along and north of I-40.
1/26/2011	As low pressure developed off the southeast coast, rain changed to snow across the higher elevations of the North Carolina mountains during the morning, and gradually worked its way toward the valleys as colder air filtered into the region. The widespread precipitation moved away from the region during the afternoon, but developing moist northwest flow resulted in development of scattered to numerous snow showers across the area. By midnight, snowfall accumulation ranged from little more than a dusting in the valleys to 4 or 5 inches in the highest elevations along the Tennessee border.
2/9/2011	A weakening storm system brought light snow to portions of the western Carolinas during the evening. Total accumulations ranged from a dusting to an inch over the Piedmont to 1 to 2 inches across much of the mountains.
3/6/2011	Light snow developed across the higher elevations of the mountains of North Carolina in the wake of a cold front. Accumulations generally ranged from 1 to 4 inches at elevations above 3500 feet. However, some areas above 5000 feet received as much as 7 inches.
3/11/2011	As colder air filtered into the mountains behind a cold front, snow levels dropped to the higher elevations during the evening. Snow showers continued the rest of the night along the Tennessee

Date	Description
	border, where snow totals ranged from 2 to 5 inches at elevations above 4000 feet. However, even some of the western valleys saw around an inch as snow levels continued to drop overnight.
11/29/2011	Rain changed to snow across the higher elevations of the North Carolina mountains during the morning and began to accumulate by early afternoon. The snow began to taper off from the southwest during the afternoon, before ending early on the 30th. Accumulations were generally confined to areas above 3000 feet or so, and most locations only saw on inch or two, although some areas of the northern mountains saw as much as 4 inches.
12/7/2011	Snow showers developed across the western mountains as afternoon temperatures fell rapidly behind a cold front. Accumulating snow was mainly confined to the higher elevations above 3000 feet or so, where as much as three inches accumulated by late evening.
1/2/2012	Snow showers developed across the mountains during the evening behind a very strong cold front. Snow continued off and on through the night and much of the 3rd before ending during the afternoon. Total accumulations ranged from a dusting near the southern Blue Ridge to four inches across the Tennessee border counties. Localized higher amounts were reported in the high elevations along the state line, mainly north of the Smokies. Even where little snow fell, temperatures that fell rapidly into the teens resulted in snow sticking to roadways on the night of the 2nd and early on the 3rd. Dozens of accidents occurred across the region.
10/29/2012	As Superstorm Sandy moved across New England and stalled over the northern Mid-Atlantic region, abundant moisture was transported into the mountains. This caused snow showers to develop mainly across the high elevations of the southern and central mountains of North Carolina during the morning of the 29th which continued off and on through the 30th. Total accumulations ranged from little more than a dusting in most valley locations, to as much as 6 inches in the highest elevations.
11/5/2012	Light snow developed in the southern and central mountains, mainly above 3000 feet. The snow continued off and on overnight, with total accumulations ranging from trace amounts to as much as 2 inches in the higher elevations of the Balsams and Newfound Mountains.
12/29/2012	Snow showers developed behind a cold front by the evening of the 29th, and continued off and on through the night before ending early on the 30th. Valley accumulations ranged from little more than a dusting in the lower elevations beneath the Smokies and the middle French Broad Valley, to an inch or two across the lower French Broad and the high valleys of the northern mountains. Meanwhile, some high elevation locations near the Tennessee border saw 6 inches or more.
1/17/2013	Rain gradually began to change to snow, first in the higher elevations of the central mountains, followed by the northern foothills and the northwest Piedmont. Although snow was heavy at times in the Piedmont, warm ground temperatures and rain mixing in at times resulted in little accumulation. The brief period of heavy snow was accompanied by occasional lightning and thunder in the Piedmont. Total accumulations ranged from trace amounts in the central mountain valleys to 1-3 inches across the higher elevations, to generally 2 inches or less across the northern foothills and northwest Piedmont.
2/1/2013	Snow showers developed across the mountains around midnight and continued off and on through the morning hours. Accumulations ranged from less than an inch in the valleys surrounding the Smokies to 1-4 inches across much of the northern mountains and the lower French Broad Valley. High elevations along the Tennessee border saw slightly higher amounts.
2/2/2013	Light snow developed across the mountains during the late morning and continued off and on through much of the day. Snow tapered off during the evening, but redeveloped for a short period of time during the morning of the 3rd. Total accumulations generally ranged from 1-4 inches.
2/19/2013	Precipitation developed across the mountains during the early morning hours. Precipitation fell mainly as snow in the high elevations, but snow levels quickly worked their way down to the valleys by sunrise before coming to an end. Most areas above 3000 feet saw 1 to 3 inches of snow, with locally higher amounts, especially across the Balsams and Nantahalas. Valley locations saw accumulations from a light dusting to around an inch.

Date	Description
3/2/2013	Snow showers moved away from the usual Tennessee border areas during the early morning hours of the 2nd, tapering off by late morning. Most locations near the southern Blue Ridge saw an inch or two of snow, with some high elevation areas reporting 3 or 4 inches.
3/5/2013	Snow showers developed across the mountains during the evening of the 5th and continued through the overnight hours, with heavy snowfall criteria reported in many areas by dawn. Total accumulations generally ranged from 2 to 5 inches across the area. Some valley locations saw a little less, while the higher elevations saw as much as 8 inches. Very gusty winds also resulted in considerable blowing and drifting of the snow.
3/20/2013	Snow showers developed over the western mountains during the evening of the 20th and continued off and on through the mid-morning hours of the 21st. Total accumulations ranged from 1 to 3 inches across the Tennessee border from Haywood County north, and across the higher elevations of the southern mountains.
3/25/2013	Snow showers developed during the early morning hours of the 25th and continued off and on throughout the day. Synoptically enhanced northwest flow snow showers became heavy overnight across the western mountains, and by the afternoon hours of the 26th storm total snowfall amounts of 4 to 8 inches were common across the area. Snow showers continued through the early morning hours of the 27th across the higher elevations near the Tennessee border, where totals of a foot or more were prevalent. Heavy snowfall was mainly confined to areas above 3000 feet or so in the southern and central mountains, but was a little more widespread in the northern mountains.
11/26/2013	As cold air spilled into the North Carolina mountains in the wake of an arctic cold front, rain quickly changed to snow during the pre-dawn hours. Periods of moderate and briefly heavy snow were reported at times. Precipitation ended in most areas by late morning. However, northwest flow snow showers continued across the Tennessee border counties through the 27th before ending around midnight. Most areas saw an inch or less of accumulation. However, 2-4 inches fell across the higher elevations along the Tennessee border, although accumulations were difficult to report owing to wind gusts up to 50 mph causing considerable blowing and drifting snow.
1/2/2014	After a strong cold front introduced much colder air to the mountains, snow showers developed across the mountains during mid-evening and continued into the overnight hours. Light accumulations were primarily confined to areas above 3500 feet, where 1-4 inches accumulated by the pre-dawn hours. Locally higher amounts occurred on the higher peaks near the Tennessee border. Lower elevations saw little more than a dusting. Very strong northwest winds gusting as high as 50-60 mph also resulted in considerable blowing and drifting of snow in the high elevations.
1/28/2014	Light snow developed across the mountains during the morning and continued into the afternoon before tapering off. The snow initially melted on roads. However, air temperatures rapidly cooling into the lower and mid 20s caused many roads to subsequently freeze. Although snowfall totals were very light (an inch or less in most areas), the slick roads caused hundreds of traffic accidents, including a school bus that overturned in Henderson County.
2/10/2014	Light to moderate snow developed across the central and northern mountains during late morning and continued off and on through the afternoon. While most locations saw an inch or less, a small band of moderate to heavy snow developed during the afternoon from the high elevations of northern Jackson County, through central Haywood, and central and southern Buncombe Counties, where two-to-four-inch amounts were common. Some high elevation areas saw as much as 5 inches in this area. Several accidents in the Balsam area resulted in major traffic problems on Highway 74 near the Haywood/Jackson line.
2/12/2014	A Miller type-A low pressure system moved up along the South Carolina coast bringing widespread heavy snow to the mountains of western North Carolina. Total accumulations generally ranged from 5-9 inches across the area, although locations above 4000 feet or so saw 1-1.5 feet.

Date	Description
3/24/2014	As an upper air disturbance approached the region from the west, light to moderate snow developed across the North Carolina mountains around midnight early on the 25th, mainly in the high elevations of the southern mountains, and across much of the central and northern mountains (including the valleys) near the Tennessee border. The bulk of the snow accumulated during the morning of the 25th, when 2-4 inches fell across a fairly large area. Snow showers then redeveloped within northwest flow behind a cold front across the Tennessee border counties during the afternoon, resulting in additional accumulations, although those were primarily confined to the high elevations along the Tennessee border. Total accumulations ranged from 2-4 inches in the valleys across the Tennessee border counties (from I-40 north) and in the high elevations of the southern mountains, to 4-8 inches in the higher elevations along the Tennessee border.
3/29/2014	Snow showers developed behind a strong cold front across the western mountains late on the evening of the 29th and continued off and on through the night before tapering off around sunrise. Total accumulations were generally in the 1–2-inch range across the high elevations and in the valleys from around I-40 north. However, locally heavy snowfall in the 6-10\ range was reported in the higher elevations of the Smokies.
10/31/2014	Precipitation associated with a strong upper-level disturbance and associated strong cold front changed to snow at the highest peaks and ridge tops by early Halloween evening, with snow levels dropping rapidly to the valley floors by the end of the evening as an arctic air mass infiltrated the region behind the front. Snowfall accumulation by midnight was mainly confined to the high elevations, although the snow continued into the morning of the 1st.
11/26/2014	Rain associated with a cold front changed to snow across the high elevations of the North Carolina mountains during the early morning hours of the 26th. The snow was brief, but heavy at times, with a quick couple of inches accumulating in some areas. the precipitation ended by mid-morning, but snow showers redeveloped near the Tennessee border during the afternoon on a cold and moist northwest flow. Accumulating snowfall continued off and on across the Tennessee border counties through the evening and overnight hours before tapering off during the morning of the 27th. Total accumulations ranged from up to two inches in the valleys north of I-40 near the Tennessee border, to 2-6 inches with locally higher amounts in the high elevations, mainly above 4000 feet.
1/26/2015	Snow developed across the higher elevations of the North Carolina mountains as a cold front moved across the area during the early morning of the 26th. A quick 2-4 inches fell during the morning, mainly above 4000 feet. After a brief lull, a moist northwest flow developing behind the front resulted in scattered to numerous snow showers developing near the Tennessee border by afternoon, which continued off and on through the 27th. 36-hour accumulations ranged from 4-8 inches across the high elevations (mainly above 4000 feet), while the valleys saw little more than a dusting. The highest totals occurred across the Smokies, Balsams, and surrounding mountains.
2/16/2015	Sleet and snow overspread the mountains and foothills of North Carolina during the afternoon and began to accumulate. Precipitation changed quickly to sleet in most areas, before mixing with freezing rain from southwest to northeast during the late afternoon and early evening. Sleet and freezing caused deteriorating road conditions by early evening, when heavy accumulations of sleet and/or freezing rain were reported across much of the area. Most locations saw around a half inch to an inch of sleet, along with around a tenth of an inch of ice accretion. The valleys of southwest North Carolina saw more freezing rain than sleet, with about one quarter inch of ice reported. Scattered power outages were therefore more concentrated there. Meanwhile, the northern foothills saw mostly sleet, with many areas reporting 2 to 3 inches of accumulation. Roads became very treacherous and impassable in many areas until melting began on the afternoon of the 17th.
2/18/2015	Snow showers developed across the Southern Appalachians along and immediately behind a strong arctic cold front that swept across the region during the afternoon of the 18th. Snow

Date	Description
	tapered off in most areas through the evening, the only exception being locations across the far western North Carolina mountains, where snow showers didn't taper off until the pre-dawn hours of the 19th. Total accumulations ranged from a dusting up to an inch in locations closer to the South Carolina border and the lower valleys surrounding the Smokies, to 2-4 inches in the valleys north of I-40 near the Tennessee border. Locally, much higher amounts occurred across the high peaks and ridge tops near the Tennessee border. Combined with the snowfall from the storm of the 16th/17th, areas above 5000 feet reported 1-2 feet of snow on the ground by the morning of the 19th. Very strong winds resulted in considerable blowing and drifting of snow and periods of blizzard-like conditions across these high elevations.
2/20/2015	Light snow developed across portions of the southern Appalachians during the evening of the 20th in association with a warm front. The snow began to mix with or change to sleet in some areas during the overnight before a transition to rain occurred around daybreak on the 21st. Accumulations ranged from a half inch to an inch, with locally higher amounts of around 2 inches in areas that saw only snow.
2/23/2015	Light snow associated with a wave of low pressure overspread the southern Appalachians by late evening of the 23rd, and continued into the overnight. Snow, heavy at times, continued into the pre-dawn hours, when heavy snow accumulations were reported across much of the area. Total accumulations were generally in the 3-to-5-inch range, with locally higher amounts reported in the high elevations. The snow tapered off shortly after sunrise.
2/25/2015	After the significant snowfall that fell across the mountains on the morning of the 24th, an area of low pressure moving along the Gulf Coast spread yet another round of snow across the southern Appalachians during the evening of the 25th. The snow was heavy at times, and quickly accumulated. Heavy accumulations were reported in many areas by late evening. By the time the snow tapered off during the early morning of the 26th, total accumulations ranged from 4 to 6 inches, with locally higher amounts across the mountains.
3/27/2015	Snow showers developed across the western North Carolina mountains during the evening and continued through the overnight before dissipating during the pre-dawn hours. Accumulations generally ranged from 1-2 inches in the lower elevations, while the high elevations near the Tennessee border saw 2-4 inches.
1/20/2016	Light snow developed over the mountains of North Carolina in association with an upper air disturbance during the morning. The snow continued off and on through much of the day before winding down during the evening. The most significant accumulations were above 4000 feet or so, where amounts ranged from 5 to 8 inches. Meanwhile, valley totals ranged from a half inch across the upper French Broad Valley to around 3 inches across the high valleys of the northern mountains.
1/22/2016	Light snow developed around midnight across the southwest mountains of North Carolina in association with an area of low pressure. The snow became moderate to heavy at times during the pre-dawn hours. By sunrise, accumulations of 2-6 inches were common across the area. Warm air began filtering into the valleys from the southwest through the morning, and by late morning, most of the Little Tennessee Valley and surrounding valleys south of the Smokies had transitioned to rain. Total accumulations ranged from 2-5 inches in the far southwest valleys, to more than a foot across the high elevations and the upper French Broad Valley, where the cold air remained in place through the day.
2/8/2016	A moist northwest flow developing in the wake of a strong arctic cold front brought a protracted period of scattered to numerous snow showers to the far western mountains of North Carolina. Although snow showers developed off and on over a 60-hour period, most valley locations received rather light accumulations, generally of 2-5 inches, with locally higher amounts reported close to the Tennessee border. This was especially the case over northern Madison County, where a small band of moderate to heavy snow developed off and on, and some locations saw storm total amounts of as much as a foot there. Otherwise, the highest totals were found above 4000 feet, where storm total amounts ranged from 12-18 inches.

Date	Description
3/20/2016	A moist northwest flow interacted with an unseasonably cold air mass to produce snow showers across the mountains, especially across the Tennessee border counties during the afternoon and evening. Accumulating snowfall was confined to the high elevations, mainly above 4000 feet, where totals ranged from 2 to as high as 6 inches across the Smokies and the Balsams.
1/29/2017	A strong upper air disturbance combined with moist northwest winds flowing up the western slopes of the Appalachians resulted in development of numerous snow showers across the North Carolina mountains throughout the 29th and into the early part of the 30th. The most significant impacts were to the high elevations (above 5000 feet) of the northern mountains, where as much as a foot of snow fell. Meanwhile, total accumulations in the high valleys of the northern mountains were generally in the 2–4-inch range. Farther south, accumulations in the high elevations of the Smokies and other ranges along the Tennessee border were from 2 to 5 inches, while the lower valleys from the French Broad south saw little more than an inch.
3/11/2017	An upper-level disturbance interacting with an unseasonably cold air mass resulted in light to moderate snow overspreading the North Carolina mountains late on the 11th, continuing through the overnight hours before tapering off on the morning of the 12th. Total snowfall accumulation generally ranged from 1-3 inches. However, some locations received as much as 5 inches, particularly near the South Carolina border.
3/14/2017	As low pressure moved up the East Coast, light precipitation developed over western North Carolina during the evening of the 13th, beginning as rain in most locations. As colder air wrapped into the area behind the low, snow levels dropped, allowing all but the lower valleys to transition to snow. Moist northwest flow resulted in the precipitation retreating to the Tennessee border areas with time. Total accumulation was generally in the 3-to-5-inch range for elevations above 3500 feet or so, while the lower valleys saw anywhere from trace amounts to around a couple of inches.
12/8/2017	As moisture associated with developing and strengthening low pressure over the northeast Gulf of Mexico overspread the western Carolinas, snow developed over the mountains of southwest North Carolina around daybreak on the 8th and quickly accumulated. By late morning, heavy snowfall accumulations were reported across the Smoky Mountains and Balsams and vicinity. Total accumulations generally ranged from 8-12 inches, with locally higher amounts well over a foot reported in the higher elevations, and lower amounts reported in the low valleys along the Tennessee border. While occasional flurries and light snow showers produced locally light additional accumulations into the early daylight hours of the 9th, the accumulating snow ended in most areas shortly after midnight.
1/17/2018	As a strengthening upper-level disturbance and associated cold front approached the region from the Tennessee Valley, light precipitation developed across the North Carolina mountains around midnight. While the precipitation may have started as rain or a rain/snow mix in the lower valleys, a transition to snow had occurred in most locations by daybreak. As the snow band moved east, snowfall rates increased with time such that the highest totals were found north and east of the Balsams, where amounts of 2-4 inches were common. Meanwhile, locations west of the Balsams generally saw 1-2 inches.
3/7/2018	A moist northwest flow developing in the wake of a cold front resulted in snow shower development near the Tennessee border throughout the morning of the 7th. Snow showers were somewhat scattered and accumulations were largely dependent upon terrain exposure and elevation. Most locations saw from a dusting to up to 2 inches. However, localized amounts of 4 to 6 inches were reported, primarily in the high elevations.
3/21/2018	Light rain developed across the mountains during the evening of the 20th in association with an area of low pressure and associated cold front that moved across the area. Strong northwest winds developing in the wake of this system ushered in a much colder air mass, which allowed the rain to turn to snow in most locations shortly after midnight on the 21st. The northwest flow acting in a moist environment resulted in development of numerous snow showers near the Tennessee border throughout the 21st. By the time the snow showers tapered off during the late

Date	Description
	evening, accumulations generally ranged from 1 to 3 inches across the valleys, while the higher elevations received anywhere from 4 to 10 inches.
12/21/2018	Rain changed to snow across the high elevations of the North Carolina mountains as freezing levels quickly fell in the wake of a strong cold front. A cold and moist northwest flow developing in the wake of the front across the Tennessee Valley and the southern Appalachians resulted in scattered to numerous snow showers continuing near the Tennessee border throughout the afternoon and evening of the 21st, through the morning of the 22nd. Accumulations were mainly confined to elevations above 3500 feet, where 1 to 3 inches generally fell. Some locations above 5000 feet reported as much as a half foot.
12/1/2019	Arctic air filtering in behind a cold front, along with a moist northwest flow resulted in the first notable snowfall event of the season for portions of the North Carolina mountains. Scattered to numerous snow showers continued through the day of the 2nd before tapering off during the early morning of the 3rd. Total accumulations were largely elevation dependent, with only a dusting up to an inch reported in the valleys, with 2-4 inches reported above 3500 ft or so. Locally higher amounts were reported in the higher elevations along the Tennessee border.
1/27/2020	Precipitation developed across western North Carolina early on the 27th in association with an upper-level disturbance. Temperatures above roughly 3500 feet were cold enough for much of this precipitation to fall as snow. By the time the snow tapered off to light snow showers and flurries late in the evening, accumulations of 2 to 4 inches were common in the high elevations, with some locally higher totals.
2/8/2020	Precipitation associated with developing low pressure along the Gulf Coast overspread far southwest North Carolina during the morning. Temperatures were cold enough in most areas for the precipitation to fall as snow. The snow, which was heavy at times quickly accumulated. Heavy snowfall totals were realized in many areas by around noon, and by the time the snow tapered off during early/midafternoon, total accumulations generally ranged from 3 to 6 inches.
2/21/2020	Moisture overspreading a southward-moving cold front resulted in development of precipitation across the North Carolina mountains throughout the daylight hours of the 21st. Temperatures were cold enough in most locations for this precipitation to fall as snow, although rain mixed in at times below about 2500 feet. By the time the snow tapered off during the evening, snowfall totals ranged from trace amounts up to an inch in the lower interior valleys, to 1 to 4 inches above 2500 feet and in the valleys near the Blue Ridge.
2/28/2020	A strong upper-level disturbance crossing the southern Appalachians resulted in redevelopment of snow showers across the North Carolina mountains throughout the 28th and early on the 29th. The relatively long duration of the event along with the enhanced lift from the disturbance allowed for higher accumulations than normally seen during northwest flow events, while accumulating snowfall was also reported well south and east of the usual Tennessee border areas, including across portions of the middle and upper French Broad Valley. Total amounts were generally in the 2–4-inch range, although amounts as high as 8 inches were reported on some of the high peaks and ridge tops.
11/30/2020	Snow levels fell quickly across the North Carolina mountains during the evening in the wake of a strong cold front. Strong northwest winds pushing moisture up the western slopes of the Appalachians resulted in development of numerous to widespread snow showers near the Tennessee border. By midnight on the 1st, accumulations of up 2 inches were reported, with locally higher amounts above 3500 feet. The snow showers continued into the 1st, when heavy snowfall totals were realized during the pre-dawn hours.
12/1/2020	Snow showers that began across western North Carolina during the evening of the 30th continued through the morning of the 1st as strong northwest winds pushed moisture up the western slopes of the Appalachians resulted in development of numerous to widespread snow showers near the Tennessee border. By the time the snow showers tapered off around noon on the 1st, snow accumulations ranged from 1 to 4 inches, with locally higher amounts in the higher elevations along the Tennessee border.

Date	Description
1/7/2021	Snow developed across the mountains and foothills of North Carolina during the evening of the 7th as an area of low pressure moved across the coastal plain of Georgia and the Carolinas. The snow mixed with or changed to rain in many areas before tapering off during the daylight hours of the 9th. Total accumulations were generally in the 1-to-3-inch range, although some areas above 2500 feet or so saw as much as 4 inches.
2/1/2021	Snow showers developed across the Tennessee border counties of North Carolina as strong northwest winds developed in the wake of a cold front, pushing moist and cold air up the western slopes of the mountains. By the time the snow showers tapered off to flurries and light snow showers late on the 2nd, total snow accumulations of 1 to 5 inches were reported across Graham County and across far northern Buncombe County near the Madison and Yancey County lines.
2/6/2021	Snow developed across the North Carolina mountains during the afternoon and evening of the 6th and continued through the overnight as a cold front approached from the Tennessee and Ohio Valleys. By the time the snow tapered off during the morning of the 7th. Total accumulations ranged from 2 to 4 inches across the area, with some locally higher amounts reported above 3500 feet or so.
Haywood County	
1/16/2000	A quick burst of freezing rain and sleet caused numerous traffic accidents across the mountains. The precipitation was light - less than a tenth of an inch in most places, but as high as one third inch near Robbinsville.
12/13/2000	
2/6/2002	Light snow and sleet fell for much of the day. Up to 2 inches of accumulation was reported in a few locations, while most areas had only a dusting. By late afternoon, most locations had changed over to rain.
12/14/2002	Snow accumulated to 1 to 3 inches, with the highest amounts occurring in the highest elevations. Wind gusts to 50 mph also caused some isolated tree damage.
12/22/2002	Freezing rain developed during the early morning across the North Carolina mountains, and some roads and bridges became ice covered. A few traffic accidents resulted.
12/25/2002	Light snow fell throughout the day across the North Carolina mountains, resulting in snowfall amounts of between a trace and 3 inches within the valleys. Four-to-six-inch amounts were common in the higher elevations from Madison County northward.
1/6/2003	Light snow fell for much of the day across the western mountains of North Carolina. By evening, 1 to 3 inches had accumulated, mainly in areas above 3000 feet. The snow was accompanied by wind gusts of up to 50 mph.
1/19/2003	Mainly light snow produced accumulations of 1 to 2 inches across much of the North Carolina mountains, although some high elevation areas along the Tennessee border received 3 to 6 inches, while locations near the Blue Ridge received little more than a dusting. In addition, gusty winds resulted in blowing snow across a portion of the area, with some snow drifts to one-and-a-half feet.
1/26/2003	Light snow fell across the North Carolina mountains during the evening of the 26th, and by early morning on the 27th, up to 3 inches of snow had accumulated. The heaviest amounts occurred in the highest elevations along the Tennessee border, while locations near the Blue Ridge received little more than a dusting.
2/9/2003	An extended period of intermittent light snow produced spotty accumulations of 1 to 2 inches within the major valleys of the North Carolina mountains. The higher elevations received as much as 4 inches, especially the highest peaks along the Tennessee border.
2/23/2003	Light snow resulted in accumulations of an inch or less across the mountains along the Tennessee border. This resulted in some slick spots on area roads.
3/30/2003	A light, wet snow developed around midnight across the southern and central mountains, and gradually intensified through dawn. By sunrise, 1 to 2 inches had accumulated across much of the area.

Date	Description
3/30/2003	After a brief lull, snow redeveloped during the afternoon across the mountains. By midnight, an additional 1 to 3 inches of snow had fallen, mainly in areas along the Tennessee border. Some of the highest peaks received as much as an additional 6 inches.
11/28/2003	The first significant snowfall of the season dumped 1 to 3 inches of snow in some of the major valleys of the North Carolina mountains, and in the higher elevations of the foothills. As much as 6 inches accumulated in the higher elevations of the Balsams and the Smokies.
12/3/2003	Light snow, mixed at times with sleet, fell across the North Carolina mountains, accumulating up to an inch in some areas.
12/4/2003	Heavy snow and sleet began during the early morning hours across the North Carolina mountains, and by late afternoon had accumulated to 3 to 4 inches across much of the area. Some slopes with an eastern exposure had up to 5 inches.
12/5/2003	Light snow fell across portions of the North Carolina mountains during the evening. Accumulations in most locations were an inch or less, although some locations along the Tennessee border received 2 to 3 inches.
12/10/2003	A mix of freezing rain, sleet, and snow fell across portions of the North Carolina mountains, resulting in some slick roads. Some of the highest elevations received up to an inch of snowfall.
12/18/2003	Light snow developed during the evening of the 18th across the North Carolina mountains. Accumulations were light during this time, but some icy roads developed in the higher elevations. The snow became heavier late in the evening.
1/9/2004	Light snow developed across much of western North Carolina during the early morning hours of the 9th. By mid-morning, 1 to 2 inches had accumulated across much of the area. There were some isolated 3-inch amounts in the higher terrain along the Tennessee border. Many roads became slick and hazardous.
1/27/2004	Light snow developed across the Tennessee border counties during the evening of the 27th, and continued into the early morning hours of the 28th. Accumulations of 1 to 3 inches occurred, mainly right along the state line.
2/2/2004	Light freezing rain developed during the morning hours across the North Carolina mountains. This resulted in a thin layer of glaze that was responsible for numerous traffic accidents.
2/5/2004	Light freezing rain developed during the afternoon across portions of the southern mountains. Light ice accretion occurred mainly on elevated surfaces, although a few slick spots developed on roads near Highlands and Cashiers.
3/30/2004	Light snow fell across much of the southern and central mountains, as well as the foothills, but accumulations were generally an inch or less.
4/13/2004	Light snow fell during the late evening and overnight hours across the North Carolina mountains. Accumulations of up to an inch occurred on grassy surfaces.
12/14/2004	Snow fell, along with winds sustained at 30 mph gusting to 40 mph, and accumulated generally from 1 to 3 inches across much of the mountains. Areas along the TN state line received the most, with areas around Highlands and Cashiers also receiving similar amounts.
1/16/2005	Light snow fell across the mountains during the evening hours. Significant accumulations were mainly confined to the ridgetops and high valleys near the Tennessee border where 1-to-3-inch totals were common. However, a dusting was observed as far south and east as Waynesville and the higher elevations of eastern Buncombe County. Roads became very slick and hazardous, and there were several traffic accidents, particularly in the Newland and Banner Elk areas.
1/22/2005	Light snow fell across the southern and central mountains overnight. The heaviest accumulations occurred near the Tennessee border, where 1–2-inch totals were common. Some of the higher elevations received as much as 4 inches. Accumulations tapered off rapidly toward the east, as locations from Franklin to Waynesville to Asheville received only a dusting. Roads became very slick and hazardous, and there were several traffic accidents, especially on I-40 through Haywood County.

Date	Description
2/2/2005	Light freezing rain began falling during the evening of the 2nd across the mountains, and continued overnight before ending by mid-morning of the 3rd. Up to 1/8 inch of ice accumulated, mainly on elevated surfaces. Slick spots developed on roads, and trees fell here and there across the area.
2/10/2005	Light snow began to fall during the pre-dawn hours across the mountains, and continued off and on for much of the day. Accumulations ranged from a trace to an inch in locations from Bryson City to Waynesville to Asheville. However, locations along the Tennessee border, including the lower end of the French Broad Valley, received as much as 3 inches. Slick roads resulted in quite a few traffic accidents across the area.
2/27/2005	Wet snow, mixed with rain and sleet at times, began falling across western North Carolina during the evening of the 27th, and continued into the morning hours of the 28th. Total snow accumulations ranged from a trace across the southwest mountain valleys and lower elevations of the foothills and piedmont south of I-40, to 2 inches in the higher elevations, and in piedmont and foothills locations north of I-40. By around sunrise on the 28th, most of the precipitation had changed to rain.
2/28/2005	Snow showers redeveloped during the evening of the 28th, continuing off and on through the evening of the 1st. Additional snowfall accumulations of 1 to 2 inches were observed. The higher elevations along the Tennessee border were the main areas affected. However, some valley locations as far east as northern Buncombe and northern Jackson counties received light accumulations.
3/1/2005	Snow showers redeveloped during the evening of the 28th, continuing off and on through the evening of the 1st. Additional snowfall accumulations of 1 to 2 inches were observed. The higher elevations along the Tennessee border were the main areas affected. However, some valley locations as far east as northern Buncombe and northern Jackson counties received light accumulations.
3/8/2005	Snow showers developed behind a cold front across the western mountains during the morning hours and continued through much of the day. By the time the snow tapered off to flurries during the evening, isolated accumulations as high as 6 inches were observed in the higher elevations along the Tennessee border. However, the valleys generally received less than 2 inches.
3/11/2005	Snow showers developed behind a cold front across the western mountains during the afternoon of the 11th, and continued into the early morning hours of the 12th. By the time the snow ended, accumulations generally ranged from a trace to 2 inches across the area, although isolated higher amounts occurred in the higher elevations.
3/17/2005	Wet snow, mixed at times with rain and sleet developed during the early morning hours across western North Carolina, and persisted through late morning. By the time the snow ended, accumulations ranged from just a dusting in the southwest mountain valleys and southern piedmont areas, to as much as 3 inches in areas north of I-40. Slushy roads led to a few traffic accidents across the area.
4/2/2005	Wet snow, heavy at times, developed in the higher elevations of the North Carolina mountains during the morning. By early evening, snowfall amounts ranged from trace amounts to 4 inches, mainly in areas above 3500 feet. By early evening, some of the highest elevations reached heavy snowfall criteria, mainly above 4000 feet. Light accumulations were reported in locations as low as 3000 feet. Meanwhile, the major valleys received mostly rain.
4/23/2005	A late season storm brought significant snowfall to the mountains of North Carolina. Accumulations were highly variable across the area, with as much as 8 inches falling in the higher elevations. However, even locations in the lower French Broad Valley observed up to 3 inches.
11/21/2005	Rain quickly transitioned to heavy snow across the higher elevations of the North Carolina mountains during the evening of the 21st. Snow quickly accumulated to depths of 1 to 3 inches, mainly in areas above about 3500 feet. Highway 441 was closed through the Smokies for a brief period of time. Portions of the Blue Ridge Parkway were also reported to be slick and hazardous. Mainly rain fell in the valleys during this time.

Date	Description
11/21/2005	By mid-evening, heavy snowfall began accumulating in the higher elevations of Haywood County, with around 4 inches of snow reported along the Blue Ridge Parkway. Isolated amounts of up to 8 inches were reported, particularly in the eastern part of the county. Precipitation mainly fell as rain, with perhaps some wet snow mixed in at times in the valleys.
12/3/2005	Light freezing rain developed in the higher elevations of the mountains during the morning, and continued into the afternoon. Ice accretion was mainly confined to elevated surfaces, but a few slick spots did develop. Locations below about 3500 feet observed mainly rain.
12/8/2005	
12/15/2005	Freezing rain developed around midnight across the mountains, and continued into the late morning before transitioning to mainly rain. Ice accretion ranged from a trace up to an eighth of an inch. The impact of the event was much greater further south and east toward the Blue Ridge.
12/26/2005	Snow showers began around midnight and persisted through the overnight and morning hours across the western mountains. For the most part, accumulations ranged from 1 to 2 inches along the Tennessee border, with only trace amounts reported in areas from Robbinsville, to Bryson City, to Waynesville and Marshall. Isolated amounts of 3 to 5 inches were reported, especially in the higher elevations of Madison County.
1/14/2006	Snow developed across the mountains during the early morning hours, and was periodically heavy before tapering off to flurries and light snow showers later in the morning and during the afternoon. Total accumulations generally ranged from a trace to 3 inches, although there were some locally heavier amounts in the higher elevations. Accumulating snow extended into the higher elevations of the foothills, with around 3 inches reported at Little Switzerland.
1/30/2006	Rain changed to snow or a rain and snow mixture across the mountains of North Carolina for a brief period during the evening. In some locations, snow quickly accumulated to 1 to 2 inches before ending, mainly in areas above 3000 feet.
2/8/2006	
2/11/2006	
2/18/2006	The southern valleys saw a mixture of sleet, snow, and rain, while the central valleys and higher elevations saw sleet, snow and freezing rain which developed around sunrise and continued off and on through most of the day. Precipitation amounts were light, but numerous slick spots developed on roads, especially in the higher elevations. Numerous accidents resulted.
3/20/2006	A brief period of heavy sleet developed across portions of the central mountains, foothills, and western piedmont of North Carolina during the morning. Although there was little or no accumulation, trace amounts of sleet accumulated on some roads, causing several traffic accidents. The precipitation transitioned to rain in the afternoon.
3/22/2006	Snow developed across the higher elevations of the North Carolina mountains during the evening and persisted through the overnight hours. By the morning of the 23rd, snow had accumulated to 1-3 inches, mainly in areas above 4000 feet.
11/19/2006	The first significant snowfall of the season in the North Carolina mountains mainly affected areas along the Tennessee border above 4000 feet. Accumulations of up to 4 inches were reported across the higher elevations along the Cherohala Skyway, in the Smokies, and across the northern mountains. Some light snow and sleet occurred in the valleys, but accumulations were limited to a dusting at best.
12/7/2006	Light snow accumulated to depths ranging from a trace in the valleys to up to 2 inches in the higher elevations near the Tennessee border. The combination of the snow and very cold temperatures caused roads to become very slick and hazardous. Numerous traffic accidents resulted.
12/26/2006	Light to occasionally moderate snow showers produced accumulations of 1 to 3 inches across the western mountains, mainly in elevations above 3000 feet. Valley locations generally received less than an inch.

Date	Description
1/21/2007	Light rain and freezing rain fell across the mountains for much of the day. Ice accretion was most concentrated in areas along and near the Blue Ridge, where around a tenth of an inch of ice accumulation was common, mainly on trees, power lines, and other elevated surfaces. However, some icy spots did develop on roads, and there were sporadic traffic accidents. In locations west of the Blue Ridge, significant accumulations of ice were mainly confined to the higher elevations, as the valleys warmed above freezing early in the day.
1/28/2007	Snow was mainly confined to the highest elevations during the morning. However, snow levels dropped quickly behind a front, and scattered to numerous snow showers produced 1 to 3 inches of snow along the Tennessee border through the day. South of I-40, accumulations were mainly confined to the higher elevations. However, most locations from the lower French Broad valley north received measurable snowfall. Due to very cold temperatures, the snow caused many roads to become slick and hazardous. Numerous vehicle accidents were reported, especially across the northern mountains.
2/1/2007	Light snow began during mid-morning across portions of the central and northern mountains, as well as the northern foothills, and continued through much of the morning. By late morning, snowfall accumulations of up to 2 inches had occurred across much of the area.
1/19/2008	Light rain changed to snow during the morning and afternoon hours across the mountains and foothills. Most locations reported accumulations ranging from trace amounts to less than an inch. However, a few spots received as much as 2-3 inches, particularly along the southern escarpment of the Blue Ridge.
1/31/2008	Freezing rain developed across the mountains during mid-evening and continued into the early morning hours. Roads became slick and hazardous, with a few traffic accidents reported. Ice accretion of up to 1/8 inch or so was reported, resulting in a few downed trees and power lines. During the early morning hours of February 1st, more significant icing developed, but that part of the event will be included in next month's Storm Data.
2/1/2008	Freezing rain developed across the mountains during mid-evening hours of January 31st, and continued into the early morning hours of the 1st. Roads became slick and hazardous, with a few traffic accidents reported. Ice accretion of up to 1/8 inch or so was reported, resulting in a few downed trees and power lines.
10/27/2008	The first mountain snowfall of the season produced accumulations as high as 4 inches, mainly across the higher elevations along the Tennessee border. However, even valley locations as far south and east as Cashiers, Black Mountain, and Brevard saw up to a half inch of snowfall.
11/16/2008	Light snow developed across the Tennessee border counties during the early morning hours, before tapering off by early afternoon. Significant accumulations were mainly confined to elevations above 3000 feet, with little more than a dusting reported in the lower valleys. Accumulations as high as 6 inches were reported on the higher peaks along the state line.
11/18/2008	Light snow accumulated generally along the Tennessee border from I-40 north. Accumulations ranged from a trace in the lower valleys to 3 or 4 inches in the higher elevations along the state line.
11/21/2008	Light snow showers began falling across the mountains of North Carolina around midnight, and continued off and on through the overnight and morning hours. Total accumulations ranged from trace amounts in the lower elevations near the Blue Ridge to as much as 3 or 4 inches in the higher elevations near the Tennessee border.
1/8/2009	Northwesterly, upslope winds brought a period of light to moderate snow showers to the southwest mountains of North Carolina, primarily along the Tennessee line. Accumulations ranged from 1 to 3 inches, mostly above 3000 feet.
1/13/2009	Light to moderate snow showers developed across much of the North Carolina mountains during the late evening. Snowfall amounts ranged from trace amounts to 3 inches or so in areas from the Smokies, to the lower and middle French Broad Valley, to the northern mountains.
2/2/2009	Snow showers developed during the evening of the 2nd along the Tennessee border and continued off and on through the overnight hours and through much of the 3rd. One to four

Date	Description
	inches had accumulated in many areas by the evening of the 3rd. Numerous traffic accidents were reported on I-40 through the Pigeon River gorge in Haywood County. Snow showers increased in coverage and intensity during the late evening, then continued for much of the overnight hours. Snow persisted off and on through much of the 4th. Total accumulations ranged from 1 to 4 inches in the lower valleys, to as much as 8 inches in the higher elevations along the Tennessee border.
2/22/2009	Snow showers developed during the pre-dawn hours across the western mountains and continued through the morning. By noon, accumulations of up to 2 inches were reported in the lower French Broad valley and the higher elevations of the interior mountains, while 3 inches or more fell in the highest elevations along the Tennessee border.
3/1/2009	Rain changed to snow across portions of the southern and central mountains, generally in locations from the Balsams to areas north and east, and continued through the afternoon. The snow became heavy at times, and quickly accumulated to 1-4 inches by early evening. Locally higher amounts were reported in the higher elevations of the Balsams and Newfound Mountains. Snow, heavy at times continued into the evening hours. By the time the snow tapered off, accumulations of 2-5 inches were common across the area. However, locally higher amounts occurred, especially in the higher elevations, where up to 10 inches were reported. The heavy wet snow, combined with gusty winds, caused some trees to fall and isolated power outages.
10/17/2009	The first high elevation snowfall of the season occurred as moist northwest flow developed behind a strong cold front, resulting in scattered snow showers. Accumulations were mainly confined to areas along the Tennessee border, above 4000 feet, where as much as 2 inches fell. However, locations as far south as the high elevations above Lake Toxaway saw a dusting.
12/18/2009	A strengthening area of low pressure moved out of the Gulf of Mexico, across southern Georgia, and then up the southeast coast. As the low passed south of the region, snow became heavy across the southern and central mountains, as well as the Smokies and surrounding valleys late in the morning. Heavy snow developed a little later over the northern mountains. The heavy snow continued throughout the afternoon. Snowfall rates of 1-2 inches per hour became common across the area during the afternoon. Meanwhile, warming temperatures allowed the snow to mix with and eventually change to rain and sleet in the southwest mountain valleys. The heavy, wet snow combined with gusty winds to cause numerous trees and power lines to fall across the area during the afternoon. Widespread power outages resulted, and some customers were without power for as much as a week. Even longer outages affected parts of the northern mountains. ||The snow ended over the Blue Ridge and the central mountains on the evening of the 18th. However, wrap around snow showers developed along the Tennessee line, resulting in additional snow accumulations overnight and into the morning hours of the 19th. Total accumulations ranged from 12-18 inches across the lower northern mountain valleys, to 2-3 feet in the higher elevations along the Tennessee border, and in areas along the eastern escarpment. Over the southern and central mountains, total accumulations ranged from 6-10 inches in the lower elevations near the southern escarpment, to as much as 2 feet in the higher elevations. While the southwest mountain valleys generally saw only 3-5 inches, 2-3 feet of total snowfall was reported in the higher elevations of the Smokies and along the Cherohala Skyway in Graham County. Hundreds of traffic accidents were reported during the storm, and continued for several days thereafter, as continuous melting and refreezing of ice and snow resulted in treacherous road conditions during the late night and morning hours. Hospitals reported 100s of cases and slips and falls during this time as well.
12/30/2009	A light mix of sleet and snow developed over the mountains and foothills of western North Carolina during the evening, and continued for much of the overnight. Accumulations ranged from trace amounts over the lower elevations of the foothills, to localized 2–3-inch amounts over the mountains. A few slick spots developed on mountain roads, resulting in quite a few accidents.
1/2/2010	A very cold and moist northwest flow resulted in the development of scattered to numerous snow showers across the Tennessee border counties, and the higher elevations of Buncombe County, during the early morning hours. The higher elevations along the Tennessee line saw 2 to 4 inches

Date	Description
	of powdery snow, while the lower elevations received anywhere from trace amounts to 2 inches. The snow was a little heavier in Avery County, were total accumulations ranged from 2 to 3 inches in the lower valleys to 4-6 inches in the higher elevations along the state line.
1/4/2010	Another round of very cold and moist northwest flow resulted in development of scattered to numerous snow showers across the western mountains overnight on the 4th. The showers persisted off and on through the day of the 5th. 24-hour snowfall totals of 1-4 inches were common across the area, with the highest amounts occurring over the higher elevations. Over Avery County, heavy snow accumulations occurred, with amounts ranging from 2-3 inches near the Blue Ridge, to 6-8 inches in the higher elevations along the Tennessee border.
1/7/2010	A very cold and moist northwest flow resulted in development of scattered to numerous snow showers across the western mountains during the evening of the 7th. The snow showers continued across much of the Tennessee border counties through the day on the 8th, with heavy accumulations reached in some areas by late morning. Total accumulations ranged from 1-3 inches over the lower French Broad Valley, to 3-6 inches across the northern mountains. Over the southwest mountains, total snowfall accumulations ranged from trace amounts in the valleys beneath the Smokies, to 2-4 inches in the higher elevations along the Tennessee border.
1/9/2010	A very cold and moist northwest flow resulted in development of scattered to numerous snow showers across the western mountains during the evening of the 9th, continuing into the 10th. Total snowfall accumulations were highly variable across the area, ranging from trace amounts in the valleys beneath the Smokies to as much as 4 inches in some areas.
1/12/2010	Snow showers developed across the western mountains during the early morning hours. In some areas, the snow changed to freezing drizzle, resulting in extremely slick roads, especially in the Asheville and Weaverville areas. Hundreds of vehicle accidents occurred during the morning rush. Accumulations of ice and snow ranged from trace amounts in the lower valleys to a couple of inches above 3000 feet.
2/4/2010	Low pressure moved across the deep south, spreading light snow over the southern mountains of North Carolina during the late afternoon. The snow gradually spread north and east into the North Carolina foothills and piedmont during the evening and overnight hours. The snow mixed with sleet during the evening, before changing to mostly sleet after midnight, then changing to rain as temperatures warmed during the pre-dawn hours. Total accumulations of sleet and snow ranged from trace amounts along the edge of the southern escarpment of the Blue Ridge, to 3 inches north of I-40 and in the higher elevations of the Balsams. Heavier snow fell across the central and northern mountains as well as the foothills of North Carolina, which is detailed elsewhere in Storm Data.
2/10/2010	Moist northwest flow behind a cold front produced numerous snow showers across the western mountains of North Carolina during the early morning hours. Snow began to quickly accumulate, and by late morning, snowfall ranged from trace across the interior valleys from Asheville, to Waynesville, to Franklin, to an inch or two in the valleys near the Tennessee border, to 4 to 5 inches in the higher elevations. Gusty winds of 30 to 40 mph caused periods of blizzard-like conditions, with considerable blowing and drifting snow. A few trees and power lines were blown down across the area as well.
2/12/2010	Light snow developed during the early evening across the mountains, and then quickly spread into the foothills and the western piedmont through the evening. Total snowfall ranged from an inch or two in areas north of I-40, to as much as three inches in areas further to the south.
2/15/2010	A band of light to moderate snow moved rapidly across the North Carolina mountains during the morning. Higher elevations saw as much as 4 inches of snow, with most valley locations receiving an inch or less.
2/15/2010	Scattered to numerous northwest flow snow showers developed on the evening of the 15th, and continued on and off for more than two days. Three-day totals varied widely across the area, depending upon terrain. While the lower elevations from Bryson City, to Waynesville and Sylva, to Asheville saw little more than a dusting, some of the higher elevations along the Tennessee

Date	Description
	border, including the Smokies and the Cherohala Skyway received 6 or more inches during the period.
3/3/2010	Northwest flow snow showers developed during the pre-dawn hours across the Tennessee border counties, and persisted off and on for the next 24 hours. By the morning of the 4th, total accumulations ranged from trace amounts in the valleys below the Smokies, to 2-5 inches in the higher elevations along the state line.
3/22/2010	Snow showers developed over the mountains during the early afternoon, and continued into the evening hours. Total snowfall ranged from trace amounts in the valleys, to as much as 4 inches at the highest peaks.
12/4/2010	A storm system brought light snow to the high elevations of the North Carolina mountains early on the 4th. By early afternoon, 1 to 3 inches of snow was reported across the higher elevations, mainly above 3500 feet. After an arctic cold front passed through the area, snow levels dropped quickly during the afternoon and evening, while strong northwest winds resulted in development of scattered to numerous snow showers. The snow showers persisted for almost three days, with snowfall piling up steadily over the ensuing 60 hours. By the morning of the 7th, 3-day accumulations ranged from around 10 inches in the higher elevations of the Smokies, to as much as 18 inches in the higher elevations of the northern mountains. Snowfall totals in the lower elevations were much less, generally 2-6 inches in the valleys of the Tennessee border counties. Gusty winds and very cold temperatures also resulted in wind chill values below 0 in many areas during the overnight and early morning hours.
12/15/2010	Light precipitation fell across the mountains during the evening, and continued for much of the overnight. Precipitation mainly fell as freezing rain, although some areas saw a period of light accumulating snow at the onset. By late morning, most areas had received at least a trace of ice accretion, resulting in very slippery roads. Over the piedmont and foothills the majority of the precipitation fell as freezing rain and freezing drizzle. Most areas saw at least trace amounts of ice, with some areas along the I-40 corridor seeing as much as a tenth of an inch. Very hazardous driving conditions existed across the northern foothills and northwest Piedmont. Locations closer to I-85 only saw a light glaze on elevated surfaces and patchy slick spots on roads. Hundreds of traffic accidents were reported across the region. Temperatures warmed above freezing in most areas by late morning.
1/5/2011	A weak area of low pressure brought a brief period of light snow to the western mountains of North Carolina during the evening. Total accumulations ranged from 1 to 3 inches across the area.
1/11/2011	Moist northwest flow resulted in the development of scattered to numerous snow showers during the evening of the 11th. The snow showers persisted overnight and throughout the 12th. Total accumulations were highly variable across the area, but generally ranged from 1 to 6 inches, with some higher amounts in the higher elevations along the Tennessee border.
1/24/2011	A quick shot of snow produced light accumulations in a brief period of time across the mountains during the pre-dawn hours. Although most areas saw little more than a dusting, roads became very slick, and numerous traffic accidents occurred during the morning rush, especially in areas along and north of I-40.
1/26/2011	As low pressure developed off the southeast coast, rain changed to snow across the higher elevations of the North Carolina mountains during the morning, and gradually worked its way toward the valleys as colder air filtered into the region. The widespread precipitation moved away from the region during the afternoon, but developing moist northwest flow resulted in development of scattered to numerous snow showers across the area. By midnight, snowfall accumulation ranged from little more than a dusting in the valleys to 4 or 5 inches in the highest elevations along the Tennessee border.
2/9/2011	A weakening storm system brought light snow to portions of the western Carolinas during the evening. Total accumulations ranged from a dusting to an inch over the Piedmont to 1 to 2 inches across much of the mountains.

Date	Description
3/6/2011	Light snow developed across the higher elevations of the mountains of North Carolina in the wake of a cold front. Accumulations generally ranged from 1 to 4 inches at elevations above 3500 feet. However, some areas above 5000 feet received as much as 7 inches.
3/11/2011	As colder air filtered into the mountains behind a cold front, snow levels dropped to the higher elevations during the evening. Snow showers continued the rest of the night along the Tennessee border, where snow totals ranged from 2 to 5 inches at elevations above 4000 feet. However, even some of the western valleys saw around an inch as snow levels continued to drop overnight.
11/29/2011	Rain changed to snow across the higher elevations of the North Carolina mountains during the morning and began to accumulate by early afternoon. The snow began to taper off from the southwest during the afternoon, before ending early on the 30th. Accumulations were generally confined to areas above 3000 feet or so, and most locations only saw on inch or two, although some areas of the northern mountains saw as much as 4 inches.
12/7/2011	Snow showers developed across the western mountains as afternoon temperatures fell rapidly behind a cold front. Accumulating snow was mainly confined to the higher elevations above 3000 feet or so, where as much as three inches accumulated by late evening.
1/2/2012	Snow showers developed across the mountains during the evening behind a very strong cold front. Snow continued off and on through the night and much of the 3rd before ending during the afternoon. Total accumulations ranged from a dusting near the southern Blue Ridge to four inches across the Tennessee border counties. Localized higher amounts were reported in the high elevations along the state line, mainly north of the Smokies. Even where little snow fell, temperatures that fell rapidly into the teens resulted in snow sticking to roadways on the night of the 2nd and early on the 3rd. Dozens of accidents occurred across the region.
10/29/2012	As Superstorm Sandy moved across New England and stalled over the northern Mid-Atlantic region, abundant moisture was transported into the mountains. The first snow showers of the season developed within this moist northwest flow across the higher elevations of the southwest North Carolina mountains during the pre-dawn hours of the 29th. Snow showers, some heavy, continued through the day and overnight, and by the pre-dawn hours of the 30th, heavy snowfall accumulations were observed across the higher elevations of the Smokies, Balsams, and Newfound Mountains. By the time the snow showers tapered off during the late evening, 1-2 feet of snow was reported in the high elevations (above 4000 feet or so), with the heaviest amounts occurring at the peaks along the Tennessee border. Meanwhile, the lower valleys saw much less snowfall. In fact, some of the lower valleys beneath the Smokies saw little more than flurries.
11/5/2012	Light snow developed in the southern and central mountains, mainly above 3000 feet. The snow continued off and on overnight, with total accumulations ranging from trace amounts to as much as 2 inches in the higher elevations of the Balsams and Newfound Mountains.
12/29/2012	Snow showers developed behind a cold front by the evening of the 29th, and continued off and on through the night before ending early on the 30th. Valley accumulations ranged from little more than a dusting in the lower elevations beneath the Smokies and the middle French Broad Valley, to an inch or two across the lower French Broad and the high valleys of the northern mountains. Meanwhile, some high elevation locations near the Tennessee border saw 6 inches or more.
1/25/2013	Light sleet developed across much of the western Carolinas and northeast Georgia during the morning. The intermittent sleet eventually changed to light freezing rain in most areas by late afternoon. Most areas north of the I-85 corridor saw measurable sleet, generally less than a quarter inch. A light glaze then fell on top of that, making for treacherous driving conditions during the afternoon. Most areas south of the I-85 corridor saw only trace accumulations, but that was enough to cause plenty of slick spots. Hundreds of accidents were reported across the area, especially along the I-85 corridor.
2/1/2013	Snow showers developed across the mountains around midnight and continued off and on through the morning hours. Accumulations ranged from less than an inch in the valleys

Date	Description
	surrounding the Smokies to 1-4 inches across much of the northern mountains and the lower French Broad Valley. High elevations along the Tennessee border saw slightly higher amounts.
2/2/2013	Light snow developed across the mountains during the late morning and continued off and on through much of the day. Snow tapered off during the evening, but redeveloped for a short period of time during the morning of the 3rd. Total accumulations generally ranged from 1-4 inches.
2/15/2013	Light snow and snow showers developed during the evening of the 15th, and continued periodically through the early morning of the 17th. By the time the snow tapered off, most areas had received 1 to 4 inches, with locally heavier amounts in the higher elevations.
2/19/2013	Precipitation developed across the mountains during the early morning hours. Precipitation fell mainly as snow in the high elevations, but snow levels quickly worked their way down to the valleys by sunrise before coming to an end. Most areas above 3000 feet saw 1 to 3 inches of snow, with locally higher amounts, especially across the Balsams and Nantahalas. Valley locations saw accumulations from a light dusting to around an inch.
2/27/2013	Snow showers developed during the late evening of the 27th and continued off and on for several days. Total snowfall across the northern mountains and the high elevations of the Smokies and Newfound Mountains was estimated at 3 to 8 inches, with a foot or more estimated at the peaks and ridge tops of the northern mountains. However, gusty winds causing quite a bit of blowing snow, and long lulls between snow showers allowing for some melting made accurate snowfall totals difficult to come by.
3/1/2013	Snow showers developed during the late evening of February 27th and continued off and on until the afternoon hours of March 2nd. Total snowfall across the northern mountains and the high elevations of the Smokies and Newfound Mountains was estimated at 3 to 8 inches, with a foot or more estimated at the peaks and ridge tops of the northern mountains. However, gusty winds causing quite a bit of blowing snow, and long lulls between snow showers allowing for some melting made accurate snowfall totals difficult to come by.
3/5/2013	Snow showers developed across the mountains during the evening of the 5th and continued through the overnight hours, with heavy snowfall criteria reported in many areas by dawn. Total accumulations generally ranged from 2 to 5 inches across the area. Some valley locations saw a little less, while the higher elevations saw as much as 8 inches. Very gusty winds also resulted in considerable blowing and drifting of the snow.
3/20/2013	Snow showers developed over the western mountains during the evening of the 20th and continued off and on through the mid-morning hours of the 21st. Total accumulations ranged from 1 to 3 inches across the Tennessee border from Haywood County north, and across the higher elevations of the southern mountains.
3/25/2013	Snow showers developed during the early morning hours of the 25th and continued off and on throughout the day. Synoptically enhanced northwest flow snow showers became heavy overnight across the western mountains, and by the afternoon hours of the 26th storm total snowfall amounts of 4 to 8 inches were common across the area. Snow showers continued through the early morning hours of the 27th across the higher elevations near the Tennessee border, where totals of a foot or more were prevalent. Heavy snowfall was mainly confined to areas above 3000 feet or so in the southern and central mountains, but was a little more widespread in the northern mountains.
4/4/2013	Weak low pressure moved south of the region during the daytime hours of the fourth. A light mix of sleet and freezing rain developed across portions of the North Carolina mountains around daybreak and continued into early afternoon. The most significant accumulation of ice and sleet occurred along and near the eastern Blue Ridge in a persistent area of cold air damming. Some areas along the escarpment received almost a quarter inch accumulation of ice. For areas more than 10 or 15 miles from the escarpment, light accumulations were largely confined to areas above 3000 feet.
11/25/2013	Light freezing rain, mixing occasionally with sleet, developed over the North Carolina mountains during the late evening and continued off and on through the overnight. Warming temperatures

Date	Description
	from the southwest forced a transition to rain in most areas after midnight, although freezing rain lingered along the eastern escarpment until just after sunrise on the 26th. Total ice accumulation ranged from trace amounts in the vicinity of the Balsams to near 1/4 inch in areas along the eastern Blue Ridge escarpment. Very slick roads were reported in the northern mountains.
1/2/2014	After a strong cold front introduced much colder air to the mountains, snow showers developed near the Tennessee border during mid-evening. The snow showers lasted through the pre-dawn hours, resulting in heavy accumulations across mainly the higher elevations of the northern and central mountains. Total accumulations were generally in the 3–5-inch range above 3500 feet near the Tennessee border. Locally higher amounts were observed on the high peaks and ridge tops, while most lower valley areas saw anywhere from a dusting to less than two inches. Very strong northwest winds resulted in considerable blowing and drifting snow.
1/15/2014	Snow showers developed near the Tennessee border around daybreak and continued off and on through the day. Accumulations of 1 to 3 inches were primarily confined to elevations above 3500 feet.
1/28/2014	Light snow developed across the mountains during the morning and continued into the afternoon before tapering off. The snow initially melted on roads. However, air temperatures rapidly cooling into the lower and mid 20s caused many roads to subsequently freeze. Although snowfall totals were very light (an inch or less in most areas), the slick roads caused hundreds of traffic accidents, including a school bus that overturned in Henderson County.
2/10/2014	Light to moderate snow developed across the central and northern mountains during late morning and continued off and on through the afternoon. While most locations saw an inch or less, a small band of moderate to heavy snow developed during the afternoon from the high elevations of northern Jackson County, through central Haywood, and central and southern Buncombe Counties, where two-to-four-inch amounts were common. Some high elevation areas saw as much as 5 inches in this area. Several accidents in the Balsam area resulted in major traffic problems on Highway 74 near the Haywood/Jackson line.
2/12/2014	A Miller type-A low pressure system moved up along the South Carolina coast bringing widespread heavy snow to the mountains of western North Carolina. Total accumulations generally ranged from 5-9 inches across the area, although locations above 4000 feet or so saw 1-1.5 feet.
3/6/2014	An intensifying cyclone off the Southeast coast and cold air damming combined to produce a period of rain, sleet, and snow across portions of the southern and central North Carolina mountains as well as portions of the foothills. Precipitation began during the late evening of the 6th. Precipitation changed to rain in most areas after midnight, but not before 1-4 inches of snow had accumulated across the higher elevations of the Balsams, and across the Blue Ridge areas south of I-40. Sleet was favored across the foothills, and some locations saw enough to cover the ground. Meanwhile, rain changed briefly back to heavy snow around daybreak of the 7th, and a narrow corridor along the Blue Ridge areas of Henderson and Buncombe Counties saw 2–5-inch totals, while the lower elevations along the I-40 corridor saw 1-2 inches during this time.
3/24/2014	As an upper air disturbance approached the region from the west, light to moderate snow developed across the North Carolina mountains around midnight early on the 25th, mainly in the high elevations of the southern mountains, and across much of the central and northern mountains (including the valleys) near the Tennessee border. The bulk of the snow accumulated during the morning of the 25th, when 2-4 inches fell across a fairly large area. Snow showers then redeveloped within northwest flow behind a cold front across the Tennessee border counties during the afternoon, resulting in additional accumulations, although those were primarily confined to the high elevations along the Tennessee border. Total accumulations ranged from 2-4 inches in the valleys across the Tennessee border counties (from I-40 north) and in the high elevations of the southern mountains, to 4-8 inches in the higher elevations along the Tennessee border.

Date	Description
3/29/2014	Snow showers developed behind a strong cold front across the western mountains late on the evening of the 29th and continued off and on through the night before tapering off around sunrise. Total accumulations were generally in the 1–2-inch range across the high elevations and in the valleys from around I-40 north. However, locally heavy snowfall in the 6-10\ range was reported in the higher elevations of the Smokies.
10/31/2014	Precipitation associated with a strong upper-level disturbance and associated strong cold front changed to snow at the highest peaks and ridge tops by early Halloween evening, with snow levels dropping rapidly to the valley floors by the end of the evening as an arctic air mass infiltrated the region behind the front. Snowfall accumulation by midnight was mainly confined to the high elevations, although the snow continued into the morning of the 1st.
11/26/2014	Rain associated with a cold front changed to snow across the high elevations of the North Carolina mountains during the early morning hours of the 26th. The snow was brief, but heavy at times, with a quick couple of inches accumulating in some areas. the precipitation ended by mid-morning, but snow showers redeveloped near the Tennessee border during the afternoon on a cold and moist northwest flow. Accumulating snowfall continued off and on across the Tennessee border counties through the evening and overnight hours before tapering off during the morning of the 27th. Total accumulations ranged from up to two inches in the valleys north of I-40 near the Tennessee border, to 2-6 inches with locally higher amounts in the high elevations, mainly above 4000 feet.
1/26/2015	Snow developed across the higher elevations of the North Carolina mountains as a cold front moved across the area during the early morning of the 26th. A quick 2-4 inches fell during the morning, mainly above 4000 feet. After a brief lull, a moist northwest flow developing behind the front resulted in scattered to numerous snow showers developing near the Tennessee border by afternoon, which continued off and on through the 27th. 36-hour accumulations ranged from 4-8 inches across the high elevations (mainly above 4000 feet), while the valleys saw little more than a dusting. The highest totals occurred across the Smokies, Balsams, and surrounding mountains.
2/2/2015	Snow showers developed in the wake of a cold front across the central and southern North Carolina mountains during the late morning of the 2nd. The snow showers gradually retreated to areas along the Tennessee border during the afternoon and overnight hours, before tapering off during the morning of the 3rd. Total accumulations ranged from an inch or two across the valleys (primarily the lower French Broad valley), to 4-6 inches in the high elevations near the Tennessee border.
2/16/2015	Sleet and snow overspread the mountains and foothills of North Carolina during the afternoon and began to accumulate. Precipitation changed quickly to sleet in most areas, before mixing with freezing rain from southwest to northeast during the late afternoon and early evening. Sleet and freezing caused deteriorating road conditions by early evening, when heavy accumulations of sleet and/or freezing rain were reported across much of the area. Most locations saw around a half inch to an inch of sleet, along with around a tenth of an inch of ice accretion. The valleys of southwest North Carolina saw more freezing rain than sleet, with about one quarter inch of ice reported. Scattered power outages were therefore more concentrated there. Meanwhile, the northern foothills saw mostly sleet, with many areas reporting 2 to 3 inches of accumulation. Roads became very treacherous and impassable in many areas until melting began on the afternoon of the 17th.
2/18/2015	Snow showers developed across the Southern Appalachians along and immediately behind a strong arctic cold front that swept across the region during the afternoon of the 18th. Snow tapered off in most areas through the evening, the only exception being locations across the far western North Carolina mountains, where snow showers didn't taper off until the pre-dawn hours of the 19th. Total accumulations ranged from a dusting up to an inch in locations closer to the South Carolina border and the lower valleys surrounding the Smokies, to 2-4 inches in the valleys north of I-40 near the Tennessee border. Locally, much higher amounts occurred across the high

Date	Description
	peaks and ridge tops near the Tennessee border. Combined with the snowfall from the storm of the 16th/17th, areas above 5000 feet reported 1-2 feet of snow on the ground by the morning of the 19th. Very strong winds resulted in considerable blowing and drifting of snow and periods of blizzard-like conditions across these high elevations.
2/23/2015	Light snow associated with a wave of low pressure overspread the southern Appalachians by late evening of the 23rd, and continued into the overnight. Snow, heavy at times, continued into the pre-dawn hours, when heavy snow accumulations were reported across much of the area. Total accumulations were generally in the 3-to-5-inch range, with locally higher amounts reported in the high elevations. The snow tapered off shortly after sunrise.
2/25/2015	After the significant snowfall that fell across portions of the North Carolina mountains on the morning of the 24th, an area of low pressure moving along the Gulf Coast spread yet another round of snow across the southern Appalachians and adjacent foothills during the evening of the 25th. The snow was heavy at times, and quickly accumulated, with occasional mixed rain undercutting the totals a bit across the southern foothills. Many areas reported heavy accumulations by late evening. By the time the snow tapered off during the early morning of the 26th, total accumulations ranged from 4 to 6 inches, with locally higher amounts across the mountains. Across the foothills, where snow occasionally mixed with or changed to rain along the Highway 74 corridor, accumulations ranged from 2 to 5 inches.
3/27/2015	Snow showers developed across the western North Carolina mountains during the evening and continued through the overnight before dissipating during the pre-dawn hours. Accumulations generally ranged from 1-2 inches in the lower elevations, while the high elevations near the Tennessee border saw 2-4 inches.
1/20/2016	Light snow developed over the mountains of North Carolina in association with an upper air disturbance during the morning. The snow continued off and on through much of the day before winding down during the evening. The most significant accumulations were above 4000 feet or so, where amounts ranged from 5 to 8 inches. Meanwhile, valley totals ranged from a half inch across the upper French Broad Valley to around 3 inches across the high valleys of the northern mountains.
1/22/2016	Light snow developed around midnight across the southwest mountains of North Carolina in association with an area of low pressure. The snow became moderate to heavy at times during the pre-dawn hours. By sunrise, accumulations of 2-6 inches were common across the area. Warm air began filtering into the valleys from the southwest through the morning, and by late morning, most of the Little Tennessee Valley and surrounding valleys south of the Smokies had transitioned to rain. Total accumulations ranged from 2-5 inches in the far southwest valleys, to more than a foot across the high elevations and the upper French Broad Valley, where the cold air remained in place through the day.
2/8/2016	A moist northwest flow developing in the wake of a strong arctic cold front brought a protracted period of scattered to numerous snow showers to the far western mountains of North Carolina. Although snow showers developed off and on over a 60-hour period, most valley locations received rather light accumulations, generally of 2-5 inches, with locally higher amounts reported close to the Tennessee border. This was especially the case over northern Madison County, where a small band of moderate to heavy snow developed off and on, and some locations saw storm total amounts of as much as a foot there. Otherwise, the highest totals were found above 4000 feet, where storm total amounts ranged from 12-18 inches.
3/20/2016	A moist northwest flow interacted with an unseasonably cold air mass to produce snow showers across the mountains, especially across the Tennessee border counties during the afternoon and evening. Accumulating snowfall was confined to the high elevations, mainly above 4000 feet, where totals ranged from 2 to as high as 6 inches across the Smokies and the Balsams.
5/5/2016	Showers developing within an unseasonably cold airmass in the wake of a cold front and beneath an area of deep upper-level low pressure resulted in a late season accumulating snowfall across

Date	Description
	the high elevations of the North Carolina mountains. Elevations above about 5000 feet near the Tennessee border saw anywhere from a dusting up to about 5 inches.
1/29/2017	A strong upper air disturbance combined with moist northwest winds flowing up the western slopes of the Appalachians resulted in development of numerous snow showers across the North Carolina mountains throughout the 29th and into the early part of the 30th. The most significant impacts were to the high elevations (above 5000 feet) of the northern mountains, where as much as a foot of snow fell. Meanwhile, total accumulations in the high valleys of the northern mountains were generally in the 2–4-inch range. Farther south, accumulations in the high elevations of the Smokies and other ranges along the Tennessee border were from 2 to 5 inches, while the lower valleys from the French Broad south saw little more than an inch.
3/11/2017	An upper-level disturbance interacting with an unseasonably cold air mass resulted in light to moderate snow overspreading the North Carolina mountains late on the 11th, continuing through the overnight hours before tapering off on the morning of the 12th. Total snowfall accumulation generally ranged from 1-3 inches. However, some locations received as much as 5 inches, particularly near the South Carolina border.
3/14/2017	As low pressure moved up the East Coast, light precipitation developed over western North Carolina during the evening of the 13th, beginning as rain in most locations. As colder air wrapped into the area behind the low, snow levels dropped, allowing all but the lower valleys to transition to snow. Moist northwest flow resulted in the precipitation retreating to the Tennessee border areas with time. Total accumulation was generally in the 3-to-5-inch range for elevations above 3500 feet or so, while the lower valleys saw anywhere from trace amounts to around a couple of inches.
4/6/2017	Scattered to numerous showers developed under a strong upper-level low pressure throughout the 6th and early on the 7th. Meanwhile, lowering snow levels in the wake of a cold front resulted in periods of snow above about 4000 feet. However, significant accumulations were primarily confined to elevations above 5000 feet. As much as a foot fell on the high peaks of the northern mountains.
10/29/2017	A strong and moist northwest flow developing in the wake of a cold front resulted in development of snow showers across the high terrain of the far western mountains of North Carolina. The first accumulating snowfall of the season was observed across the high elevations along the Tennessee border, where 1 to 4 inches fell, mainly above 4000 feet. Additionally, very gusty winds of 40-50 mph (50-60 mph at the high elevations) developed across the mountains and foothills, with some damage due to a falling tree reported across the foothills.
12/8/2017	As moisture associated with developing and strengthening low pressure over the northeast Gulf of Mexico overspread the western Carolinas, snow developed over the mountains of southwest North Carolina around daybreak on the 8th and quickly accumulated. By late morning, heavy snowfall accumulations were reported across the Smoky Mountains and Balsams and vicinity. Total accumulations generally ranged from 8-12 inches, with locally higher amounts well over a foot reported in the higher elevations, and lower amounts reported in the low valleys along the Tennessee border. While occasional flurries and light snow showers produced locally light additional accumulations into the early daylight hours of the 9th, the accumulating snow ended in most areas shortly after midnight.
12/31/2017	Very light precipitation developed across the mountains during the afternoon and continued into the evening. While most of the precipitation fell as snow, a brief transition to light freezing rain and drizzle occurred during mid-afternoon. Due to the very cold air that was in place, ice quickly formed on roads across the area. Numerous traffic accidents were reported during this time, especially in the Asheville area. Accumulating snowfall was fairly sporadic, primarily confined to locations along the eastern face of the Blue Ridge. Locations that did see snowfall generally only saw around an inch, with trace amounts of ice.
1/17/2018	As a strengthening upper-level disturbance and associated cold front approached the region from the Tennessee Valley, light precipitation developed across the North Carolina mountains around

Date	Description
	midnight. While the precipitation may have started as rain or a rain/snow mix in the lower valleys, a transition to snow had occurred in most locations by daybreak. As the snow band moved east, snowfall rates increased with time such that the highest totals were found north and east of the Balsams, where amounts of 2-4 inches were common. Meanwhile, locations west of the Balsams generally saw 1-2 inches.
1/29/2018	A strong upper-level disturbance and associated cold front swept across the mountains during the late evening, bringing cold air and moisture, with snow initially developing in the higher elevations before snow levels quickly dropped to the valley floors. After the cold front passed, strong northwest winds pushing cold air and moisture up the western slopes of the Appalachians resulted in a continuation of snow showers across the Tennessee border counties through the overnight before the snow tapered off to flurries around sunrise. Measurable snowfall was generally limited to the high elevations (above 3500 feet or so) roughly southwest of I-26, while accumulations were a little more evenly distributed across the northern mountains. Total accumulations of 2-5 were reported throughout these areas, with locally higher amounts of up to 7 inches across the high peaks and ridge tops, and across portions of Avery County.
3/7/2018	A moist northwest flow developing in the wake of a cold front resulted in snow shower development near the Tennessee border throughout the morning of the 7th. Snow showers were somewhat scattered and accumulations were largely dependent upon terrain exposure and elevation. Most locations saw from a dusting to up to 2 inches. However, localized amounts of 4 to 6 inches were reported, primarily in the high elevations.
3/13/2018	Snow showers developed across portions of the central mountains in response to a strong and moist northwest flow developing in the wake of a cold front. While snow showers were initially light, they increased in intensity, becoming moderate to occasionally heavy during the pre-dawn hours. The largest impact was along and near the I-26 corridor north of I-40, where 2 to 4 inches, with locally higher amounts fell across much of Madison County and northern portions of Buncombe County. A large portion of that fell in only a 2- or 3-hour period around daybreak. Meanwhile, amounts across much of Haywood County and southern Buncombe County amounted to little more than a heavy dusting, although some heavier totals were reported in the higher elevations of Haywood County.
3/21/2018	Light rain developed across the mountains during the evening of the 20th in association with an area of low pressure and associated cold front that moved across the area. Strong northwest winds developing in the wake of this system ushered in a much colder air mass, which allowed the rain to turn to snow in most locations shortly after midnight on the 21st. The northwest flow acting in a moist environment resulted in development of numerous snow showers near the Tennessee border throughout the 21st. By the time the snow showers tapered off during the late evening, accumulations generally ranged from 1 to 3 inches across the valleys, while the higher elevations received anywhere from 4 to 10 inches.
11/15/2018	Precipitation developed in association with weak low pressure moving across the Southeast during the overnight of the 14th and early morning of the 15th. Precipitation began as rain and/or snow across the mountains, but transitioned to liquid as temperatures warmed aloft. However, a wedge of cool air remained in place across the Blue Ridge, resulting in freezing rain, mainly within a few miles either side of the Continental Divide. Most of these areas saw trace amounts to around a tenth of an inch of ice accretion, although locally higher amounts were reported north of I-40.
12/21/2018	Rain changed to snow across the high elevations of the North Carolina mountains as freezing levels quickly fell in the wake of a strong cold front. A cold and moist northwest flow developing in the wake of the front across the Tennessee Valley and the southern Appalachians resulted in scattered to numerous snow showers continuing near the Tennessee border throughout the afternoon and evening of the 21st, through the morning of the 22nd. Accumulations were mainly confined to elevations above 3500 feet, where 1 to 3 inches generally fell. Some locations above 5000 feet reported as much as a half foot.

Date	Description
1/29/2019	Moisture associated with a cold front resulted in development of precipitation across the North Carolina mountains during the morning of the 29th. Temperatures were cold enough in the high elevations for most of the precipitation to fall as snow. Moist northwest flow developing in the wake of the front resulted in snow shower development near the Tennessee border throughout the afternoon. By the time the snow tapered off during the evening, total accumulations of 1 to 4 inches were reported, mainly above 3500 feet along the Tennessee border. Meanwhile, the lower elevations saw a heavy dusting at best.
12/1/2019	Arctic air filtering in behind a cold front, along with a moist northwest flow resulted in the first notable snowfall event of the season for portions of the North Carolina mountains. Scattered to numerous snow showers continued through the day of the 2nd before tapering off during the early morning of the 3rd. Total accumulations were largely elevation dependent, with only a dusting up to an inch reported in the valleys, with 2-4 inches reported above 3500 ft or so. Locally higher amounts were reported in the higher elevations along the Tennessee border.
1/27/2020	Precipitation developed across western North Carolina early on the 27th in association with an upper-level disturbance. Temperatures above roughly 3500 feet were cold enough for much of this precipitation to fall as snow. By the time the snow tapered off to light snow showers and flurries late in the evening, accumulations of 2 to 4 inches were common in the high elevations, with some locally higher totals.
2/21/2020	Moisture overspreading a southward-moving cold front resulted in development of precipitation across the North Carolina mountains throughout the daylight hours of the 21st. Temperatures were cold enough in most locations for this precipitation to fall as snow, although rain mixed in at times below about 2500 feet. By the time the snow tapered off during the evening, snowfall totals ranged from trace amounts up to an inch in the lower interior valleys, to 1 to 4 inches above 2500 feet and in the valleys near the Blue Ridge.
2/26/2020	A moist northwest flow ushering in quickly falling temperatures resulted in snow showers developing near the Tennessee/North Carolina border by early evening on the 26th, which then continued through the overnight before ending by late morning of the 27th. Appreciable snow accumulations were primarily confined to the higher elevations of the counties bordering Tennessee, where 1 to 4 inches, with some locally higher amounts fell.
2/28/2020	A strong upper-level disturbance crossing the southern Appalachians resulted in redevelopment of snow showers across the North Carolina mountains throughout the 28th and early on the 29th. The relatively long duration of the event along with the enhanced lift from the disturbance allowed for higher accumulations than normally seen during northwest flow events, while accumulating snowfall was also reported well south and east of the usual Tennessee border areas, including across portions of the middle and upper French Broad Valley. Total amounts were generally in the 2-4 inch range, although amounts as high as 8 inches were reported on some of the high peaks and ridge tops.
11/30/2020	Snow levels fell quickly across the North Carolina mountains during the evening in the wake of a strong cold front. Strong northwest winds pushing moisture up the western slopes of the Appalachians resulted in development of numerous to widespread snow showers near the Tennessee border. By midnight on the 1st, accumulations of up 2 inches were reported, with locally higher amounts above 3500 feet. The snow showers continued into the 1st, when heavy snowfall totals were realized during the pre-dawn hours.
1/7/2021	Snow developed across the mountains and foothills of North Carolina during the evening of the 7th as an area of low pressure moved across the coastal plain of Georgia and the Carolinas. The snow mixed with or changed to rain in many areas before tapering off during the daylight hours of the 9th. Total accumulations were generally in the 1-to-3-inch range, although some areas above 2500 feet or so saw as much as 4 inches.
1/17/2021	Snow showers redeveloped along and in the wake of a cold front across the Tennessee border counties of North Carolina during the evening of the 17th, continuing through the early morning hours of the 18th, before tapering off during the daylight hours. Total snow accumulations

Date	Description
	generally ranged from 1 to 4 inches. However, some high elevation locations saw as much as 8 inches, especially right along the state line.
1/30/2021	A wintry mix developed across portions of the mountains and portions of the foothills during the evening of the 30th as a frontal system moved across the Tennessee and Ohio Valleys. Precipitation began as snow in most locations and accumulated lightly before warming temperatures aloft forced a transition to sleet and freezing rain. Total accumulations of sleet and snow generally ranged from one half inch to less than two inches, although some locations above 3000 feet or so saw up to 3 inches.
2/17/2021	Moisture and precipitation overspread the western Carolinas late in the evening of the 17th and continued into the morning of the 18th in association with an area of low pressure moving along the Gulf Coast. Enough cold air was in place to allow some of this precipitation to fall as freezing rain, until warming temperatures gradually forced a transition to rain from southwest to northeast. Total ice accretion was generally in the .10 to .20 range, with spotty higher amounts. Due to warm road temperatures, accretion was primarily limited to elevated surfaces and limited travel difficulties.
Jackson County	
1/16/2000	A quick burst of freezing rain and sleet caused numerous traffic accidents across the mountains. The precipitation was light - less than a tenth of an inch in most places, but as high as one third inch near Robbinsville.
1/29/2000	Weakening low pressure in the Ohio River Valley, developing low pressure along the Gulf Coast and cold, arctic air in place across the Carolinas resulted in a wintry mess across western North Carolina. This was the last in a series of 5 winter storms that wreaked havoc on western North Carolina in an 11-day span. The ice storm in the mountains consisted mainly of a couple inches of sleet. However, the combined accumulation of the mixture of sleet and snow was generally 2 to 3 inches. Some freezing rain mixed in during the morning of the 30th. Across the foothills and piedmont, precipitation which briefly began as some light sleet and snow, turned quickly to freezing rain. The freezing rain was heavy enough across the southern piedmont, including the Charlotte area, to result in a 1/4-to-1/2-inch glaze. Scattered power outages resulted, with Gaston County reporting 2500 people without power. The entire Duke Power system reported 77,000 people without power.
12/13/2000	
2/6/2002	Light snow and sleet fell for much of the day. Up to 2 inches of accumulation was reported in a few locations, while most areas had only a dusting. By late afternoon, most locations had changed over to rain.
12/14/2002	Snow accumulated to 1 to 3 inches, with the highest amounts occurring in the highest elevations. Wind gusts to 50 mph also caused some isolated tree damage.
12/22/2002	Freezing rain developed during the early morning across the North Carolina mountains, and some roads and bridges became ice covered. A few traffic accidents resulted.
12/25/2002	Light snow fell throughout the day across the North Carolina mountains, resulting in snowfall amounts of between a trace and 3 inches within the valleys. Four-to-six-inch amounts were common in the higher elevations from Madison County northward.
1/6/2003	Light snow fell for much of the day across the western mountains of North Carolina. By evening, 1 to 3 inches had accumulated, mainly in areas above 3000 feet. The snow was accompanied by wind gusts of up to 50 mph.
1/19/2003	Mainly light snow produced accumulations of 1 to 2 inches across much of the North Carolina mountains, although some high elevation areas along the Tennessee border received 3 to 6 inches, while locations near the Blue Ridge received little more than a dusting. In addition, gusty winds resulted in blowing snow across a portion of the area, with some snow drifts to one-and-a-half feet.

Date	Description
2/9/2003	An extended period of intermittent light snow produced spotty accumulations of 1 to 2 inches within the major valleys of the North Carolina mountains. The higher elevations received as much as 4 inches, especially the highest peaks along the Tennessee border.
3/30/2003	A light, wet snow developed around midnight across the southern and central mountains, and gradually intensified through dawn. By sunrise, 1 to 2 inches had accumulated across much of the area.
3/30/2003	After a brief lull, snow redeveloped during the afternoon across the mountains. By midnight, an additional 1 to 3 inches of snow had fallen, mainly in areas along the Tennessee border. Some of the highest peaks received as much as an additional 6 inches.
11/28/2003	The first significant snowfall of the season dumped 1 to 3 inches of snow in some of the major valleys of the North Carolina mountains, and in the higher elevations of the foothills. As much as 6 inches accumulated in the higher elevations of the Balsams and the Smokies.
12/3/2003	Light snow, mixed at times with sleet, fell across the North Carolina mountains, accumulating up to an inch in some areas.
12/4/2003	Heavy snow and sleet began during the early morning hours across the North Carolina mountains, and by late afternoon had accumulated to 3 to 4 inches across much of the area. Some slopes with an eastern exposure had up to 5 inches.
12/5/2003	Light snow fell across portions of the North Carolina mountains during the evening. Accumulations in most locations were an inch or less, although some locations along the Tennessee border received 2 to 3 inches.
12/10/2003	A mix of freezing rain, sleet, and snow fell across portions of the North Carolina mountains, resulting in some slick roads. Some of the highest elevations received up to an inch of snowfall.
12/18/2003	Light snow developed during the evening of the 18th across the North Carolina mountains. Accumulations were light during this time, but some icy roads developed in the higher elevations. The snow became heavier late in the evening.
2/2/2004	Light freezing rain developed during the morning hours across the North Carolina mountains. This resulted in a thin layer of glaze that was responsible for numerous traffic accidents.
2/7/2004	Light snow developed across portions of the North Carolina mountains during the afternoon, and continued into the morning of the 8th. Up to 2 inches accumulated by the time the snow ended.
2/12/2004	Light snow developed across the southern mountains during the early morning hours, and accumulated up to 2 inches in some areas by daybreak.
2/26/2004	Light snow developed during the pre-dawn hours across the southwest mountains. Up to 3 inches accumulated by late morning.
3/30/2004	Light snow fell across much of the southern and central mountains, as well as the foothills, but accumulations were generally an inch or less.
4/13/2004	Light snow fell during the late evening and overnight hours across the North Carolina mountains. Accumulations of up to an inch occurred on grassy surfaces.
12/14/2004	Snow fell, along with winds sustained at 30 mph gusting to 40 mph, and accumulated generally from 1 to 3 inches across much of the mountains. Areas along the TN state line received the most, with areas around Highlands and Cashiers also receiving similar amounts.
12/19/2004	Snow fell and quickly iced up many roads as the temperature rapidly fell. Snowfall in many areas reached 1 to 3 inches, but even a half inch in some places caused traffic problems. The snow in the foothills counties was limited to the mountainous western sections where accumulations actually reached more than 4 inches in some cases. Also, 4 to 6 inches were reported around Nantahala in western Macon County.
1/22/2005	Light snow fell across the southern and central mountains overnight. The heaviest accumulations occurred near the Tennessee border, where 1–2-inch totals were common. Some of the higher elevations received as much as 4 inches. Accumulations tapered off rapidly toward the east, as locations from Franklin to Waynesville to Asheville received only a dusting. Roads became very

Date	Description
	slick and hazardous, and there were several traffic accidents, especially on I-40 through Haywood County.
2/27/2005	Wet snow, mixed with rain and sleet at times, began falling across western North Carolina during the evening of the 27th, and continued into the morning hours of the 28th. Total snow accumulations ranged from a trace across the southwest mountain valleys and lower elevations of the foothills and piedmont south of I-40, to 2 inches in the higher elevations, and in piedmont and foothills locations north of I-40. By around sunrise on the 28th, most of the precipitation had changed to rain.
2/28/2005	Snow showers redeveloped during the evening of the 28th, continuing off and on through the evening of the 1st. Additional snowfall accumulations of 1 to 2 inches were observed. The higher elevations along the Tennessee border were the main areas affected. However, some valley locations as far east as northern Buncombe and northern Jackson counties received light accumulations.
3/1/2005	Snow showers redeveloped during the evening of the 28th, continuing off and on through the evening of the 1st. Additional snowfall accumulations of 1 to 2 inches were observed. The higher elevations along the Tennessee border were the main areas affected. However, some valley locations as far east as northern Buncombe and northern Jackson counties received light accumulations.
3/8/2005	Snow showers developed behind a cold front across the western mountains during the morning hours and continued through much of the day. By the time the snow tapered off to flurries during the evening, isolated accumulations as high as 6 inches were observed in the higher elevations along the Tennessee border. However, the valleys generally received less than 2 inches.
3/11/2005	Snow showers developed behind a cold front across the western mountains during the afternoon of the 11th, and continued into the early morning hours of the 12th. By the time the snow ended, accumulations generally ranged from a trace to 2 inches across the area, although isolated higher amounts occurred in the higher elevations.
3/17/2005	Wet snow, mixed at times with rain and sleet developed during the early morning hours across western North Carolina, and persisted through late morning. By the time the snow ended, accumulations ranged from just a dusting in the southwest mountain valleys and southern piedmont areas, to as much as 3 inches in areas north of I-40. Slushy roads led to a few traffic accidents across the area.
4/2/2005	Wet snow, heavy at times, developed in the higher elevations of the North Carolina mountains during the morning. By early evening, snowfall amounts ranged from trace amounts to 4 inches, mainly in areas above 3500 feet. By early evening, some of the highest elevations reached heavy snowfall criteria, mainly above 4000 feet. Light accumulations were reported in locations as low as 3000 feet. Meanwhile, the major valleys received mostly rain.
4/23/2005	A late season storm brought significant snowfall to the mountains of North Carolina. Accumulations were highly variable across the area, with as much as 8 inches falling in the higher elevations. However, even locations in the lower French Broad Valley observed up to 3 inches.
11/21/2005	Rain quickly transitioned to heavy snow across the higher elevations of the North Carolina mountains during the evening of the 21st. Snow quickly accumulated to depths of 1 to 3 inches, mainly in areas above about 3500 feet. Highway 441 was closed through the Smokies for a brief period of time. Portions of the Blue Ridge Parkway were also reported to be slick and hazardous. Mainly rain fell in the valleys during this time.
12/3/2005	Light freezing rain developed in the higher elevations of the mountains during the morning, and continued into the afternoon. Ice accretion was mainly confined to elevated surfaces, but a few slick spots did develop. Locations below about 3500 feet observed mainly rain.
1/14/2006	Snow developed across the mountains during the early morning hours, and was periodically heavy before tapering off to flurries and light snow showers later in the morning and during the afternoon. Total accumulations generally ranged from a trace to 3 inches, although there were

Date	Description
	some locally heavier amounts in the higher elevations. Accumulating snow extended into the higher elevations of the foothills, with around 3 inches reported at Little Switzerland.
1/30/2006	Rain changed to snow or a rain and snow mixture across the mountains of North Carolina for a brief period during the evening. In some locations, snow quickly accumulated to 1 to 2 inches before ending, mainly in areas above 3000 feet.
2/8/2006	
2/11/2006	Snow developed over the mountains during the evening and continued through much of the overnight hours. Accumulations ranged from 2 to 3 inches in the Pigeon River and Little Tennessee valleys to 1-2 inches in the lower French Broad valley and the high valleys of the northern mountains. Up to 8 inches fell in the higher elevations of the central mountains.
2/18/2006	The southern valleys saw a mixture of sleet, snow, and rain, while the central valleys and higher elevations saw sleet, snow and freezing rain which developed around sunrise and continued off and on through most of the day. Precipitation amounts were light, but numerous slick spots developed on roads, especially in the higher elevations. Numerous accidents resulted.
3/22/2006	Snow developed across the higher elevations of the North Carolina mountains during the evening and persisted through the overnight hours. By the morning of the 23rd, snow had accumulated to 1-3 inches, mainly in areas above 4000 feet.
12/7/2006	Light snow accumulated to depths ranging from a trace in the valleys to up to 2 inches in the higher elevations near the Tennessee border. The combination of the snow and very cold temperatures caused roads to become very slick and hazardous. Numerous traffic accidents resulted.
1/21/2007	Light rain and freezing rain fell across the mountains for much of the day. Ice accretion was most concentrated in areas along and near the Blue Ridge, where around a tenth of an inch of ice accumulation was common, mainly on trees, power lines, and other elevated surfaces. However, some icy spots did develop on roads, and there were sporadic traffic accidents. In locations west of the Blue Ridge, significant accumulations of ice were mainly confined to the higher elevations, as the valleys warmed above freezing early in the day.
2/17/2007	Light to occasionally moderate snow developed across the mountainous areas away from the Tennessee border during the early evening and continued through the overnight hours. Snowfall totals ranged from trace amounts across far southern portions of the area to 2-3 inches further north and west.
4/6/2007	A record-setting cold airmass, northwest flow, and a strong upper air disturbance resulted in a late season snow shower event across the North Carolina mountains. The showery nature of the event resulted in highly variable snowfall totals across the area, with amounts ranging from a trace to 3 inches in the valleys, with heavier totals reported in the higher elevations along the Tennessee border.
1/1/2008	Scattered snow showers developed over the western mountains of North Carolina, and as far south and east as the foothills before dissipating during the late evening and overnight hours. By sunrise, accumulations ranged from trace amounts over the lower elevations of the foothills, to 4 inches across the higher elevations of the Blue Ridge mountains.
1/19/2008	Light rain changed to snow during the morning and afternoon hours across the mountains and foothills. Most locations reported accumulations ranging from trace amounts to less than an inch. However, a few spots received as much as 2-3 inches, particularly along the southern escarpment of the Blue Ridge.
1/22/2008	Freezing drizzle developed during the morning hours across the valleys of the southwest mountains. Icy spots developed on some roads, and there were quite a few traffic accidents reported.
1/31/2008	Freezing rain developed across the mountains during mid-evening and continued into the early morning hours. Roads became slick and hazardous, with a few traffic accidents reported. Ice accretion of up to 1/8 inch or so was reported, resulting in a few downed trees and power lines.

Date	Description
	During the early morning hours of February 1st, more significant icing developed, but that part of the event will be included in next month's Storm Data.
2/1/2008	Freezing rain developed across the mountains during mid-evening hours of January 31st, and continued into the early morning hours of the 1st. Roads became slick and hazardous, with a few traffic accidents reported. Ice accretion of up to 1/8 inch or so was reported, resulting in a few downed trees and power lines.
2/26/2008	Snow showers developed across the western mountains during the late evening and continued overnight. A few of these showers made it as far east as northern Jackson and northern Buncombe counties, with as much as 3 inches were reported in isolated areas, especially in the higher elevations.
10/27/2008	The first mountain snowfall of the season produced accumulations as high as 4 inches, mainly across the higher elevations along the Tennessee border. However, even valley locations as far south and east as Cashiers, Black Mountain, and Brevard saw up to a half inch of snowfall.
11/21/2008	Light snow showers began falling across the mountains of North Carolina around midnight, and continued off and on through the overnight and morning hours. Total accumulations ranged from trace amounts in the lower elevations near the Blue Ridge to as much as 3 or 4 inches in the higher elevations near the Tennessee border.
12/1/2008	Snow showers developed during the early morning hours and continued through much of the day across the higher elevations of the Blue Ridge mountains. By late afternoon, accumulations ranged from around an inch to as much as 4 inches. Meanwhile, the valleys saw only occasional flurries or light snow, with just a dusting reported here and there.
1/13/2009	Light to moderate snow showers developed across much of the North Carolina mountains during the late evening. Snowfall amounts ranged from trace amounts to 3 inches or so in areas from the Smokies, to the lower and middle French Broad Valley, to the northern mountains.
1/17/2009	Snow showers developed across the mountains of western North Carolina during the late evening, and continued off and on for much of the night, before tapering off on the morning of the 18th. Snow accumulations ranged from trace amounts to amounts of around 3 inches.
2/2/2009	Light snow showers developed during the evening of the 2nd, and continued off and on for two days. Total accumulations ranged from amounts up to 2 inches in the lower elevations, to about 4 inches across many high elevation areas. Locally higher amounts occurred in the higher elevations along the Tennessee border.
2/22/2009	Snow showers developed during the pre-dawn hours across the western mountains and continued through the morning. By noon, accumulations of up to 2 inches were reported in the lower French Broad valley and the higher elevations of the interior mountains, while 3 inches or more fell in the highest elevations along the Tennessee border.
3/1/2009	Light rain changed to light snow across portions of the southwest mountains of North Carolina during the early afternoon hours. The snow continued off and on through the afternoon before ending during mid-evening. Accumulations generally ranged from a dusting to an inch.
4/7/2009	Light to occasionally moderate snow showers that developed along the Tennessee border began affecting portions of the interior mountains during the daytime hours. Accumulations ranged from trace amounts in the valleys to as much as 4 inches in the higher elevations of the Balsams.
10/17/2009	The first high elevation snowfall of the season occurred as moist northwest flow developed behind a strong cold front, resulting in scattered snow showers. Accumulations were mainly confined to areas along the Tennessee border, above 4000 feet, where as much as 2 inches fell. However, locations as far south as the high elevations above Lake Toxaway saw a dusting.
12/18/2009	A strengthening area of low pressure moved out of the Gulf of Mexico, across southern Georgia, and then up the southeast coast. As the low passed south of the region, snow became heavy across the southern and central mountains, as well as the Smokies and surrounding valleys late in the morning. Heavy snow developed a little later over the northern mountains. The heavy snow continued throughout the afternoon. Snowfall rates of 1-2 inches per hour became common across the area during the afternoon. Meanwhile, warming temperatures allowed the snow to

Date	Description
	mix with and eventually change to rain and sleet in the southwest mountain valleys. The heavy, wet snow combined with gusty winds to cause numerous trees and power lines to fall across the area during the afternoon. Widespread power outages resulted, and some customers were without power for as much as a week. Even longer outages affected parts of the northern mountains. ||The snow ended over the Blue Ridge and the central mountains on the evening of the 18th. However, wrap around snow showers developed along the Tennessee line, resulting in additional snow accumulations overnight and into the morning hours of the 19th. Total accumulations ranged from 12-18 inches across the lower northern mountain valleys, to 2-3 feet in the higher elevations along the Tennessee border, and in areas along the eastern escarpment. Over the southern and central mountains, total accumulations ranged from 6-10 inches in the lower elevations near the southern escarpment, to as much as 2 feet in the higher elevations. While the southwest mountain valleys generally saw only 3-5 inches, 2-3 feet of total snowfall was reported in the higher elevations of the Smokies and along the Cherohala Skyway in Graham County. Hundreds of traffic accidents were reported during the storm, and continued for several days thereafter, as continuous melting and refreezing of ice and snow resulted in treacherous road conditions during the late night and morning hours. Hospitals reported 100s of cases and slips and falls during this time as well.
12/30/2009	A light mix of sleet and snow developed over the mountains and foothills of western North Carolina during the evening, and continued for much of the overnight. Accumulations ranged from trace amounts over the lower elevations of the foothills, to localized 2–3-inch amounts over the mountains. A few slick spots developed on mountain roads, resulting in quite a few accidents.
1/2/2010	A very cold and moist northwest flow resulted in the development of scattered to numerous snow showers across the Tennessee border counties, and the higher elevations of Buncombe County, during the early morning hours. The higher elevations along the Tennessee line saw 2 to 4 inches of powdery snow, while the lower elevations received anywhere from trace amounts to 2 inches. The snow was a little heavier in Avery County, were total accumulations ranged from 2 to 3 inches in the lower valleys to 4-6 inches in the higher elevations along the state line.
2/4/2010	Low pressure moved across the deep south, spreading light snow over the southern mountains of North Carolina during the late afternoon. The snow gradually spread north and east into the North Carolina foothills and piedmont during the evening and overnight hours. The snow mixed with sleet during the evening, before changing to mostly sleet after midnight, then changing to rain as temperatures warmed during the pre-dawn hours. Total accumulations of sleet and snow ranged from trace amounts along the edge of the southern escarpment of the Blue Ridge, to 3 inches north of I-40 and in the higher elevations of the Balsams. Heavier snow fell across the central and northern mountains as well as the foothills of North Carolina, which is detailed elsewhere in Storm Data.
2/10/2010	Moist northwest flow behind a cold front produced numerous snow showers across the western mountains of North Carolina during the early morning hours. Snow began to quickly accumulate, and by late morning, snowfall ranged from trace across the interior valleys from Asheville, to Waynesville, to Franklin, to an inch or two in the valleys near the Tennessee border, to 4 to 5 inches in the higher elevations. Gusty winds of 30 to 40 mph caused periods of blizzard-like conditions, with considerable blowing and drifting snow. A few trees and power lines were blown down across the area as well.
2/12/2010	Light snow developed during the early evening across the mountains, and then quickly spread into the foothills and the western piedmont through the evening. Total snowfall ranged from an inch or two in areas north of I-40, to as much as three inches in areas further to the south.
2/15/2010	A band of light to moderate snow moved rapidly across the North Carolina mountains during the morning. Higher elevations saw as much as 4 inches of snow, with most valley locations receiving an inch or less.
2/15/2010	Scattered to numerous northwest flow snow showers developed on the evening of the 15th, and continued on and off for more than two days. Three-day totals varied widely across the area,

Date	Description
	depending upon terrain. While the lower elevations from Bryson City, to Waynesville and Sylva, to Asheville saw little more than a dusting, some of the higher elevations along the Tennessee border, including the Smokies and the Cherohala Skyway received 6 or more inches during the period.
3/22/2010	Snow showers developed over the mountains during the early afternoon, and continued into the evening hours. Total snowfall ranged from trace amounts in the valleys, to as much as 4 inches at the highest peaks.
12/4/2010	A storm system brought light snow to the high elevations of the North Carolina mountains early on the 4th. By early afternoon, 1 to 3 inches of snow was reported across the higher elevations, mainly above 3500 feet. After an arctic cold front passed through the area, snow levels dropped quickly during the afternoon and evening, while strong northwest winds resulted in development of scattered to numerous snow showers. The snow showers persisted for almost three days, with snowfall piling up steadily over the ensuing 60 hours. By the morning of the 7th, 3-day accumulations ranged from around 10 inches in the higher elevations of the Smokies, to as much as 18 inches in the higher elevations of the northern mountains. Snowfall totals in the lower elevations were much less, generally 2-6 inches in the valleys of the Tennessee border counties. Gusty winds and very cold temperatures also resulted in wind chill values below 0 in many areas during the overnight and early morning hours.
12/15/2010	Light precipitation fell across the mountains during the evening, and continued for much of the overnight. Precipitation mainly fell as freezing rain, although some areas saw a period of light accumulating snow at the onset. By late morning, most areas had received at least a trace of ice accretion, resulting in very slippery roads. Over the piedmont and foothills the majority of the precipitation fell as freezing rain and freezing drizzle. Most areas saw at least trace amounts of ice, with some areas along the I-40 corridor seeing as much as a tenth of an inch. Very hazardous driving conditions existed across the northern foothills and northwest Piedmont. Locations closer to I-85 only saw a light glaze on elevated surfaces and patchy slick spots on roads. Hundreds of traffic accidents were reported across the region. Temperatures warmed above freezing in most areas by late morning.
1/7/2011	Light to moderate snow developed ahead of a cold front over the mountains during the afternoon and continued into the early evening hours. By the time the snow tapered off to snow showers during the evening, as much as 3 inches had fallen over the area. Snow showers continued to affect the higher elevations and the valleys of northern Buncombe County through the overnight hours, adding to the accumulations. By the time the snow completely tapered off, amounts ranged from 1 to 4 inches, with some higher amounts in the higher elevations and in extreme northern Buncombe County.
1/11/2011	Moist northwest flow resulted in the development of scattered to numerous snow showers during the evening of the 11th. The snow showers persisted overnight and throughout the 12th. Total accumulations were highly variable across the area, but generally ranged from 1 to 6 inches, with some higher amounts in the higher elevations along the Tennessee border.
1/24/2011	A quick shot of snow produced light accumulations in a brief period of time across the mountains during the pre-dawn hours. Although most areas saw little more than a dusting, roads became very slick, and numerous traffic accidents occurred during the morning rush, especially in areas along and north of I-40.
1/26/2011	As low pressure developed off the southeast coast, rain changed to snow across the higher elevations of the North Carolina mountains during the morning, and gradually worked its way toward the valleys as colder air filtered into the region. The widespread precipitation moved away from the region during the afternoon, but developing moist northwest flow resulted in development of scattered to numerous snow showers across the area. By midnight, snowfall accumulation ranged from little more than a dusting in the valleys to 4 or 5 inches in the highest elevations along the Tennessee border.

Date	Description
2/9/2011	A weakening storm system brought light snow to portions of the western Carolinas during the evening. Total accumulations ranged from a dusting to an inch over the Piedmont to 1 to 2 inches across much of the mountains.
3/6/2011	Light snow developed across the higher elevations of the mountains of North Carolina in the wake of a cold front. Accumulations generally ranged from 1 to 4 inches at elevations above 3500 feet. However, some areas above 5000 feet received as much as 7 inches.
3/11/2011	As colder air filtered into the mountains behind a cold front, snow levels dropped to the higher elevations during the evening. Snow showers continued the rest of the night along the Tennessee border, where snow totals ranged from 2 to 5 inches at elevations above 4000 feet. However, even some of the western valleys saw around an inch as snow levels continued to drop overnight.
11/29/2011	Rain changed to snow across the higher elevations of the North Carolina mountains during the morning and began to accumulate by early afternoon. The snow began to taper off from the southwest during the afternoon, before ending early on the 30th. Accumulations were generally confined to areas above 3000 feet or so, and most locations only saw on inch or two, although some areas of the northern mountains saw as much as 4 inches.
1/2/2012	Snow showers developed across the mountains during the evening behind a very strong cold front. Snow continued off and on through the night and much of the 3rd before ending during the afternoon. Total accumulations ranged from a dusting near the southern Blue Ridge to four inches across the Tennessee border counties. Localized higher amounts were reported in the high elevations along the state line, mainly north of the Smokies. Even where little snow fell, temperatures that fell rapidly into the teens resulted in snow sticking to roadways on the night of the 2nd and early on the 3rd. Dozens of accidents occurred across the region.
2/11/2012	Snow showers developed over much of the North Carolina mountains during the early morning hours, and continued throughout the day. Snow showers continued off and on across the Tennessee border counties during the evening and early part of the overnight. Total accumulations ranged from a couple of inches in the lower valleys, to as much as 8 inches in the higher elevations of the Newfound Mountains and northern mountains.
10/29/2012	As Superstorm Sandy moved across New England and stalled over the northern Mid-Atlantic region, abundant moisture was transported into the mountains. The first snow showers of the season developed within this moist northwest flow across the higher elevations of the southwest North Carolina mountains during the pre-dawn hours of the 29th. Snow showers, some heavy, continued through the day and overnight, and by the pre-dawn hours of the 30th, heavy snowfall accumulations were observed across the higher elevations of the Smokies, Balsams, and Newfound Mountains. By the time the snow showers tapered off during the late evening, 1-2 feet of snow was reported in the high elevations (above 4000 feet or so), with the heaviest amounts occurring at the peaks along the Tennessee border. Meanwhile, the lower valleys saw much less snowfall. In fact, some of the lower valleys beneath the Smokies saw little more than flurries.
11/5/2012	Light snow developed in the southern and central mountains, mainly above 3000 feet. The snow continued off and on overnight, with total accumulations ranging from trace amounts to as much as 2 inches in the higher elevations of the Balsams and Newfound Mountains.
1/17/2013	Rain gradually began to change to snow, first in the higher elevations of the central mountains, followed by the northern foothills and the northwest Piedmont. Although snow was heavy at times in the Piedmont, warm ground temperatures and rain mixing in at times resulted in little accumulation. The brief period of heavy snow was accompanied by occasional lightning and thunder in the Piedmont. Total accumulations ranged from trace amounts in the central mountain valleys to 1-3 inches across the higher elevations, to generally 2 inches or less across the northern foothills and northwest Piedmont.
1/25/2013	Light sleet developed across much of the western Carolinas and northeast Georgia during the morning. The intermittent sleet eventually changed to light freezing rain in most areas by late afternoon. Most areas north of the I-85 corridor saw measurable sleet, generally less than a quarter inch. A light glaze then fell on top of that, making for treacherous driving conditions during

Date	Description
	the afternoon. Most areas south of the I-85 corridor saw only trace accumulations, but that was enough to cause plenty of slick spots. Hundreds of accidents were reported across the area, especially along the I-85 corridor.
2/1/2013	Snow showers developed across the mountains around midnight and continued off and on through the morning hours. Accumulations ranged from less than an inch in the valleys surrounding the Smokies to 1-4 inches across much of the northern mountains and the lower French Broad Valley. High elevations along the Tennessee border saw slightly higher amounts.
2/19/2013	Precipitation developed across the mountains during the early morning hours. Precipitation fell mainly as snow in the high elevations, but snow levels quickly worked their way down to the valleys by sunrise before coming to an end. Most areas above 3000 feet saw 1 to 3 inches of snow, with locally higher amounts, especially across the Balsams and Nantahalas. Valley locations saw accumulations from a light dusting to around an inch.
3/2/2013	Snow showers moved away from the usual Tennessee border areas during the early morning hours of the 2nd, tapering off by late morning. Most locations near the southern Blue Ridge saw an inch or two of snow, with some high elevation areas reporting 3 or 4 inches.
3/5/2013	Snow showers developed across the mountains during the evening of the 5th and continued through the overnight hours, with heavy snowfall criteria reported in many areas by dawn. Total accumulations generally ranged from 2 to 5 inches across the area. Some valley locations saw a little less, while the higher elevations saw as much as 8 inches. Very gusty winds also resulted in considerable blowing and drifting of the snow.
3/20/2013	Snow showers developed over the western mountains during the evening of the 20th and continued off and on through the mid-morning hours of the 21st. Total accumulations ranged from 1 to 3 inches across the Tennessee border from Haywood County north, and across the higher elevations of the southern mountains.
3/25/2013	Snow showers developed during the early morning hours of the 25th and continued off and on throughout the day. Synoptically enhanced northwest flow snow showers became heavy overnight across the western mountains, and by the afternoon hours of the 26th storm total snowfall amounts of 4 to 8 inches were common across the area. Snow showers continued through the early morning hours of the 27th across the higher elevations near the Tennessee border, where totals of a foot or more were prevalent. Heavy snowfall was mainly confined to areas above 3000 feet or so in the southern and central mountains, but was a little more widespread in the northern mountains.
11/26/2013	As cold air spilled into the North Carolina mountains in the wake of an arctic cold front, rain quickly changed to snow during the pre-dawn hours. Periods of moderate and briefly heavy snow were reported at times. Precipitation ended in most areas by late morning. However, northwest flow snow showers continued across the Tennessee border counties through the 27th before ending around midnight. Most areas saw an inch or less of accumulation. However, 2-4 inches fell across the higher elevations along the Tennessee border, although accumulations were difficult to report owing to wind gusts up to 50 mph causing considerable blowing and drifting snow.
1/2/2014	After a strong cold front introduced much colder air to the mountains, snow showers developed across the mountains during mid-evening and continued into the overnight hours. Light accumulations were primarily confined to areas above 3500 feet, where 1-4 inches accumulated by the pre-dawn hours. Locally higher amounts occurred on the higher peaks near the Tennessee border. Lower elevations saw little more than a dusting. Very strong northwest winds gusting as high as 50-60 mph also resulted in considerable blowing and drifting of snow in the high elevations.
1/21/2014	Widespread snow showers developed along the Tennessee border along and immediately behind a cold front during the late morning and moved east to the interior mountains, where occasional snow fell off and on through the day. By late evening, 1 to 4 inches had accumulated in many areas of northern Jackson, northern Buncombe, and the high elevations of Swain and northern Macon Counties.

Date	Description
1/28/2014	Light snow developed across the mountains during the morning and continued into the afternoon before tapering off. The snow initially melted on roads. However, air temperatures rapidly cooling into the lower and mid 20s caused many roads to subsequently freeze. Although snowfall totals were very light (an inch or less in most areas), the slick roads caused hundreds of traffic accidents, including a school bus that overturned in Henderson County.
2/10/2014	Light to moderate snow developed across the central and northern mountains during late morning and continued off and on through the afternoon. While most locations saw an inch or less, a small band of moderate to heavy snow developed during the afternoon from the high elevations of northern Jackson County, through central Haywood, and central and southern Buncombe Counties, where two-to-four-inch amounts were common. Some high elevation areas saw as much as 5 inches in this area. Several accidents in the Balsam area resulted in major traffic problems on Highway 74 near the Haywood/Jackson line.
2/12/2014	A Miller type-A low pressure system moved up along the South Carolina coast bringing widespread heavy snow to the mountains of western North Carolina. Total accumulations generally ranged from 5-9 inches across the area, although locations above 4000 feet or so saw 1-1.5 feet.
3/24/2014	As an upper air disturbance approached the region from the west, light to moderate snow developed across the North Carolina mountains around midnight early on the 25th, mainly in the high elevations of the southern mountains, and across much of the central and northern mountains (including the valleys) near the Tennessee border. The bulk of the snow accumulated during the morning of the 25th, when 2-4 inches fell across a fairly large area. Snow showers then redeveloped within northwest flow behind a cold front across the Tennessee border counties during the afternoon, resulting in additional accumulations, although those were primarily confined to the high elevations along the Tennessee border. Total accumulations ranged from 2-4 inches in the valleys across the Tennessee border counties (from I-40 north) and in the high elevations of the southern mountains, to 4-8 inches in the higher elevations along the Tennessee border.
10/31/2014	Precipitation associated with a strong upper-level disturbance and associated strong cold front changed to snow at the highest peaks and ridge tops by early Halloween evening, with snow levels dropping rapidly to the valley floors by the end of the evening as an arctic air mass infiltrated the region behind the front. Snowfall accumulation by midnight was mainly confined to the high elevations, although the snow continued into the morning of the 1st.
11/1/2014	Precipitation associated with a strong upper-level disturbance and associated strong cold front changed to snow at the highest peaks and ridge tops by late Halloween evening, with snow levels dropping rapidly to the valley floors by the end of the evening as an arctic air mass infiltrated the region behind the front. By mid-morning on the 1st, snow accumulation ranged from an inch or less in the low valleys of the southern mountains, to as much as 5 inches across portions of the French Broad Valley and in elevations above 4000 feet, where some locally higher amounts also occurred.
11/26/2014	Rain associated with a cold front changed to snow across the high elevations of the North Carolina mountains during the early morning hours of the 26th. The snow was brief, but heavy at times, with a quick couple of inches accumulating in some areas. the precipitation ended by mid-morning, but snow showers redeveloped near the Tennessee border during the afternoon on a cold and moist northwest flow. Accumulating snowfall continued off and on across the Tennessee border counties through the evening and overnight hours before tapering off during the morning of the 27th. Total accumulations ranged from up to two inches in the valleys north of I-40 near the Tennessee border, to 2-6 inches with locally higher amounts in the high elevations, mainly above 4000 feet.
1/13/2015	Light freezing rain and drizzle developed first across the northern mountains during the evening of the 13th, then gradually spread south along the Blue Ridge and east along the I-40 corridor through the overnight and early morning of the 14th. While accumulations were very light,

Date	Description
	generally no more than a few hundredths of an inch, some secondary roads and bridges and overpasses became slick and hazardous, resulting in a few accidents.
1/26/2015	Snow developed across the higher elevations of the North Carolina mountains as a cold front moved across the area during the early morning of the 26th. A quick 2-4 inches fell during the morning, mainly above 4000 feet. After a brief lull, a moist northwest flow developing behind the front resulted in scattered to numerous snow showers developing near the Tennessee border by afternoon, which continued off and on through the 27th. 36-hour accumulations ranged from 4-8 inches across the high elevations (mainly above 4000 feet), while the valleys saw little more than a dusting. The highest totals occurred across the Smokies, Balsams, and surrounding mountains.
2/16/2015	Sleet and snow overspread the mountains and foothills of North Carolina during the afternoon and began to accumulate. Precipitation changed quickly to sleet in most areas, before mixing with freezing rain from southwest to northeast during the late afternoon and early evening. Sleet and freezing caused deteriorating road conditions by early evening, when heavy accumulations of sleet and/or freezing rain were reported across much of the area. Most locations saw around a half inch to an inch of sleet, along with around a tenth of an inch of ice accretion. The valleys of southwest North Carolina saw more freezing rain than sleet, with about one quarter inch of ice reported. Scattered power outages were therefore more concentrated there. Meanwhile, the northern foothills saw mostly sleet, with many areas reporting 2 to 3 inches of accumulation. Roads became very treacherous and impassable in many areas until melting began on the afternoon of the 17th.
2/18/2015	Snow showers developed across the Southern Appalachians along and immediately behind a strong arctic cold front that swept across the region during the afternoon of the 18th. Snow tapered off in most areas through the evening, the only exception being locations across the far western North Carolina mountains, where snow showers didn't taper off until the pre-dawn hours of the 19th. Total accumulations ranged from a dusting up to an inch in locations closer to the South Carolina border and the lower valleys surrounding the Smokies, to 2-4 inches in the valleys north of I-40 near the Tennessee border. Locally, much higher amounts occurred across the high peaks and ridge tops near the Tennessee border. Combined with the snowfall from the storm of the 16th/17th, areas above 5000 feet reported 1-2 feet of snow on the ground by the morning of the 19th. Very strong winds resulted in considerable blowing and drifting of snow and periods of blizzard-like conditions across these high elevations.
2/23/2015	Light snow associated with a wave of low pressure overspread the southern Appalachians by late evening of the 23rd, and continued into the overnight. Snow, heavy at times, continued into the pre-dawn hours, when heavy snow accumulations were reported across much of the area. Total accumulations were generally in the 3 to 5 inch range, with locally higher amounts reported in the high elevations. The snow tapered off shortly after sunrise.
2/25/2015	After the significant snowfall that fell across the mountains on the morning of the 24th, an area of low pressure moving along the Gulf Coast spread yet another round of snow across the southern Appalachians during the evening of the 25th. The snow was heavy at times, and quickly accumulated. Heavy accumulations were reported in many areas by late evening. By the time the snow tapered off during the early morning of the 26th, total accumulations ranged from 4 to 6 inches, with locally higher amounts across the mountains.
1/20/2016	Light snow developed over the mountains of North Carolina in association with an upper air disturbance during the morning. The snow continued off and on through much of the day before winding down during the evening. The most significant accumulations were above 4000 feet or so, where amounts ranged from 5 to 8 inches. Meanwhile, valley totals ranged from a half inch across the upper French Broad Valley to around 3 inches across the high valleys of the northern mountains.
1/22/2016	Light snow developed around midnight across the southwest mountains of North Carolina in association with an area of low pressure. The snow became moderate to heavy at times during

Date	Description
	the pre-dawn hours. By sunrise, accumulations of 2-6 inches were common across the area. Warm air began filtering into the valleys from the southwest through the morning, and by late morning, most of the Little Tennessee Valley and surrounding valleys south of the Smokies had transitioned to rain. Total accumulations ranged from 2-5 inches in the far southwest valleys, to more than a foot across the high elevations and the upper French Broad Valley, where the cold air remained in place through the day.
2/8/2016	A moist northwest flow developing in the wake of a strong arctic cold front brought a protracted period of scattered to numerous snow showers to the far western mountains of North Carolina. Although snow showers developed off and on over a 60-hour period, most valley locations received rather light accumulations, generally of 2-5 inches, with locally higher amounts reported close to the Tennessee border. This was especially the case over northern Madison County, where a small band of moderate to heavy snow developed off and on, and some locations saw storm total amounts of as much as a foot there. Otherwise, the highest totals were found above 4000 feet, where storm total amounts ranged from 12-18 inches.
3/20/2016	A moist northwest flow interacted with an unseasonably cold air mass to produce snow showers across the mountains, especially across the Tennessee border counties during the afternoon and evening. Accumulating snowfall was confined to the high elevations, mainly above 4000 feet, where totals ranged from 2 to as high as 6 inches across the Smokies and the Balsams.
1/29/2017	A strong upper air disturbance combined with moist northwest winds flowing up the western slopes of the Appalachians resulted in development of numerous snow showers across the North Carolina mountains throughout the 29th and into the early part of the 30th. The most significant impacts were to the high elevations (above 5000 feet) of the northern mountains, where as much as a foot of snow fell. Meanwhile, total accumulations in the high valleys of the northern mountains were generally in the 2–4-inch range. Farther south, accumulations in the high elevations of the Smokies and other ranges along the Tennessee border were from 2 to 5 inches, while the lower valleys from the French Broad south saw little more than an inch.
3/11/2017	An upper-level disturbance interacting with an unseasonably cold air mass resulted in light to moderate snow overspreading the North Carolina mountains late on the 11th, continuing through the overnight hours before tapering off on the morning of the 12th. Total snowfall accumulation generally ranged from 1-3 inches. However, some locations received as much as 5 inches, particularly near the South Carolina border.
3/14/2017	As low pressure moved up the East Coast, light precipitation developed over western North Carolina during the evening of the 13th, beginning as rain in most locations. As colder air wrapped into the area behind the low, snow levels dropped, allowing all but the lower valleys to transition to snow. Moist northwest flow resulted in the precipitation retreating to the Tennessee border areas with time. Total accumulation was generally in the 3-to-5-inch range for elevations above 3500 feet or so, while the lower valleys saw anywhere from trace amounts to around a couple of inches.
12/8/2017	As moisture associated with developing and strengthening low pressure over the northeast Gulf of Mexico overspread the western Carolinas, snow developed over the mountains of southwest North Carolina around daybreak on the 8th and quickly accumulated. By late morning, heavy snowfall accumulations were reported across the Smoky Mountains and Balsams and vicinity. Total accumulations generally ranged from 8-12 inches, with locally higher amounts well over a foot reported in the higher elevations, and lower amounts reported in the low valleys along the Tennessee border. While occasional flurries and light snow showers produced locally light additional accumulations into the early daylight hours of the 9th, the accumulating snow ended in most areas shortly after midnight.
12/31/2017	Very light precipitation developed across the mountains during the afternoon and continued into the evening. While most of the precipitation fell as snow, a brief transition to light freezing rain and drizzle occurred during mid-afternoon. Due to the very cold air that was in place, ice quickly formed on roads across the area. Numerous traffic accidents were reported during this time,

Date	Description
	especially in the Asheville area. Accumulating snowfall was fairly sporadic, primarily confined to locations along the eastern face of the Blue Ridge. Locations that did see snowfall generally only saw around an inch, with trace amounts of ice.
1/17/2018	As a strengthening upper-level disturbance and associated cold front approached the region from the Tennessee Valley, light precipitation developed across the North Carolina mountains around midnight. While the precipitation may have started as rain or a rain/snow mix in the lower valleys, a transition to snow had occurred in most locations by daybreak. As the snow band moved east, snowfall rates increased with time such that the highest totals were found north and east of the Balsams, where amounts of 2-4 inches were common. Meanwhile, locations west of the Balsams generally saw 1-2 inches.
1/31/2020	Precipitation spread northeast across western North Carolina beginning around daybreak. Temperatures were just cold enough for precipitation to begin as snow across the Blue Ridge. Snow continued through the morning across much of this area before ending or changing to rain in some locations. Total accumulations were generally in the 1-to-3-inch range.
2/8/2020	A weakening area of precipitation associated with developing low pressure along the Gulf Coast overspread southwest North Carolina during the morning. Temperatures were cold enough in most areas for the precipitation to fall as snow. While heavy snow accumulated in Graham County, total accumulations of 1 to 4 inches were seen for a couple of tiers of counties east of there. Due to a warm ground and roads, travel problems were minimal.
2/21/2020	Moisture overspreading a southward-moving cold front resulted in development of precipitation across the North Carolina mountains throughout the daylight hours of the 21st. Temperatures were cold enough in most locations for this precipitation to fall as snow, although rain mixed in at times below about 2500 feet. By the time the snow tapered off during the evening, snowfall totals ranged from trace amounts up to an inch in the lower interior valleys, to 1 to 4 inches above 2500 feet and in the valleys near the Blue Ridge.
12/24/2020	Precipitation associated with an area of low pressure and attendant cold front moved across western North Carolina throughout Christmas Eve into Christmas morning. Snow levels dropped quickly across the mountains during the evening hours, resulting in rain changing to snow. By the time the snow tapered off around daybreak on Christmas, snowfall totals range from 1 to 4 inches across the area, with locally higher amounts in the higher elevations. This was the first notable Christmas snowfall for this area since 2010.
1/7/2021	Snow developed across the mountains and foothills of North Carolina during the evening of the 7th as an area of low pressure moved across the coastal plain of Georgia and the Carolinas. The snow mixed with or changed to rain in many areas before tapering off during the daylight hours of the 9th. Total accumulations were generally in the 1-to-3-inch range, although some areas above 2500 feet or so saw as much as 4 inches.
Swain County	
1/16/2000	A quick burst of freezing rain and sleet caused numerous traffic accidents across the mountains. The precipitation was light - less than a tenth of an inch in most places, but as high as one third inch near Robbinsville.
2/6/2002	Light snow and sleet fell for much of the day. Up to 2 inches of accumulation was reported in a few locations, while most areas had only a dusting. By late afternoon, most locations had changed over to rain.
12/4/2002	Two inches of snow fell at Highlands, Cashiers, and Nantahala, while the highest elevations along the Tennessee border received as much as 6 inches. A combination of sleet, freezing rain, and rain was observed in the major valleys, with no significant accumulations.
12/22/2002	Freezing rain developed during the early morning across the North Carolina mountains, and some roads and bridges became ice covered. A few traffic accidents resulted.

Date	Description
12/25/2002	Light snow fell throughout the day across the North Carolina mountains, resulting in snowfall amounts of between a trace and 3 inches within the valleys. Four-to-six-inch amounts were common in the higher elevations from Madison County northward.
1/6/2003	Light snow fell for much of the day across the western mountains of North Carolina. By evening, 1 to 3 inches had accumulated, mainly in areas above 3000 feet. The snow was accompanied by wind gusts of up to 50 mph.
1/19/2003	Mainly light snow produced accumulations of 1 to 2 inches across much of the North Carolina mountains, although some high elevation areas along the Tennessee border received 3 to 6 inches, while locations near the Blue Ridge received little more than a dusting. In addition, gusty winds resulted in blowing snow across a portion of the area, with some snow drifts to one-and-a-half feet.
1/26/2003	Light snow fell across the North Carolina mountains during the evening of the 26th, and by early morning on the 27th, up to 3 inches of snow had accumulated. The heaviest amounts occurred in the highest elevations along the Tennessee border, while locations near the Blue Ridge received little more than a dusting.
2/9/2003	An extended period of intermittent light snow produced spotty accumulations of 1 to 2 inches within the major valleys of the North Carolina mountains. The higher elevations received as much as 4 inches, especially the highest peaks along the Tennessee border.
2/23/2003	Light snow resulted in accumulations of an inch or less across the mountains along the Tennessee border. This resulted in some slick spots on area roads.
3/30/2003	A light, wet snow developed around midnight across the southern and central mountains, and gradually intensified through dawn. By sunrise, 1 to 2 inches had accumulated across much of the area.
3/30/2003	After a brief lull, snow redeveloped during the afternoon across the mountains. By midnight, an additional 1 to 3 inches of snow had fallen, mainly in areas along the Tennessee border. Some of the highest peaks received as much as an additional 6 inches.
11/28/2003	The first significant snowfall of the season dumped 1 to 3 inches of snow in some of the major valleys of the North Carolina mountains, and in the higher elevations of the foothills. As much as 6 inches accumulated in the higher elevations of the Balsams and the Smokies.
12/3/2003	Light snow, mixed at times with sleet, fell across the North Carolina mountains, accumulating up to an inch in some areas.
12/4/2003	Heavy snow and sleet began during the early morning hours across the North Carolina mountains, and by late afternoon had accumulated to 3 to 4 inches across much of the area. Some slopes with an eastern exposure had up to 5 inches.
12/5/2003	Light snow fell across portions of the North Carolina mountains during the evening. Accumulations in most locations were an inch or less, although some locations along the Tennessee border received 2 to 3 inches.
12/10/2003	A mix of freezing rain, sleet, and snow fell across portions of the North Carolina mountains, resulting in some slick roads. Some of the highest elevations received up to an inch of snowfall.
12/17/2003	Light snow fell across the northern mountains of North Carolina. Most locations received a dusting, while an inch or two fell in some areas.
12/18/2003	Light snow developed during the evening of the 18th across the North Carolina mountains. Accumulations were light during this time, but some icy roads developed in the higher elevations. The snow became heavier late in the evening.
1/9/2004	Light snow developed across much of western North Carolina during the early morning hours of the 9th. By mid-morning, 1 to 2 inches had accumulated across much of the area. There were some isolated 3-inch amounts in the higher terrain along the Tennessee border. Many roads became slick and hazardous.

Date	Description
1/27/2004	Light snow developed across the Tennessee border counties during the evening of the 27th, and continued into the early morning hours of the 28th. Accumulations of 1 to 3 inches occurred, mainly right along the state line.
2/2/2004	Light freezing rain developed during the morning hours across the North Carolina mountains. This resulted in a thin layer of glaze that was responsible for numerous traffic accidents.
2/12/2004	Light snow developed across the southern mountains during the early morning hours, and accumulated up to 2 inches in some areas by daybreak.
3/30/2004	Light snow fell across much of the southern and central mountains, as well as the foothills, but accumulations were generally an inch or less.
4/13/2004	Light snow fell during the late evening and overnight hours across the North Carolina mountains. Accumulations of up to an inch occurred on grassy surfaces.
12/14/2004	Snow fell, along with winds sustained at 30 mph gusting to 40 mph, and accumulated generally from 1 to 3 inches across much of the mountains. Areas along the TN state line received the most, with areas around Highlands and Cashiers also receiving similar amounts.
1/22/2005	Light snow fell across the southern and central mountains overnight. The heaviest accumulations occurred near the Tennessee border, where 1–2-inch totals were common. Some of the higher elevations received as much as 4 inches. Accumulations tapered off rapidly toward the east, as locations from Franklin to Waynesville to Asheville received only a dusting. Roads became very slick and hazardous, and there were several traffic accidents, especially on I-40 through Haywood County.
2/10/2005	Light snow began to fall during the pre-dawn hours across the mountains, and continued off and on for much of the day. Accumulations ranged from a trace to an inch in locations from Bryson City to Waynesville to Asheville. However, locations along the Tennessee border, including the lower end of the French Broad Valley, received as much as 3 inches. Slick roads resulted in quite a few traffic accidents across the area.
2/27/2005	Wet snow, mixed with rain and sleet at times, began falling across western North Carolina during the evening of the 27th, and continued into the morning hours of the 28th. Total snow accumulations ranged from a trace across the southwest mountain valleys and lower elevations of the foothills and piedmont south of I-40, to 2 inches in the higher elevations, and in piedmont and foothills locations north of I-40. By around sunrise on the 28th, most of the precipitation had changed to rain.
2/28/2005	Snow showers redeveloped during the evening of the 28th, continuing off and on through the evening of the 1st. Additional snowfall accumulations of 1 to 2 inches were observed. The higher elevations along the Tennessee border were the main areas affected. However, some valley locations as far east as northern Buncombe and northern Jackson counties received light accumulations.
3/1/2005	Snow showers redeveloped during the evening of the 28th, continuing off and on through the evening of the 1st. Additional snowfall accumulations of 1 to 2 inches were observed. The higher elevations along the Tennessee border were the main areas affected. However, some valley locations as far east as northern Buncombe and northern Jackson counties received light accumulations.
3/8/2005	Snow showers developed behind a cold front across the western mountains during the morning hours and continued through much of the day. By the time the snow tapered off to flurries during the evening, isolated accumulations as high as 6 inches were observed in the higher elevations along the Tennessee border. However, the valleys generally received less than 2 inches.
3/11/2005	Snow showers developed behind a cold front across the western mountains during the afternoon of the 11th, and continued into the early morning hours of the 12th. By the time the snow ended, accumulations generally ranged from a trace to 2 inches across the area, although isolated higher amounts occurred in the higher elevations.

Date	Description
4/2/2005	Wet snow, heavy at times, developed in the higher elevations of the North Carolina mountains during the morning. By early evening, snowfall amounts ranged from trace amounts to 4 inches, mainly in areas above 3500 feet. By early evening, some of the highest elevations reached heavy snowfall criteria, mainly above 4000 feet. Light accumulations were reported in locations as low as 3000 feet. Meanwhile, the major valleys received mostly rain.
4/23/2005	A late season storm brought significant snowfall to the mountains of North Carolina. Accumulations were highly variable across the area, with as much as 8 inches falling in the higher elevations. However, even locations in the lower French Broad Valley observed up to 3 inches.
11/21/2005	Rain quickly transitioned to heavy snow across the higher elevations of the North Carolina mountains during the evening of the 21st. Snow quickly accumulated to depths of 1 to 3 inches, mainly in areas above about 3500 feet. Highway 441 was closed through the Smokies for a brief period of time. Portions of the Blue Ridge Parkway were also reported to be slick and hazardous. Mainly rain fell in the valleys during this time.
12/26/2005	Snow showers began around midnight and persisted through the overnight and morning hours across the western mountains. For the most part, accumulations ranged from 1 to 2 inches along the Tennessee border, with only trace amounts reported in areas from Robbinsville, to Bryson City, to Waynesville and Marshall. Isolated amounts of 3 to 5 inches were reported, especially in the higher elevations of Madison County.
1/14/2006	Snow developed across the mountains during the early morning hours, and was periodically heavy before tapering off to flurries and light snow showers later in the morning and during the afternoon. Total accumulations generally ranged from a trace to 3 inches, although there were some locally heavier amounts in the higher elevations. Accumulating snow extended into the higher elevations of the foothills, with around 3 inches reported at Little Switzerland.
1/30/2006	Rain changed to snow or a rain and snow mixture across the mountains of North Carolina for a brief period during the evening. In some locations, snow quickly accumulated to 1 to 2 inches before ending, mainly in areas above 3000 feet.
2/8/2006	Snow developed over the mountains during the evening and continued through much of the overnight hours. Accumulations ranged from 2 to 3 inches in the Pigeon River and Little Tennessee valleys to 1-2 inches in the lower French Broad valley and the high valleys of the northern mountains. Up to 8 inches fell in the higher elevations of the central mountains.
2/11/2006	
2/18/2006	The southern valleys saw a mixture of sleet, snow, and rain, while the central valleys and higher elevations saw sleet, snow and freezing rain which developed around sunrise and continued off and on through most of the day. Precipitation amounts were light, but numerous slick spots developed on roads, especially in the higher elevations. Numerous accidents resulted.
3/22/2006	Snow developed across the higher elevations of the North Carolina mountains during the evening and persisted through the overnight hours. By the morning of the 23rd, snow had accumulated to 1-3 inches, mainly in areas above 4000 feet.
11/19/2006	The first significant snowfall of the season in the North Carolina mountains mainly affected areas along the Tennessee border above 4000 feet. Accumulations of up to 4 inches were reported across the higher elevations along the Cherohala Skyway, in the Smokies, and across the northern mountains. Some light snow and sleet occurred in the valleys, but accumulations were limited to a dusting at best.
12/7/2006	Light snow accumulated to depths ranging from a trace in the valleys to up to 2 inches in the higher elevations near the Tennessee border. The combination of the snow and very cold temperatures caused roads to become very slick and hazardous. Numerous traffic accidents resulted.
12/26/2006	Light to occasionally moderate snow showers produced accumulations of 1 to 3 inches across the western mountains, mainly in elevations above 3000 feet. Valley locations generally received less than an inch.

Date	Description
1/21/2007	Light rain and freezing rain fell across the mountains for much of the day. Ice accretion was most concentrated in areas along and near the Blue Ridge, where around a tenth of an inch of ice accumulation was common, mainly on trees, power lines, and other elevated surfaces. However, some icy spots did develop on roads, and there were sporadic traffic accidents. In locations west of the Blue Ridge, significant accumulations of ice were mainly confined to the higher elevations, as the valleys warmed above freezing early in the day.
1/28/2007	Snow was mainly confined to the highest elevations during the morning. However, snow levels dropped quickly behind a front, and scattered to numerous snow showers produced 1 to 3 inches of snow along the Tennessee border through the day. South of I-40, accumulations were mainly confined to the higher elevations. However, most locations from the lower French Broad valley north received measurable snowfall. Due to very cold temperatures, the snow caused many roads to become slick and hazardous. Numerous vehicle accidents were reported, especially across the northern mountains.
4/6/2007	A record-setting cold airmass, northwest flow, and a strong upper air disturbance resulted in a late season snow shower event across the North Carolina mountains. The showery nature of the event resulted in highly variable snowfall totals across the area, with amounts ranging from a trace to 3 inches in the valleys, with heavier totals reported in the higher elevations along the Tennessee border.
1/1/2008	Scattered snow showers developed over the western mountains of North Carolina, and as far south and east as the foothills before dissipating during the late evening and overnight hours. By sunrise, accumulations ranged from trace amounts over the lower elevations of the foothills, to 4 inches across the higher elevations of the Blue Ridge mountains.
1/22/2008	Freezing drizzle developed during the morning hours across the valleys of the southwest mountains. Icy spots developed on some roads, and there were quite a few traffic accidents reported.
10/27/2008	The first mountain snowfall of the season produced accumulations as high as 4 inches, mainly across the higher elevations along the Tennessee border. However, even valley locations as far south and east as Cashiers, Black Mountain, and Brevard saw up to a half inch of snowfall.
11/16/2008	Light snow developed across the Tennessee border counties during the early morning hours, before tapering off by early afternoon. Significant accumulations were mainly confined to elevations above 3000 feet, with little more than a dusting reported in the lower valleys. Accumulations as high as 6 inches were reported on the higher peaks along the state line.
11/21/2008	Light snow showers began falling across the mountains of North Carolina around midnight, and continued off and on through the overnight and morning hours. Total accumulations ranged from trace amounts in the lower elevations near the Blue Ridge to as much as 3 or 4 inches in the higher elevations near the Tennessee border.
1/8/2009	Northwesterly, upslope winds brought a period of light to moderate snow showers to the southwest mountains of North Carolina, primarily along the Tennessee line. Accumulations ranged from 1 to 3 inches, mostly above 3000 feet.
1/13/2009	Light to moderate snow showers developed across much of the North Carolina mountains during the late evening. Snowfall amounts ranged from trace amounts to 3 inches or so in areas from the Smokies, to the lower and middle French Broad Valley, to the northern mountains.
1/17/2009	Snow showers developed across the mountains of western North Carolina during the late evening, and continued off and on for much of the night, before tapering off on the morning of the 18th. Snow accumulations ranged from trace amounts to amounts of around 3 inches.
2/2/2009	Light snow showers developed during the evening of the 2nd, and continued off and on for two days. Total accumulations ranged from amounts up to 2 inches in the lower elevations, to about 4 inches across many high elevation areas. Locally higher amounts occurred in the higher elevations along the Tennessee border.
2/22/2009	Snow showers developed during the pre-dawn hours across the western mountains and continued through the morning. By noon, accumulations of up to 2 inches were reported in the

Date	Description
	lower French Broad valley and the higher elevations of the interior mountains, while 3 inches or more fell in the highest elevations along the Tennessee border.
3/1/2009	Light rain changed to light snow across portions of the southwest mountains of North Carolina during the early afternoon hours. The snow continued off and on through the afternoon before ending during mid-evening. Accumulations generally ranged from a dusting to an inch.
10/17/2009	The first high elevation snowfall of the season occurred as moist northwest flow developed behind a strong cold front, resulting in scattered snow showers. Accumulations were mainly confined to areas along the Tennessee border, above 4000 feet, where as much as 2 inches fell. However, locations as far south as the high elevations above Lake Toxaway saw a dusting.
12/18/2009	A strengthening area of low pressure moved out of the Gulf of Mexico, across southern Georgia, and then up the southeast coast. As the low passed south of the region, snow became heavy across the southern and central mountains, as well as the Smokies and surrounding valleys late in the morning. Heavy snow developed a little later over the northern mountains. The heavy snow continued throughout the afternoon. Snowfall rates of 1-2 inches per hour became common across the area during the afternoon. Meanwhile, warming temperatures allowed the snow to mix with and eventually change to rain and sleet in the southwest mountain valleys. The heavy, wet snow combined with gusty winds to cause numerous trees and power lines to fall across the area during the afternoon. Widespread power outages resulted, and some customers were without power for as much as a week. Even longer outages affected parts of the northern mountains. ||The snow ended over the Blue Ridge and the central mountains on the evening of the 18th. However, wrap around snow showers developed along the Tennessee line, resulting in additional snow accumulations overnight and into the morning hours of the 19th. Total accumulations ranged from 12-18 inches across the lower northern mountain valleys, to 2-3 feet in the higher elevations along the Tennessee border, and in areas along the eastern escarpment. Over the southern and central mountains, total accumulations ranged from 6-10 inches in the lower elevations near the southern escarpment, to as much as 2 feet in the higher elevations. While the southwest mountain valleys generally saw only 3-5 inches, 2-3 feet of total snowfall was reported in the higher elevations of the Smokies and along the Cherohala Skyway in Graham County. Hundreds of traffic accidents were reported during the storm, and continued for several days thereafter, as continuous melting and refreezing of ice and snow resulted in treacherous road conditions during the late night and morning hours. Hospitals reported 100s of cases and slips and falls during this time as well.
1/2/2010	A very cold and moist northwest flow resulted in the development of scattered to numerous snow showers across the Tennessee border counties, and the higher elevations of Buncombe County, during the early morning hours. The higher elevations along the Tennessee line saw 2 to 4 inches of powdery snow, while the lower elevations received anywhere from trace amounts to 2 inches. The snow was a little heavier in Avery County, were total accumulations ranged from 2 to 3 inches in the lower valleys to 4-6 inches in the higher elevations along the state line.
1/4/2010	Another round of very cold and moist northwest flow resulted in development of scattered to numerous snow showers across the western mountains overnight on the 4th. The showers persisted off and on through the day of the 5th. 24-hour snowfall totals of 1-4 inches were common across the area, with the highest amounts occurring over the higher elevations. Over Avery County, heavy snow accumulations occurred, with amounts ranging from 2-3 inches near the Blue Ridge, to 6-8 inches in the higher elevations along the Tennessee border.
1/7/2010	A very cold and moist northwest flow resulted in development of scattered to numerous snow showers across the western mountains during the evening of the 7th. The snow showers continued across much of the Tennessee border counties through the day on the 8th, with heavy accumulations reached in some areas by late morning. Total accumulations ranged from 1-3 inches over the lower French Broad Valley, to 3-6 inches across the northern mountains. Over the southwest mountains, total snowfall accumulations ranged from trace amounts in the valleys beneath the Smokies, to 2-4 inches in the higher elevations along the Tennessee border.

Date	Description
1/9/2010	A very cold and moist northwest flow resulted in development of scattered to numerous snow showers across the western mountains during the evening of the 9th, continuing into the 10th. Total snowfall accumulations were highly variable across the area, ranging from trace amounts in the valleys beneath the Smokies to as much as 4 inches in some areas.
1/12/2010	Snow showers developed across the western mountains during the early morning hours. In some areas, the snow changed to freezing drizzle, resulting in extremely slick roads, especially in the Asheville and Weaverville areas. Hundreds of vehicle accidents occurred during the morning rush. Accumulations of ice and snow ranged from trace amounts in the lower valleys to a couple of inches above 3000 feet.
2/4/2010	Low pressure moved across the deep south, spreading light snow over the southern mountains of North Carolina during the late afternoon. The snow gradually spread north and east into the North Carolina foothills and piedmont during the evening and overnight hours. The snow mixed with sleet during the evening, before changing to mostly sleet after midnight, then changing to rain as temperatures warmed during the pre-dawn hours. Total accumulations of sleet and snow ranged from trace amounts along the edge of the southern escarpment of the Blue Ridge, to 3 inches north of I-40 and in the higher elevations of the Balsams. Heavier snow fell across the central and northern mountains as well as the foothills of North Carolina, which is detailed elsewhere in Storm Data.
2/10/2010	Moist northwest flow behind a cold front produced numerous snow showers across the western mountains of North Carolina during the early morning hours. Snow began to quickly accumulate, and by late morning, snowfall ranged from trace across the interior valleys from Asheville, to Waynesville, to Franklin, to an inch or two in the valleys near the Tennessee border, to 4 to 5 inches in the higher elevations. Gusty winds of 30 to 40 mph caused periods of blizzard-like conditions, with considerable blowing and drifting snow. A few trees and power lines were blown down across the area as well.
2/12/2010	Light snow developed during the early evening across the mountains, and then quickly spread into the foothills and the western piedmont through the evening. Total snowfall ranged from an inch or two in areas north of I-40, to as much as three inches in areas further to the south.
2/15/2010	A band of light to moderate snow moved rapidly across the North Carolina mountains during the morning. Higher elevations saw as much as 4 inches of snow, with most valley locations receiving an inch or less.
2/15/2010	Scattered to numerous northwest flow snow showers developed on the evening of the 15th, and continued on and off for more than two days. Three-day totals varied widely across the area, depending upon terrain. While the lower elevations from Bryson City, to Waynesville and Sylva, to Asheville saw little more than a dusting, some of the higher elevations along the Tennessee border, including the Smokies and the Cherohala Skyway received 6 or more inches during the period.
3/3/2010	Northwest flow snow showers developed during the pre-dawn hours across the Tennessee border counties, and persisted off and on for the next 24 hours. By the morning of the 4th, total accumulations ranged from trace amounts in the valleys below the Smokies, to 2-5 inches in the higher elevations along the state line.
3/22/2010	Snow showers developed over the mountains during the early afternoon, and continued into the evening hours. Total snowfall ranged from trace amounts in the valleys, to as much as 4 inches at the highest peaks.
12/4/2010	A storm system brought light snow to the high elevations of the North Carolina mountains early on the 4th. By early afternoon, 1 to 3 inches of snow was reported across the higher elevations, mainly above 3500 feet. After an arctic cold front passed through the area, snow levels dropped quickly during the afternoon and evening, while strong northwest winds resulted in development of scattered to numerous snow showers. The snow showers persisted for almost three days, with snowfall piling up steadily over the ensuing 60 hours. By the morning of the 7th, 3-day accumulations ranged from around 10 inches in the higher elevations of the Smokies, to as much

Date	Description
	as 18 inches in the higher elevations of the northern mountains. Snowfall totals in the lower elevations were much less, generally 2-6 inches in the valleys of the Tennessee border counties. Gusty winds and very cold temperatures also resulted in wind chill values below 0 in many areas during the overnight and early morning hours.
12/15/2010	Light precipitation fell across the mountains during the evening, and continued for much of the overnight. Precipitation mainly fell as freezing rain, although some areas saw a period of light accumulating snow at the onset. By late morning, most areas had received at least a trace of ice accretion, resulting in very slippery roads. Over the piedmont and foothills the majority of the precipitation fell as freezing rain and freezing drizzle. Most areas saw at least trace amounts of ice, with some areas along the I-40 corridor seeing as much as a tenth of an inch. Very hazardous driving conditions existed across the northern foothills and northwest Piedmont. Locations closer to I-85 only saw a light glaze on elevated surfaces and patchy slick spots on roads. Hundreds of traffic accidents were reported across the region. Temperatures warmed above freezing in most areas by late morning.
1/5/2011	A weak area of low pressure brought a brief period of light snow to the western mountains of North Carolina during the evening. Total accumulations ranged from 1 to 3 inches across the area.
1/11/2011	Moist northwest flow resulted in the development of scattered to numerous snow showers during the evening of the 11th. The snow showers persisted overnight and throughout the 12th. Total accumulations were highly variable across the area, but generally ranged from 1 to 6 inches, with some higher amounts in the higher elevations along the Tennessee border.
1/24/2011	A quick shot of snow produced light accumulations in a brief period of time across the mountains during the pre-dawn hours. Although most areas saw little more than a dusting, roads became very slick, and numerous traffic accidents occurred during the morning rush, especially in areas along and north of I-40.
1/26/2011	As low pressure developed off the southeast coast, rain changed to snow across the higher elevations of the North Carolina mountains during the morning, and gradually worked its way toward the valleys as colder air filtered into the region. The widespread precipitation moved away from the region during the afternoon, but developing moist northwest flow resulted in development of scattered to numerous snow showers across the area. By midnight, snowfall accumulation ranged from little more than a dusting in the valleys to 4 or 5 inches in the highest elevations along the Tennessee border.
2/9/2011	A weakening storm system brought light snow to portions of the western Carolinas during the evening. Total accumulations ranged from a dusting to an inch over the Piedmont to 1 to 2 inches across much of the mountains.
3/6/2011	Light snow developed across the higher elevations of the mountains of North Carolina in the wake of a cold front. Accumulations generally ranged from 1 to 4 inches at elevations above 3500 feet. However, some areas above 5000 feet received as much as 7 inches.
3/11/2011	As colder air filtered into the mountains behind a cold front, snow levels dropped to the higher elevations during the evening. Snow showers continued the rest of the night along the Tennessee border, where snow totals ranged from 2 to 5 inches at elevations above 4000 feet. However, even some of the western valleys saw around an inch as snow levels continued to drop overnight.
11/29/2011	Rain changed to snow across the higher elevations of the North Carolina mountains during the morning and began to accumulate by early afternoon. The snow began to taper off from the southwest during the afternoon, before ending early on the 30th. Accumulations were generally confined to areas above 3000 feet or so, and most locations only saw on inch or two, although some areas of the northern mountains saw as much as 4 inches.
12/7/2011	Snow showers developed across the western mountains as afternoon temperatures fell rapidly behind a cold front. Accumulating snow was mainly confined to the higher elevations above 3000 feet or so, where as much as three inches accumulated by late evening.
1/2/2012	Snow showers developed across the mountains during the evening behind a very strong cold front. Snow continued off and on through the night and much of the 3rd before ending during

Date	Description
	the afternoon. Total accumulations ranged from a dusting near the southern Blue Ridge to four inches across the Tennessee border counties. Localized higher amounts were reported in the high elevations along the state line, mainly north of the Smokies. Even where little snow fell, temperatures that fell rapidly into the teens resulted in snow sticking to roadways on the night of the 2nd and early on the 3rd. Dozens of accidents occurred across the region.
2/11/2012	Snow showers developed over much of the North Carolina mountains during the early morning hours, and continued throughout the day. Snow showers continued off and on across the Tennessee border counties during the evening and early part of the overnight. Total accumulations ranged from a couple of inches in the lower valleys, to as much as 8 inches in the higher elevations of the Newfound Mountains and northern mountains.
10/29/2012	As Superstorm Sandy moved across New England and stalled over the northern Mid-Atlantic region, abundant moisture was transported into the mountains. The first snow showers of the season developed within this moist northwest flow across the higher elevations of the southwest North Carolina mountains during the pre-dawn hours of the 29th. Snow showers, some heavy, continued through the day and overnight, and by the pre-dawn hours of the 30th, heavy snowfall accumulations were observed across the higher elevations of the Smokies, Balsams, and Newfound Mountains. By the time the snow showers tapered off during the late evening, 1-2 feet of snow was reported in the high elevations (above 4000 feet or so), with the heaviest amounts occurring at the peaks along the Tennessee border. Meanwhile, the lower valleys saw much less snowfall. In fact, some of the lower valleys beneath the Smokies saw little more than flurries.
11/5/2012	Light snow developed in the southern and central mountains, mainly above 3000 feet. The snow continued off and on overnight, with total accumulations ranging from trace amounts to as much as 2 inches in the higher elevations of the Balsams and Newfound Mountains.
12/29/2012	Snow showers developed behind a cold front by the evening of the 29th, and continued off and on through the night before ending early on the 30th. Valley accumulations ranged from little more than a dusting in the lower elevations beneath the Smokies and the middle French Broad Valley, to an inch or two across the lower French Broad and the high valleys of the northern mountains. Meanwhile, some high elevation locations near the Tennessee border saw 6 inches or more.
1/17/2013	Rain gradually began to change to snow, first in the higher elevations of the central mountains, followed by the northern foothills and the northwest Piedmont. Although snow was heavy at times in the Piedmont, warm ground temperatures and rain mixing in at times resulted in little accumulation. The brief period of heavy snow was accompanied by occasional lightning and thunder in the Piedmont. Total accumulations ranged from trace amounts in the central mountain valleys to 1-3 inches across the higher elevations, to generally 2 inches or less across the northern foothills and northwest Piedmont.
1/25/2013	Light sleet developed across much of the western Carolinas and northeast Georgia during the morning. The intermittent sleet eventually changed to light freezing rain in most areas by late afternoon. Most areas north of the I-85 corridor saw measurable sleet, generally less than a quarter inch. A light glaze then fell on top of that, making for treacherous driving conditions during the afternoon. Most areas south of the I-85 corridor saw only trace accumulations, but that was enough to cause plenty of slick spots. Hundreds of accidents were reported across the area, especially along the I-85 corridor.
2/1/2013	Snow showers developed across the mountains around midnight and continued off and on through the morning hours. Accumulations ranged from less than an inch in the valleys surrounding the Smokies to 1-4 inches across much of the northern mountains and the lower French Broad Valley. High elevations along the Tennessee border saw slightly higher amounts.
2/15/2013	Light snow and snow showers developed during the evening of the 15th, and continued periodically through the early morning of the 17th. By the time the snow tapered off, most areas had received 1 to 4 inches, with locally heavier amounts in the higher elevations.

Date	Description
2/19/2013	Precipitation developed across the mountains during the early morning hours. Precipitation fell mainly as snow in the high elevations, but snow levels quickly worked their way down to the valleys by sunrise before coming to an end. Most areas above 3000 feet saw 1 to 3 inches of snow, with locally higher amounts, especially across the Balsams and Nantahalas. Valley locations saw accumulations from a light dusting to around an inch.
2/27/2013	Snow showers developed during the late evening of the 27th and continued off and on for several days. Total snowfall across the northern mountains and the high elevations of the Smokies and Newfound Mountains was estimated at 3 to 8 inches, with a foot or more estimated at the peaks and ridge tops of the northern mountains. However, gusty winds causing quite a bit of blowing snow, and long lulls between snow showers allowing for some melting made accurate snowfall totals difficult to come by.
3/1/2013	Snow showers developed during the late evening of February 27th and continued off and on until the afternoon hours of March 2nd. Total snowfall across the northern mountains and the high elevations of the Smokies and Newfound Mountains was estimated at 3 to 8 inches, with a foot or more estimated at the peaks and ridge tops of the northern mountains. However, gusty winds causing quite a bit of blowing snow, and long lulls between snow showers allowing for some melting made accurate snowfall totals difficult to come by.
3/5/2013	Snow showers developed across the mountains during the evening of the 5th and continued through the overnight hours, with heavy snowfall criteria reported in many areas by dawn. Total accumulations generally ranged from 2 to 5 inches across the area. Some valley locations saw a little less, while the higher elevations saw as much as 8 inches. Very gusty winds also resulted in considerable blowing and drifting of the snow.
3/20/2013	Snow showers developed over the western mountains during the evening of the 20th and continued off and on through the mid-morning hours of the 21st. Total accumulations ranged from 1 to 3 inches across the Tennessee border from Haywood County north, and across the higher elevations of the southern mountains.
3/25/2013	Snow showers developed during the early morning hours of the 25th and continued off and on throughout the day. Synoptically enhanced northwest flow snow showers became heavy overnight across the western mountains, and by the afternoon hours of the 26th storm total snowfall amounts of 4 to 8 inches were common across the area. Snow showers continued through the early morning hours of the 27th across the higher elevations near the Tennessee border, where totals of a foot or more were prevalent. Heavy snowfall was mainly confined to areas above 3000 feet or so in the southern and central mountains, but was a little more widespread in the northern mountains.
11/26/2013	As cold air spilled into the North Carolina mountains in the wake of an arctic cold front, rain quickly changed to snow during the pre-dawn hours. Periods of moderate and briefly heavy snow were reported at times. Precipitation ended in most areas by late morning. However, northwest flow snow showers continued across the Tennessee border counties through the 27th before ending around midnight. Most areas saw an inch or less of accumulation. However, 2-4 inches fell across the higher elevations along the Tennessee border, although accumulations were difficult to report owing to wind gusts up to 50 mph causing considerable blowing and drifting snow.
1/2/2014	After a strong cold front introduced much colder air to the mountains, snow showers developed across the mountains during mid-evening and continued into the overnight hours. Light accumulations were primarily confined to areas above 3500 feet, where 1-4 inches accumulated by the pre-dawn hours. Locally higher amounts occurred on the higher peaks near the Tennessee border. Lower elevations saw little more than a dusting. Very strong northwest winds gusting as high as 50-60 mph also resulted in considerable blowing and drifting of snow in the high elevations.
1/21/2014	Widespread snow showers developed along the Tennessee border along and immediately behind a cold front during the late morning and moved east to the interior mountains, where occasional snow fell off and on through the day. By late evening, 1 to 4 inches had accumulated in many

Date	Description
	areas of northern Jackson, northern Buncombe, and the high elevations of Swain and northern Macon Counties.
1/28/2014	Light snow developed across the mountains during the morning and continued into the afternoon before tapering off. The snow initially melted on roads. However, air temperatures rapidly cooling into the lower and mid 20s caused many roads to subsequently freeze. Although snowfall totals were very light (an inch or less in most areas), the slick roads caused hundreds of traffic accidents, including a school bus that overturned in Henderson County.
2/10/2014	Light to moderate snow developed across the central and northern mountains during late morning and continued off and on through the afternoon. While most locations saw an inch or less, a small band of moderate to heavy snow developed during the afternoon from the high elevations of northern Jackson County, through central Haywood, and central and southern Buncombe Counties, where two-to-four-inch amounts were common. Some high elevation areas saw as much as 5 inches in this area. Several accidents in the Balsam area resulted in major traffic problems on Highway 74 near the Haywood/Jackson line.
2/12/2014	A Miller type-A low pressure system moved up along the South Carolina coast bringing widespread heavy snow to the mountains of western North Carolina. Total accumulations generally ranged from 5-9 inches across the area, although locations above 4000 feet or so saw 1-1.5 feet.
3/24/2014	As an upper air disturbance approached the region from the west, light to moderate snow developed across the North Carolina mountains around midnight early on the 25th, mainly in the high elevations of the southern mountains, and across much of the central and northern mountains (including the valleys) near the Tennessee border. The bulk of the snow accumulated during the morning of the 25th, when 2-4 inches fell across a fairly large area. Snow showers then redeveloped within northwest flow behind a cold front across the Tennessee border counties during the afternoon, resulting in additional accumulations, although those were primarily confined to the high elevations along the Tennessee border. Total accumulations ranged from 2-4 inches in the valleys across the Tennessee border counties (from I-40 north) and in the high elevations of the southern mountains, to 4-8 inches in the higher elevations along the Tennessee border.
3/29/2014	Snow showers developed behind a strong cold front across the western mountains late on the evening of the 29th and continued off and on through the night before tapering off around sunrise. Total accumulations were generally in the 1–2-inch range across the high elevations and in the valleys from around I-40 north. However, locally heavy snowfall in the 6-10\ range was reported in the higher elevations of the Smokies.
10/31/2014	Precipitation associated with a strong upper-level disturbance and associated strong cold front changed to snow at the highest peaks and ridge tops by early Halloween evening, with snow levels dropping rapidly to the valley floors by the end of the evening as an arctic air mass infiltrated the region behind the front. Snowfall accumulation by midnight was mainly confined to the high elevations, although the snow continued into the morning of the 1st.
11/26/2014	Rain associated with a cold front changed to snow across the high elevations of the North Carolina mountains during the early morning hours of the 26th. The snow was brief, but heavy at times, with a quick couple of inches accumulating in some areas. the precipitation ended by mid-morning, but snow showers redeveloped near the Tennessee border during the afternoon on a cold and moist northwest flow. Accumulating snowfall continued off and on across the Tennessee border counties through the evening and overnight hours before tapering off during the morning of the 27th. Total accumulations ranged from up to two inches in the valleys north of I-40 near the Tennessee border, to 2-6 inches with locally higher amounts in the high elevations, mainly above 4000 feet.
1/26/2015	Snow developed across the higher elevations of the North Carolina mountains as a cold front moved across the area during the early morning of the 26th. A quick 2-4 inches fell during the morning, mainly above 4000 feet. After a brief lull, a moist northwest flow developing behind the

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	front resulted in scattered to numerous snow showers developing near the Tennessee border by afternoon, which continued off and on through the 27th. 36-hour accumulations ranged from 4-8 inches across the high elevations (mainly above 4000 feet), while the valleys saw little more than a dusting. The highest totals occurred across the Smokies, Balsams, and surrounding mountains.
2/16/2015	Sleet and snow overspread the mountains and foothills of North Carolina during the afternoon and began to accumulate. Precipitation changed quickly to sleet in most areas, before mixing with freezing rain from southwest to northeast during the late afternoon and early evening. Sleet and freezing caused deteriorating road conditions by early evening, when heavy accumulations of sleet and/or freezing rain were reported across much of the area. Most locations saw around a half inch to an inch of sleet, along with around a tenth of an inch of ice accretion. The valleys of southwest North Carolina saw more freezing rain than sleet, with about one quarter inch of ice reported. Scattered power outages were therefore more concentrated there. Meanwhile, the northern foothills saw mostly sleet, with many areas reporting 2 to 3 inches of accumulation. Roads became very treacherous and impassable in many areas until melting began on the afternoon of the 17th.
2/18/2015	Snow showers developed across the Southern Appalachians along and immediately behind a strong arctic cold front that swept across the region during the afternoon of the 18th. Snow tapered off in most areas through the evening, the only exception being locations across the far western North Carolina mountains, where snow showers didn't taper off until the pre-dawn hours of the 19th. Total accumulations ranged from a dusting up to an inch in locations closer to the South Carolina border and the lower valleys surrounding the Smokies, to 2-4 inches in the valleys north of I-40 near the Tennessee border. Locally, much higher amounts occurred across the high peaks and ridge tops near the Tennessee border. Combined with the snowfall from the storm of the 16th/17th, areas above 5000 feet reported 1-2 feet of snow on the ground by the morning of the 19th. Very strong winds resulted in considerable blowing and drifting of snow and periods of blizzard-like conditions across these high elevations.
2/20/2015	Light snow developed across portions of the southern Appalachians during the evening of the 20th in association with a warm front. The snow began to mix with or change to sleet in some areas during the overnight before a transition to rain occurred around daybreak on the 21st. Accumulations ranged from a half inch to an inch, with locally higher amounts of around 2 inches in areas that saw only snow.
2/23/2015	Light snow associated with a wave of low pressure overspread the southern Appalachians by late evening of the 23rd, and continued into the overnight. Snow, heavy at times, continued into the pre-dawn hours, when heavy snow accumulations were reported across much of the area. Total accumulations were generally in the 3-to-5-inch range, with locally higher amounts reported in the high elevations. The snow tapered off shortly after sunrise.
2/25/2015	After the significant snowfall that fell across the mountains on the morning of the 24th, an area of low pressure moving along the Gulf Coast spread yet another round of snow across the southern Appalachians during the evening of the 25th. The snow was heavy at times, and quickly accumulated. Heavy accumulations were reported in many areas by late evening. By the time the snow tapered off during the early morning of the 26th, total accumulations ranged from 4 to 6 inches, with locally higher amounts across the mountains.
3/27/2015	Snow showers developed across the western North Carolina mountains during the evening and continued through the overnight before dissipating during the pre-dawn hours. Accumulations generally ranged from 1-2 inches in the lower elevations, while the high elevations near the Tennessee border saw 2-4 inches.
1/20/2016	Light snow developed over the mountains of North Carolina in association with an upper air disturbance during the morning. The snow continued off and on through much of the day before winding down during the evening. The most significant accumulations were above 4000 feet or so, where amounts ranged from 5 to 8 inches. Meanwhile, valley totals ranged from a half inch

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	across the upper French Broad Valley to around 3 inches across the high valleys of the northern mountains.
1/22/2016	Light snow developed around midnight across the southwest mountains of North Carolina in association with an area of low pressure. The snow became moderate to heavy at times during the pre-dawn hours. By sunrise, accumulations of 2-6 inches were common across the area. Warm air began filtering into the valleys from the southwest through the morning, and by late morning, most of the Little Tennessee Valley and surrounding valleys south of the Smokies had transitioned to rain. Total accumulations ranged from 2-5 inches in the far southwest valleys, to more than a foot across the high elevations and the upper French Broad Valley, where the cold air remained in place through the day.
2/8/2016	A moist northwest flow developing in the wake of a strong arctic cold front brought a protracted period of scattered to numerous snow showers to the far western mountains of North Carolina. Although snow showers developed off and on over a 60-hour period, most valley locations received rather light accumulations, generally of 2-5 inches, with locally higher amounts reported close to the Tennessee border. This was especially the case over northern Madison County, where a small band of moderate to heavy snow developed off and on, and some locations saw storm total amounts of as much as a foot there. Otherwise, the highest totals were found above 4000 feet, where storm total amounts ranged from 12-18 inches.
3/20/2016	A moist northwest flow interacted with an unseasonably cold air mass to produce snow showers across the mountains, especially across the Tennessee border counties during the afternoon and evening. Accumulating snowfall was confined to the high elevations, mainly above 4000 feet, where totals ranged from 2 to as high as 6 inches across the Smokies and the Balsams.
5/5/2016	Showers developing within an unseasonably cold airmass in the wake of a cold front and beneath an area of deep upper-level low pressure resulted in a late season accumulating snowfall across the high elevations of the North Carolina mountains. Elevations above about 5000 feet near the Tennessee border saw anywhere from a dusting up to about 5 inches.
1/29/2017	A strong upper air disturbance combined with moist northwest winds flowing up the western slopes of the Appalachians resulted in development of numerous snow showers across the North Carolina mountains throughout the 29th and into the early part of the 30th. The most significant impacts were to the high elevations (above 5000 feet) of the northern mountains, where as much as a foot of snow fell. Meanwhile, total accumulations in the high valleys of the northern mountains were generally in the 2–4-inch range. Farther south, accumulations in the high elevations of the Smokies and other ranges along the Tennessee border were from 2 to 5 inches, while the lower valleys from the French Broad south saw little more than an inch.
3/11/2017	An upper-level disturbance interacting with an unseasonably cold air mass resulted in light to moderate snow overspreading the North Carolina mountains late on the 11th, continuing through the overnight hours before tapering off on the morning of the 12th. Total snowfall accumulation generally ranged from 1-3 inches. However, some locations received as much as 5 inches, particularly near the South Carolina border.
3/14/2017	As low pressure moved up the East Coast, light precipitation developed over western North Carolina during the evening of the 13th, beginning as rain in most locations. As colder air wrapped into the area behind the low, snow levels dropped, allowing all but the lower valleys to transition to snow. Moist northwest flow resulted in the precipitation retreating to the Tennessee border areas with time. Total accumulation was generally in the 3-to-5-inch range for elevations above 3500 feet or so, while the lower valleys saw anywhere from trace amounts to around a couple of inches.
10/29/2017	A strong and moist northwest flow developing in the wake of a cold front resulted in development of snow showers across the high terrain of the far western mountains of North Carolina. The first accumulating snowfall of the season was observed across the high elevations along the Tennessee border, where 1 to 4 inches fell, mainly above 4000 feet. Additionally, very gusty winds of 40-50

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	mph (50-60 mph at the high elevations) developed across the mountains and foothills, with some damage due to a falling tree reported across the foothills.
12/8/2017	As moisture associated with developing and strengthening low pressure over the northeast Gulf of Mexico overspread the western Carolinas, snow developed over the mountains of southwest North Carolina around daybreak on the 8th and quickly accumulated. By late morning, heavy snowfall accumulations were reported across the Smoky Mountains and Balsams and vicinity. Total accumulations generally ranged from 8-12 inches, with locally higher amounts well over a foot reported in the higher elevations, and lower amounts reported in the low valleys along the Tennessee border. While occasional flurries and light snow showers produced locally light additional accumulations into the early daylight hours of the 9th, the accumulating snow ended in most areas shortly after midnight.
1/17/2018	As a strengthening upper-level disturbance and associated cold front approached the region from the Tennessee Valley, light precipitation developed across the North Carolina mountains around midnight. While the precipitation may have started as rain or a rain/snow mix in the lower valleys, a transition to snow had occurred in most locations by daybreak. As the snow band moved east, snowfall rates increased with time such that the highest totals were found north and east of the Balsams, where amounts of 2-4 inches were common. Meanwhile, locations west of the Balsams generally saw 1-2 inches.
1/29/2018	A strong upper-level disturbance and associated cold front swept across the mountains during the late evening, bringing cold air and moisture, with snow initially developing in the higher elevations before snow levels quickly dropped to the valley floors. After the cold front passed, strong northwest winds pushing cold air and moisture up the western slopes of the Appalachians resulted in a continuation of snow showers across the Tennessee border counties through the overnight before the snow tapered off to flurries around sunrise. Measurable snowfall was generally limited to the high elevations (above 3500 feet or so) roughly southwest of I-26, while accumulations were a little more evenly distributed across the northern mountains. Total accumulations of 2-5 were reported throughout these areas, with locally higher amounts of up to 7 inches across the high peaks and ridge tops, and across portions of Avery County.
3/7/2018	A moist northwest flow developing in the wake of a cold front resulted in snow shower development near the Tennessee border throughout the morning of the 7th. Snow showers were somewhat scattered and accumulations were largely dependent upon terrain exposure and elevation. Most locations saw from a dusting to up to 2 inches. However, localized amounts of 4 to 6 inches were reported, primarily in the high elevations.
12/21/2018	Rain changed to snow across the high elevations of the North Carolina mountains as freezing levels quickly fell in the wake of a strong cold front. A cold and moist northwest flow developing in the wake of the front across the Tennessee Valley and the southern Appalachians resulted in scattered to numerous snow showers continuing near the Tennessee border throughout the afternoon and evening of the 21st, through the morning of the 22nd. Accumulations were mainly confined to elevations above 3500 feet, where 1 to 3 inches generally fell. Some locations above 5000 feet reported as much as a half foot.
1/29/2019	Moisture associated with a cold front resulted in development of precipitation across the North Carolina mountains during the morning of the 29th. Temperatures were cold enough in the high elevations for most of the precipitation to fall as snow. Moist northwest flow developing in the wake of the front resulted in snow shower development near the Tennessee border throughout the afternoon. By the time the snow tapered off during the evening, total accumulations of 1 to 4 inches were reported, mainly above 3500 feet along the Tennessee border. Meanwhile, the lower elevations saw a heavy dusting at best.
12/1/2019	Arctic air filtering in behind a cold front, along with a moist northwest flow resulted in the first notable snowfall event of the season for portions of the North Carolina mountains. Scattered to numerous snow showers continued through the day of the 2nd before tapering off during the early morning of the 3rd. Total accumulations were largely elevation dependent, with only a

Date	Description
	dusting up to an inch reported in the valleys, with 2-4 inches reported above 3500 ft or so. Locally higher amounts were reported in the higher elevations along the Tennessee border.
1/27/2020	Precipitation developed across western North Carolina early on the 27th in association with an upper-level disturbance. Temperatures above roughly 3500 feet were cold enough for much of this precipitation to fall as snow. By the time the snow tapered off to light snow showers and flurries late in the evening, accumulations of 2 to 4 inches were common in the high elevations, with some locally higher totals.
2/8/2020	A weakening area of precipitation associated with developing low pressure along the Gulf Coast overspread southwest North Carolina during the morning. Temperatures were cold enough in most areas for the precipitation to fall as snow. While heavy snow accumulated in Graham County, total accumulations of 1 to 4 inches were seen for a couple of counties east of there. Due to a warm ground and roads, travel problems were minimal.
2/21/2020	Moisture overspreading a southward-moving cold front resulted in development of precipitation across the North Carolina mountains throughout the daylight hours of the 21st. Temperatures were cold enough in most locations for this precipitation to fall as snow, although rain mixed in at times below about 2500 feet. By the time the snow tapered off during the evening, snowfall totals ranged from trace amounts up to an inch in the lower interior valleys, to 1 to 4 inches above 2500 feet and in the valleys near the Blue Ridge.
2/26/2020	A moist northwest flow ushering in quickly falling temperatures resulted in snow showers developing near the Tennessee/North Carolina border by early evening on the 26th, which then continued through the overnight before ending by late morning of the 27th. Appreciable snow accumulations were primarily confined to the higher elevations of the counties bordering Tennessee, where 1 to 4 inches, with some locally higher amounts fell.
2/28/2020	A strong upper-level disturbance crossing the southern Appalachians resulted in redevelopment of snow showers across the North Carolina mountains throughout the 28th and early on the 29th. The relatively long duration of the event along with the enhanced lift from the disturbance allowed for higher accumulations than normally seen during northwest flow events, while accumulating snowfall was also reported well south and east of the usual Tennessee border areas, including across portions of the middle and upper French Broad Valley. Total amounts were generally in the 2–4-inch range, although amounts as high as 8 inches were reported on some of the high peaks and ridge tops.
11/30/2020	Snow levels fell quickly across the North Carolina mountains during the evening in the wake of a strong cold front. Strong northwest winds pushing moisture up the western slopes of the Appalachians resulted in development of numerous to widespread snow showers near the Tennessee border. By midnight on the 1st, accumulations of up 2 inches were reported, with locally higher amounts above 3500 feet. The snow showers continued into the 1st, when heavy snowfall totals were realized during the pre-dawn hours.
1/7/2021	Snow developed across the mountains and foothills of North Carolina during the evening of the 7th as an area of low pressure moved across the coastal plain of Georgia and the Carolinas. The snow mixed with or changed to rain in many areas before tapering off during the daylight hours of the 9th. Total accumulations were generally in the 1-to-3-inch range, although some areas above 2500 feet or so saw as much as 4 inches.
2/6/2021	Snow developed across the North Carolina mountains during the afternoon and evening of the 6th and continued through the overnight as a cold front approached from the Tennessee and Ohio Valleys. By the time the snow tapered off during the morning of the 7th. Total accumulations ranged from 2 to 4 inches across the area, with some locally higher amounts reported above 3500 feet or so.
1/29/2019	Moisture associated with a cold front resulted in development of precipitation across the North Carolina mountains during the morning of the 29th. Temperatures were cold enough in the high elevations for most of the precipitation to fall as snow. Moist northwest flow developing in the wake of the front resulted in snow shower development near the Tennessee border throughout

Date	Description
	the afternoon. By the time the snow tapered off during the evening, total accumulations of 1 to 4 inches were reported, mainly above 3500 feet along the Tennessee border. Meanwhile, the lower elevations saw a heavy dusting at best.
12/1/2019	Arctic air filtering in behind a cold front, along with a moist northwest flow resulted in the first notable snowfall event of the season for portions of the North Carolina mountains. Scattered to numerous snow showers continued through the day of the 2nd before tapering off during the early morning of the 3rd. Total accumulations were largely elevation dependent, with only a dusting up to an inch reported in the valleys, with 2-4 inches reported above 3500 ft or so. Locally higher amounts were reported in the higher elevations along the Tennessee border.
1/27/2020	Precipitation developed across western North Carolina early on the 27th in association with an upper-level disturbance. Temperatures above roughly 3500 feet were cold enough for much of this precipitation to fall as snow. By the time the snow tapered off to light snow showers and flurries late in the evening, accumulations of 2 to 4 inches were common in the high elevations, with some locally higher totals.
2/8/2020	A weakening area of precipitation associated with developing low pressure along the Gulf Coast overspread southwest North Carolina during the morning. Temperatures were cold enough in most areas for the precipitation to fall as snow. While heavy snow accumulated in Graham County, total accumulations of 1 to 4 inches were seen for a couple of counties east of there. Due to a warm ground and roads, travel problems were minimal.
2/21/2020	Moisture overspreading a southward-moving cold front resulted in development of precipitation across the North Carolina mountains throughout the daylight hours of the 21st. Temperatures were cold enough in most locations for this precipitation to fall as snow, although rain mixed in at times below about 2500 feet. By the time the snow tapered off during the evening, snowfall totals ranged from trace amounts up to an inch in the lower interior valleys, to 1 to 4 inches above 2500 feet and in the valleys near the Blue Ridge.